Introduction to Game Center

Get your Game Center on

Session 407

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iOS Engineering

Game Center

- Online social-gaming network
  - Available with iOS 4.1+
- Online leaderboards
  - Compare best scores
- Integrated achievements
  - Track and reward progress
- Multiplayer gaming and voice chat
  - Compete online
- Promotion and discovery
  - See what your friends are playing

50 Million

Game Center users

Game Center

- Massive community
- Many top games
- Tons of activity
- Growing steadily

What You Will Learn

Game Center essentials

- Game Center app overview
  - How Game Center promotes games
- GameKit framework overview
  - How to enhance your game with Game Center features
- Game Center services
  - How to define, test, and submit your game
- New features for iOS 5

Game Center App

Game Center
Delivered in three parts

Game Center
App

GameKit
Framework

Game Center
Services

Game Center App

Game Center App

GameKit Framework

Game Center Services

Game Center App
Built-in app for social gaming

- Account management
- Browse and discover friends
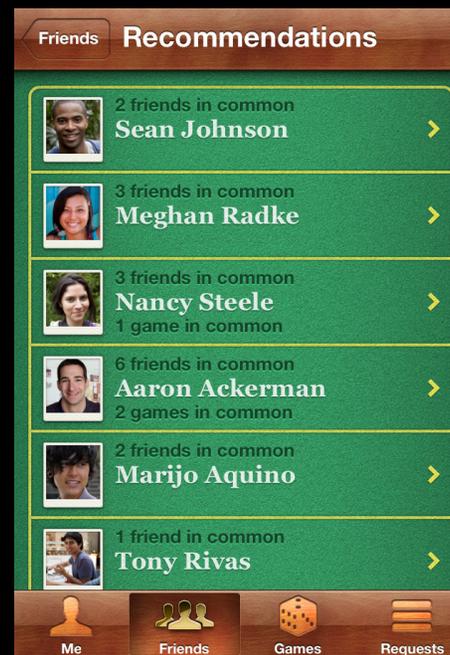- Browse and discover games

Game Center App

Me tab

- Player overview
- Edit status
- Change photo
- Account management

Game Center App
Friends tab

- Browse friends
  - Game Center friends
  - Achievement leaderboard
- Discover friends
  - Friend Recommendations
  - Add Friends

Game Center App
Friends details

- Discover games
  - Ordered by last played
  - Ability to purchase
  - Achievements
- Discover friends
  - Friends of friends

Game Center App
Games tab

- Browse games
  - Played recently
  - Installed
- Discover games
  - Game recommendations
  - Game Center room in App Store

Game Center App
Game details

- Browse games
  - Leaderboards
  - Achievements
  - Comparison to friend
- Discover friends
  - Recent players
- Discover games
  - Link to App Store
  - Tell a friend

Game Center App

Store integration

- Discover games
  - Directly purchase
  - Submit rating
  - Browse related products
  - Tell a friend
  - Gifting

GameKit Framework

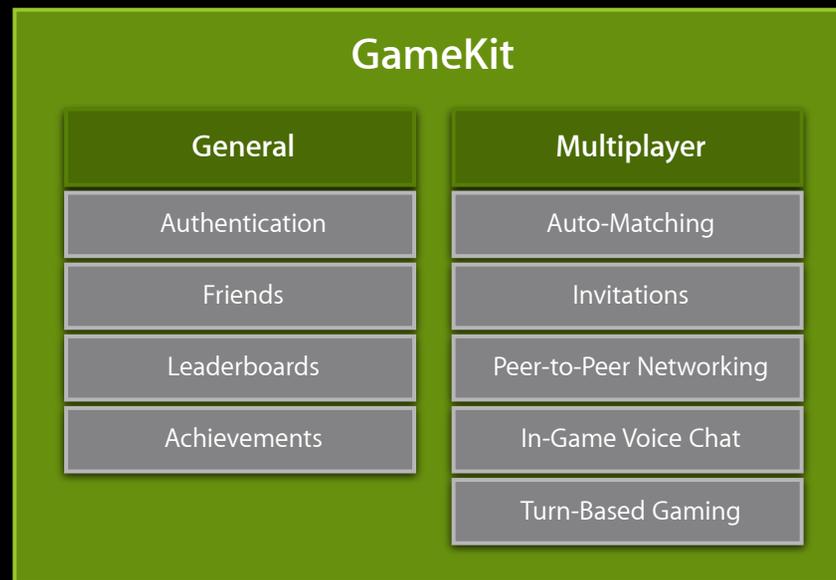# GameKit Framework

Game Center App

GameKit Framework

Game Center Services

GameKit Framework

GameKit

| General	Multiplayer
Authentication	Auto-Matching
Friends	Invitations
Leaderboards	Peer-to-Peer Networking
Achievements	In-Game Voice Chat
	Turn-Based Gaming

GameKit Framework Overview

Framework to enhance game development

- Authenticating player
- Submitting scores and displaying leaderboards
- Submitting and displaying achievements
- Establishing multiplayer games
  - Peer to peer
  - Server-hosted
  - Turn-based
- In-game voice chat

Think Asynchronously
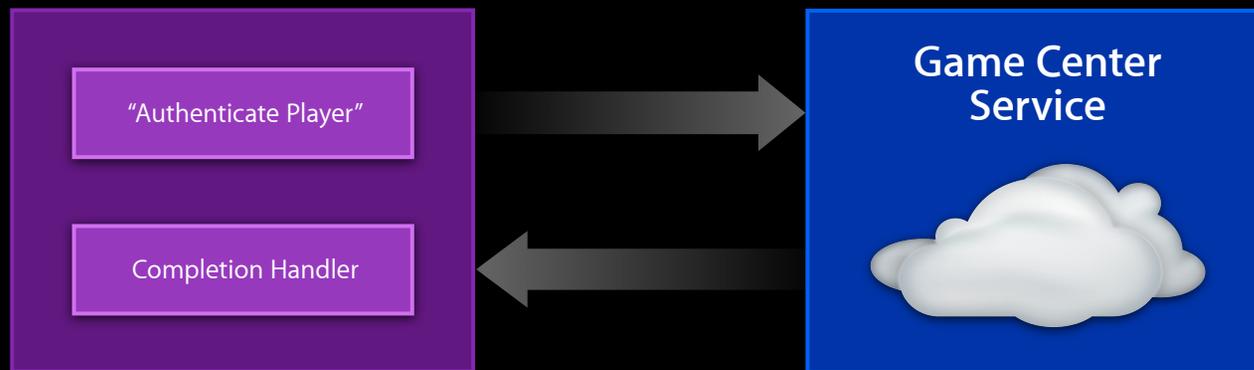
- GameKit API designed to operate asynchronously
- Implemented using blocks as callbacks
  - "Completion handlers"

Think Asynchronously
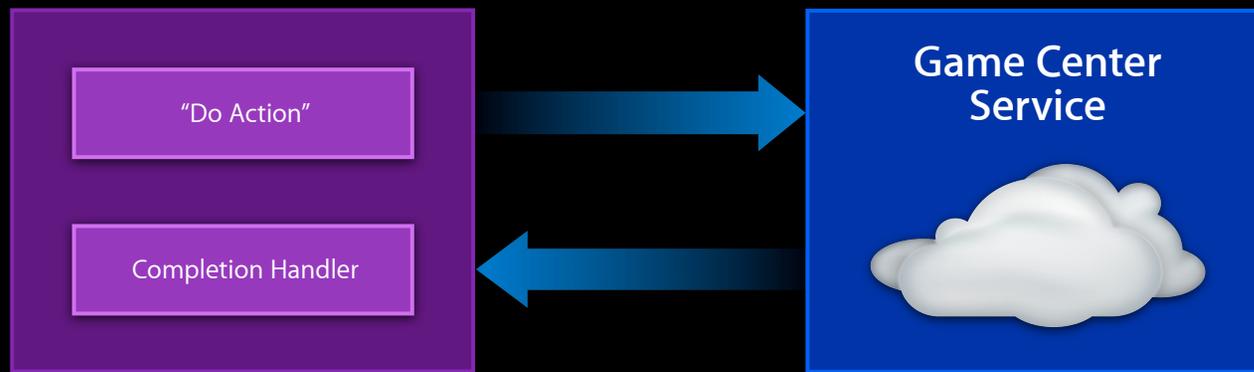

```
[object doActionWithCompletionHandler: ^(NSError *error) {
        if (error) {
            // handle error
        } else {
            // action was done
        }
    }
];
```

Players

- Represents Game Center user
  - Backed by AppleID
  - Invariant PlayerID
  - Nickname
  - Load photo
- Local user is special
  - Friends
  - Underage
  - Authentication

GKLocalPlayer

GameKit
Authentication

- All Game Center games start by authenticating the player
- Game Center handles the process for you automatically
  - Returning player
  - First time sign-up
  - User opt-out

GameKit
Authentication steps

- Check for Game Center support
  - Game Center API
  - OS Version
- Request Authentication
  - Using GKLocalPlayer
- Check the result
  - Enable or disable Game Center functionality

Authentication
Example

```objc
// check for presence of GKLocalPlayer API
Class gcClass = NSClassFromString(@"GKLocalPlayer");

  // check if the device is running iOS 4.1 or later
BOOL osVersionSupported = ([[[UIDevice currentDevice] systemVersion]
    compare:@"4.1" options:NSNumericSearch] != NSOrderedAscending);

  // if supported, request authentication
  if (gcClass && osVersionSupported) {
    GKLocalPlayer *localPlayer = [GKLocalPlayer localPlayer];
    [localPlayer authenticateWithCompletionHandler:^(NSError *error) {
      if (localPlayer.authenticated) {
        // authentication successful
```

Authentication
Handling errors

- Authentication might not be successful
  - Game Center not enabled (`GKErrorGameUnrecognized`)
  - Device not supported (`GKErrorNotSupported`)
  - User canceled (`GKErrorCancelled`)
- Provide a graceful fallback
  - Proceed with Game Center features disabled
  - Do not show Game Center UI

GameKit
Leaderboards

- Enhance competition
  - Track how friends are doing
  - See how the best players in the community are doing
- Encourage return play
  - Try to beat their friends
  - Try to best their high score

GameKit
Leaderboards

- Defined in iTunes Connect

Name	Scoreboard
ID	com.company.app.score
Score Type	Integer
Sort Order	High to low
Language	English
Display Name	Top Scores
Score Format	100,000
Suffix (singular)	Point
Suffix (plural)	Points

GameKit
Leaderboards

- GKScore
  - Represents a score
  - Used to report high score
  - Store and forward if offline
- GKLeaderboard
  - Categories
  - Range of scores
  - Scores for specific players
  - Default leaderboard

GKLeaderboard

GameKit

Leaderboards

- Standard UI
  - GKLeaderboardViewController
  - App Store ratings
  - Friends and global leaderboards
- Custom UI
  - GKLeaderboard
  - Load small ranges

Leaderboards
Submitting a score

```
// init the score
GKScore *score = [[[GKScore alloc] initWithCategory:@"ALeaderboardCategory"]
autorelease];
```

```
// set the value
score.value = aHighScoreValue;
```

```
// set any valuable context
score.context = aScoreContext;
```

```
// make this the default leaderboard
score.shouldSetDefaultLeaderboard = YES;
```

```
[score reportScoreWithCompletionHandler:^(NSError *error) {
    if (error) {
        // handle error
    }
}];
```

Leaderboards

Loading scores

```objc
// init the leaderboard
GKLeaderboard *leaderboard = [[[GKLeaderboard alloc] init] autorelease];
```

```objc
// set the category
leaderboard.category = @"ALeaderboardCategory";
leaderboard.range = NSMakeRange(1,10);
```

```objc
// set the time and player scope
leaderboard.timeScope = GKLeaderboardTimeScopeAllTime;
leaderboard.playerScope = GKLeaderboardPlayerScopeFriendsOnly;
```

```objc
[leaderboard loadScoresWithCompletionHandler:^(NSArray *scores, NSError *error) {
    if (scores) {
        // display scores
    }
    if (error) {
        // handle error
    }
}];
```

GameKit
Achievements

- Keep players involved
  - Try to unlock all achievements
  - Finding hidden achievements
  - Comparing to their friends
  - Track game progress
- Encourage return play

GameKit
Achievements

- Defined in iTunes Connect
  - Before and after achieved states
  - Hidden achievements
  - Images
- Single set per application
  - 1000 points total
  - 100 achievements maximum
  - 100 points per achievement max

GameKit

Achievements

- GKAchievement Description
  - Defines the achivement
  - Load descriptions
  - Load achievement image
- GKAchievement
  - User's achievement state
  - Load achievements
  - Shows banner on completion
- GKAchievementViewController
  - Standard UI
  - App rating

GKAchievement

Achievements
Submitting achievement

```objc
// init the achievement

GKAchievement *achievement = [[GKAchievement alloc]
initWithIdentifier:@"AnAchievement"];
```

```objc
// set the percent complete

achievement.percentComplete = 100.0;
```
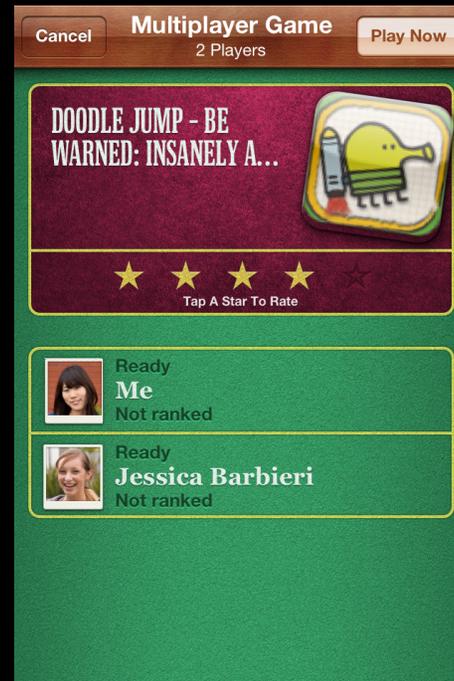
```objc
// show the banner

achievement.showsCompletionBanner = YES;
```

```objc
[achievement reportAchievementWithCompletionHandler:^(NSError *error) {

    if (error) {

        // handle error

    }

}];
```

GameKit

Multiplayer

- Peer to peer and hosted
  - Invitations
  - Auto-matching
- In-game voice chat
- Turn-based
  - Invitations
  - Auto-matching

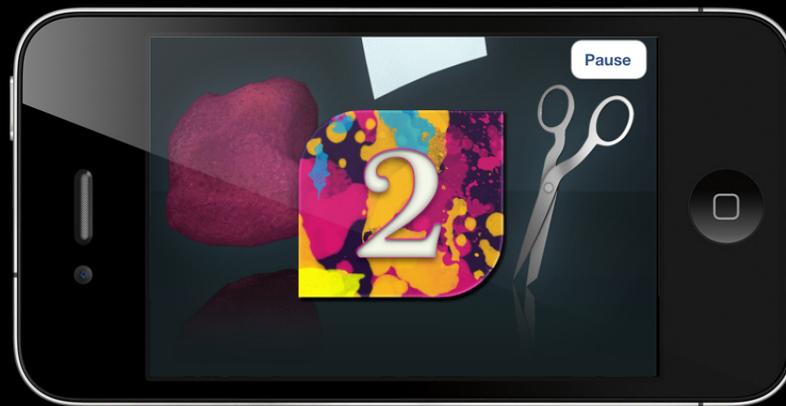# GameKit
Why add multiplayer?

- Make your app stand out
  - People like to play against real opponents
  - Encourage cooperative team play
  - One of the most requested/discussed features
- Increase the longevity of your game
  - Keeps players coming back

Multiplayer Invites
Flow

Multiplayer Invites
Ready to play

GameKit
Peer to peer

- GKMatchRequest
  - Defines the match parameters
- GKMatch
  - Manages networking
  - Tracks player state
- GKMatchmaker
  - Invite handler
  - Quick auto-matching without UI
- GKMatchmakerViewController
  - Standard UI for invitations and auto-matching
  - App Rating

GKMatch

GameKit

In-game voice chat

- GKVoiceChat
  - Create voice chat from match
  - Control participation
  - Get player-state updates
  - Adjust the volume

GKVoiceChat

GameKit
Turn-based multiplayer gaming

- More leisurely multiplayer
- Good for classic games and board games
  - Chess
  - Backgammon
  - Checkers
- Fully asynchronous
  - Player never needs to wait in game
  - Asynchronous invitations
  - Asynchronous auto-matching
- Game state stored on servers

GameKit

Turn-based classes

- GKMatchRequest
  - Same as for peer to peer
- GKTurnBasedMatch
  - Tracks match state
  - Load existing matches
  - Quick auto-matching without UI
- GKTurnBasedMatchmakerViewController
  - Game list
  - Invitations
  - Auto-matching

GKTurnBasedMatch

GameKit

Turn-based classes continues

- GKTurnBasedEventHandler
  - Routes events to delegate
  - Invitations
  - New turn
  - Game ended
- GKTurnBasedParticipant
  - Represents a seat at the table
  - Player state
  - Game outcome (won, lost, tied)

GKTurnBasedParticipant

Turn-Based Multiplayer

Taking a turn

```objectivec
GKTurnBasedMatch *match = [self currentMatch];
```

```objectivec
// get the current game state
NSData *gameData = [self currentGameDataForMatch: match];


// determine who's turn is next
GKTurnBasedPartipant *nextParticipant = [self nextParticipantForMatch:match];
```

```objectivec
[match endTurnWithNextParticipant:nextParticipant
                        matchData:gameData
                completionHandler:^(NSError *error) {
    if (error) {
        // handle error
    }
}];
```

Game Center Services

Game Center Services
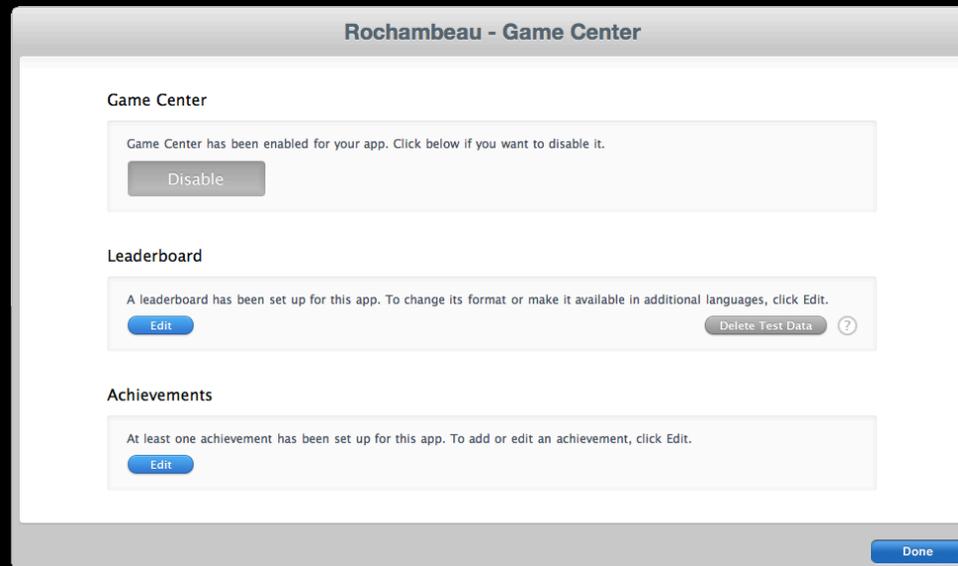
Game Center Servers
iTunes Connect

- Enable your game to use Game Center
- Add leaderboards
- Add achievements
- Specify multiplayer version compatibility

iTunes Connect
Enable Game Center

iTunes Connect
Add leaderboard

iTunes Connect
Add achievement

Game Center "Sandbox"
Which environment

- Games in development use the Sandbox
  - Development builds
  - Simulator builds
  - Ad hoc builds
- Games from the App Store use the production server
  - Can test backward compatibility in Sandbox

Sign in to Game Center

*** Sandbox ***

Use Existing Account

Create New Account

Cancel

Game Center "Sandbox"
Prerelease test environment

- For testing your app with Game Center
  - Duplicates production Game Center functionality
  - Same iTunes Connect metadata
  - Separate Game Center servers
  - Separate players

Game Center "Sandbox"

Accounts

- Single AppleID for Sandbox and production
- Separate players for Sandbox and production
- Tip: choose different nicknames
  - "Apollo" in production
  - "Apollo-sandbox" in Sandbox

Game Center "Sandbox"
Switching

- Switching to Sandbox
  - Automatic during authentication
  - Only when required
- Switching out of Sandbox
  - Manual process
  - Log out with Game Center app
  - Log in or
  - Launch game and log in

Submitting to the App Store
Production

Game Center	Enabled for This Version

- Verify bundle identifier and version
- Submit game to App Store
- Metadata sent to production environment
- Leaderboard changes are restricted
    - Can't remove leaderboards
    - Can't change sort order

Summary

Summary
Becoming a Game Center game

Prerequisites

Enabled in iTunes Connect

Player Authentication

Features

Leaderboards

Achievements

Multiplayer

Summary
New features for iOS 5

- Turn-based gaming

- Custom invite sounds

- Add players to in-progress matches

- App Store ratings in game

- Game recommendations

- Friend recommendations

- Achievement leaderboards

- Player photos

- More!

Summary

- Easy ways to enhance social gameplay
  - Leaderboards
  - Achievements
  - Multiplayer invites and auto-matching
- Discovery through Game Center
  - Friends' games
  - Game recommendations
  - Multiplayer invitations
  - Top games on iPad

Related Sessions

Working with Game Center	Mission Wednesday 9:00 AM
Multiplayer Gaming with Game Center	Mission Wednesday 10:15 AM
Turn-Based Gaming with Game Center	Mission Wednesday 11:30 AM
Introduction to Game Center (Repeat)	Russian Hill Friday 9:00 AM

Labs

Game Center Lab	Graphics, Media & Games Lab A Wednesday 2:00PM
Game Center Lab	Graphics, Media & Games Lab A Friday 11:30AM

More Information

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