MASVS-PLATFORM-1:

App Permissions:

aero.panasonic.inflight.permission.ACCESS_IFESERVICE	unknown	Unknown permission	Unknown permission from android reference
android.permission.ACCESS_ADSERVICES_AD_ID	normal	allow app to access the device's advertising ID.	This ID is a unique, user-resettable identifier provided by Google's advertising services, allowing apps to track user behavior for advertising purposes while maintaining user privacy.

PERMISSION	STATUS	INFO	DESCRIPTION
android.permission.ACCESS_ADSERVICES_ATTRIBUTION	normal	allow applications to access advertising service attribution	This enables the app to retrieve information related to advertising attribution, which can be used for targeted advertising purposes. App can gather data about how users interact with ads, such as clicks or impressions, to measure the effectiveness of advertising campaigns.
android.permission.ACCESS_ADSERVICES_TOPICS	normal	allow applications to access advertising service topics	This enables the app to retrieve information related to advertising topics or interests, which can be used for targeted advertising purposes.

For permissions the app uses most of them with in reason such as location, wifi, and bluetooth. Although why it needs bluetooth permissions is unknown at the moment. The most concerning permissions however are the ad permissions that reduce user privacy and of most concern a custom permisison to allow connection to inflight panasonic devices.

Testing for Sensitive Functionality Exposure through IPC:

The following reported exported as true:

```
<activity android:theme="@android:style/Theme.NoDisplay"
android:name="com.united.mobile.android.ui.NfcActivity" android:exported="true">


<activity android:name="com.united.mobile.android.ui.main.MainActivity" android:exported="true"
android:launchMode="singleTask" android:configChanges="screenSize|orientation">


<activity-alias android:name="com.united.mobile.android.ui.main.TravelReadyCenterAlias"
android:exported="true" android:targetActivity="com.united.mobile.android.ui.main.MainActivity">


<receiver android:name="com.united.mobile.android.widget.tripCountDown.TripCountDownWidgetLargeProvider"
android:permission="com.united.mobile.android.Main" android:enabled="true" android:exported="true">


<activity-alias android:name="com.united.mobile.android.ui.main.TravelReadyCenterAlias"
android:exported="true" android:targetActivity="com.united.mobile.android.ui.main.MainActivity">


<receiver android:name="com.united.mobile.android.appcore.receiver.InstallReferrerReceiver"
android:enabled="true" android:exported="true">


<activity android:theme="@style/DeviceCredentialHandlerTheme"
android:name="androidx.biometric.DeviceCredentialHandlerActivity" android:exported="true"/>


<receiver android:name="com.google.firebase.iid.FirebaseInstanceIdReceiver"
android:permission="com.google.android.c2dm.permission.SEND" android:exported="true">


<receiver android:name="com.usebutton.sdk.internal.receivers.LocaleChangedReceiver"
android:exported="true">


<service android:name="androidx.work.impl.background.systemjob.SystemJobService"
android:permission="android.permission.BIND_JOB_SERVICE"
android:enabled="@bool/enable_system_job_service_default" android:exported="true"
android:directBootAware="false"/>


<receiver android:name="androidx.work.impl.diagnostics.DiagnosticsReceiver"
android:permission="android.permission.DUMP" android:enabled="true" android:exported="true"
android:directBootAware="false">
<service android:name="com.google.android.play.core.assetpacks.AssetPackExtractionService"
android:enabled="false" android:exported="true">


<provider android:name="com.inmobile.MeshProvider" android:readPermission="" android:enabled="true"
android:exported="true" android:authorities="com.united.mobile.android.provider" android:syncable="true"/>
```

App also has many intent filters:

```
<intent-filter>
    <action android:name="android.intent.action.VIEW"/>
</intent-filter>
<intent-filter android:autoVerify="true">
    <action android:name="android.intent.action.VIEW"/>
    <category android:name="android.intent.category.DEFAULT"/
    <category android:name="android.intent.category.BROWSABLE
    <data android:scheme="http"/>
    <data android:scheme="https"/>
    <data android:host="www.united.com"/>
    <data android:host="united.com"/>
    <data android:pathPrefix="/ual/en/us/navigation/airportna
    <data android:pathPrefix="/ual/en/us/navigation/airportNA
    <data android:pathPrefix="/ual/en/US/navigation/airportna
    <data android:pathPrefix="/ual/en/US/navigation/airportNA
    <data android:pathPrefix="/en/us/fly/travel/airport/termi
</intent-filter>
<intent-filter android:autoVerify="true">
    <action android:name="android.intent.action.VIEW"/>
    <category android:name="android.intent.category.BROWSABLE
    <category android:name="android.intent.category.DEFAULT"/
    <data android:scheme="ualentertainment"/>
</intent-filter>
<intent-filter android:autoVerify="true">
    <action android:name="android.intent.action.VIEW"/>
    <category android:name="android.intent.category.BROWSABLE
    <category android:name="android.intent.category.DEFAULT"/
    <data android:scheme="ualpartnerprovisionreturn"/>
    <data android:scheme="ualpartnerprovisioncancel"/>
</intent-filter>
<intent-filter android:autoVerify="true">
    <action android:name="android.intent.action.VIEW"/>
    <category android:name="android.intent.category.BROWSABLE
    <category android:name="android.intent.category.DEFAULT"/
    <data android:scheme="http"/>
    <data android:scheme="https"/>
    <data android:host="www.united.com"/>
    <data android:host="united.com"/>
    <data android:host="news.united.com"/>
    <data android:pathPrefix="/offers/myoffers"/>
</intent-filter>
<intent-filter android:autoVerify="true">
    <action android:name="android.intent.action.VIEW"/>
    <category android:name="android.intent.category.BROWSABLE
    <category android:name="android.intent.category.DEFAULT"/
    <data android:scheme="ualpaypalreturn"/>
    <data android:scheme="ualpaypalcancel"/>
</intent-filter>
<intent-filter android:autoVerify="true">
    <action android:name="android.intent.action.VIEW"/>
```

Testing Deep Links:

com.united.mobile.android.ui.NfcActivity

- unitednfctag://nfcbagprint

com.united.mobile.android.ui.main.MainActivity

- http://click.enews.united.com/
- http://news.united.com/offers/myoffers
- http://news.united.com/pub/acc
- http://united.com/en/US/manageres/tripdetails
- http://united.com/en/us/account
- http://united.com/en/us/checkin
- http://united.com/en/us/flightstatus/details
- http://united.com/en/us/fly/travel/airport/terminal-guide/download-app.html
- http://united.com/en/us/fly/travel/mobile-tools/united-trip-planner
- http://united.com/en/us/manageRes/tripDetails
- http://united.com/en/us/manageres/tripdetails
- http://united.com/offers/myoffers
- http://united.com/s/us
- http://united.com/travel/checkin/quickstart
- http://united.com/ual/en/US/navigation/airportNAV/nav
- http://united.com/ual/en/US/navigation/airportnav/nav
- http://united.com/ual/en/us/navigation/airportNAV/nav
- http://united.com/ual/en/us/navigation/airportnav/nav
- http://www.united.com/en-us/flights
- http://www.united.com/en/US/manageres/tripdetails
- http://www.united.com/en/us/account
- http://www.united.com/en/us/checkin
- http://www.united.com/en/us/flightstatus/details
- http://www.united.com/en/us/fly/travel/airport/terminal-guide/download-app.html
- http://www.united.com/en/us/fly/travel/mobile-tools/united-trip-planner
- http://www.united.com/en/us/manageRes/tripDetails
- http://www.united.com/en/us/manageres/mytrips
- http://www.united.com/en/us/manageres/tripdetails
- http://www.united.com/offers/myoffers
- http://www.united.com/s/us
- http://www.united.com/travel/checkin/quickstart
- http://www.united.com/ual/en/US/navigation/airportNAV/nav
- http://www.united.com/ual/en/US/navigation/airportnav/nav
- http://www.united.com/ual/en/us/navigation/airportNAV/nav
- http://www.united.com/ual/en/us/navigation/airportnav/nav
- http://www.unitedwifi.com/portal/l/appdetection
- https://click.enews.united.com/
- https://news.united.com/offers/myoffers
- https://news.united.com/pub/acc
- https://united.com/en/US/manageres/tripdetails
- https://united.com/en/us/account
- https://united.com/en/us/baggage/issues-with-your-checked-bags
- https://united.com/en/us/checkin
- https://united.com/en/us/digital-wallet/checkout
- https://united.com/en/us/flightstatus/details
- https://united.com/en/us/fly/travel/airport/terminal-guide/download-app.html
- https://united.com/en/us/fly/travel/baggagetracking
- https://united.com/en/us/fly/travel/mobile-tools/united-trip-planner
- https://united.com/en/us/manageRes/tripDetails
- https://united.com/en/us/manageres/tripdetails
- https://united.com/en/us/myunited/verify/email
- https://united.com/en/us/myunited/verify/phone
- https://united.com/en/us/pbs
- https://united.com/en/us/preordermeals/deeplink/marketing
- https://united.com/en/us/preordermeals/flightinformation
- https://united.com/en/us/travelreadycenter
- https://united.com/offers/myoffers
- https://united.com/s/us
- https://united.com/travel/checkin/quickstart
- https://united.com/travelreadycenter
- https://united.com/ual/en/US/navigation/airportNAV/nav
- https://united.com/ual/en/US/navigation/airportnav/nav
- https://united.com/ual/en/us/navigation/airportNAV/nav
- https://united.com/ual/en/us/navigation/airportnav/nav
- https://www.united.com/Booking/SearchInjection/VendorQueryPinDown
- https://www.united.com/en-us/flights
- https://www.united.com/en/US/manageres/tripdetails
- https://www.united.com/en/us/account
- https://www.united.com/en/us/baggage/issues-with-your-checked-bags
- https://www.united.com/en/us/checkin

- https://www.united.com/en/us/digital-wallet/checkout
- https://www.united.com/en/us/flightstatus/details
- https://www.united.com/en/us/fly/print/bagtag
- https://www.united.com/en/us/fly/travel/airport/terminal-guide/download-app.html
- https://www.united.com/en/us/fly/travel/baggagetracking
- https://www.united.com/en/us/fly/travel/mobile-tools/united-trip-planner
- https://www.united.com/en/us/manageRes/tripDetails
- https://www.united.com/en/us/manageres/mytrips
- https://www.united.com/en/us/manageres/tripdetails
- https://www.united.com/en/us/myunited/verify/email
- https://www.united.com/en/us/myunited/verify/phone
- https://www.united.com/en/us/pbs
- https://www.united.com/en/us/preordermeals/deeplink/marketing
- https://www.united.com/en/us/preordermeals/flightinformation
- https://www.united.com/en/us/travelreadycenter
- https://www.united.com/offers/myoffers
- https://www.united.com/s/us
- https://www.united.com/travel/checkin/quickstart
- https://www.united.com/travelreadycenter
- https://www.united.com/ual/en/US/navigation/airportNAV/nav
- https://www.united.com/ual/en/US/navigation/airportnav/nav
- https://www.united.com/ual/en/jp/Booking/SearchInjection/VendorQueryPinDown
- https://www.united.com/ual/en/us/Booking/SearchInjection/VendorQueryPinDown
- https://www.united.com/ual/en/us/navigation/airportNAV/nav
- https://www.united.com/ual/en/us/navigation/airportnav/nav
- https://www.unitedwifi.com/portal/l/appdetection
- https://www.unitedwifi.com/portal/vod/playmovie
- ualentertainment://
- ualmasterpassreturn://
- ualmobile://flights
- ualmobile://homescreen
- ualmobile://mytrips
- ualmobile://openapp/.*
- ualpartnerprovisioncancel://
- ualpartnerprovisionreturn://
- ualpaypalcancel://
- ualpaypalreturn://
- ualprepaidbagsreturn://
- uaportalpacstream://

All united related links I deemed to be legitimate

MASVS-PLATFORM-2:

Testing Javascript Execution in WebViews:

Several locations where the setting is on. Most notably from google services + ads. Also some refences to a variety of games such as a flight sim, a Santa sleigh game and a trivia game.

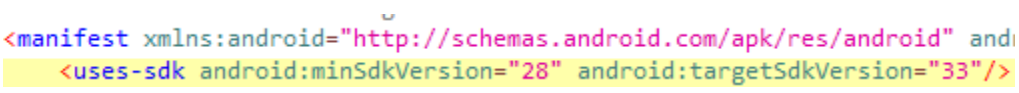
MASVS-PLATFORM-3:

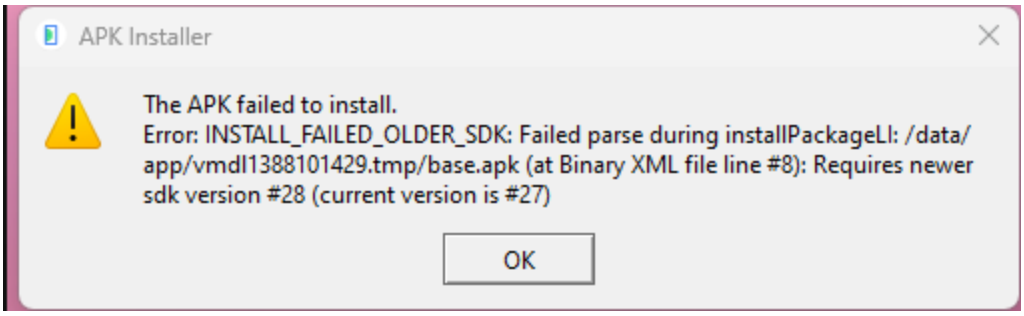
Finding Sensitive Information in Auto-Generated Screenshots:

No Overlay Attacks found.

MASVS-CODE-1:

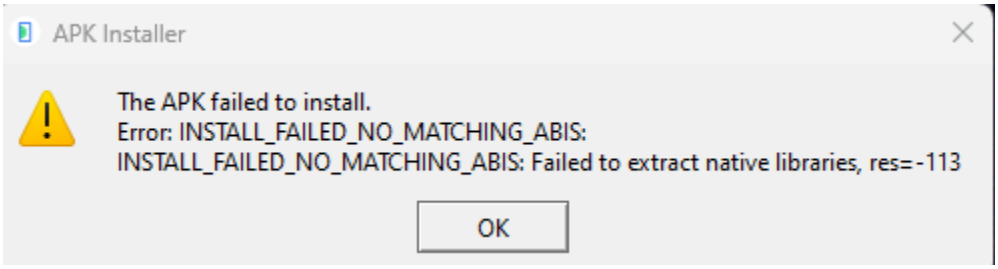
App has a minimum version of 28, below I tested the app on android api version 28





MASVS-CODE-2:

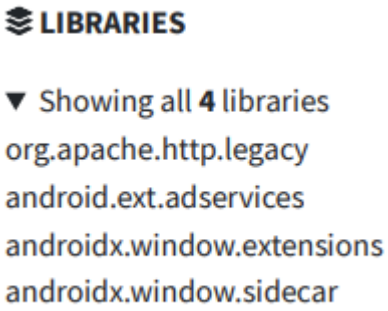
I got an apk from APK Mirror for a united airlines version from 2017, when loading it into an api version 30 emulator it could not load:



I then Downloaded a versions from 2022 and app successfully installed and ran with no indications for enforced updates.

MASVS-CODE-3:

MobSF does not report vulnerable library's.



MASVS-CODE-4:

EnableSafteBrowsing was not found

In testing the injection flaws on a rooted device, it seems that inputs are sanitized. In the following image testing on a rooted device the following error were received with the last command being of a export=false, used as a control to test the command's functionality: