Gatekeeper and Developer ID

Session 702

Perry The Cynic
OS Security Architect

What You Will Learn

- What Gatekeeper is and how it works
- How to control what can install and run on your Mac
- How to sign your app so Macs will accept it by default
- How to debug problems with Gatekeeper and Developer ID
- Code Signing refresher

Code Signing

Refresher

Code Signing in General

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- A code identification technology

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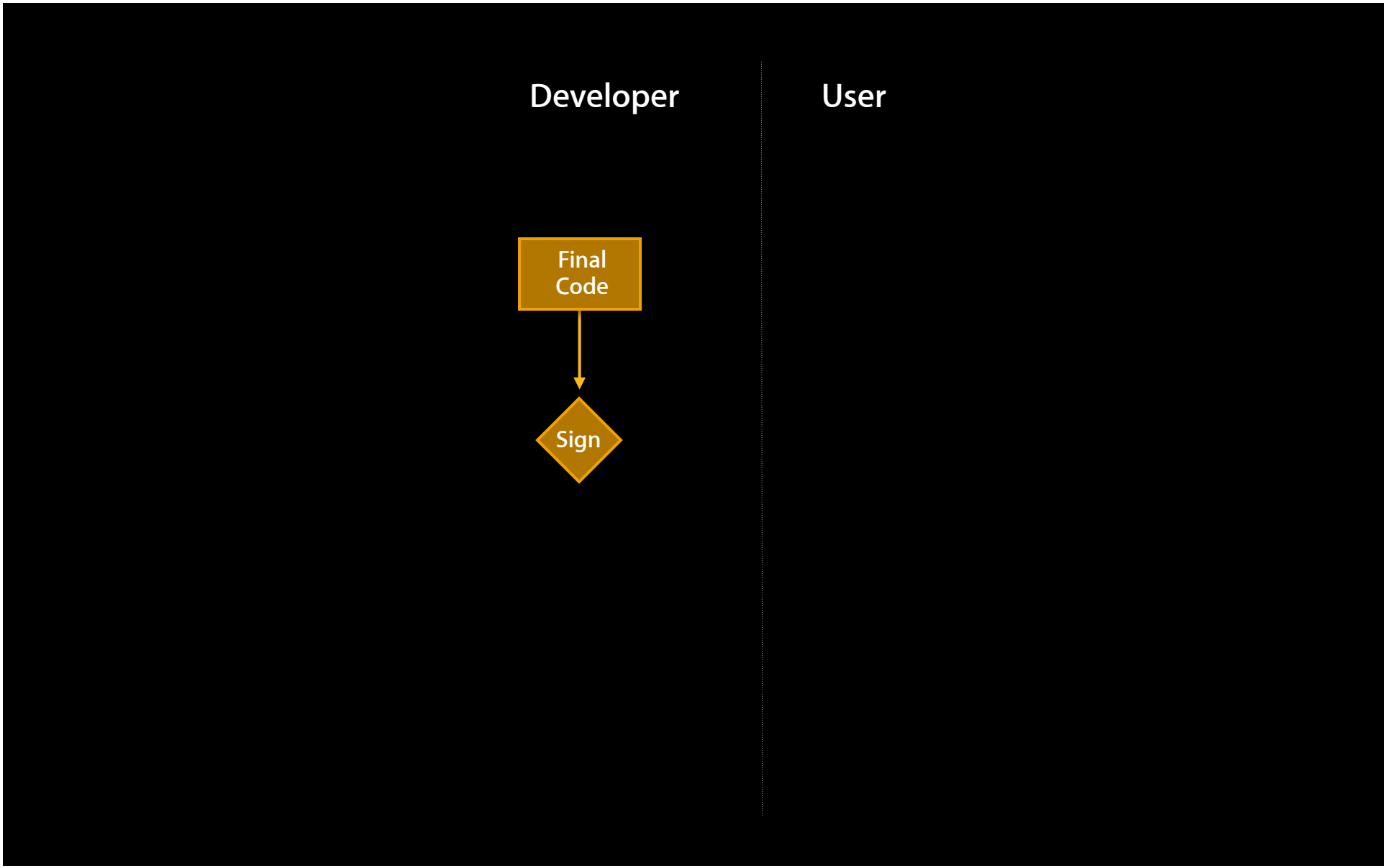
- Vouch for code with a digital signature
- Tolerate intended code changes
- Define and resolve code identity
- Efficient runtime identification and validation

Developer

User


Developer
User
Final
Code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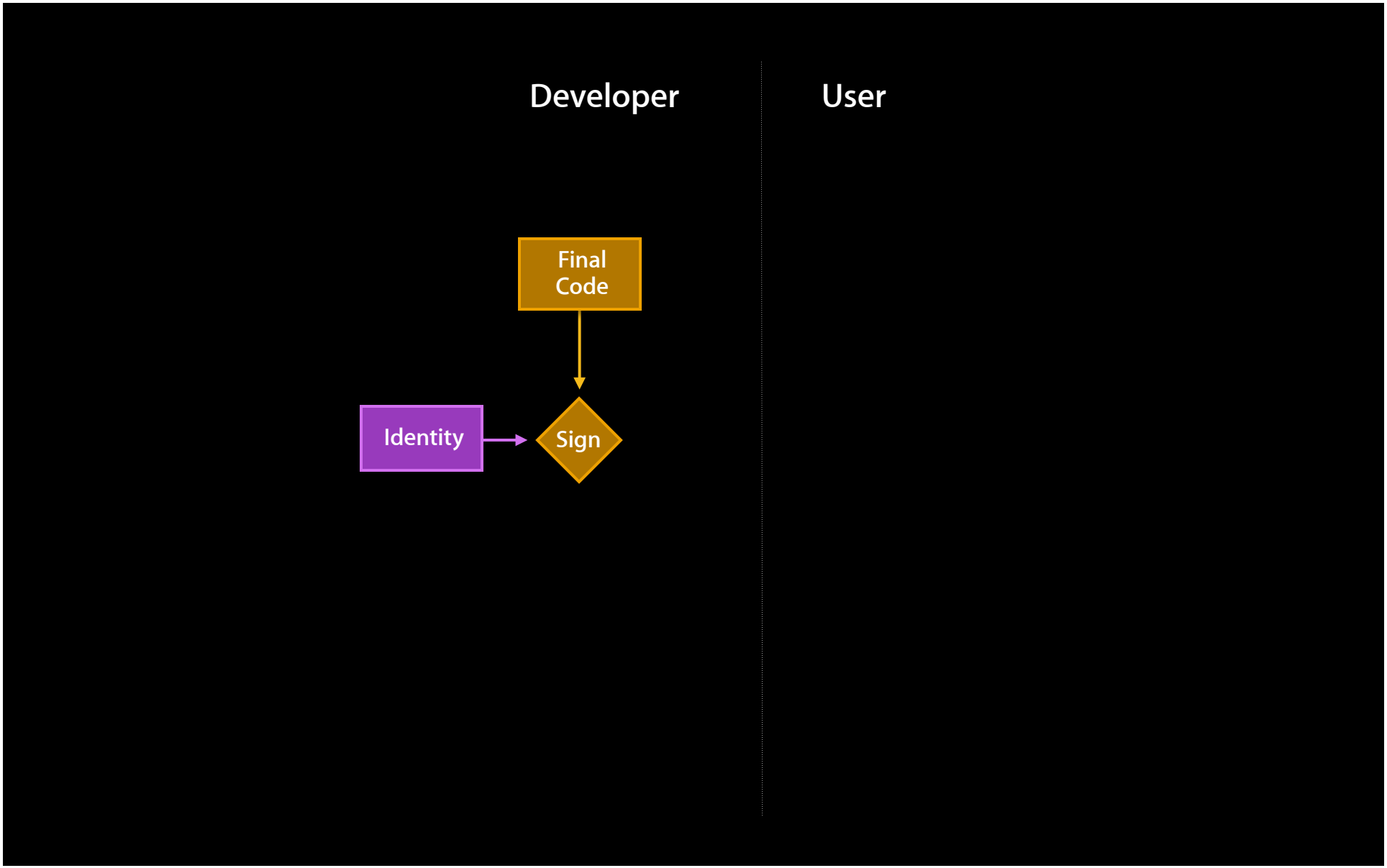
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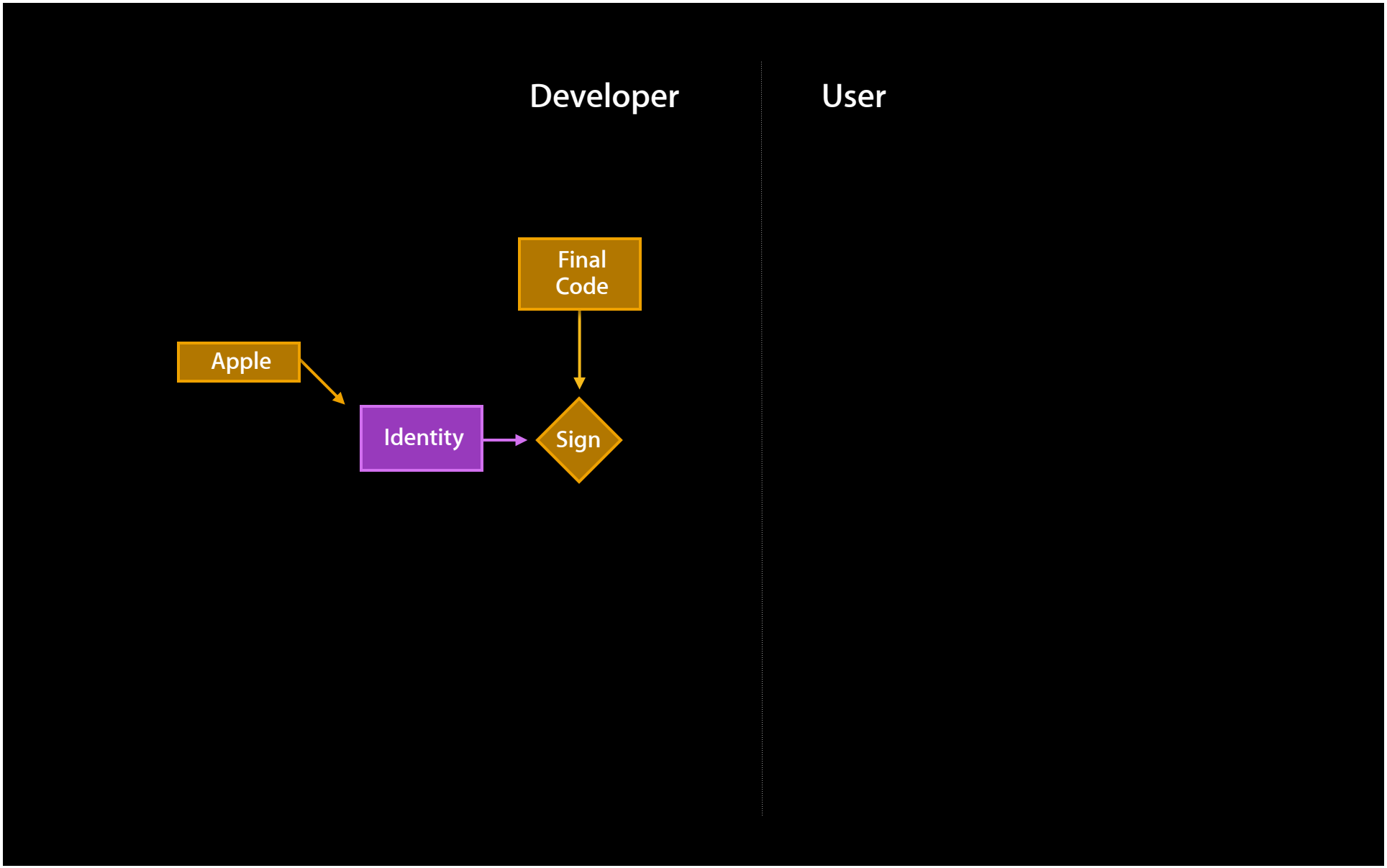
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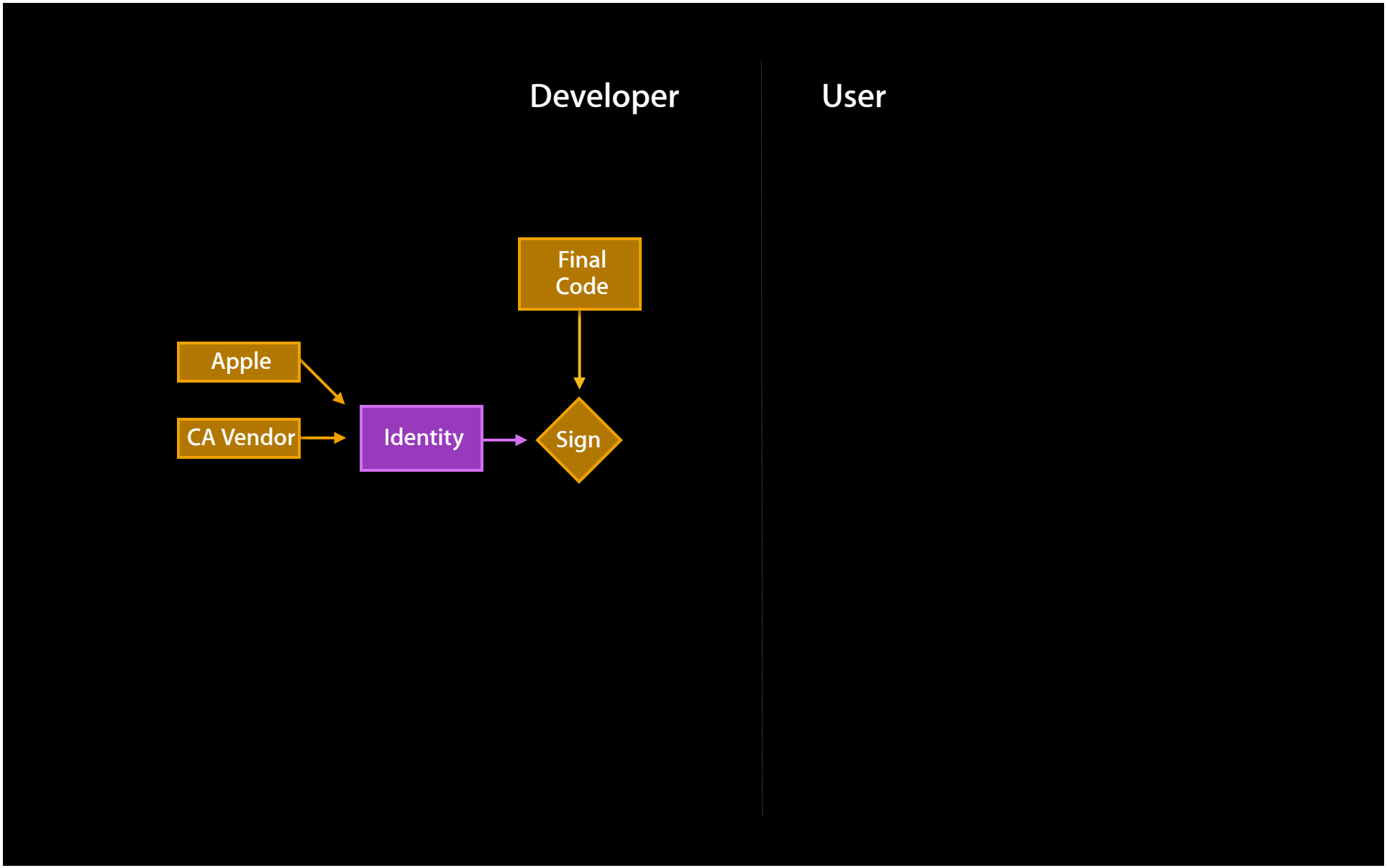
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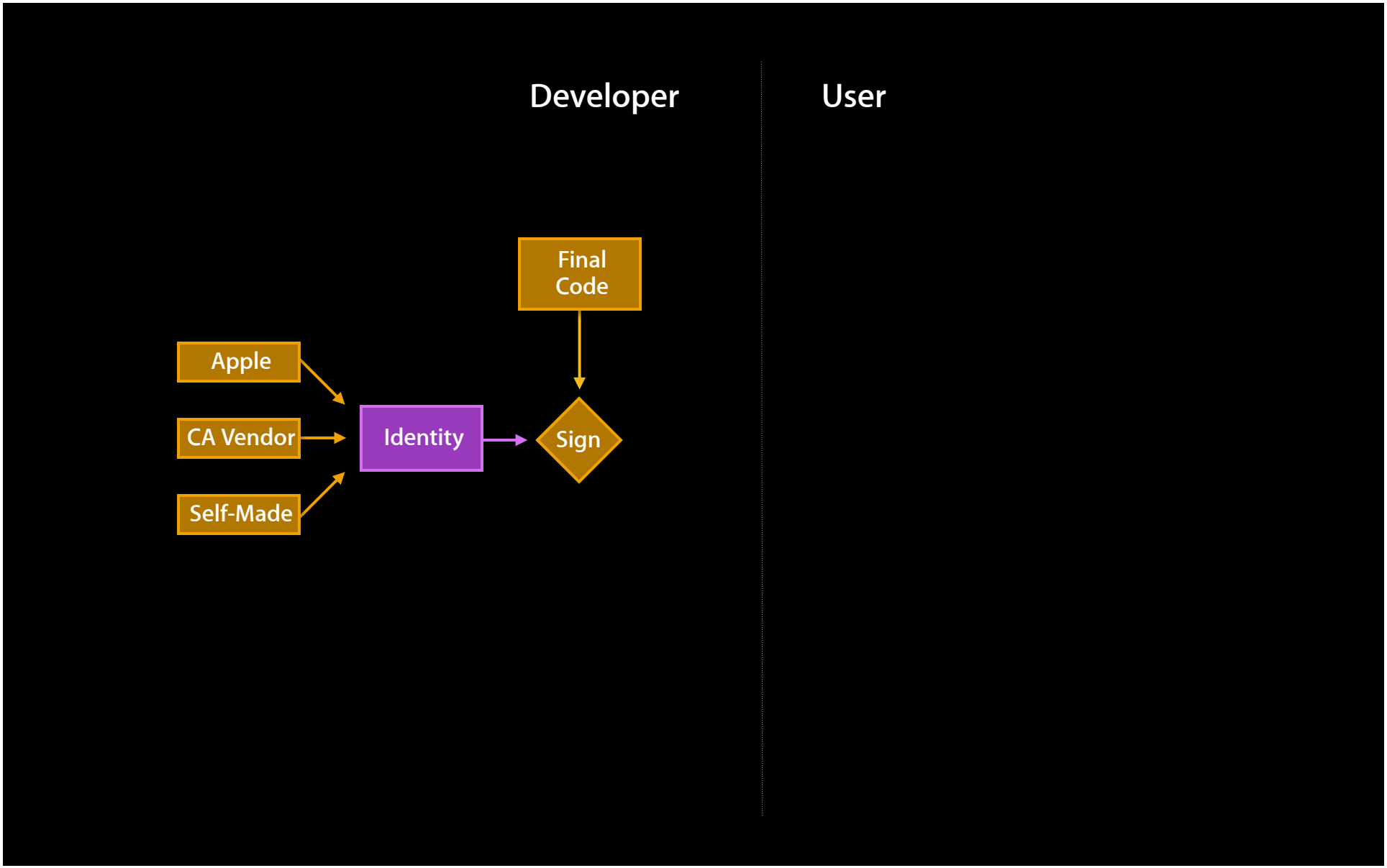
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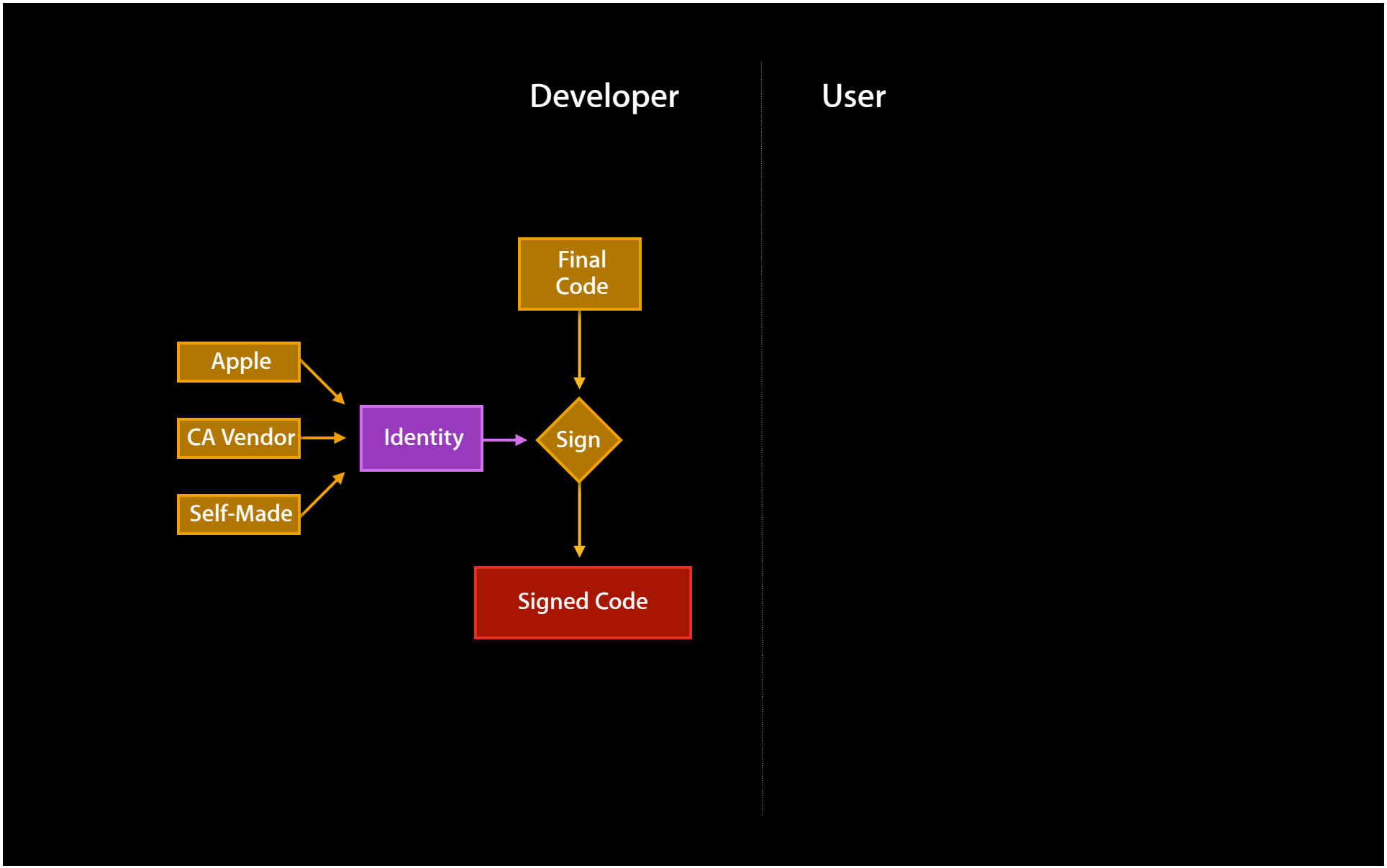
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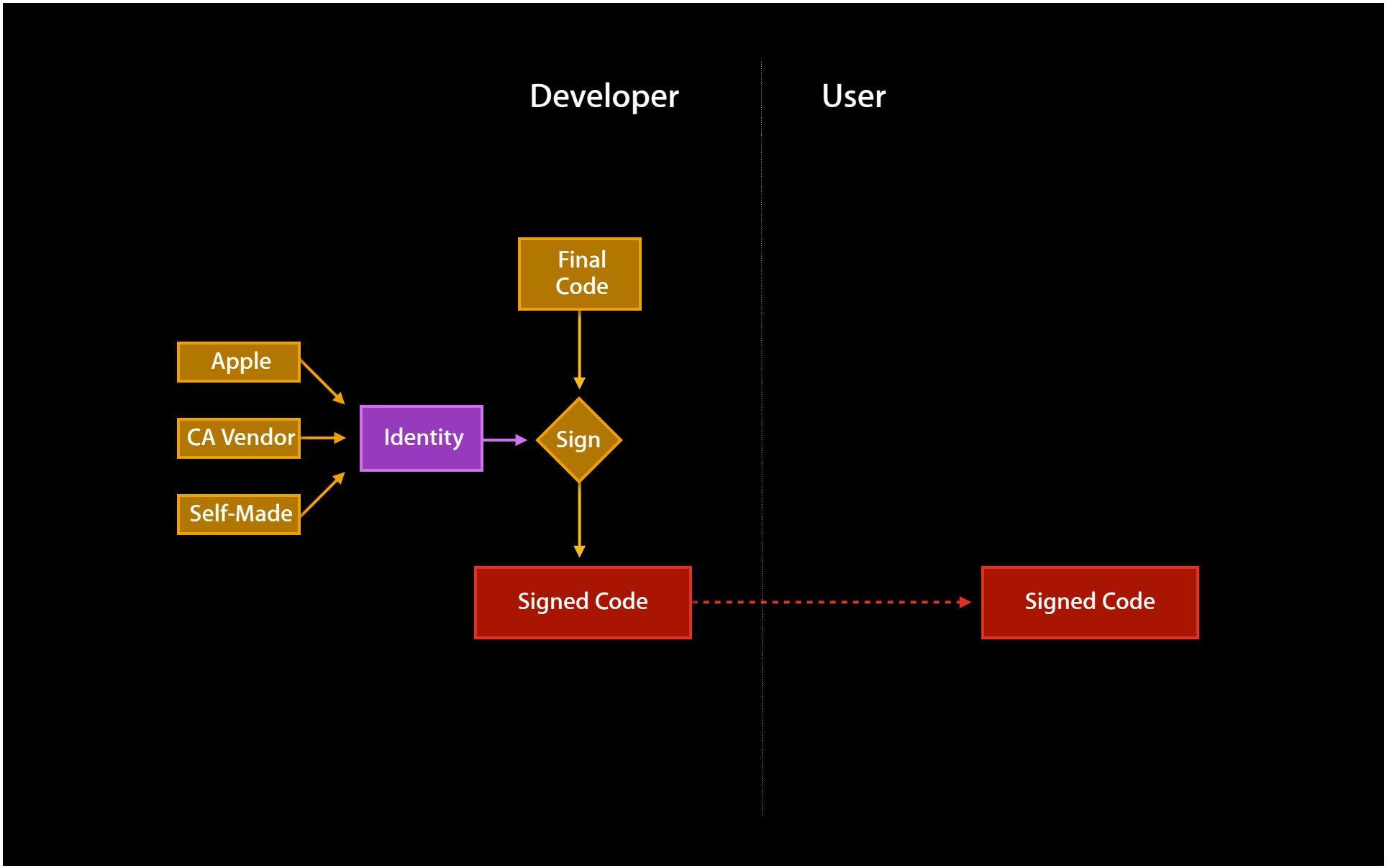
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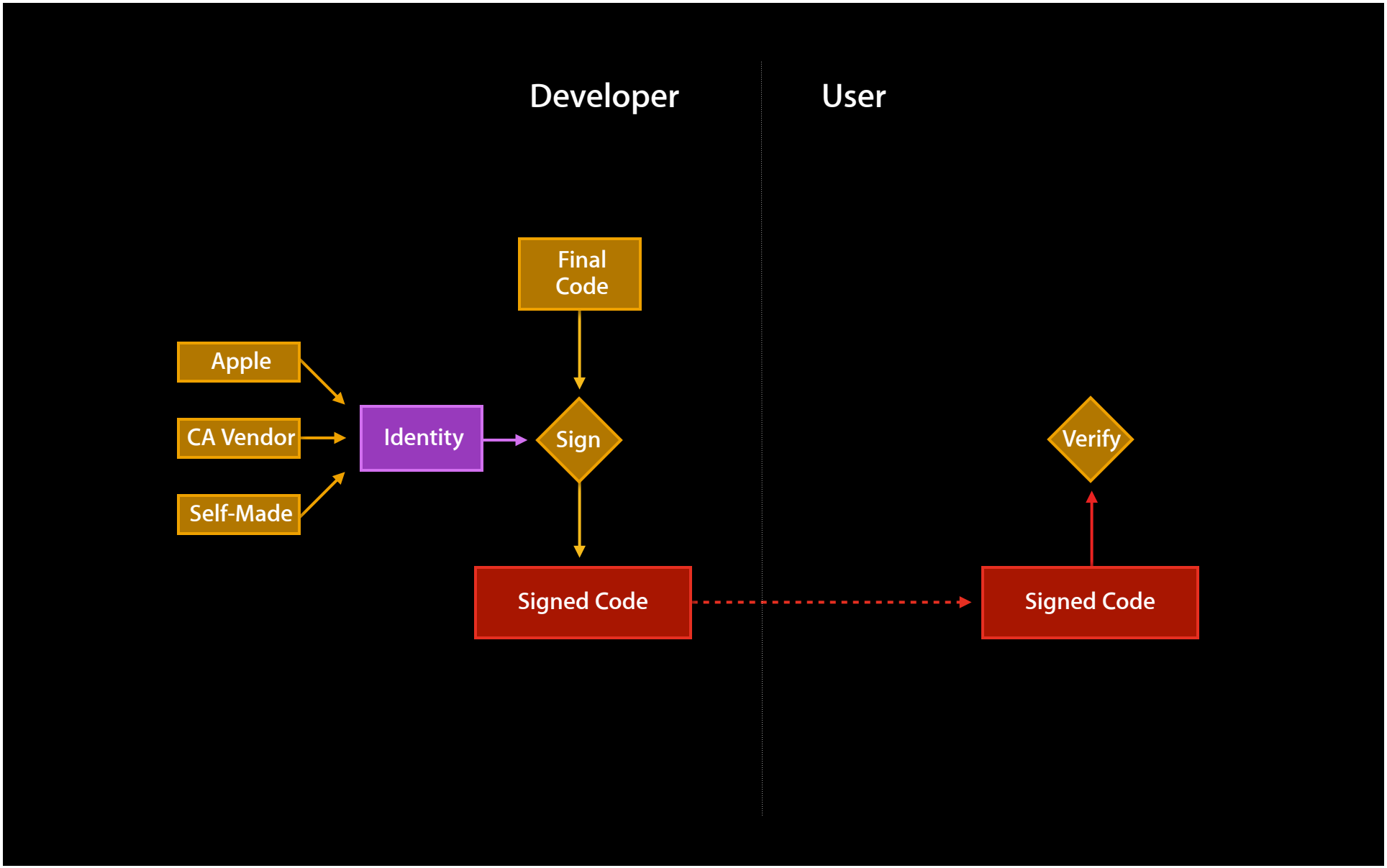
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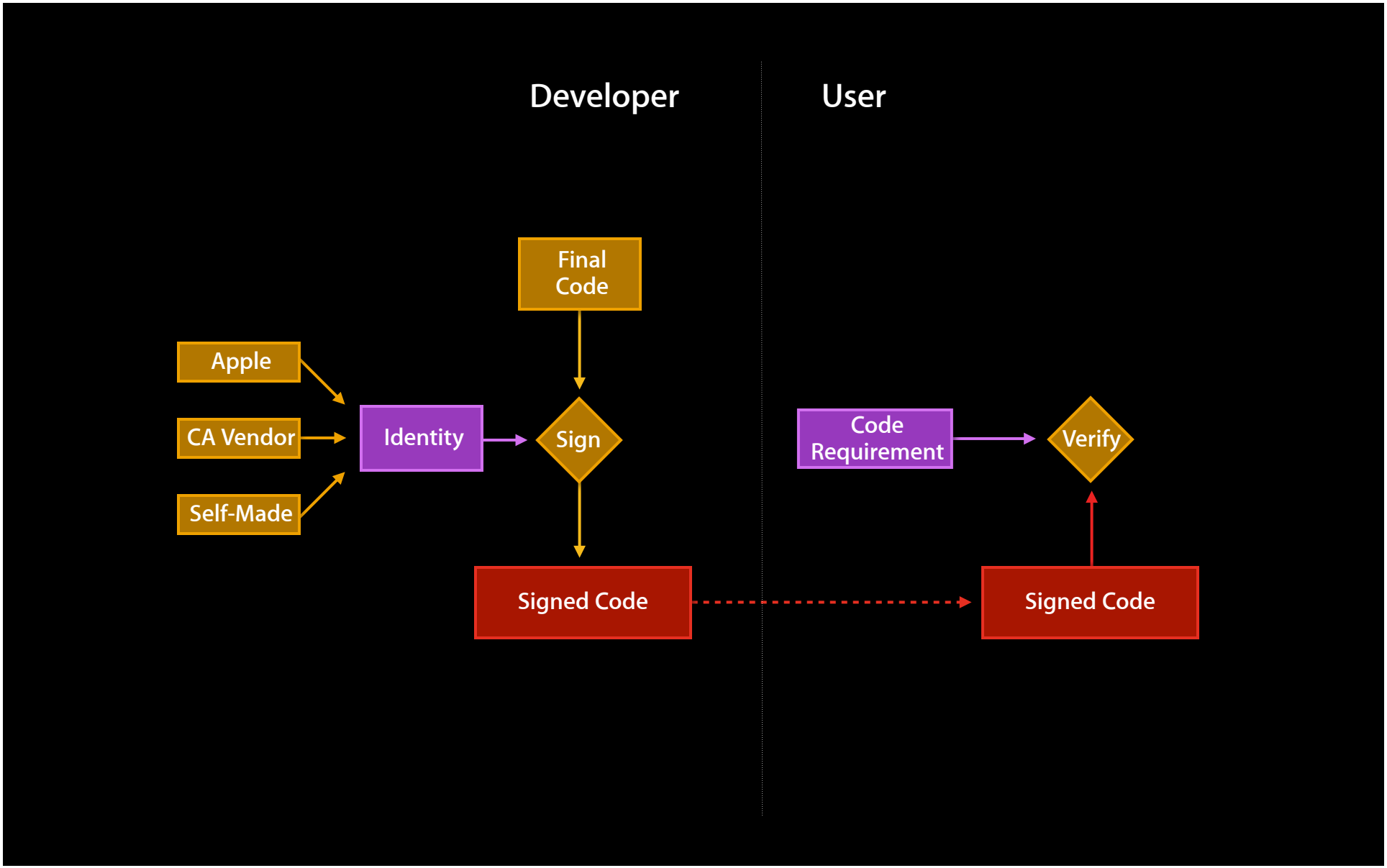
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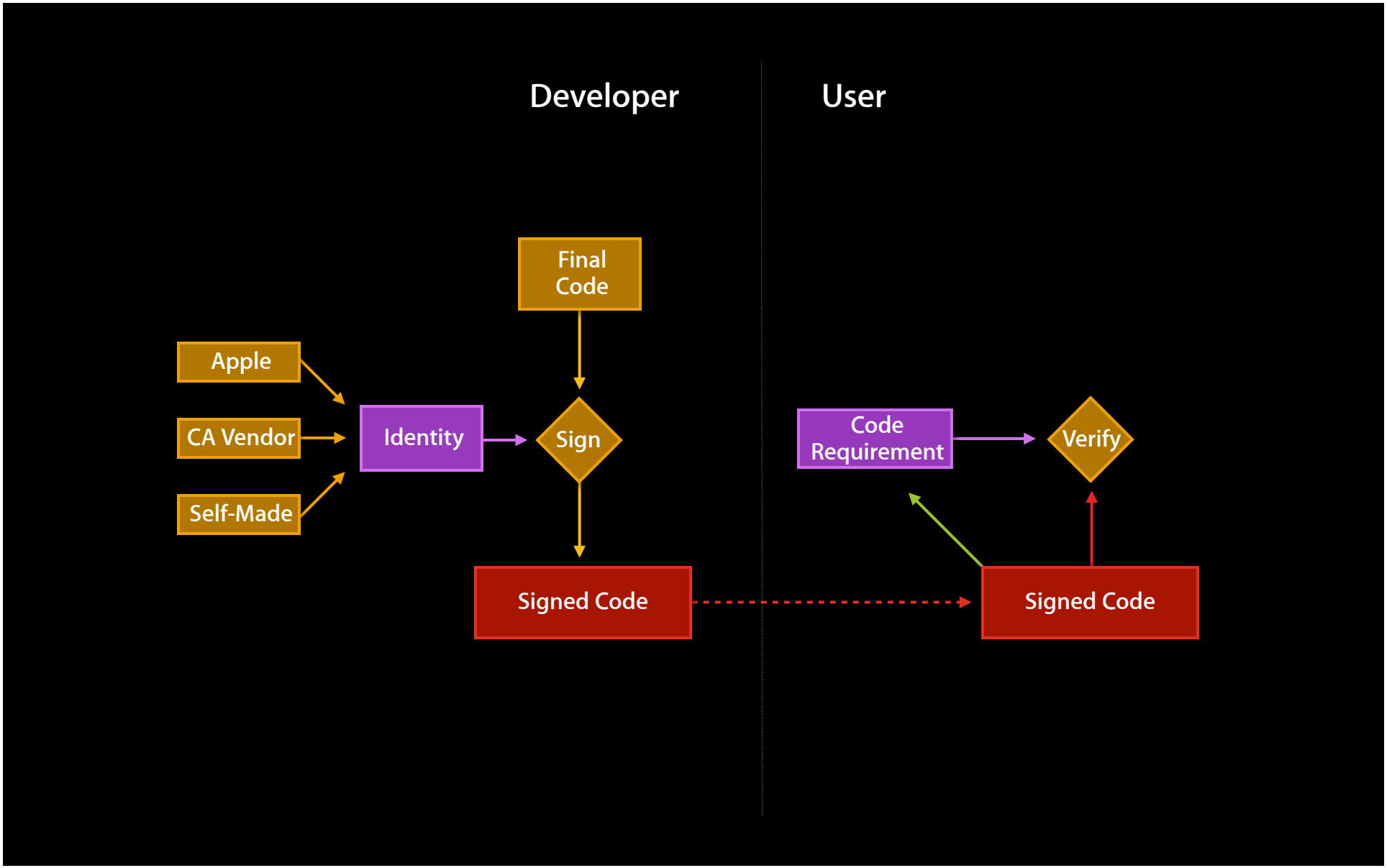
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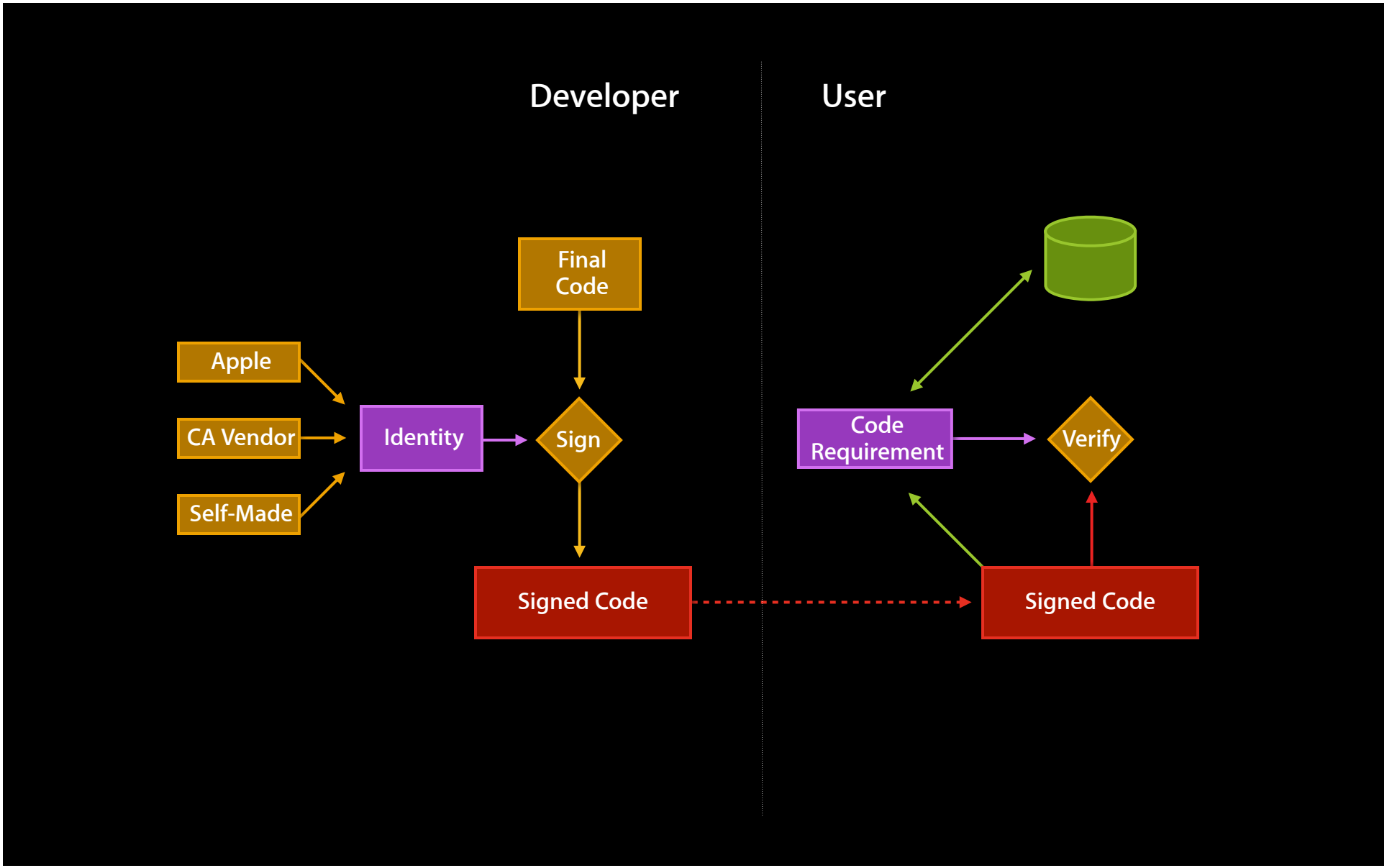
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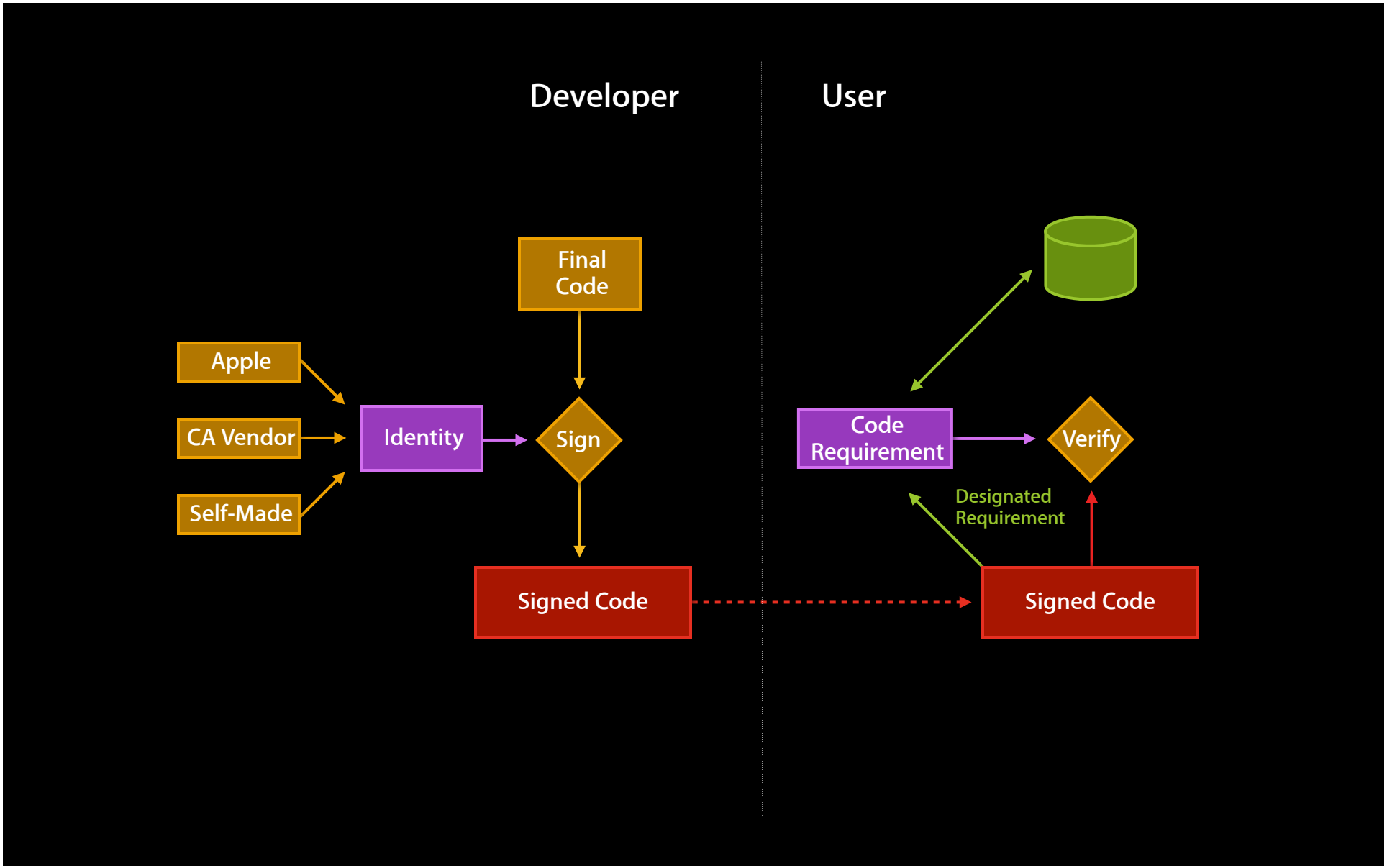
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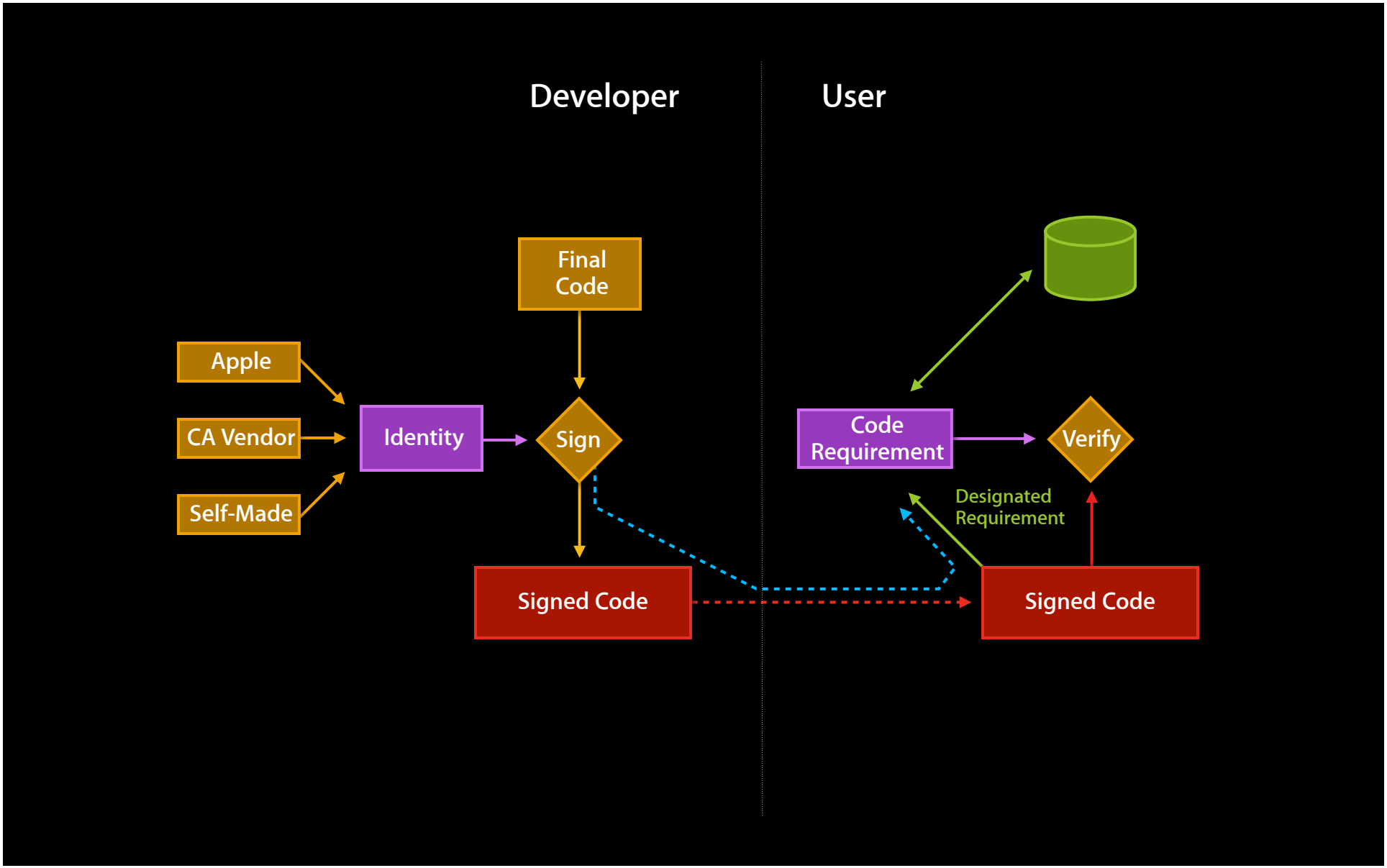
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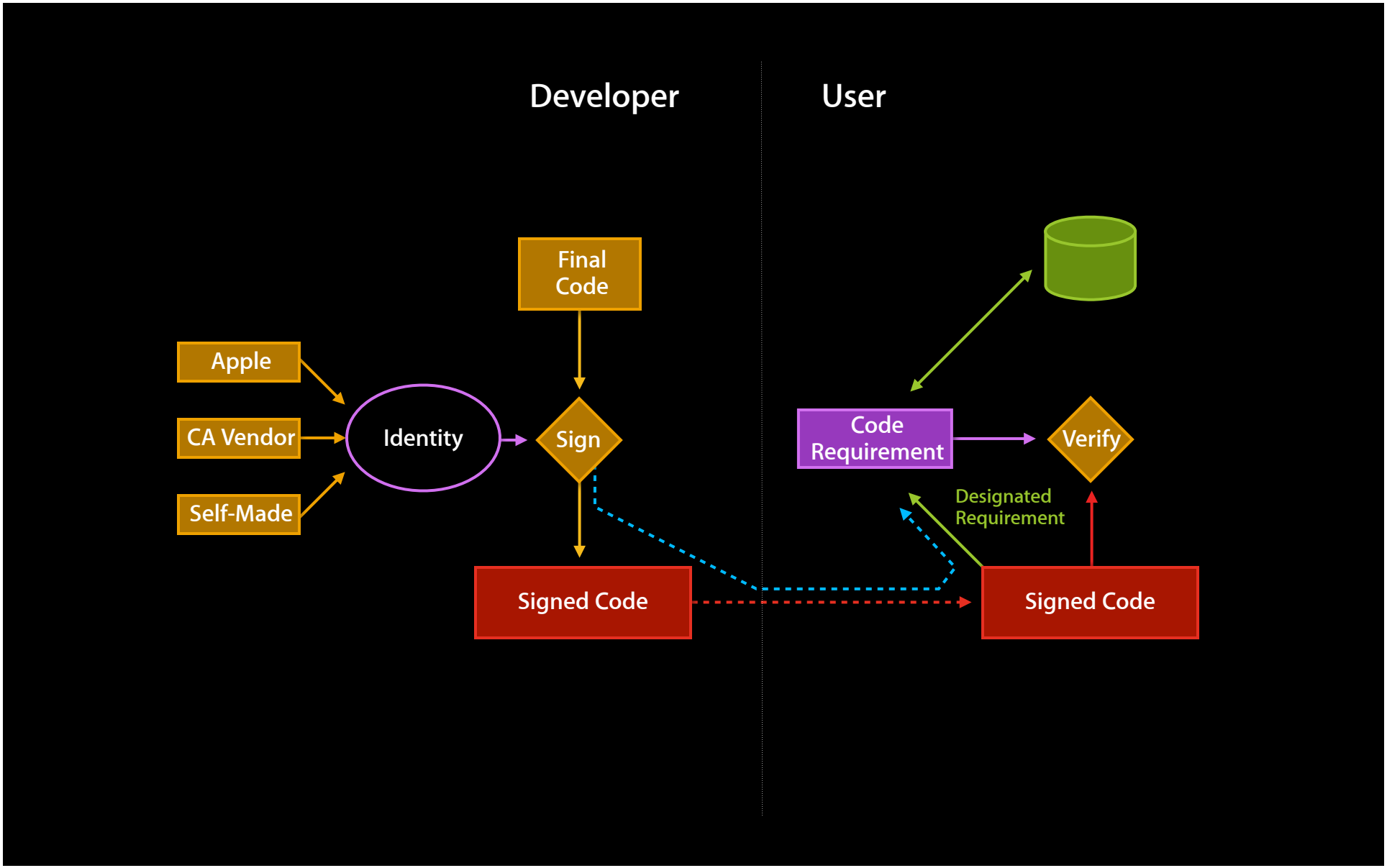
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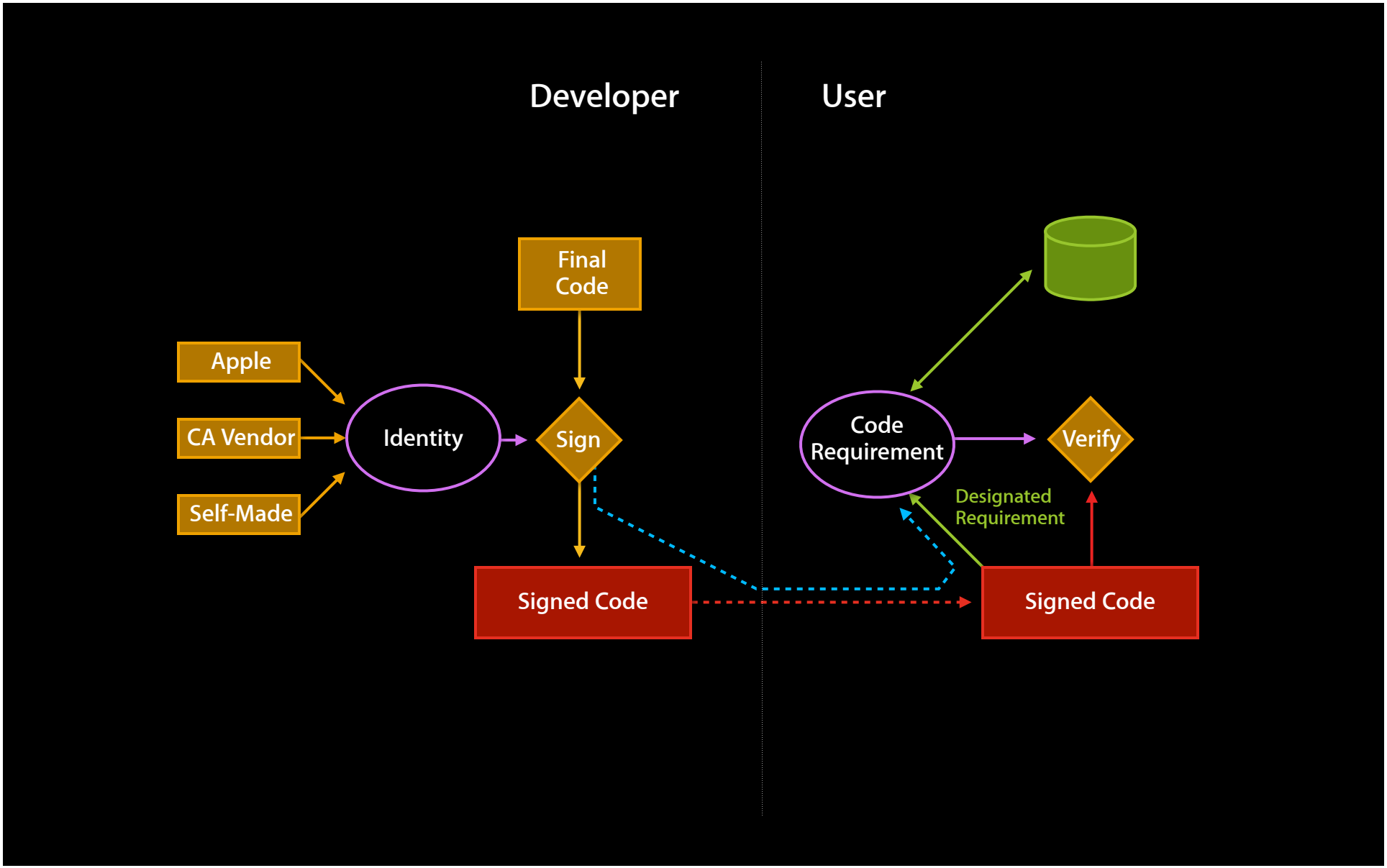
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Code Requirement Examples

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- Developer ID

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  1.2.840.113635.100.6.1.9] or certificate 1[field.1.2...6.2.6] and certificate leaf[field.1.2...6.1.13] and
  certificate leaf[subject.OU] = XYR4B7AAFB)

Developer ID

Доверяй, но проверяй

Mac Developer Program

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- Supports development for Macintosh

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- $99/year

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- Issues Development and Distribution certificates
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Developer ID

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- Part of the Mac Developer program

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Comparison

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Mac App Store	Developer ID

Comparison

	Mac App Store	Developer ID
Distribution	By Apple (Mac App Store)	Direct (up to you)

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Code Identity	Coordinated	

Comparison

Certificate flow

Comparison

Certificate flow

Mac App Store

Developer ID

Comparison

Certificate flow

Mac App Store

Developed App

Developer ID

Comparison

Certificate flow

Mac App Store

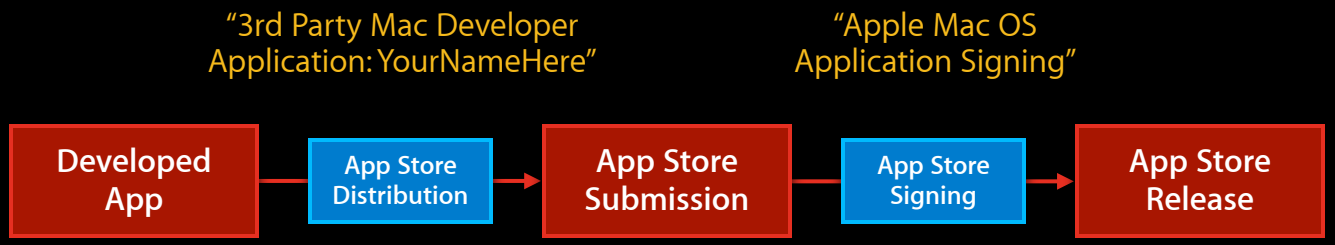
"3rd Party Mac Developer Application: YourNameHere"

Developer ID

Comparison

Certificate flow

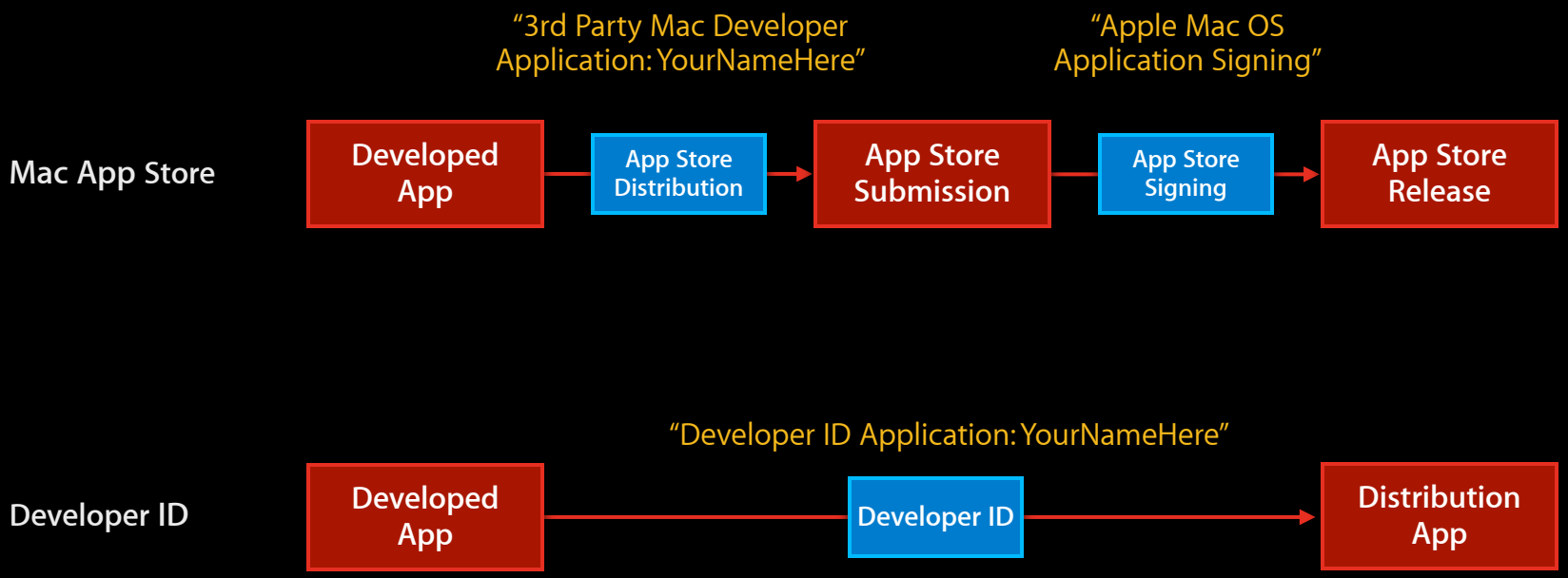
Mac App Store



Developer ID

Comparison

Certificate flow



Using Developer ID

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- Use Xcode 4.3+

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- Archive to Developer ID

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- Takes care of generating proper Designated Requirements

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- Takes care of obtaining and managing certificates
- Takes care of generating proper Designated Requirements
- Use `codesign(1)` only as last resort

Demo

Managing Your Keys

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- Nobody else has your private keys

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- Use Xcode export/import to copy them
- Developer ID keys belong to your entire team
- Keep your keys secret
- Report loss or compromise (product-security@apple.com)

Transition to Developer ID

Transition to Developer ID

- From unsigned code

Transition to Developer ID

- From unsigned code
- From Mac App Store

Transition to Developer ID

- From unsigned code
- From Mac App Store
- From third-party signature

Gatekeeper

What's on *your* Mac?

Download Quarantine

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- A “tag” attached to files

Download Quarantine

- A “tag” attached to files
- Applied by downloading apps

Download Quarantine

- A “tag” attached to files
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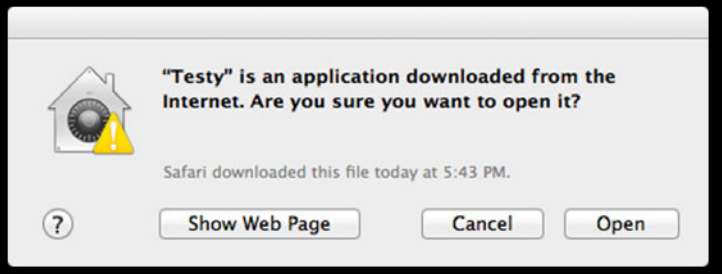
- Preserved by copy, archives, disk images

Download Quarantine

- A “tag” attached to files
- Applied by downloading apps
- Preserved by copy, archives, disk images
- Confirmation dialog



Download Quarantine

- A “tag” attached to files
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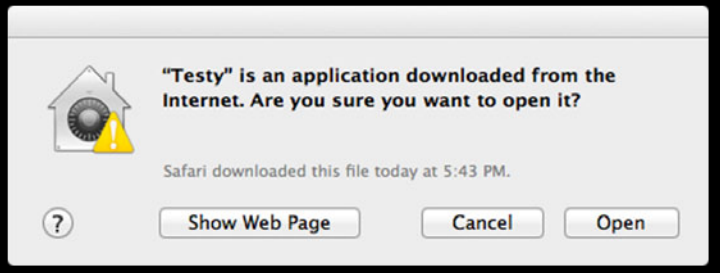
- Preserved by copy, archives, disk images
- Confirmation dialog
- Not applied to prior content



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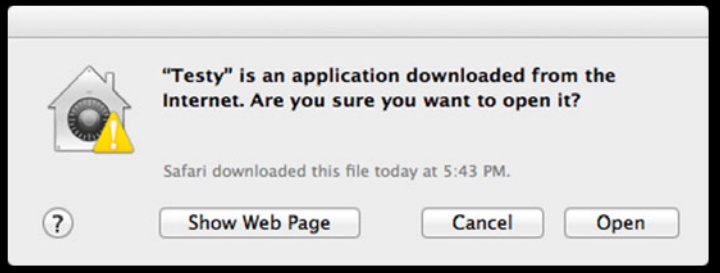

Download Quarantine

- A “tag” attached to files
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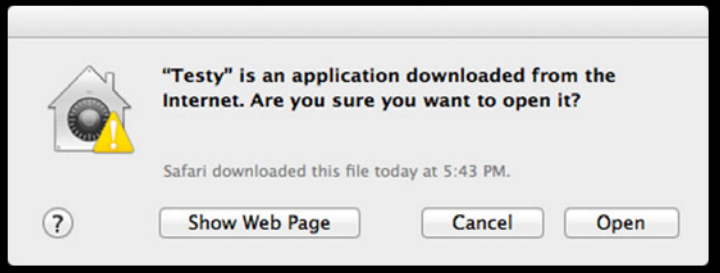
- Preserved by copy, archives, disk images
- Confirmation dialog
- Not applied to prior content
- Not applied to local files
  - That includes most remote file systems



Malware Detection

Malware Detection

- Pattern matching

Malware Detection

- Pattern matching
- Frequent updates

Malware Detection

- Pattern matching
- Frequent updates
- Warning with extreme prejudice

The Traditional Way

- Descriptions of known-bad programs
- Everything else is allowed
- Problem: Evasion

The Gatekeeper Way

- Descriptions of identified programs
- Everything else is denied
- Problem: Catch all the good ones

Gatekeeper

Gatekeeper

- System facility

Gatekeeper

- System facility
- Rule-driven

Gatekeeper

- System facility
- Rule-driven
- Based on signatures and Code Requirements

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- Based on signatures and Code Requirements
- Highly configurable

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- Applied to downloads

Demo

Affected Subjects

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- Applications and other code

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- Flat Installer packages

Affected Subjects

- Applications and other code
- Flat Installer packages
- Dangerous documents

Affected Subjects

- Applications and other code
- Flat Installer packages
- Dangerous documents
- XIP Archives (.xip)

XIP Archives

- New archive file format
- Signed with installer certificates
- Create and sign using command line
- Extract by opening (double-clicking)

Rules

- Matched by Code Requirements
- Typed (execution, installation, …)
- Can be prioritized, labelled, disabled, expired, annotated, searched, …
- Outcomes cached systemwide

Developer

User


Developer
User
Final
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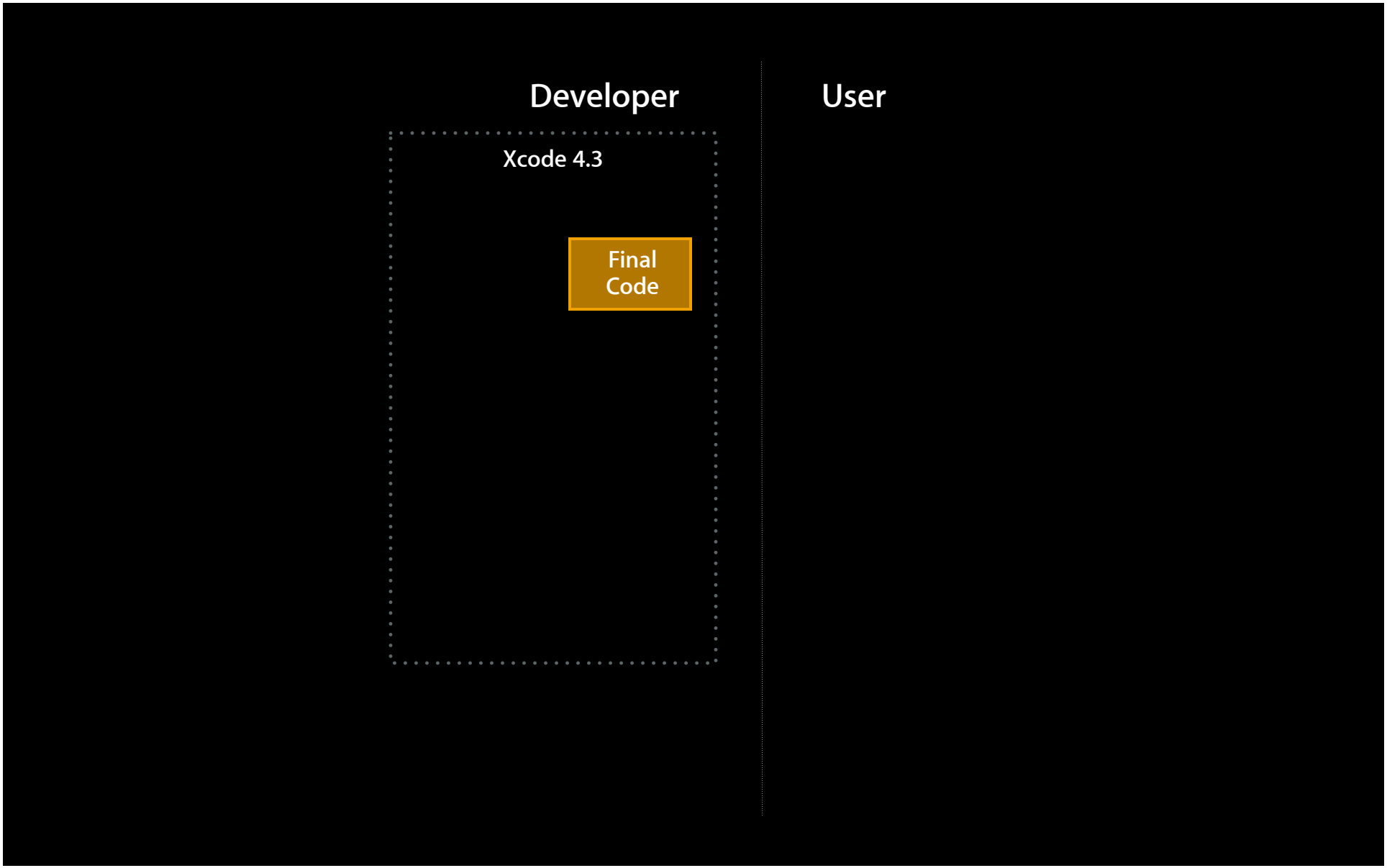
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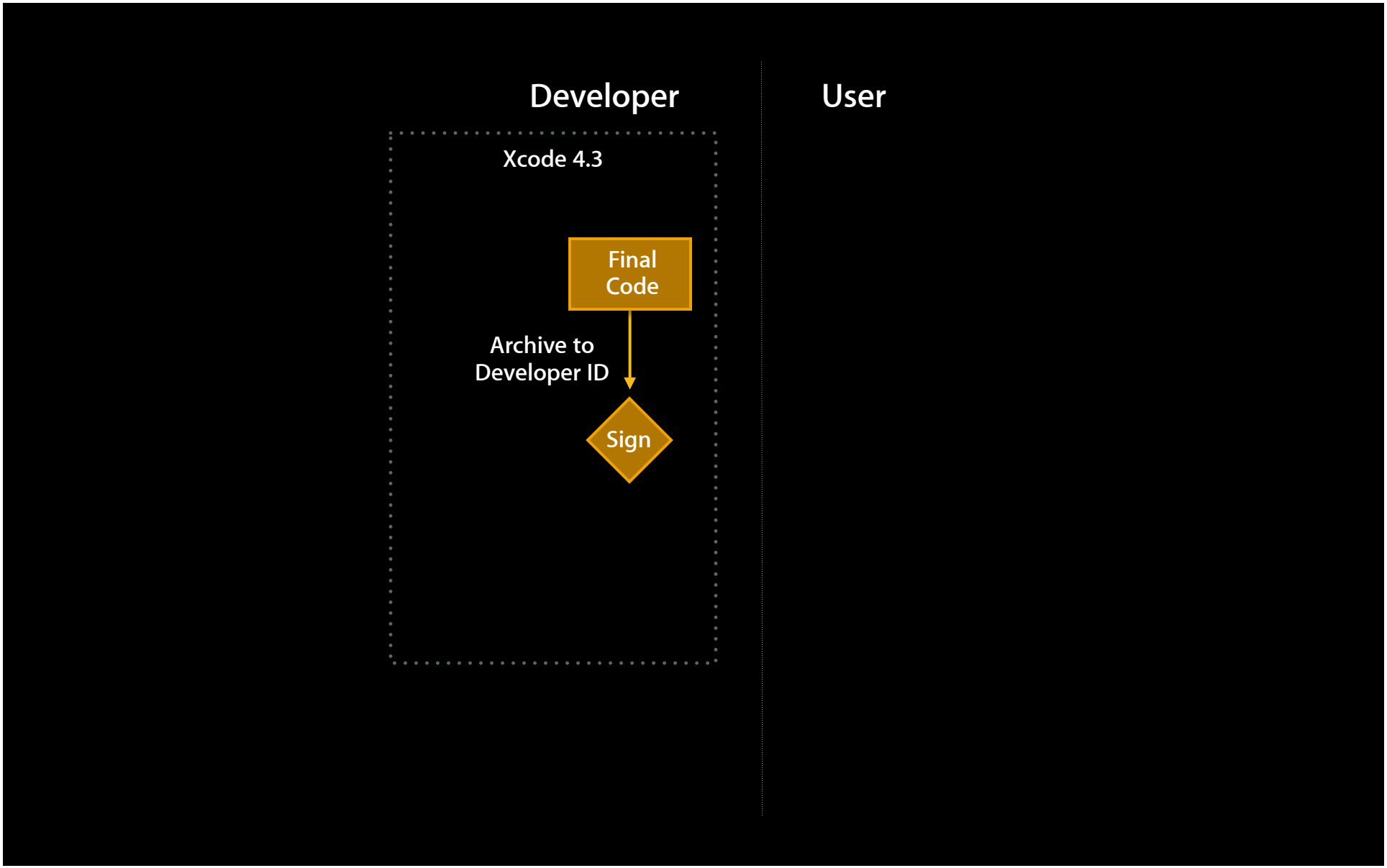
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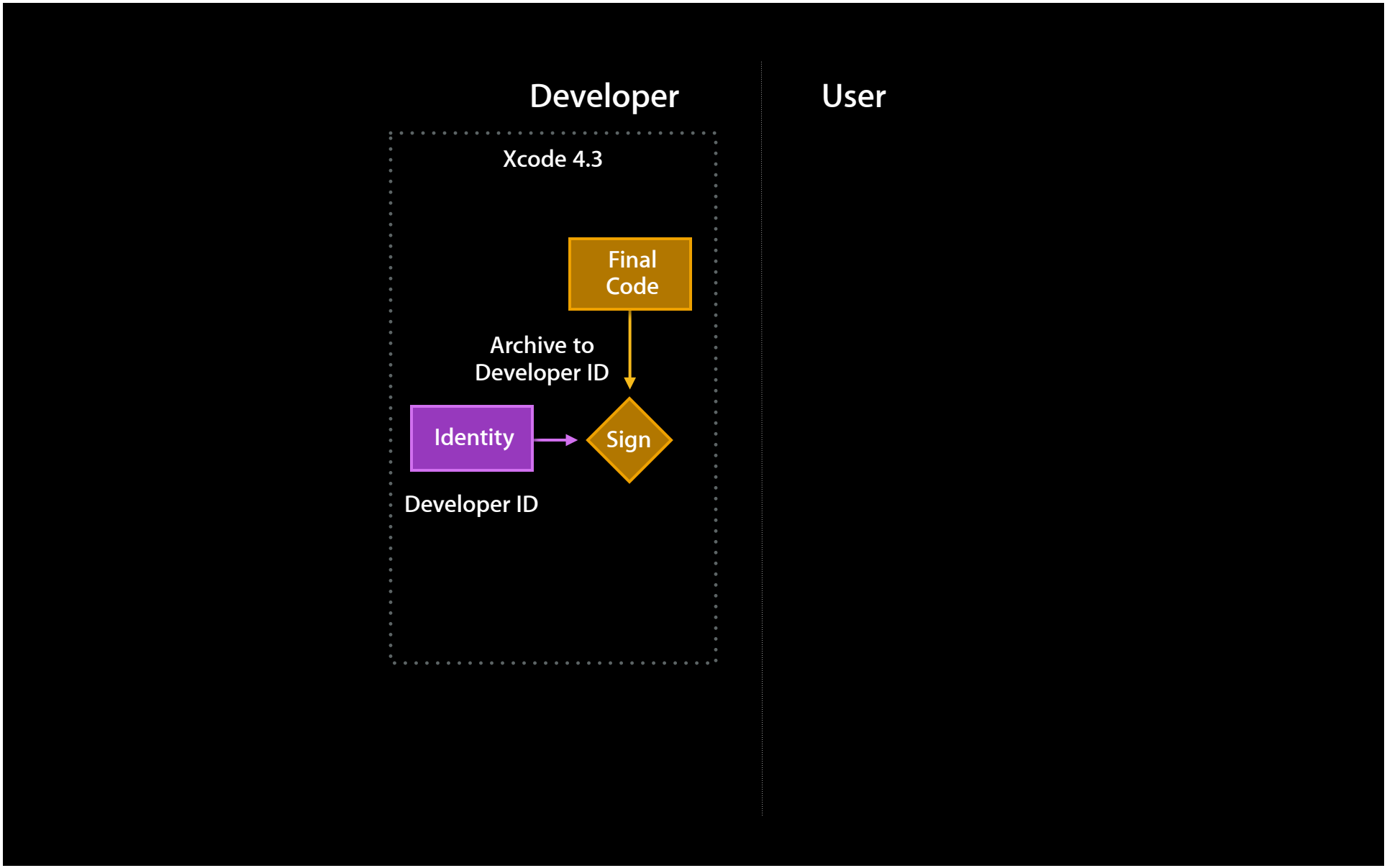
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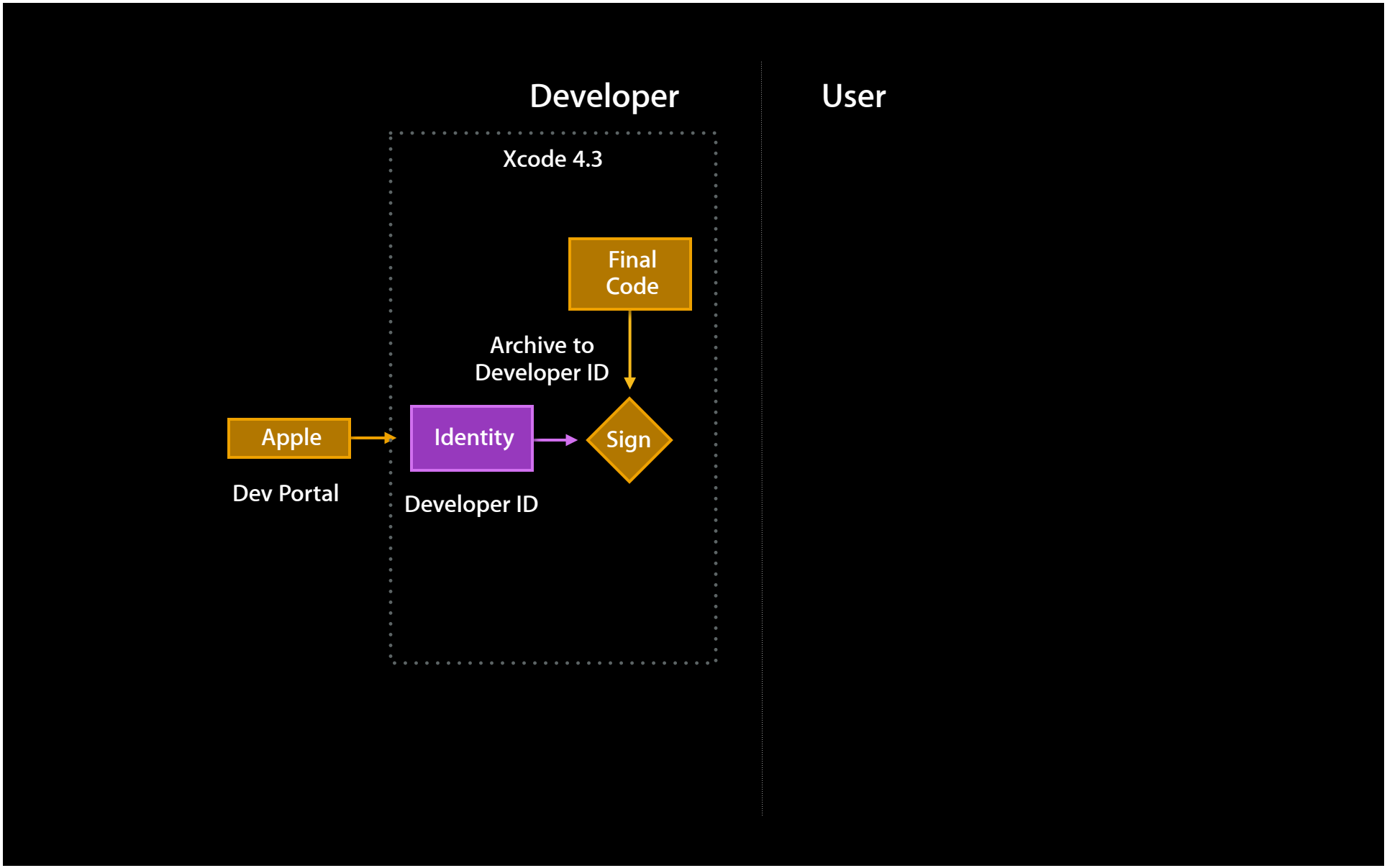
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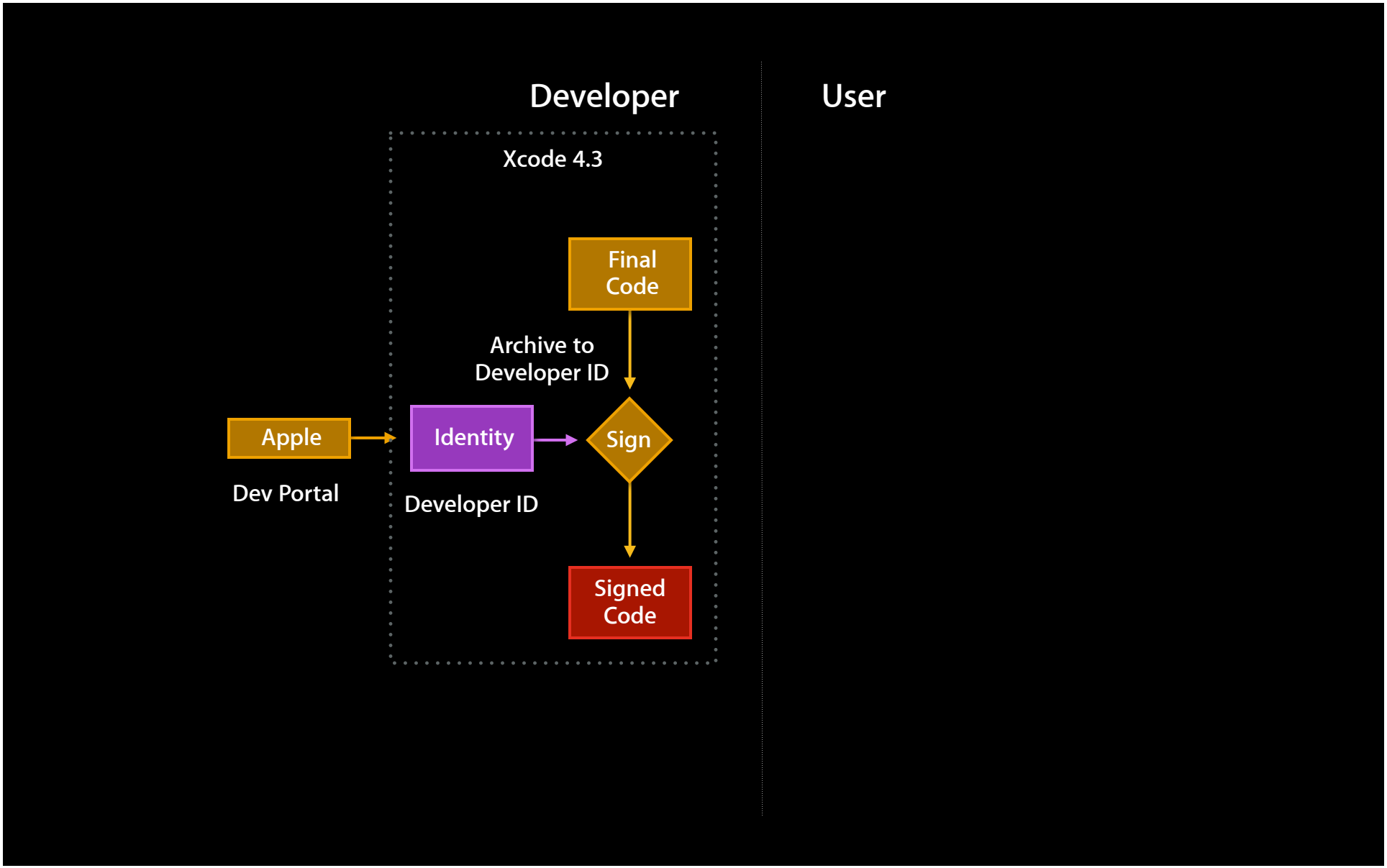
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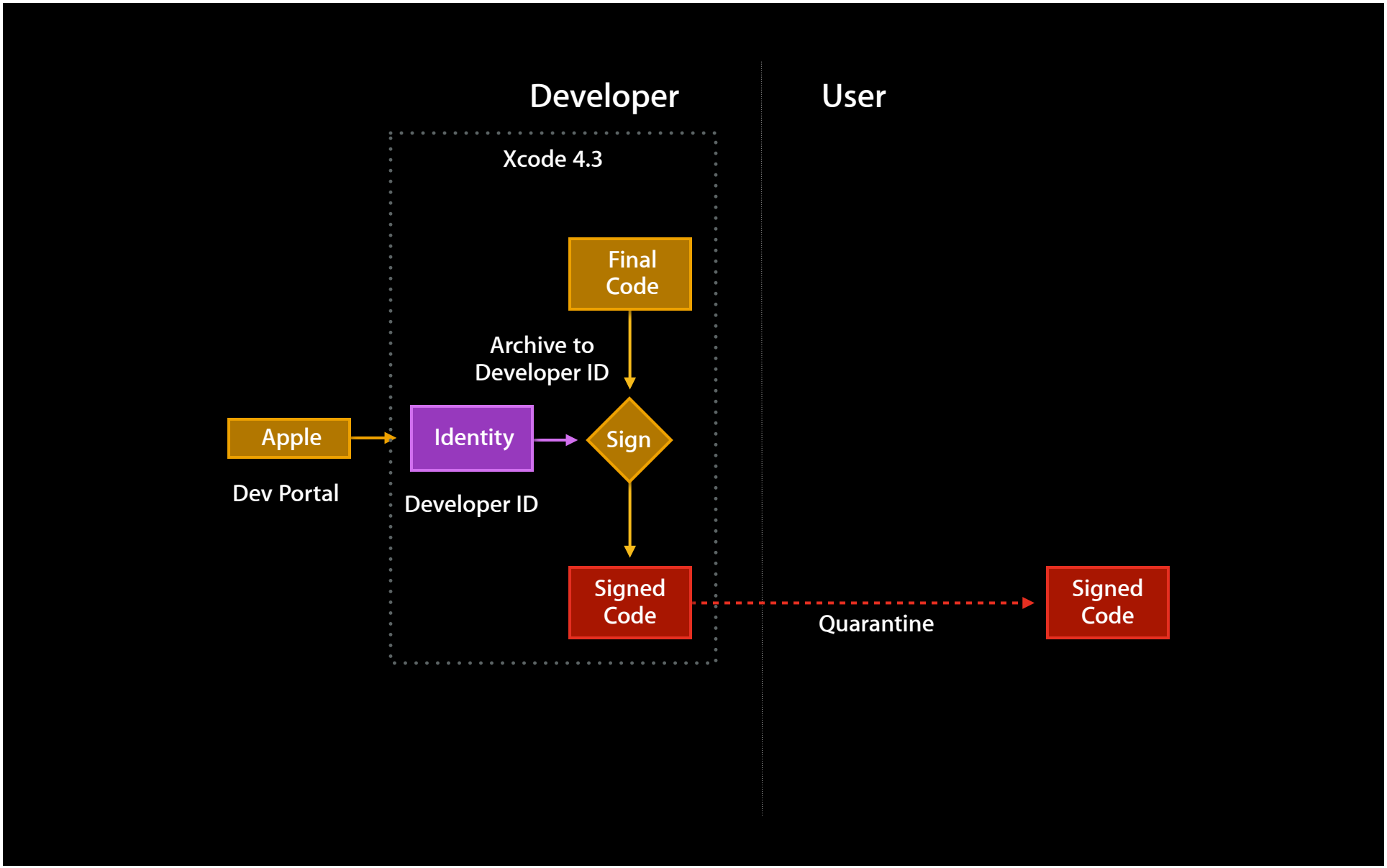
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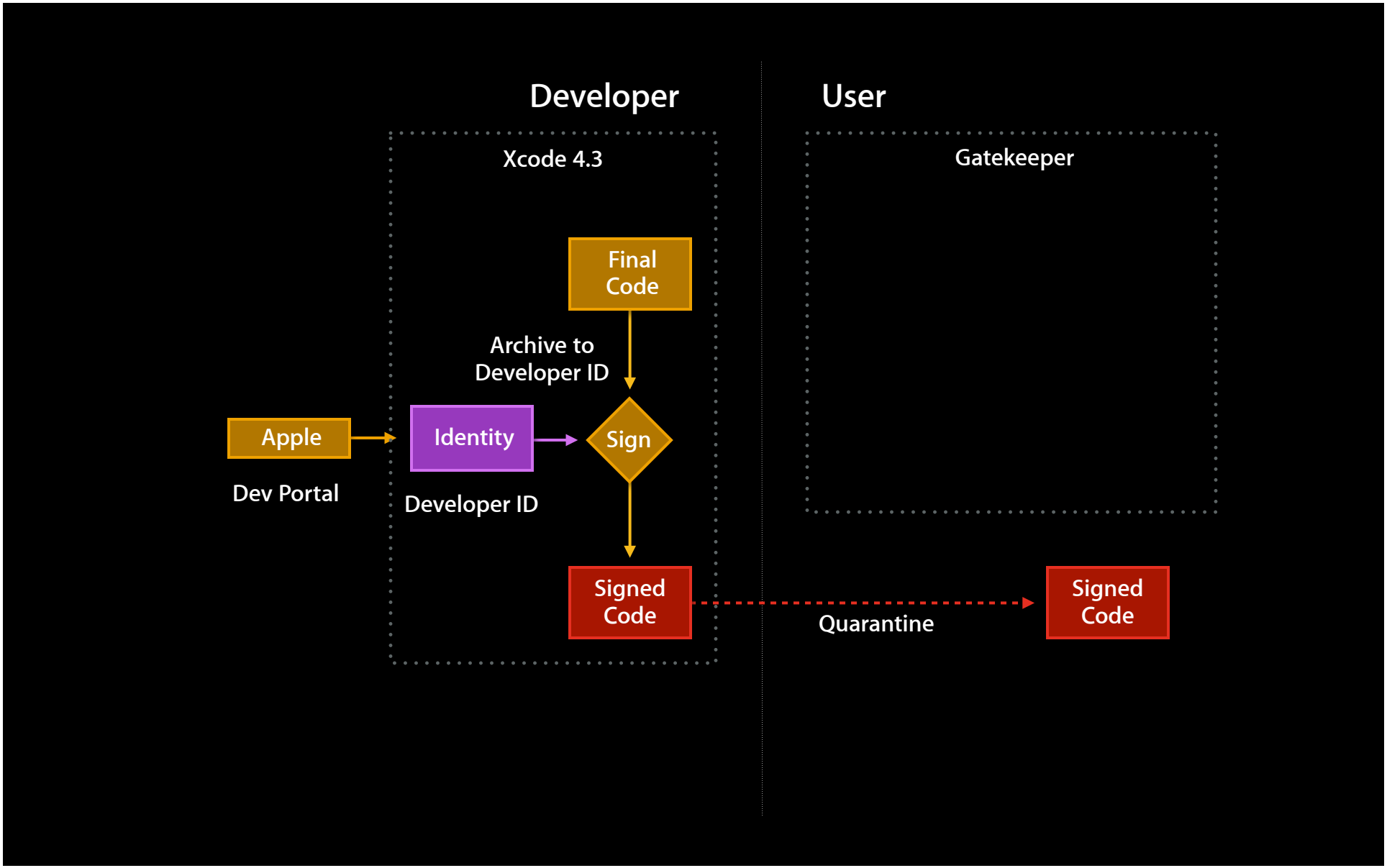
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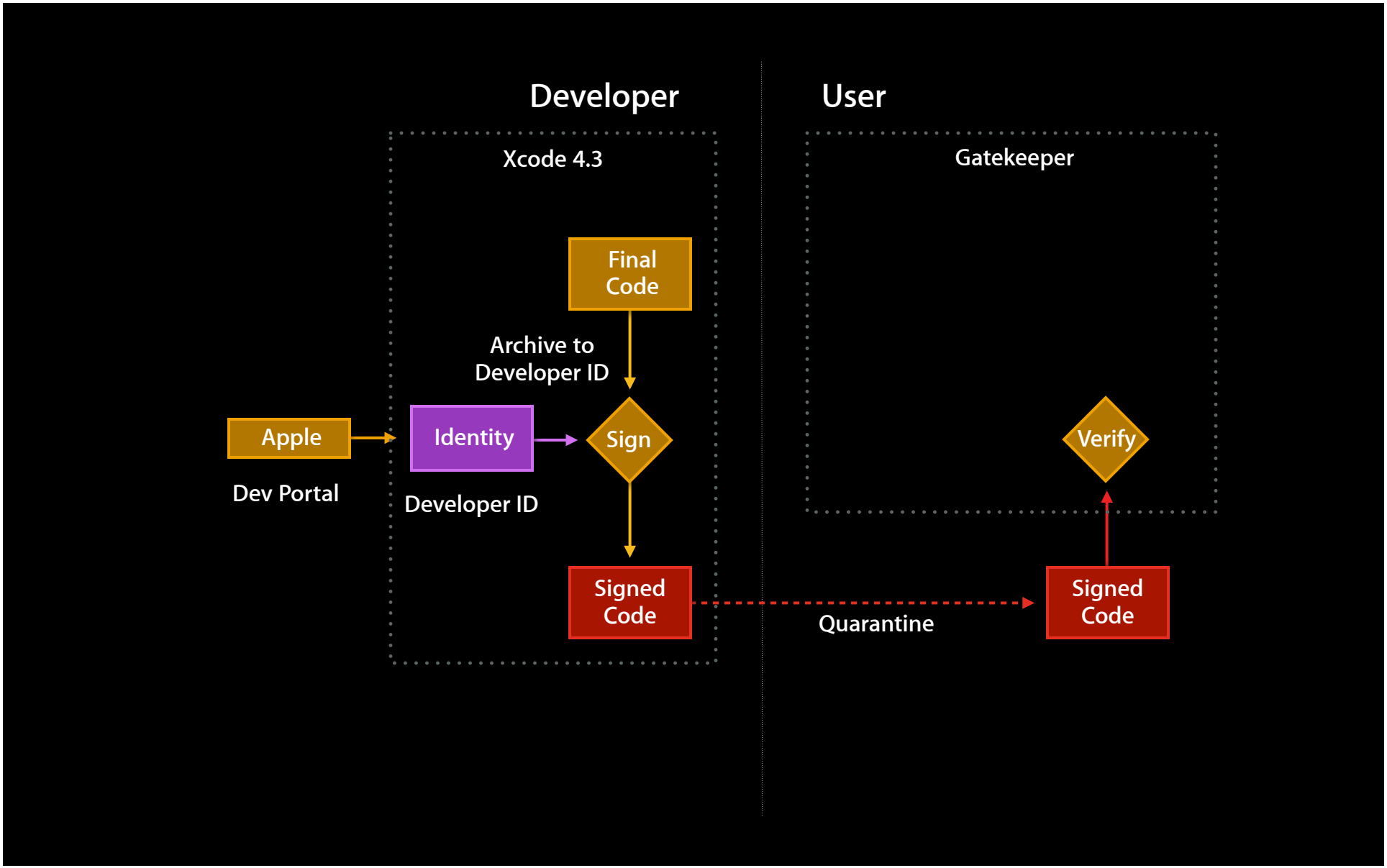
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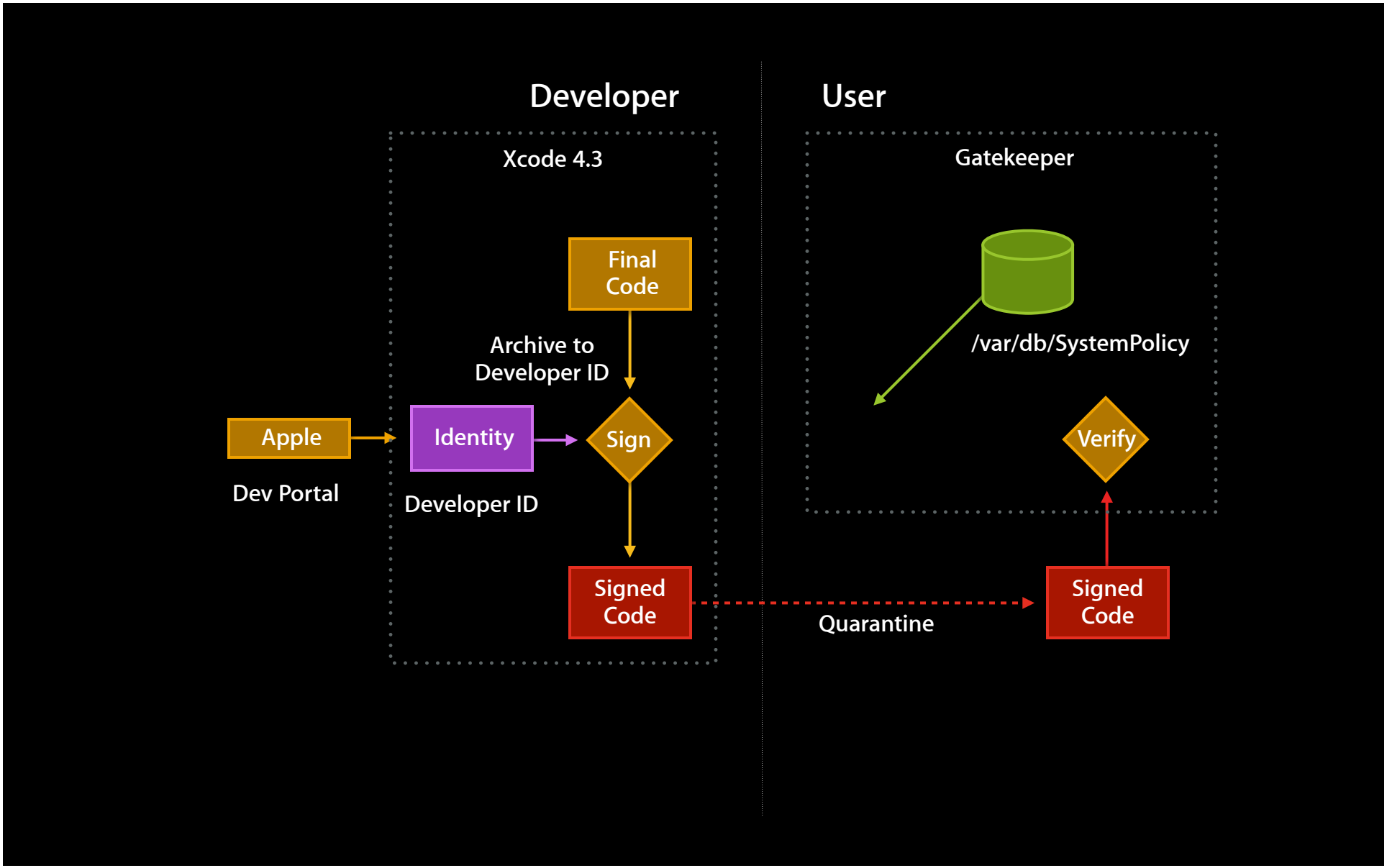
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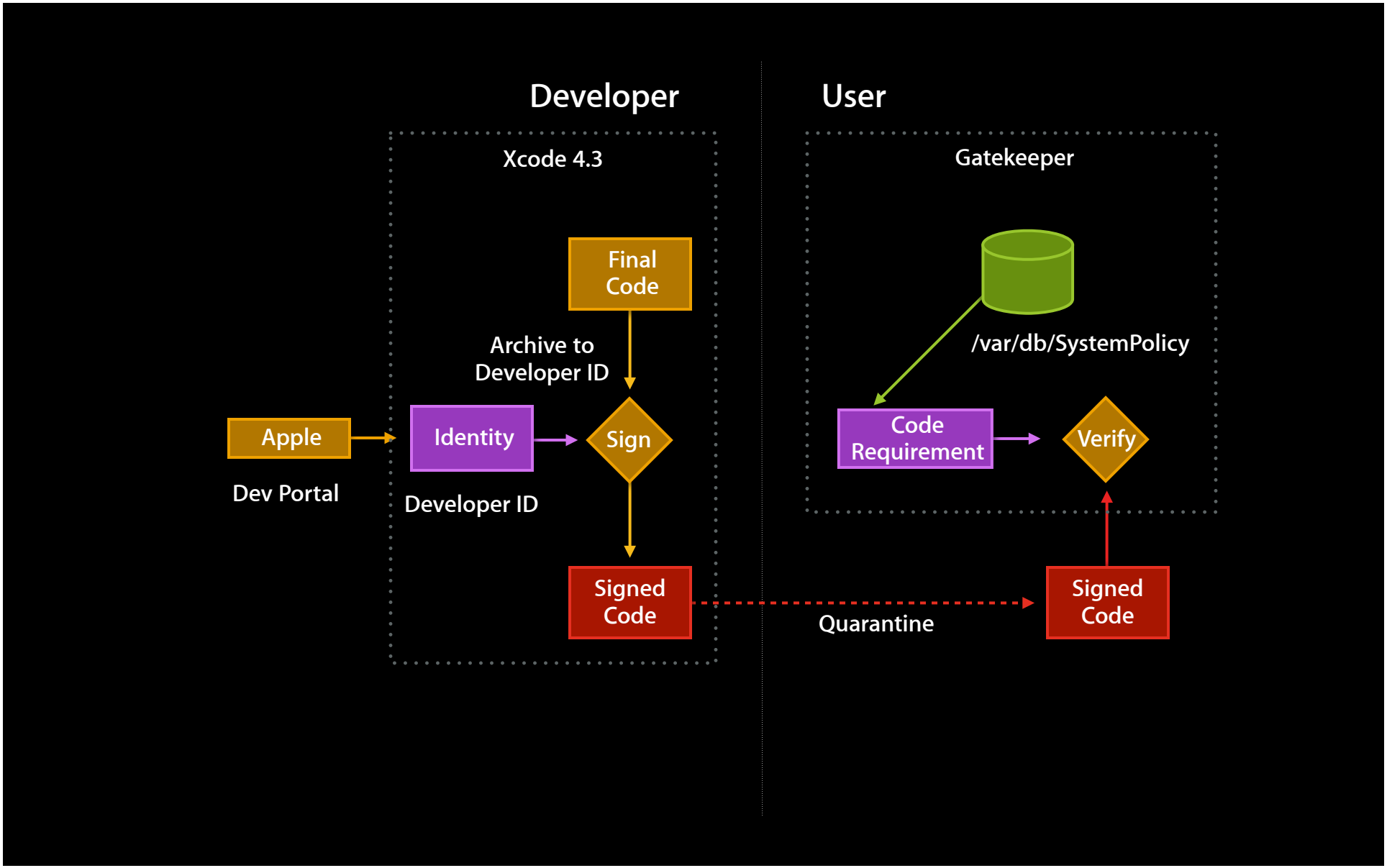
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Quarantine

Rule Deployment

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- Default (System, Mac App Store, Developer ID)

Rule Deployment

- Default (System, Mac App Store, Developer ID)
- Individual exceptions (administrator)

Rule Deployment

- Default (System, Mac App Store, Developer ID)
- Individual exceptions (administrator)
- Configuration profiles (OS X Server)

Rule Deployment

- Default (System, Mac App Store, Developer ID)
- Individual exceptions (administrator)
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- Default (System, Mac App Store, Developer ID)
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- Local rule changes (administrator: `spctl`)

Supported Systems

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- Mountain Lion (enabled by default)

Supported Systems

- Mountain Lion (enabled by default)
- Lion 10.7.4+ (disabled and hidden by default)

End-to-End Test

- Download via Safari
  - Or mail an attachment and save
- Double-click it in the Finder
- Watch what happens

Terminal Tools

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$ man spctl      # Direct access to System Policy Assessor
```

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```
$ man spctl      # Direct access to System Policy Assessor
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$ productsign --sign identity input.pkg output.pkg
$ xip --sign identity inputs... output
```

More Information

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Core OS Evangelist
danbold@apple.com

Documentation
Developer ID and Gatekeeper
http://developer.apple.com/resources/developer-id/

Apple Developer Forums
http://devforums.apple.com

Related Sessions

The Security Framework	Nob Hill Tuesday 2:00PM
Building, Archiving, and Submitting Your App	Pacific Heights Thursday 4:30PM
The OS X App Sandbox (Repeat)	Nob Hill Friday 10:15AM

Labs

Security Lab	Core OS Lab B Tuesday 3:15PM
Xcode Lab	Developer Tools Lab B Tuesday 2:00PM
Security Lab (For Early Risers)	Core OS Lab B Thursday 9:00AM

Summary

- Gatekeeper helps the user control what runs on their Mac
- Developer ID helps you identify your code for those users
- Gatekeeper is on by default in Mountain Lion
  - Can be enabled in Lion if the user wishes
- Developer ID signed code will be allowed by default

Q&A


WWDC2012