Using ANE with Adobe AIR

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A talk for

Adobe AIR
Developers Group

- **Intermediate level**
- Android (**Java**) / iOS (**Obj-C**)
- **AS3** / Adobe AIR

AS3 and Native

- Choose the short way
- Which platforms
  - Desktop: macOS, Windows, Linux
  - Mobile: iOS, Android
  - Tablet: iOS, Android
  - TV: tvOS, Android
  - Game consoles: Wii, PS4, XBox ?
- Let’s talk about ANEs

Objectives

Setup your IDEs

Create an AS3 library (SWC)

Create Java (Android) and Objective-C (iOS) libraries

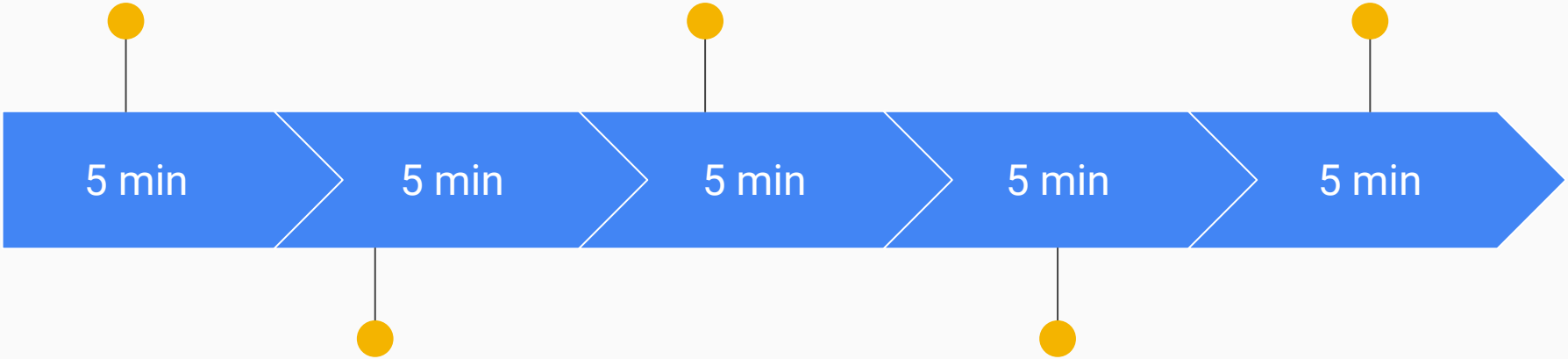
Create libraries for other platforms (Windows, macOS, tvOS)

Compile and use native extensions in your Adobe AIR projects

Set up Adobe AIR SDK in your IDE

Create Android and iOS libraries

Use ANEs in your projects



Create an AS3 library

Compile an ANE with ADT

Setup

- Download latest AIR SDK
- Install your IDEs
  - IntelliJ - Animate - Flash Builder
  - Eclipse / Xcode
  - Other IDEs
- Setup your tools
- Start to code

Set up your tools

Prior to everything, you have to:

- Download latest Adobe AIR SDK
- Choose your IDEs
- Install and setup your tools

You are ready to start your code. First, your AS3 library, then your iOS and Android libraries.

(1) https://www.adobe.com/devnet/air/air-sdk-download.html

(2) https://www.jetbrains.com/idea/download/
https://www.adobe.com/fr/products/animate.html
https://www.adobe.com/products/flash-builder-family.html
https://fdt.powerflasher.com
http://www.flashdevelop.org
http://moonshine-ide.com

(3) If you plan to make a pure AS3 project based on Flash Runtime, you do not need to do anything else.
If you plan to use Starling/Feathers or another Framework, it's a good idea to start here :
https://gamua.com/starling/

(4) Create a new project according to your IDE and start coding your amazing ANE with super powers

AS3 Library

- Keep the things simple
- Designing the common structure
- Comment and document the code
- Compile the SWC

AS3 Library

Before coding, you'll have to:

- Open Apple and Google APIs documentations. Read them completely.

Then begin your work with AS3:

- Keep the things simple
- Design the common structure
- Comment and document the code
- Compile the SWC

(1) Put yourself in the place of the developer who will use your extension when you start designing.

(2) Always keep side by side the documentations of the native libraries that you want to interface and take the lowest common denominator. The very principle of multiplatform development is to have only one code base.

(3) Always comment and document your developments, you will certainly need to get your hands in the grease in a few months. Native libraries and OSs evolve quickly, so your ANE should be easy to update accordingly.

(4) Nothing very complicated, your IDE should allow you to create a SWC library in a few clicks.

iOS Library

- Read de documentations of the native frameworks
- Follow AS3 Library steps
- Code in Obj-C or Swift
- Comment and document the code

iOS Library

To create a native iOS Library, you'll have to:

- Choose Obj-C or Swift
- Read the official documentation

Then start coding your native library:

- Follow your AS3 Library steps
- Comment and document the code
- Compile your library

(1) First of all you have to choose your native language for the iOS side. You can use Objective-C or Swift (depending on your own skills).
I'll provide only Objective-C examples.
If you want to go with Swift, maybe you can start with the excellent work from TUARUA:
https://github.com/tuarua/Swift-IOS-ANE

(2) It's always a good idea to have the full documentation of what you are using to build your native extension.

(3) You'll have to follow the exact functions you expose in your AS3 library. But you can use a lot of private function to make your code more easy to maintain.

(4) And for the exact same reason (make your code easy to maintain), document and comment everything in it.

(5) Compile your ".A" Universal library for production or profiling

Android Library

- Read de documentations of the native frameworks
- Follow AS3 Library steps
- Code in Java or Kotlin
- Comment and document the code

Android Library

To create a native Android Library, you'll have to:

- Choose Java or Kotlin
- Read the official documentation

Then start coding your native library:

- Follow your AS3 Library steps
- Comment and document the code
- Compile your library

(1) First of all you have to choose your native language for the Android side. You can use Java or Kotlin (depending on your own skills).
I'll provide only Java examples.
If you want to go with Kotlin, maybe you can start with the excellent work from TUARUA (again):
https://github.com/tuarua/FreKotlin-Android-ANE

(2) It's always a good idea to have the full documentation of what you are using to build your native extension.

(3) You'll have to follow the exact functions you expose in your AS3 library. But you can use a lot of private function to make your code more easy to maintain.

(4) And for the exact same reason (make your code easy to maintain), document and comment everything in it.

(5) Compile your ".JAR" library for production

Compiling ANE

- Extract SWF from SWC
- Copy different files
- Generate ANE with ADT
- Generate DOC with ASDOC

How to compile your ANE

To build your ANE and generate Docs, you'll have to:

- Extract SWF from SWC
- Copy all files to build directory
- Generate ANE with ADT
- Generate DOC with ASDOC

(1) Unzip your AS3 library (SWC) to get a copy of the library.swf file. This file is required for every platform you target.

(2) Get a fresh copy of every file generated or extracted in a "build" directory (this include : .swf, .jar, .a files)

(3) Use ADT on the command line to generate your ANE file.
You can modify and use the script "createANE.sh" provided in my sample files.

(4) Use ASDOC on the command line to generate a fresh and standardized documentation for your ANE.
You can modify and use "genDOC.sh" provided in my sample files.

(5) You can download, fork, contribute to the sample files provided with this talk on GitHub:
https://github.com/Fabrice-Montfort/Create-and-Use-ANE-with-Adobe-AIR

Using ANE

- Link ANE to your project
- Use native functions inside your AIR app or game
- Test on real devices

How to use ANEs

To use a Native Extension in your AIR project, you have to:

- Link ANE to your project
- Use functions inside your AIR app or game
- Test your application

(1) For a complete example, you can see this documentations :
Flash / Animate :
https://www.adobe.com/devnet/air/articles/using-ane-in-flash.html
IntelliJ :
https://fabricemontfort.com/product/ezspeech-ane-air-native-extension/
FlashDevelop :
http://www.flashdevelop.org/wikidocs/index.php?title=F.A.Q#What_needs_to_be_done_to_use_an_.ANE_.28Adobe_Native_Extension.29_with_FD.3F

(2) Make your own demo app with the minimum UI to let you (and your users) test the native extension

(3) Compile the demo app and deploy on real devices

Conclusion

- Identify and list your needs
- Create or buy ANEs
- Build better apps
- Meet the community
- Go further with Desktop and TV
- Be proud of your work

A few last words

I hope this talk learn you a few things:

- Imagine AIR apps and games with extra powers
- Develop or simply use ANEs
- Participate in the community
  Discover the AIR ecosystem
- Monetize your work

(1) Only your imagination have limits. You have a full access to the native side with Java, Kotlin, Objective-C, Swift, C/C++ or C#. Everything is exposed to give your apps super powers

(2) Before you reinvent the wheel, it could be a good idea to see if another developer have this extension available (for free or with a paid licence).
This is a non exhaustive list of ANE providers:
Adobe, Milkman Games, Distriqt, MyFlashLabs, Marpies, FreshPlanet…
A quick look here could help :
https://www.adobe.com/devnet/air/native-extensions-for-air.html

(3) Don't be afraid to talk to other AIR devs, to share tips and links and to ask for help. There's a lot persons of good will.

(4) If you want to make money with your amazing ANE, good luck, you have to do a lot of work and updates.

Thanks for your attention

Do you have any question ?

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https://twitter.com/fabriceMONTFORT
https://github.com/Fabrice-Montfort
https://fabricemontfort.com/

Happy coding with AS3, Java, Kotlin, Obj-C, Swift, C++, C# (and maybe more soon… keep fingers crossed...)