Qeedji

Developer manual 002A

AOSP-9.10.10

Legal notices

AOSP-9.10.10 (002A_en)

Rights and Responsibilities

Product information

The conception and specifications of the product may change without prior notice, and this applies to hardware, embedded software and this guide. Consumable items accessories may slightly differ than herein described as Qeedji is depending on the evolutions of its suppliers. This document contains confidential information; it can't be disclosed to any third parties without prior written authorization of Qeedji.

Safety instructions

Please read carefully the following instructions before switching the product on: - WARNING! Correct fitting and installation is of the utmost importance. Incorrect fitting and/or installation may result in personal injury or loss. Qeedji disclaims all liability, of whatever kind, if the product is assembled, fitted and/or installed in an incorrect manner. - Do not use the product near a water supply. - Do not pour anything on the product, like flammable liquids or material. - Do not expose the product to direct sun, near a heating source or a dust nor vibrations. - Do not obstruct holes, to be sure that air flows freely around the product. - Switch off the product during a storm. - Do not open the product in any circumstances.

Guarantee terms

Qeedji products are eligible for a warranty to cover genuine manufacturing defect for 3 years. Product failure occurring as the result of factors that do not constitute genuine manufacturing defect are not covered under the terms of the warranty and any repairs of this nature would be chargeable. For example: Inappropriate maintenance action, a non-authorized modification, a not specified environment utilization (see 'Safety instructions'), or if the product has been damaged after an impact, a fall, a bad manipulation or a storm consequence, an insufficient protection against heat, moisture or frost. This warranty is not transferrable. In addition, any repairs carried out by non-authorized personnel will invalidate the warranty.

WEEE Directive

This symbol means that your end of life equipment must not be disposed of with household waste but must be deposited at a collection point for waste electrical and electronic equipment or to your reseller. This will benefit the environment. In this context, a system for collecting and recycling has been implemented by the European Union

Table of content

Part I :

Part II :

1.1 Introduction

This documentation is intended for ISVs (`Independent Software Vendors`), wishing to develop `AOSP APKs` on `Qeedji` TAB10s devices.

> ⚠ Android `APK` development skills are required to go ahead.
>
> ⚠ It is recommended to read first the TAB10s user manual.

Demo Package Content

Items	Description	Quantity
TAB10s	`Qeedji` tablet embedding `AQS` 9	1
Power supply	USB Type-C	1
USB Type-C cable	Cable - Assembly, Type-C Male to Type-A Male	1
USB hub	USB Type-A (2.0), USB Type-C	1

1.2 APK Development

Prerequisite

The software developer already knows how to develop an `Android APK` and how to generate/debug it with `Android Studio`.

AOSP Standard API

The standard API of `AQS` 9.10.10 is based on the `AOSP` SDK 28.
The `AQS` 9.10.10 embeds `Chromium Web engine 83`.

The getDeviceId method of the TelephonyManager class allows to get the device identification UUID value.
The getSerial method of the Build class allows to get the raw PSN.
The BASE_OS static string of the Build.VERSION class allows to get the software version.

Qeedji System Java API

The `Qeedji` github is hosting the tech-qeedji-system-lib-classes.jar Java library.

The tech-qeedji-system-lib-classes.jar Java library exposes an API for specific features.

```
public class SurroundLight {
    public static final int OFF = 0;
    public static final int RED = 1;
    public static final int GREEN = 2;
    public static final int ORANGE = 3;

    public SurroundLight();
    public void setColor(int color);
    public int getColor();
}

public class Rfid125KHz {
    public Rfid125KHz(Context c);
    public void setEnabled(boolean value);
}

public class DipSwitch {
    public DipSwitch(Context c);
    public boolean camera();
    public boolean microphone();
}

public class SharedPreferenceAPI {
    public String getPreferenceAuthority();
    public Object[][] initPreferences();
}

public interface DeviceModeListener {
    public void onDeviceModeChanged(int oldDeviceMode, int newDeviceMode);
}
public class DeviceMode {
    public static final int INVALID = -1;
    public static final int NATIVE = 0;
    public static final int KIOSK = 1;

    public DeviceMode(Context c);
    public void setValue(int devicemode);
    public int getValue();
    public void registerListener(DeviceModeListener listener);
    public void unregisterListener(DeviceModeListener listener);
}

public class DisplayOutputMode {
    public DisplayOutputMode(String label, long width, long height, long refresh_rate);
    public String getLabel();
    public long getWidth();
    public long getHeight();
    public long getRefreshRate();
    public boolean equals(DisplayOutputMode aMode);
}

public class DisplayOutput {
    public static final int TYPE_UNKNOWN = 0;
    public static final int TYPE_INTERNAL = 1;
    public static final int TYPE_EXTERNAL = 2;

    public static final long PORT_TYPE_UNKNOWN = 0
    public static final long PORT_TYPE_HDMI = 8;
    public static final long PORT_TYPE_MIPI = 10;
    public static final long PORT_TYPE_USBC = 11;

    public DisplayOutput(Context context);
    public int getType();
    public boolean getAutoPortType();
    public void setAutoPortType(boolean enable);
    public long[] getPortTypes();
    public long getPortType();
    public void setPortType(long portType);
    public String getLabelOfPort(long portType);
    public long getPortTypeFromLabel(String label);
    public boolean getAutoDisplayMode();
    public void setAutoDisplayMode(boolean enable);
    public DisplayOutputMode[] getDisplayModes();
    public DisplayOutputMode getDisplayMode();
    public void setDisplayMode(String labelMode);
    public long[] getRotations();
    public long getRotation();
    public void setRotation(long rotation);
    public boolean getDpmsPowerModeEnabled();
    public void setDpmsPowerModeEnabled(boolean enable);
}
```

Qeedji System Javascript API

The `Qeedji` github is hosting the tech-qeedji-host-webview.aar Android library.

The tech-qeedji-host-webview.aar Android library exposes an Javascript API for specific functionalities in a WebView.

The tech-qeedji-host-webview.aar Android library embeds the tech-qeedji-system-lib-classes.jar library.

```
String Host.Bluetooth().getHardwareAddress();

String Host.Device().getModel();
String Host.Device().getManufacturer();
String Host.Device().getSerial();
String Host.Device().getPsn();
String Host.Device().getSoftwareVersion();
String Host.Device().getDeviceName();
String Host.Device().getUUID();
String Host.Device().getHostname();
String Host.Device().getMacId();
String Host.Device().getField1();
String Host.Device().getField2();
String Host.Device().getField3();
String Host.Device().getField4();
String Host.Device().getField5();

boolean Host.DipSwitch().getCamera();
boolean Host.DipSwitch().getMicrophone();

int Host.NetworkInterfaces().length();
NetworkInterface Host.NetworkInterfaces().get(int index);
String NetworkInterface.getName();
String NetworkInterface.getHardwareAddress();
boolean NetworkInterface.isUp();

void Host.NFC().start();
void Host.NFC().stop();
// parameter type is unused
callback : void onHostNFCReading(String type, String id);

void Host.PowerManager().goToSleep();
void Host.PowerManager().wakeUp();
void Host.PowerManager().reboot();

void Host.ProximitySensor().start();
void Host.ProximitySensor().stop();
callback : void onHostProximitySensorReading(float distance);

void Host.Rfid125KHz().start();
void Host.Rfid125KHz().stop();

int Host.SurroundLight().OFF();
int Host.SurroundLight().RED();
int Host.SurroundLight().GREEN();
int Host.SurroundLight().ORANGE();
void Host.SurroundLight().setColor(int color);
int Host.SurroundLight().getColor();

void Host.SystemButton().start();
void Host.SystemButton().stop();
callback : void onHostSystemButtonReading(int count);
```

APK shared preferences handling with configuration script

An APK can be designed to share some preferences which can be then read or written by the `Qeedji System` service:

- either through the configuration script,
- or through the device configuration Web interface.

The APK must link the tech-qeedji-system-lib-classes.jar Java library.

The APK must also implement a child class of the *SharedPreferenceAPI* class supported in the tech-qeedji-system-lib-classes.jar Java library.

```
package tech.qeedji.test1;

import tech.qeedji.system.lib.SharedPreferenceAPI;

public class MySharedPreferenceAPI extends SharedPreferenceAPI {

    @Override
    public String getPreferenceAuthority() {
        return BuildConfig.APPLICATION_ID;
    }

    @Override
    public Object[][] initPreferences() {
        Object[][] preferences = {
            // filename, key, access, type, default_value
            {"test1", "test1Integer", "rw", int.class, 1},
            {"test1", "test1Long", "rw", long.class, 10000000L},
            {"test1", "test1Float", "rw", float.class, 0.897546F},
            {"test1", "test1Boolean", "rw", boolean.class, true},
            {"test1", "test1String", "rw", String.class, "test1StringValue"},
            {"test1", "test1StringSet", "rw", String[].class, new String[]{"http://Val0", "http://Val1", "http://Val2"}},
        };
        return preferences;
    }
}
```

The APK must declare a provider in its manifest.

```
<?xml version="1.0" encoding="utf-8"?>
<manifest xmlns:android="http://schemas.android.com/apk/res/android"
    package="tech.qeedji.test1">

    <application
        android:icon="@mipmap/ic_launcher"
        android:label="@string/app_name"
        android:roundIcon="@mipmap/ic_launcher_round"
        android:theme="@style/AppTheme">
        <activity android:name=".MainActivity">
            <intent-filter>
                <action android:name="android.intent.action.MAIN" />

                <category android:name="android.intent.category.LAUNCHER" />
            </intent-filter>
        </activity>
        <provider android:name="tech.qeedji.test1.MySharedPreferenceAPI"
            android:authorities="tech.qeedji.test1"
            android:multiprocess="false"
            android:exported="true"
            android:singleUser="false"
            android:initOrder="100"
            android:visibleToInstantApps="true"/>
    </application>
</manifest>
```

Extract example from a configuration script:

```
Android.Preferences("SharedPreferences", "tech.qeedji.test1", "test1").setInt("test1Integer", 8);
Android.Preferences("SharedPreferences", "tech.qeedji.test1", "test1").setLong("test1Long", 99999999);
Android.Preferences("SharedPreferences", "tech.qeedji.test1", "test1").setFloat("test1Float", 0.123456);
Android.Preferences("SharedPreferences", "tech.qeedji.test1", "test1").setBoolean("test1Boolean", false);
Android.Preferences("SharedPreferences", "tech.qeedji.test1", "test1").setString("test1String", "Newtest1StringValue");
Android.Preferences("SharedPreferences", "tech.qeedji.test1", "test1").setStringArray("test1StringSet", ["http://NewVal0", "http://NewVal1", "http://NewVal2"]);
```

Examples

The `Qeedji` github for TAB10s is hosting APK examples using the `AOSP SDK` for TAB10s:

- proximity_sensor APK: displays a message `Hello Qeedji` when a person is detected, or displays a message `Nobody detected` when no one is detected.

This APK uses the SensorManager API with a default sensor of type Sensor.TYPE_PROXIMITY.

- rfid_tag_reader APK: detects `NFC` tags or `RFID 125KHz` tags and print their values (type and ID).

This APK uses the NfcAdapter API for NFC tags and the KeyEvent.Callback for RFID 125KHz tags.
The NFC permission and the android.hardware.nfc feature API are required.
This APK requires user system access rights to be executed.

- surround_light APK: allows to set the surround light color and state with steady/green, steady/orange, steady/red, off.

This APK uses the SurroundLight class described in the specific API.
This APK requires user system access rights to be executed.

- autorestart APK: is launched automatically after a device reboot. It is relaunched also automatically after it crashes.

This APK uses the BroadcastReceiver and Thread.UncaughtExceptionHandler APIs.
The RECEIVE_BOOT_COMPLETED permission is required.

- Device Power Standby: allows to go into (or exit from) Android sleep mode (display off, touch screen off).

This APK uses the PowerManager API.
The DEVICE_POWER and WAKE_LOCK permissions are required.
This APK requires user system access rights to be executed.

- System Button: print a notification message when a short press on the system button, lower than two seconds, is detected.

This APK uses the BroadcastReceiver API.
This APK requires user system access rights to be executed.

- URL Launcher: load an URL.

This APK uses the WebView API and the tech-qeedji-host-webview.aar Android library for Qeedji.
The RECEIVE_BOOT_COMPLETED and INTERNET permissions are required.
This APK has user system access rights.
A specific 000000000000.js configuration script allows to configure the URL launcher APK (set URL, set login credentials, ...).
Several websites examples are available on Qeedji github for TAB10s.

> ⚠ Designing an APK, requiring `system user` access rights to be executed, requires for ISV to either sign its APK with a `Java Keystore` having a `certificate` signed by `Qeedji` or set its APK as `system App`. For further information, refer respectively to the chapter § APK Signing or to the chapter § Set App as System App.

APK debug

The `AQS` Operating system for the TAB10s device is compatible with Android Studio and Android Debug Bridge (ADB)[2] software development suite.

[2] *ADB is included in the Android SDK Platform-Tools package*.

You can debug with ADB using:

- `USB` ,
- `WLAN` ,
- `LAN` [3].

[3] *Debugging with the LAN interface of the your computer requires to have an USB hub with an* `Ethernet to USB` *bridge*.

USB debug

> Connect a cable between the USB-C connector of the TAB10s device and the USB 2.0 connector of your computer. Then wait for the TAB10s device is booting up.
> *Unlike an Android Mobile tablet, the TAB10s device has no battery and is completely powered by the USB-C connector. Before supply the TAB10s device with the USB connector of your computer, check with your computer's manufacturer that its USB connectors are protected against over-intensity to warranty that its USB output will be never damaged. Check also that the USB output is able to deliver a sufficient power else the TAB10s device may not stop rebooting.*

WLAN debug

> Connect the power cable of your USB-C wall plug to the USB-C connector of the TAB10s device. Then wait for the TAB10s device is booting up. Then go in the `Settings` application and configure the WLAN.

LAN debug

> Prerequisite: have a suitable `Ethernet to USB` (USB-C or POGO type connector) bridge which is connected to the LAN network.
> Connect the `Ethernet to USB` bridge to on the TAB10s device (USB-C or POGO type connector).

Debug mode setting

Launch the `Settings` application:

- press on the `About tablet` menu,
- press 5 times on the button `Build number (9.yy.zz release keys)` . The message *You are now a developer* should appear showing that the debug mode is activated,
- go in the `Advanced` item of the `System` menu. The `Developer options` menu is now available,
- activate `Network debugging` or `USB debugging` according to your needs.

☛*To activate the debug mode on the TAB10s device, download the configuration script available on the Qeedji github, and uncomment the line* `enableAllowDeveloperOptions();` . *To inactivate the debug mode, comment the previous line, and uncomment the line* `disableAllowDeveloperOptions();` . *Then to inject this* `.js` *configuration script, refer to the chapter § Installation by USB or to the chapter § Installation by WebDAV.*

Network access permissions

To access the network, an APK needs to declare INTERNET and ACCESS_NETWORK_STATE permissions in its manifest:

```
<uses-permission android:name="android.permission.INTERNET" />
<uses-permission android:name="android.permission.ACCESS_NETWORK_STATE" />
```

1.3 System App

A `System App` is an Android notion telling that the `APK` requires `system user` execution rights to be executed.

An `APK` developped by an `ISV` becomes `System App` as soon as this `APK` uses some specific `AOSP` features or some specific `AQS` features requiring `system user` execution rights.

> ☛ *If the `ISV` designs its `APKs` to not use these specific `AQS` features requiring `system user` execution rights, no specific signing procedure with Qeedji CSR is required.*

In this `AQS` version, this is the exhaustive list of `AQS` features requiring automatically `system user` execution rights:

- *Surround Light*: feature allowing to command the `surround light` ,
- *Rfid 125KHz*: feature allowing to get a badge ID when a badging is done with a `RFID 125KHz` badge,
- *Dip Switch*: feature allowing to get the current configuration for the `micro` and `camera` `Dip switch` ,
- *Device Mode*: feature allowing to set dynamically the device mode of the AQS into `kiosk` mode or into `native` mode,
- *System Button*: feature allowing to be notified when the system button is pushed (short push, long push),
- *Pptx*: feature allowing an app using a `Android System WebView` to play MS-PowerPoint medias (`.ppsx` and `.pptx`),
- *Pdfjs*: feature allowing an app using a `Android System WebView` to play PDF medias (`.pdf`),
- *setAppAsSystemApp*: feature granting `system user` execution rights for a list of app.

In this `AQS` version, some native `AOSP` features require automatically `system user` execution rights. The list of features is not exhaustive.

- *Device Power Standby*: feature allowing to put the connected display device into standby or to wake up the connected display device,
- *Reboot*: feature allowing to launch a device reboot,

This is the exhaustive `AOSP` features that do not require `system user` execution rights.

- *NFC*: feature allowing to be notify and to get the badge ID when a badging is done with a `NFC` badge,
- *Proximity Sensor*: feature allowing to be notified of the `presence detection` distance,
- *SharedPreferenceAPI*: feature allowing to make shared some preferences,
- *Autorestart*: feature allowing to `autostart` the `APK` after the device has reboot.

To be able to execute `APK` requiring `system user` execution rights:

- the `ISV` must first create a `public certificate key` (.pk12) with a `CSR` ,
- then the `ISV` has two ways to finalize the procedure:
  - either signing its `APK` by using its `System Java Keystore` (.jks) with its `public certificate key` (.pk12),
  - or declare a list of `APK` to be granted to `System App` , stored in a .xml file signed with its `public certificate key` (.pk12) with the *AQS-setAppAsSystemApp* PowerShell tool.

Procedure to create a public certificate key (.pk12) with a CSR

> ☛ *In the example, it is considered that the company name is Contoso. ISD means IT Service Department. In the procedure, it is required to use the generic email of the Chief Information Security Officer (CISO) of the company, for example `ciso@contoso.com` .*
>
> ⚠ In the following procedure, the following example values have been used.

Label type	Label value examples
C	US
ST	California
L	San-Francisco
O	Contoso
OU	Contoso_ISD
CN	CISO
E	ciso@contoso.com
Passphrase	1234
Java_keystore basename file	contoso_qeedji_java_keystore
Java_keystore password	567890
Friendly_name / name / key_alias	qeedji_aosp_key

1 . GENERATE YOUR PRIVATE KEY

> ⚠ *You are responsible for your private key storing which has to be never communicated to a third party.*
> Generate your private key with a length of 2048 bits with the *RSA 2048 Bits* key type.
> For example:
> **openssl genrsa -f4 2048 > contoso_private_key_for_android.key**

2 . GENERATE YOUR OWN CSR (CERTIFICATE SIGNING REQUEST)

> Generate your own `.csr` certificate signing request thanks to your private key and some applicant identification used to digitally sign the request. Thanks to match the filename pattern by replacing contoso by your own organization name.
> For example:
> **openssl req -new -key contoso_private_key_for_android.key -subj '/C=US/ST=California/L=San-Francisco/O=Contoso/OU=Contoso_ISD/CN=CISO/emailAddress=ciso@contoso.com' > contoso-for_qeedji_aosp.csr**

3 . SEND YOUR CSR TO QEEDJI

> Once generated, send a email to the *csr@qeedji.tech* with your `CSR` (`contoso-for_qeedji_aosp.csr` file for example) in attachment.

4 . WAIT FOR THE QEEDJI ANSWER

> `Qeedji` should then return an answer within 7 days.
> ⚠ *Qeedji will send its answer to the email defined into the CSR file (ciso@contoso.com for example), which may be not the same email used to send the CSR to Qeedji.*
> `Qeedji` sends 2 files: the signed certificate (extension .crt) and the CA file (extension .pem).
> For example:
>
> - `contoso-qeedji_aosp-certificate-001A.crt` ,
> - `contoso-qeedji_aosp-certificate_authority-001A.pem`

5 . GENERATE YOUR PUBLIC CERTIFICATE KEY

> You have first to generate your public certificate key. For example:
> **openssl pkcs12 -export -in contoso-qeedji_aosp-certificate-001A.crt -inkey contoso_private_key_for_android.key -out contoso_certificate_and_key_for_qeedji_aosp.pk12 -password pass:1234 -name qeedji_aosp_key -chain -CAfile contoso-qeedji_aosp-certificate_authority-001A.pem**
>
> ⚠ *In case the security or commercial conditions are not fully filled, Qeedji keeps the rights to revocate a ISV certificate.*

Now your public certificate key is generated. You can go to the next signing step.

1.3.1 APK Signing

With this signing procedure, the `system Java Keystore` (.jks) must be generated by the `ISV` with its public certificate key (.pk12).

Prerequisite: the steps to generate a `public certificate key` (.pk12) have been done once by the `ISV` .

6 . GENERATE THE JAVA KEYSTORE

> Generate then a `Java Keystore` from your public certificate key with the `keytool` [1] toolbox.
> The `Java Keystore` system is now usable in `Android Studio` .
> For example:
> **keytool -importkeystore -deststorepass 567890 -destkeystore contoso_qeedji_java_keystore.jks -srckeystore contoso_certificate_and_key_for_qeedji_aosp.pk12 -srcstoretype PKCS12 -srcstorepass 1234**

[1] *Keytool is a toolbox to handle certificates for Java products. It is provided by default in the JDK since version 1.1.*

> ☛ *The `ISV` must use its own `Java Keystore` for all its `APK` requiring `system user` execution rights and the same certificate for all the `ISV` TAB10s devices. When signing is required for your `APK` , the `ISV` must follow, at least once per `APK` , this procedure to create its system Java Keystore.*

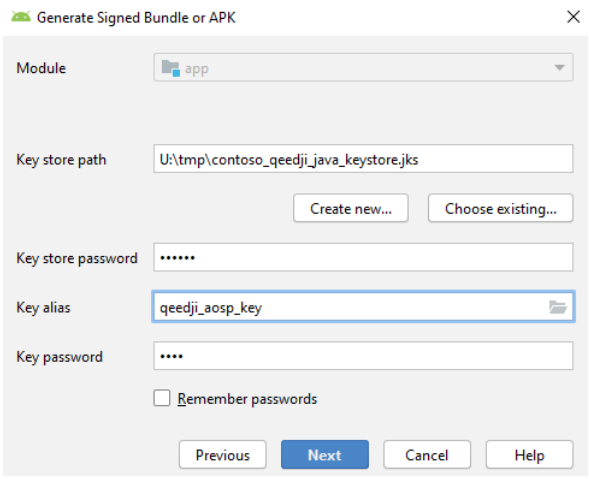
7 . MODIFY THE MANIFEST

> Modify the APK manifest by adding this string: `android:sharedUserId="android.uid.system"`
> Sample manifest (*AndroidManifest.xml* file):

```
<?xml version="1.0" encoding="utf-8"?>
<manifest xmlns:android="http://schemas.android.com/apk/res/android"
    package="tech.qeedji.reboot"
    android:sharedUserId="android.uid.system">
    <uses-permission android:name="android.permission.REBOOT" />
    <application
        android:allowBackup="true"
        android:icon="@mipmap/ic_launcher"
        android:label="@string/app_name"
        android:roundIcon="@mipmap/ic_launcher_round"
        android:supportsRtl="true"
        android:theme="@style/AppTheme">
        <activity android:name=".MainActivity">
            <intent-filter>
                <action android:name="android.intent.action.MAIN" />
                <category android:name="android.intent.category.LAUNCHER" />
            </intent-filter>
        </activity>
    </application>
</manifest>
```

8 . SIGN THE APPLICATION WITH YOUR SYSTEM JAVA KEYSTORE

> When creating the APK, sign the APK with your own System Java Keystore (.jks).



With the previous example, you would have to use the following parameters values:

- Key store password = 567890
- Key password = 1234

The signing procedure is over. Your `APK` requiring `system user` execution rights can now run on `AQS` devices.

1.3.2 Set App as System App

This procedure allows to declare a list of `APK` to be granted as `System App`, stored in a .xml file signed with the `ISV` `public certificate key` (.pk12) with the *AQS-setAppAsSystemApp* PowerShell tool.

> ☛ *With this procedure, there is no need to use your `System Java Keystore`.*

Prerequisite: the steps to generate a `public certificate key` (.pk12) have been done once by the `ISV`.

6 . GET YOUR APK APPLICATION ID

> This is an example to get the `applicationId` of `APK` generated with the Gradle plugin for Android Studio: https://github.com/Qeedji/aosp-TAB10s-sdk/blob/master/examples/surround_light/app/build.gradle.

```
android {
    compileSdkVersion 29
    buildToolsVersion "29.0.3"
    defaultConfig {
        applicationId "tech.qeedji.tablet.surround_light"
        minSdkVersion 28
        targetSdkVersion 29
        versionCode 2
        versionName "1.10.12"
        testInstrumentationRunner "androidx.test.runner.AndroidJUnitRunner"
    }
    buildTypes {
        release {
            minifyEnabled false
            proguardFiles getDefaultProguardFile('proguard-android-optimize.txt'), 'proguard-rules.pro'
        }
    }
}
```

> This is an example to get the `applicationId` of `APK` delivered on the `Google Play` store. For example, for the `NFC tools` application, the URL is https://play.google.com/store/apps/details?id=com.wakdev.wdnfc. The applicationId is the suffix of the URL behind `id=` (in the example `com.wakdev.wdnfc`.
>
> If you are not the developer of the `APK`, if the `APK` is not available on the `Google Play` store, it may be required to request to the `APK` developer to provide the `applicationId` of the `APK`.

7 . CONFIGURE THE POWERSHELL SCRIPT BY ADDING YOUR APK APPLICATION ID

> Download the `AQS-setAppAsSystemApp~001B.zip` archive from the Qeedji Website.
> Extract the archive in your favorite folder (for example `C:\Powershell-Script\AQS-setAppAsSystemApp\`) and open the folder. The folder contains two files:
>
> - `app-list.xml`,
> - `AQS-setAppAsSystemApp.ps1`.
>
> Edit the `app-list.xml` file and enter the respective `applicationId` of your different APKs between the `<AppId>` and `</AppId>` tags. The example is given for three fake `applicationId`. Remove the unconsistent lines.

```
<?xml version="1.0"?>
<AppList>
  <AppId>tech.qeedji.app1</AppId>
  <AppId>tech.qeedji.app2</AppId>
  <AppId>tech.qeedji.app3</AppId>
</AppList>
```

8 . COPY THE PUBLIC CERTIFICATION KEY (PK12 FILE) INTO THE POWERSHELL FOLDER

> Copy and paste your public certificate key (.pk12) (in the example: contoso_certificate_and_key_for_qeedji_aosp.pk12) in the `PowerShell` folder (in the example: `C:\Powershell-Script\AQS-setAppAsSystemApp\`)

9 . EXECUTE THE POWERSHELL SCRIPT

> Open a `PowerShell` command window and go into your `PowerShell` folder (in the example: `C:\Powershell-Script\AQS-setAppAsSystemApp\`). Execute the `PowerShell` script with the name of your own public certificate key (.pk12`) file, and the name of the xml files, as arguments. For example, with contoso_certificate_and_key_for_qeedji_aosp.pk12:

.\AQS-setAppAsSystemApp.ps1 -pk12File .\contoso_certificate_and_key_for_qeedji_aosp.pk12 -xmlFile .\app-list.xml -outputFile .\app-list-signed.xml

> When asked, enter the password for your public certificate key (.pk12).

10 . EDIT THE FILE GENERATED WITH THE POWERSHELL SCRIPT AND COPY THE CONTENT

> Edit the generated `app-list-signed.xml` file and copy the entire file content.

11 . CONFIGURE A CONFIGURATION SCRIPT FOR THE DEVICE

> Open the configuration script example on the Qeedji Website. Uncomment the 2 lines below and replace the value `<?xml version="1.0"?><AppList>...` of the `xmlSignedFileData` variable by the entire file content of the generated `app-list-signed.xml` file.

```
let xmlSignedFileData = `<?xml version="1.0"?><AppList><AppId>...`;
setAppAsSystemApp(xmlSignedFileData);
```

> ☛ *The configuration script must be V1.10.17 (or above).*

12 . INJECT THE CONFIGURATION SCRIPT IN THE DEVICE

> Copy the configuration script in the `.configuration WebDAV` directory of the device or copy the configuration script on a USB storage device and inject it on a USB hub connected to the device. After the automatic device reboot, your `APK` requiring `system user` execution rights, whose `applicationId` is declared in the `app-list-signed.xml` file, should be executed properly on the device.

⚠ After configuration script installation, if an `APK` concerned by the list was already installed on the device, it will lose all its user parameters. This is also the case when an `APK` is removed from the list. Qeedji advises you to install the configuration script first, and after, install the `APK` which, will have consequently the `system user` execution rights granted.

☛ *To return to a configuration which do not grant `system user` execution rights for `APK` anymore, the `app-list-signed.xml` must be generated with an empty `app-list-signed.xml` content like shown below.*

```
<?xml version="1.0"?>
<AppList>
</AppList>
```

1.4 Qeedji System service

The TAB10s device embeds the `Qeedji System` service. The `Qeedji System` service is defined as a privileged application of the `AQS` device.

This service allows to:

- install one or more `APK` on the TAB10s device:
  - by uploading an APK with the device Web user interface,
  - by pushing one APK on the `.apps/` directory of the `WebDAV` server with a `WebDAV` client,
  - by inserting an USB storage device containing `.apk` files,
- update the `AQS` operation system of the TAB10s device:
  - by uploading a `.fqs` firmware with the device Web user interface,
  - by pushing a `.fqs` firmware on the `.software/` directory of the `WebDAV` server with a `WebDAV` client,
  - by inserting an USB storage device containing an `.fqs` file,
- configure the TAB10s device thanks to a suitable `.js` configuration script:
  - by pushing a suitable `.js` configuration script on the `.configuration/` directory of the `WebDAV` server with a `WebDAV` client,
  - by inserting an USB storage device containing an `.fqs` file,
  - by getting `.js` configuration script hosted on a `TFTP` server (`DHCP` , *code 66*),
- push your data on the `.data/` directory of the `WebDAV` server with a `WebDAV` client.

This service allows also to configure the AQS device mode as soon as the device has started.

1.4.1 Installation by USB

Refer to the TAB10s user manual to install with an USB storage device:

- a new `APK` (.apk),
- a new `AQS` firmware (.fqs),
- a new configuration script (.js).

1.4.2 Installation by WebDAV

The available `WebDAV` directories are:

- `.apps`,
- `.software`,
- `.configuration`,
- `.data`.

Refer to the TAB10s user manual to install with a `WebDAV` client:

- a new `APK` (.apk),
- a new `AQS` firmware (.fqs),
- a new configuration script (.js).

Data

To push user data with a `WebDAV` client, drop them in the `.data/` directory of the `WebDAV` server.

> ☛ On the file system of the device, the `.data/` directory is `/storage/emulated/0/Android/data/tech.qeedji.system/files/.data`. This directory is available by apps with READ_EXTERNAL_STORAGE and WRITE_EXTERNAL_STORAGE permissions.

1.4.3 AOSP device mode

The `Qeedji System` service allows to configure the `AOSP device mode` dynamically. It is handled thanks to the `persist.sys.device_mode` system property, used by the *SystemUI* and *Launcher3* `AOSP` services.

Two values are possible for the `persist.sys.device_mode` system property:

- `native` (default value): thanks to `AOSP` menu, the user can, whenever he wants, stops the APK, returns to the `AOSP` home screen, launches another APK, access to `AOSP` functions like, for example, the *Back* button or the *Settings* application.
- `kiosk` : all the `AOSP` user interfaces are unavailable. However the `AOSP` virtual keyboard remains available.

> ☛ Note for developers: if the `persist.sys.device_mode` system property value is invalid or if it does not exist, the default `AOSP` device mode is `native` . If the `persist.sys.device_mode` system property value is `kiosk` , the *SystemUI* service inhibits the *system bars* and the *Launcher3* service hides the *AllApps* view and the *OptionsPopupView* dialog box.

The `persist.sys.device_mode` system property can be changed by using the configuration script:

- `native` :

```
setDeviceModeNative(); /* default mode */
//setDeviceModeKiosk();
```

- `kiosk` :

```
//setDeviceModeNative(); /* default mode */
setDeviceModeKiosk();
```

For further information, refer to the TAB10s user manual.

[1] *To be launched automatically in kiosk mode, the application requires a subscription to the event ACTION_BOOT_COMPLETED. In this case, it is recommended to have only one `APK` with this subscription. For further information, refer to https://developer.android.com/reference/android/content/Intent#ACTION_BOOT_COMPLETED. In case no `APK` has subscribed to the event ACTION_BOOT_COMPLETED, the Qeedji wallpaper [2] is displayed.*

[2] *A next release will allow to load a custom wallpaper.*

1.5 Qeedji preferences

AOSP system properties added by Qeedji

Name	Type	R/W	Default value	Values	Description
persist.sys.delivery-software-version	String	RO	9.10.10_beta11	<x>.<v>.<z> <software-extraversion>	Save the version of the last AQS firmware upgrade.
persist.sys.device_mode	String	RW	native	native , kiosk	Handle the AOSP device mode.
persist.sys.rfid125khz.enable	Boolean	RW	true	true , false	Handle the RFID 125KHz.
persist.sys.rfid125khz.keyboard_wedge.key_interval	String	RW	0	0 to 1000	Define the key interval of RFID 125KHz keyboard edge.
persist.sys.rfid125khz.keyboard_wedge.key_press_duration	String	RW	0	0 to 1000	Define the key press duration of RFID 125KHz keyboard edge.
persist.sys.proximity_sensor.type	String	RW	ir	ir	Define the proximity sensor.
persist.sys.proximity_sensor.max_distance	String	RW	200	50 100 150 200 250 300 350 400 450 500 550 600	Define the max distance in cm of the proximity sensor.
persist.sys.hostname	String	RW	TAB10s	For example TAB10s-00001	Define the hostname. If the hostname is empty, the network hostname corresponds to the canonized device name. Else, the network hostname corresponds to the canonized hostname.
persist.sys.webserver.http.port	Integer	RW	80	1 to 65535	Define the port of the http server.
persist.sys.webserver.webdav.credential	String	RW	default		Define the credential ID for the WebDAV profile.
persist.sys.webserver.webuiappli.credential	String	RW	default		Define the credential ID for the webuiappli profile.
persist.sys.webserver.webuiadmin.credential	String	RW	default		Define the credential ID for the webuiadmin profile.
persist.sys.webserver.webservice.credential	String	RW	default		Define the credential ID for the webservice profile.
persist.sys.webserver.credential.default.type	String	RW	native	native	Define the default credential type.
persist.sys.webserver.credential.default.username	String	RW	admin	admin	Define the default credential username.
persist.sys.webserver.credential.default.password	String	RW	admin	admin	Define the default credential password.
persist.sys.webserver.credential.<credential_ID>.type	String	RW		native	Define the credential type.
persist.sys.webserver.credential.<credential_ID>.username	String	RW			Define the credential username for the native type.
persist.sys.webserver.credential.<credential_ID>.password	String	RW			Define the credential password for the native type.
persist.sys.device_info.field1	String	RW			Custom device field1 variable.
persist.sys.device_info.field2	String	RW			Custom device field2 variable.
persist.sys.device_info.field3	String	RW			Custom device field3 variable.
persist.sys.device_info.field4	String	RW			Custom device field4 variable.
persist.sys.device_info.field5	String	RW			Custom device field5 variable.

Settings preferences added by Qeedji

Name	Namespace	Type	R/W	Default value	Values	Description
`developer_options_allowed`	secure	Integer	RW	`0`	`0` , `1`	When the preference value is `1` , the debug mode is allowed.
`adb_tcp_enabled`	global	Integer	RW	`0`	`0` , `1`	When the preference value is `1` , *adb* over network is activated.
`adb_tcp_port`	global	Integer	RW	`5555`	`0` to `64738`	Allows to define the TCP port for *adb*.
`ptp_allowed`	global	Integer	RW	`0`	`0` , `1`	Allows the PTP (Picture Transfer Protocol).

Shared preferences for Qeedji System service

Name	Type	R/W	Default value	Values	Description
`externalstorage.copy.apk.enabled`	Boolean	RW	`true`	`true` , `false`	When the preference value is `true` , the `APK` installation from the root of the USB storage is authorized.

Shared preferences for the URL Launcher APK

The shared preferences for URL Launcher `APK` is stored in the `tech.qeedji.url_launcher.prefs.xml` file. In case login credentials are required to connect to the URL, an additional shared preferences `tech.qeedji.url_launcher.credential.<credential_label>.prefs.xml` file is required.

> ⚠ The shared preferences files for URL launcher `APK` must be created and updated with the specific 000000000000.js configuration script.

`tech.qeedji.url_launcher.prefs.xml`	Type	R/W	Default value	Values	Description
`start_after_boot_completed`	Boolean	RW	`true`	`true` , `false`	When the preference value is `true` , The URL launcher `APK` is automatically started after the `AOSP` has started.
`autorefresh_url_enabled`	Boolean	RW	`false`	`true` , `false`	When the preference value is `true` , The URL launcher `APK` relaunches periodically the URL.
`autorefresh_url_interval`	Long	RW	`60`	`1` to `86400`	Defines the reload period in seconds for the URL launcher `APK` .
`url`	String	RW		for example: `https://www.demo.contoso.com/`	Defines the URL to launch.
`credential`	String	RW		for example: If `<credential_label>` worths `native` , the value is `native`	Defines the subpart of the expected filename for the additional file required when login credentials are needed to connect to the URL.

> ☛ *The `<credential_label>` subpart of the filename is defined in the `tech.qeedji.url_launcher.prefs.xml` file above.*

`tech.qeedji.url_launcher.credential.<credential_label>.prefs`	Type	R/W	Default value	Values	Description
`type`	String	RW	`native`	`native` [1]	Define the credential type.
`username`	String	RW			Define the URL credential username.
`password`	String	WO			Define the URL credential password.

[1] In this version, only the `native` value is possible.

1.6 FAQ

Do you have special adapters ?

Several PoE adapters can be ordered to Qeedji.

Commercial reference	Device model	Information
`EXC.ETH.POGO`	`NAPOE109kt`	Ethernet PoE Krone to TAB10s built-in adapter
`EXC.ETH.USBC`	`NAPOE109ku`	Ethernet PoE Krone to USB-C built-in adapter

Is it possible to change the brightness of the surround light?

No, the surround light can only be:

- Green,
- Red,
- Orange,
- Off

How to deploy the APK in production mode without an USB hub?

To deploy your `APK` in production for the first time, there is several ways:

- either drop your `APK` in the `/.apps/` directory of the `WebDAV` server,
- or, if the TAB10s device is installed on a `EXC.ETH.POGO` adapter:
  - put your `.apk` files at the root directory of the USB-C storage device,
  - plug the USB-C storage device on the free USB-C connector of the TAB10s device.
- or, if the debug mode is enabled:
  - use the Android tool named adb (`adb install -g <apk_file>`).

Once your `APK` is installed:

- you can use a method described above,
- your `APK` can install `.apk` files with the API PackageInstaller.

How to deploy the .apk files in production mode with an USB hub?

- plug on the TAB10s device an USB hub supporting an USB-C connector for power delivery,
- put your `.apk` files at the root directory of the USB storage device,
- plug the USB storage device on the USB hub.

How to launch an app in `kiosk` device mode?

Explain in the paragraph AOSP device mode. Qeedji implements an `APK` example named url_launcher. Look at the two files below:

- AndroidManifest.xml,
- StartActivityAtBootReceiver.java.

Is it possible to download a configuration script and .apk files from a remote server?

No, but you can develop your own `APK` .

2.1 Contacts

For further information, please contact us by e-mail:

- **Technical support**: support@qeedji.tech,
- **Sales department**: sales@qeedji.tech.

Refer to the `Qeedji` Website for FAQ, application notes, and software downloads:

https://www.qeedji.tech/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