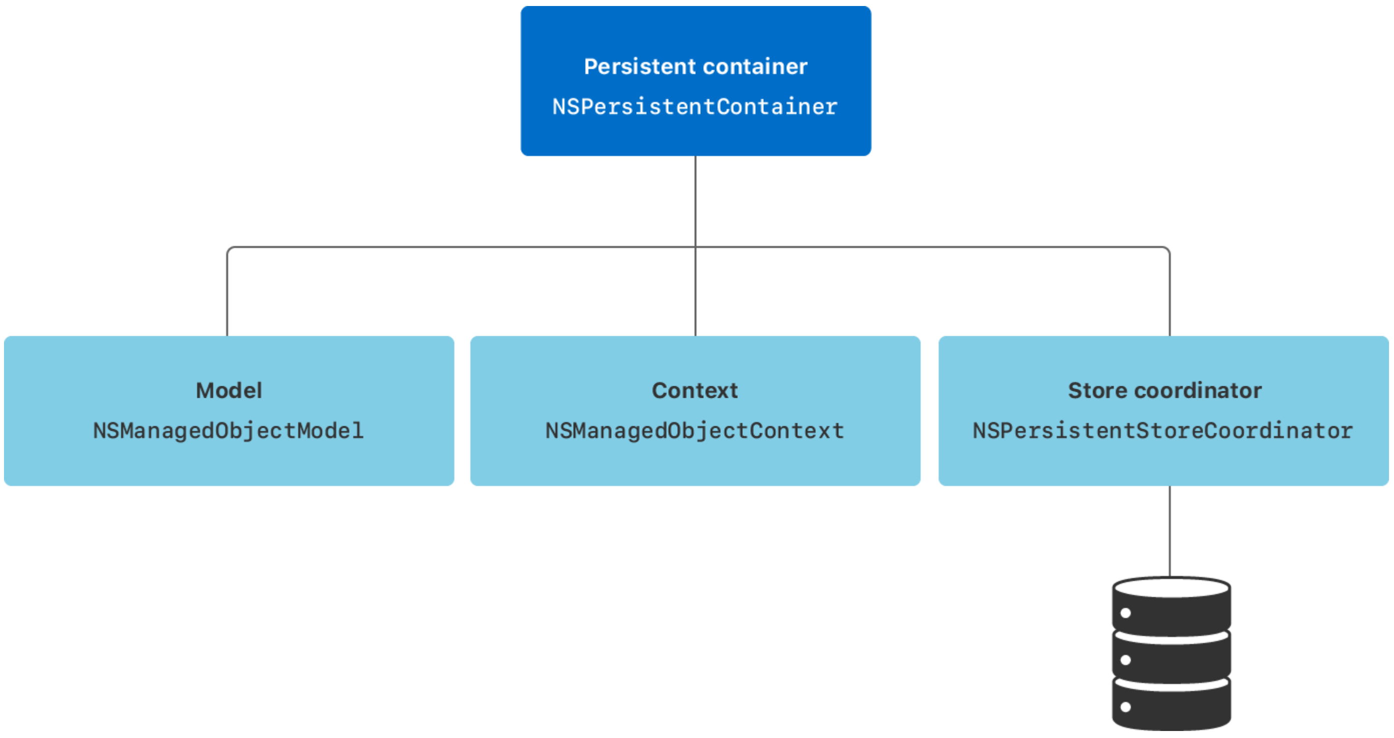
Article

Setting up a Core Data stack

Set up the classes that manage and persist your app's objects.

Overview

After you create a data model file as described in Creating a Core Data model, set up the classes that collaboratively support your app's model layer. These classes are collectively referred to as the Core Data stack.



- An instance of `NSManagedObjectModel` represents your app's model file describing your app's types, properties, and relationships.
- An instance of `NSManagedObjectContext` tracks changes to instances of your app's types.
- An instance of `NSPersistentStoreCoordinator` saves and fetches instances of your app's types from stores.

- An instance of NSPersistentContainer sets up the model, context, and store coordinator all at once.

Initialize a Persistent Container

Typically, you initialize a Core Data stack as a singleton:

```
// Define an observable class to encapsulate all Core Data-related functionality.
class CoreDataStack: ObservableObject {
    static let shared = CoreDataStack()

    // Create a persistent container as a lazy variable to defer instantiation until
    lazy var persistentContainer: NSPersistentContainer = {

        // Pass the data model filename to the container’s initializer.
        let container = NSPersistentContainer(name: "DataModel")

        // Load any persistent stores, which creates a store if none exists.
        container.loadPersistentStores { _, error in
            if let error {
                // Handle the error appropriately. However, it's useful to use
                // `fatalError(_:file:line:)` during development.
                fatalError("Failed to load persistent stores: \(error.localizedDescr
            }
        }
        return container
    }()

    private init() { }
}
```

Once created, the persistent container holds references to the model, context, and store coordinator instances in its managedObjectModel, viewContext, and persistentStoreCoordinator properties, respectively.

You can now use the Core Data stack througout your app.

Inject the managed object context

Create an instance of the Core Data stack and inject its managed object context into your app environment:

```swift
@main
struct ShoppingListApp: App {
    // Create an observable instance of the Core Data stack.
    @StateObject private var coreDataStack = CoreDataStack.shared

    var body: some Scene {
        WindowGroup {
            ContentView()
            // Inject the persistent container's managed object context
            // into the environment.
                .environment(\.managedObjectContext,
                              coreDataStack.persistentContainer.viewContext)
        }
    }
}
```

Use an environment property wrapper to access the managed object context in your views:

```swift
//#-code-listing(AccessManagedObjectContext) [Access the managed object context]
struct ContentView: View {
    // Get a reference to the managed object context from the environment.
    @Environment(\.managedObjectContext) private var viewContext

    // Remaining implementation of the user interface.
}
```

Add functionality to the stack

Your Core Data stack is a convenient place to put related code, such as methods to save changes and delete managed objects in the persistent store:

```swift
extension CoreDataStack {
    // Add a convenience method to commit changes to the store.
    func save() {
        // Verify that the context has uncommitted changes.
        guard persistentContainer.viewContext.hasChanges else { return }

        do {
            // Attempt to save changes.
            try persistentContainer.viewContext.save()
        } catch {
            // Handle the error appropriately.
            print("Failed to save the context:", error.localizedDescription)
        }
    }

    func delete(item: ShoppingItem) {
        persistentContainer.viewContext.delete(item)
        save()
    }
}
```

The `save` method improves performance by saving the context only when there are changes.

Topics

Legacy Stack Setup

Setting up a Core Data stack manually

Create the individual components that Core Data requires manually, to support earlier versions of Apple operating systems.

See Also

Essentials

Creating a Core Data model

Define your app's object structure with a data model file.

Core Data stack

Manage and persist your app's model layer.

Handling Different Data Types in Core Data

Create, store, and present records for a variety of data types.

Linking Data Between Two Core Data Stores

Organize data in two different stores and implement a link between them.