What’s New in ClassKit

John Calhoun, iOS Engineer
ClassKit introduction
New features
Best practices
ClassKit introduction
New features
Best practices
What is ClassKit?

Introduced in iOS 11.3
What is ClassKit?

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Part of Apple’s education ecosystem
What is ClassKit?

Introduced in iOS 11.3

Part of Apple’s education ecosystem

Sharing progress data with teachers
What is ClassKit?

Introduced in iOS 11.3

Part of Apple’s education ecosystem

Sharing progress data with teachers

Secure, privileged users
An Education Scenario

Code Klatch
An Education Scenario

Code Klash

Student
An Education Scenario

Code Klatch

Student

Teacher
An Education Scenario

Code Klatch

Student

ClassKit

Teacher
Schoolwork

Displays ClassKit progress
Schoolwork

Displays ClassKit progress

Free app for iPad
Schoolwork

Displays ClassKit progress

Free app for iPad

Used by schools worldwide
Schoolwork

Displays ClassKit progress

Free app for iPad

Used by schools worldwide

For teachers and students both
To get started, contact your school administrator or make sure you’re signed in with your school account.

Learn about Schoolwork >
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**Developer**

- **CORESPOTLIGHT TESTING**
  - Reindex All Items
  - Reindex All Items with Identifiers

- **SHORTCUTS TESTING**
  - Display Recent Shortcuts
    - When enabled, Siri Suggestions in Search & Siri Watch Face show the most recently provided shortcuts rather than current predictions.
  - Display Upcoming Media
    - When enabled, Siri Suggestions in Search will show Upcoming Media Intents donated via INUpcomingMediaManager.
  - Display Donations on Lock Screen
    - When enabled, the most recently donated shortcuts will be shown on the Lock Screen.
  - Force Sync Shortcuts to Watch

- **MIDI-CI TESTING**
  - Enable MIDI-CI
Settings

ACT AS OTHER ROLE

Off
Teacher
Student

Reset Development Data
Handouts

Programming languages
Continue in Code Klatch to learn about the programming language, Swift.
Handouts

Programming languages
Continue in Code Klatch to learn about the programming language, Swift.

DEV CLASS

2
NOT DONE
TOMORROW
DUE DATE
Programming languages
Continue in Code Klatch to learn about the programming language, Swift.

2
TOMORROW
NOT DONE
DUE DATE
Handouts

Introducing ClassKit

WWDC 2018

Programming languages
Continue in Code Klatch to learn about the programming language, Swift.

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TOMORROW
NOT DONE
DUE DATE
Introducing ClassKit

Programming languages
Continue in Code Klatch to learn about the programming language, Swift.

2
NOT DONE
TOMORROW
DUE DATE

WWDC 2018
CLSCContext

Surfaces activities for ClassKit-enabled apps
CLSContext

Surfaces activities for ClassKit-enabled apps

Containers for progress data
CLSContext

Surfaces activities for ClassKit-enabled apps

Containers for progress data

Your app defines tree structure of contexts
Your main app context
Your main app context

```swift
let ourMainContext: CLSContext = CLSDataStore.shared.mainAppContext
```
Your App’s Activities

Intro section

Variables and data-types section

Conditionals section
Your App’s Activities

Intro section

Variables and data-types section

Conditionals section
Your App’s Activities

Intro section

What is an IDE?

What is Swift?

Variables and data-types section

What is a variable?

Simple data types

Structs and other complex data types

Conditionals section

If statements

Switch statements
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Your App’s Activities

What is an IDE?

What is Swift?

What is a variable?

Variables and data-types section

Simple data types

Structs and other complex data types

If statements
Your App’s Activities

What is an IDE?

What is Swift?

What is a variable?

Variables and data-types section

Variable quiz

Simple data types

Simple types quiz

Structs and other complex data types

Complex types quiz

If statements

If quiz
Context Identifier Paths

mainAppContext

- 0_ide
- 1_swift
- 2_vars
- 3_datatypes
- 4_structs
- 5_if
- 6_switch

- 2_quiz
- 3_quiz
- 4_quiz
- 5_quiz
- 6_quiz
let path = ["4_structs", "4_quiz"]
Our App’s Context Tree

- mainAppContext
  - 0_ide
  - 1_swift
  - 2_vars
  - 3_datatypes
  - 4_structs
  - 5_if
  - 6_switch
    - 2_quiz
    - 3_quiz
    - 4_quiz
    - 5_quiz
    - 6_quiz
**Classes**

- **Art Class**
  - 5 Handouts due

- **Calculating**
  - 2 Handouts due

- **Dev Class**
  - 13 Handouts due

**Due Next 7 Days**

- **Hacking Fundamentals of Physics I**
  - MAR 7
  - Not done
  - This course provides a thorough introduction to the principles and methods of physics for students who...

- **Hacking Course Introduction and Newto...**
  - MAR 8
  - Not done
  - Professor Shankar introduces the course and answers student questions about the material and the reque...

- **Hacking Assignment**
  - MAR 11
  - PAST DUE
  - Read Wolfs...n and Pasachoff, Physics with Modern Physics, chapters 1-3.

- **Calculating Introductory Essay: The Fundam...**
  - MAR 11
  - PAST DUE
  - Read the attached essay.

- **Calculating Problem Set 1**
  - MAR 11
  - PAST DUE
  - Prof. Shankar has only made the Problem Set 1 Solutions available for Open Yale Courses. Review the PDF f...

- **Calculating Introductory Essay: Recent revel...**
  - MAR 11
  - PAST DUE
  - Read the attached essay.
Classes

- Art Class
  - 5 Handouts due

- calculating
  - 2 Handouts due

- Dev Class
  - 13 Handouts due

Due Next 7 Days

- HACKING Fundamentals of Physics I
  - This course provides a thorough introduction to the principles and methods of physics for students who...
  - 10 NOT DONE
  - MAR 7 PAST DUE

- HACKING Course Introduction and Newtonian Mechanics
  - Professor Shankar introduces the course and answers student questions about the material and the requirements...
  - 10 NOT DONE
  - MAR 8 PAST DUE

- HACKING Assignment
  - Read Wolfsen and Pasachoff, Physics with Modern Physics, chapters 1-3.
  - 10 NOT DONE
  - MAR 11 PAST DUE

- CALCULATING Introductory Essay: The Fundamental Theorem of Calculus
  - Read the attached essay.

- HACKING Problem Set 1
  - Prof. Shankar has only made the Problem Set 1 Solutions available for Open Yale Courses. Review the PDF...

- CALCULATING Introductory Essay: Recent revelations on the nature of reality
  - Read the attached essay.
Introduction to Swift

Complete the attached activity that will introduce you to the programming language called Swift.
Introduction to Swift

Complete the attached activity that will introduce you to the programming language called Swift.
Programming languages
Due Next 7 Days

- Fundamentals of Physics I
  - This course provides a thorough introduction to the principles and methods of physics for students.

Apps with Student Progress

- Code Klatch
- Hopscotch
- IXL
- Kahoot!
- Lexia Core5
- ProgressReader

Books
Classes

Due Next 7 Days

Fundamentals of Physics I
This course provides a thorough introduction to the principles and methods of physics for students.

Hacking
Introductory Essay: The Future of Programming
Read the attached essay.

Calculating
Introductory Essay: The Future of Programming
Read the attached essay.

Apps

Code Klash

What is an IDE?
What is Swift?
What is a variable?
Simple data types
Structs and other complex data types
If statements
Switch statements
Recently Viewed
Variable Quiz

What is a variable?

Search

Variable Quiz
What is Swift?

- What is a variable?
  - 2 Activities
- Simple data types
  - 2 Activities
- Structs and other complex data types
  - 2 Activities
- If statements
  - 2 Activities
- Switch statements
  - 2 Activities

Recently Viewed
**Introduction to Swift**

Complete the attached activity that will introduce you to the programming language called Swift.
ClassKit introduction

New features

Best practices
Context Provider Extension
Activity completion API
Correct/incorrect progress value
Context Provider Extension
Activity completion API
Correct/incorrect progress value
Context Provider Extension Template
Context Provider Extension Template
Context Provider Extension

CLSContextProvider
Context Provider Extension

CLSContextProvider

func updateDescendants(of context: CLSContext, completion: @escaping (Error?) -> Void)
Context Provider Extension

CLSContextProvider

func updateDescendants(of context: CLSContext, completion: @escaping (Error?) -> Void)

// Code here should be performant
Context Provider Extension

CLSContextProvider

func updateDescendants(of context: CLSContext, completion: @escaping (Error?) -> Void)
    var error: Error? = nil

    // This is where your code creates child contexts for the context passed in.
    // If there is nothing to do, call the completion (below) and you're done.
    // Otherwise, create children, add to context & -[CLSDataStore saveWithCompletion:].
    // Call completion when you are finished.

    completion(error)

}
CLSContextProvider

```swift
func updateDescendants(of context: CLSContext, completion: @escaping (Error?) -> Void) {
    var error: Error? = nil

    // This is where your code creates child contexts for the context passed in.
    completion(error)
}
```

Context Provider Subclass

- mainAppContext
  - 0_ide
  - 1_swift
  - 2_vars
  - 3_datatypes
  - 4_structs
  - 5_if
  - 6_switch
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func updateDescendants(of context: CLSContext, completion: @escaping (Error?) -> Void) {
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    completion(error)
}
Context Provider Extension Purpose

Opportunity to create your tree
Context Provider Extension Purpose

Opportunity to create your tree

Extension registered on app download
Context Provider Extension Purpose

Opportunity to create your tree

Extension registered on app download

Create smaller batches of CLSContexts
Context Provider Extension Purpose

Opportunity to create your tree

Extension registered on app download

Create smaller batches of CLSContexts

Not useful for apps that require user interaction
Apps with Student Progress

- Books
- Code Klatich
- Hopscotch
- IXL
- Kahoot!
- Lexia Core5
- ProgressReader
Context-provider extension
Mark activity as complete
Correct/incorrect type
Mark Activity as Complete

DEV CLASS
Programming languages
Continue in Code Klatch to learn about the programming language, Swift.

1
TOMORROW
NOT DONE
DUE DATE
What is a variable (quiz)?
What is a variable (quiz)?
// Mark Activity as Complete

func completeAllAssignedActivities(matching contextPath: [String])
// Example function to indicate the quiz is complete

func indicateVariableQuizComplete() {
    // Call function with identifier path to quiz.
    CLSDataStore.shared.completeAllAssignedActivities(matching: ["2_vars", "2_quiz"])
}

What is a variable (quiz)?
Context-provider extension
Mark activity as complete
Correct/incorrect type
CLSActivityItems

CLSActivityItem

CLSBinaryItem  CLSQuantityItem  CLSScoreItem
// CLSBinaryItem enum value

typedef NS_ENUM(NSInteger, CLSBinaryValueType) {
    CLSBinaryValueTypeTrueFalse = 0,
    CLSBinaryValueTypePassFail,
    CLSBinaryValueTypeYesNo,
};
typedef NS_ENUM(NSInteger, CLSBinaryValueType) {
    CLSBinaryValueTypeTrueFalse = 0,
    CLSBinaryValueTypePassFail,
    CLSBinaryValueTypeYesNo,
    CLSBinaryValueTypeCorrectIncorrect,
};
QUIZZES

What is a variable (quiz)?

Variable Quiz
Code KLatch Quiz

Score: 70%
Total Time: 19 sec
Progress: 100%
Done: No

Correct | Incorrect
Question 1: Correct
Question 2: Correct
Question 3: Incorrect
Question 4: Correct

Class Avg. 70%
Class Avg. 19 sec
Class Avg. 100%
ClassKit introduction
New features
Best practices
First App Launch

mainAppContext

0 Ide
1 Swift
2 Vars
3 Datatypes
Second App Launch

mainAppContext

0_ide 0_ide 1_swift 1_swift 2_vars 2_vars 3_datatypes 3_datatypes
Second App Launch

mainAppContext

0_ide 0_ide 1_swift 1_swift 2_vars 2_vars 3_datatypes 3_datatypes

Error: same identifier path
Error: same identifier path
Error: same identifier path
Error: same identifier path
CLSDataStore Delegate

CLSDataStore.shared.contexts(matchingIdentifierPath: ["ide_0"]) { contexts, error in
    if contexts.isEmpty {
        // No matching context with the identifier path exists, create it here.
    }
}
CLSDataStore Delegate

```swift
CLSDataStore.shared.contexts(matchingIdentifierPath: \["ide_0"]) { contexts, error in
    if contexts.isEmpty {
        // No matching context with the identifier path exists, create it here.
    }
}

CLSDataStore.shared.mainAppContext.descendant(matchingIdentifierPath: \["ide_0"])) { context, error in
    if context == nil {
        // No matching context with the identifier path exists, create it here.
    }
}
```
func createContext (forIdentifier identifier: String, parentContext: CLSContext, parentIdentifierPath: [String]) -> CLSContext? {

    // Your code here to create CLSContext

    return newContext
}

func beginActivity (_ path: [String])  {
    // Query specified context, delegate will create context if necessary.
    CLSDataStore.shared.mainAppContext.descendant(matchingIdentifierPath: path) {context, error in
        // Activate the context, add and start activity.
        context?.becomeActive()
        context?.createNewActivity()
        context?.currentActivity?.start()

        // Save.
        CLSDataStore.shared.save { error in
            guard error == nil else {
                print("Save error: \(error!.localizedDescription)")
                return
            }
            
        }
    }
}
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    }
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New features
Best practices
Where to go from here...