Mobile Programming and Multimedia

Store Deployment

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Google Play Store

App stores

Once completed the development of the app, there are two critical steps:

– Test
– Deployment

Both the stores, with different accuracy levels, test the applications before adding them to their catalog. Therefore, it is essential to deeply test the application before the deployment phase

The deployment procedure asks for different screenshots of the application, both for the tablet and the smartphone versions

The deployment phase should not be underestimated, as it may take some time and several temporal constraints are not manageable by the developer
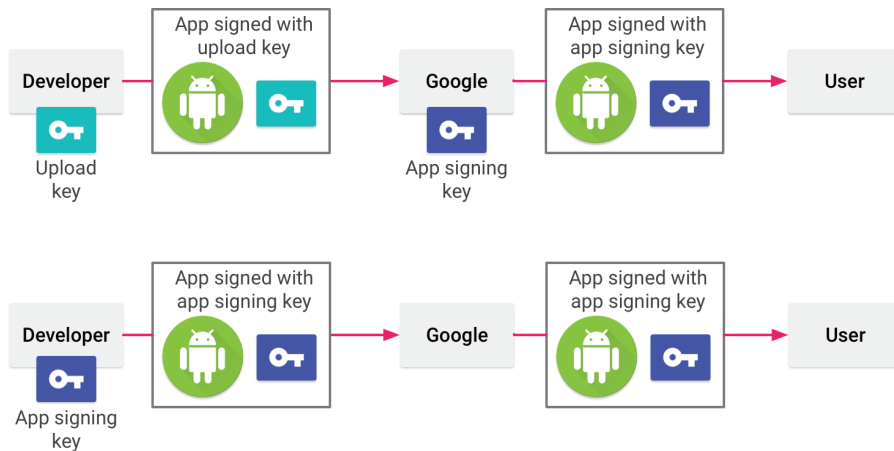
Necessary accounts

In addition to a Google account, it is necessary to have a developer account on the Google Play Developer Console:

– https://developer.android.com/distribute/console/
– 25$ unlimited duration, unlimited number of apps, it allows different accounts with different roles
– Credit card

For payment apps or apps with in-app purchases, it is necessary to have an account on the Google Payments Center

– activated from the console under the section "Commercial Account", and after "Configure the commercial account" with the required data

Application signing

Application signing

To deploy the apk of an app in the Play Store it is not possible to use debug signatures

- To generate a private key, it is possible to use the keytool command from a shell
- Some information required: keystore password and key password, developer name and company name

```
keytool -genkey -v -keystore
mykeystore.keystore -alias aliasname -keyalg
RSA -validity 999999 -keysize 2048
```

mykeystore is the name of the app

aliasname is the name of the alias

Required information - 1

- Name
- Description
- Screenshot for smartphone (at least two, min 320, max 3840, jpg or png 24 bits no more than 2:1) and tablet (at least one screenshot for 7 inches tablet and one for 10 inches tablet), Icon (png 32 bits (with alfa), 512x512)
- Feature image for the presentation page (1024x500, jpg or png,24 bit)
- Other images (android TV, wear OS, promotional image, etc.), but not mandatory
- APK

Required information - 2

- Categorization (type and category)
- Content classification: necessary to determine the minimum age for the app. Requires to compile a questionnaire
- Contact email
- URL with privacy information
- List of compatible devices
- Prices and countries where it is available
- Is it suitable for children?
- Does it contain advertisements?
- Does it contain in-app products?

Other services

App signature can be managed using the console

It is possible to add different app localizations

It is possible to buy translation or optimization services

The app can be distributed as an alpha or beta version, deciding if it can be tested by

- A closed group (email invitation)
- An open group (all the users of the google play store)

Prices and distribution

Once an application is deployed as free, it is not possible to transform it into a payment app

- Solution: ex novo project

The price can be automatically converted into different currencies or can be manually defined (in this case, prices can be different)

- The Freemium version (free base version, advanced paid functionalities) is a good solution to let the user evaluate the app before buying it

Google keeps 30% of the net amount

Timing

Once uploaded, the app is not immediately available because Google tests it

If everything goes fine, it is uploaded on the Play Store within hours or a day

- Attention: Google policy is different from Apple policy, the app can be removed if the quality level is not considered enough
- Pay particular attention to app categorization and content classification: wrong information can determine its removal

Apple Store

Requirements

Publishing an application on the Apple Store requires an Apple Developer Program account
- Cost: 99$/year
- Necessary for signing the application
- Registration as a private user or as a company

Moreover, an App Store Connect account is necessary
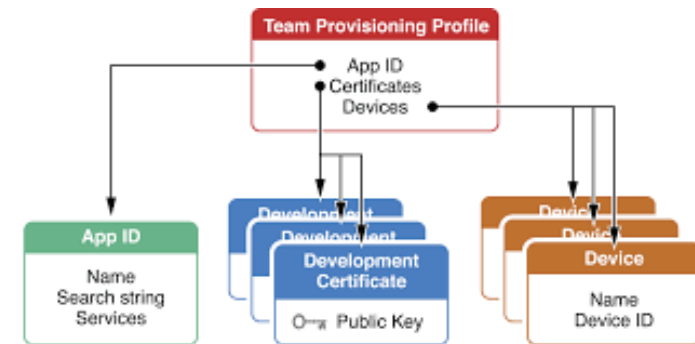- https://appstoreconnect.apple.com/

The entire process is much longer than the one for the Play Store

Publication process requires a Mac with Xcode installed
- It is not always necessary to directly use Xcode, but the program for building the app uses Xcode
- Necessary for high-resolution screenshot

Certificates

Certificates

Apple provides different certificates:
- Developer: is the developer signature of the application
- Application: linked to the application, defines the name
- Device: linked to a single device, used during the test phase for deployment of the app on devices linked to the signature account

An application must be signed with a Provisioning Profile, which collects information from all the previous certificates
This profile can be:
- Development: for the test phase
- Distribution, sometimes called Production: for the deployment on the store

A company account can be linked to different Developer, Application and Device certificates, and to different Provisioning Profiles

Certificates creation - 1

Necessary to have an Apple Developer Program account
- https://developer.apple.com/ and select "Certificates, Identifiers & Profiles "
- Create before an App Id and after a Distribution Provisioning Profile
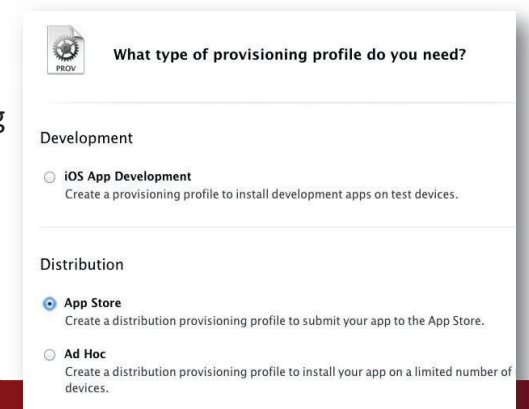
Certificates creation - 2

Once created a Provisioning Profile, download it (on an Apple computer) and add it into the keychain (double click on the certificate)

If the developer certificate was not already installed on the used computer, to build the app, it is necessary to download it and add it to the keychain

App creation

Once created and installed all the certificates, it is possible to create a .ipa file

Xcode is the tool for native development

In our case, we use the Corona/Solar 2D framework that allows sending the app directly to the Apple Store without opening Xcode

Mandatory information

If we want to publish a payment app, it is necessary to add bank coordinates under the section *«Contractual, fiscal and banking information»*
– Apple keeps 30% of the amount

To publish a new app the initial information are:
– Platforms
– Name
– Primary language
– Packet ID (is the ID chosen when creating the certificate)
– SKU (a unique id, not visible to Apple, defined by you)

Other mandatory information

Once created a record on iTunes Connect, other pieces of information are required

Panel «App information»
– URL with privacy information
– Subtitle (optional)
– Category and classification: attention, very important. It is possible to choose two categories and one or two subcategories
– License agreement
– Screenshot

It is possible to save a partial draft and continue later

Panel «Prices and availability»

The app can be:
- Free
- For payment
- With in-app payments

This panel allows specifying all these information

Screenshot

The App Store requires to add at least one screenshot for each supported device, because resolution can deeply change
- Insert this information with two purposes:
  - Attract the user
  - Show how the app works on different devices, adapting to different resolutions
- png and jpeg images with precise dimensions
  - https://help.apple.com/app-store-connect/#/devd274dd925
- Xcode simulator can be used to create the screenshots (cmd+S)
- Do not underestimate this step!

Other information

Other information that can be added in a second moment are:
- Application description and keywords: keywords cannot be modified
- URL for support and customer care information
- The build (or binary)
- Icon (1024x1024 pixels)
- Copyright information
- Version number
- App review information: Reference contact, particular requirements must be written in the notes, timing for app release (immediately after verification or in a different moment decided by the developer)

Verification and Timing

Apple checks that your app:
- does not contain malware or not authorized content
- has and high-quality standard of the interface and follows the indications
- works!

Tests are made manually, in the past they required on average two weeks, actually one week (if everything goes well the first time)

App Store Connect allows monitoring the app after release, providing information about
- downloads and sells
- crashes (only if users provide consensus)

And after?

Do not abandon the user!

Especially for Android applications, it is crucial to monitor app usage
- With "Abnormal stops and ANR", "Application Not Responding", it is possible to see malfunctions and with which devices, and error reports from the users
- Crashes are listed only if the user accepts to send the report

Publish new versions both to solve bugs and to provide new functionalities

App optimization for the stores
- The higher is the position of the app on the listing, the higher probability of new installations

Optimization

Stores are huge. To be downloaded, an application must be in the first positions of the ranking
- App ranking is crucial
- *ASO, App Store Optimization*

Two different strategies:
- Onsite: similar to on-page optimization for search engines, it defines methods that modify the application page on the store. It considers name, description, icon, screenshot all the other information of the app
- Offsite: similar to off-page optimization, it works on factors that cannot be modified autonomously, such as number of downloads and users' rating

Unluckily, differently from search engines, both Google and Apple do not publish ranking criteria

Onsite criteria

Onsite criteria that influence ranking are:
- Keyword, both inside the name and between ones defined when the app was inserted in the store
- Presence and type of icon
- Number and quality of screenshots
- Preview video
- Usage and evaluation stats

Offsite criteria

Offsite criteria that influence ranking are :

- Number of downloads
- Download evolution
- Number of installations
- Number of uninstalls
- Number and average of the evaluations
- Ratings evolution

Do not try to influence these values with dishonest methods to avoid being "banned"

ASO for the Play Store - 1

Since there is no available information about ranking implementation, the starting point is the optimization of the Google engine

Keywords:

- Excellent if they are contained in the title but it must be shorter than 20-25 characters
- Insert the brand name in the title only if it is well known, otherwise it is better to put keywords that describe the content
- Very important in the app description (both in the short and long form)
- The Play Store provides an Auto Suggest feature that shows the most used keywords, and can be a resource to choose the correct keywords

ASO for the Play Store - 2

Screenshots and videos:

- Used to improve ranking, and increase the possibility of being chosen by the user, that considers more seriously pages with a lot of visual elements
- Really important are colors usage and quality
- The icon must be easily recognizable even within an interface full of elements if you want to be sure that the app will be used once installed

Choosing the right category is very important

Play store gives high importance to the number and quality of external links that point to the page of the app

- Good app promotion outside and good quality are the winning factors

ASO for the l'App Store - 1

As for the Play Store, keywords are very important, but in this case are inserted in a specific field with a maximum of 100 characters

- If the app is multilanguage, even the keywords must be multilanguage
- Separate keywords with commas without spaces
- Do not add the category to the keywords, but choose it carefully

The name of the app can be at most 50 characters (suggestion: maximum 23) and must avoid terms that recall the app content

The description is a maximum of 4000 characters, but it is better to use less to improve readability

- Apple officially declared to use the keywords only in the specific input field, but adding them in the description is not a bad idea
- First sentences are the most important

Even in this case, icon, visual material, number of downloads, and ratings are critical

- Ratings are important even if not positive
- Customer service helps improve ratings

Android
- https://developer.android.com/studio/publish/
- https://developer.android.com/studio/publish/app-signing

Apple
- App Distribution guide: https://help.apple.com/xcode/mac/current/#/dev8b4250b57
- App store Connect Developer Guide: https://developer.apple.com/support/app-store-connect/