WWDC25

Highlights of new technologies introduced at WWDC25.

Overview

Browse a selection of documentation for new technologies and frameworks introduced at WWDC25. Many existing frameworks have added significant functionality to enhance your apps when run on the latest platform releases.

For a comprehensive list of downloadable sample code projects, see WWDC25 Sample Code. To tour the frameworks and tools for Apple platforms, browse Technology Overviews. For the latest design guidance, see Human Interface Guidelines > What's New.

Topics

Accessibility

Add Accessibility Nutrition Labels to your App Store product page to highlight features you support to give your app a greater reach. For instance, a person that requires reading glasses may search the store for apps that support Larger Text.

≋ Accessibility

Make your apps accessible to everyone who uses Apple devices.

App services

≋ PaperKit

Add drawings, shapes, and a consistent markup experience to your app.

- **EnergyKit**

  Provide a grid forecast for your app to help people choose when to use electricity.

- **Performing long-running tasks on iOS and iPadOS**

  Use a continuous background task to do work that can complete as needed.

- `final actor SpeechAnalyzer`

  Analyzes spoken audio content in various ways and manages the analysis session.

- **Creating custom views for Live Activities**

  Create reusable custom views and layouts that support each Live Activity presentation.

- **Launching your app from a Live Activity**

  Use deep links to enable people to open your app's scene that matches the data of you Live Activity.

- **Configuring App Clip experiences**

  Review how people launch your App Clip with invocation URLs, default and demo links, and advanced App Clip experiences.

App Store distribution and marketing

- **Understanding StoreKit workflows**

  Implement an in-app store with several product types, using StoreKit views.

- **Background Assets**

  Improve or eliminate the time people wait while your app downloads assets.

- **Configuring attribution rules for your app**

  Tune aspects of attribution flow, including the time available to register impressions and the minimum time your app is willing to accept conversions.

- **Identifying the parameters in a postback**

  Interpret postback properties to understand the attribution report.

- **Receiving postbacks in multiple conversion windows**

  Learn about the data that postbacks can contain in each conversion window.

- **Packaging and distributing Safari Web Extensions with App Store Connect**

  Upload and distribute Safari Web Extensions without using a Mac or Xcode.

Apple Intelligence and machine learning

Apple Intelligence and machine learning

Add intelligent features with Apple Intelligence, machine learning, and related technologies.

Foundation Models

Perform tasks with the on-device model that specializes in language understanding, structured output, and tool calling.

Improving the safety of generative model output

Create generative experiences that appropriately handle sensitive inputs and respect people.

Integrating actions with Siri and Apple Intelligence

Create app intents, entities, and enumerations that conform to assistant schemas to tap into the enhanced action capabilities of Siri and Apple Intelligence.

Displaying static and interactive snippets

Enable people to view the outcome of an app intent and immediately perform follow-up actions.

Making app entities available in Spotlight

Allow people to find your app's content in Spotlight by donating app entities to its semantic index.

Generating content and performing tasks with Foundation Models

Enhance the experience in your app by prompting an on-device large language model.

Visual Intelligence

Include your app's content in search results that visual intelligence provides.

Integrating your app with visual intelligence

Enable people to find app content that matches their surroundings or objects onscreen with visual intelligence.

Recognizing tables within a document

Scan a document containing a contact table and extract the content within the table in a formatted way.

struct DetectLensSmudgeRequest

A request that detects a smudge on a lens from an image or video frame capture.

Apple Pay and Wallet

📄 Implementing as an identity document provider

Add your app as an option for mobile document web presentment.

▧ IdentityDocumentServices

Share mobile documents using the Digital Credentials API.

▧ IdentityDocumentServicesUI

Provide an interface so people can present mobile documents.

📄 Setting up Tap to Pay on iPhone

Request and configure the required entitlement to support Tap to Pay on iPhone.

Audio, Video, and Media

📄 Signing people in to their media accounts automatically

Implement single sign-on for media-streaming apps by managing a sign-in token on a person's Apple Account.

▧ Video Subscriber Account

Support TV provider and Apple TV app functionality.

▧ Automatic Sign-In API

Manage sign-in tokens from your web server that facilitate single sign-on across the devices of your media-streaming service customers.

{} Capturing Spatial Audio in your iOS app

Enhance your app's audio recording capabilities by supporting Spatial Audio capture.

{} Editing Spatial Audio with an audio mix

Add Spatial Audio editing capabilities with the Audio Mix API in the Cinematic framework.

{} Enhancing your app with machine learning-based video effects

Add powerful effects to your videos using the VideoToolbox VTFrameProcessor API.

📄 Observing playback state in SwiftUI

Keep your user interface in sync with state changes from playback objects.

📄 Anchoring sound to a window or volume

Provide unique app experiences by attaching sounds to windows and volumes in 3D space.

{} Creating a seamless multiview playback experience

Build advanced multiview playback experiences with the AVFoundation and AVRouting frameworks.

Developer tools

Creating your app icon using Icon Composer

Use Icon Composer to stylize your app icon for different platforms and appearances.

Writing code with intelligence in Xcode

Generate code, fix bugs fast, and learn as you go with intelligence built directly into Xcode.

Running code snippets using the playground macro

Add playgrounds to your code that run and display results in the canvas.

Understanding and improving SwiftUI performance

Identify and address long-running view updates, and reduce the frequency of updates.

Analyzing the performance of your shipping app

View power and performance metrics for apps you distribute through the App Store.

Recording UI automation for testing

Capture and replay interaction sequences to verify your app's behavior.

Downloading and installing additional Xcode components

Add more Simulator runtimes, optional features, and support for additional platforms.

Measuring your app's power use with Power Profiler

Profile your app's power impact whether or not your device is connected to Xcode.

Graphics and games

Game technologies

Plan the creation of your game and incorporate the gameplay features people expect.

GameSave

Store and sync your application's save files in iCloud.

Touch Controls

Integrate on-screen touch controls into your Metal-based games.

`Beta`

📄 **Discovering and tracking spatial game controllers and styli**

Receive controller and stylus input to interact with content in your augmented reality app.

📄 **Creating activities for your game**

Use activities to surface game content to players and encourage them to connect with each other.

`class` `GKGameActivity`

An object that represents a single instance of a game activity for the current game.

📄 **Choosing a leaderboard for your challenges**

Understand what gameplay works well when configuring challenges in your game.

📄 **Creating engaging challenges from leaderboards**

Encourage friendly competition by adding challenges to your game.

📄 **Building your macOS game remotely from your PC**

Configure a Mac for remote builds, and use it to build your game from your PC and catch mistakes when porting your game to macOS.

Maps and location

🗇 GeoToolbox

Determine place descriptor information for map coordinates.

`struct` `PlaceDescriptor`

A structure that contains identifying information about a place that a mapping service may use to attempt to find rich place information such as phone numbers, websites, and so on.

Metal

📄 **Understanding the Metal 4 core API**

Discover the features and functionality in the Metal 4 foundational APIs.

📄 **Using the Metal 4 compilation API**

Control when and how you compile an app's shaders.

`{}` **Drawing a triangle with Metal 4**

Render a colorful, rotating 2D triangle by running draw commands with a render pipeline on a GPU.

{} Processing a texture in a compute function

Create textures by running copy and dispatch commands in a compute pass on a GPU.

📄 Machine-learning passes

Add machine-learning model inference to your Metal app's GPU workflow.

📄 Resource synchronization

Prevent multiple commands that can access the same resources simultaneously by coordinating those accesses with barriers, fences, or events.

📄 Synchronizing resource accesses within a single pass with an intrapass barrier

Resolve resource access conflicts between stages within a single pass by adding an intrapass barrier.

📄 Synchronizing resource accesses between multiple passes with a fence

Resolve resource access conflicts between multiple passes within a single command queue by signaling a fence in one pass and waiting for it in another.

📄 Synchronizing resource accesses with earlier passes with a consumer-based queue barrier

Resolve resource access conflicts between multiple passes within a single command queue by creating a consumer-based intraqueue barrier.

📄 Synchronizing resource accesses with subsequent passes with a producer-based queue barrier

Resolve resource access conflicts between multiple passes within a single command queue by creating a producer-based intraqueue barrier.

Parental controls and safety

≋ PermissionKit

Create communication experiences between a child and their parent or guardian.

≋ Declared Age Range

Create age-appropriate experiences in your app by asking people to share their age range.

class SCVideoStreamAnalyzer

An object that monitors a stream of video by analyzing frames for sensitive content.

Security and privacy

📄 Enabling enhanced security for your app

Detect out-of-bounds memory access, use of freed memory, and other potential vulnerabilities.

Spatial computing with visionOS

📚 Immersive Media Support

Read and write essential Apple Immersive Video metadata.

{} Authoring Apple Immersive Video

Prepare and package immersive video content for delivery.

📄 Adopting best practices for persistent UI

Create persistent and contextually relevant spatial experiences by managing scene restoration, customizing window behaviors, and surface snapping data.

{} Presenting images in RealityKit

Create and display spatial scenes in RealityKit

{} Tracking accessories in volumetric windows

Translate the position and velocity of tracked handheld accessories to throw virtual balls at a stack of cans.

📄 Configure your visionOS app for sharing with people nearby

Create shared experiences for people wearing Vision Pro in the same room and those on FaceTime.

SwiftUI, UIKit, and AppKit

📄 Liquid Glass

Learn how to design and develop beautiful interfaces that leverage Liquid Glass.

📄 Adopting Liquid Glass

Find out how to bring the new material to your app.

{} Landmarks: Building an app with Liquid Glass

Enhance your app experience with system-provided and custom Liquid Glass.

{} Landmarks: Displaying custom activity badges

Provide people with a way to mark their adventures by displaying animated custom activity badges.

{} Landmarks: Refining the system provided Liquid Glass effect in toolbars

Organize toolbars into related groupings to improve their appearance and utility.

{} Landmarks: Extending horizontal scrolling under a sidebar or inspector

Improve your horizontal scrollbar's appearance by extending it under a sidebar or inspector.

📄 Applying Liquid Glass to custom views

Configure, combine, and morph views using Liquid Glass effects.

📄 Building and customizing the menu bar with SwiftUI

Provide a seamless, cross-platform user experience by building a native menu bar for iPadOS and macOS.

📄 Populating SwiftUI menus with adaptive controls

Improve your app by populating menus with controls and organizing your content intuitively.

{} Building rich SwiftUI text experiences

Build an editor for formatted text using SwiftUI text editor views and attributed strings.

System services

≋ Wi-Fi Aware

Securely pair and connect to external devices over peer-to-peer Wi-Fi.

📄 Connecting devices for peer-to-peer Wi-Fi

Make outgoing and accept incoming secure connections with paired devices.

{} Building peer-to-peer apps

Communicate with nearby devices over a secure, high-throughput, low-latency connection by using Wi-Fi Aware.

📄 Adopting Wi-Fi Aware

Add entitlements and declare your app's services.

≋ AlarmKit

Schedule prominent alarms and countdowns to help people manage their time.

{} Scheduling an alarm with AlarmKit

Create prominent alerts at specified dates for your iOS app.

WirelessInsights

Receive notifications for anticipated changes in cellular data service conditions.

RelevanceKit

Provide on-device intelligence with contextual clues that increase your widget's visibility on Apple Watch.

TelephonyMessagingKit

Send and receive standards-based messages over cellular networks.

See Also

WWDC

WWDC24

Highlights of new technologies introduced at WWDC24.

WWDC23

Highlights of new technologies introduced at WWDC23.

WWDC22

Highlights of new technologies introduced at WWDC22.

WWDC21

Highlights of new technologies introduced at WWDC21.