

Privacy Agreement Module Integration Guide

Workspace ONE for Android

VMware Workspace ONE® for Android can be used to present privacy agreements and track their acceptance by the end user. Presentation and tracking of agreements is handled by a separate privacy module in the software development kit for Android. Use of the module in an app isn't dependent on integration with the rest of the Workspace ONE platform.

This document is part of the Workspace ONE Integration Guide for Android set.

Table of Contents

Introduction.....	2
Open Source Sample Code.....	4
Preparation.....	5
Task: Add the privacy module build configuration and files.....	7
Task: Add a consent check at application launch.....	11
Task: Add agreement review.....	18
Task: Configure agreement content.....	20
Add custom app permission text.....	20
Add an app permission with a custom icon.....	21
Add an app permission with a built-in icon.....	23
Add custom data collection text.....	23
Add a built-in data collection item.....	24
Task: Remove data sharing opt-in.....	27
Task: Configure agreement rejection.....	28
Task: Add agreement revocation.....	30
Configuration Reference.....	31
Configuration Screen Capture Images.....	34
Appendix: Built-In App Permission Icons.....	38
Appendix: Built-In Data Collection Types.....	39
Appendix: How to reset application state.....	40
Document Information.....	41

Introduction

Privacy agreements are commonplace for enterprise applications on mobile devices. Enterprise end users typically must agree to some data collection and app permissions in order to make use of mobile apps.

The VMware Workspace ONE privacy module for Android can be used to present privacy agreements and track their acceptance by the end user. Note that the privacy module doesn't itself collect data, protect the privacy of the user, nor protect application data.

For an overview of privacy agreement configuration, see the [Configuration Screen Capture Images](#) section.

Features

The privacy agreements module supports the following types of agreement.

- Mandatory privacy agreement.
- Optional privacy agreement.
- Additional data sharing opt-in.

The privacy module supports the following interactions.

- Accept the privacy agreement.
- Open a privacy policy web page.
- Opt in or out of additional data sharing.
- Check if the privacy agreement has been accepted before opening the app user interface.
- Check if the privacy agreement has changed since it was accepted.
- Review the privacy agreement from within the app user interface.
- Revoke acceptance of the privacy agreement.

The module is configurable, for example in the following aspects.

- Descriptions, titles, and clauses in the privacy agreement are configurable.
 - An icon can be configured for each clause in the agreement.
- A privacy policy web address can be configured, if required.
- The additional data sharing opt-in, if required, can be configured.

For an overview of privacy agreement configuration, see the [Configuration Screen Capture Images](#) section.

Integration Guides

This document is part of the Workspace ONE Integration Guide for Android set.

See other guides in the set for an introduction to integration with the Workspace ONE platform.

An overview that includes links to all the guides is available

- in Markdown format, in the repository that also holds the sample code:
<https://github.com/vmware-samples/...IntegrationOverview.md>
- in Portable Document Format (PDF), on the VMware website:
<https://developer.vmware.com/...IntegrationOverview.pdf>

Compatibility

Instructions in this document have been followed with the Workspace ONE Software Development Kit (SDK) for Android and other software, to confirm compatibility.

Software	Version
Workspace ONE SDK for Android	24.01
Android Studio integrated development environment	2022.3.1

Table 1: Software compatibility versions

Open Source Sample Code

This document includes illustrative Kotlin code for some integration tasks. The code is taken from an Open Source sample application. You can use the code in the sample application as a starting point for your own implementation.

The application is published in the Workspace ONE Software Development Kit Integration Samples repository. See:

[github.com/.../workspace-ONE-SDK-integration-samples/.../privacyKotlin](https://github.com/WorkspaceOne/sdk-integration-samples/tree/master/privacyKotlin)

You can download the application, or clone the whole repository. Build instructions are in the repository here:

[github.com/.../workspace-ONE-SDK-integration-samples/.../build.md](https://github.com/WorkspaceOne/sdk-integration-samples/tree/master/build.md)

Preparation

Before you begin integration of the privacy agreements module, you will need the following.

- Developer environment.

The instructions in the integration guide documents assume you use the Android Studio integrated developer environment (IDE). Check the [Compatibility](#) table for a recommended version.

- Developer device or emulator.

You can use a physical Android device or the Android emulator to work on privacy module integration. Instructions for setting up a physical developer device, and for setting up emulated devices can be found on the Android developer website. See, for example, the following pages.

- Configure on-device developer options
<https://developer.android.com/studio/debug/dev-options.html>
- Run apps on a hardware device
<https://developer.android.com/studio/run/device>
- Create and manage virtual devices
<https://developer.android.com/studio/run/managing-avds>

- Android application source code.

Integrating the Workspace ONE privacy module will involve changes to the application source code. You will need access to the Java or Kotlin source, to the manifest and resources, and to any other files required to build the application.

You can integrate Workspace ONE with an existing Android application of your own, or with an Android sample application, or start a new application from an Android Studio template, for example.

The instructions in the integration guide documents assume your application uses AndroidX instead of the original support library. Instructions for migrating from the support library to AndroidX can be found on the Android developer website, for example here:

<https://developer.android.com/jetpack/androidx/migrate>

- Workspace ONE SDK for Android.

The privacy agreements module is distributed with the Workspace ONE SDK for Android.

Instructions for obtaining the SDK are given in the Workspace ONE for Android Integration Preparation Guide, starting here:

<https://github.com/vmware-samples/...obtain-software-development-kit>

(Some PDF viewers incorrectly escape the hash anchor marker in the above link. If that happens, edit the link in the browser address bar.)

The whole guide is available

- in Markdown format, in the repository that also holds the sample code:

<https://github.com/vmware-samples/...IntegrationPreparation.md>

- in Portable Document Format (PDF), on the VMware website:

<https://developer.vmware.com/...IntegrationPreparation.pdf>

Go to the Task: Obtain software development kit.

This completes the preparation for integrating your Android application with the Workspace ONE privacy module. You are now ready to start the first [Task: Add the privacy module build configuration and files](#)

Task: Add the privacy module build configuration and files

Adding the Workspace ONE privacy agreements module build configuration and files to your Android app is the first integration task.

These instructions assume that your application has a typical project structure, as follows:

- *Project* files in the root directory.
- *Application* module in a sub-directory.
- Separate `build.gradle` files for the project and application.

Project Structure Diagram

The following diagram illustrates the expected project directory structure, and the locations of changes to be made.

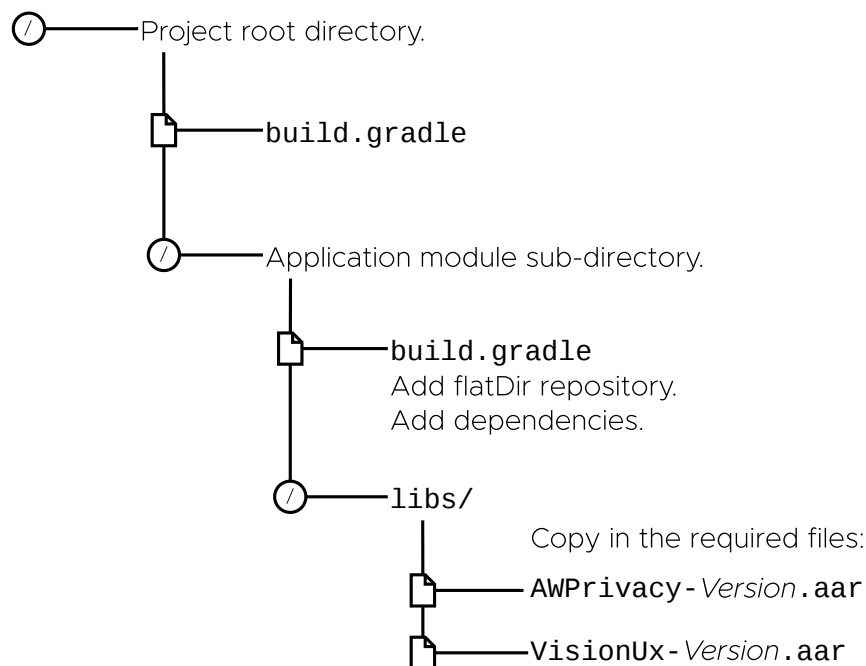


Diagram 1: Project structure and locations of changes

Tip: It might be easier to see the structure, and identify which Gradle file is which, in the Android Studio project navigator if you select the Project view, instead of the Android view.

Software Development Kit Download Structure Diagram

The following diagram illustrates the directory structure of the SDK download.

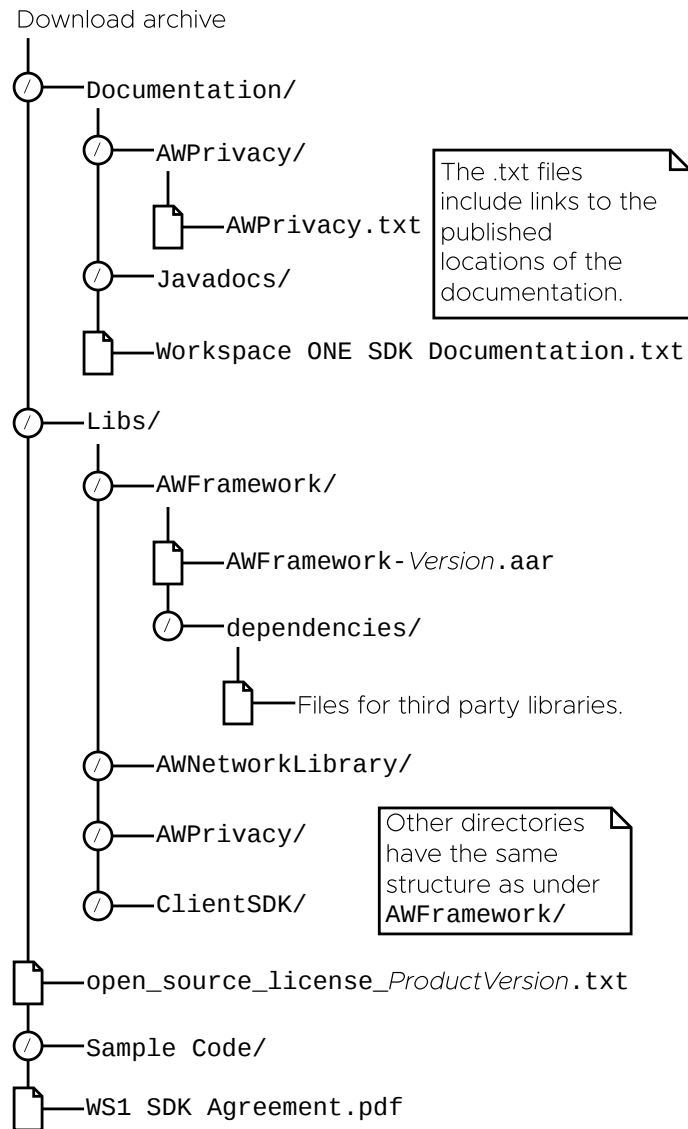


Diagram 2: Download structure of the SDK for Android

Files from within the above structure are copied under your application project in the following instructions.

Instructions

Proceed as follows.

1. Add the required libraries to the build.

In the application build.gradle file, in the **dependencies** block, add references to the required libraries. (The library files will be copied in the next step.) For example:

```
dependencies {
    implementation fileTree(dir: 'libs', include: ['*.jar'])
    implementation ...
    implementation ...

    // Following lines are added to integrate the Workspace ONE privacy agreement module ...

    // Workspace ONE libraries that are part of the SDK.
    implementation(name: "AWPrivacy-21.5.1", ext: 'aar')
    implementation(name: 'VisionUX-1.5.0.a', ext: 'aar')

    // Third party libraries that are hosted remotely.
    implementation 'com.google.android.material:material:1.1.0'

    ...
}
```

The location of this change is shown in the [Project Structure Diagram](#).

2. Copy the required library files.

The code snippet in the previous step indicates which libraries are part of the SDK.

Files for those libraries can be found in the SDK distribution, under one or other of the **Libs** sub-directories or their **dependencies** sub-directories. See the [Software Development Kit Download Structure Diagram](#).

Copy the files into your project, under the application module sub-directory, in the **libs** sub-directory. The location is shown in the [Project Structure Diagram](#). If the sub-directory doesn't exist, create it now.

3. Add the library files' location to the application build configuration.

In the application build.gradle file, add a **repositories** block that specifies the location of the library file copies. For example:

```
repositories {
    flatDir {
        dirs 'libs'
    }
}
```

The location of this change is shown in the [Project Structure Diagram](#).

This completes the required changes to the build configuration. Build the application to confirm that no mistakes have been made. After that, continue with the next integration [Task: Add a consent check at application launch](#).

Troubleshooting

In case of difficulties with build integration, check the following troubleshooting tips.

- Cannot find launch Activity.

An error like this might be shown in the IDE console:

```
Unable to instantiate activity ComponentInfo{.../...MainActivity}:
java.lang.ClassNotFoundException: Didn't find class "...MainActivity"
```

This might be resolved by specifying Java version 8 language features. You can do this by adding code like the following to the application build.gradle file.

```
android {
    // ...

    compileOptions {
        sourceCompatibility JavaVersion.VERSION_1_8
        targetCompatibility JavaVersion.VERSION_1_8
    }

    kotlinOptions {
        jvmTarget = "1.8"
    }

    // ...
}
```

- Dependencies.

It might be necessary to add explicit dependencies such as the following.

```
implementation "org.jetbrains.kotlin:kotlin-stdlib:$kotlin_version"
implementation 'androidx.core:core-ktx:1.3.2'
implementation 'androidx.appcompat:appcompat:1.2.0'
implementation 'androidx.constraintlayout:constraintlayout:2.0.4'
```

Task: Add a consent check at application launch

Adding a consent check at application launch is a Workspace ONE privacy agreements integration task for Android application developers.

User Experience

These instructions assume that accepting the privacy agreement will be mandatory for end users of your app. This is the typical enterprise requirement. The user experience will therefore be as follows.

1. The app is installed and launched for the first time.
2. The privacy agreement is displayed.
3. The user accepts the privacy agreement.
4. The app's user interface is displayed.
5. Later, after running other apps and maybe power cycling the device, the user opens the app again.
6. The privacy agreement isn't presented, because it has already been accepted.
7. Instead, app's user interface is displayed straight away.

By default, there is no way for the user to skip the privacy agreement and open the app user interface. If your app has some features that can be used without acceptance of the privacy agreement, you can allow rejection of the agreement. See the [Task: Configure Agreement Rejection](#) for instructions, but do this task first.

Instructions

The consent check task is dependent on the [Task: Add the privacy module build configuration and files](#). These instructions assume that the dependent task is complete already.

The code snippets in this section are taken from an Open Source sample application. The application is published in the Workspace ONE Software Development Kit Integration Samples repository. See: github.com/.../workspace-ONE-SDK-integration-samples/.../privacyKotlin

Privacy Helper Class

First, create a privacy helper class. Requirements for the class are illustrated by the following Kotlin code, which can be used as an example. See the numbered notes below the code for explanations.

```
open class PrivacyBase(
    private val context: Context,
    sharedPreferencesName: String = "com.airwatch.privacy"
) {
    init {
        // 1. Module initialization.....
        AWPrivacyController.initialize(
            context.getSharedPreferences(
                sharedPreferencesName, Context.MODE_PRIVATE
            )
        )
    }

    private val agreement: AWPrivacyConfig by lazy {
        configureAgreement(context)
    }

    // 2. Content initialization.....
    protected open fun configureAgreement(context: Context): AWPrivacyConfig {
        return AWPrivacyConfig().apply {
            applicationName = context.packageManager.getApplicationLabel(
                context.applicationInfo).toString()
        }
    }

    companion object {
        fun privacyCallback(callback: (result: AWPrivacyResult) -> Unit):AWPrivacyCallback {
            return object : AWPrivacyCallback() {
                override fun onComplete(result: AWPrivacyResult) =
                    callback(result)
            }
        }
    }

    // 3. Consent check.....
    val consentRequired:Boolean get() = AWPrivacyController.getConsentRequired(agreement)

    // 4. Consent user interface flow.....
    fun startPrivacyFlow(context: Context, callback: (result: AWPrivacyResult) -> Unit) {
        AWPrivacyController.startPrivacyFlow(
            context, agreement, privacyCallback(callback)
        )
    }
}
```

Privacy Helper Class Notes

These notes can be read in context of the preceding code snippet.

- **// 1. Module initialization.**

Initialize the privacy agreement module in the helper class.

The module requires an Android SharedPreferences file in order to track the end user's acceptance of the privacy agreement.

- **// 2. Content initialization.**

Initialize the privacy agreement content in the helper class.

A minimal agreement can be used at this stage of integration. This will be enough to fit the privacy agreement into the application user interface code.

In the sample code, only the display name of the application is configured. The content of the agreement will be configured later, in the [Task: Configure agreement content](#).

- **// 3. Consent check.**

Implement a utility method that checks consent for the agreement whose content has been configured in the helper. The sample code implements the check as a property with a get accessor.

- **// 4. Consent user interface flow.**

Implement a utility method that starts the consent user interface flow for the agreement whose content has been configured in the helper.

The sample code here takes as a parameter a callback to invoke with the result. The callback parameter value is a Kotlin lambda. The privacy module requires an AWPrivacyCallback instance. That's in keeping with the Java idiom but seems less suitable for Kotlin. To unify the two, the privacy helper class has code to wrap a Kotlin lambda into an AWPrivacyCallback instance.

Next Steps

Build and run the application to confirm that no mistakes have been made. After that, continue with the next step: [Launch Activity Change](#).

Launch Activity Change

After creating the privacy helper class, add a consent check to your app's launch Activity. The changes are illustrated by the following Kotlin code, which can be used as an example. See the numbered notes below the code for explanations.

```
open class MainActivity : Activity() {
    // 1. Helper instantiation.....
    private val privacy by lazy {PrivacyBase(this)}

    // 2. Separate user interface initialization.....
    private fun initializeUserInterface() {
        setContentView(R.layout.activity_main)
        // ...
        // Any other user interface initialization from the onCreate goes here.
    }

    // 3. Privacy result receipt.....
    private fun privacyCallback(result: AWPrivacyResult) {
        toastHere(
            "Privacy agreement ${result.privacyResultType} ${result.privacyUserOptInStatus}")
        initializeUserInterface()
    }

    private fun toastHere(message: String) = runOnUiThread {
        Toast.makeText(this, message, Toast.LENGTH_LONG).show()
    }

    override fun onCreate(savedInstanceState: Bundle?) {
        super.onCreate(savedInstanceState)

        // 4. Check consent requirement.....
        if (privacy.consentRequired) {

            // 5. Consent flow launch.....
            privacy.startPrivacyFlow(this, this::privacyCallback)
        }
        else {
            initializeUserInterface()
        }
    }
    ...
}
```

Launch Activity Change Notes

These notes can be read in context of the preceding code snippet.

- **// 1. Helper instantiation.**

Add a property for an instance of the privacy helper class from the previous step. The property can use Kotlin lazy initialization.

- **// 2. Separate user interface initialization.**

Move the user interface initialization code from the onCreate into a new method. This could be all the code from the setContentView onwards.

This method will be called to complete user interface initialization when it is OK to do so.

- **// 3. Privacy result receipt.**

Create a callback method to receive the result of the user interface flow that gets consent to the privacy agreement.

For now, the method can display the result in an Android toast message, and continue with user interface initialization, as shown in the sample code.

There is no need to check the result because the end user won't have an option to reject the privacy agreement with the configuration used at this stage. Instructions for that are under the [Task: Configure agreement rejection](#).

- **// 4. Check consent requirement.**

Add a check for whether user consent is required, or has already been given.

Make the check in the onCreate method, after the base class call but before any user interface initialization. If consent isn't required, continue with user interface initialization.

- **// 5. Consent flow launch.**

Start the user interface flow to get consent, if required.

In the sample code, the callback is the privacy result receipt callback, bound to this Activity instance. It is specified by the double colon syntax.

Next Steps

Build and run the application to check that the launch is as expected:

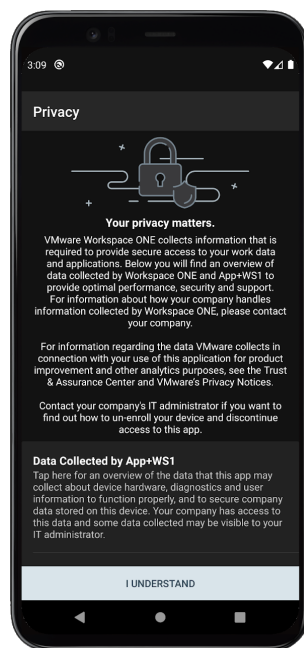
- When the app starts for the first time, the privacy agreement should be displayed. See the screen capture of the first screen, below.

You can consent by selecting: I Understand.

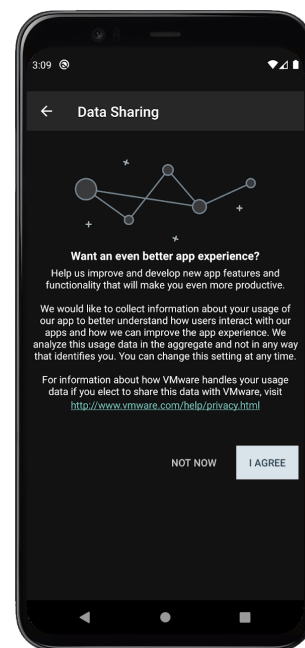
- After you consent, the data sharing opt-in should open. See the screen capture of the second screen, below.

You can opt out by selecting: Not Now.

- If you opt out, you will be asked to confirm. You can confirm by selecting: Don't Send.
- After you have consented, and opted in or out, the main app user interface should open.
- If you terminate and restart the app after consenting, the main app user interface should open. You shouldn't have to consent twice.



Screen Capture 1: Base privacy helper, first screen, dark mode



Screen Capture 2: Base privacy helper, second screen, dark mode

If you want to test the above interaction, you can clear the app storage and restart it. See the [Appendix: How to reset application state](#) for instructions, if needed.

If everything is as expected, you are ready to proceed to the next [Task: Add Agreement Review](#).

Task: Add agreement review

Adding a review option is a Workspace ONE privacy agreements integration task for Android application developers.

An option to review agreement content should be made available in any app that requires consent to a privacy agreement. The privacy module has a built-in user interface for this.

In the review user interface, the user can read again the contents of the agreement that they accepted. They can also opt in or out of additional data sharing. They cannot withdraw consent to the main privacy agreement from the review user interface, but see the [Task: Add Agreement Revocation](#).

The add agreement review task is dependent on the [Task: Add a consent check at application launch](#). These instructions assume that the dependent task is complete already.

The code snippets in this section are taken from an Open Source sample application. The application is published in the Workspace ONE Software Development Kit Integration Samples repository. See: github.com/.../workspace-ONE-SDK-integration-samples/.../privacyKotlin

Instructions

Proceed as follows.

1. Add a utility method to the privacy helper.

Implement a utility method that starts the review consent user interface flow for the agreement whose content has been configured in the helper.

Kotlin code for the method could look like the following.

```
open class PrivacyBase(...) {
    ...
    fun reviewPrivacy(context: Context, callback: (result: AWPrivacyResult) -> Unit) {
        AWPrivacyController.previewPrivacy(
            context, agreement, privacyCallback(callback)
        )
    }
}
```

The new method has similar parameters and structure to the `startPrivacyFlow()` method.

2. Call the utility method from a handler in an Activity.

For example, add a TextView, button or other clickable element to the main Activity that already has a property for the privacy helper instance. In the click event listener, add code like this:

```
privacy.reviewPrivacy(context, this::privacyCallback)
```

Next Steps

Build and run the application, and test the change just made.

- The privacy agreement content should be the same as when it was accepted.
- The option to accept, I Understand, won't be present.
- The user can return to the app user interface by
 - selecting a reverse navigation option.
 - tapping the Android back button.

The location of the reverse navigation option is shown in the configuration screen capture images in this document. See [Privacy Splash](#).

If everything is as expected, you are ready to proceed to the next [Task: Configure agreement content](#).

Task: Configure agreement content

Configuration of the agreement is a Workspace ONE privacy module integration task for Android application developers.

The configure agreement task is dependent on the [Task: Add a consent check at application launch](#). These instructions assume that the dependent task is complete already.

There are many aspects of the privacy agreement that can be configured. The programming interface for agreement configuration is the `AWPrivacyConfig` and `AWPrivacyContent` classes. The general approach to configuration is to set the properties of an instance of one of those classes.

If you are unfamiliar with the privacy agreement sections, take a look at the [Privacy Sections](#) annotated screen capture images.

If you follow these instructions you will make minimal customizations of the app permissions section of the privacy agreement, then the data collection section. Having done that, you and your code will be ready to complete the configuration of the privacy agreement according to your requirements.

Add custom app permission text

Proceed as follows.

1. Add a privacy content item factory function to the privacy helper.

Implement a factory function for instantiating new privacy content items. This will facilitate building lists for configuration later.

The Kotlin code for a factory function could look like the following.

```
class PrivacyBase(...) {
    companion object {
        // ... Other companion object code here.

        fun privacyContent(
            title: String, summary: String
        ) : AWPrivacyContent = AWPrivacyContent().apply {
            this.title = title
            this.summary = summary
        }
    }
}
```

2. Create a privacy helper subclass and override the content initialization method.

Use a subclass to separate general utility code from specific code for each app. The base privacy helper class can then be re-used in other apps.

Kotlin code for the subclass declaration could look like the following.

```
class Privacy(context: Context) : PrivacyBase(context) {
    override fun configureAgreement(context: Context): AWPrivacyConfig
    { return super.configureAgreement(context).apply {
        appPermissionTitle = "My App Permissions"
        appPermissionItems = ArrayList( listOf(
            privacyContent(
                "Custom permission", "My permission, without an icon, goes here.")
            // ToDo: More app permission items here.
        ))
        // ToDo: Other agreement configuration here.
    } }
}
```

Note that the AWPrivacyConfig appPermissionItems property is a Java-style ArrayList. It can be constructed from a Kotlin immutable list.

3. Instantiate the subclass instead of the privacy helper base class.

Change PrivacyBase to Privacy wherever it is used, for example as in the following code.

```
// private val privacy by lazy {PrivacyBase(this)}
private val privacy by lazy {Privacy(this)}
```

Build and run the application to test the changes just made:

- The app permissions section title in the privacy consent and review user interfaces should be the value set in the code.
- On the screen that opens when the app permissions title is tapped, the custom permission should appear.

If everything is as expected, you are ready to continue to the next step.

Add an app permission with a custom icon

In the previous step a custom app permission was added. In this step, an icon will be added to represent a custom app permission.

Proceed as follows.

1. Add an icon resource to your application.

If you don't have an icon to hand, you can create a placeholder using the tools that come with Android Studio. Instructions can be found here, for example: <https://developer.android.com/studio/write/image-asset-studio#access> (Some PDF viewers incorrectly escape the hash anchor marker in the above links. If that happens, edit the link in the browser address bar.)

The instructions in either of the following sections will help you create a suitable placeholder.

- Create adaptive and legacy launcher icons.
- Create a notification icon.

Save your image, in `res/drawable`, or in `res/mipmap` for example. Note the resource name for later.

2. Add a new privacy content item factory function to the privacy helper base class.

Implement a factory function for instantiating new privacy content items with icon resources. The function can be based on the factory function created in the preceding step.

The Kotlin code for the factory function could look like the following.

```
class PrivacyBase(...) {
    companion object {
        // ... Other companion object code here and previous factory function.

        fun privacyContent(
            title: String, summary: String, id: Int
        ) : AWPPrivacyContent = privacyContent(title, summary).apply { this.id = id }
    }
}
```

3. Add a new item to the privacy agreement app permissions.

In the code added in the preceding step, in the `appPermissionItems` list, instantiate a new item with code like the following.

```
appPermissionItems = ArrayList( listOf(
    privacyContent(
        "Another Permission", "Another permission with a custom icon goes here.",
        R./* mipmap or drawable for example */ . /* resource name */
    ),
    // ... Existing custom permission here.
) )
```

Build and run the application to test that the new permission appears, with its icon.

If everything is as expected, you are ready to continue to the next step.

Add an app permission with a built-in icon

The privacy module comes with built-in icon resources that you can use in your privacy agreement, instead of creating your own custom icons.

Built-in icons are accessed via the `AWPrivacyController` `getPermissionResource` static method. They are represented by the `AWPrivacyPermissionType` enumerated constants. Screen captures showing all the icons and constant names are included in this document, in the [Appendix: Built-In App Permission Icons](#).

Proceed as follows.

1. **Add a new privacy content item factory function to the privacy helper base class.**

Implement a factory function for instantiating new privacy content items with built-in icons. The function can be based on the factory function created in the preceding step.

The Kotlin code for the factory function could look like the following.

```
class PrivacyBase(...) {
    companion object {
        // ... Other companion object code here and previous factory functions.

        fun privacyContent(
            title: String, summary: String, id: AWPrivacyPermissionType
        ) : AWPrivacyContent = privacyContent(
            title, summary, AWPrivacyController.getPermissionResource(id)
        )
    }
}
```

2. **Add a new item to the privacy agreement app permissions.**

In the code added in the preceding step, in the `appPermissionItems` list, instantiate a new item with code like the following.

```
appPermissionItems = ArrayList( listOf(
    privacyContent(
        "Camera", "Required for taking pictures.", AWPrivacyPermissionType.PERMISSION_CAMERA),
    // ... Existing custom permission here.
) )
```

In this code, the camera icon has been used. For a list of all the icon names, see the [Appendix: Built-In App Permission Icons](#).

Build and run the application to test that the new permission appears, with its icon.

If everything is as expected, you are ready to continue to the next step.

Add custom data collection text

The previous steps customized the app permissions section of the privacy agreement. The next steps will customize the data collection section.

Customization of the data collection section of the privacy agreement uses the same classes as customization of the app permissions section. The factory methods added to the privacy helper for app permissions will be used again.

In the code added for app permission customization, in the `configureAgreement` method, customize the data collection text with code like the following.

```
override fun configureAgreement(context: Context): AWPrivacyConfig
{ return super.configureAgreement(context).apply {

    appPermissionTitle = "My App Permissions"
    appPermissionItems = ArrayList( listOf( ... ) )

    // Following code is added for data collection customization.
    dataCollectionDescription = "Description of data collection by my app."
    dataCollectionItems = ArrayList( listOf(
        privacyContent(
            "Browsing history", "The app will log which sites you browse."
        )
    ) )

    // ToDo: Other agreement configuration here.
} }
```

Build and run the application to test the change just made:

- The data collection section title in the privacy consent and review user interfaces will be the value set in the code.
- On the screen that opens when the data collection title is tapped, the custom privacy item appears.

If everything is as expected, you are ready to continue to the next step.

Add a built-in data collection item

The privacy module comes with built-in data collection items that you can use in your privacy agreement. These are “canned” full items each with a short title text, longer description text, and icon.

Built-in data collection items are accessed via the `AWPrivacyController` `getAppDataContent` static method. An Android `Context` is required as a parameter. Items are represented by the `AWPrivacyAppDataType` enumerated constants. Screen captures showing all the items and constant names are included in this document, in the [Appendix: Built-In Data Collection Types](#).

In the code added in the preceding step, in the `dataCollectionItems` list, instantiate a new item with code like the following.


```
dataCollectionItems = ArrayList( listOf(
    AWPrivacyController.getAppDataContent(
        context, AWPrivacyAppDataType.APP_DATA_DEVICE_HARDWARE)!! ,
    // ... Existing data collection items here.
) )
```

Build and run the application to test that the new permission appears, with its icon.

Next Steps

You have now configured some representative parts of the privacy agreement, and your code has a structure that can accommodate all the configuration options of the privacy module.

Think about your requirements for privacy agreements and check the [Configuration Reference](#) section in this document to see how they can be implemented. That section lists the configuration properties of the Workspace ONE privacy module and illustrates their positions with annotated screen capture images.

Notes on content configuration

The following notes apply to agreement content configuration.

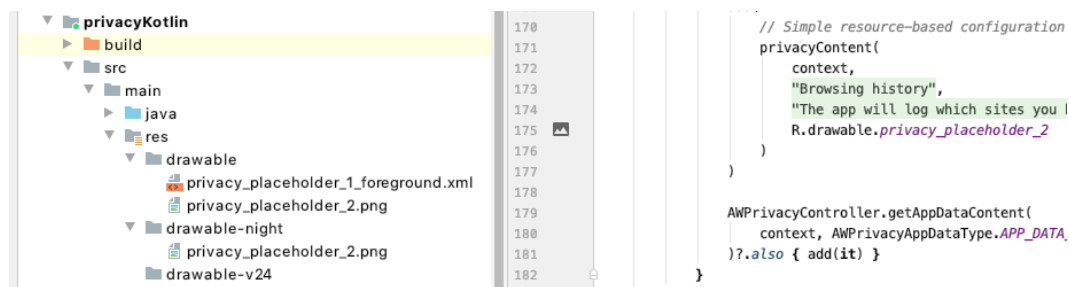
- The privacy module has a built-in default list of data collection items. A mutable copy of the built-in list can be created by calling the `AWPrivacyConfig.dataCollectionDefaultItems` static method. An Android Context is required as a parameter. Kotlin code to access the list could be like the following.

```
val items = AWPrivacyConfig.dataCollectionDefaultItems(context)
```

- The privacy module user interfaces support Android night mode, also known as dark mode. The built-in app permission icons and data collection items come with light- and dark-mode versions of their graphics.

You can provide night-mode versions of custom icons in your agreement configuration. Use the Android alternative resources mechanism with the “night” suffix.

The following screen capture shows a night-mode alternative for the `privacy_placeholder_2.png` resource in the Android Studio project view of the Open Source privacy module sample application.



Screen Capture 3: Alternative resources for night mode

For details, see the Android developer website, for example:
<https://developer.android.com/.../providing-resources#AlternativeResources>

Task: Remove data sharing opt-in

Removing the opt-in for data sharing is an optional Workspace ONE privacy agreements integration task for Android application developers.

Data here means additional data gathered for analytical and other non-essential purposes. For example, recording which features of the app are actually used so that usage patterns can be analysed with a view to informing product development decisions. This type of data isn't essential to the operation nor security of the app.

By default, the privacy module offers a data sharing opt-in to the user. The user can accept or decline the opt-in, separately to consenting to the main privacy agreement. For screen capture images, see [Privacy Splash](#) and [Data Sharing Opt In](#) in this document.

If your app doesn't gather and share additional data, remove the opt-in from the privacy agreement user interface by following the instructions below.

This task is dependent on the [Task: Configure agreement content](#). These instructions assume that the dependent task is complete already.

Instructions

Set the `AWPrivacyConfig` property `dataSharingShow` to `false` to remove the opt-in.

In your privacy helper subclass, in the code added for app permission customization, in the `configureAgreement` method, remove the opt-in with code like the following.

```
override fun configureAgreement(context: Context): AWPrivacyConfig
{ return super.configureAgreement(context).apply {
    dataSharingShow = false
    // ... Other agreement content configuration here.
} }
```

Next Steps

Build and run the application, and test the changes just made.

- In the consent and review user interfaces, the opt-in shouldn't appear on the privacy splash screen.
- After consenting to the main privacy agreement, you shouldn't be prompted to opt in to additional data sharing.

This completes removal of the additional data sharing opt-in.

Task: Configure agreement rejection

Configuring rejection is an optional Workspace ONE privacy agreements integration task for Android application developers.

By default, the privacy module treats the privacy agreement as mandatory. The module's consent flow user interface won't offer an option to reject the agreement unless configured to do so. For details of the consent flow, see the [Task: Add a consent check at application launch](#).

If your app has some features that can be used without acceptance of the privacy agreement, you can allow rejection of the agreement. Follow the instructions below.

The configure agreement rejection task is dependent on the [Task: Configure agreement content](#). These instructions assume that the dependent task is complete already.

Instructions

Proceed as follows.

1. Set `privacyRejectShow:true` to allow rejection of the agreement.

In your privacy helper subclass, in the code added for app permission customization, in the `configureAgreement` method, allow rejection with code like the following.

```
override fun configureAgreement(context: Context): AWPrivacyConfig
{ return super.configureAgreement(context).apply {
    privacyRejectShow = true
    // ... Other agreement content configuration here.
} }
```

2. Update your privacy result receipt callback to recognize rejection.

For example, in the sample code under [Launch Activity Change](#) the privacy receipt callback is the `privacyCallback` method. It receives an `AWPrivacyResult` as a parameter.

You can check for rejection of the agreement with code like the following.

```
private fun privacyCallback(result: AWPrivacyResult) {
    val rejected = result.privacyResultType == AWPrivacyResultType.CANCEL
    // TODO: If rejected, only show app features that can be used without
    // acceptance of the privacy agreement.
}
```

3. Restrict your app user interface and features in the rejected case.

Whichever features of your app cannot be used without acceptance of the privacy agreement must be blocked if it was rejected.

Next Steps

Build and run the application, and test the changes just made.

- In the consent flow user interface, a reverse navigation option should appear on the privacy splash screen. The location is shown in the configuration screen capture images in this document. See [Privacy Splash](#).
- In case you already accepted the agreement in your app as installed, you can do one of the following to force the consent flow to open.
 - Uninstall and reinstall the app.
 - Revoke the agreement and restart the app, if you have completed the [Task: Add Agreement Revocation](#).
 - Clear the app storage and restart it. See the [Appendix: How to reset application state](#) for instructions, if needed.

This completes configuration of agreement rejection.

Task: Add agreement revocation

Adding revocation is an optional Workspace ONE privacy agreements integration task for Android application developers.

An option to revoke the privacy agreement could be offered in your app user interface. To revoke the privacy agreement, call the `AWPrivacyController` `reset` static method. Kotlin code to do this could be as follows.

```
AWPrivacyController.reset()
```

After revoking the privacy agreement, the app code must re-run the consent check and any ensuing updates to its user interface. If the privacy agreement is mandatory, for example, then the main app user interface mustn't be shown after revocation until the agreement is accepted again.

Next Steps

Build and run the application, and test the change just made.

Configuration Reference

There are many aspects of the privacy agreement that can be configured. The programming interface for agreement configuration is the `AWPrivacyConfig` and `AWPrivacyContent` classes. The general approach to configuration is to set the properties of an instance of one of those classes.

The following table lists all the configuration properties.

AWPrivacyConfig property	Type	Note
Banner that appears at the top of the privacy details screen:		
aboutPrivacyTitle	String	Heading.
aboutPrivacyDescription	String	Statement.
Data collection section:		
dataCollectionTitle	String	Section heading.
dataCollectionDescription	String	Statement.
dataCollectionItems	ArrayList <AWPrivacyContent>	List of collected data types.
App permissions section:		
appPermissionTitle	String	Section heading.
appPermissionDescription	String	Statement.
appPermissionItems	ArrayList <AWPrivacyContent>	List of app permissions.
Privacy policy section:		
enterprisePolicyShow	Boolean	Whether to show the section.
enterprisePolicyTitle	String	Section heading.
enterprisePolicyDescription	String	Statement.
enterprisePolicyLink	String	URL to open for more information.
Additional data sharing opt in:		
dataSharingShow	Boolean	Whether to show the opt in.
dataSharingTitle	String	Section heading.
dataSharingDescription	String	Statement.
dataSharingNavigation	String	How to get to the option in the app user interface.
Other:		
applicationName	String	App name as it should appear in the privacy agreement user interface.
privacyRejectShow	Boolean	Whether the agreement can be rejected.
AWPrivacyContent property		
title	String	Heading.
summary	String	Statement.
id	Int	Android resource identifier for the icon.

Table 2: Configuration properties

Agreement Structure

The order in which the sections of the privacy agreement appear is fixed. Data collection is first, then app permissions, then privacy policy is last, if it is shown.

The hierarchy of the privacy agreement is also fixed. The data collection and app permissions sections each have a list of constituent items. Additional custom list-

based sections cannot be added. Constituent items cannot be added to any other section of the agreement.

Agreement Consent Tracking

The privacy module tracks end user consent to the privacy agreement. At the point of consent, the privacy module generates and stores an acceptance record for tracking purposes.

The record includes an acceptance check value that is generated from the privacy agreement as it was configured when consent was given. The following parts of the agreement are factors in the generation of the acceptance check value.

- The `enterprisePolicyLink` URL.
- All of the `appPermissionItems` `AWPrivacyContent` summary texts.
- All of the `dataCollectionItems` `AWPrivacyContent` summary texts.

The app could change the agreement configuration after end user consent in such a way that the acceptance check value would be different. In that case, the user's previous consent no longer applies. The user must be prompted to consent to the changed agreement before continuing to use the app.

The [Task: Add a consent check at application launch](#) has instructions for checking the need for user consent, and for starting the consent flow.

See Also

For instructions and sample code, see the following sections of this document.

- [Task: Configure agreement content.](#)
- [Task: Configure agreement rejection.](#)

For pictures that show where the configurable properties appear in the privacy user interface, see the [Configuration Screen Capture Images](#) in this document

Configuration Screen Capture Images

The following screen capture images show configurable properties in the Workspace ONE privacy agreement user interface.

Privacy Splash

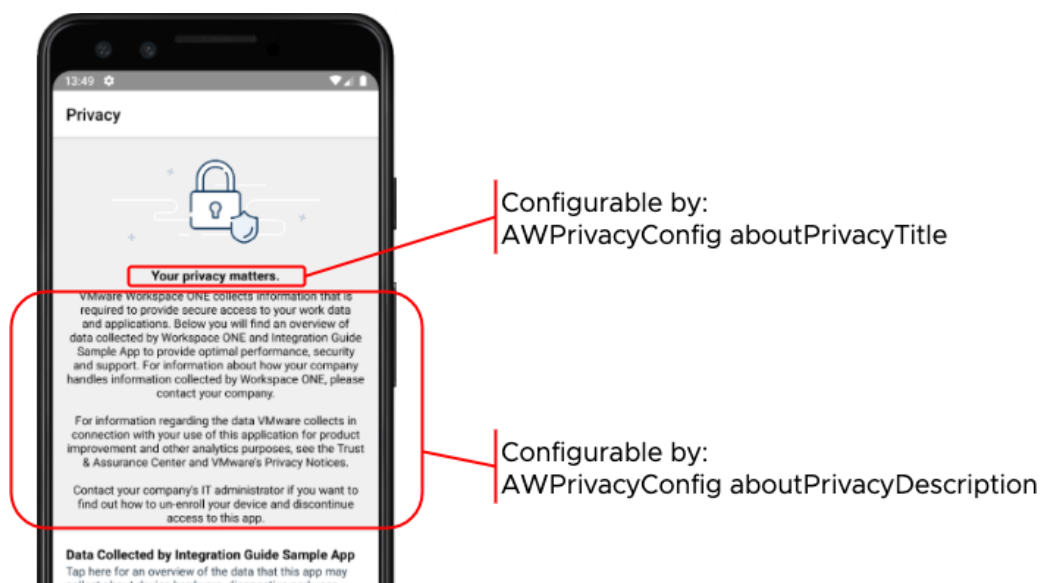
The following screen capture image shows configurable properties on the privacy splash screen. The splash screen is the first screen in the consent and review user interfaces.



Screen capture 4: Privacy Splash screen

About Privacy

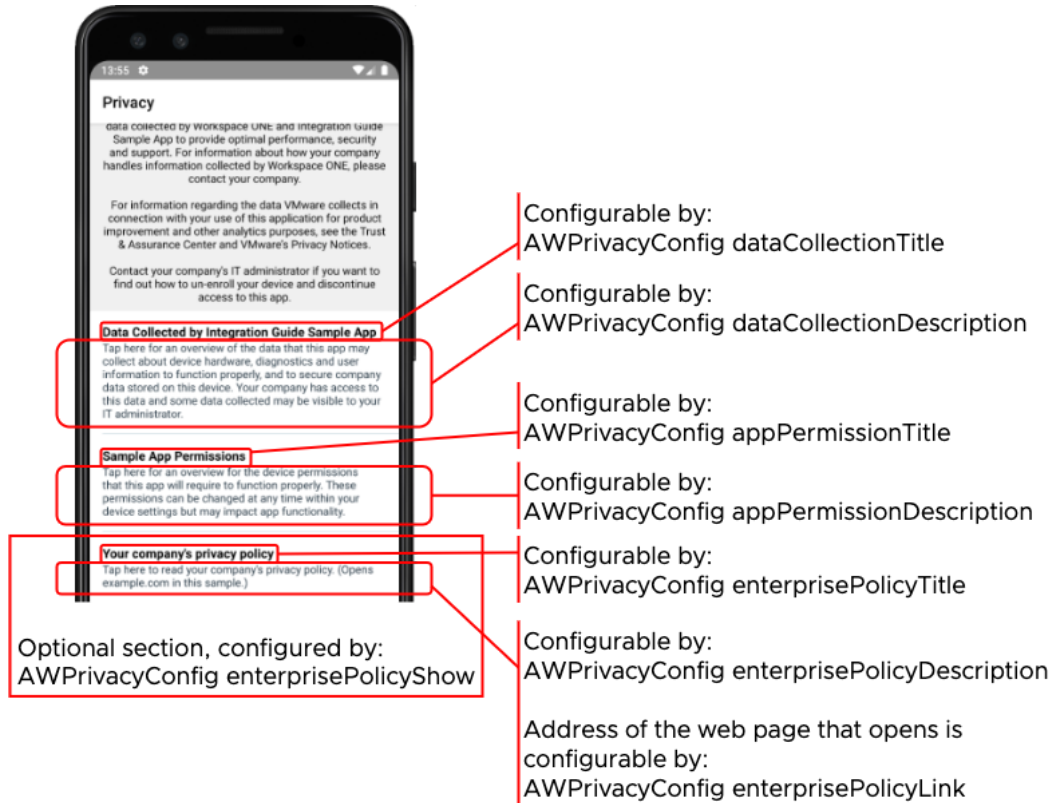
The following screen capture image shows configurable properties in the about privacy banner.



Screen capture 5: About Privacy configuration

Privacy Sections

The following screen capture image shows configurable properties in the privacy sections.

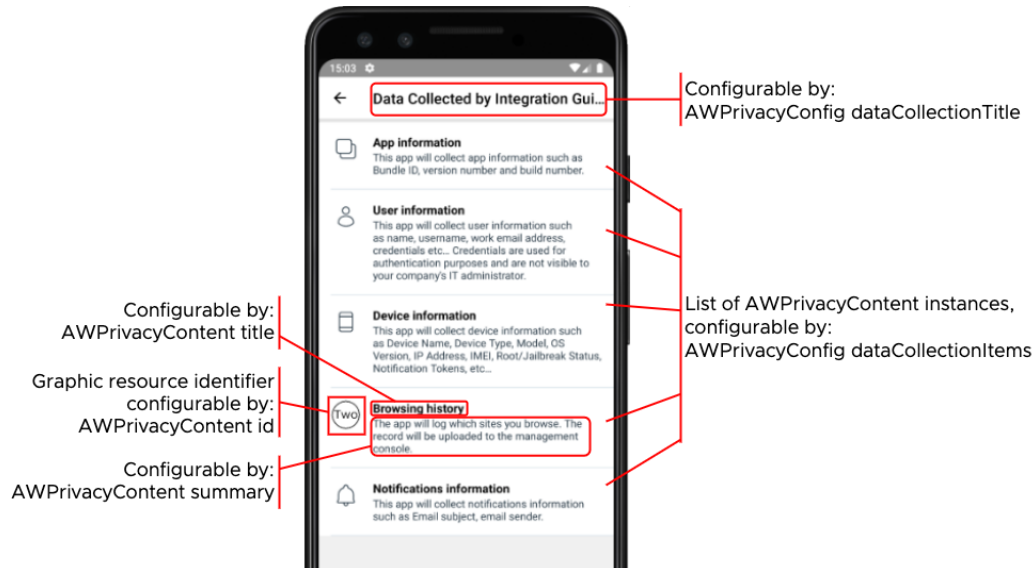


Screen capture 6: Privacy Sections

Note that the Android system permission INTERNET would be required for the app to open the web page configured in the enterprisePolicyLink.

Data Collection Items

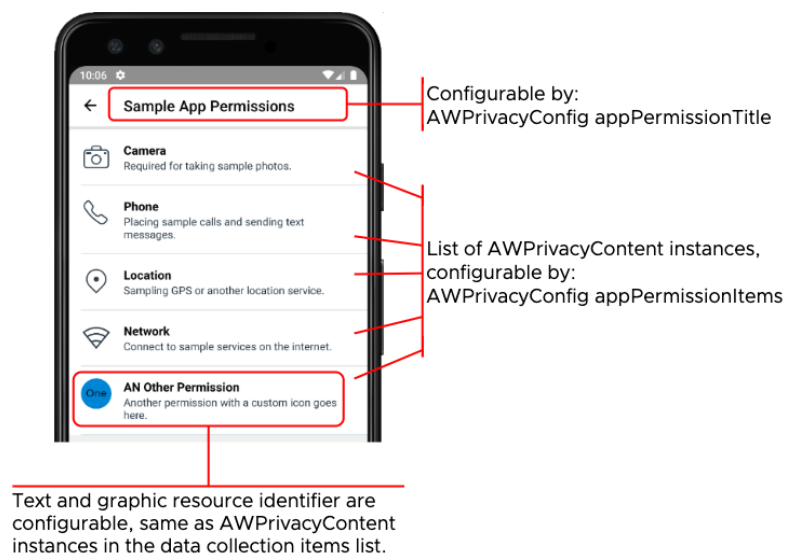
The following screen capture image shows configurable properties in the data collection items.



Screen capture 7: Data Collection Items

App Permission Items

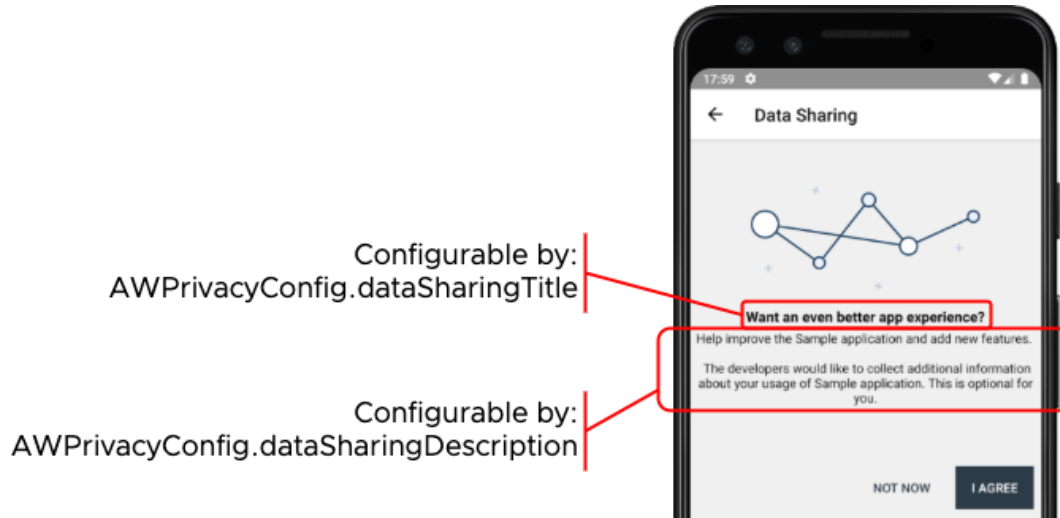
The following screen capture image shows configurable properties in the app permission items.



Screen capture 8: App Permission Items

Data Sharing Opt In

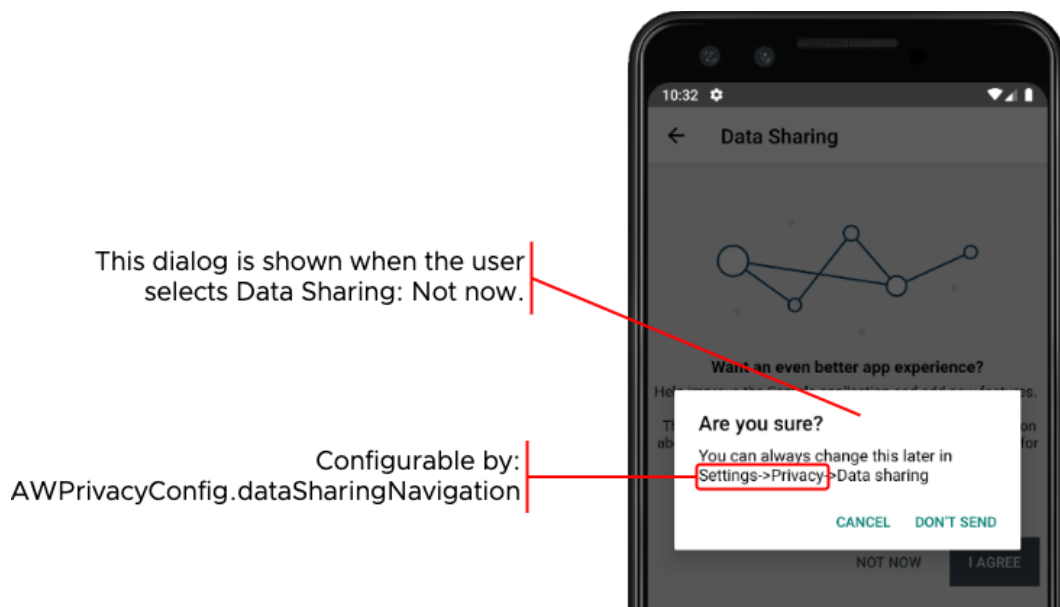
The following screen capture image shows configuration of the data sharing opt in screen.



Screen capture 9: Data Sharing Opt In

Data Sharing Navigation

The following screen capture image shows configuration of the data sharing navigation instructions.

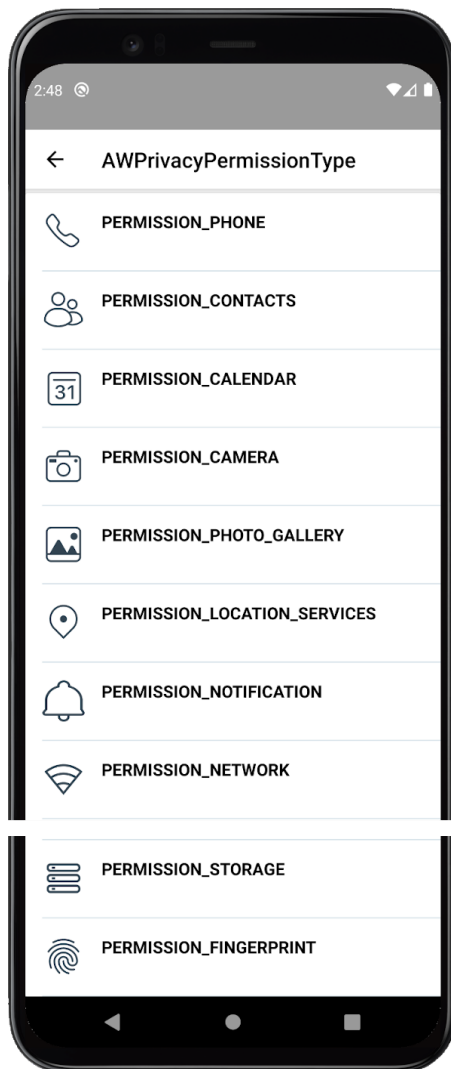


Screen capture 10: Data Sharing Navigation

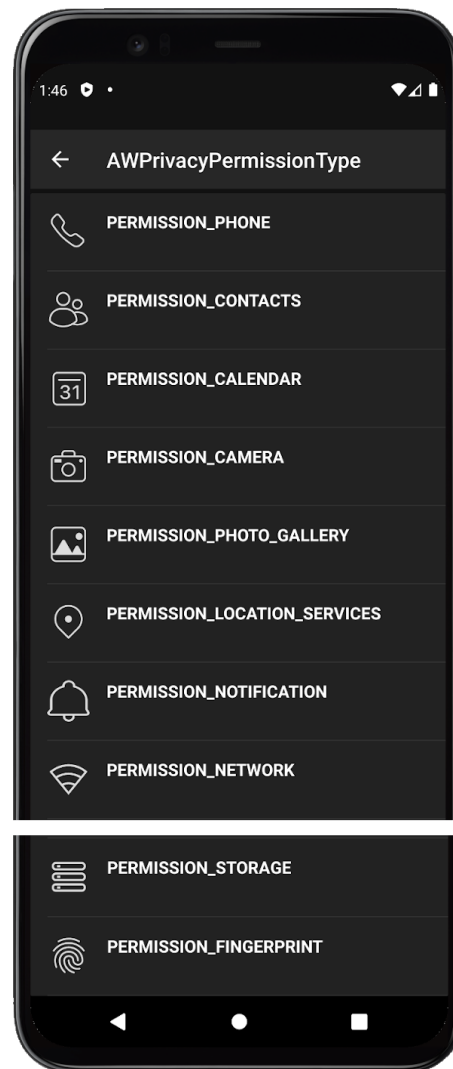
Appendix: Built-In App Permission Icons

The following screen capture images show the built-in app permission icons that come with the privacy module.

For instructions how to use these icons, see [Add an app permission with a built-in icon](#).



Screen capture 11: Built-in app permission icons, light mode



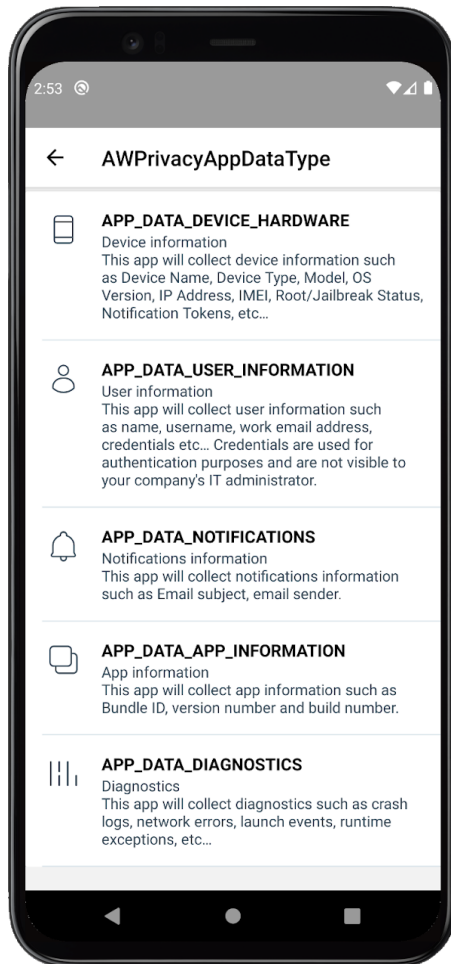
Screen capture 12: Built-in app permission icons, dark mode

(There is a break in the image because the icons don't all fit on a single screen.)

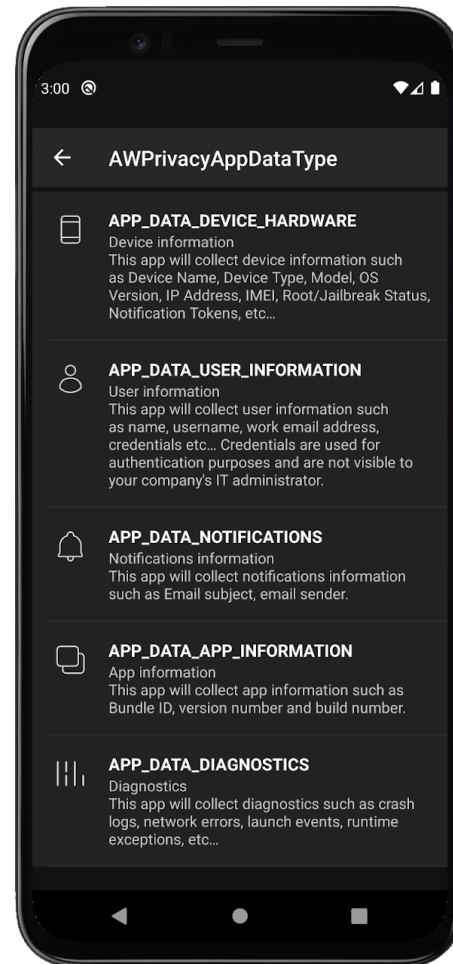
Appendix: Built-In Data Collection Types

The following screen capture image shows the built-in data collection items that come with the privacy module.

For instructions how to use these items, see [Add a built-in data collection item](#).



Screen capture 13: Built-in data collection types, light mode



Screen capture 14: Built-in data collection types, dark mode

Appendix: How to reset application state

You can reset an application to its just-installed state by following these instructions.

- 1. Open the App Info screen for the application whose data you want to reset.**

For example, do one of the following.

- From the device home screen, long press the application icon and then select App info in the context menu that appears.
- Open the device Settings and search for the application by its long name. (The long name isn't necessarily the same as the package identifier.)
- Open the device Settings and navigate to Apps and notifications, then select the application from the recent list, or from the all list.

- 2. Select Storage & cache.**

This opens the Storage management screen for the application.

- 3. Select to Clear Storage, and confirm this if prompted.**

All application data has now been deleted and any privacy agreement consent will have been reverted.

Document Information

Published Locations

This document is available

- in Markdown format, in the repository that also holds the sample code:
<https://github.com/vmware-samples/...Privacy.md>
- in Portable Document Format (PDF), on the VMware website:
<https://developer.vmware.com/...Privacy.pdf>

Revision History

12jul2021	First publication, for 21.5.1 SDK for Android.
20aug2021 to 09dec2021	Updated, for 21.7 to 21.11 SDK for Android releases.
26Jan2022	Updated, for 22.1 SDK for Android.
28Feb2022	Updated, for 22.2 SDK for Android.
04Apr2022	Updated, for 22.3 SDK for Android.
29Apr2022	Updated, for 22.4 SDK for Android.
06Jun2022	Updated, for 22.5 SDK for Android.
05Jul2022	Updated, for 22.6 SDK for Android.
23Aug2022	Updated, for 22.8 SDK for Android.
04Nov2022	Updated, for 22.10 SDK for Android.
13Dec2022	Updated, for 22.11 SDK for Android.
25Jan2023	Updated, for 23.01 SDK for Android.
15Mar2023	Updated, for 23.03 SDK for Android.
27Apr2023	Updated, for 23.04 SDK for Android.
06Jun2023	Updated, for 23.06 SDK for Android.
24Jul2023	Updated, for 23.07 SDK for Android.
07Sep2023	Updated, for 23.09 SDK for Android.
25Oct2023	Updated, for 23.10 SDK for Android.
18Dec2023	Updated, for 23.12 SDK for Android.
25Jan2024	Updated, for 24.01 SDK for Android.

Legal

VMware LLC 3401 Hillview Avenue Palo Alto CA 94304 USA Tel 877-486-9273 Fax 650-427-5001 www.vmware.com
Copyright © 2024 VMware LLC All rights reserved.

This content is protected by U.S. and international copyright and intellectual property laws. VMware products are covered by one or more patents listed at <https://www.vmware.com/go/patents>. VMware is a registered trademark or trademark of VMware LLC and its subsidiaries in the United States and other jurisdictions. All other marks and names mentioned herein may be trademarks of their respective companies.

The Workspace ONE Software Development Kit integration samples are licensed under a two-clause BSD license.
SPDX-License-Identifier: BSD-2-Clause