Apple Inc.

Apple iOS 16: iPhones and Apple iPadOS 16: iPads Common Criteria Configuration Guide

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1 Revision History

Version	Date	Change
0.1	2022-11-04	Initial.
0.2	2023-06-08	Updates made to bring guide in line with ST v0.07.
0.3	2023-08-30	Updated VPN audit records. Remove A9X
0.4	2023-09-02	Address comments

2 Trademarks

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3 Introduction

This document is written for administrators and users of Apple mobile devices that are managed using a mobile device management (MDM) solution. The “Apple iOS 16: iPhones Security Target” [IOS_ST] and “Apple iPadOS 16: iPads Security Target” [IPADOS_ST] include security functional specifications for Wi-Fi, Bluetooth, and virtual private network (VPN) capabilities. This configuration guide applies to both NIAP certifications VID11349 (Apple iOS 16: iPhones) and VID11350 (Apple iPadOS 16: iPads). Where applicable, this guide points out the differences between iPhones and iPads.

The evaluated software versions are the following.

- iOS 16.3
- iPadOS 16.3

According to the [IOS_ST] and the [IPADOS_ST], the evaluated devices are a series of Apple iPhone and iPad mobile devices running the evaluated iOS and iPadOS operating system versions stated above, respectively. The operating systems manage the mobile device hardware, provide mobile device agent functionality, and provide the technologies required to implement native applications (apps). The operating systems provide a built-in MDM application programming interface (API), giving management features that may be utilized by external MDM solutions and allowing enterprises to use Configuration Profiles to control some of the mobile device settings. The devices provide a consistent set of capabilities allowing for supervision. These capabilities include the preparation of devices for deployment, the subsequent management of the devices, and the termination of management. Some of the Configuration Profiles detailed in this configuration guide are listed in Appendix A: Configuration Profiles.

The devices are expected to be part of an MDM solution that enables the enterprise to control and administer all devices that are part of the enterprise MDM solution.

The devices do not contain any preinstalled third-party apps. The devices do include controls that limit the behavior of installed apps—third-party and other types.

For the user, the operating systems support end users by providing facilities for connectivity using the Wireless LAN radio client and functionality for the management of the Wi-Fi interface. Additionally, the operating systems support end users in an enterprise setting by providing always-on connectivity via an IPsec VPN tunnel to provide secure, reliable access to enterprise assets.

For clarity, the following conventions will be used throughout this document.

- Keys: This document will specify keys or attributes found in Configuration Profiles that will need to be set to certain values to configure the mobile devices into the evaluated configuration. When a key is mentioned, it will be written in italics: *AlwaysOn*.
- GUI navigation: There are certain configurations or values that can be viewed by navigating to it on the mobile device itself. When instructions for these are mentioned, it will be written in the following font: *Settings » Siri & Search*
- Document sections: In the referenced Apple documentation, the navigation to relevant sections is indicated as: “Hardware Security and Biometrics” → “Touch ID and Face ID”

3.1 Purpose

This document is intended to provide information for the secure installation and use of the Target of Evaluation (TOE) for the Common Criteria (CC) evaluated configuration of the mobile devices. The TOE is the mobile devices specified in Table 2 and Table 3. Readers of this document may use the term "mobile device" synonymously with the term "TOE." This guidance is based on the CC requirements and the requirements given in the following documents:

- Protection Profile for Mobile Device Fundamentals, Version 3.3, dated 2022-09-12 [PP_MDF_V3.3] with:
    - PP-Module for MDM Agents, Version 1.0, dated 2019-04-25 [MOD_MDM_AGENT_V1.0]
    - PP-Module for Bluetooth, Version 1.0, dated 2021-04-15 [MOD_BT_V1.0]
    - collaborative PP-Module for Biometric enrollment and verification – for unlocking the device, Version 1.1, 2022-09-12 [MOD_CPP_BIO_V1.1]
    - PP-Module for Virtual Private Network (VPN) Clients, Version 2.4, dated 2022-03-31 [MOD_VPNC_V2.4]
    - PP-Module for Wireless Local Area Network (WLAN) Clients, Version 1.0, dated 2022-03-31 [MOD_WLANC_V1.0]
    - Functional Package for Transport Layer Security (TLS), Version 1.1, dated 2019-03-01 [PKG_TLS_V1.1]

3.2 TOE Security Functionality

In the evaluated configuration, the mobile devices provide the following security functionality.

- Security audit
- Cryptographic support
- User data protection
- Identification and authentication
- Security management
- Protection of the TOE Security Functionality (TSF)
- TOE access
- Trusted path/channels

3.3 Supporting Apple Documentation

This document provides clarifications to the Apple documentation as related to configuring the mobile devices into the evaluated configuration. Because the purpose of this document is to configure and maintain the mobile devices as per the evaluated configuration, there may be conflicts in the configuration recommendations and usages between this document and other Apple documentation. In such cases, this document has precedence over other Apple documentation. The official Apple documentation should be referred to and followed only as directed within this document. Table 1: Guidance Documents lists the guidance documents relevant to the configuration and operation of the mobile devices.

Table 1: Guidance Documents

Reference	Document Name	Location
Mobile Device Administrator Guidance		
[CCGUIDE]	Apple iOS 16: iPhones and Apple iPadOS 16: iPads Common Criteria Configuration Guide **(This document)**	https://www.niap-ccevs.org/MMO/Product/st_vid11349-agd.pdf https://www.niap-ccevs.org/MMO/Product/st_vid11350-agd.pdf
[DEV_MAN]	Device Management (online)	https://developer.apple.com/documentation/devicemanagement
Mobile Device User Guidance		
[iPhone_UG]	iPhone User Guide for iOS 16.3 (2022) (This version is no longer available, but screenshots exist in section 11.)	The latest iPhone User Guide: https://support.apple.com/guide/iphone/welcome/ios
[iPad_UG]	iPad User Guide for iPadOS 16.3 (2022) (This version is no longer available, but screenshots exist in section 11.)	The latest iPad User Guide: https://support.apple.com/guide/ipad/welcome/ipados
[PASSCODE_Help] (March 28, 2022)	Use a passcode with your iPhone, iPad, or iPod touch	https://support.apple.com/en-us/HT204060 International: https://support.apple.com/HT204060
[BLUETOOTH_HELP] (November 19, 2021)	Pair a third-party Bluetooth accessory with your iPhone, iPad, or iPod touch	https://support.apple.com/en-us/HT204091 International: https://support.apple.com/HT204091
Mobile Device Management		
[AConfig]	Apple Configurator 2 User Guide (online)	https://support.apple.com/guide/apple-configurator-2/welcome/mac
[ABM_Guide] (April 27, 2022)	Apple Business Manager User Guide	https://support.apple.com/guide/apple-business-manager/welcome/web

Reference	Document Name	Location
[PM_Help]	Profile Manager User Guide for macOS Monterey	https://support.apple.com/guide/profile-manager/welcome/mac
Supporting Documents		
[DeployRef] (June 2023)	Apple Platform Deployment	https://support.apple.com/guide/deployment/welcome/web
[LOGGING]	Logging	https://developer.apple.com/documentation/os/logging?language=objc
[PROFS_LOGS]	Profiles and Logs (Applies to both iOS and iPadOS)	https://developer.apple.com/bug-reporting/profiles-and-logs/?platforms=ios
[TRUST_STORE] (December 2, 2022)	List of available trusted root certificates in iOS 16, iPadOS 16, macOS 13, tvOS 16, and watchOS 9	https://support.apple.com/en-us/HT213464 International: https://support.apple.com/HT213464
[MANAGE_CARDS] (November 28, 2022)	Change or remove the payment cards that you use with Apple Pay	https://support.apple.com/en-us/HT205583 International: https://support.apple.com/HT205583
[PAY_SETUP] (April 19, 2023)	Set up Apple Pay	https://support.apple.com/en-us/HT204506 International: https://support.apple.com/HT204506
[CONTENT-CACHING]	Set up content caching on Mac	https://support.apple.com/guide/mac-help/set-up-content-caching-on-mac-mchl3b6c3720/13.0/mac/13.0
[APFS_DOC]	File system formats available in Disk Utility on Mac	https://support.apple.com/en-euro/guide/disk-utility/dsku19ed921c/22.0/mac/13.0
App Developer Guidance		
[CKTSREF]	Certificate, Key, and Trust Services	https://developer.apple.com/documentation/security/certificate_key_and_trust_services
[KEYCHAINPG]	Keychain Services (Programming Guide)	https://developer.apple.com/documentation/security/keychain_services
[AP_SEC] (May 2022)	Apple Platform Security	https://help.apple.com/pdf/security/en_US/apple-platform-security-guide.pdf

Reference	Document Name	Location
[APFS_DEV_DOC]	About Apple File System	https://developer.apple.com/documentation/foundation/file_system/about_apple_file_system
[CertPinning]	Identity Pinning: How to configure server certificates for your app	https://developer.apple.com/news/?id=g9ejcf8y

3.4 Evaluated Mobile Devices

Table 2 and Table 3 list the iPhone and iPad devices that are covered by the CC evaluation.

Table 2: Mobile Devices Covered by the Evaluation, lists the iPhones that are covered by the VID11349 evaluation.

Processor	Device Name	Model Number
iPhones		
A11 Bionic	iPhone 8	A1863
		A1906 (Japan)
		A1907
		A1905 (GSM)
	iPhone 8 Plus	A1864
		A1898 (Japan)
		A1899
		A1897 (GSM)
	iPhone X	A1865 (Japan)
		A1902 (Japan)
		A1901
A12 Bionic	iPhone XS	A1920 (US/CA/HK)
		A2097
		A2098 (Japan)
		A2099 (Global)
		A2100 (China)
	iPhone XS Max	A1921 (US/CA)
		A2101 (Global)
		A2102 (Japan)
		A2104 (China/HK)
	iPhone XR	A1984 (US/CA)
		A2105 (Global)

Processor	Device Name	Model Number
		A2106 (Japan)
		A2107 (US/CA)
		A2108 (HK/China)
A13 Bionic	iPhone 11	A2111
		A2221
		A2223
	iPhone 11 Pro	A2160
		A2215
		A2217
	iPhone 11 Pro Max	A2161
		A2218
		A2220
	iPhone SE (2nd gen)	A2275 (US/CA)
		A2298 (China)
		A2296 (Global)
A14 Bionic	iPhone 12 mini	A2176
		A2398
		A2399
		A2400
	iPhone 12	A2172
		A2402
		A2403
		A2404
	iPhone 12 Pro	A2341
		A2406
		A2407
		A2408
	iPhone 12 Pro Max	A2342
		A2410
		A2411
		A2412
A15 Bionic	iPhone 13 mini	A2481
		A2626
		A2628
		A2629
		A2630

Processor	Device Name	Model Number
	iPhone 13	A2482
		A2631
		A2633
		A2634
		A2635
	iPhone 13 Pro	A2483
		A2636
		A2638
		A2639
		A2640
	iPhone 13 Pro Max	A2484
		A2641
		A2643
		A2644
		A2645
	iPhone SE (3rd gen)	A2595
		A2782
		A2783
		A2785
	iPhone 14	A2649
		A2881
		A2882
		A2883
		A2884
	iPhone 14 Plus	A2632
		A2885
		A2886
		A2887
		A2888
A16 Bionic	iPhone 14 Pro	A2650
		A2889
		A2890
		A2891
		A2892
	iPhone 14 Pro Max	A2651
		A2893
		A2894

Processor	Device Name	Model Number
		A2895
		A2896

Table 3: Mobile Devices Covered by the Evaluation, lists the iPads that are covered by the VID11350 evaluation.

Processor	Device Name	Model Number
iPads		
A9	iPad 9.7-inch (5th gen)	A1822
		A1823
A10 Fusion	iPad 9.7-inch (6th gen)	A1893
		A1954
	iPad 10.2-inch (7th gen)	A2197
		A2199
		A2200
		A2198 (Hong Kong)
A10X Fusion	iPad Pro 12.9-inch (2nd gen)	A1670
		A1671
		A1821 (China)
	iPad Pro 10.5-inch	A1701
		A1709
		A1852 (China)
A12 Bionic	iPad mini (5th gen)	A2133
		A2125 (China)
		A2124
		A2126
	iPad Air 10.5-inch (3rd gen)	A2152
		A2154 (China)
		A2123
		A2153
	iPad 10.2-inch (8th gen)	A2270
		A2428
		A2429
		A2430 (China)
A12X Bionic	iPad Pro 11-inch	A1934 (US/CA)
		A1979 (China)
		A1980
		A2013 (US/CA)
	iPad Pro 12.9 inch (3rd gen)	A2014 (US/CA)
		A1876
		A1895

		A1983 (China)
A12Z Bionic	iPad Pro 11-inch (2nd gen)	A2228
		A2231 (China)
		A2230
		A2068
	iPad Pro 12.9-inch (4th gen)	A2229
		A2069
		A2232
		A2233 (China)
A13 Bionic	iPad 10.2-inch (9th gen)	A2602
		A2603
		A2604
		A2605
A14 Bionic	iPad Air (4th gen)	A2316
		A2324 (US/CA)
		A2072 (Global)
		A2325 (China)
	iPad (10th gen)	A2696
		A2757
A15 Bionic	iPad mini (6th gen)	A2567
		A2568
		A2569
M1	iPad Pro 11-inch (3rd gen)	A2301
		A2377
		A2460
	iPad Pro 12.9-inch (5th gen)	A2378
		A2379
		A2461
		A2462
	iPad Air (5th gen)	A2588
		A2589
		A2591
M2	iPad Pro 11-inch (4th gen)	A2435
		A2759
		A2761
		A2762
	iPad Pro 12.9-inch (6th gen)	A2436
		A2437
		A2766

3.5 Assumptions

The following assumptions apply when operating the mobile devices in the evaluated configuration. These assumptions must be valid within the organization to maintain security of the mobile devices.

3.5.1 Administrators

- One or more competent, trusted personnel who are not careless, willfully negligent, or hostile are assigned and authorized as the mobile device administrators and do so using and abiding by guidance documentation.
- Device administrators are trusted to follow and apply all administrator guidance in a trusted manner.
- Personnel configuring the mobile device and its operational environment will follow the applicable security configuration guidance.
- Device administrators will configure the mobile device's security functions correctly to create the intended security policy.

3.5.2 Mobile device users

- Mobile device users are not willfully negligent or hostile and use the mobile device within compliance of a reasonable enterprise security policy.
- The mobile device user exercises precautions to reduce the risk of loss or theft of the mobile device.
- The mobile device user will immediately notify the administrator if the mobile device is lost or stolen.
- Physical security, commensurate with the value of the mobile device and the data it contains, is assumed to be provided by the environment.

3.5.3 Network

- The mobile device relies on network connectivity to carry out its management activities. The mobile device will robustly handle instances when connectivity is unavailable or unreliable.
- Information cannot flow between the wireless client and the internal wired network without passing through the TOE.
- Information cannot flow onto the network to which the VPN client's host is connected without passing through the device.

3.5.4 Other

- The MDM Agent relies upon mobile platform and hardware evaluated against the [PP_MDF_V3.3] and assured to provide policy enforcement as well as cryptographic services and data protection. The mobile device platform provides trusted updates and software integrity verification of the MDM Agent.

3.6 Organizational Security Policies

The following requirements are for policies that must be implemented by the deploying organization in support of meeting the security requirements of the [IOS_ST] and the [IPADOS_ST].

- The mobile device administrators must adhere to the organizational security policies.
- The mobile device must be supervised using an MDM solution prior to connecting to the network.
- The mobile device user is held accountable for their actions while using the device.
- The mobile device user must promptly report their lost or stolen device to the mobile device administrator. The mobile device administrator must take appropriate actions using the MDM solution used to manage the mobile device.

3.7 Security Functional Requirements (SFRs) in the STs requiring configuration

In the evaluated configuration, the devices address each SFR in the following table. Table 4: SFR Configuration Requirements identifies each SFR specified in the Security Targets [IOS_ST] and [IPADOS_ST] and provides references to sections within this document for information on the function in the "Related Section" column. The "Configurable?" column denotes if the function needs to or can be configured.

Table 4: SFR Configuration Requirements

SFR ID	Function Description	Configurable?	Related Section
FAU_ALT_EXT.2	Agent Alerts	No	Section 4.3.5
FAU_GEN.1	Audit Data Generation	Yes	Section 6.1
FAU_GEN.1(2)	Audit Data Generation	Yes	Section 6.1
FAU_GEN.1/BT	Audit Data Generation (Bluetooth)	Yes	Section 6.1
FAU_GEN.1/VPN	Audit Data Generation (Virtual Private Network)	Yes	Section 6.1
FAU_GEN.1/WLAN	Audit Data Generation (Wireless LAN)	Yes	Section 6.1
FAU_SAR.1	Audit Review	Yes	Section 6.1
FAU_SEL.1(2)	Security Audit Event Selection	Yes	Section 6.2, Section 6.3

SFR ID	Function Description	Configurable?	Related Section
FAU_STG.1	Audit Storage Protection	No: Audit records are not accessible to device Administrators or Users and must be viewed on a trusted workstation or MDM server.	Section 6.2
FAU_STG.4	Prevention of Audit Data Loss	No: The default behavior is to overwrite the oldest entry.	Section 6.2
FCS_CKM.1	Cryptographic Key Generation	No: The API allows specification of the requested key sizes and key types.	Section 5.2.1
FCS_CKM.1/VPN	VPN Cryptographic Key Generation (IKE)	No: IKEv2 is an available option. The API allows for the specification of the key size and key types.	Section 5.3.6
FCS_CKM.1/WPA	Cryptographic Key Generation (Symmetric Keys for WPA/WPA3 Connections)	No: Wi-Fi Protected (WPA) keys are generated for the cipher suite offered by the access point.	Section 5.3.6
FCS_CKM.2/UNLOCKED	Cryptographic Key Establishment	No: The API allows specification of the requested key sizes and key types.	Section 5.2.2
FCS_CKM.2/LOCKED	Cryptographic Key Establishment (While device is locked)	No: Key establishment is hard coded.	Section 5.2.2
FCS_CKM.2/WLAN	WLAN Cryptographic Key Distribution (Group Temporal Key for WLAN)	No: The WLAN protocol is implemented according to IEEE 802.11 2012.	N/A

SFR ID	Function Description	Configurable?	Related Section
FCS_CKM_EXT.1	Cryptographic Key Support	No: REK is permanently etched in silicon and is both unmodifiable as well as inaccessible by iOS/iPadOS and apps.	N/A
FCS_CKM_EXT.2	Cryptographic Key Random Generation	No: Generation and maintenance of DEK are hard coded.	N/A
FCS_CKM_EXT.3	Cryptographic Key Generation	No: Generation and maintenance of KEK are hard coded.	N/A
FCS_CKM_EXT.4	Key Destruction	No: Zeroization of keys is hard coded.	N/A
FCS_CKM_EXT.5	TSF Wipe	Yes	Section 5.4.1 – How to enable encryption. Section 5.4.3 – How to wipe the device.
FCS_CKM_EXT.6	Salt Generation	No: Generation and maintenance of Salt are hard coded.	N/A
FCS_CKM_EXT.7	Cryptographic Key Support (REK)	No: REK is permanently etched in silicon and is both unmodifiable as well as inaccessible by iOS/iPadOS and apps.	N/A
FCS_CKM_EXT.8	Bluetooth Key Generation	No: ECDH key pairs are generated for each new connection attempt.	N/A
FCS_COP.1/ENCRYPT	Cryptographic Operation	No: For AES operations performed by the TSF. No: For AES operations performed by a third party where the API allows specification of the AES cipher type	Section 5.2.6

SFR ID	Function Description	Configurable?	Related Section
FCS_COP.1/HASH	Cryptographic Operation	No: For hash operations performed by the TSF for TLS. Yes: For hash operations performed for VPN No: For hash operations performed by a third party where the API allows specification of the hash cipher type.	Section 5.2.3
FCS_COP.1/SIGN	Cryptographic Operation	No: For signature operations performed by TSF. No: For signature operations performed by a third party where the API allows specification of the hash cipher type.	Section 5.2.1
FCS_COP.1/KEYHMAC	Cryptographic Operation	No: For HMAC operations performed by TSF No: For HMAC operations performed by a third party where the API allows specification of the hash cipher type.	Section 5.2.3
FCS_COP.1/CONDITION	Cryptographic Operation	No: Generation and maintenance of PBKDF are hard coded.	N/A

SFR ID	Function Description	Configurable?	Related Section
FCS_HTTPS_EXT.1	HTTPS protocol	No: The used HTTPS cipher suite is defined by the HTTPS server where all cipher suites listed in the [IOS_ST] and the [IPADOS_ST] are always available.	Section 5.3.2
FCS_IPSEC_EXT.1	IPsec	Yes	Section 5.3.5, Section 5.3.3
FCS_IV_EXT.1	Initialization Vector Generation	No: Generation and maintenance of IVs are hard coded.	N/A
FCS_RBG_EXT.1/HW	Random Bit Generation (Hardware)	No: Generation of random numbers is hard coded.	Section 5.2.4
FCS_RBG_EXT.1/SW	Random Bit Generation (Software)	No: Generation of random numbers is hard coded.	Section 5.2.4
FCS_SRV_EXT.1	Cryptographic Algorithm Services	No	Section 5.2
FCS_STG_EXT.1	Cryptographic Key Storage	No	Section 5.6.13
FCS_STG_EXT.2	Encrypted Cryptographic Key Storage	No: Generation and maintenance of DEK and KEK are hard coded.	N/A
FCS_STG_EXT.3	Integrity of Encrypted Key Storage	No: Generation and maintenance of DEK and KEK are hard coded.	N/A
FCS_STG_EXT.4	Cryptographic Key Storage	No	N/A
FCS_TLS_EXT.1	TLS Protocol	Yes	Section 5.3.2
FCS_TLSC_EXT.1	TLS Client Protocol	Yes	Section 5.3.2

SFR ID	Function Description	Configurable?	Related Section
FCS_TLSC_EXT.1/WLAN	TLS Client Protocol (EAP-TLS for WLAN)	No: Used TLS cipher suites are defined by the TLS server where all cipher suites listed in the [IOS_ST] and the [IPADOS_ST] are always available. The API of the third-party application defines specific TLS protocol rules.	Section 5.3.1
FCS_TLSC_EXT.2	TLS Client Support for Mutual Authentication	No	Section 5.3.2
FCS_TLSC_EXT.4	TLS Client Support for Renegotiation	No	N/A
FCS_TLSC_EXT.5	TLS Client Support for Supported Groups Extension	No	N/A
FCS_WPA_EXT.1	Supported WPA Versions	No	
FDP_ACF_EXT.1	Access Control for System Services	No: Access control settings are hard coded.	N/A
FDP_ACF_EXT.2	Access Control for System Resources	No	N/A
FDP_DAR_EXT.1	Protected Data Encryption	No: Data is always encrypted. TSF is hard coded to use the appropriate data protection levels based on classes. External storage must be formatted in the AFPS format with encrypted volumes. Unencrypted external storage is not allowed in the evaluated configuration.	Section 5.4

SFR ID	Function Description	Configurable?	Related Section
FDP_DAR_EXT.2	Sensitive Data Encryption	No: Data is always encrypted. TSF is hard coded to use the appropriate data protection level based on classes. External storage must be formatted in the AFPS format with encrypted volumes. Unencrypted external storage is not allowed in the evaluated configuration.	Section 5.4
FDP_IFC_EXT.1	Subset Information Flow Control	Yes	Section 5.3.5, Section 5.3.3
FDP_RIP.2	Full Residual Information Protection	No	N/A
FDP_STG_EXT.1	User Data Storage	No: The trust anchor database maintenance is hard coded. The mobile device administrator can add/remove their own Anchors of Trust to/from that database.	Section 5.5.6
FDP_UPC_EXT.1/APPS	Inter-TSF User Data Transfer Protection (Applications)	Yes: Depending on the protocol used, configuration is possible (e.g., IPsec) while other options are not configurable	FTP_ITC_EXT.1 (Section 5.3) FCS_TLSC_EXT.1 (Section 5.3.2) FCS_IPSEC_EXT.1 (Section 5.3.5) FCS_HTTPS_EXT.1 (Section 5.3.2)
FDP_UPC_EXT.1/BLUETOOTH	Inter-TSF User Data Transfer Protection (Bluetooth)	No: Only enabling/disabling of Bluetooth is supported.	Section 5.3.4
FDP_VPN_EXT.1	Split Tunnel Prevention	Yes	Section 5.3.5
FIA_AFL_EXT.1	Authentication Failure Handling	Yes	Section 5.5.4

SFR ID	Function Description	Configurable?	Related Section
FIA_BLT_EXT.1	Bluetooth User Authorization	No: The Bluetooth protocol allows different types of authorization that are supported by the mobile device. The used authorization type depends on the remote device capability.	Section 5.3.4
FIA_BLT_EXT.2	Bluetooth Mutual Authentication	No: Bluetooth mutual authentication is required prior to data transfer.	Section 5.3.4
FIA_BLT_EXT.3	Rejection of Duplicate Bluetooth Connections	No: No mobile device can establish duplicate Bluetooth connections.	N/A
FIA_BLT_EXT.4	Secure Simple Pairing	No: Secure simple pairing cannot be disabled.	Section 5.3.4
FIA_BLT_EXT.6	Trusted Bluetooth Device User Authorization	No	N/A
FIA_BLT_EXT.7	Untrusted Bluetooth Device User Authorization	No	N/A
FIA_ENR_EXT.2	Agent Enrollment of Mobile Device into Management	Yes	Section 4.3.14.3.3
FIA_MBE_EXT.1	Biometric enrollment	No	Section 5.5.3
FIA_MBE_EXT.2	Quality of biometric templates for biometric enrolment	No	Section 5.5.3
FIA_MBV_EXT.1	Biometric verification	No	Section 5.5.3
FIA_MBV_EXT.2	Quality of biometric samples for biometric verification	No	Section 5.5.3

SFR ID	Function Description	Configurable?	Related Section
FIA_PAE_EXT.1	Port Access Entity (PAE) Authentication	No: The WLAN protocol is implemented according to IEEE 802.11 2012.	N/A
FIA_PMG_EXT.1	Password Management	Yes	Section 5.5.1
FIA_TRT_EXT.1	Authentication Throttling	No: The authentication delay is hard coded.	N/A
FIA_UAU.5	Multiple Authentication Mechanisms	Yes	Section 5.5
FIA_UAU.6/CREDENTIAL	Re-Authenticating (Credential Change)	No: Users must be re-authenticated before any changes to the password authentication factor can be made.	Section 5.5.5
FIA_UAU.6/LOCKED	Re-Authenticating (TSF Lock)	No	Section 5.5.5
FIA_UAU.7	Protected Authentication Feedback	No: Enabled by default.	Section 5.5.2
FIA_UAU_EXT.1	Authentication for Cryptographic Operation	Yes: The mobile device user must set a passphrase to enable authentication token protection.	Section 5.5.1
FIA_UAU_EXT.2	Timing of Authentication	No	Section 5.6.2
FIA_X509_EXT.1	X.509 Validation of Certificates	No: The certificate validation rules are hard coded.	N/A
FIA_X509_EXT.1/WLAN	X509 Certificate Validation	Yes	Section 5.3, Section 5.5.6

SFR ID	Function Description	Configurable?	Related Section
FIA_X509_EXT.2	X509 Certificate Authentication	Yes: The certificates required for authentication must be provided. Note that some root certificates are provided in the Apple Trust store.	Section 5.3, 5.5.6
FIA_X509_EXT.2/WLAN	X509 Certificate Authentication (EAP-TLS for WLAN)	Yes	Section 5.5.6
FIA_X509_EXT.3	Request Validation of Certificates	No: The API is provided with certificate validation rules hard coded.	Section 5.5.6
FIA_X509_EXT.6	Certificate Storage Management	No	Section 5.5.6
FMT_MOF_EXT.1	Management of Security Functions Behavior	Yes	Section 3.8
FMT_POL_EXT.2	Agent Trusted Policy Update	No	N/A
FMT_SMF.1	Specification of Management Functions	Yes	Section 3.8
FMT_SMF.1/VPN	Specification of Management Functions (VPN)	Yes	Section 3.8
FMT_SMF.1/WLAN	Specification of Management Functions (WLAN Client)	Yes	Section 3.8
FMT_SMF_EXT.1/BT	Specification of Management Functions	Yes	Section 3.8
FMT_SMF_EXT.2	Specification of Remediation Actions	Yes	Section 4.3.4, 5.4.3
FMT_SMF_EXT.4	Specification of Management Functions	No	N/A

SFR ID	Function Description	Configurable?	Related Section
FMT_UNR_EXT.1	User Unenrollment Prevention	Yes	Section 4.3.4
FPT_AEX_EXT.1	Application of Address Space Layout Randomization (ASLR)	No: The service is hard coded.	N/A
FPT_AEX_EXT.2	Memory Page Permissions	No: The service is hard coded.	N/A
FPT_AEX_EXT.3	Stack Overflow Protection	No: The service is hard coded.	N/A
FPT_AEX_EXT.4	Domain Isolation	No: The service is hard coded.	N/A
FPT_BDP_EXT.1	Biometric data processing	No: The service is hard coded.	N/A
FPT_JTA_EXT.1	JTAG Disablement	No: JTAG interfaces are not present on iOS/iPadOS devices.	N/A
FPT_KST_EXT.1	Key Storage	No: Keys are stored in secure enclave or in key chain. Wrapped keys are stored in Effaceable Storage.	N/A
FPT_KST_EXT.2	No Key Transmission	No: Keys are stored in secure enclave or in key chain.	N/A
FPT_KST_EXT.3	No Plaintext Key Export	No: Keys are stored in secure enclave, which does not provide key export facility. The mobile device does not export keys stored in key chain.	N/A
FPT_NOT_EXT.1	Self-Test Notification	No	N/A
FPT_PBT_EXT.1	Protection of Biometric Template	No	N/A
FPT_STM.1	Reliable Time Stamps	Yes	Section 5.6.4

SFR ID	Function Description	Configurable?	Related Section
FPT_TST_EXT.1	TSF Cryptographic Functionality Testing	No	Section 5.2
FPT_TST_EXT.1/VPN	TSF Self-Test	No	Section 5.2
FPT_TST_EXT.2/PREKERNEL	TSF Integrity Checking (Pre-Kernel)	No	N/A
FPT_TST_EXT.2/POSTKERNEL	TSF Integrity Checking (Post-Kernel)	No	N/A
FPT_TST_EXT.3	TSF Integrity Testing	No	Section 5.5.6
FPT_TST_EXT.3/WLAN	TSF Cryptographic Functionality Testing (WLAN Client)	No	Section 5.2
FPT_TUD_EXT.1	TSF Version Query	No	N/A
FPT_TUD_EXT.2	TSF Update Verification	No	N/A
FPT_TUD_EXT.3	Application Signing	No	Section 5.6.10
FPT_TUD_EXT.4	Trusted Update Verification	No	Section 5.6.10
FPT_TUD_EXT.5	Application Verification	No	Section 5.6.10
FPT_TUD_EXT.6	Trusted Update Verification	No	N/A
FTA_SSL_EXT.1	TSF- and User-initiated Locked State	Yes	Section 5.6.3
FTA_TAB.1	Default TOE Access Banners	Yes	Section 5.6.5
FTA_WSE_EXT.1	Wireless Network Access	Yes	Section 5.6.7
FTP_BLT_EXT.1	Bluetooth Encryption	No: Enforced by default.	Section 5.3.4
FTP_BLT_EXT.2	Persistence of Bluetooth Encryption	No	Section 5.3.4

SFR ID	Function Description	Configurable?	Related Section
FTP_BLT_EXT.3/BR	Bluetooth Encryption Parameters (BR/EDR)	No	Section 5.3.4
FTP_BLT_EXT.3/LE	Bluetooth Encryption Parameters (LE)	No	Section 5.3.4
FTP_ITC.1/WLAN	Trusted Channel Communication (Wireless LAN)	Yes	Section 5.3
FTP_ITC_EXT.1	Trusted Channel Communication	Yes	Section 5.3
FTP_ITC_EXT.1(2)	Trusted Channel Communication	Yes	Section 5.3
FTP_TRP.1(2)	Trusted Path (for Enrollment)	Yes	Section 5.3

3.8 Security Management Configuration

In the evaluated configuration, the mobile devices perform the management functions listed in Table 5: Required Mobile Device Management Functions.

These management functions can be managed either by the mobile device user or by an authorized mobile device administrator (marked by ‘X’).

In addition, the Provided Guidance column references the section(s) in this document where guidance can be found to perform the respective management function. The management function values in parenthesis (e.g., F1, F2) in the following table correspond to the function values specified in the [IOS_ST] and the [IPADOS_ST] Table 15 plus the additional management functions specific to Bluetooth, Wi-Fi, and VPN management functionality also specified in the [IOS_ST] and the [IPADOS_ST].

Table 5: Required Mobile Device Management Functions

Management Function	Restricted to the User	Administrator	Restricted to the Administrator	Provided Guidance
MDF (FMT_SMF.1)				
Configure password policy (F1)	-	X	X	Section 5.5.1
Configure session locking policy (F2)	-	X	X	Sections 5.6.3

Management Function	Restricted to the User	Administrator	Restricted to the Administrator	Provided Guidance
Enable/disable the VPN protection (F3)	-	X	-	Sections 5.3.5
Enable/disable Bluetooth, cellular, Wi-Fi radios, satellite, NFC, UWB[1] (F4)	-	X	-	Section 5.6.7
Enable/disable cameras (F5)	-	X	-	Section 5.6.6
Transition to the locked state (F6)	-	X	-	Section 5.6.3
TSF wipe of protected data (F7)	-	X	-	Section 5.4.3
Configure application installation policy by denying installation of applications (F8)	-	X	X	Section 5.6.12
Import keys or secrets into the secure key storage (F9)	-	X	-	Section 5.2.5
Destroy imported keys or secrets and no other keys/secrets in the secure key storage (F10)	-	X	-	Section 5.2.5
Import X.509v3 certificates in the Trust Anchor Database (F11)	-	X	X	Section 5.5.6

[1] Satellite, NFC, and UWB only apply to devices supporting these radios.

Management Function	Restricted to the User	Administrator	Restricted to the Administrator	Provided Guidance
Remove imported X509v3 certificates and no other X509v3 certificates in the Trust Anchor Database (F12)	-	X	-	Section 5.5.6
Enroll the TOE in management (F13)	X	-	-	Section 4.3.1
Remove applications (F14)	-	X	X	Section 5.6.1
Update system software (F15)	-	X	-	Section 5.6
Install applications (F16)	-	X	X	Section 5.6.1
Remove Enterprise applications (F17)	-	X	-	Section 5.6.1
Enable/disable display notification in the locked state of all notifications (F18)	-	X	-	Section 5.6.2
Enable data-at-rest protection (F19)	-	-	-	Section 5.4.1
Enable removable media’s data-at-rest protection (F20)	-	X	X	Section 5.4.1
Enable/disable location services (across device and on a per-app basis) (F21)	-	X	-	Section 5.6.8

Management Function	**Restricted to the User**	**Administrator**	**Restricted to the Administrator**	**Provided Guidance**
Enable/disable the use of Biometric Authentication Factor (F22)	-	X	X	Section 5.5.3
Configure whether to allow or disallow establishment of a TLS trusted channel if the peer or server certificate is deemed invalid. (F23)	X	-	-	Section 5.5.6.3
Wipe Enterprise data (F28)	-	X	-	Section 5.4.3
Configure whether to allow or disallow establishment of a trusted channel if the TSF cannot establish a connection to determine the validity of a certificate (F30)	-	X	-	Section 5.5.6
Read audit logs kept by the TSF (F32)		X	X	Section 6
Configure the unlock banner (F36)	-	X	X	Section 5.6.5
Configure the auditable items (F37)	-	X	-	Section 6.3
Unenroll the TOE from management *(mandated by MDF Use Case 3)* (F44)	-	X	-	Section 4.3.4
Enable/disable the Always On VPN protection (across device and no other method) *(mandated by VPN FMT_SMF.1)* (F45)	-	X	X	Section 5.3.5

Management Function	**Restricted to the User**	**Administrator**	**Restricted to the Administrator**	**Provided Guidance**
Enable/disable microphones on a per-app basis (F47)	-	X	-	Section 5.6.6
Bluetooth (FMT_SMF_EXT.1/BT)				
Configure the Bluetooth trusted channel. Disable/enable the Discoverable (for BR/EDR) and Advertising (for LE) modes (FBT-1)	X	-	-	Section 5.3.4
Wi-Fi (FMT_SMF.1/WLAN)				
Configure security policy for each wireless network: 1. Specify the CA(s) from which the TSF will accept WLAN authentication server certificates(s) 2. Specify Wi-Fi security type 3. Specify authentication protocol for Wi-Fi 4. Specify client credentials used for Wi-Fi authentication (WL-1)	-	X	X	Section 5.3.6
Specify wireless networks (SSIDs) to which the TSF may connect (WL-2)	-	X	X	Section 5.3.5.3

Management Function	Restricted to the User	Administrator	Restricted to the Administrator	Provided Guidance
Enable/disable wireless network bridging capability (for example, bridging a connection between the WLAN and cellular radios to function as a hotspot) authenticated by passcode (WL-3)	-	X	-	Section 5.6.7
Disable ad hoc wireless client-to-client connection capability (a.k.a. Apple AirDrop) (WL-5)	-	X	-	Section
Disable roaming capability (WL-6)	-	X	X	Section
Loading X.509 certificates into the TOE (WL-8)	-	X	X	Section 5.5.6
Revoke X.509 certificates loaded into the TOE (WL-9)	-	X	-	Section 5.5.6
VPN (FMT_SMF.1/VPN)				
Specify VPN gateways to use for connection	-	X	X	Section 5.3.6

3.9 Un-evaluated Functionalities

The following security functionalities were not evaluated and are, therefore, excluded from the secure configuration of the mobile devices.

3.9.1 Two-Factor Authentication

Two-factor authentication is an extra layer of security for an Apple ID used in the Apple store, iCloud, and other Apple services. It is designed to enhance the security on these online Apple accounts.

This feature is outside the scope of the evaluation.

3.9.2 Bonjour

Bonjour is Apple's standards-based, zero-configuration network protocol that lets devices find services on a network.

This feature is outside the scope of the evaluation.

3.9.3 VPN Split Tunnel

VPN split tunnel is not included in the evaluation and must be disabled in the mobile device configurations meeting the requirements of this CC evaluation.

While VPN split tunnel is not included, in the evaluated configuration, the VPN must be in its Always-On configuration. See section 5.3.5 VPN Configuration for more information.

3.9.4 Siri Interface

The Siri interface supports some commands related to configuration settings.

This feature is not included in the evaluation and must be disabled in the mobile device configurations that meet the requirements of this CC evaluation.

3.9.5 Shared iPad for education

Apple offers the ability to configure the iPad devices for multiple users. This configuration was not included in the evaluation and must not be used in the mobile device configurations that meet the requirements of this CC evaluation.

3.9.6 Third-party MDM Agents

Some third-party applications are available that provide functionality as a mobile device MDM Agent. No third-party MDM Agent applications were included in the evaluation and are outside the scope of the evaluated configuration.

3.9.7 VPN Protocols and Authentication Methods

The following Virtual Private Network (VPN) protocols are not included in the evaluation and must be disabled in the mobile device configurations that meet the requirements of this CC evaluation.

- Cisco IPsec
- Layer Two Tunneling Protocol (L2TP) over IPsec
- Secure Sockets Layer (SSL) VPN
- Shared secret authentication

3.9.8 Face ID with a Mask

Face unlock with a face mask was not included in the evaluation. The Face ID with a Mask setting must be disabled in the evaluated configuration. This setting is found in *Settings » Face ID & Passcode » Face ID with a Mask*.

4 Secure Delivery and Installation

4.1 Prerequisites

Prior to deploying the mobile device(s) onto the network, an MDM solution may be architected and deployed. The MDM solution will support the mobile device administrator in configuring and managing the mobile devices. There are various MDM solutions that can be used to achieve this.

A VPN gateway supporting IPsec and the necessary VPN settings discussed below must be architected and deployed. The VPN infrastructure will support secure communication with the devices. If the devices will be utilizing x509 certificates for authenticating to the VPN connection, then a public key infrastructure (PKI) system will need to be deployed by the organization which includes a certificate authority (CA) trusted both by the VPN gateway and the device, and an Online Certificate Status Protocol (OCSP) responder or published certificate revocation list (CRL) to service revocation checking requests.

4.2 Secure Delivery of the Devices

The evaluated mobile devices are intended for authorized mobile device users of entities such as business organizations and government agencies.

The mobile device administrator of the devices is responsible for performing the necessary configuration to ensure that the mobile devices are configured as specified by the evaluation.

4.2.1 Obtaining the mobile device(s)

To obtain a device listed in Table 2 and Table 3, follow the directions for the distribution channel that best fits your situation.

The normal distribution channels for obtaining these devices include the following.

- The Apple Store (either a physical store or online at https://apple.com)
- Apple retailers
- Service carriers (e.g., AT&T, Verizon)
- Resellers

Business-specific distribution channel

There is a distinct online store for Business customers with a link from the “Apple Store” to Apple and Business: (https://www.apple.com/business/). Additionally, the following link to “Shop for Business” is provided (https://www.apple.com/retail/business/).

Government-specific distribution channel

Government customers can use the link: https://www.apple.com/r/store/government/

Additional

Large customers can have their own Apple Store Catalog for their employees to purchase devices directly from Apple under their corporate employee purchase program.

4.2.2 Verifying the device(s)

When the mobile devices are received, the model number of the devices should be verified to ensure that the model number is one of those listed in Table 2 and Table 3. This can be accomplished using any of the following methods.

- Physically checking the back of the mobile devices.
- Once authenticated to the mobile device, the information is available to mobile device users in *Settings » General » About* under the "Model Number" entry.
- Mobile device administrators can query the mobile devices using the Mobile Device Management (MDM) protocol described in [DeployRef] under "MDM settings." The Results Payload from the mobile device provides the requested information.
- Also see the following Apple support webpages.
  a. https://support.apple.com/en-us/HT208200
  b. https://support.apple.com/en-us/HT201471

The iOS/iPadOS version of the devices, which must be a version of iOS/iPadOS 16, should also be verified. This can be accomplished using either of the following methods.

- A mobile device user can obtain information about the iOS/iPadOS software on the mobile device by following these instructions. (Sections 11.1 and 11.2 contain screenshots from these documents.)

  [iPhone_UG]: "Basics" → "Get information about your iPhone"

  [iPad_UG]: "Basics" → "Get information about your iPad"

- Mobile device administrators can query the mobile devices using the MDM protocol described in [DeployRef] under "MDM settings." The Results Payload from the mobile device provides the requested information.

4.3 Mobile Device Supervision and Configuration

In order to ensure that the devices are configured in a way that meets the requirements of this Common Criteria evaluation, the devices must be placed under supervised mode.

Once under supervised mode, the mobile devices are typically managed using an MDM solution. The process for doing this will vary based on the MDM solution chosen by the organization deploying the devices, and it is up to the mobile device administrator to determine the detailed steps as they apply to the organization's chosen MDM solution. The mobile devices are configured using Configuration Profiles that are specified by the mobile device administrator and deployed to the mobile devices.

4.3.1 Mobile Device Enrollment into Management Configuration

iOS/iPadOS natively includes an MDM agent. Mobile device users and/or device administrators can enroll the mobile device in management. Information for enrolling the mobile device is provided in the following document and section.

[DeployRef]: "MDM settings"

The MDM server identity is provided to the mobile device by sending an MDM payload in a Configuration Profile. Examples of Configuration Profiles can be found in Appendix A: Configuration Profiles.

The methods by which the mobile device can be enrolled for management are as follows.

- Using the Apple Business Manager (ABM), which provides an automated and enforced method of automatically enrolling new devices
- Using Apple's Profile Manager, which provides a manual method of enrolling mobile devices
- Using the Apple Configurator 2, which provides both automated and manual methods of enrolling mobile devices
- Using Email or a Website, which provides a way to distribute an enrollment profile to a mobile device

4.3.1.1 Apple Business Manager

For the Apple Business Manager (ABM), each MDM server must be registered with Apple at the ABM management portal, which is made available by Apple at https://business.apple.com.

The ABM provides details about the server entity to identify it uniquely throughout the organization deploying the MDM server. Each server can be identified by either its system-generated universally unique identifier (UUID) or by a user-provided name assigned by one of the organization's users. Both the UUID and server name must be unique within the organization.

The organization assigns iOS/iPadOS devices to Apple's virtual MDM server using either Apple order numbers or device serial numbers. When the iOS/iPadOS device is powered on, the mobile device will automatically connect to the virtual MDM server during setup and will be assigned to the MDM server specified in the MDM payload sent by the virtual MDM server to the iOS/iPadOS device.

During the mobile device enrollment, the MDM enrollment service returns a JavaScript Object Notation (JSON) dictionary to the mobile device with the keys shown in Table 6: Essential MDM Payload keys for the evaluated configuration.

Additional information on the ABM is provided in the [ABM_Guide]. Additional information on managing mobile devices is provided in [DeployRef] and [DEV_MAN].

4.3.1.2 Apple Profile Manager

For enrolling a device using Apple's Profile Manager, see the following document and section.

[PM_Help]:	"Mobile device management"

4.3.1.3 Apple Configurator

For enrolling a device using the Apple Configurator 2, see the following document and sections.

[AConfig]:	"Automated device management" → "Automated device configuration"
[AConfig]:	"Automated device management" → "Automated Device Enrollment"
[AConfig]:	"Manually prepare devices"

4.3.1.4 Other Methods

Other methods of enrollment may be specific to the MDM application being used by a deploying organization. In general, the Configuration Profile is made available to the mobile device often through a link provided on a website or by email to the mobile device user. Once the mobile device user clicks the link, the enrollment process is started.

4.3.2 Mobile Device Configuration

Many aspects of the security functionality of the mobile devices are configured using Configuration Profiles that are installed on the mobile devices. Configuration Profiles are Extensible Markup Language (XML) files that allow the distribution of configuration information to mobile devices. They may contain settings for several configurable parameters on the mobile device.

Configuration Profiles can be deployed in any one of the following ways.

- Using the Apple Configurator 2 tool, available from the Apple Store
- Via an email message
- Via a webpage
- Using over-the-air configuration
- Using over-the-air configuration via an MDM application

iOS/iPadOS supports using encryption to protect the contents of Configuration Profiles, and Configuration Profiles can also be signed to guarantee data integrity.

Within a Configuration Profile, various Keys are used to specify the desired configuration. These are organized by topic into groups called “Payloads.”

Detailed information on Configuration Profiles is given in the Device Management [DEV_MAN] document, and information on some of the Configuration Profiles used in this configuration guide can be found in Appendix A: Configuration Profiles.

The following mandatory configurations must be configured using Configuration Profiles.

4.3.3 Configure MDM Agent and MDM Communications

MDM Agent-Server communication is achieved securely using the MDM protocol, which is built on top of HTTP, transport layer security (TLS), and push notifications that use HTTP PUT over TLS (secure sockets layer (SSL)). A managed mobile device uses an identity to authenticate itself to the MDM server over TLS (SSL). This identity can be included in the profile as a Certificates Payload or can be generated by enrolling the mobile device with Simple Certificate Enrollment Protocol (SCEP).

The MDM Agent communications using the iOS/iPadOS Security Framework as described in section 5.3.2 TLS Configuration. Configuring the device’s TLS protocol automatically configures the MDM Agent communications. If an additional CA certificate needs to be added to support the MDM Server, see section 5.3.2.3.

4.3.4 Device Unenrollment Prevention

During the enrollment process, a Configuration Profile including an MDM Payload is loaded onto the mobile device and used to associate the mobile device to an MDM Server. If the MDM

Payload is removed, the mobile device will no longer be enrolled with the MDM server and can no longer be considered to be in the evaluated configuration.

As described in [DEV_MAN], the mobile device administrator can specify the *PayloadRemovalDisallowed* key to allow or disallow the ability of a mobile device user to remove the MDM Payload from the device.

The mobile device must be under management to lock the MDM Payload to the device.

An MDM Payload can have a removal password associated with it. If the *PayloadRemovalDisallowed* key is set to prevent unenrollment and the MDM Payload has a removal password associated with it, the mobile device user can unenroll the mobile device only if the mobile device user knows the removal password. The *PayloadRemovalDisallowed* key is described in the following document and section.

[DEV_MAN]: "Profile-Specific Payload Keys" → "TopLevel" → "TopLevel"

In the evaluated configuration, the TOE must be configured to disallow (prevent) unenrollment. If the administrator has allowed the ability for a mobile device user to unenroll the device, the user can remove the profile from the device by choosing *Settings » General » VPN & Device Management*, selecting the appropriate profile, and removing the profile.

4.3.5 MDM Agent Alerts

The iOS/iPadOS MDM Agent generates and sends an alert in response to an MDM server request for applying a Configuration Profile and in response to receiving a reachability event. These responses are always enabled.

When the application of a Configuration Profile to a mobile device is successful, the MDM Agent replies with an MDM Result Payload with Status value "Acknowledged".

When the application of a Configuration Profile is unsuccessful, the MDM Agent replies with an MDM Result Payload with Status value "Error" or *CommandFormatError*, "Idle", and "NotNow".

[DEV_MAN]: "Implementing Device Management" → "Sending MDM Commands to a Device" → "Execute the Command and Report Results"

When a reachability event is received by the iOS/iPadOS MDM Agent, the MDM Agent replies with an MDM Result Payload to acknowledge that the mobile device received the event.

More information on the MDM Result Payloads is found in [DeployRef] and [DEV_MAN].

4.3.6 The MDM Payload

The Mobile Device Management (MDM) Payload, a simple property list, is designated by the "com.apple.mdm" value in the PayloadType field.

Table 6: Essential MDM Payload keys for the evaluated configuration

Payload	Key	Setting
MDM	*PayloadRemovalDisallowed*	Must be set to 'true'
MDM	*AccessRights*	Must be set to a value that includes the logical OR with the value 8.

5 Mobile Device Configuration

This section provides more detailed guidance to configure the supervised mobile devices in the way that conforms to the requirements of the CC evaluation.

This section provides details of the dictionary key values that must be used, or where certain options for the key value are not allowed, in order to meet the requirements of the evaluated configuration described in the [IOS_ST] and the [IPADOS_ST].

For dictionary keys not mentioned in this document, please refer to the deploying organization's security policies.

5.1 General Restrictions

5.1.1 Keys for General Restrictions

Below are the essential keys in the Restrictions Payload.

Table 7: Essential keys in the Restrictions Payload

Payload	Key	Description
Restrictions	*allowAssistant*	Must be set to 'false'. (Siri is not allowed in the evaluated configuration.)
Restrictions	*allowAssistantUserGeneratedContent*	Must be set to 'false'. (Siri is not allowed in the evaluated configuration.)
Restrictions	*allowAssistantWhileLocked*	Must be set to 'false'. (Siri is not allowed in the evaluated configuration.)
Restrictions	*allowLockScreenControlCenter*	Must be set to 'false'.
Restrictions	*allowEnablingRestrictions*	Must be set to 'false'.
Restrictions	*allowUSBRestrictedMode*	Must be set to 'true'.

Additional keys can be found in the following document and section.

[DEV_MAN]: "Profile-Specific Payload Keys" → "Restrictions"

5.2 Cryptographic Support Functions

The mobile devices include three cryptographic modules that provide the cryptographic services via the following three cryptographic modules.

- Apple corecrypto Module v13.0 [Apple ARM, User, Software, SL1]
- Apple corecrypto Module v13.0 [Apple ARM, Kernel, Software, SL1]
- Apple corecrypto Module v13.0 [Apple ARM, Secure Key Store, Hardware, SL2]

Warning: The use of other cryptographic engines beyond those listed above was neither evaluated nor tested during the mobile device's Common Criteria evaluation.

The approved mode of operation for these cryptographic modules is configured by default and cannot be changed by the mobile device user or administrator. If the mobile device starts up successfully, then the modules have passed all self-tests and are operating in the approved mode.

5.2.1 Key Generation, Signature Generation, and Verification

5.2.1.1 General information

The mobile devices generate the following asymmetric keys.

- Rivest-Shamir-Adleman (RSA) with key sizes of 2048 bits or greater
- Elliptic-curve cryptography (ECC) with NIST curves P-256 and P-384 with key sizes of 256 bits and 384 bits, respectively
- ECC curve 25519 with a key size of 256 bits
- Finite-field cryptography (FFC) with key sizes of 2048 bits or greater

5.2.1.2 Mobile device users

For the evaluated configuration, no configuration is required from the mobile device user.

5.2.1.3 Mobile device administrators

For the evaluated configuration, no configuration is required from the mobile device administrator.

5.2.2 Key Establishment

5.2.2.1 General information

The mobile devices use the following for key establishment.

- RSA-based scheme
- ECC-based scheme
- Diffie-Hellman (DH)-based scheme

Key establishment is used for TLS and IKE.

5.2.2.2 Mobile device users

For the evaluated configuration, no configuration is required from the mobile device user.

5.2.2.3 Mobile device administrators

For the evaluated configuration, no configuration is required from the mobile device administrator.

5.2.3 Hashing

5.2.3.1 General information

The mobile devices perform the hash functions secure hash algorithm SHA-1, SHA-256, SHA-384, and SHA-512 with message digest sizes 160, 256, 384, and 512 bits.

Functions to perform hashing are provided as part of the Apple corecrypto libraries. The invoking function dictates which SHA function is used. Neither the mobile device user nor the mobile device administrator can configure this choice.

Similarly, each TLS cipher suite uses a specific and appropriate SHA function. Neither the mobile device user nor the mobile device administrator can configure this choice.

5.2.3.2 Mobile device users

For the evaluated configuration, no configuration is required from the mobile device user.

5.2.3.3 Mobile device administrators

For VPN connections with IKEv2, the integrity algorithm to be used is selectable by the mobile device administrator by setting the *IntegrityAlgorithm* key in the VPN payload. Note that setting *IntegrityAlgorithm* to 'SHA1-96' is not allowed in the evaluated configuration.

5.2.4 Random Number Generation

5.2.4.1 General information

For random bit generation, the mobile devices use a deterministic random bit generator (DRBG) seeded by an internal entropy source. That source accumulates entropy from software-based noise and seeds the DRBG with a minimum of 256 bits of entropy.

5.2.4.2 Mobile device users

For the evaluated configuration, no configuration is required from the mobile device user.

5.2.4.3 Mobile device administrators

For the evaluated configuration, no configuration is required from the mobile device administrator.

5.2.5 Keys/Secrets Import/Destruction

5.2.5.1 General information

Cryptographic keys are stored in keychains. In iOS/iPadOS, an application only has access to its own keychain items, so access restrictions are automatically satisfied.

The "Keychain Services Programming Guide" [KEYCHAINPG] describes how keychain items are created, managed, and deleted.

5.2.5.2 Mobile device users

For the evaluated configuration, no configuration is required from the mobile device user.

5.2.5.3 Mobile device administrators

For the evaluated configuration, no configuration is required from the mobile device administrator.

5.2.6 Keys for Configuring Cryptographic Functions

This section provides details of dictionary key values that must be used or that are not allowed to be used in order to meet the requirements of the evaluated configuration described in the [IOS_ST] and the [IPADOS_ST]. The following values can be found in [DEV_MAN] in the VPN.IKEv2.IKESecurityAssociationParameters section.

Table 8: Essential keys for Configuring Cryptographic Functions

Payload	Key	Description
VPN	*EncryptionAlgorithm*	Must be set to one of the following: • 'AES-128' • 'AES-256' (Default) • 'AES-128-GCM' (16-octet ICV) • 'AES-256-GCM' (16-octet ICV) Other values must not be used in the evaluated configuration. Note that 'AES-128' and 'AES-256' use the CBC mode of operation.
VPN	*IntegrityAlgorithm*	Must be set to one of the following: • 'SHA1-160' • 'SHA2-256' (Default) • 'SHA2-384' • 'SHA2-512' Other values must not be used in the evaluated configuration.
VPN	*DiffieHellmanGroup*	Must be set to one of the following: '5', '14', '15', '19', or '20'. Other values must not be used in the evaluated configuration.

5.3 Network Protocols

5.3.1 EAP-TLS Configuration

5.3.1.1 General information

For Extensible Authentication Protocol (EAP)-TLS, iOS/iPadOS implements TLS 1.0, TLS 1.1, and TLS 1.2 supporting the cipher suites listed in Table 9: EAP-TLS Cipher Suites.

In the evaluated configuration, the mobile devices must use only the EAP-TLS cipher suites.

Table 9: EAP-TLS Cipher Suites

Cipher suite Name
TLS_RSA_WITH_AES_128_CBC_SHA
TLS_RSA_WITH_AES_128_CBC_SHA256
TLS_RSA_WITH_AES_256_CBC_SHA256

No additional configuration is needed for the automatic recovery of a broken Wi-Fi connection.

5.3.1.2 Mobile device user

For the evaluated configuration, no configuration is required from the mobile device user.

5.3.1.3 Mobile device administrator

The cipher suites in Table 9: EAP-TLS Cipher Suites above are automatically selected by the mobile devices (i.e., the mobile devices do not support the individual selection of EAP-TLS cipher suites) when Wi-Fi Protected Access (WPA)-EAP is configured via Configuration Profile as follows.

- *EncryptionType* key must be set to 'WPA2' or 'WPA3'.
- *AcceptEAPTypes* key must be set to '13', which is the value representing EAP-TLS.

Because the evaluation of the mobile devices included TLS versions 1.0, 1.1, and 1.2, setting the *TLSMinimumVersion* and *TLSMaximumVersion* keys is a matter for the deploying organization's policy. These keys configure the minimum and maximum TLS versions to be used with EAP-TLS authentication. The default minimum value is '1.0' and the default maximum value is '1.2'.

The *EncryptionType* key is described in the following document and section.

[DEV_MAN]: "Profile-Specific Payload Keys" → "Networking" → "WiFi"

The *AcceptEAPTypes*, *TLSMinimumVersion*, and *TLSMaximumVersion* keys are described in the following document and section.

[DEV_MAN]: "Profile-Specific Payload Keys" → "Networking" → "WiFi" → "WiFi.EAPClientConfiguration"

5.3.2 TLS Configuration

5.3.2.1 General information

TLS is provided by the APIs of the iOS/iPadOS Security Framework, which uses the Apple corecrypto Module v13.0 [Apple ARM, User, Software, SL1].

The library implements TLS 1.0, 1.1, and 1.2 supporting the cipher suites listed in Table 10: TLS Cipher Suites. In the evaluated configuration, only TLS 1.2 is supported. The [IOS_ST] and the [IPADOS_ST] limit the cipher suites used by TLS connections in the evaluated configuration.

The supported cipher suites below are automatically selected by the mobile devices (i.e., the devices do not support the individual selection of TLS cipher suites). The TLS cipher suites available are defined by the TLS server where all cipher suites listed in the [IOS_ST] and the

[IPADOS_ST] are always available. Thus, no additional configuration is required by the administrator.

Table 10: TLS Cipher Suites

Cipher suite Name
TLS_RSA_WITH_AES_256_GCM_SHA384
TLS_ECDHE_RSA_WITH_AES_128_GCM_SHA256
TLS_ECDHE_RSA_WITH_AES_256_GCM_SHA384
TLS_ECDHE_ECDSA_WITH_AES_128_GCM_SHA256
TLS_ECDHE_ECDSA_WITH_AES_256_GCM_SHA384

There are some trusted root certificates that are preinstalled with iOS/iPadOS in a Trust Anchor Database to establish a chain of trust. These certificates are automatically trusted and do not need to be included when creating a Configuration Profile. A list of iOS/iPadOS trusted root certificates can be found at [TRUST_STORE].

There are also blocked and always-ask certificates in the Trust Anchor Database. Blocked certificates are believed to be compromised and are never trusted. Always-ask certificates prompt the user whether they want to trust the certificate. Lists of these certificates can also be found at [TRUST_STORE].

5.3.2.2 Mobile device users

For the evaluated configuration, no configuration is required from the mobile device user.

5.3.2.3 Mobile device administrators

TLS/HTTPS Configuration

The mobile device must be configured to automatically reject untrusted HTTPS certificates rather than prompting the user to ask whether to accept it. This is done by setting the *allowUntrustedTLSPrompt* key to ‘false’ in the Restrictions Payload.

Some restrictions must be placed on AirPrint to ensure that it uses only TLS and only trusted certificates for TLS communication. This is done by setting both the *ForceTLS* key in the AirPrint Payload and the *forceAirPrintTrustedTLSRequirement* key in the Restrictions Payload to ‘true’.

The mobile device administrator must also configure the *TLSTrustedServerNames* and *PayloadCertificateAnchorUUID* dictionary keys in the Wi-Fi Payload EAPClientConfiguration Dictionary such that they specify which server certificate common names and certificates will be accepted by the mobile device.

Reference Identifier Configuration

Mobile device administrators can use the functions of the Certificate, Key, and Trust Services [CKTSREF] API to manage and manipulate certificates.

The iOS/iPadOS device implements a set of X.509 policy checks that cannot be altered. If an application wants to enforce additional checks, it can use the API detailed in [CKTSREF].

When interpreting the term "reference identifier" as the name of the remote peer whose certificate should be validated, the TOE TLS and IKE stacks set the FQDN of the remote peer with the X.509 protocol checker. This operation is hard coded and cannot be influenced by the user via any API when using TLS or IKE.

Guidance documentation for setting additional constraints in validating an X.509 certificate can be specified with the rule definitions found in the following document and section.

[CKTSREF]: "Policies" → "Security Policy Keys"

Certificate Authority (CA) Configuration

Additional CAs can be added to the mobile device by using a Configuration Profile with the *EAPClientConfiguration* dictionary, and the *PayloadCertificateAnchorUUID*, and *TLSTrustedServerNames* dictionary keys in the Wi-Fi Payload.

The keys above are described in the following document and section.

[DEV_MAN]: "Profile-Specific Payload Keys" → "WiFi" → "WiFi.EAPClientConfiguration"

Client Certificate Configuration

A client certificate with its keys can be installed on the mobile device using a Certificates payload in the Configuration Profile, as described in [DEV_MAN]. Examples of Configuration Profiles can be found in Appendix A: Configuration Profiles.

Configuration of the Supported Elliptic Curves Extension

The supported elliptic curves below are automatically selected by the mobile devices (i.e., the mobile devices do not support the individual selection of elliptic curves). The [IOS_ST] and the [IPADOS_ST] limit the curves used by TLS connections in the evaluated configuration. The curves available are defined by the server where all curves listed in the [IOS_ST] and the [IPADOS_ST] are always available. This behavior does not require any additional configuration by the mobile device administrator.

The following curves are available.

- secp256r1 (P-256)
- secp384r1 (P-384)
- secp521r1 (P-521) (SigGen/SigVer only)

Curve25519 is also supported by the mobile devices and may be disabled in the operational environment.

5.3.3 IPsec Configuration

5.3.3.1 General information

The mobile devices implement IPsec natively, as part of their operating system, so any processing of packets used in IPsec communication takes place on the mobile device. IPsec VPN tunnels are configured and controlled by the Network Extension Framework, which is a part of the Core OS Layer of the mobile devices' operating system.

The Security Policy Database (SPD) is created and configured by defining exceptions for IP traffic routing in a Configuration Profile. By default, all IP traffic is sent through a protected channel between the devices and the desired endpoint (PROTECT in the SPD). Any deviations from the default routing behavior must be explicitly specified as exceptions in the Configuration Profile, using the Wi-Fi Payload. Examples of Configuration Profiles can be found in Appendix A: Configuration Profiles.

Packet processing exceptions can be created for applications that make use of Captive Networking Identifiers (Captive Networking Apps), as well as for VoiceMail, AirPrint, and CellularServices. The mobile device administrator will need to refer to their organization's security policies to determine whether exceptions should be created and how those exceptions should be configured.

Exceptions for Captive Networking Apps can be configured in the Wi-Fi Payload to allow traffic for these apps to pass outside the tunnel (BYPASS in the SPD). Exceptions for voicemail, AirPrint, and CellularServices can allow traffic to pass unencrypted outside the tunnel (BYPASS in the SPD) or drop the traffic entirely (DISCARD in the SPD).

When the VPN is configured as Always-On, the mobile device uses IKEv2 for security association (SA) establishment. Since the mobile device must be configured with Always-On VPN to ensure that it is in the evaluated configuration, the use of IKEv2 does not need to be configured separately.

5.3.3.2 Mobile device users

For the evaluated configuration, no configuration is required from the mobile device user.

5.3.3.3 Mobile device administrators

To configure exceptions for Voicemail, AirPrint, and CellularServices, the mobile device administrator can specify a *ServiceExceptions* array in the AlwaysOn dictionary of the VPN payload (VPN.AlwaysOn).

Each entry in a *ServiceExceptions* array lists a *ServiceName* key and a corresponding *Action* key. The allowed values for *ServiceName* and *Action* can be found in Table 12: Essential Keys for the VPN Payload. For each *ServiceName*, the corresponding *Action* can be set to 'Allow' (BYPASS in the SPD) or 'Drop' (DISCARD in the SPD).

To configure exceptions for Captive Networking Apps, the mobile device administrator can use the *AllowCaptiveWebSheet*, *AllowAllCaptiveNetworkPlugins*, and *AllowedCaptiveNetworkPlugins* keys in the Configuration Profile. Information on these keys can be found in following document and section.

[DEV_MAN]: "Profile-Specific Payload Keys" → "VPN" → "VPN.AwlaysOn"

When the *VPNType* key is set to 'AlwaysOn', a catch-all PROTECT rule is created in the SPD. Any traffic not covered by an exception will be covered by that rule.

The mobile device administrator must not declare conflicting traffic exceptions, e.g. declaring both an 'Allow' and a 'Drop' value for 'Voicemail'. This guarantees that the SPD is unambiguous and unaffected by the ordering of SPD entries.

5.3.4 Bluetooth Configuration

5.3.4.1General information

On iOS/iPadOS, manual authorization for Bluetooth connections is implicitly configured, as Bluetooth pairing can only occur when the mobile device is explicitly made discoverable through the *Settings » Bluetooth* interface. When the mobile device is made discoverable in this manner, another device (or the mobile device itself) can send a pairing request. Commonly, a six-digit number is displayed on both sides which must be manually matched by a mobile device user, i.e., the PIN is shown and the user must accept it before the pairing will complete. If one device does not support this automatic exchange of a PIN, a window for entering a manual PIN is presented to the user. The PIN entered must match on both sides.

Two conditions must be met for the mobile device to become discoverable: Bluetooth must be enabled and the Bluetooth configuration panel must be both active and in the foreground. If the Bluetooth configuration panel is not the active panel, or if Bluetooth is disabled, the mobile device is not discoverable. There is no other method to make the mobile device discoverable or not discoverable.

Devices that want to pair with the evaluated devices via Bluetooth are required by iOS/iPadOS to use Secure Simple Pairing, which uses Elliptic Curve Diffie-Hellman- (ECDH) based authentication and key exchange.

iOS/iPadOS requires that remote Bluetooth devices use an encrypted connection. Connections via Bluetooth BR/EDR and LE are secured using AES-128 in CCM mode. Further information about Bluetooth security is found in [BT]. This behavior requires no additional configuration by the mobile device administrator.

5.3.4.2 Mobile device users

For instructions on how to turn Bluetooth on and off and how to pair and unpair a Bluetooth device, the mobile device user can refer to the following documents and sections. (Sections 11.3 and 11.4 contain screenshots from these documents.)

[iPhone_UG]: "Accessories" → "Set up and use Bluetooth accessories on iPhone"

[iPad_UG]: "Accessories" → "Set up and use Bluetooth accessories on iPad"

Bluetooth can be disassociated by the mobile device user via the Control Center.

Further information on enabling and disabling Bluetooth can be found in the document [BLUETOOTH_HELP].

5.3.4.3 Mobile device administrators

In the evaluated configuration, the mobile device administrator can allow or disallow the mobile device user from making modifications to Bluetooth settings on the mobile device by using the *allowBluetoothModification* key in the Restrictions Payload in a Configuration Profile.

5.3.5 VPN Configuration

5.3.5.1 General information

In the evaluated configuration, the VPN must be in its Always-On configuration. The Always-On VPN configuration enables the organization to have full control over supervised device traffic by tunneling all IP traffic back to the organization.

5.3.5.2 Mobile device users

For the evaluated configuration, no configuration is required from the mobile device user.

5.3.5.3 Mobile device administrators

The mobile device administrator uses the VPN Payload to configure a traditional systemwide VPN based on IPsec, to specify Internet Key Exchange Version 2 (IKEv2) settings, and to specify attributes such as:

- the Always-On VPN configuration
- the Certificate authentication method
- administrator-defined certificates

Always-On VPN must be enabled by setting the *VPNType* key to 'AlwaysOn' in the Configuration Profile. When 'AlwaysOn' is selected as the *VPNType* for a Configuration Profile, the corresponding *ProtocolType* key must be set to 'IKEv2'. The *Interfaces* array, which lists the interfaces a particular Always-On VPN configuration applies to, can optionally be specified as 'Cellular, WiFi' (Default), 'Cellular', or 'WiFi'.

The mobile device administrator must specify the Service Set Identifiers (SSIDs) that the iOS/iPadOS device can connect to. This is done by specifying an array of strings of allowed SSIDs using the *SSIDMatch* key in the OnDemandRules dictionary of the VPN payload.

IKEv2 must be configured using the IKEv2 Dictionary Keys. The mobile device administrator must specify the IP address or hostname of the VPN server via *RemoteAddress*, the client identifier via *LocalIdentifier*, the remote identifier via *RemoteIdentifier*, the authentication method as 'Certificate' via *AuthenticationMethod*, and the certificate to be used for authentication via *PayloadCertificateUUID*.

Optional keys can be configured, which allow:

- enabling extended authentication via *ExtendedAuthEnabled*
- the specification of a username and password via *AuthName* and *AuthPassword*
- the specification of the interval the connection is kept alive when the peer cannot be reached via *DeadPeerDetectionRate*
- the specification of the Common Name of the server certificate issuer and/or the Common Name of their server certificate via *ServerCertificateIssuerCommonName* and *ServerCertificateCommonName*
- the specification of *IKESecurityAssociationParameters* and *ChildSecurityAssociationParameters*, both of which allow the further specification of an *EncryptionAlgorithm*, an *IntegrityAlgorithm*, and a *DiffieHellmanGroup* as described in Table 13: Essential keys for Data Protection

5.3.6 Keys for Configuring Network Protocols

This section provides details of the dictionary key values that must or must not be used in order to meet the requirements of the evaluated configuration described in the [IOS_ST] and the [IPADOS_ST].

For dictionary keys not mentioned in this document, please refer to the deploying organization’s security policies.

5.3.6.1 TLS Configuration Keys

Table 11: Essential Payload Keys for TLS and EAP-TLS

Payload	Key	Description
Restrictions	*allowUntrustedTLSPrompt*	Must be set to ‘false’.
Restrictions	*forceAirPrintTrustedTLSRequirement*	Must be set to ‘true’.
AirPrint	*ForceTLS*	Must be set to ‘true’.
Wi-Fi	*EncryptionType*	Must be set to ‘WPA2’ or ‘WPA3’.
	EAPClientConfiguration Dictionary Keys	
Wi-Fi	*AcceptEAPTypes*	Must be set to ‘13’ (EAP-TLS).
Wi-Fi	*PayloadCertificateAnchorUUID*	Must contain at least one UUID of a Certificates Payload that is to be trusted. Note that setting this key prevents the mobile device from asking the user if certificates are trusted.
Wi-Fi	*TLSTrustedServerNames*	Must be set.
Wi-Fi	*TLSCertificateIsRequired*	Must be set to ‘true’.

5.3.6.2 VPN Configuration keys

Table 12: Essential Keys for the VPN Payload

Payload	Key	Description
VPN	*VPNType*	Must be set to ‘AlwaysOn’.
VPN	*OnDemandEnabled*	Must be set to ‘0’.
	IKEv2 Dictionary Keys	
VPN	*RemoteAddress*	Must be set. Specifies the IP address or hostname of your organization’s VPN server.
VPN	*LocalIdentifier*	Must be set.
VPN	*RemoteIdentifier*	Must be set.
VPN	*AuthenticationMethod*	Must be set to ‘Certificate’.

VPN	*PayloadCertificateUUID*	Must be set. Specifies the universally unique identifier (UUID) of the identity certificate used as the account credential.
VPN	*CertificateType*	Must be set to one of the following: • RSA (Default) • ECDSA P-256 • ECDSA P-384 • Specifies the type of PayloadCertificateUUID used for IKEv2 machine authentication.
VPN	*ServerCertificateIssuerCommonName*	Must be set. Specifies the Common Name of the server certificate issuer. This key will cause IKE to send a certificate request to the server based on the specified certificate issuer.
VPN	*EnableCertificateRevocationCheck*	Must be set to '1'. Enables a certificate revocation check for IKEv2 connections.
VPN	*IKESecurityAssociationParameters*	Optional. A dictionary that specifies the parameters for IKEv2 IKE_SA_INIT and IKE_AUTH exchanges (Phase 1).
VPN	*ChildSecurityAssociationParameters*	Optional. A dictionary that specifies the parameters for IKEv2 child SAs (Phase 2). If parameters are not specified for Phase 2, the Phase 1 parameters will be used. If the corresponding Phase 1 parameters are also not specified, the default values for those parameters will be used.
	IKESecurityAssociationParameters and ChildSecurityAssociationParameters Dictionary Keys	
VPN	*EncryptionAlgorithm*	Must be set to one of the following. • 'AES-128' • 'AES-256' (Default) • 'AES-128-GCM' (16-octet ICV) • 'AES-256-GCM' (16-octet ICV) Other values must not be used in the evaluated configuration. Note that 'AES-128' and 'AES-256' use the CBC mode of operation.

VPN	*IntegrityAlgorithm*	Must be set to one of the following. • 'SHA1-160' • 'SHA2-256' (Default) • 'SHA2-384' • 'SHA2-512' Other values must not be used in the evaluated configuration.	
VPN	*DiffieHellmanGroup*	Set to one of the following: '5', '14', '15', '19', or '20'. Other values must not be used in the evaluated configuration.	
VPN	*LifeTimeInMinutes*	Optional. SA lifetime (rekey interval) in minutes. Allowed values are '10' through '1440'. Defaults to '1440' (24 hours).	
	AlwaysOn Dictionary Keys		
VPN	*UIToggleEnabled*	Must be set to '0'. If set to '1', allows the mobile device user to disable this VPN configuration. Defaults to '0'.	
VPN	*TunnelConfigurations*	*ProtocolType*	Must be set to 'IKEv2'
		Interfaces	Optional. An array that lists the interfaces to which this configuration applies. Valid array entries are 'Cellular' and 'WiFi'. Defaults to 'Cellular, WiFi'.
VPN	*ServiceExceptions*	*ServiceName*	The name of a system service which is exempt from AlwaysOn VPN. May be set to one of the following. • VoiceMail • AirPrint • CellularServices
		Action	May be set to one of the following. • Allow • Drop
VPN	*AllowCaptiveWebSheet*	Optional. If set to '1', allows traffic from Captive Web Sheet outside the VPN tunnel. Defaults to '0'.	

VPN	*AllowAllCaptiveNetworkPlugins*	Optional. If set to '1', allows traffic from all Captive Networking apps outside the VPN tunnel to perform Captive network handling. Defaults to '0'.
VPN	*AllowedCaptiveNetworkPlugins*	Optional. An array of dictionaries that describes Captive Networking apps whose traffic will be allowed outside the VPN tunnel to perform Captive network handling. Used only when *AllowAllCaptiveNetworkPlugins* is '0'. Each dictionary in this array must contain a *BundleIdentifier* key of type string, the value of which must be the application's bundle identifier.
	OnDemandRules Dictionary Keys	
VPN	*SSIDMatch*	Must be set. An array of allowed SSIDs must be given to which the iOS/iPadOS device is allowed to connect.
	DNS Dictionary Keys	
VPN	*SupplementalMatchDomains*	Must not be set. (This key is used to create a split DNS, which is not allowed in the evaluated configuration.)

5.4 Data Protection

5.4.1 Data-At-Rest (DAR) Protection Configuration

5.4.1.1 General information

To ensure data-at-rest protection, establishment of a passcode on the mobile device is required.

The TOE only supports external storage encryption with storage devices formatted in the APFS format; other formats with encryption or encrypted volumes are not supported by the TOE.

In the evaluated configuration, external storage devices must be formatted in the APFS file format and volumes must be encrypted. All other storage formats are not allowed in the evaluated configuration.

Further information on the APFS format can be found in [APFS_DOC] and [APFS_DEV_DOC].

5.4.1.2 Mobile device users

Users can check that data-at-rest protection is enabled on their device with the following.

Face ID Device: *Settings » Face ID & Passcode*

Touch ID Device: *Settings » Touch ID & Passcode*

This screen allows the user to enable data protection on the device by enabling these ID features. No further configuration is required to enable data protection on the device. More information can be found on this topic in the following documents and sections. (Sections 11.5 and 11.6 contain screenshots from these documents.)

[iPhone_UG]: "Security and privacy" → "Protect your iPhone" → "Set a passcode on iPhone"

[iPad_UG]: "Security and privacy" → "Protect your iPad" → "Set a passcode on iPad"

Mobile device users can only use external storage devices formatted in the APFS format with encrypted volumes. No other file format is supported in the evaluated configuration, and the APFS-formatted device must have only encrypted volumes. An APFS-formatted device without encrypted volumes is not supported.

Instructions on formatting devices in the APFS format with encrypted volumes can be found in [APFS_DOC]. Further technical information on the APFS format with encrypted volumes can be found in [APFS_DEV_DOC].

5.4.1.3 Mobile device administrators

Mobile device administrators must ensure that mobile device users set a passcode by using the *forcePIN* key in the Passcode Payload. Other keys available in this payload allow administrators to configure passcode requirements to their deploying organizations policy.

See 5.5.1, Passcode Authentication Configuration, for more information on passcode configuration.

Mobile device administrators can restrict USB drive access in the Files app if desired by setting the *allowFilesUSBDriveAccess* key to 'false' in the "Restrictions" section of the Configuration Profile.

Mobile device administrators must ensure through organizational policies that mobile device users only use external storage devices formatted in the APFS format with encrypted volumes. Unencrypted volumes and other formats are not allowed in the evaluated configuration.

5.4.2 Restrict Application Access to System Services

5.4.2.1 General information

Access control to system services in the Core Services layer is hard coded and, thus, not configurable by the mobile device user or administrator.

Access control for applications to system services can be restricted on a per-app basis. In the operating systems, these services are as follows.

- Location Services
- Tracking
- Contacts
- Calendars
- Reminders
- Photos

- Bluetooth
- Local Network
- Nearby Interactions (iPhones only)
- Microphone
- Speech Recognition
- Camera
- Health (iPhones only)
- Research Sensor & Usage Data (iPhones only)
- HomeKit
- Media & Apple Music
- Files and Folders
- Motion & Fitness
- Focus

5.4.2.2Mobile device users

A list of system services can be obtained from the mobile device *Settings » Privacy & Security*. For each system service, the Applications that have permission to use that service can be inspected and changed.

5.4.2.3 Mobile device administrators

Mobile device administrators can not specify access control for applications to system services.

5.4.3 Wiping of Protected Data

5.4.3.1General information

A wipe operation is performed after the mobile device user exceeds the limit of the number of failed authentication attempts or upon receiving a request from an authorized administrator. The administrator can configure the number of failed attempts by using the following Configuration Profile key in the Passcode Payload: *maxFailedAttempts*. This key takes an integer value between ‘2’ and ‘11’.

5.4.3.2 Mobile device users

Mobile device users can wipe the device themselves. This can be performed on the device using the following.

Device: *Settings » General » Transfer or Reset iPhone/iPad » Erase All Content and Settings*

More information can be found on this topic in the following documents and section. (Sections 11.7 and 11.8 contain screenshots from these documents.)

[iPhone_UG]: “Restart, update, reset, and restore” → “Erase iPhone”

[iPad_UG]: “Restart, update, reset, and restore” → “Erase iPad”

Depending on the organizational policy, the mobile device administrator can disable this function.

5.4.3.3 Mobile device administrators

It is mandatory that the mobile device administrator can issue a remote wipe command from the MDM server using the MDM protocol as described in [DeployRef] and [DEV_MAN].

The following key is required to execute a remote device wipe: *RequestType* with a value of 'EraseDevice' when sending the EraseDeviceCommand.Command command. Upon receiving this command, the device immediately erases itself. No warning is given to the user. This command is performed immediately even if the device is locked.

[DEV_MAN]: "Commands and Queries" → "Erase a Device" → "EraseDeviceCommand" → "EraseDeviceCommand.Command"

To execute this command successfully, Device Erase access rights must be set. To enable this access, the following MDM Payload-related key must be used: *AccessRights*. The value for this key is determined by a logical "OR" that includes the value '8', where 8 stands for allowing device erase rights.

Depending on the organizational policy, the mobile device administrator can disallow the mobile device user from wiping the device themselves. This ability can be configured by the mobile device administrator by setting the *allowEraseContentAndSettings* key to 'false' in the Restrictions Payload.

5.4.4 Keys for Configuring Data Protection

This section provides details of the dictionary key values that must be used, or where certain options for the key value are not allowed, in order to meet the requirements of the evaluated configuration described in the [IOS_ST] and the [IPADOS_ST].

For dictionary keys not mentioned in this document, please refer to the deploying organization's security policies.

Table 13: Essential keys for Data Protection

Payload	**Key**	**Description**
MDM	*AccessRights*	A logical "OR" including the value "8"
Passcode	*maxFailedAttempts*	A value between '2' and '11' according to the organizations security policy
Restrictions	*allowEraseContentAndSettings*	Disables the option to erase all content and settings from the mobile device UI if set to 'false'
Restrictions	*allowFilesUSBDriveAccess*	Disables external storage via device connection

5.5 Identification & Authentication

5.5.1 Passcode Authentication Configuration

5.5.1.1 General information

In the evaluated configuration, mobile devices must be configured to use either a numeric passcode or an alphanumeric passcode.

The Passcode Payload is described in [DEV_MAN] and describes the keys that can be used to set attributes such as:

- defining the minimum passcode length
- defining requirements for the passcode complexity
- defining the maximum passcode lifetime
- defining the maximum time of inactivity after which the mobile device is locked automatically
- defining the maximum number of consecutive authentication failures after which the mobile device is wiped

The devices allow the following parameters for passcode complexity:

- Passcodes can be composed of any combination of upper- and lower-case letters, numbers, and special characters: “!”, “@”, “#”, “$”, “%”, “^”, “&”, “*”, “(”, “)”
- Passcode length must be between 1 and 16

5.5.1.2 Mobile device users

In the evaluated configuration, the mobile device user cannot configure the passcode policy.

5.5.1.3 Mobile device administrators

It is mandatory that the mobile device administrator configure the passcode policy for the mobile device.

The Passcode Payload presents the administrator with an alphanumeric passcode entry mechanism, which allows for the entry of arbitrarily long and complex passcodes including the selection of special characters. To do this, set the configuration keys *allowSimple* to ‘false’ and *requireAlphanumeric* to ‘true’.

Also, set the configuration key *minLength* to a value greater than zero, defined by the deploying organization's policy.

5.5.2 Protected Authentication Feedback

5.5.2.1 General information

All passcode entries are obscured by iOS/iPadOS. This is done by displaying a dot symbol in place of each character as the passcode entry user input occurs. No configuration of this feature is required from the mobile device administrator.

Biometric authentication inputs do not provide feedback to the user unless the input is rejected. Additionally, biometric authentication inputs do not relay authentication entry information and are inherently obscured. When an invalid fingerprint sample is given or a fingerprint sample cannot be authenticated, a simple error message is returned, which prompts the user to try again. When an invalid facial sample is given or a facial sample cannot be authenticated, the mobile device will vibrate. If three invalid biometric samples are presented, the mobile device will offer passcode entry. After five invalid biometric samples are presented, passcode authentication is required.

Refer to [PASSCODE_Help] for more information on how to manage a passcode.

5.5.2.2 Mobile device users

Passcode entry is obscured by iOS/iPadOS; no configuration of this feature is required from the mobile device user.

5.5.2.3 Mobile device administrators

Passcode entry is obscured by iOS/iPadOS; no configuration of this feature is required from the mobile device administrator.

5.5.3 Biometric Authentication Factors

5.5.3.1 General information

Enrollment and management of biometric authentication factors and credentials is found on the device using the following.

Face ID Device: *Settings » Face ID & Passcode*

Touch ID Device: *Settings » Touch ID & Passcode*

More information can be found on this topic in the following documents and sections.

[iPhone_UG]: (Sections 11.9 and 11.10 of this document contain screenshots from [iPhone_UG].)

Face ID: “Security and privacy” → “Protect your iPhone” → "Set up Face ID on iPhone”

Touch ID: “Security and privacy” → “Protect your iPhone” → "Set up Touch ID on iPhone”

[iPad_UG]: (Sections 11.11 and 11.12 of this document contain screenshots from [iPad_UG].)

Face ID: “Security and privacy” → “Protect your iPad” → "Set up Face ID on iPad”

Touch ID: “Security and privacy” → “Protect your iPad” → "Set up Touch ID on iPad”

5.5.3.2Biometric Sample Quality

The mobile device OS inspects sample quality before it is passed to the matcher algorithm for both Touch ID and Face ID. In general, the inspection is based on the following criteria:

For Touch ID:

- Finger motion
- Sensor coverage
- Fixed pattern noise (FPN)

For Face ID:

- Pose: Pose angles
- Distance: Within a specific range
- Occlusion: Visible face region
- Attention: Subject must be looking at the device

If the sample quality passes verification during enrollment, the TOE saves it as an enrollment template. When a user authenticates, an authentication template is generated. If a properly formatted template contains unusual data properties, incorrect syntax, low quality, or unrealistic modality, the device rejects the template.

The validation of the discussed mechanism is performed regularly for each major TOE OS release. The test is based on specialized datasets containing different levels of coverage and different artifacts. These samples are fed to the biometric system, and it is confirmed whether the sample is correctly passed or rejected from the processing as expected.

Additionally, the biometric system is tested by feeding artificially created images containing different geometric patterns.

5.5.3.3 Mobile device users

In the evaluated configuration, the mobile device user cannot enable Touch ID or Face ID. Only the mobile device administrator can enable/disable Touch ID or Face ID using the Restrictions Payload. If the mobile device administrator has enabled these biometric authentication factors, the following is guidance on how the mobile user can configure Touch ID and Face ID.

Enrollment for Touch ID is typically accomplished during initial device configuration but can also be performed using the *Settings » Touch ID & Passcode* menus. Multiple fingerprints may be enrolled, named, and deleted from this menu. To remove a specific finger, a device user must tap the finger for removal followed by delete fingerprint. Mobile device users may place a finger on the Touch ID sensor to determine which biometric credential entry it is mapped to. Users may also disable Touch ID selectively for applications, or entirely, from the *Settings » Touch ID & Passcode* menu by authenticating using their passcode and turning off one or more of the following corresponding options.

- Unlock
- Apple Pay
- iTunes & App Store

Enrollment for Face ID is typically accomplished during initial device configuration but can also be performed using the *Settings » Face ID & Passcode* menu by tapping the “Set up Face ID” option. Mobile users can enroll an alternative appearance for Face ID, for a total of two enrollments per device. Mobile users may establish Face ID credentials by providing biometric samples. They may also remove biometric samples from the *Settings » Face ID & Passcode* menu by tapping the *Reset Face ID* option. This action removes all established Face ID credentials. Users may also disable Face ID selectively for applications, or entirely, from the *Settings » Face ID & Passcode* menu by turning off one or more of the following corresponding options.

- Unlock

- Apple Pay
- iTunes & App Store
- Safari AutoFill

5.5.3.4 Mobile device administrators

A mobile device administrator can configure to not allow a device user to enable Touch ID or Face ID by setting the key *allowFingerprintForUnlock* to false in a Configuration Profile using the Restrictions Payload.

5.5.4 Authentication Attempt Configuration

5.5.4.1 General information

Both Face ID and Touch ID allow up to five unsuccessful authentication attempts before passcode authentication is required. For details, please see the following document and section.

[AP_SEC]: "Hardware security and biometrics" → "Face ID and Touch ID" → "Face ID, Touch ID, passcodes, and passwords"

5.5.4.2 Mobile device users

In the evaluated configuration, the mobile device user cannot configure the maximum number of failed authentication attempts.

5.5.4.3 Mobile device administrators

To limit/configure the number of consecutive failed authentication attempts for the passcode, the administrator can use the key *maxFailedAttempts* This key takes an integer value between '2' and '11'. See the Passcode Payload in section 5.5.1, Passcode Authentication Configuration.

5.5.5 Re-Authentication Configuration

5.5.5.1 General information

When the use of a passcode is enabled, the mobile device automatically prompts the user for a passcode to unlock the device. No additional configuration is required.

Use of Touch ID or Face ID can be set in the *Settings » Touch ID & Passcode* or *Settings » Face ID & Passcode*. The biometric authentication factor can be configured for device unlock, Apple Pay, iTunes, and App Store.

The Passcode Payload allows an administrator to enable/disable modification of Touch ID or Face ID through specification of the *allowFingerprintModification* key.

A passcode must be supplied for additional security validation in any of the following instances.

- The mobile device has just been turned on or restarted
- For device software updates
- To wipe the device
- To view or change passcode settings

- To install iOS/iPadOS Configuration Profiles
- The mobile device has not been unlocked for more than 48 hours
- The passcode has not been used to unlock the mobile device in the last 156 hours (six and a half days) and Face ID or Touch ID has not been used to unlock the mobile device in the last 4 hours
- The device has received a remote lock command
- After five unsuccessful biometric attempts (though, for usability, the device might offer entering a passcode instead of using biometrics after a smaller number of failures).
- After exiting power off/Emergency SOS by pressing and holding either volume button and the sleep/wake simultaneously for 2 seconds and then pressing Cancel.

Note that when Touch ID or Face ID is enabled on an iPhone or iPad, the device immediately locks when the sleep/wake is pressed, and the device locks every time it goes to sleep. Touch ID and Face ID require a successful match—or, optionally, the passcode—at every wake.

5.5.5.2 Mobile device users

In the evaluated configuration, the mobile device user cannot enable/disable the modification of Touch ID or Face ID.

5.5.5.3 Mobile device administrators

In the evaluated configuration, the mobile device administrator set the *allowFingerprintModification* key to a value defined by the organization's policy.

5.5.6 X.509 Certificate Configuration

5.5.6.1 General

X.509 certificates are configured by an administrator using the keys of the *Certificates Payload* in a Configuration Profile.

[DEV_MAN]: "Profile-Specific Payload Keys" → "Certificates"

Certificates have a certificate type that defines their respective application area. This ensures that only certificates defined for a specific application area are used. In addition, the database containing trust anchors for all certificates is protected via integrity check and write protection. The certificate types supported by the devices are as follows.

- AppleX509Basic
- AppleSSL
- AppleSMIME
- AppleEAP
- AppleIPsec
- AppleCodeSigning
- AppleIDValidation
- AppleTimeStamping

The list of supported certificate and identity formats is as follows.

- Certificate (PKCS1): cer, .crt, .der, X.509 certificates with RSA keys
- Identity (PKCS12): .pfx, .p12

For more information on the certificate and identity formats, see the following document and sections.

[DeployRef]: "Ensure device security" → "Manage certificates" → "Intro to certificate management"

[DeployRef]: "MDM settings" → "MDM payload settings" → "Certificates payload settings"

External entities can be authenticated using a digital certificate. Out of the box, the TOE includes a number of preinstalled root certificates.

Code signing certificates need to be assigned by Apple and can be imported into a device. The issue of such a certificate can be by app developers or by enterprises that want to deploy apps from their MDM to managed devices. All apps must have a valid signature that can be verified by a code signing certificate before they are installed on a device.

The mobile devices have a Trust Anchor Database, which contains trusted root certificates preinstalled with iOS/iPadOS to establish a chain of trust; see [TRUST_STORE]. These preinstalled trusted root certificates cannot be modified, are automatically trusted, and do not need to be included when creating a Configuration Profile. New certificates can be added to the Trust Anchor Database, or currently installed certificates can be removed.

There are also blocked and always-ask certificates in the Trust Anchor Database. Blocked certificates are believed to be compromised and are never trusted. Always-ask certificates prompt the user whether they want to trust the certificate. Lists of these certificates can also be found at [TRUST_STORE].

When attempting to establish a connection using a peer certificate (i.e., a certificate received from the other endpoint), the peer certificate is first checked to ensure it is valid as per RFC 5280. Certificates are validated against the Subject Alternative Name (SAN). It must contain a Fully Qualified Domain Name (FQDN). Wildcards are supported. The Common Name (CN) is ignored. If the SAN does not match the corresponding domain name system (DNS) or IP Address of the server being accessed, validation and, subsequently, the connection will fail. If the certificate is valid, the attempt to establish the connection continues. If the certificate is invalid, the next step is up to the application.

The iOS/iPadOS device, excluding WLAN, uses OCSP for validating the revocation status of certificates. When a connection cannot be established to the OCSP server to determine the revocation status of a certificate, the iOS/iPadOS device considers the certificate as not revoked.

As part of the certificate chain validation, the validity period of each certificate in the chain is verified. If the certificate is marked as an extended validation certificate, the iOS/iPad device performs an OCSP lookup to verify the validity (revocation status) of the certificate (except for WLAN certificate validation, which does not support OCSP). The basicContraints extension and the Certificate Authority (CA) flag are checked. CA certificates must have the basicContraints extension, the CA flag set to 'true', and include the caSigning purpose. The extendedKeyUsage (EKU) is validated against the rules defined in FIA_X509_EXT.1 (which is a superset of the rules in FIA_X509_EXT.1/WLAN). Finally, the signature of the issuer of the certificate is verified. Only when all checks succeed, the certificate is considered valid and the next certificate in the certificate chain is checked.

The certificate chain searches for the certificates in the trust store. The trust store is a combination of the trust store delivered with the iOS/iPadOS device and the certificates stored in the key chain and marked as trustworthy. Certificates from the trusted store are validated using the previously described checks at the time that they are used. Certificate path validation terminates with a certificate in the trust store.

Further information on certificates can be found in the Certificates section of [CKTSREF], in [DeployRef], and in [DEV_MAN].

5.5.6.2 Mobile device users

In the evaluated configuration, the mobile device user cannot import X.509v3 certificates into the Trust Anchor Database. However, if the mobile device is unsupervised, the mobile device user can install root certificates into the Trust Anchor Database.

Unless the administrator has disallowed the removal of the Configuration Profile that contains the certificate, mobile device users can manually remove certificates that have been installed on their device. Choose *Settings » General » VPN & Device Management*, select a profile, choose More Details, and then choose the appropriate certificate to remove.

In the evaluated configuration, the mobile device user can remove imported X.509v3 certificates but cannot remove other X.509v3 certificates in the Trust Anchor Database.

5.5.6.3 Mobile device administrators

In the evaluated configuration, mobile device administrators are allowed to modify the Trust Anchor Database. X.509 certificates can be configured by using a Configuration Profile.

Certificate identities can be deployed using the following two methods: 1) using Public Key Cryptography Standards (PKCS) #12 identity certificate and 2) Simple Certificate Enrollment Protocol (SCEP). The mobile device administrator should use the Certificates Payload of the Configuration Profile if using the first option and should use the SCEP Payload of the Configuration Profile if using the second option.

The mobile device administrator can also send the mobile device user an email with the certificate as an attachment or a link to a secure site hosting the certificate. The user will download the certificate, from the email or site, to install on the mobile device.

More information on certificate configuration can be found in [DeployRef] and subsection EAPClientConfiguration Dictionary of the Wi-Fi section of [DEV_MAN].

In the evaluated configuration, the mobile device administrator must disallow the removal of a Certificates Payload by a user in a Configuration Profile by setting the *PayloadRemovalDisallowed* key for that payload to ‘true’. See the [DEV_MAN] section ProfileListResponse.ProfileListItem.

When configuring the devices to utilize EAP-TLS as part of a WPA2 or WPA3-protected Wi-Fi network, the CA certificate(s) to which the server's certificate must chain can be configured using the *PayloadCertificateAnchorUUID* key in the Wi-Fi Payload of the Configuration Profile. More information can be found in the Wi-Fi Payload and subsection EAPClientConfiguration Dictionary of [DEV_MAN].

Mobile device administrators can view all certificates on a device and remove any certificates it has installed via the MDM protocol using the *RequestType* key with the content “CertificateList”. The MDM protocol also allows for certificate removal.

A list of all available trusted root certificates on the iOS/iPadOS device can be found in [TRUST].

Certificate Validation

To configure the devices to reject untrusted certificates, the administrator can use the *PayloadCertificateAnchorUUID* and *TLSTrustedServerNames* dictionary keys in the Wi-Fi Payload EAPClientConfiguration Dictionary of the Configuration Profile, which enforces that untrusted certificates are not accepted and the authentication fails if such untrusted certificates are presented.

To enforce the verification of the server name defined with the X.509 certificate during the WPA-EAP handshake between the mobile device and the remote access point, the policy must contain the server name to be expected in the certificate with the *TLSTrustedServerNames* dictionary key in the Wi-Fi Payload EAPClientConfiguration Dictionary of the Configuration Profile.

Guidance and the API documentation related to certificate validation is provided in “Certificate, Key, and Trust Services” [CKTSREF] in the section “Trust.”

5.5.7 Keys for Identification and Authentication

This section provides details of the dictionary key values that must be used, or where certain options for the key value are not allowed, in order to meet the requirements of the evaluated configuration described in the [IOS_ST] and the [IPADOS_ST].

Table 14: Essential keys for Identification and Authentication

Payload	**Key**	**Setting**
Passcode	*allowSimple*	Must be set to 'false'.
	forcePIN	Must be set to 'true'.
	maxFailedAttempts	Must be set to a value between 2 and 11 according to the deploying organization’s policy.
	maxInactivity	Should be set to a value defined by the deploying organization's policy.
	maxPINAgeInDays	Should be set to a value defined by the deploying organization’s policy.
	minComplexChars	Should be set to a value defined by the deploying organization’s policy.
	minLength	Should be set to a value defined by the organization's policy.

Payload	Key	Setting
	requireAlphanumeric	Should be set to a value defined by the organization's policy.
	pinHistory	Should be set to a value defined by the organization's policy.
	maxGracePeriod	Must be set to 0.
	changeAtNextAuth	Should be set to a value defined by the organization's policy.
Restrictions	*allowFingerprintModification*	Should be set to a value defined by the organization's policy.

5.6 Security Management

5.6.1 Install/Remove Apps from the Device

5.6.1.1 General information

If the mobile device is enrolled in MDM, managed apps on the mobile device can be removed by an administrator remotely via the MDM System or when the mobile device user removes their own device from MDM. If a mobile phone is removed from MDM, the mobile device administrator has some control over what happens to the associated data. When a managed app is removed from a device, the associated data is removed with it.

For more information on managed apps, refer to the following document and section.

[DeployRef]: “Distribute content” → “Distribute apps”

5.6.1.2 Mobile device users

Mobile device users may be able to install or remove an application from their device. (This depends upon the organization’s policy and the value of the dictionary keys in the Restrictions Payload for *allowAppRemoval* and *allowAppInstallation*.)

For more information on installing applications, see the following documents and section. (Sections 11.13 and 11.14 contain the screenshots from these documents.)

[iPhone_UG]: “App Store” → “Get apps in the App Store on iPhone”

[iPad_UG]: “App Store” → “Get apps in the App Store on iPad”

For more information on removing applications, see the following documents and section. (Sections 11.15 and 11.16 contain the screenshots from these documents.)

[iPhone_UG]: “Personalize your iPhone” → “Customize the Home Screen” → “Remove apps from iPhone”

[iPad_UG]: “Personalize your iPad” → “Customize the Home Screen” → “Remove apps from iPad”

5.6.1.3 Mobile device administrators

The mobile device administrator can install applications on the mobile device using an MDM system or Apple Configurator 2. Refer to the following documents and sections.

[DeployRef]: "Distribute content" → "Distribute apps"

[AConfig]: "Distribute content" → "Add apps to a device"

[DEV_MAN]: "Commands and Queries" → "Install an App"

If installing an enterprise application, refer to the following document and section.

[DEV_MAN]: "Commands and Queries" → "Install an Enterprise App"

The mobile device administrator can remove managed applications using MDM. To remove an application, the MDM server sends a command using the *RequestType* and *Identifier* keys. The below table provides additional information on these keys.

Table 15: Application Removal Key Details

Key	Description
RequestType	This key must be set to: RemoveApplication
Identifier	The application's identifier

More information can be found in the following document and section.

[DEV_MAN]: "Commands and Queries" → "Remove an App" → "RemoveApplicationCommand" → "RemoveApplicationCommand.Command"

5.6.2 Configure Access and Notification in Locked State

5.6.2.1 General information

By default, the following features are available when the mobile device is locked and authentication is not needed.

- Making emergency calls
- Using the camera
- Using the flashlight

Access to certain optional features can be allowed when the mobile device is in a locked state. These optional features include the following.

- Email notification
- Calendar appointment
- Text message notification

5.6.2.2 Mobile device users

To allow access to the optional features when the mobile device is locked, use the following on the device.

Face ID Device:	*Settings » Face ID & Passcode*
Touch ID Device:	*Settings » Touch ID & Passcode*

Enter the passcode and select the features you want to allow access under the Allow Access When Locked menu.

Those items may be restricted by a Configuration Profile installed by an administrator. For more information, refer to the following documents and sections. (Sections 11.17 and 11.18 contain the screenshots from these documents.)

[iPhone_UG]:	"Basics" → "Access features from the iPhone Lock screen"
[iPad_UG]:	"Basics" → "Access features from the iPad Lock screen"

Certain display notifications can be set when the mobile device is in the locked state. To enable/disable display notifications in the locked state, go to *Settings » Face ID & Passcode* or *Settings » Touch ID & Passcode* and enter the passcode. Once authenticated, turn on Notification Center (found in the Allow Access When Locked options list). For more information, refer to the following documents and sections. (Sections 11.19 and 11.20 contain the screenshots from these documents.)

[iPhone_UG]:	"Personalize your iPhone" → "Set up Focus, notifications, and Do Not Disturb" → "Change notification settings on iPhone"
[iPad_UG]:	"Personalize your iPad" → "Set up Focus, notifications, and Do Not Disturb" → "Change notification settings on iPad"

5.6.2.3 Mobile device administrators

The mobile device administrator can use the *allowLockScreenNotificationsView* key in the Restrictions Payload in a Configuration Profile to disallow the user from viewing past notifications (i.e., disable Notification history). However, the mobile device user can see notifications as they arrive. To disable displaying notifications on the lock screen for applications, the *ShowInLockScreen* key in the Notifications Payload must be set to 'true'.

Once the notification settings have been implemented by the mobile device administrator, the *allowNotificationsModification* key in the Restrictions Payload must be set to 'true' if the settings are not allowed to be modified.

Refer to [DEV_MAN] for more information.

5.6.3 Device/Session Locking

5.6.3.1 General information

The mobile device is locked after a configurable time of user inactivity. To unlock the mobile device, an authentication mechanism must be enabled. For example, the device user uses a passcode or Face ID or Touch ID for authentication.

5.6.3.2 Mobile device users

In the evaluated configuration, the mobile device user is not allowed to configure the auto-lock in *Settings » Display & Brightness » Auto-Lock.*

Mobile device users can transition to the locked state by pressing the side button (or for some mobile device models, the Sleep/Wake button).

5.6.3.3 Mobile device administrators

It is mandatory that mobile device administrators configure the device/session locking policy on the mobile devices. This is done by setting the Configuration Profile key *maxInactivity* in the Passcode Payload to the desirable time. The number of authentication failures allowed is set using the *maxFailedAttempts* key, in the same payload, to a value between '2' and '11'. Refer to [DEV_MAN] for additional information.

Additionally, the mobile device administrator can set the *RequestType* to 'DeviceLock' as described in the following document and section.

[DEV_MAN]: "Commands and Queries" → "Lock a Device" → "LockDeviceCommand" → "LockDeviceCommand.Command"

This key requires the Device Lock and Passcode Removal access rights. In the MDM payload, setting the *AccessRights* key to '4' allows for device lock and passcode removal.

5.6.4 Timestamp Configuration

5.6.4.1 General information

In the evaluated configuration, the mobile device must be configured to update its time automatically. Accurate timestamps are crucial when it comes to analyzing audit logs (see Section 6, Security Audit for information on audit logs). The devices can use several time sources to automatically update the time: Network, Identity and Time Zone (NITZ); Global Positioning Satellites (GPS); Network Time Protocol (NTP) standards; or the cellular carrier time service. When configured and maintained using one of these time sources, the time may be considered reliable. Only the NTP is configurable by the mobile device administrator.

5.6.4.2 Mobile device users

In the evaluated configuration, the mobile device user is not allowed to configure the automatic time update options.

5.6.4.3 Mobile device administrators

The mobile device administrator can configure the mobile device to connect to a time server. Using the Time Server Payload, the *timeServer* and *timeZone* keys should be used. The following table provides additional details about these keys.

Table 16: Mobile Device Administrator Key Details

Key	Description
timeserver	This value represents the network time protocol (NTP) server to connect to.

timeZone	This value represents the timezone. It must be an entry in the /usr/share/zoneinfo/. Examples include: “America/Denver” or “Zulu”

The mobile administrator can disallow the mobile user from turning off the “Set Automatically” option for the date and time. In the Restrictions Payload, setting the *forceAutomaticDateAndTime* key to ‘true’ turns on the Date and Time “Set Automatically” feature and it cannot be turned off by the mobile device user.

Additional information on these settings can be found in [DEV_MAN].

5.6.5 Access Banner Configuration

5.6.5.1 General information

In the evaluated configuration, the mobile devices are required to display an access banner as an advisory warning message regarding unauthorized use of the mobile device.

5.6.5.2 Mobile device users

In the evaluated configuration, the mobile device user is not allowed to configure the access banner.

5.6.5.3 Mobile device administrators

Also, the access banner can be configured by creating a background picture with the relevant information and configuring that picture as the background for the lock screen as described in the following document and section.

[DEV_MAN]: “Profile-Specific Payload Keys” → "Restrictions”

This banner is not allowed to be changed by the mobile device user in the evaluated configuration. To prevent the changing of the banner, set the *allowWallpaperModification key* to ‘false’ as described in [DEV_MAN].

The image is sent as a Base64 encoded image (as part of the Wallpaper command). It must be either a PNG or JPEG.

Alternatively, a notice and consent warning message can be configured through an app that provides the requisite notice and acknowledgement functionality rather than through iOS/iPadOS itself. The implementing organization must deploy a customizable application that provides users notice of the banner (e.g., through the Apple Push Notification Service) and also the ability to acknowledge the banner content within the application.

5.6.6 Enable/Disable Cameras and Microphones

5.6.6.1General information

The cameras and microphones on the iPhone and iPad can be managed across the devices or on a per-app basis.

Additional information on these settings can be found in [DEV_MAN].

5.6.6.2 Mobile device users

Mobile device users can optionally disable the use of the cameras on a per-app basis. This can be done on the iPhone or iPad from *Settings » Privacy & Security » Camera*. If the mobile device administrator has restricted the use of the camera, then this functionality will not work.

Mobile device users can optionally disable the use of the microphones on a per-app basis. This can be done on the iPhone or iPad from *Settings » Privacy & Security » Microphone*.

5.6.6.3 Mobile device administrators

The mobile device administrator can optionally disallow camera use across the mobile device by using the key *allowCamera* in the Restrictions Payload.

The mobile device administrator can optionally disallow camera use on a per-app basis using the key *Camera* in the Privacy Preferences Policy Control Payload.

The mobile device administrator can optionally disallow microphone use on a per-app basis using the key *Microphone* in the Privacy Preferences Policy Control Payload.

Refer to [DEV_MAN] for more information.

5.6.7 Enable/Disable Cellular, Wi-Fi, Wi-Fi Hotspot, Bluetooth, NFC, UWB, Satellite

5.6.7.1 General information

The devices contain a variety of radios that can be configured by the users or administrators according to the organization’s policy.

5.6.7.2 Mobile device users

Mobile device users can enable/disable cellular by following instructions provided in the following documents and sections. (Sections 11.21 and 11.22 contain the screenshots from these documents.)

[iPhone_UG]: “Safety, handling, and support” → “View or change cellular data settings on iPhone”

[iPad_UG]: “Safety, handling, and support” → “View or change cellular data settings on iPad (Wi-Fi + Cellular models)”

Mobile device users can enable/disable Bluetooth by following the instructions provided in the following documents and sections. (Sections 11.3 and 11.4 contain screenshots from these documents.)

[iPhone_UG]: “Accessories” → “Set up and use Bluetooth accessories on iPhone”

[iPad_UG]: “Accessories” → “Set up and use Bluetooth accessories on iPad”

Further information on enabling and disabling Bluetooth can be found in [BLUETOOTH_HELP].

Mobile device users can enable/disable Wi-Fi by following the instructions provided in the following documents and sections. (Sections 11.23 and 11.24 contain the screenshots from these documents.)

[iPhone_UG]: “Set up and get started” → “Connect iPhone to the internet”

[iPad_UG]: “Set up and get started” → “Connect iPad to the internet”

Mobile device users can enable/disable Wi-Fi hotspot by following the instructions provided in the following documents and sections. (Sections 11.25 and 11.26 contain the screenshots from these documents.)

[iPhone_UG]: "Use iPhone with iPad, iPod touch, Mac, and PC" → "Share your internet connection from iPhone"

[iPad_UG]: "Use iPad with iPhone, iPod touch, Mac, and PC" → "Share your internet connection from iPad (Wi-Fi + Cellular)"

NFC will be disabled if there are no passes and no payment cards including credit/debit cards or Apple Cash stored in the Apple Wallet application and there are no third-party applications with NFC functionality installed on the device. Passes are stored data representing physical cards such as boarding passes and credit cards. When the mobile user adds a pass, a credit/debit card, Apple Cash, or installs an application with NFC capabilities, NFC is automatically activated. The mobile device administrator is able to disable NFC using a Configuration Profile key; see section 5.6.7.3 for details.

Instructions for adding passes are located in [PAY_SETUP]. Instructions for removing passes are located in [MANAGE_CARDS].

Mobile device users can enable/disable Ultra Wideband (UWB) communications by following the instructions provided in the following document and section. (Section 11.27 contains the screenshots from these documents.)

[iPhone_UG]: "Safety, handling, and support" → "Ultra Wideband information"

Only the following iPhone models possess UWB communication chips; iPads do not have UWB chips.

- iPhone 11, iPhone 11 Pro, iPhone 11 Pro Max
- iPhone 12 mini, iPhone 12, iPhone 12 Pro, iPhone 12 Pro Max
- iPhone 13 mini, iPhone 13, iPhone 13 Pro, iPhone 13 Pro Max

To disable only the UWB functionality while maintaining cellular and Wi-Fi functions, mobile device users should turn off "Location for Networking & Wireless" by navigating on the device to *Settings » Privacy & Security » Location Services » System Services* and setting the "Networking and Wireless" toggle to the OFF position, then, at the prompt, confirm by selecting "Turn Off."

Mobile device users can enable/disable the Emergency SOS satellite functionality on devices that support this functionality by enabling/disabling Airplane Mode under *Settings » Airplane Mode*. This functionality is an emergency-use-only communications system with extremely low bandwidth and cannot be used as a normal communication channel.

5.6.7.3Mobile device administrators

The mobile device administrator can optionally restrict the mobile device from using cellular data by specifying the Network Usage Rules Payload key *AllowCellularData* to 'false'.

The mobile device administrator can optionally restrict the mobile device user from modifying any cellular data settings by using the Restrictions Payload key: *allowAppCellularDataModification*

The mobile device administrator can optionally enable/disable the ability of the mobile device user to modify Bluetooth settings by using the following Restrictions Payload key: *allowBluetoothModification*

The mobile device administrator can optionally enable/disable Wi-Fi hotspot functionality by using the *IsHotspot* key in the Wi-Fi Payload.

Wi-Fi can effectively be enabled/disabled by an administrator setting the Restrictions Payload key *forceWiFiToAllowedNetworksOnly.*

The mobile device administrator can specify the allowed SSID of the Wi-Fi network that the iOS/iPadOS device can connect to by using the *SSID_STR* Configuration Profile key in the Wi-Fi Payload. To use this method of specifying SSIDs, the *DomainName* key in the Wi-Fi Payload must not be set.

The mobile device administrator can optionally enable/disable NFC by using the following Restrictions Payload key: *allowNFC*. If set to 'false', this will disable NFC. This requires a supervised device.

NFC can also be disabled by not having any passes stored in the Apple Wallet application, having no credit/debit payment cards or Apple Cash stored in the application and by not having any third-party applications with NFC capabilities on the device. Passes are stored data representing physical cards such as boarding passes. If there are no passes stored and no credit/debit payment cards or Apple Cash, the mobile device administrator can disable the Wallet application using the Restrictions payload key *blockedAppBundleIDs* with a string array containing the "com.apple.Passbook" bundle ID value. If the Wallet application is not disabled, the mobile device user can add a pass and enable NFC.

Refer to [DEV_MAN] for more information.

5.6.8 Enable/Disable Location Services

5.6.8.1 General information

Additional information on enabling and disabling location services can be found in [DEV_MAN].

5.6.8.2 Mobile device users

Device users can enable/disable location services by following the instructions provided in the following documents and sections. (Sections 11.28 and 11.29 contain the screenshots from these documents.)

[iPhone_UG]: "Security and privacy" → "Privacy protections on iPhone" → "Control the location information you share on iPhone"

[iPad_UG]: "Security and privacy" → "Privacy protections on iPad" → "Control the location information you share on iPad"

5.6.8.3 Mobile device administrators

The mobile device administrator can enable/disable location services during initial setup of the mobile device. This can occur after a device wipe or when setting up the device for the first time. Setting the *skip_setup_items* key to 'Location' causes the Setup Assistant to skip the Location Services screens. By skipping these screens, Location Services will not be set up.

More information can be found in [DeployRef] and [DEV_MAN].

5.6.9 Enable/Disable iCloud Drive Documents and Data

5.6.9.1 General information

The devices have the functionality to upload files to iCloud. In the evaluated configuration, this functionality must be disabled.

Additional information on this setting can be found in [DEV_MAN] and in the following documents and section. (Sections 11.30 and 11.31 contain the screenshots from these documents.)

[iPhone_UG]: "Files" → "Set up iCloud Drive on iPhone"

[iPad_UG]: "Files" → "Set up iCloud Drive on iPad"

5.6.9.2 Mobile device users

In the evaluated configuration, the mobile device user is not allowed to configure the iCloud Drive Documents and Data functionality.

5.6.9.3 Mobile device administrators

It is mandatory that the mobile device administrator disable iCloud Drive Documents and Data during initial setup of the device. Using the Restrictions Payload, the *allowCloudDocumentSync* key should be used to disable this on a supervised device. The following table provides additional details about these keys.

Table 17: Restrict iCloud Data Key Details

Payload	Key	Description
Restrictions	*allowCloudDocumentSync*	Should be set to 'false'. This disables document and key-value syncing to iCloud.

Additional information on these settings can be found in [DEV_MAN].

5.6.10 Secure Software Updates

5.6.10.1 General information

The mobile device startup process helps ensure that only Apple-signed code can be installed on a device. To prevent devices from being downgraded to older versions that lack the latest security updates, iOS/iPadOS uses a process called System Software Authorization. If downgrades were possible, an attacker who gains possession of a device could install an older version of iOS/iPadOS and exploit a vulnerability that has been fixed in the newer version.

Software updates to the mobile devices are released regularly to address emerging security concerns and also provide new features; these updates are provided for all supported devices simultaneously. A request is sent to the mobile device to pull the update from the servers. Updates are delivered wirelessly, encouraging rapid adoption of the latest security fixes, as well as downloadable through the iTunes and Finder applications.

Mobile device users receive iOS/iPadOS update notifications on the mobile device, through Finder on macOS versions 10.13.0 (High Sierra) and higher, or through iTunes on macOS versions prior to 10.15.0 (Catalina) and on PCs. Note that the iTunes application is not available on macOS versions 10.15.0 and higher. The mobile device user is notified of the availability of the update upon connection of the device via a USB cable.

iOS/iPadOS software updates can be installed automatically (if the Software 'Automatic Updates' Settings are turned ON in *Settings » General » Software Update » Automatic Updates* on the device) or manually using over-the-air (OTA) on the device. Software updates may also be installed manually using Finder on macOS versions 10.13.0 (High Sierra) and higher or manually using iTunes on macOS versions prior to 10.15.0 (Catalina) and on PCs. A USB connection between the computer and the device is necessary to perform updates using Finder or iTunes.

With Finder or iTunes, a full copy of iOS/iPadOS is downloaded and installed. OTA software updates download only the components required to complete an update, rather than downloading the entire OS, improving network efficiency. Additionally, software updates can be cached on a local network server running the caching service on macOS Server so that iOS/iPadOS devices do not need to access Apple servers to obtain the necessary update data. Software updates may also be cached on a standard macOS system using the built-in Caching Service, which can be found in *System Settings » Sharing » Content* Caching (note that earlier versions of macOS use the term *System Preferences)*. More information about content caching on macOS can be found in [CONTENT-CACHING].

All iOS/iPadOS updates are digitally signed by Apple. The user can verify the software version installed on the mobile devices. Refer to section 4.2.2 Verifying the device(s) for more information.

More info about iOS/iPadOS application and system security as well as encryption and data protection can be found in [AP_SEC].

5.6.10.2 Mobile device users

The integrity and authenticity of software updates is ensured by the design of iOS/iPadOS. There is no configuration for a device user to change that. Mobile device users can update iOS/iPadOS software on their device. Additional information can be found in the following documents and sections. (Sections 11.32 and 11.33 contain the screenshots from these documents.)

[iPhone_UG]:	"Restart, update, reset, and restore" → "Update iOS on iPhone"
[iPad_UG]:	"Restart, update, reset, and restore" → "Update iPadOS"

5.6.10.3 Mobile device administrators

The integrity and authenticity of software updates is ensured by the design of iOS/iPadOS. There is no configuration for a device administrator to change that.

Mobile device administrators can delay iOS/iPadOS software updates by setting the *forceDelayedSoftwareUpdates* and *enforcedSoftwareUpdateDelay* keys in the Restrictions Payload. More information can be found in document and section.

[DEV_MAN]:	"Profile-Specific Payload Keys" → "Restrictions"

5.6.11 Enable/Disable Remote Backup

5.6.11.1 General information

The devices have the functionality to back up remotely to iCloud. In the evaluated configuration, this functionality must be disabled.

Backups are done using iCloud on the device or by connecting the device to a computer using a USB cable and using Finder on macOS versions 10.15.0 (Catalina) and higher or using iTunes on macOS versions prior to 10.15.0 and on PCs. Note that the iTunes application is not available on macOS versions 10.15.0 and higher.

If backup is enabled, iCloud automatically backs up a device daily when the device is connected to power, locked, and on Wi-Fi. In the evaluated configuration, backups to iCloud are not allowed and must be restricted by the mobile device administrator using a configuration profile. This does not restrict mobile device users from backing up a device to a Mac or PC, which is allowed in the evaluated configuration.

Users can also sync their iTunes content on computers supporting iTunes to their iPhone/iPad.

5.6.11.2 Mobile device users

Device users can disable remote backup to iCloud or enable backup to a Mac or PC by following the instructions provided in the following documents and sections. (Sections 11.34 and 11.35 contain the screenshots from these documents.)

[iPhone_UG]:	"Restart, update, reset, and restore" → "Back up iPhone"
[iPad_UG]:	"Restart, update, reset, and restore" → "Back up iPad"

Mobile device users should note that backup to a Mac or PC is done by connecting the device to a computer using a USB cable and using Finder on macOS versions 10.15.0 (Catalina) and higher or using iTunes on macOS versions prior to 10.15.0 and on PCs. Note that the iTunes application is not available on macOS versions 10.15.0 and higher.

5.6.11.3 Mobile device administrators

In the evaluated configuration, administrators must disable remote backup for the mobile device to iCloud by setting the *allowCloudBackup* key to 'false' in the Restrictions Payload.

This does not restrict mobile device users from backing up a device to a Mac or PC, which is allowed in the evaluated configuration.

Additional information on these settings can be found in [DEV_MAN], and example Configuration Profiles can be found in Appendix A: Configuration Profiles.

5.6.12 Configure Application Installation Policy

5.6.12.1 General information

Apple recommends that MDM is used to manage applications for an enterprise. MDM can be used to help users install enterprise apps.

5.6.12.2 Mobile device users

In the evaluated configuration, mobile device users cannot change the application installation policy.

5.6.12.3 Mobile device administrators

It is mandatory that mobile device administrators configure an application installation policy.

This is accomplished by setting *allowAppInstallation* to ‘false’ in the Restrictions Payload, which means that the App Store is disabled. Mobile device users are unable to install or update their applications.

5.6.13 Importing keys/ shared secrets

5.6.13.1 General information

It is mandatory that keys can be imported and destroyed on the mobile devices by the mobile device administrators.

All keys/secrets are automatically stored in secure key storage.

5.6.13.2 Mobile device users

In the evaluated configuration, mobile device users cannot import and destroy keys/secrets.

5.6.13.3 Mobile device administrators

Mobile device administrators can import keys/secrets into the secure key storage by specifying the value when using dictionary keys that are associated with keys/secrets.

5.6.14 Dictionary Keys for Management Functions

Table 18: Essential keys for Management functions

Payload	Key	Description
Cameras and Microphones		
Restrictions	*allowCamera*	If set to ‘false’, it will completely disable the cameras.
Privacy Preferences Policy Control	*Camera*	Provides the array of bundle IDs/binary installation path that is not allowed to use the camera.
Privacy Preferences Policy Control	*Microphone*	Provides the array of bundle IDs/binary installation path that is not allowed to use the microphone.
Access Banner		
Restrictions	*allowWallpaperModification*	Must be ‘false’.
Date and Time		
Restrictions	*forceAutomaticDateAndTime*	Must be ‘true’.

6 Security Audit

6.1 Audit Logging

iOS/iPadOS logging capabilities collect a wide array of information concerning device usage and configuration. The available commands and responses constitute audit records and must be configured by administrators using Configuration Profiles. The details for profile implementation and audit record collection are located in [DEV_MAN], [PROFS_LOGS], and [LOGGING].

Each audit record, at a minimum, contains the following:

- Date and time of the event
- Type of event (this is described as log level and log tag)
- Subject identity (this is described as PID and PPID)
- The outcome (success or failure) of the event
- Any applicable required additional information

Each field of the example log below corresponds with the above format.

Table 19: Example Audit Log

Date and Time	Type of event	Subject identity	The outcome
Dec 10 15:22:29.546196	<Error>:	iPadAir2 neagent[446]	Certificate authentication data could not be verified. Failed to process IKE Auth packet.

The following tables list the auditable events for the required SFRs and provide example audit records.

Table 20: Mandatory Auditable Events (MDF)

SFR from (MDF) specified in the ST	Auditable events	Additional audit record contents	Example of audit records
FAU_GEN.1	Start-up and shutdown of the audit functions	No additional information.	Dec 5 11:34:58 iPadAir2 mdmd(libdyld.dylib)[6307] <Notice>: mdmd starting… Dec 5 11:39:19 iPadAir2 mdmd(libdyld.dylib)[6314] <Notice>: mdmd preparing to stop.
	All auditable events for the not selected level of audit	No additional information.	Dec 5 11:34:58 iPadAir2 mdmd(libdyld.dylib)[6307] <Notice>: mdmd starting…

SFR from (MDF) specified in the ST	Auditable events	Additional audit record contents	Example of audit records
	All administrative actions	No additional information.	Dec 5 12:30:48 iPadAir2 dmd[3038] <Notice>: Received request: <DMFInstallProfileRequest: 0x100c207f0>, from client: <CATTaskSession: 0x100c2f620 { state = Connected, session = BCD262D5-C3B1-4E1F-879C-900ADAFC490E, transport = <CATXPCTransport: 0x100c375b0 { state = Connected }> }>
	Start-up and shutdown of the OS	No additional information.	Apr 27 14:39:22 iPad SpringBoard(SpringBoard)[57] <Notice>: Shutdown requested for with context: <SBShutdownContext:0x282a38940 - reason:'Powerdown UI'; fromUserPowerDown:YES> Apr 27 14:39:22 iPad SpringBoard(FrontBoard)[57] <Notice>: [com.apple.Preferences] Executing termination for reason shutting down system with request: <FBSProcessTerminationRequest: 0x283f717c0; label: "Shutdown (<SBShutdownContext:0x282a38940 - reason:'Powerdown UI'; fromUserPowerDown:YES>)"; exceptionCode: "Force Quit (0xFBFBFBFB)"; performGracefully: YES; reportType: (none); explanation: "Shutdown (<SBShutdownContext:0x282a38940 - reason:'Powerdown UI'; fromUserPowerDown:YES>)"> Apr 27 14:39:22 iPad CommCenter(IMFoundation)[80] <Notice>: IMSystemMonitor: Updating to note that system is currently shutting down Apr 27 14:39:22 iPad rapportd(IMFoundation)[76] <Notice>: IMSystemMonitor: Received IMSystemMonitorSBShutdownCallback Apr 27 14:39:22 iPad rapportd(IMFoundation)[76] <Notice>: IMSystemMonitor: Updating to note that system is currently shutting down Apr 27 14:39:22 iPad contextstored(CoreDuet)[56] <Notice>: Got shutdown notification com.apple.springboard.deviceWillShutDown

SFR from (MDF) specified in the ST	Auditable events	Additional audit record contents	Example of audit records
			Apr 27 14:39:22 iPad contextstored(CoreDuet)[56] <Notice>: Calling shutdown handler for monitor <private>. Apr 27 14:39:22 iPad SpringBoard(RunningBoardServices)[57] <Notice>: Firing exit handlers for 190 with context <RBSProcessExitContext; specific: <RBSProcessExitStatus; domain: frontboard (10); code: 0xfbfbfbfb>; terminationContext: <RBSTerminateContext: 0x2831c9540; domain: 10; code: 0xFBFBFBFB; explanation: "Shutdown (<SBShutdownContext:0x282a38940 - reason:'Powerdown UI'; fromUserPowerDown:YES>)
	Insertion or removal of removable media	No additional information	default 02:40:02.471883-0700 livefileproviderd ReallyMountVolume: Enter on behalf of process 2102 for provider com.apple.filesystems.UserFS.FileProvider mounting: /private/var/mobile/Library/LiveFiles/com.apple.filesystems.userfsd/Thumb default 02:40:53.494457-0700 livefileproviderd Unmounting /private/var/mobile/Library/LiveFiles/com.apple.filesystems.userfsd/Thumb how 03 on behalf of pid 2102
FCS_STG_EXT.1	Import or key destruction	Identity of key. Role and identity of requestor.	49506633: AKS unwrap_media_key_from_class succeeded for tag = 7 49506633: aks_migrate_SEPUUID2b_to_classM_key() succeeded for AES, container = /dev/disk0s1 49506633: AKS unwrap_media_key_from_class succeeded for tag = 7 apfs_meta_crypto_state_unwrap:980: got key for volume 2F29025D-A75E-40CE-9EFE-61A6B8848880 apfs_device_locked:3837: apfs Data is now UN-locked! (flags 0x40)
FCS_STG_EXT.3	Failure to verify integrity of stored key.	Identity of key being verified.	apfs_unwrap_key:1263: AKS unwrap_key failed, error = e00002e2

SFR from (MDF) specified in the ST	Auditable events	Additional audit record contents	Example of audit records
FDP_DAR_EXT.1	Failure to encrypt/decrypt data.	No additional information.	Sep 25 09:19:38 iPad securityd[96] <Notice>: ks_encrypt_data (db): failed: AppleKeyStore: operation failed (pid: 156 sel: 17 ret: e00002c2 '-536870206')
FDP_DAR_EXT.2	Failure to encrypt/decrypt data.	No additional information.	Sep 25 09:19:38 iPad securityd[96] <Notice>: ks_encrypt_data (db): failed: AppleKeyStore: operation failed (pid: 156 sel: 17 ret: e00002c2 '-536870206')
FDP_STG_EXT.1	Addition or removal of certificate from Trust Anchor Database	Subject name of certificate	May 13 13:40:22 iPad mc_mobile_tunnel(MDM)[4225] <Notice>: Attempting to perform Supervised request: RemoveProfile May 13 13:40:22 iPad profiled[97] <Notice>: Removing profile \M-b\M^@\M^\Testers-MacBook-Air.local.D3DACE3B-FD7E-489B-B20C-FC89E076C028\M-b\M^@\M^]... May 13 13:40:22 iPad profiled[97] <Notice>: Committing restrictions.
FIA_X509_EXT.1	Failure to validate x.509v3 certificate	Reason for failure of validation	default 14:49:33.115596+0200 nsurlsessiond boringssl_session_handshake_incomplete(191) [C5.1:2][0x10119f090] Early handshake return caused by SSL_ERROR_WANT_CERTIFICATE_VERIFY [16]
FPT_TST_EXT.1	Initiation of self-test	No additional information.	SEP: SEP: FIPS POST begin SEP: FIPSPOST_L4 fipspost_post:109: PASSED: (2 ms) - fipspost_post_integrity SEP: sks: FIPS POST Succeeded
	Failure of self-test	No additional information.	fipspost_post fipspost_post_integrity -POST_FAILURE: 0xFFFFFFFF
FPT_TST_EXT.2/ PREKERNEL	Start-up of TOE	No additional information.	Darwin Kernel Version 19.0.0: Wed Oct 9 22:37:47 PDT 2019; root:xnu_development-6153.42.1~1/DEVELOPMENT_ARM64_T8010 iBoot version: iBoot-5540.40.51

Table 21: Auditable Events (WLAN)

SFR from (WLAN) specified in the ST	Auditable events	Additional audit record contents	Example of audit records
FCS_TLSC_EXT.1/ WLAN	Failure to establish an EAP-TLS session.	Reason for failure. Non-TOE device endpoint connection.	May 13 15:28:40 iPad wifid(WiFiPolicy)[45] <Notice>: {ASSOC+} Attempting Apple80211AssociateAsync May 13 15:28:40 iPad wifid(WiFiPolicy)[45] <Notice>: Attempting to join EAP network: test May 13 15:28:41 iPad wifid(WiFiPolicy)[45] <Notice>: {ASSOC*} Completed Apple80211AssociateAsync (-3905 - 0xFFFFF0BF) May 13 15:28:41 iPad wifid(WiFiPolicy)[45] <Error>: {ASSOC-} Failed to join(-3905 - 0xFFFFF0BF): test
	Establishment/ termination of an EAP-TLS session.	Reason for failure. Non-TOE device endpoint connection.	May 13 15:28:40 iPad wifid(WiFiPolicy)[45] <Notice>: {ASSOC+} Attempting Apple80211AssociateAsync May 13 15:28:40 iPad wifid(WiFiPolicy)[45] <Notice>: Attempting to join EAP network: test May 13 15:28:41 iPad wifid(WiFiPolicy)[45] <Notice>: {ASSOC*} Completed Apple80211AssociateAsync (-3905 - 0xFFFFF0BF) May 13 15:28:41 iPad wifid(WiFiPolicy)[45] <Error>: {ASSOC-} Failed to join(-3905 - 0xFFFFF0BF): test
FIA_X509_EXT.1/ WLAN	Failure to validate x.509v3 certificate	Reason for failure of validation	default 14:49:33.115596+0200 nsurlsessiond boringssl_session_handshake_incomplete(191) [C5.1:2][0x10119f090] Early handshake return caused by SSL_ERROR_WANT_CERTIFICATE_VERIFY [16]
FPT_TST_EXT.3/WLAN	Execution of this set of TSF self-test.	No additional information.	corecrypto_kext_start called: tracing enabled

SFR from (WLAN) specified in the ST	Auditable events	Additional audit record contents	Example of audit records
			FIPSPOST_KEXT fipspost_post:109: PASSED: (0 ms) - fipspost_post_integrity FIPSPOST_KEXT fipspost_post:115: PASSED: (0 ms) - fipspost_post_hmac FIPSPOST_KEXT fipspost_post:117: PASSED: (0 ms) - fipspost_post_aes_ecb FIPSPOST_KEXT fipspost_post:118: PASSED: (0 ms) - fipspost_post_aes_cbc FIPSPOST_KEXT fipspost_post:119: PASSED: (0 ms) - fipspost_post_aes_gcm FIPSPOST_KEXT fipspost_post:120: PASSED: (0 ms) - fipspost_post_aes_xts FIPSPOST_KEXT fipspost_post:121: PASSED: (0 ms) - fipspost_post_tdes_cbc FIPSPOST_KEXT fipspost_post:125: PASSED: (39 ms) - fipspost_post_rsa_sig FIPSPOST_KEXT fipspost_post:126: PASSED: (9 ms) - fipspost_post_ecdsa FIPSPOST_KEXT fipspost_post:127: PASSED: (2 ms) - fipspost_post_ecdh FIPSPOST_KEXT fipspost_post:128: PASSED: (0 ms) - fipspost_post_drbg_ctr FIPSPOST_KEXT fipspost_post:129: PASSED: (0 ms) - fipspost_post_drbg_hmac FIPSPOST_KEXT fipspost_post:136: all tests PASSED (129 ms)
FTA_WSE_EXT.1	All attempts to connect to access points.	For each access point record the Complete SSID and MAC of the MAC Address. Success	SSID and MAC address records: default 17:47:01.890053-0800 wifid [corewifi] BEGIN REQ [GET KNOWN NETWORK MATCHING SCAN RESULT] (pid=311 proc=Preferences service=com.company.corewifi.internal -xpc intf=(null) uuid=CD90C info={ ScanResult = "testNet -

SFR from (WLAN) specified in the ST	Auditable events	Additional audit record contents	Example of audit records
		and failures (including reason for failure).	ssid=4465774e6574, bssid=58:96:30:91:5b:fd, security=wpa2-personal, channel=[5g157/80 (0x410)], cc=US, phy=a (0x2), rssi=-46, rsn=[mcast=aes_ccm, bip=none, ucast={ aes_ccm }, auths={ psk }, mfp=no, caps=0xC], wpa=(null), wapi=no, wep=no, ibss=no, ph=no, swap=no, hs20=no, age=116ms, match=[(null)]";}) Success: May 13 15:28:40 iPad wifid(WiFiPolicy)[45] <Notice>: {ASSOC+} Attempting Apple80211AssociateAsync May 13 15:28:40 iPad wifid(WiFiPolicy)[45] <Notice>: Attempting to join EAP network: test May 13 15:28:41 iPad wifid(WiFiPolicy)[45] <Notice>: {ASSOC*} Completed Apple80211AssociateAsync (-3905 - 0xFFFFF0BF) Failure: May 13 15:28:41 iPad wifid(WiFiPolicy)[45] <Error>: {ASSOC-} Failed to join(-3905 - 0xFFFFF0BF): test
FTP_ITC.1/WLAN	All attempts to establish a trusted channel.	Identification of the non-TOE device endpoint of the channel.	Apr 27 15:36:58 iPad wifid(WiFiPolicy)[45] <Notice>: {ASSOC+} Attempting Apple80211AssociateAsync Apr 27 15:36:58 iPad wifid(WiFiPolicy)[45] <Notice>: Attempting to join WPA network: test Apr 27 15:36:59 iPad wifid(WiFiPolicy)[45] <Notice>: {ASSOC*} Completed Apple80211AssociateAsync (0 - 0x0) Apr 27 15:36:59 iPad wifid(WiFiPolicy)[45] <Notice>: {ASSOC-} Joined: test

Table 22: Auditable Events (Agent)

SFR from (AGENT) specified in the ST	Auditable events	Additional audit record contents	Example of audit records
FAU_ALT_EXT.2	Success/failure of sending alert.	No additional information.	Success: 15:20:20.164655-0500 default profiled Beginning profile installation for com.apple.config.mdm01.cc.atsec.us.mdm profiled com.apple.ManagedConfiguration 15:20:56.320020-0500 default profiled Profile "com.apple.config.mdm01.cc.atsec.us.mdm" installed. Profiled com.apple.ManagedConfiguration 13:30:52.778054-0500 default mdmd Accepted new connection. MDM mdmd 13:30:45.799798-0500 default profiled Sending MDM settings changed notification. Failure: 11:50:29.527861-0500 error profiled Cannot Check Out. Error: NSError: Desc : The Internet connection appears to be offline. Domain : NSURLErrorDomain Code : -1009 Type : DMCFatalError MDMClientLibrary com.apple.devicemanagementclient
FAU_GEN.1(2)	Start-up and shutdown of the MDM Agent	No additional information.	Dec 5 11:34:58 iPadAir2 mdmd(libdyld.dylib)[6307] <Notice>: mdmd starting… Dec 5 11:39:19 iPadAir2 mdmd(libdyld.dylib)[6314] <Notice>: mdmd preparing to stop.
	MDM policy updated.	No additional information.	May 13 14:10:46 iPad profiled[97] <Notice>: Profile \M-b\M^@\M^\Tester-MacBook-Air.local.D3DACE3B-FD7E-489B-B20C-FC89E076C028\M-b\M^@\M^] is replacing an existing profile having the same identifier.
	Any modification commanded by the MDM Server	No additional information.	default 15:05:35.071156+0200 mdmd Received push notification.
FAU_SEL.1(2)	All modifications to the audit configuration that		May 13 14:40:22 iPad profiled[97] <Notice>: Profile \M-b\M^@\M^\Tester-MacBook-Air.local.D3DACE3B-FD7E-

SFR from (AGENT) specified in the ST	Auditable events	Additional audit record contents	Example of audit records
	occur while the audit collection functions are operating.	No additional information.	489B-B20C-FC89E076C028\M-b\M^@\M^] removed.
			May 13 13:40:22 iPad mc_mobile_tunnel(MDM)[4225] <Notice>: Attempting to perform Supervised request: RemoveProfile May 13 14:10:22 iPad mc_mobile_tunnel(MDM)[4225] <Notice>: Handling request type: RemoveProfile
			May 13 13:40:22 iPad mc_mobile_tunnel(MDM)[4225] <Notice>: Attempting to perform Supervised request: RemoveProfile May 13 13:40:22 iPad profiled[97] <Notice>: Removing profile \M-b\M^@\M^\Tester-MacBook-Air.local.D3DACE3B-FD7E-489B-B20C-FC89E076C028\M-b\M^@\M^]… May 13 13:40:22 iPad profiled[97] <Notice>: Committing restrictions.
FCS_TLSC_EXT.1	Failure to establish a TLS session	Reason for failure.	May 13 15:28:40 iPad wifid(WiFiPolicy)[45] <Notice>: {ASSOC+} Attempting Apple80211AssociateAsync May 13 15:28:40 iPad wifid(WiFiPolicy)[45] <Notice>: Attempting to join EAP network: test May 13 15:28:41 iPad wifid(WiFiPolicy)[45] <Notice>: {ASSOC*} Completed Apple80211AssociateAsync (-3905 - 0xFFFFF0BF) May 13 15:28:41 iPad wifid(WiFiPolicy)[45] <Error>: {ASSOC-} Failed to join(-3905 - 0xFFFFF0BF): test
	Failure to verify presented identifier	Presented identifier and reference identifier.	May 13 15:28:40 iPad wifid(WiFiPolicy)[45] <Notice>: {ASSOC+} Attempting Apple80211AssociateAsync May 13 15:28:40 iPad wifid(WiFiPolicy)[45] <Notice>: Attempting to join EAP network: test May 13 15:28:41 iPad wifid(WiFiPolicy)[45] <Notice>: {ASSOC*} Completed

SFR from (AGENT) specified in the ST	Auditable events	Additional audit record contents	Example of audit records
			Apple80211AssociateAsync (-3905 - 0xFFFFF0BF) May 13 15:28:41 iPad wifid(WiFiPolicy)[45] <Error>: {ASSOC-} Failed to join(-3905 - 0xFFFFF0BF): test
	Establishment/termination of a TLS session.	Non-TOE device endpoint of connection.	May 13 15:28:09 iPad nsurlsessiond(CFNetwork)[162] <Notice>: Connection 571: enabling TLS
FIA_ENR_EXT.2	Enrollment in management	Reference identifier of MDM Server.	default 14:09:39.308624+0200 profiled Checking for MDM installation... default 14:09:39.312514+0200 profiled ...finished checking for MDM installation. default 14:09:39.318516+0200 profiled Beginning profile installation... default 14:09:39.318710+0200 profiled Beginning profile installation for com.apple.config.osxserver.atsec.com.mdm default 14:09:39.321386+0200 profiled Profile “com.apple.config.osxserver.atsec.com.mdm” is replacing an existing profile having the same identifier. default 14:09:39.346118+0200 profiled Refreshing MDM details. Default 14:09:39.346309+0200 profiled No MDM installation found.
FMT_POL_EXT.2	Failure of policy validation.	Reason for failure of validation.	error 17:13:20.765096+0200 wifid {ASSOC-} Failed to join(-369033199 - 0xEA010011): test default 15:19:57.113029+0200 wifid {AUTOJOIN, ASSOC*} Failed to associate with test, reason -369033199
FMT_SMF_EXT.4	Outcome (Success/failure) of function.	No additional information.	default 15:05:35.071156+0200 mdmd Received push notification.
FMT_UNR_EXT.1	Attempt to unenroll	No additional information.	Default 19:43:43.048171-0800 Preferences _didHideAlertController: <UIAlertController: 0x10a025600> title="Remove Management" message="Removing your iPad from

SFR from (AGENT) specified in the ST	Auditable events	Additional audit record contents	Example of audit records
			management will delete 14 apps and their data." Default 19:43:43.096961-0800 profiled Removing profile “00000000-0000-0000-A000-4A414D460003” on behalf of “com.apple.Preferences”…
FTP_ITC_EXT.1(2)	Initiation and termination of trusted channel.	Trusted channel protocol. Non-TOE device endpoint of connection.	Apr 27 15:36:58 iPad wifid(WiFiPolicy)[45] <Notice>: {ASSOC+} Attempting Apple80211AssociateAsync Apr 27 15:36:58 iPad wifid(WiFiPolicy)[45] <Notice>: Attempting to join WPA network: test Apr 27 15:36:59 iPad wifid(WiFiPolicy)[45] <Notice>: {ASSOC*} Completed Apple80211AssociateAsync (0 - 0x0) Apr 27 15:36:59 iPad wifid(WiFiPolicy)[45] <Notice>: {ASSOC-} Joined: test

Table 23: Auditable Events (BT)

SFR from {BT} specified in the ST	Auditable events	Additional audit record contents	Example of audit records
FAU_GEN.1.1/BT	Start-up and shutdown of the audit functions	No additional information.	Dec 5 11:34:58 iPadAir2 mdmd(libdyld.dylib)[6307] <Notice>: mdmd starting… Dec 5 11:39:19 iPadAir2 mdmd(libdyld.dylib)[6314] <Notice>: mdmd preparing to stop.
FIA_BLT_EXT.1	Failed user authorization of Bluetooth device.	User authorization decision (e.g., user-rejected connection, incorrect pin entry).	default 08:55:22.471374-0600 bluetoothd Session "com.apple.Preferences-MBF-419-0-unique-id-com.apple.Preferences-419" is asking to disconnect device " Test-Lab-System1" Decision: default 08:56:35.373472-0600 bluetoothd Rejecting SSP request for device 744DD52B
	Failed user authorization for local Bluetooth Service.	Bluetooth address and name of device. Bluetooth profile. Identity of	default 08:53:41.365190-0600 bluetoothd Device found: CBDevice 9D6E9A89-6C27-273D-1295-B73EC2FDF868, BDA 7C:7A:91:E3:B1:00, Nm ‘Test-Lab-System1', PID 0x0246 (?), VID 0x1D6B, VS 2, DsF 0x800000 < Pairing >, DvF 0x54000 < ClsP HIDG UsrC >, DvT LaptopComputer, RSSI -57, Color 0, FV

SFR from {BT} specified in the ST	Auditable events	Additional audit record contents	Example of audit records

		local service with service ID.	'5.3.12', MicM Auto, Plcm M Enabled, srMd Disabled, CF 0x80000000000 < Attr >
			Local device ID:
			default 08:50:11.358071-0600 cloudpaird Successfully sending message {
			MessageType = CloudPairing;
			"Version 1" = {
			DeviceName = "iPhone-A14_updated";
			EncryptionType = Basic;
			MessageType = PairingRequest;
			PublicAddress = "8C:EC:7B:06:16:D5";
			RequestedKeyLength = 16;
			RequestedKeyType = (
			EncryptionKeys,
			IdentityKeys);};
			"Version 2" = {
			DeviceName = "iPhone-A14_updated";
			EncryptionType = ECDH;
			MessageType = InitiatorPairingKeys;
			PublicAddress = "8C:EC:7B:06:16:D5";
			RequestedKeyLength = 16;
			RequestedKeyType = (
			PublicKeys,
			IdentityKeys);
			RequestedKeys = {
			CloudNonce = {length = 16, bytes = 0xfd0dab7cea305af21fb7d8b7f86fe1a2};
			CloudPublicKey = {length = 64, bytes = 0x27b6adf0 8b2b90ab cb344a1b 07b43042 ... f879146b 2e6b2adf };
			IRK = {length = 16, bytes = 0xcd318d659b7febadf7f50c3623e86ac4};};
			TimeStamp = 751850567329;};
			"Version 3" = {
			DeviceName = "iPhone-A14_updated";
			EncryptionType = ECDH;
			MessageType = InitiatorPairingKeys;
			PublicAddress = "8C:EC:7B:06:16:D5";
			RequestedKeyLength = 16;
			RequestedKeyType = (
			PublicKeys,
			IdentityKeys);
			RequestedKeys = {
			CloudNonce = {length = 16, bytes = 0xfd0dab7cea305af21fb7d8b7f86fe1a2};
			CloudPublicKey = {length = 64, bytes = 0x27b6adf0 8b2b90ab cb344a1b 07b43042 ... f879146b 2e6b2adf };
			IRK = {length = 16, bytes = 0xcd318d659b7febadf7f50c3623e86ac4};};

SFR from {BT} specified in the ST	Auditable events	Additional audit record contents	Example of audit records
			TimeStamp = 751850567329;};}
FIA_BLT_EXT.2	Initiation of Bluetooth connection.	Bluetooth address and name of device.	default 08:54:05.557719-0600 bluetoothd Session "com.apple.Preferences-MBF-419-83-unique-idcom.apple.Preferences-419" is asking to connect device "Test-Lab-System1" default 08:53:41.365190-0600 bluetoothd Device found: CBDevice 9D6E9A89-6C27-273D-1295-B73EC2FDF868, BDA 7C:7A:91:E3:B1:00, Nm 'Test-Lab-System1', PID 0x0246 (?), VID 0x1D6B, VS 2, DsF 0x800000 < Pairing >, DvF 0x54000 < ClsP HIDG UsrC >, DvT LaptopComputer, RSSI -57, Color 0, FV '5.3.12', MicM Auto, Plcm M Enabled, srMd Disabled, CF 0x80000000000 < Attr >
	Failure of Bluetooth connection.	Reason for failure.	error 08:55:22.467318-0600 bluetoothd Connection to device 744DD52B failed - result was 705

Table 24: Auditable Events (VPN)

SFR from (VPN) specified in the ST	Auditable events	Additional audit record contents	Example of audit records
FAU_GEN.1.1/VPN	Start-up and shutdown of the audit functions	No additional information.	Dec 5 11:34:58 iPadAir2 mdmd(libdyld.dylib)[6307] <Notice>: mdmd starting… Dec 5 11:39:19 iPadAir2 mdmd(libdyld.dylib)[6314] <Notice>: mdmd preparing to stop.
FCS_IPSEC_EXT.1	Decision to DISCARD or BYPASS network packets processed by the TOE.	Presumed identity of source subject. The entry in the SPD that applied to the decision.	In the evaluated configuration of Always On, there are no DISCARD or BYPASS audit records generated.
FCS_IPSEC_EXT.1	Failure to establish an IPsec SA.	Identity of destination subject. Reason for failure.	2023-02-06 20:26:42.559181-0800 0x28ffc Default 0x0 237 0 nesessionmanager: [com.apple.networkextension:] NESMAlwaysOnSession[TEST:5D3D3176-21A7-4C16-AC83-E4AE997C4189]: status changed to connecting

SFR from (VPN) specified in the ST	Auditable events	Additional audit record contents	Example of audit records
			2023-02-06 20:26:42.796987-0800 0x29151 Debug 0x0 26107 0 NEIKEv2Provider: (NetworkExtension) [com.apple.networkextension:] Creating UDP NAT-T transport 10.15.15.184:4500(4500) to 10.181.181.17:4500 on "pdp_ip0" 2023-02-06 20:26:42.798863-0800 0x29151 Debug 0x0 26107 0 NEIKEv2Provider: (NetworkExtension) [com.apple.networkextension:] NEIKEv2Transport: Created <NEIKEv2Transport> UDP NAT-T 10.15.15.184:4500 -> 10.181.181.17:4500 on interface pdp_ip0 with local address 2023-02-06 20:26:42.798924-0800 0x29151 Default 0x0 26107 0 NEIKEv2Provider: (NetworkExtension) [com.apple.networkextension:] NEIKEv2Transport: Adding client IKEv2Session[1, DAA761525C2FEA4F-4415253061787F4B] with SPI DAA761525C2FEA4F on <NEIKEv2Transport> UDP NAT-T 10.15.15.184:4500 -> 10.181.181.17:4500 2023-02-06 20:26:42.864179-0800 0x29153 Default 0x0 26107 0 NEIKEv2Provider: (NetworkExtension) [com.apple.networkextension:] Cancelling client DAA761525C2FEA4F for <NEIKEv2Transport> UDP NAT-T 10.15.15.184:4500 -> 10.181.181.17:4500 2023-02-06 20:26:42.864225-0800 0x29153 Info 0x0 26107 0 NEIKEv2Provider: (NetworkExtension) [com.apple.networkextension:] Removing client [NEIKEv2TransportClient DAA761525C2FEA4F IKEv2Session[1, DAA761525C2FEA4F-4415253061787F4B]] for <NEIKEv2Transport> UDP NAT-T 10.15.15.184:4500 -> 10.181.181.17:4500 2023-02-06 20:26:42.864251-0800 0x29153 Default 0x0 26107 0 NEIKEv2Provider: (NetworkExtension) [com.apple.networkextension:] <NEIKEv2Transport> UDP NAT-T

SFR from (VPN) specified in the ST	Auditable events	Additional audit record contents	Example of audit records
			10.15.15.184:4500 -> 10.181.181.17:4500 out of clients, invalidating 2023-02-06 20:26:42.868726-0800 0x29153 Debug 0x0 26107 0 NEIKEv2Provider: (NetworkExtension) [com.apple.networkextension:] deallocating <NEIKEv2Transport> UDP NAT-T 10.15.15.184:4500 -> 10.181.181.17:4500 (Closed) 2023-02-06 20:26:42.870738-0800 0x29124 Default 0x0 237 0 nesessionmanager: [com.apple.networkextension:] NESMIKEv2VPNSession[Child:Primary Tunnel:TEST:5D3D3176-21A7-4C16-AC83-E4AE997C4189:pdp_ip0]: status changed to disconnecting 2023-02-06 20:26:42.870897-0800 0x29124 Default 0x0 237 0 nesessionmanager: [com.apple.networkextension:] NESMAlwaysOnSession[TEST:5D3D3176-21A7-4C16-AC83-E4AE997C4189]: status changed to disconnecting 2023-02-06 20:26:42.884445-0800 0x29120 Default 0x0 237 0 nesessionmanager: [com.apple.networkextension:] NESMIKEv2VPNSession[Child:Primary Tunnel:TEST:5D3D3176-21A7-4C16-AC83-E4AE997C4189:pdp_ip0]: status changed to disconnected, last stop reason Authentication failed
FCS_IPSEC_EXT.1	Establishment/Termination of an IPsec SA.	Identity of destination subject. Transport layer protocol, if applicable. Source subject service identifier, if applicable. Non-TOE endpoint of	Establishment: 2023-02-06 20:05:04.318246-0800 0x21e78 Default 0x0 237 0 nesessionmanager: [com.apple.networkextension:] NESMAlwaysOnSession[TEST:28CF9D41-9EE0-4D6F-B820-388C6D88C6C9]: status changed to connecting 2023-02-06 20:05:04.612645-0800 0x21ea5 Debug 0x0 20358 0 NEIKEv2Provider: (NetworkExtension) [com.apple.networkextension:] Creating UDP

SFR from (VPN) specified in the ST	Auditable events	Additional audit record contents	Example of audit records
		connection (IP address) for both successes and failures.	NAT-T transport 10.15.15.184:4500(4500) to 10.181.181.17:4500 on "pdp_ip0" 2023-02-06 20:05:04.614306-0800 0x21ea5 Debug 0x0 20358 0 NEIKEv2Provider: (NetworkExtension) [com.apple.networkextension:] NEIKEv2Transport: Created <NEIKEv2Transport> UDP NAT-T 10.15.15.184:4500 -> 10.181.181.17:4500 on interface pdp_ip0 with local address 2023-02-06 20:05:04.614359-0800 0x21ea5 Default 0x0 20358 0 NEIKEv2Provider: (NetworkExtension) [com.apple.networkextension:] NEIKEv2Transport: Adding client IKEv2Session[1, 580F2FB62A42B04D-1D490D1FA899BAAD] with SPI 580F2FB62A42B04D on <NEIKEv2Transport> UDP NAT-T 10.15.15.184:4500 -> 10.181.181.17:4500 2023-02-06 20:05:05.103117-0800 0x21e78 Default 0x0 237 0 nesessionmanager: [com.apple.networkextension:] NESMIKEv2VPNSession[Child:Primary Tunnel:TEST:28CF9D41-9EE0-4D6F-B820-388C6D88C6C9:pdp_ip0]: status changed to connected 2023-02-06 20:05:05.103300-0800 0x21e78 Default 0x0 237 0 nesessionmanager: [com.apple.networkextension:] NESMAlwaysOnSession[TEST:28CF9D41-9EE0-4D6F-B820-388C6D88C6C9]: status changed to connected Termination: 2023-02-06 20:05:27.352511-0800 0x2202a Default 0x0 237 0 nesessionmanager: [com.apple.networkextension:] NESMIKEv2VPNSession[Child:Primary Tunnel:TEST:28CF9D41-9EE0-4D6F-B820-388C6D88C6C9:pdp_ip0]: status changed to disconnecting

SFR from (VPN) specified in the ST	Auditable events	Additional audit record contents	Example of audit records
			2023-02-06 20:05:32.434617-0800 0x21ea6 Debug 0x0 20358 0 NEIKEv2Provider: (NetworkExtension) [com.apple.networkextension:] IKEv2Session[1, 580F2FB62A42B04D-1D490D1FA899BAAD] Sending request of length 72 with ID 2 on <NEIKEv2Transport> UDP NAT-T 10.15.15.184:4500 -> 10.181.181.17:4500 2023-02-06 20:05:32.436776-0800 0x21ea6 Default 0x0 20358 0 NEIKEv2Provider: (NetworkExtension) [com.apple.networkextension:] Cancelling client 580F2FB62A42B04D for <NEIKEv2Transport> UDP NAT-T 10.15.15.184:4500 -> 10.181.181.17:4500 2023-02-06 20:05:32.436821-0800 0x21ea6 Info 0x0 20358 0 NEIKEv2Provider: (NetworkExtension) [com.apple.networkextension:] Removing client [NEIKEv2TransportClient 580F2FB62A42B04D IKEv2Session[1, 580F2FB62A42B04D-1D490D1FA899BAAD]] for <NEIKEv2Transport> UDP NAT-T 10.15.15.184:4500 -> 10.181.181.17:4500 2023-02-06 20:05:32.436850-0800 0x21ea6 Default 0x0 20358 0 NEIKEv2Provider: (NetworkExtension) [com.apple.networkextension:] <NEIKEv2Transport> UDP NAT-T 10.15.15.184:4500 -> 10.181.181.17:4500 out of clients, invalidating 2023-02-06 20:05:32.438135-0800 0x21eea Debug 0x0 20358 0 NEIKEv2Provider: (NetworkExtension) [com.apple.networkextension:] deallocating <NEIKEv2Transport> UDP NAT-T 10.15.15.184:4500 -> 10.181.181.17:4500 (Closed) 2023-02-06 20:05:32.449112-0800 0x21e99 Default 0x0 237 0 nesessionmanager: [com.apple.networkextension:] NESMIKEv2VPNSession[Child:Primary Tunnel:TEST:28CF9D41-9EE0-4D6F-B820-388C6D88C6C9:pdp_ip0]: status changed to

SFR from (VPN) specified in the ST	Auditable events	Additional audit record contents	Example of audit records
			invalid, last stop reason Configuration was removed
FMT_SMF.1/ VPN	Success or failure of management function. Specify VPN gateways to use for connections.	No additional information.	The gateways are defined in a Configuration Profile. Success: Aug 2 11:46:51 iPad-A12 profiled(NetworkExtension)[486] <Notice>: Atsec FMT_SMF VPN Test: No set-aside configuration Aug 2 11:46:51 iPad-A12 profiled(NetworkExtension)[486] <Notice>: Saving configuration Atsec FMT_SMF VPN Test with existing signature (null) Aug 2 11:46:51 iPad-A12 profiled(NetworkExtension)[486] <Notice>: Successfully saved configuration Atsec FMT_SMF VPN Test Aug 2 11:46:51 iPad-A12 nesessionmanager[214] <Notice>: Creating session with type aovpn, id 98010CC6-EEC1-4CF4-8C3D-044413351D3D (Atsec FMT_SMF VPN Test) Aug 2 11:46:51 iPad-A12 nesessionmanager[214] <Notice>: NESMAlwaysOnSession[Atsec FMT_SMF VPN Test:98010CC6-EEC1-4CF4-8C3D-044413351D3D]: Registered network agent (inactive) Aug 2 11:46:51 iPad-A12 nesessionmanager[214] <Notice>: NESMAlwaysOnSession[Atsec FMT_SMF VPN Test:98010CC6-EEC1-4CF4-8C3D-044413351D3D]: Resetting VPN On Demand Aug 2 11:46:51 iPad-A12 nesessionmanager[214] <Notice>: NESMAlwaysOnSession[Atsec FMT_SMF VPN Test:98010CC6-EEC1-4CF4-8C3D-044413351D3D]: Received a start command from nesessionmanager[214] Aug 2 11:46:51 iPad-A12 nesessionmanager[214] <Notice>: Registering session NESMAlwaysOnSession[Atsec FMT_SMF VPN Test:98010CC6-EEC1-4CF4-8C3D-044413351D3D]

SFR from (VPN) specified in the ST	Auditable events	Additional audit record contents	Example of audit records
			Aug 2 11:46:51 iPad-A12 nesessionmanager[214] <Notice>: NESMAlwaysOnSession[Atsec FMT_SMF VPN Test:98010CC6-EEC1-4CF4-8C3D-044413351D3D]: Resetting VPN On Demand Aug 2 11:46:51 iPad-A12 nesessionmanager[214] <Notice>: <NESMServer: 0xbda90f040>: Register Always-On VPN Session: NESMAlwaysOnSession[Atsec FMT_SMF VPN Test:98010CC6-EEC1-4CF4-8C3D-044413351D3D] Aug 2 11:46:51 iPad-A12 nesessionmanager[214] <Notice>: NESMAlwaysOnSession[Atsec FMT_SMF VPN Test:98010CC6-EEC1-4CF4-8C3D-044413351D3D]: Successfully registered Failure: Aug 18 09:21:12 iPad-A9 NEIKEv2Provider(NetworkExtension)[14270] <Notice>: IKEv2IKESA[1.1, 0E9E7BB2DBA40B1F-0000000000000000] state Connecting -> Disconnected error (null) -> Error Domain=NEIKEv2ErrorDomain Code=3 "PeerDidNotRespond" UserInfo={NSLocalizedDescription=PeerDidNotRespond} Aug 18 09:21:12 iPad-A9 NEIKEv2Provider(NetworkExtension)[14270] <Error>: IKEv2Session[1, 0E9E7BB2DBA40B1F-0000000000000000] Failed to receive IKE SA Init reply (connect) Aug 18 09:21:12 iPad-A9 NEIKEv2Provider(NetworkExtension)[14270] <Notice>: IKEv2IKESA[1.1, 0E9E7BB2DBA40B1F-0000000000000000] not changing state Disconnected nor error Error Domain=NEIKEv2ErrorDomain Code=3 "PeerDidNotRespond" UserInfo={NSLocalizedDescription=PeerDidNotRespond} -> Error Domain=NEIKEv2ErrorDomain Code=6 "PeerInvalidSyntax: Failed to receive IKE SA Init reply (connect)" UserInfo={NSLocalizedDescription=PeerInvalidS

SFR from (VPN) specified in the ST	Auditable events	Additional audit record contents	Example of audit records
			yntax: Failed to receive IKE SA Init reply (connect)} Aug 18 09:21:12 iPad-A9 NEIKEv2Provider(NetworkExtension)[14270] <Notice>: ChildSA[1, (null)-(null)] state Connecting -> Disconnected error (null) -> Error Domain=NEIKEv2ErrorDomain Code=3 "PeerDidNotRespond" UserInfo={NSLocalizedDescription=PeerDidNotRespond} Aug 18 09:21:12 iPad-A9 NEIKEv2Provider(NetworkExtension)[14270] <Notice>: Resetting IKEv2Session[1, 0E9E7BB2DBA40B1F-0000000000000000] Aug 18 09:21:12 iPad-A9 NEIKEv2Provider(NetworkExtension)[14270] <Notice>: Aborting session IKEv2Session[1, 0E9E7BB2DBA40B1F-0000000000000000] Aug 18 09:21:12 iPad-A9 NEIKEv2Provider(NetworkExtension)[14270] <Notice>: IKEv2Session[1, 0E9E7BB2DBA40B1F-0000000000000000] KernelSASession[1, IKEv2 Session Database] Uninstalling all child SAs Aug 18 09:21:12 iPad-A9 NEIKEv2Provider(NetworkExtension)[14270] <Notice>: Invalidating transports for IKEv2IKESA[1.1, 0E9E7BB2DBA40B1F-0000000000000000] Aug 18 09:21:12 iPad-A9 NEIKEv2Provider(NetworkExtension)[14270] <Notice>: Cancelling client 0E9E7BB2DBA40B1F for <NEIKEv2Transport> UDP 10.0.0.14:500 -> 10.0.0.2:500

Table 23 does not include FIA_BLT_EXT.3 (BT) because the rejections happen at the Host Controller Interface (HCI) layer; thus, the TOE does not generate audit records for Bluetooth duplicate connection attempts.

6.2 Audit Storage

Audit records cannot be directly accessed by device users, administrators, or MDM administrators on the iOS/iPadOS device regardless of the device’s configuration. [AConfig] describes how to use the mobile device console to see all logged records. The device console is a function within Apple Configurator 2. While viewing the log files, Administrators have capabilities such as: marking selections, clearing the window to view specific events, or saving the log for troubleshooting.

Additionally, audit records cannot be modified in any way. All audit records can be synced to an MDM application using a Configuration Profile or manually via a trusted workstation using the Apple Configurator 2.

Depending on the underlying OS of the trusted workstation or MDM server, all of the mobile device audit records are transferred to the following locations.

macOS

- ~/Library/Logs/CrashReporter/MobileDevice/[Your_Device_Name]/

Windows

- C:\Users\[Your_User_Name]\AppData\Roaming\AppleComputer\Logs\CrashReporter\MobileDevice\[Your_Device_Name]\

Audit records are not confined by a global capacity limit and are instead predefined individual services depending on what information is being captured. More information may be found in [PROFS_LOGS].

iOS/iPadOS has a logging framework that is used to configure different logging levels for the various iOS/iPadOS subsystems. This framework is configured by creating and installing a logging configuration profile property list file (i.e., .plist file) into the appropriate directory. More information may be found in [LOGGING].

There is no configuration required for audit log locations because audit logs are stored in the locations specified in this section, by default. These locations cannot be changed.

If unified logging is used, log messages are written to centralized data store on disk instead of in different directories as text log files. More information may be found in [LOGGING].

6.3 Configure the Auditable Items

According to [PROFS_LOGS], additional logs can be specified by performing user actions on a device or through using a Configuration Profile. The table below shows which audit logs can be optionally gathered and how they can be initiated.

Table 25: Additional Audit Logs

Log type	Device user	Configuration Profile
Third-party Apps for iOS	Instructions	
Accounts/AuthKit for iOS	Instructions	Profile
Ad Platforms for iOS	Instructions	Profile
AirTraffic for iOS	Instructions	
APNS (Apple Push Notification Service) for iOS	Instructions	Profile
App Store for iOS	Instructions	Profile
Apple Pay for iOS	Instructions	Profile

Log type	Device user	Configuration Profile
Background Networking for iOS	Instructions	
Baseband for iOS	Instructions	Profile
Battery Life for iOS	Instructions	Profile
Bluetooth for iOS	Instructions	Profile
Calendar/Reminders for iOS	Instructions	Profile
Carousel for iOS	Instructions	
CarPlay for iOS	Instructions	Profile
CFNetwork for iOS	Instructions	Profile
Charles Logs for iOS	Instructions	
Classroom for iOS	Instructions	Profile
CloudKit for iOS	Instructions	Profile
Console Logs for iOS	Instructions	
Contacts Data Export for iOS	Instructions	
Continuity (IDS) for iOS	Instructions	Profile
CoreMedia (HTTP Live Streaming) for iOS	Instructions	Profile
Crash Logs for iOS	Instructions	
Device-specific Information for iOS	Instructions	
Disk Space Diagnostics (FSMetadata) for iOS	Instructions	Profile
Enterprise SSO and Kerberos for iOS	Instructions	Profile
FaceTime for iOS	Instructions	Profile
Handoff for iOS	Instructions	
HangTracer (Slow UI)	Instructions	Profile
Health Database Extraction for iOS	Instructions	
HealthKit for iOS	Instructions	Profile
Home app/HomeKit for iOS	Instructions	Profile
HomePod for iOS	Instructions	Profile
iAP for iOS	Instructions	Profile
iCloud Backup for iOS	Instructions	Profile
iCloud Drive for iOS	Instructions	Profile
iCloud Photos for iOS	Instructions	Profile
iWork for iOS	Instructions	Profile
Location Services for iOS	Instructions	Profile
Mail for iOS	Instructions	Profile

Log type	Device user	Configuration Profile
Mail Sync Diagnostics for iOS	Instructions	
Managed Configuration (MDM) for iOS	Instructions	Profile
Maps for iOS	Instructions	Profile
mDNSResponder for iOS	Instructions	Profile
Media Player for iOS	Instructions	
Messages for iOS	Instructions	Profile
Multipeer Connectivity for iOS	Instructions	
Music for iOS	Instructions	
Network Diagnostics for iOS	Instructions	Profile
Notes for iOS	Instructions	Profile
Phone (General) for iOS	Instructions	Profile
Photos Logging for iOS	Instructions	Profile
Podcasts for iOS	Instructions	
Schoolwork/ClassKit	Instructions	Profile
Screenshots and Screen Recordings for iOS	Instructions	
Significant Locations for iOS	Instructions	Profile
Single Sign-On for iOS	Instructions	Profile
Siri for iOS	Instructions	Profile
Slow Launches (Launch Hangs) for iOS	Instructions	Profiles
Software Update for iOS	Instructions	Profile
Spotlight for iOS	Instructions	Profile
Stackshots for iOS	Instructions	
Sync Diagnostics (DataAccess) for iOS	Instructions	Profile
sysdiagnose for iOS	Instructions	Profile
Tailspin for iOS	Instructions	Profile
TCP Dump for iOS	Instructions	
Test Cases/Sample Projects for iOS	Instructions	
TestFlight for iOS	Instructions	Profile
Touch ID for iOS	Instructions	Profile
Unlock for iOS	Instructions	
Updater for iOS	Instructions	
VPN (Network Extension) for iOS	Instructions	Profile
Wallet for iOS	Instructions	Profile

Log type	Device user	Configuration Profile
Wi-Fi for iOS	Instructions	Profile

7 Installed Apps

Table 26: Built-in Apps lists the built-in applications on the mobile devices. “X” indicates the application is available on the device running the TOE version.

Devices purchased in accordance with section 4.2.1 *Obtaining the mobile device(s)* do not include any other third-party applications when purchased.

Table 26: Built-in Apps

App Name	iPad	iPhone
App Store	X	X
Books	X	X
Calculator		X
Calendar	X	X
Camera	X	X
Clock	X	X
Compass		X
Contacts	X	X
FaceTime	X	X
Files	X	X
Find My	X	X
Fitness		X
Freeform	X	X
Health		X
Home	X	X
iTunes Store	X	X
Magnifier	X	X
Mail	X	X
Maps	X	X
Measure	X	X
Messages	X	X
Music	X	X
News	X	X
Notes	X	X
Phone		X
Photos	X	X
Podcasts	X	X

App Name	iPad	iPhone
Reminders	X	X
Safari	X	X
Settings	X	X
Shortcuts	X	X
Siri	X	X
Stocks	X	X
Tips	X	X
Translate	X	X
TV	X	X
Voice Memos	X	X
Wallet		X
Watch		X
Weather	X	X

8 References

Table 1: Guidance Documents contains the references to the guidance documents used when configuring the mobile devices. Below are the references documents providing more detailed technical information.

[BT] Specification of the Bluetooth System
https://www.bluetooth.com/specifications

[PP_MDF_V3.3] U.S. Government Approved Protection Profile - Protection Profile for Mobile Device Fundamentals, Version 3.3
https://www.niap-ccevs.org/Profile/Info.cfm?PPID=468&id=468

[MOD_MDM_AGENT_V1.0] U.S. Government Approved Protection Profile – PP-Module for MDM Agents Version 1.0
https://www.niap-ccevs.org/Profile/Info.cfm?PPID=441&id=441

[MOD_BT_V1.0] PP-Module for Bluetooth Version 1.0
https://www.niap-ccevs.org/Profile/Info.cfm?PPID=425&id=425

[MOD_CPP_BIO_V1.1] collaborative PP-Module for Biometric enrolment and verification – for unlocking the device Version 1.1
https://www.niap-ccevs.org/Profile/Info.cfm?PPID=476&id=476

[MOD_VPNC_V2.4] PP-Module for VPN Client Version 2.4
https://www.niap-ccevs.org/Profile/Info.cfm?PPID=467&id=467

[MOD_WLANC_V1.0] PP-Module for WLAN Client Version 1.0
https://www.niap-ccevs.org/Profile/Info.cfm?id=386

[PKG_TLS_V1.1] Functional Package for Transport Layer Security (TLS) Version 1.1
https://www.niap-ccevs.org/Profile/Info.cfm?PPID=439&id=439

9 Abbreviations and Acronyms

ABM	Apple Business Manager
AES	Advanced Encryption Standard
API	Application Programming Interface
APNS	Apple Push Notification Service
ARM	Advanced RISC Machine
ASLR	Anti-Exploitation Services
BR/EDR	Basic Rate/Enhanced Data Rate
CA	Certificate of Authority
CBC	Cypher Block Chaining
CC	Common Criteria
CCM	Counter with CBC-MAC
CRL	Certificate Revocation List
DAR	Data-at-Rest
DEK	Data Encryption Key
DEP	Device Enrollment Program
DES	Data Encryption Standard
DH	Diffie-Hellman
DRBG	Deterministic Random Bit Generator
EAP	Extensible Authentication Protocol
EAP-TLS	Extensible Authentication Protocol-Transport Layer Security
ECC	Elliptic Curve Cryptography
ECDH	Elliptic Curve Diffie-Hellman
ECDSA	Elliptic Curve Digital Signature Algorithm
EP	Extended Package
FIA	Identification and Authentication
FIPS	Federal Information Processing Standard
FQDN	Fully Qualified Domain Name
GCM	Galois/Counter Mode
GPS	Global Positioning Satellites
GSM	Global System for Mobile Communications
GTK	Group Temporal Key
HMAC	Keyed-Hash Message Authentication Code
IKE	Internet Key Exchange
IPsec	Internet Protocol Security
IV	Initialization Vector
JSON	JavaScript Object Notation
JTAG	Joint Test Action Group
KEK	Key Encryption Key
L2TP	Layer Two Tunneling Protocol
LE	Low Energy
LTE	Long-Term Evolution
MAC	Message Authentication Code
MDF	Mobile Device Fundamentals
MDFPP	Mobile Device Fundamentals Protection Profile
MDM	Mobile Device Management
NITZ	Network Identity and Time Zone
NFC	Near Field Communication
NTP	Network Time Protocol
OCSP	Online Certificate Status Protocol
OTA	Over-the-Air
PAE	Port Access Entity
PBKDF	Password Based Key Derivation Function
PKCS	Public Key Cryptography Standards
PKI	Public Key Infrastructure
PP	Protection Profile
REK	Root Encryption Key
RISC	Reduced Instruction Set Computing
RSA	Rivest-Shamir-Adleman
SA	Secure Association
SCEP	Simple Certificate Enrollment Protocol
SEP	Secure Enclave Processor
SFR	Security Functional Requirement
SHA	Secure Hash Algorithm
SPD	Security Policy Database
SSID	Service Set Identifier
SSL	Secure Sockets Layer
ST	Security Target
TLS	Transport Layer Security
TOE	Target of Evaluation
TSF	TOE Security Functionality
UI	User Interface
UUID	Universally Unique Identifier
UI	User Interface
UWB	Ultra Wideband
VPN	Virtual Private Network
WLAN	Wireless Local Area Network
WPA	Wi-Fi Protected Access
WPA2	Wi-Fi Protected Access 2
WPA3	Wi-Fi Protected Access 3
XML	Extensible Markup Language

10 Appendix A: Configuration Profiles

This appendix provides example Configuration Profiles and their usages.

10.1 Configuration Profile 1: “MDF PP Configuration Profile AirPrint”

```
<?xml version="1.0" encoding="UTF-8"?>
<!DOCTYPE plist PUBLIC "-//Apple//DTD PLIST 1.0//EN" "http://www.apple.com/DTDs/PropertyList-1.0.dtd">
<plist version="1.0">
<dict>
  <key>AccessRights</key>
  <integer>8</integer>
  <key>ConsentText</key>
  <dict>
    <key>default</key>
    <string>Configuration profile achieving compliance with the security settings defined by the Common Criteria evaluation.</string>
  </dict>
  <key>HasRemovalPasscode</key>
  <false/>
  <key>PayloadContent</key>
  <array>
    <dict>
      <key>AirPrint</key>
      <array>
        <dict>
          <key>ForceTLS</key>
          <true/>
        </dict>
      </array>
      <key>PayloadDescription</key>
      <string>AirPrint Configuration</string>
      <key>PayloadDisplayName</key>
      <string>AirPrint</string>
      <key>PayloadIdentifier</key>
      <string>com.apple.airprint.F0AC096F-52CD-4FAB-83A3-675259987CD7</string>
      <key>PayloadType</key>
      <string>com.apple.airprint</string>
      <key>PayloadUUID</key>
      <string>F0AC096F-52CD-4FAB-83A3-675259987CD7</string>
      <key>PayloadVersion</key>
      <integer>1</integer>
    </dict>
  </array>
  <key>PayloadDescription</key>
  <string>The configuration profile defining the AirPrint restrictions provides the general settings compliant to the Common Criteria evaluated configuration following the Mobile Device Fundamentals Protection Profile.</string>
  <key>PayloadDisplayName</key>
  <string>MDF PP Configuration Profile AirPrint</string>
  <key>PayloadIdentifier</key>
  <string>MDFPP2020.7F5C2634-0C2B-4610-9FCB-65B6298D8734</string>
  <key>PayloadRemovalDisallowed</key>
  <true/>
  <key>PayloadType</key>
  <string>Configuration</string>
  <key>PayloadUUID</key>
  <string>42FA88A0-76CF-4D15-90C3-EED747194B32</string>
  <key>PayloadVersion</key>
  <integer>1</integer>
</dict>
</plist>
```

10.2 Configuration Profile 2: “MDF PP Configuration Profile for General Restrictions”

```
<?xml version="1.0" encoding="UTF-8"?>
<!DOCTYPE plist PUBLIC "-//Apple//DTD PLIST 1.0//EN" "http://www.apple.com/DTDs/PropertyList-1.0.dtd">
<plist version="1.0">
<dict>
  <key>AccessRights</key>
  <integer>8</integer>
  <key>ConsentText</key>
  <dict>
    <key>default</key>
    <string>Configuration profile achieving compliance with the security settings defined by the Common Criteria evaluation.</string>
  </dict>
  <key>HasRemovalPasscode</key>
  <false/>
  <key>PayloadContent</key>
  <array>
    <dict>
      <key>PayloadDescription</key>
      <string>Restriction Configuration</string>
      <key>PayloadDisplayName</key>
      <string>Restrictions</string>
      <key>PayloadIdentifier</key>
      <string>com.apple.applicationaccess.16FBE9FC-1D94-49F8-91EA-806F0CE6B3EC</string>
      <key>PayloadType</key>
      <string>com.apple.applicationaccess</string>
      <key>PayloadUUID</key>
      <string>16FBE9FC-1D94-49F8-91EA-806F0CE6B3EC</string>
      <key>PayloadVersion</key>
```

```
            <integer>1</integer>
            <key>allowAssistant</key>
            <false/>
            <key>allowAssistantUserGeneratedContent</key>
            <false/>
            <key>allowAssistantWhileLocked</key>
            <false/>
            <key>allowLockScreenControlCenter</key>
            <false/>
            <key>allowEnablingRestrictions</key>
            <false/>
            <key>allowUSBRestrictedMode</key>
            <true/>

            <key>allowUntrustedTLSPrompt</key>
            <false/>
            <key>forceAirPrintTrustedTLSRequirement</key>
            <true/>

            <key>allowWallpaperModification</key>
            <true/>
            <key>forceAutomaticDateAndTime</key>
            <false/>

            <!-- Optional settings to further restrict permissions

            <key>allowEraseContentAndSettings</key>
            <false/>

            <key>allowCamera</key>
            <false/>

            -->
        </dict>
    </array>
    <key>PayloadDescription</key>
    <string>The configuration profile defining general restrictions locks various mechanisms to the secure settings compliant to the Common Criteria evaluated configuration following the Mobile Device Fundamentals Protection Profile.</string>
    <key>PayloadDisplayName</key>
    <string>MDF PP Configuration Profile for General Restrictions</string>
    <key>PayloadIdentifier</key>
    <string>MDFPP2020.7F5C2634-0C2B-4610-9FCB-65B6298D8732</string>
    <key>PayloadRemovalDisallowed</key>
    <true/>
    <key>PayloadType</key>
    <string>Configuration</string>
    <key>PayloadUUID</key>
```

```
  <string>1FAFA759-5DE3-4EEA-8F8E-8F742A2DADC2</string>
  <key>PayloadVersion</key>
  <integer>1</integer>
</dict>
</plist>
```

10.3 Configuration Profile 3: “MDF PP Configuration Profile Passcode Restrictions”

```
<?xml version="1.0" encoding="UTF-8"?>
<!DOCTYPE plist PUBLIC "-//Apple//DTD PLIST 1.0//EN" "http://www.apple.com/DTDs/PropertyList-1.0.dtd">
<plist version="1.0">
<dict>
  <key>AccessRights</key>
  <integer>8</integer>
  <key>ConsentText</key>
  <dict>
    <key>default</key>
    <string>Configuration profile achieving compliance with the security settings defined by the Common Criteria
evaluation.</string>
  </dict>
  <key>HasRemovalPasscode</key>
  <false/>
  <key>PayloadContent</key>
  <array>
    <dict>
      <key>PayloadDescription</key>
      <string>Passcode Restrictions</string>
      <key>PayloadDisplayName</key>
      <string>Code</string>
      <key>PayloadIdentifier</key>
      <string>com.apple.mobiledevice.passwordpolicy.41664EF5-450A-48C0-A19B-970C5E522638</string>
      <key>PayloadType</key>
      <string>com.apple.mobiledevice.passwordpolicy</string>
      <key>PayloadUUID</key>
      <string>41664EF5-450A-48C0-A19B-970C5E522638</string>
      <key>PayloadVersion</key>
      <integer>1</integer>
      <key>allowSimple</key>
      <false/>
      <key>forcePIN</key>
      <true/>

      <!-- Any value between 2 and 11 -->
      <key>maxFailedAttempts</key>
```

```
            <integer>10</integer>

            <!-- Any value defined by organization -->
            <key>maxInactivity</key>
            <integer>2</integer>

            <!-- Any value defined by organization -->
            <key>maxPINAgeInDays</key>
            <integer>360</integer>

            <!-- Any value defined by organization -->
            <key>minComplexChars</key>
            <integer>1</integer>

            <!-- Any value defined by organization -->
            <key>minLength</key>
            <integer>6</integer>

            <!-- Any value defined by organization -->
            <key>minHistory</key>
            <integer>1</integer>

            <!-- Any value defined by organization -->
            <key>maxGracePeriod</key>
            <integer>0</integer>

            <!-- Any value defined by organization -->
            <key>allowFingerprintModification</key>
            <true/>
        </dict>
    </array>
    <key>PayloadDescription</key>
    <string>The configuration profile template provides passcode restrictions compliant to the Common Criteria
evaluated configuration following the Mobile Device Fundamentals Protection Profile.</string>
    <key>PayloadDisplayName</key>
    <string>MDF PP Configuration Profile for Passcode Restrictions</string>
    <key>PayloadIdentifier</key>
    <string>MDFPP2020.7F5C2634-0C2B-4610-9FCB-65B6298D8733</string>
    <key>PayloadRemovalDisallowed</key>
    <true/>
    <key>PayloadType</key>
    <string>Configuration</string>
    <key>PayloadUUID</key>
    <string>754A56E0-6E64-444E-9675-FBBE0DE5CAB0</string>
    <key>PayloadVersion</key>
    <integer>1</integer>
</dict>
</plist>
```

10.4 Configuration Profile 4: “MDF PP Configuration Profile VPN”

```
<?xml version="1.0" encoding="UTF-8"?>
<!DOCTYPE plist PUBLIC "-//Apple//DTD PLIST 1.0//EN" "http://www.apple.com/DTDs/PropertyList-1.0.dtd">
<plist version="1.0">
<dict>
  <key>ConsentText</key>
  <dict>
    <key>default</key>
    <string>Configuration profile achieving compliance with the security settings defined by the Common Criteria evaluation.</string>
  </dict>
  <key>HasRemovalPasscode</key>
  <false/>
  <key>PayloadContent</key>
  <array>
    <dict>
      <!-- Replace certificate -->
      <key>Password</key>
      <string>1234</string>
      <key>PayloadCertificateFileName</key>
      <string>client-certificate.p12</string>
      <key>PayloadContent</key>
      <data>
      INVALID
      </data>
      <key>PayloadDescription</key>
      <string>PKCS#12-formatted certificate that MUST be replaced</string>
      <key>PayloadDisplayName</key>
      <string>PKCS#12-formatted certificate that MUST be replaced</string>
      <key>PayloadIdentifier</key>
      <string>com.apple.security.pkcs12.51F4CAA0-B295-4557-8D91-C4BDFB4AE825</string>
      <key>PayloadType</key>
      <string>com.apple.security.pkcs12</string>
      <key>PayloadUUID</key>
      <string>51F4CAA0-B295-4557-8D91-C4BDFB4AE825</string>
      <key>PayloadVersion</key>
      <integer>1</integer>
    </dict>
    <dict>
      <key>AlwaysOn</key>
      <dict>
        <!-- Any value defined by organization is allowed -->
        <key>AllowedCaptiveNetworkPlugins</key>
```

```
<array/>

<!-- Any value defined by organization is allowed -->
<key>ServiceExceptions</key>
<array/>

<key>TunnelConfigurations</key>
<array>
  <dict>
    <key>AuthenticationMethod</key>
    <string>Certificate</string>
    <key>ChildSecurityAssociationParameters</key>
    <dict>
      <!-- Allowed options: 5, 14, 15, 19, 20 -->
      <key>DiffieHellmanGroup</key>
      <integer>14</integer>

      <!-- Allowed options: AES-128, AES-256, AES-128-GCM, AES-256-GCM -->
      <key>EncryptionAlgorithm</key>
      <string>AES-256</string>

      <!-- Allowed options: SHA1-160, SHA2-256, SHA2-384, SHA2-512 -->
      <key>IntegrityAlgorithm</key>
      <string>SHA2-512</string>

      <!-- Any value defined by organization is allowed -->
      <key>LifeTimeInMinutes</key>
      <integer>1440</integer>
    </dict>

    <!-- Any value defined by organization is allowed -->
    <key>DeadPeerDetectionRate</key>
    <string>Medium</string>

    <key>IKESecurityAssociationParameters</key>
    <dict>
      <!-- Allowed options: 5, 14, 15, 19, 20 -->
      <key>DiffieHellmanGroup</key>
      <integer>14</integer>

      <!-- Allowed options: AES-128, AES-256, AES-128-GCM, AES-256-GCM -->
      <key>EncryptionAlgorithm</key>
      <string>AES-256</string>

      <!-- Allowed options: SHA1-160, SHA2-256, SHA2-384, SHA2-512 -->
      <key>IntegrityAlgorithm</key>
      <string>SHA2-512</string>
```

```
            <!-- Any value defined by organization is allowed -->
            <key>LifeTimeInMinutes</key>
            <integer>1440</integer>
          </dict>

          <!-- Any value defined by organization is allowed -->
          <key>Interfaces</key>
          <array>
            <string>Cellular</string>
            <string>WiFi</string>
          </array>

          <!-- Any value defined by organization is allowed -->
          <key>LocalIdentifier</key>
          <string>client</string>

          <!-- Refer to certificate above -->
          <key>PayloadCertificateUUID</key>
          <string>51F4CAA0-B295-4557-8D91-C4BDFB4AE825</string>

          <!-- Allowed options: RSA -->
          <key>CertificateType</key>
          <string>RSA</string>

          <key>ProtocolType</key>
          <string>IKEv2</string>

          <!-- Any value defined by organization is allowed -->
          <key>RemoteAddress</key>
          <string>10.0.0.1</string>

          <!-- Any value defined by organization is allowed -->
          <key>RemoteIdentifier</key>
          <string>server</string>

          <!-- Any value defined by organization is allowed -->
          <key>ServerCertificateCommonName</key>
          <string>server</string>

          <!-- Any value defined by organization is allowed -->
          <key>ServerCertificateIssuerCommonName</key>
          <string>CN of CA certificate</string>
        </dict>
      </array>
    </dict>
    <key>IPv4</key>
    <dict>
      <key>OverridePrimary</key>
```

```
                <integer>1</integer>
            </dict>
            <key>PayloadDescription</key>
            <string>Configures VPN settings</string>
            <key>PayloadDisplayName</key>
            <string>VPN</string>
            <key>PayloadIdentifier</key>
            <string>com.apple.vpn.managed.CC967500-DE00-4AA4-B775-6563EEE7E26D</string>
            <key>PayloadType</key>
            <string>com.apple.vpn.managed</string>
            <key>PayloadUUID</key>
            <string>CC967500-DE00-4AA4-B775-6563EEE7E26D</string>
            <key>PayloadVersion</key>
            <real>1</real>
            <key>Proxies</key>
            <dict/>
            <key>UserDefinedName</key>
            <string>MDFPP Compliant VPN</string>
            <key>VPNType</key>
            <string>AlwaysOn</string>
            <key>OnDemandEnabled</key>
            <integer>0</integer>
            <key>VendorConfig</key>
            <dict/>
        </dict>
    </array>

    <key>PayloadDescription</key>
    <string>The configuration profile provides VPN settings compliant to the Common Criteria evaluated configuration following the Mobile Device Fundamentals Protection Profile.</string>
    <key>PayloadDisplayName</key>
    <string>MDF PP Configuration Profile VPN Settings</string>
    <key>PayloadIdentifier</key>
    <string>MDFPP2020.7F5C2634-0C2B-4610-9FCB-65B6298D8736</string>
    <key>PayloadRemovalDisallowed</key>
    <true/>
    <key>PayloadType</key>
    <string>Configuration</string>
    <key>PayloadUUID</key>
    <string>125B2C0F-2EF0-4AA5-8381-8F1C752F4CF5</string>
    <key>PayloadVersion</key>
    <integer>1</integer>
    <key>AccessRights</key>
    <integer>8</integer>
</dict>
</plist>
```

10.5 Configuration Profile 5: “MDF PP Configuration Profile WLAN”

```
<?xml version="1.0" encoding="UTF-8"?>
<!DOCTYPE plist PUBLIC "-//Apple//DTD PLIST 1.0//EN" "http://www.apple.com/DTDs/PropertyList-1.0.dtd">
<plist version="1.0">
<dict>
  <key>AccessRights</key>
  <integer>8</integer>
  <key>ConsentText</key>
  <dict>
    <key>default</key>
    <string>Configuration profile achieving compliance with the security settings defined by the Common Criteria
evaluation.</string>
  </dict>
  <key>HasRemovalPasscode</key>
  <false/>
  <key>PayloadContent</key>
  <array>
    <dict>
      <!-- Replace certificate -->
      <key>PayloadCertificateFileName</key>
      <string>cacert.crt</string>
      <key>PayloadContent</key>
      <data>
      INVALID
      </data>
      <key>PayloadDescription</key>
      <string>CA certificate to be replaced</string>
      <key>PayloadDisplayName</key>
      <string>CA certificate to be used for WLAN EAP-TLS</string>
      <key>PayloadIdentifier</key>
      <string>com.apple.security.root.EB096643-9B1C-468B-8471-EFC210017C60</string>
      <key>PayloadType</key>
      <string>com.apple.security.root</string>
      <key>PayloadUUID</key>
      <string>EB096643-9B1C-468B-8471-EFC210017C60</string>
      <key>PayloadVersion</key>
      <integer>1</integer>
    </dict>
    <dict>
      <key>AutoJoin</key>
      <true/>
      <key>EAPClientConfiguration</key>
      <dict>
        <key>AcceptEAPTypes</key>
        <array>
```

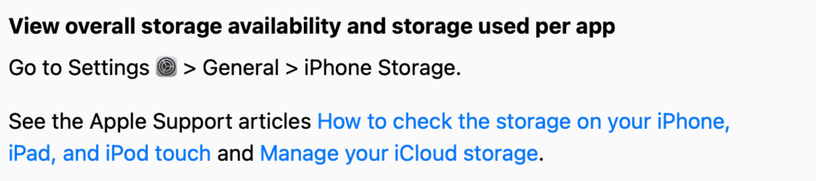
```
          <integer>13</integer>
        </array>

        <!-- Use certificate defined above -->
        <key>PayloadCertificateAnchorUUID</key>
        <array>
          <string>EB096643-9B1C-468B-8471-EFC210017C60</string>
        </array>
        <key>TLSTrustedServerNames</key>
        <array/>

        <!-- This is default and may be removed -->
        <key>TLSCertificateIsRequired</key>
        <true/>
      </dict>
      <key>EncryptionType</key>
      <string>WPA2</string>

      <!-- Any value defined by organization is allowed for the following options -->
      <key>HIDDEN_NETWORK</key>
      <false/>
      <key>IsHotspot</key>
      <false/>
      <key>PayloadCertificateUUID</key>
      <string>35DC8662-79F1-4640-B628-A8F1CF9C85DA</string>
      <key>PayloadDescription</key>
      <string>Configures Wi-Fi settings</string>
      <key>PayloadDisplayName</key>
      <string>WiFi</string>
      <key>PayloadIdentifier</key>
      <string>com.apple.wifi.managed.9E1F3E37-2CEF-468A-B8C2-BBD5C92C6E7C</string>
      <key>PayloadType</key>
      <string>com.apple.wifi.managed</string>
      <key>PayloadUUID</key>
      <string>9E1F3E37-2CEF-468A-B8C2-BBD5C92C6E7C</string>
      <key>PayloadVersion</key>
      <real>1</real>
      <key>ProxyType</key>
      <string>None</string>
      <key>SSID_STR</key>
      <string>EAP-TLSWLAN</string>
    </dict>
  </array>
  <key>PayloadDescription</key>
  <string>The configuration profile template provides the Wireless LAN settings compliant to the Common Criteria evaluated configuration following the Mobile Device Fundamentals Protection Profile.</string>
  <key>PayloadDisplayName</key>
  <string>MDF PP Configuration Profile WLAN Configuration</string>
  <key>PayloadIdentifier</key>
  <string>MDFPP2020.7F5C2634-0C2B-4610-9FCB-65B6298D8735</string>
  <key>PayloadRemovalDisallowed</key>
  <true/>
  <key>PayloadType</key>
  <string>Configuration</string>
  <key>PayloadUUID</key>
  <string>12926851-84EE-4270-9EE2-7CCB87E7B00D</string>
  <key>PayloadVersion</key>
  <integer>1</integer>
</dict>
</plist>
```

11 Appendix B: User Guide Screenshots

This appendix contains screenshots from [iPhone_UG] and [iPad_UG].

11.1 Get information about your iPhone

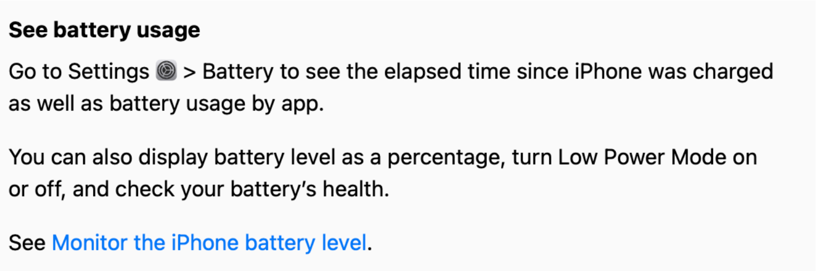
Get information about your iPhone



View overall storage availability and storage used per app

Go to Settings ⚙ > General > iPhone Storage.

See the Apple Support articles How to check the storage on your iPhone, iPad, and iPod touch and Manage your iCloud storage.

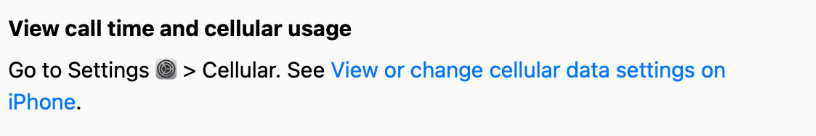


See battery usage

Go to Settings ⚙ > Battery to see the elapsed time since iPhone was charged as well as battery usage by app.

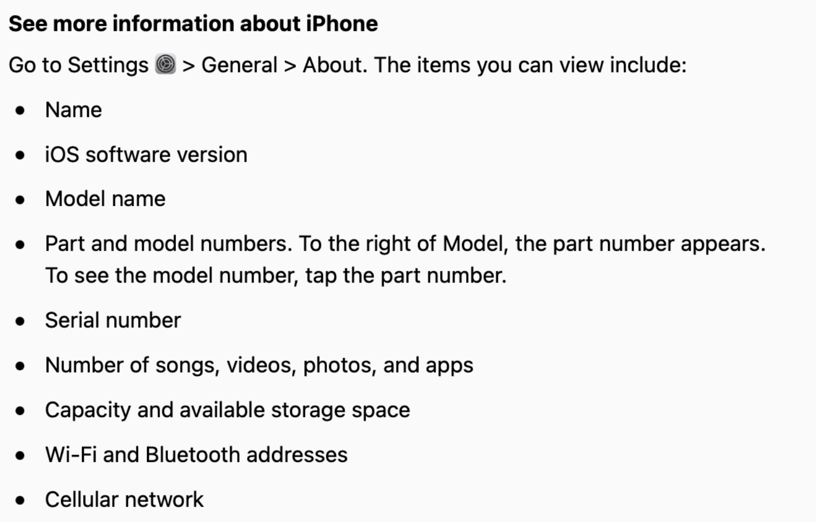
You can also display battery level as a percentage, turn Low Power Mode on or off, and check your battery's health.

See Monitor the iPhone battery level.



View call time and cellular usage

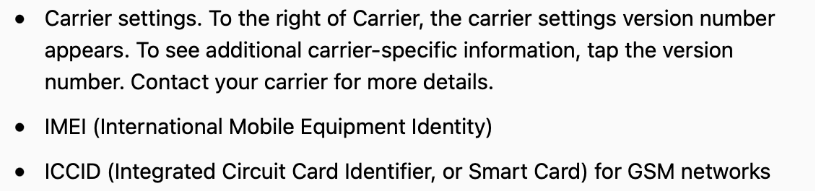
Go to Settings ⚙ > Cellular. See View or change cellular data settings on iPhone.



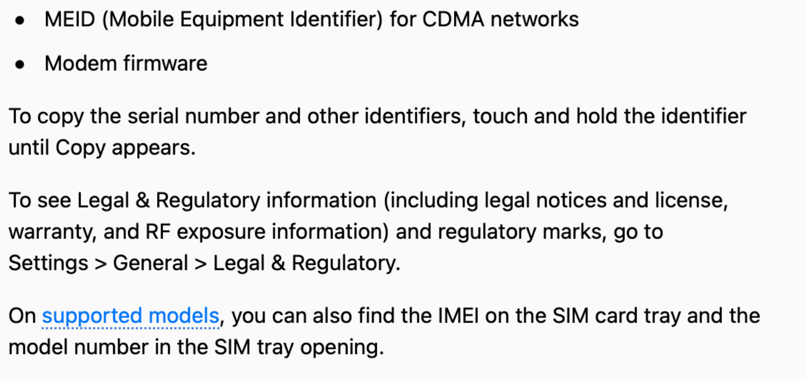
See more information about iPhone

Go to Settings ⚙ > General > About. The items you can view include:

- Name
- iOS software version
- Model name
- Part and model numbers. To the right of Model, the part number appears. To see the model number, tap the part number.
- Serial number
- Number of songs, videos, photos, and apps
- Capacity and available storage space
- Wi-Fi and Bluetooth addresses
- Cellular network



- Carrier settings. To the right of Carrier, the carrier settings version number appears. To see additional carrier-specific information, tap the version number. Contact your carrier for more details.
- IMEI (International Mobile Equipment Identity)
- ICCID (Integrated Circuit Card Identifier, or Smart Card) for GSM networks

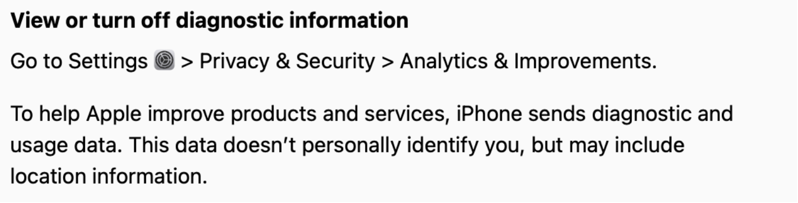


- MEID (Mobile Equipment Identifier) for CDMA networks
- Modem firmware

To copy the serial number and other identifiers, touch and hold the identifier until Copy appears.

To see Legal & Regulatory information (including legal notices and license, warranty, and RF exposure information) and regulatory marks, go to Settings > General > Legal & Regulatory.

On supported models, you can also find the IMEI on the SIM card tray and the model number in the SIM tray opening.

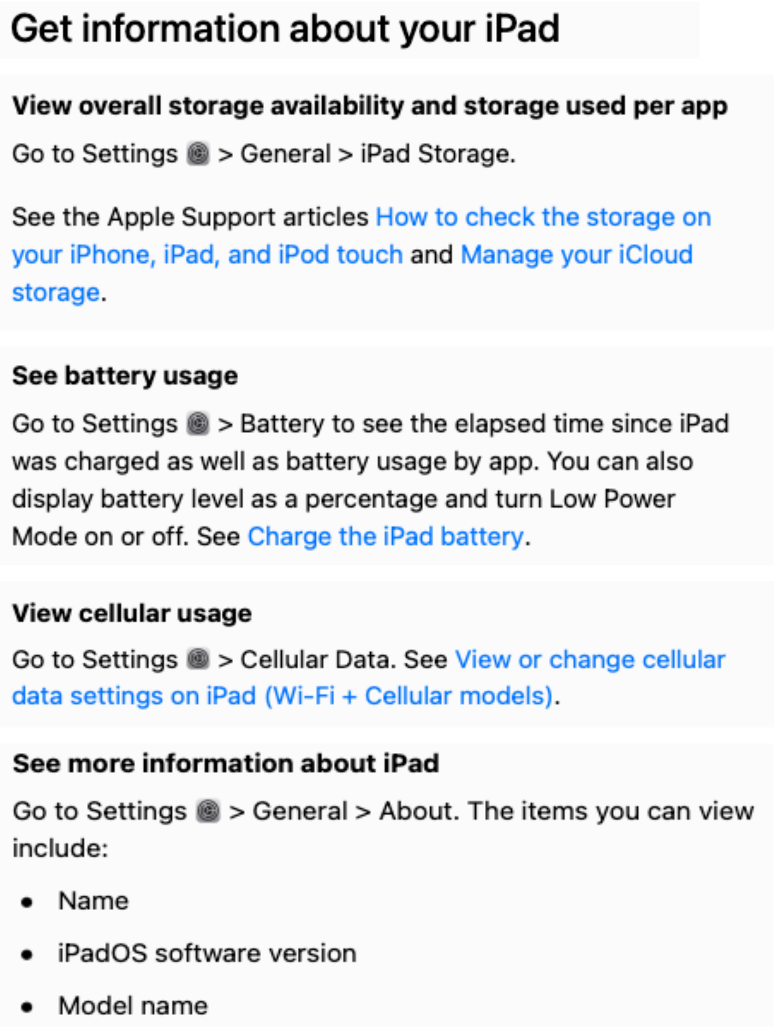


View or turn off diagnostic information

Go to Settings > Privacy & Security > Analytics & Improvements.

To help Apple improve products and services, iPhone sends diagnostic and usage data. This data doesn’t personally identify you, but may include location information.

11.2 Get information about your iPad



Get information about your iPad

View overall storage availability and storage used per app

Go to Settings > General > iPad Storage.

See the Apple Support articles How to check the storage on your iPhone, iPad, and iPod touch and Manage your iCloud storage.

See battery usage

Go to Settings > Battery to see the elapsed time since iPad was charged as well as battery usage by app. You can also display battery level as a percentage and turn Low Power Mode on or off. See Charge the iPad battery.

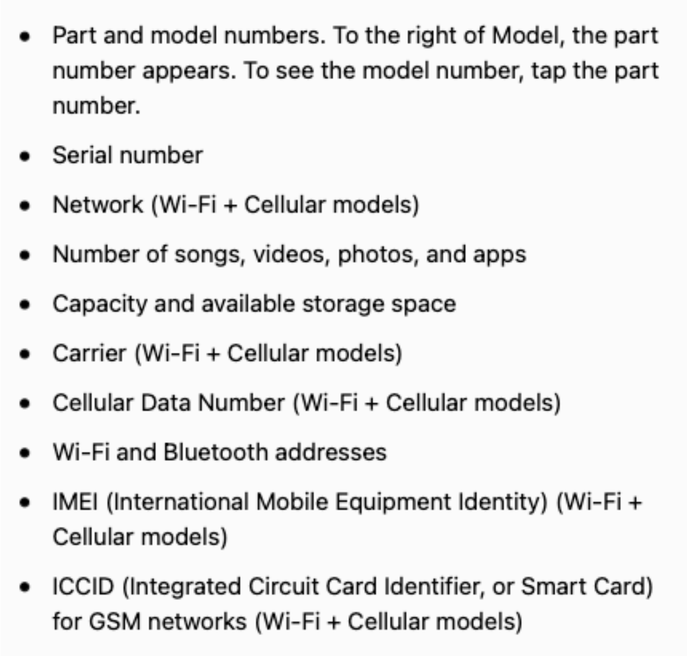
View cellular usage

Go to Settings > Cellular Data. See View or change cellular data settings on iPad (Wi-Fi + Cellular models).

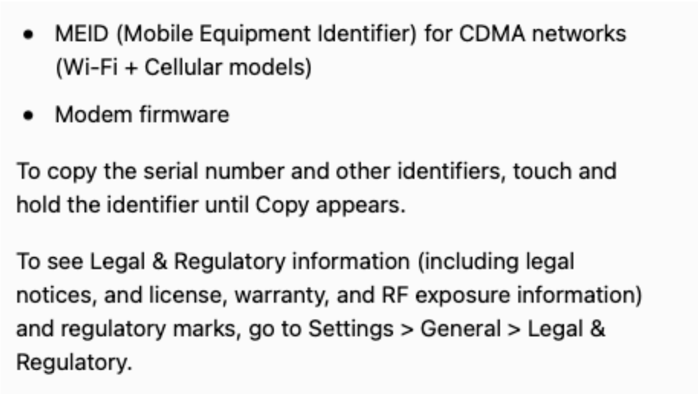
See more information about iPad

Go to Settings > General > About. The items you can view include:

- Name
- iPadOS software version
- Model name



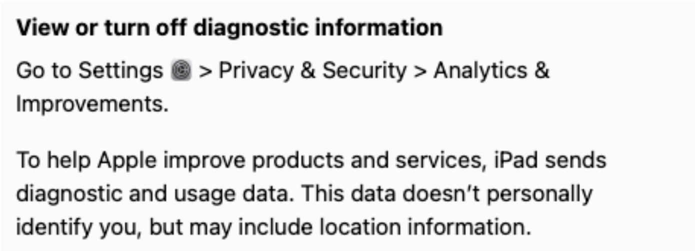
- Part and model numbers. To the right of Model, the part number appears. To see the model number, tap the part number.
- Serial number
- Network (Wi-Fi + Cellular models)
- Number of songs, videos, photos, and apps
- Capacity and available storage space
- Carrier (Wi-Fi + Cellular models)
- Cellular Data Number (Wi-Fi + Cellular models)
- Wi-Fi and Bluetooth addresses
- IMEI (International Mobile Equipment Identity) (Wi-Fi + Cellular models)
- ICCID (Integrated Circuit Card Identifier, or Smart Card) for GSM networks (Wi-Fi + Cellular models)



- MEID (Mobile Equipment Identifier) for CDMA networks (Wi-Fi + Cellular models)
- Modem firmware

To copy the serial number and other identifiers, touch and hold the identifier until Copy appears.

To see Legal & Regulatory information (including legal notices, and license, warranty, and RF exposure information) and regulatory marks, go to Settings > General > Legal & Regulatory.

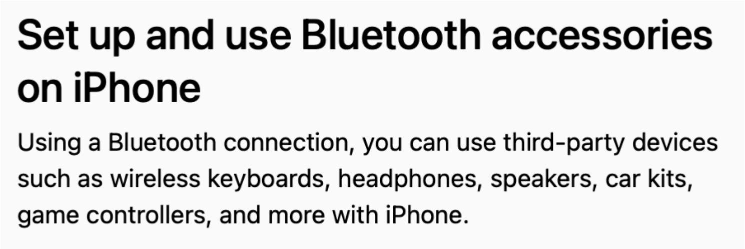


View or turn off diagnostic information

Go to Settings ⚙ > Privacy & Security > Analytics & Improvements.

To help Apple improve products and services, iPad sends diagnostic and usage data. This data doesn’t personally identify you, but may include location information.

11.3 Set up and use Bluetooth accessories on iPhone



Set up and use Bluetooth accessories on iPhone

Using a Bluetooth connection, you can use third-party devices such as wireless keyboards, headphones, speakers, car kits, game controllers, and more with iPhone.

Note: iPhone must be within about 33 feet (10 meters) of the Bluetooth device.

Pair a Bluetooth headphone, car kit, game controller, or other device

1. Follow the instructions that came with the device to put it in discovery mode.

   Note: To pair AirPods, see the instructions for your model in the “Pair and connect” section in the AirPods User Guide.

2. On iPhone, go to Settings ⚙ > Bluetooth, turn on Bluetooth, then tap the name of the device.

Note: With Siri Eyes Free (available in select cars), you can use your voice to control features of your iPhone without looking at or touching iPhone. Use Bluetooth to pair iPhone to your car (refer to the user guide that came with your car if you need to). To activate Siri, press and hold the voice command button on your steering wheel until you hear the Siri tone, then make a request.

Customize a wireless game controller

After you pair a compatible game controller, you can customize it for supported games from Apple Arcade and the App Store.

1. Go to Settings ⚙ > General > Game Controller.

2. Tap the buttons you want to change.

3. To customize for a specific app, tap Add App.

Note: Apple Arcade availability varies by country or region.

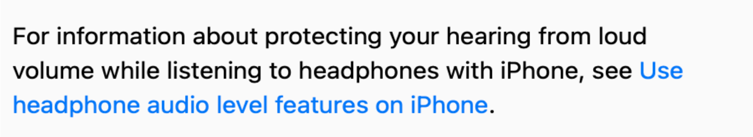
Play audio from iPhone on a Bluetooth audio device

1. On your iPhone, open an audio app, such as Music, then choose an item to play.

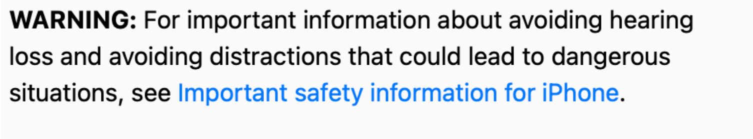
2. Tap ◎, then choose your Bluetooth device.

   While audio is playing, you can change the playback destination on the Lock Screen or in Control Center.

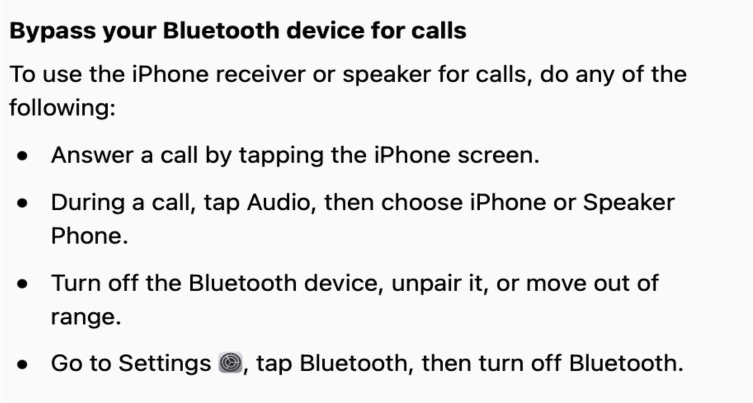
The playback destination returns to iPhone if you move the device out of Bluetooth range.



For information about protecting your hearing from loud volume while listening to headphones with iPhone, see Use headphone audio level features on iPhone.



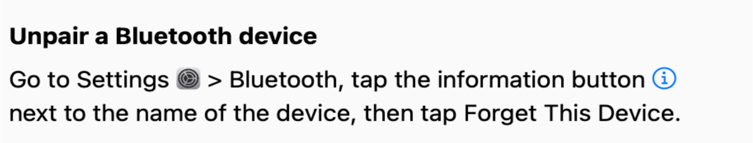
WARNING: For important information about avoiding hearing loss and avoiding distractions that could lead to dangerous situations, see Important safety information for iPhone.



Bypass your Bluetooth device for calls

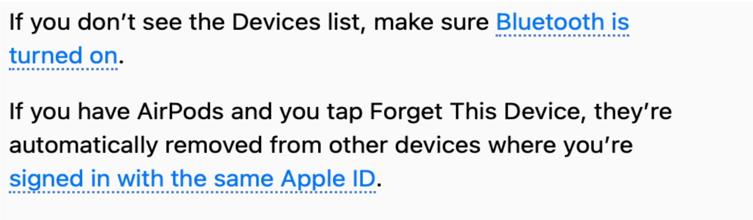
To use the iPhone receiver or speaker for calls, do any of the following:

- Answer a call by tapping the iPhone screen.
- During a call, tap Audio, then choose iPhone or Speaker Phone.
- Turn off the Bluetooth device, unpair it, or move out of range.
- Go to Settings ⚙, tap Bluetooth, then turn off Bluetooth.



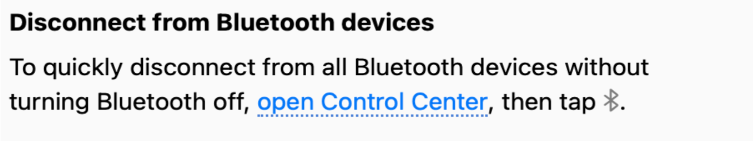
Unpair a Bluetooth device

Go to Settings ⚙ > Bluetooth, tap the information button ⓘ next to the name of the device, then tap Forget This Device.



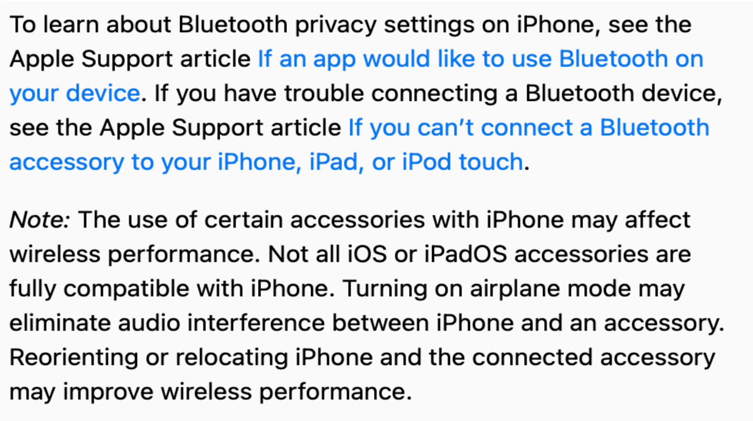
If you don't see the Devices list, make sure Bluetooth is turned on.

If you have AirPods and you tap Forget This Device, they're automatically removed from other devices where you're signed in with the same Apple ID.



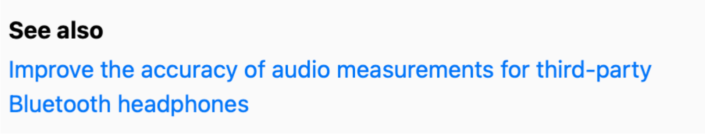
Disconnect from Bluetooth devices

To quickly disconnect from all Bluetooth devices without turning Bluetooth off, open Control Center, then tap ᛒ.



To learn about Bluetooth privacy settings on iPhone, see the Apple Support article If an app would like to use Bluetooth on your device. If you have trouble connecting a Bluetooth device, see the Apple Support article If you can't connect a Bluetooth accessory to your iPhone, iPad, or iPod touch.

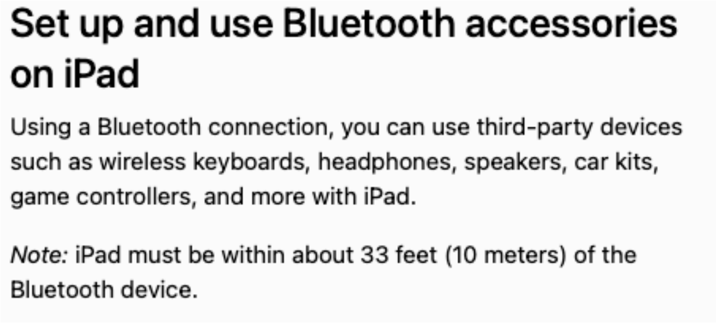
Note: The use of certain accessories with iPhone may affect wireless performance. Not all iOS or iPadOS accessories are fully compatible with iPhone. Turning on airplane mode may eliminate audio interference between iPhone and an accessory. Reorienting or relocating iPhone and the connected accessory may improve wireless performance.



See also

Improve the accuracy of audio measurements for third-party Bluetooth headphones

11.4 Set up and use Bluetooth accessories on iPad



Set up and use Bluetooth accessories on iPad

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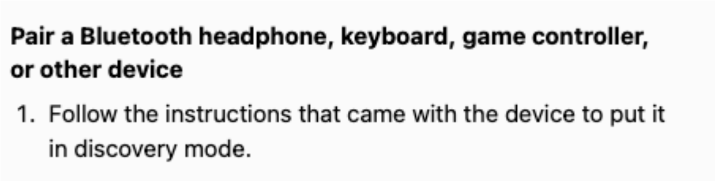
Note: iPad must be within about 33 feet (10 meters) of the Bluetooth device.



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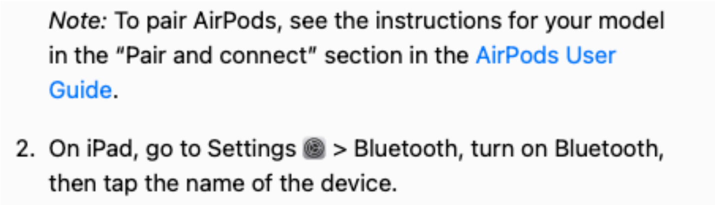
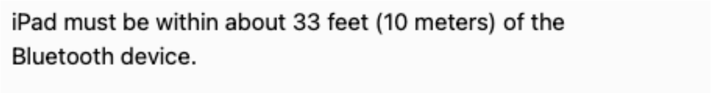
1. Follow the instructions that came with the device to put it in discovery mode.

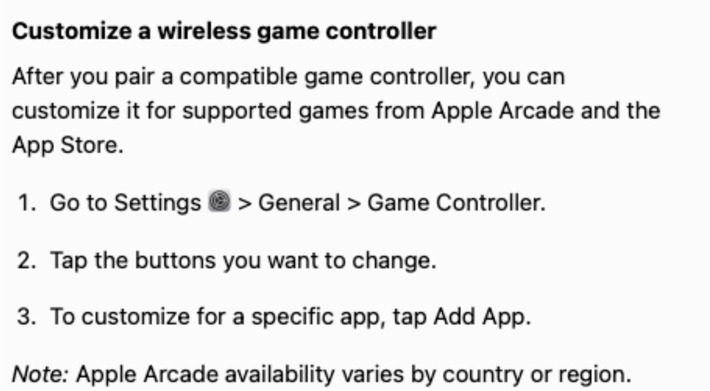


Note: To pair AirPods, see the instructions for your model in the “Pair and connect” section in the AirPods User Guide.

2. On iPad, go to Settings > Bluetooth, turn on Bluetooth, then tap the name of the device.



iPad must be within about 33 feet (10 meters) of the Bluetooth device.



Customize a wireless game controller

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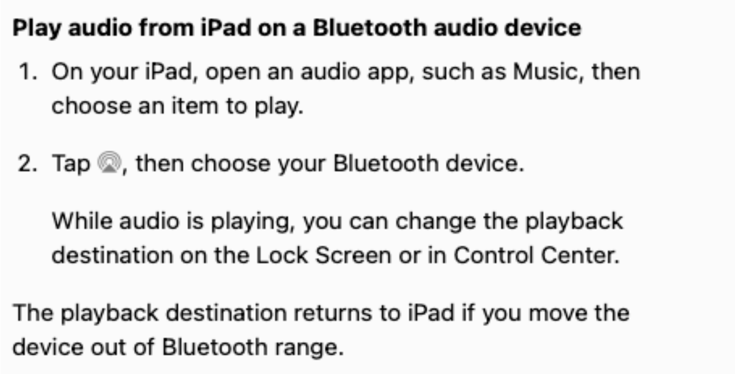
Note: Apple Arcade availability varies by country or region.



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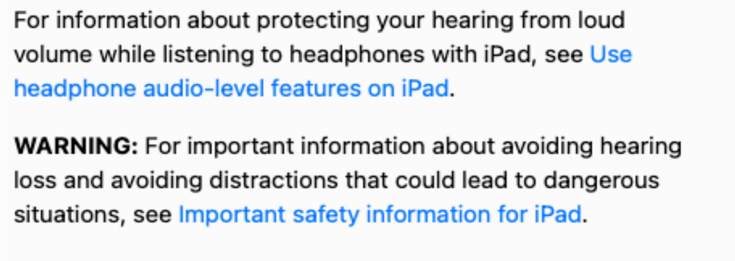
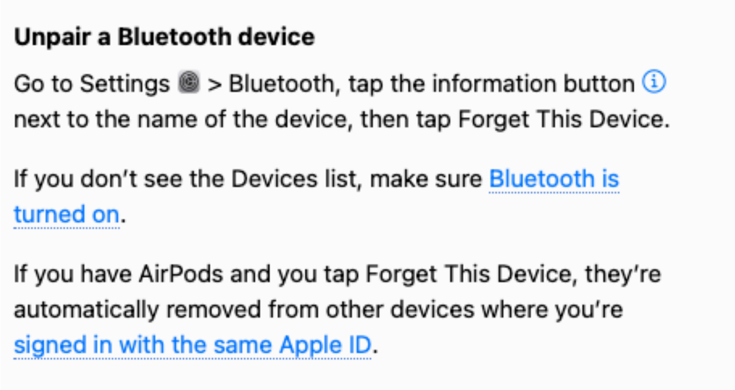


For information about protecting your hearing from loud volume while listening to headphones with iPad, see Use headphone audio-level features on iPad.

WARNING: For important information about avoiding hearing loss and avoiding distractions that could lead to dangerous situations, see Important safety information for iPad.



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Go to Settings ⚙ > Bluetooth, tap the information button ⓘ next to the name of the device, then tap Forget This Device.

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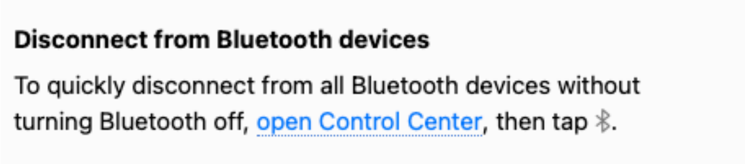
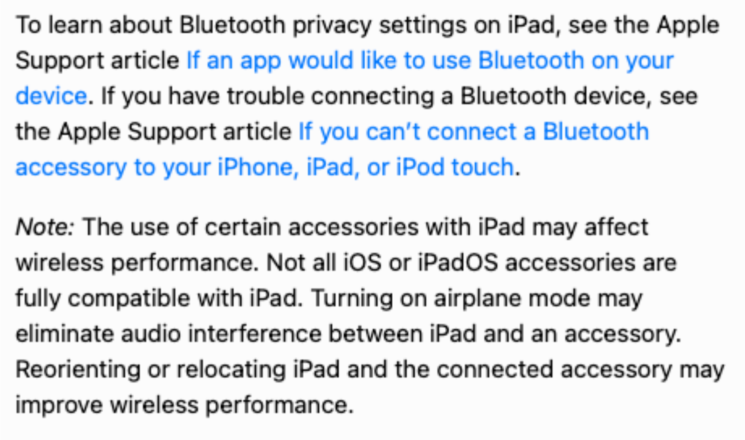


Disconnect from Bluetooth devices

To quickly disconnect from all Bluetooth devices without turning Bluetooth off, open Control Center, then tap ᛒ.



To learn about Bluetooth privacy settings on iPad, see the Apple Support article If an app would like to use Bluetooth on your device. If you have trouble connecting a Bluetooth device, see the Apple Support article If you can’t connect a Bluetooth accessory to your iPhone, iPad, or iPod touch.

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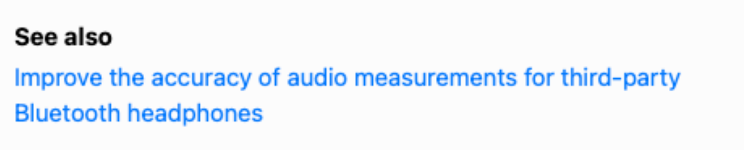
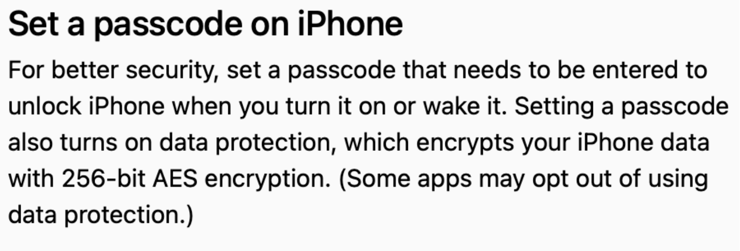


See also

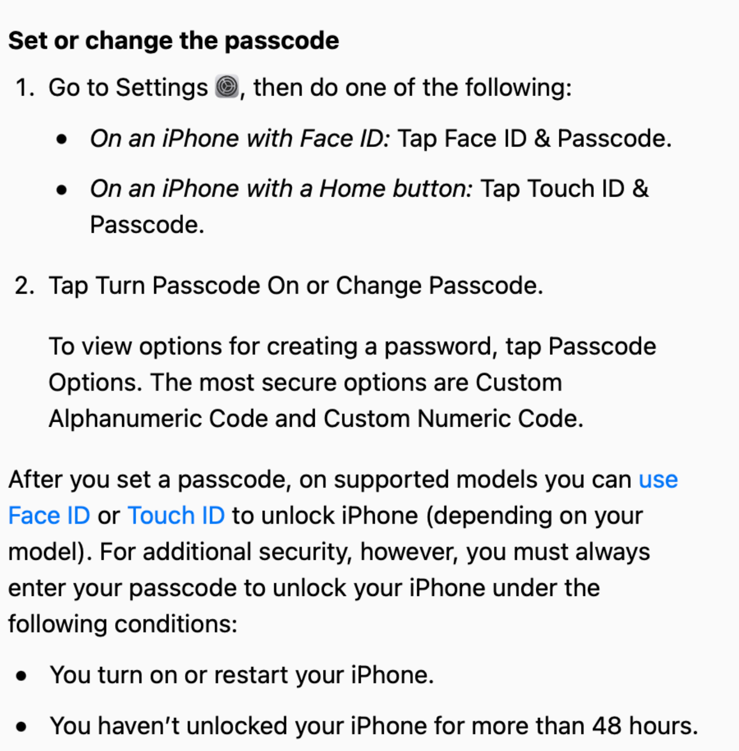
Improve the accuracy of audio measurements for third-party Bluetooth headphones

11.5 Set a passcode on iPhone



Set a passcode on iPhone

For better security, set a passcode that needs to be entered to unlock iPhone when you turn it on or wake it. Setting a passcode also turns on data protection, which encrypts your iPhone data with 256-bit AES encryption. (Some apps may opt out of using data protection.)



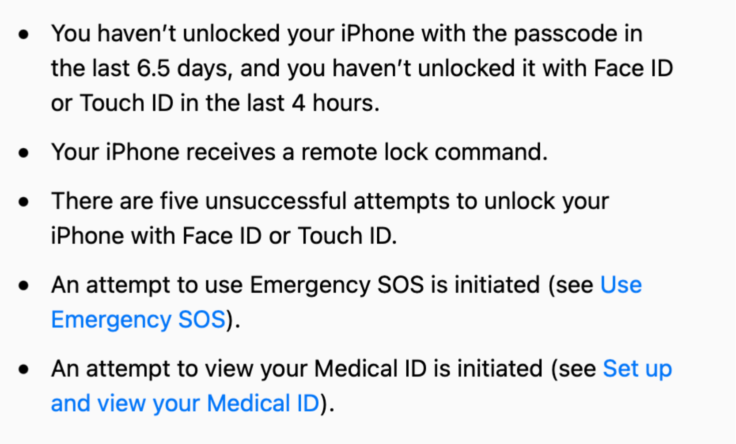
Set or change the passcode

1. Go to Settings ⚙, then do one of the following:
   - *On an iPhone with Face ID:* Tap Face ID & Passcode.
   - *On an iPhone with a Home button:* Tap Touch ID & Passcode.
2. Tap Turn Passcode On or Change Passcode.

   To view options for creating a password, tap Passcode Options. The most secure options are Custom Alphanumeric Code and Custom Numeric Code.

After you set a passcode, on supported models you can use Face ID or Touch ID to unlock iPhone (depending on your model). For additional security, however, you must always enter your passcode to unlock your iPhone under the following conditions:

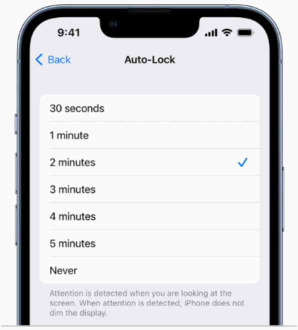
- You turn on or restart your iPhone.
- You haven’t unlocked your iPhone for more than 48 hours.



- You haven’t unlocked your iPhone with the passcode in the last 6.5 days, and you haven’t unlocked it with Face ID or Touch ID in the last 4 hours.
- Your iPhone receives a remote lock command.
- There are five unsuccessful attempts to unlock your iPhone with Face ID or Touch ID.
- An attempt to use Emergency SOS is initiated (see Use Emergency SOS).
- An attempt to view your Medical ID is initiated (see Set up and view your Medical ID).

Change when iPhone automatically locks

Go to Settings ⚙ > Display & Brightness > Auto-Lock, then set a length of time.



9:41

< Back Auto-Lock

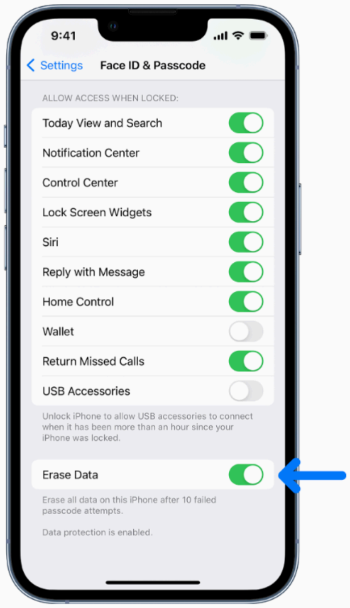
- 30 seconds
- 1 minute
- 2 minutes ✓
- 3 minutes
- 4 minutes
- 5 minutes
- Never

Attention is detected when you are looking at the screen. When attention is detected, iPhone does not dim the display.

Erase data after 10 failed passcodes

Set iPhone to erase all information, media, and personal settings after 10 consecutive failed passcode attempts.

1. Go to Settings ⚙, then do one of the following:
   - *On an iPhone with Face ID:* Tap Face ID & Passcode.
   - *On an iPhone with a Home button:* Tap Touch ID & Passcode.
2. Scroll to the bottom and turn on Erase Data.



9:41

< Settings Face ID & Passcode

ALLOW ACCESS WHEN LOCKED:

- Today View and Search ●
- Notification Center ●
- Control Center ●
- Lock Screen Widgets ●
- Siri ●
- Reply with Message ●
- Home Control ●
- Wallet ○
- Return Missed Calls ●
- USB Accessories ○

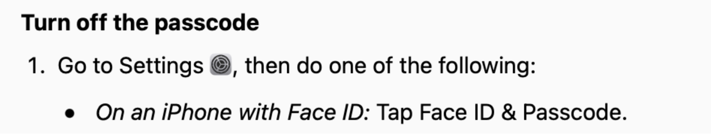
Unlock iPhone to allow USB accessories to connect when it has been more than an hour since your iPhone was locked.

- Erase Data ●

Erase all data on this iPhone after 10 failed passcode attempts.

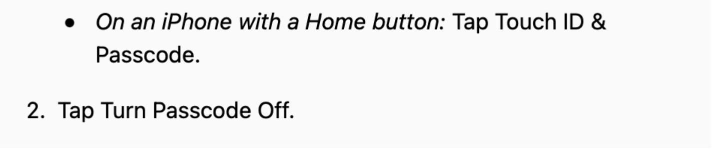
Data protection is enabled.

After all data is erased, you must restore your device from a backup or set it up again as new.

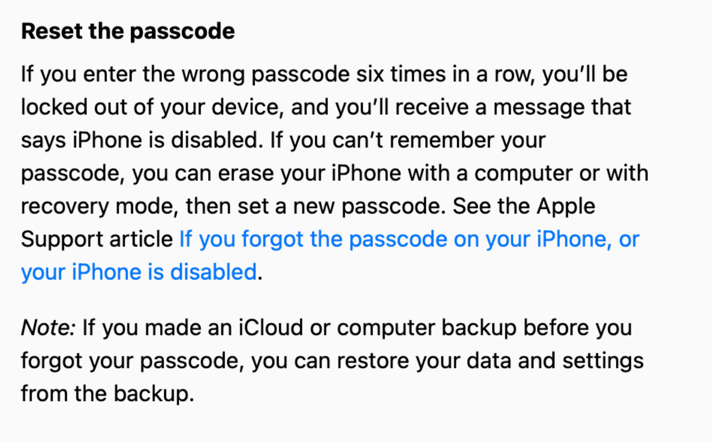


Turn off the passcode

1. Go to Settings, then do one of the following:
   - *On an iPhone with Face ID:* Tap Face ID & Passcode.



   - *On an iPhone with a Home button:* Tap Touch ID & Passcode.
2. Tap Turn Passcode Off.

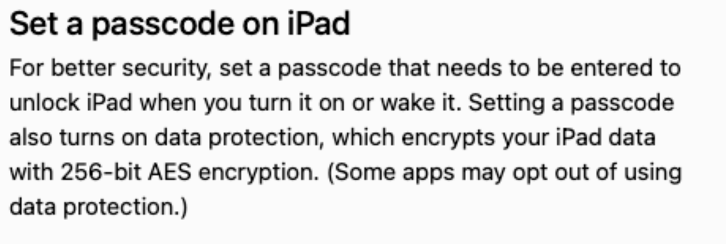


Reset the passcode

If you enter the wrong passcode six times in a row, you'll be locked out of your device, and you'll receive a message that says iPhone is disabled. If you can't remember your passcode, you can erase your iPhone with a computer or with recovery mode, then set a new passcode. See the Apple Support article If you forgot the passcode on your iPhone, or your iPhone is disabled.

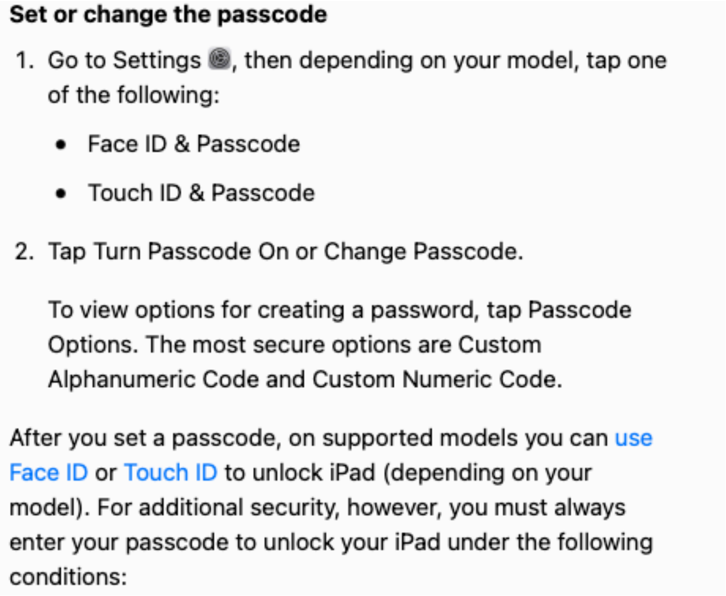
Note: If you made an iCloud or computer backup before you forgot your passcode, you can restore your data and settings from the backup.

11.6 Set a passcode on iPad



Set a passcode on iPad

For better security, set a passcode that needs to be entered to unlock iPad when you turn it on or wake it. Setting a passcode also turns on data protection, which encrypts your iPad data with 256-bit AES encryption. (Some apps may opt out of using data protection.)



Set or change the passcode

1. Go to Settings, then depending on your model, tap one of the following:
   - Face ID & Passcode
   - Touch ID & Passcode
2. Tap Turn Passcode On or Change Passcode.

   To view options for creating a password, tap Passcode Options. The most secure options are Custom Alphanumeric Code and Custom Numeric Code.

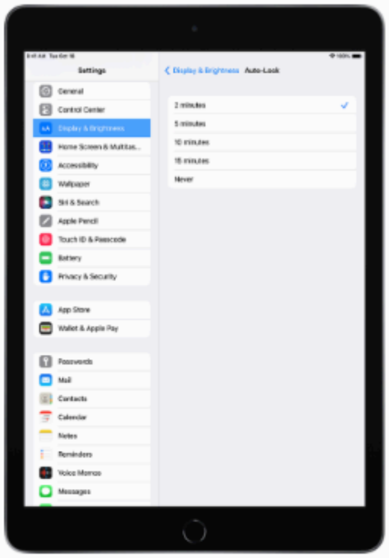
After you set a passcode, on supported models you can use Face ID or Touch ID to unlock iPad (depending on your model). For additional security, however, you must always enter your passcode to unlock your iPad under the following conditions:

- You turn on or restart your iPad.

- You haven't unlocked your iPad for more than 48 hours.
- You haven't unlocked your iPad with the passcode in the last 6.5 days, and you haven't unlocked it with Face ID or Touch ID in the last 4 hours.
- Your iPad receives a remote lock command.
- There are five unsuccessful attempts to unlock your iPad with Face ID or Touch ID.

Change when iPad automatically locks

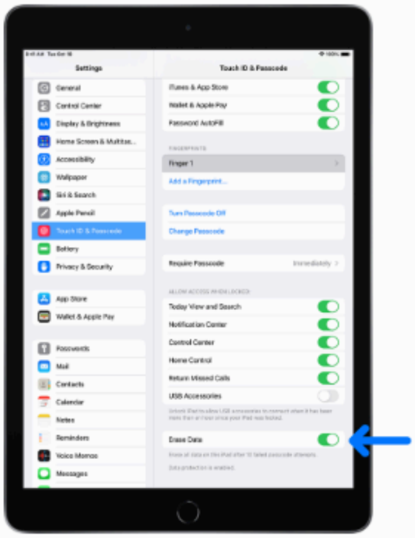
Go to Settings > Display & Brightness > Auto-Lock, then set a length of time.



Erase data after 10 failed passcodes

Set iPad to erase all information, media, and personal settings after 10 consecutive failed passcode attempts.

1. Go to Settings , then depending on your model, tap one of the following:
   - Face ID & Passcode
   - Touch ID & Passcode
   - Passcode
2. Turn on Erase Data.



Touch ID & Passcode

iTunes & App Store ●
Wallet & Apple Pay ●
Password AutoFill ●

FINGERPRINTS

Finger 1 >

Add a Fingerprint...

Turn Passcode Off

Change Passcode

Require Passcode Immediately >

ALLOW ACCESS WHEN LOCKED:

Today View and Search ●
Notification Center ●
Control Center ●
Home Control ●
Return Missed Calls ●
USB Accessories ○

Erase Data ●

After all data is erased, you must restore iPad from a backup or set it up again as new.

Turn off the passcode

1. Go to Settings, then depending on your model, tap one of the following:
   - Face ID & Passcode
   - Touch ID & Passcode
   - Passcode
2. Tap Turn Passcode Off.

Reset the passcode

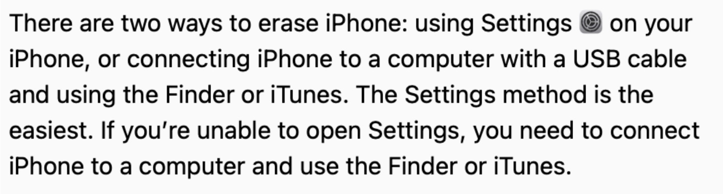
If you enter the wrong passcode six times in a row, you'll be locked out of your device, and you'll receive a message that says iPad is disabled. If you can't remember your passcode, you can erase your iPad with a computer or with recovery mode, then set a new passcode. See the Apple Support article If you forgot your iPad passcode.

Note: If you made an iCloud or computer backup before you forgot your passcode, you can restore your data and settings from the backup.

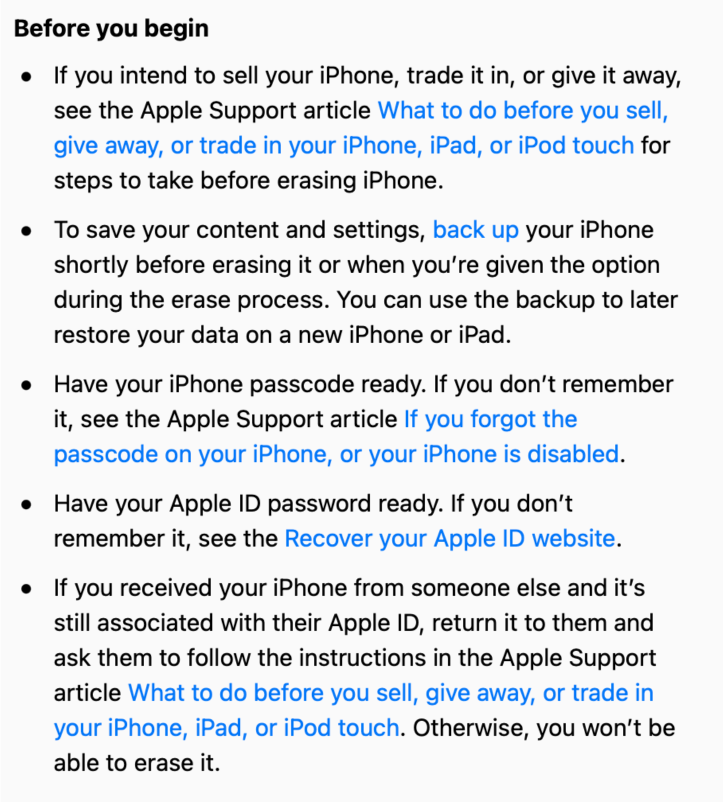
11.7 Erase iPhone

Erase iPhone

When you delete data, it no longer appears in apps on iPhone, but it isn't erased from iPhone storage. To permanently remove all of your content and settings from your iPhone, erase (wipe) your iPhone. For example, erase iPhone before you sell it, trade it in, or give it away.

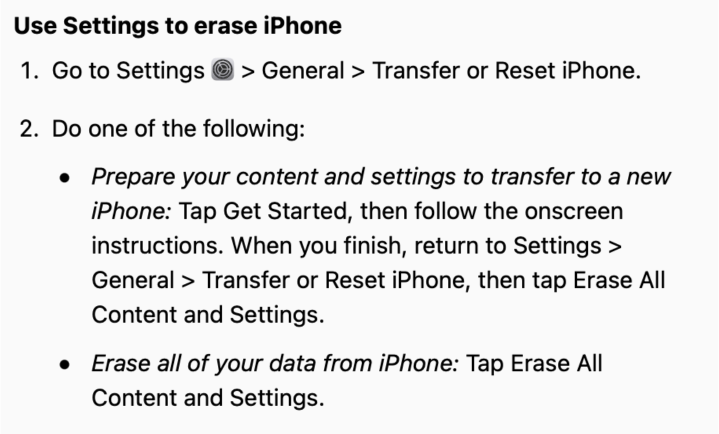


There are two ways to erase iPhone: using Settings ⚙ on your iPhone, or connecting iPhone to a computer with a USB cable and using the Finder or iTunes. The Settings method is the easiest. If you're unable to open Settings, you need to connect iPhone to a computer and use the Finder or iTunes.



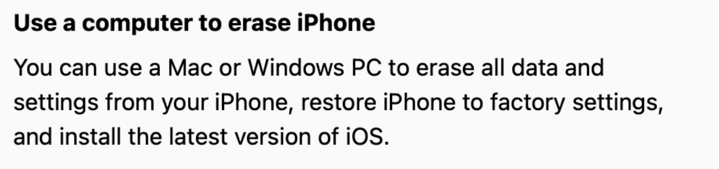
Before you begin

- If you intend to sell your iPhone, trade it in, or give it away, see the Apple Support article What to do before you sell, give away, or trade in your iPhone, iPad, or iPod touch for steps to take before erasing iPhone.
- To save your content and settings, back up your iPhone shortly before erasing it or when you're given the option during the erase process. You can use the backup to later restore your data on a new iPhone or iPad.
- Have your iPhone passcode ready. If you don't remember it, see the Apple Support article If you forgot the passcode on your iPhone, or your iPhone is disabled.
- Have your Apple ID password ready. If you don't remember it, see the Recover your Apple ID website.
- If you received your iPhone from someone else and it's still associated with their Apple ID, return it to them and ask them to follow the instructions in the Apple Support article What to do before you sell, give away, or trade in your iPhone, iPad, or iPod touch. Otherwise, you won't be able to erase it.



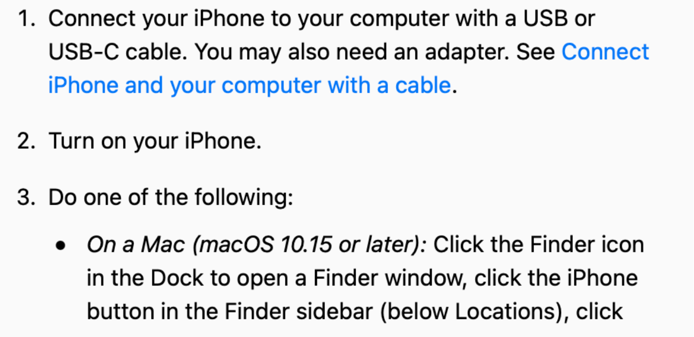
Use Settings to erase iPhone

1. Go to Settings ⚙ > General > Transfer or Reset iPhone.
2. Do one of the following:
   - *Prepare your content and settings to transfer to a new iPhone:* Tap Get Started, then follow the onscreen instructions. When you finish, return to Settings > General > Transfer or Reset iPhone, then tap Erase All Content and Settings.
   - *Erase all of your data from iPhone:* Tap Erase All Content and Settings.

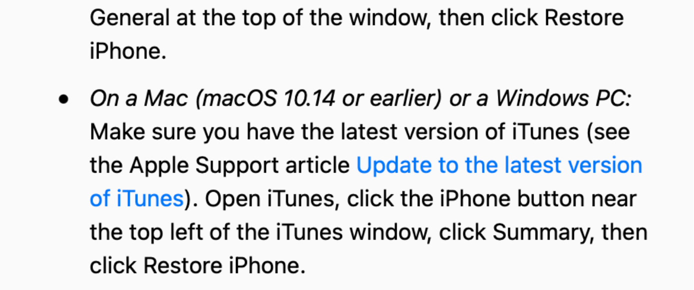


Use a computer to erase iPhone

You can use a Mac or Windows PC to erase all data and settings from your iPhone, restore iPhone to factory settings, and install the latest version of iOS.

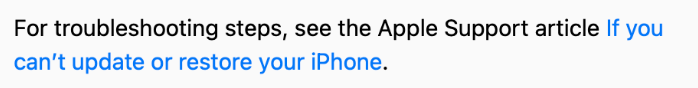


1. Connect your iPhone to your computer with a USB or USB-C cable. You may also need an adapter. See Connect iPhone and your computer with a cable.
2. Turn on your iPhone.
3. Do one of the following:
    - *On a Mac (macOS 10.15 or later):* Click the Finder icon in the Dock to open a Finder window, click the iPhone button in the Finder sidebar (below Locations), click



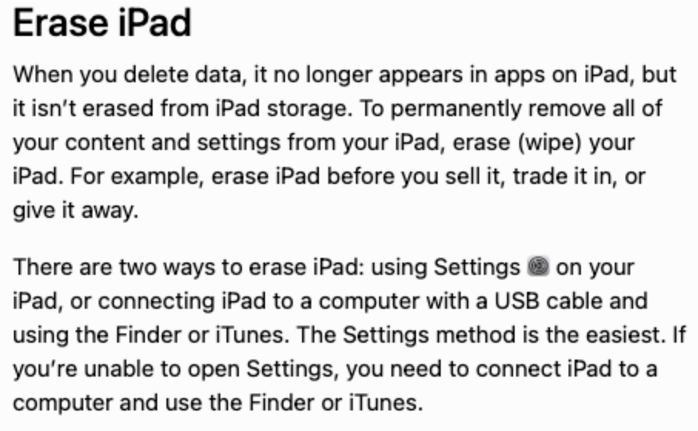
General at the top of the window, then click Restore iPhone.

- *On a Mac (macOS 10.14 or earlier) or a Windows PC:* Make sure you have the latest version of iTunes (see the Apple Support article Update to the latest version of iTunes). Open iTunes, click the iPhone button near the top left of the iTunes window, click Summary, then click Restore iPhone.



For troubleshooting steps, see the Apple Support article If you can't update or restore your iPhone.

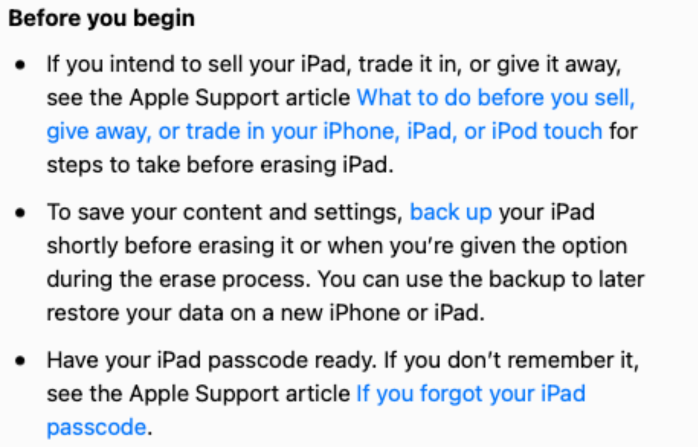
11.8 Erase iPad



Erase iPad

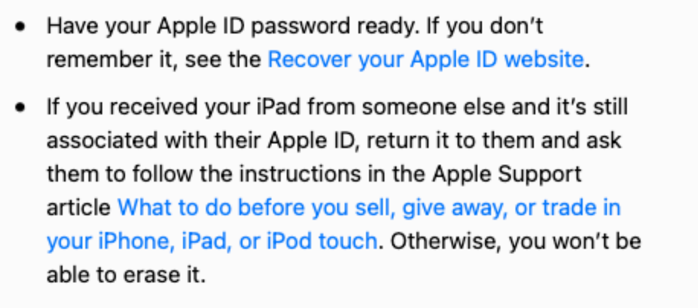
When you delete data, it no longer appears in apps on iPad, but it isn't erased from iPad storage. To permanently remove all of your content and settings from your iPad, erase (wipe) your iPad. For example, erase iPad before you sell it, trade it in, or give it away.

There are two ways to erase iPad: using Settings ⚙ on your iPad, or connecting iPad to a computer with a USB cable and using the Finder or iTunes. The Settings method is the easiest. If you're unable to open Settings, you need to connect iPad to a computer and use the Finder or iTunes.

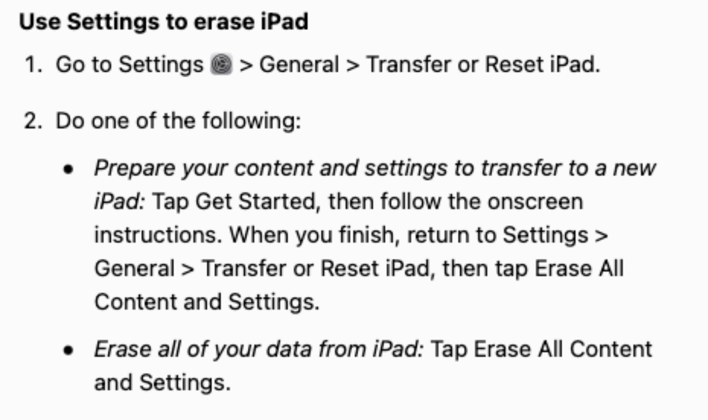


Before you begin

- If you intend to sell your iPad, trade it in, or give it away, see the Apple Support article What to do before you sell, give away, or trade in your iPhone, iPad, or iPod touch for steps to take before erasing iPad.
- To save your content and settings, back up your iPad shortly before erasing it or when you're given the option during the erase process. You can use the backup to later restore your data on a new iPhone or iPad.
- Have your iPad passcode ready. If you don't remember it, see the Apple Support article If you forgot your iPad passcode.

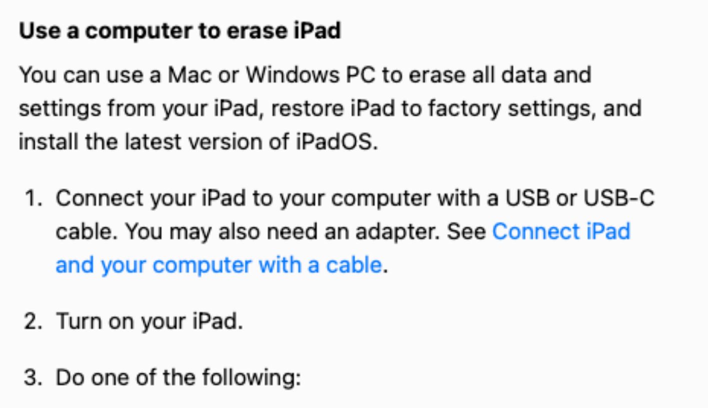


- Have your Apple ID password ready. If you don't remember it, see the Recover your Apple ID website.
- If you received your iPad from someone else and it's still associated with their Apple ID, return it to them and ask them to follow the instructions in the Apple Support article What to do before you sell, give away, or trade in your iPhone, iPad, or iPod touch. Otherwise, you won't be able to erase it.



Use Settings to erase iPad

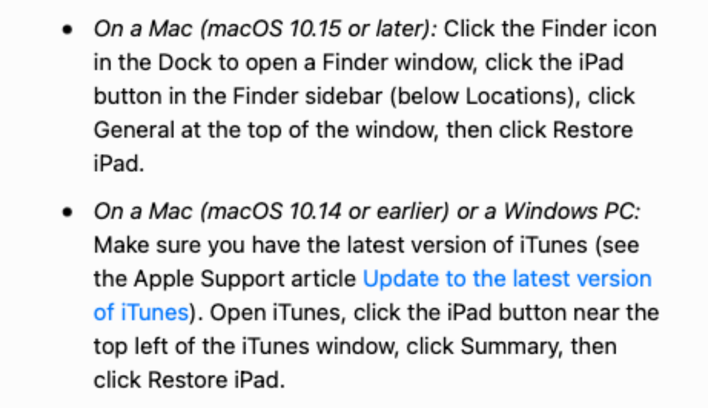
1. Go to Settings ⚙ > General > Transfer or Reset iPad.
2. Do one of the following:
   - *Prepare your content and settings to transfer to a new iPad:* Tap Get Started, then follow the onscreen instructions. When you finish, return to Settings > General > Transfer or Reset iPad, then tap Erase All Content and Settings.
   - *Erase all of your data from iPad:* Tap Erase All Content and Settings.



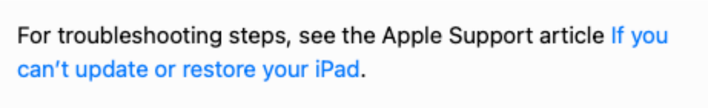
Use a computer to erase iPad

You can use a Mac or Windows PC to erase all data and settings from your iPad, restore iPad to factory settings, and install the latest version of iPadOS.

1. Connect your iPad to your computer with a USB or USB-C cable. You may also need an adapter. See Connect iPad and your computer with a cable.
2. Turn on your iPad.
3. Do one of the following:



- *On a Mac (macOS 10.15 or later):* Click the Finder icon in the Dock to open a Finder window, click the iPad button in the Finder sidebar (below Locations), click General at the top of the window, then click Restore iPad.
- *On a Mac (macOS 10.14 or earlier) or a Windows PC:* Make sure you have the latest version of iTunes (see the Apple Support article Update to the latest version of iTunes). Open iTunes, click the iPad button near the top left of the iTunes window, click Summary, then click Restore iPad.



For troubleshooting steps, see the Apple Support article If you can't update or restore your iPad.

11.9 Set up Face ID on iPhone

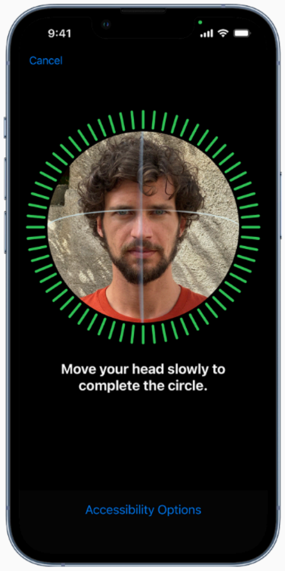
Set up Face ID on iPhone

Use Face ID (supported models) to securely and conveniently unlock iPhone, authorize purchases and payments, and sign in to many third-party apps by simply glancing at your iPhone.

To use Face ID, you must also set a passcode on your iPhone.

Set up Face ID or add an alternate appearance

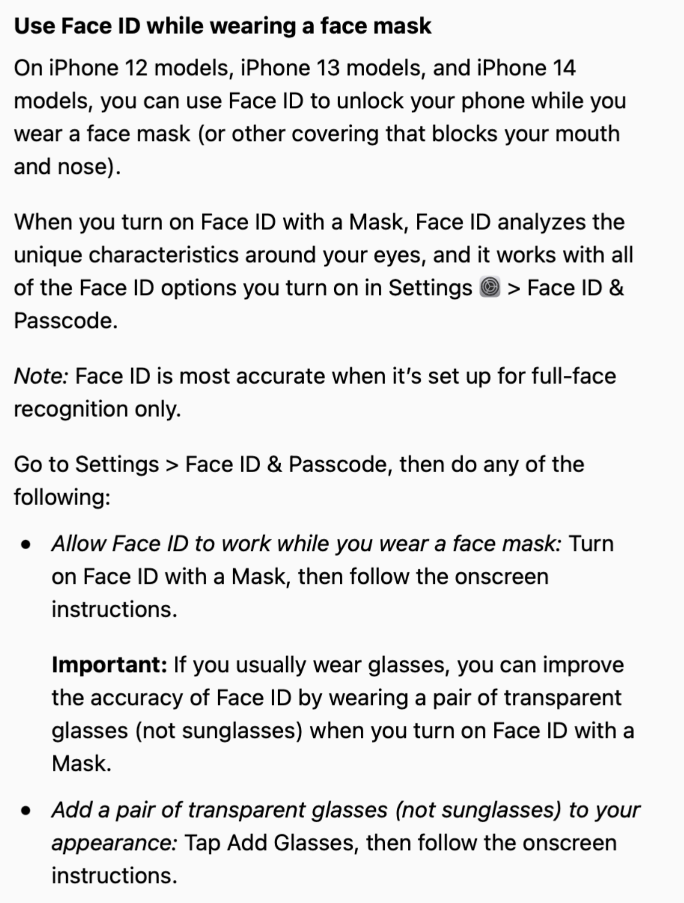
- If you didn’t set up Face ID when you first set up your iPhone, go to Settings > Face ID & Passcode > Set up Face ID, then follow the onscreen instructions.
- To set up an additional appearance for Face ID to recognize, go to Settings > Face ID & Passcode > Set Up an Alternate Appearance, then follow the onscreen instructions.



Move your head slowly to complete the circle.

If you have physical limitations, you can tap Accessibility Options during Face ID set up. When you do this, setting up facial recognition doesn’t require the full range of head motion. Using Face ID is still secure, but it requires more consistency in how you look at iPhone.

Face ID also has an accessibility feature you can use if you’re blind or have low vision. If you don’t want Face ID to require that you look at iPhone with your eyes open, go to Settings > Accessibility, then turn off Require Attention for Face ID. This feature is automatically turned off if you turn on VoiceOver when you first set up iPhone. See Change Face ID and attention settings on iPhone.



Use Face ID while wearing a face mask

On iPhone 12 models, iPhone 13 models, and iPhone 14 models, you can use Face ID to unlock your phone while you wear a face mask (or other covering that blocks your mouth and nose).

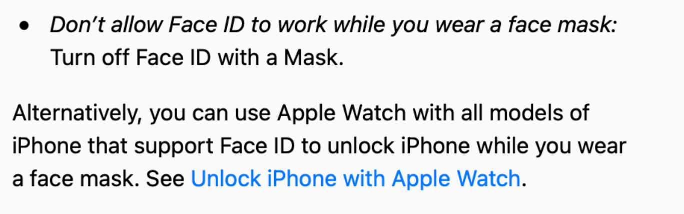
When you turn on Face ID with a Mask, Face ID analyzes the unique characteristics around your eyes, and it works with all of the Face ID options you turn on in Settings > Face ID & Passcode.

Note: Face ID is most accurate when it's set up for full-face recognition only.

Go to Settings > Face ID & Passcode, then do any of the following:

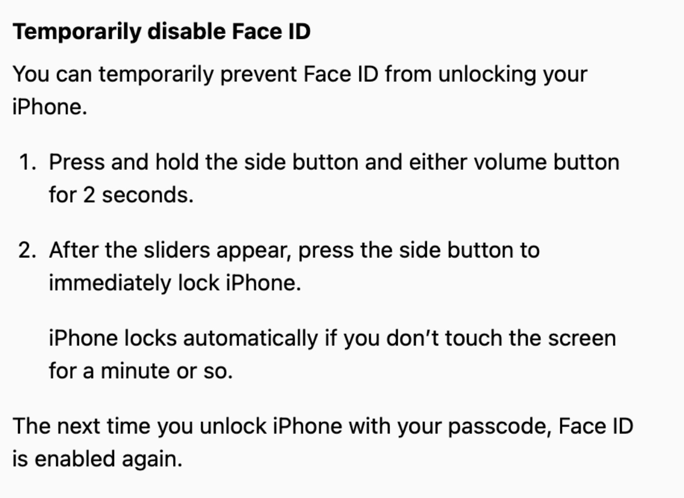
- *Allow Face ID to work while you wear a face mask:* Turn on Face ID with a Mask, then follow the onscreen instructions.

  Important: If you usually wear glasses, you can improve the accuracy of Face ID by wearing a pair of transparent glasses (not sunglasses) when you turn on Face ID with a Mask.
- *Add a pair of transparent glasses (not sunglasses) to your appearance:* Tap Add Glasses, then follow the onscreen instructions.



- *Don't allow Face ID to work while you wear a face mask:* Turn off Face ID with a Mask.

Alternatively, you can use Apple Watch with all models of iPhone that support Face ID to unlock iPhone while you wear a face mask. See Unlock iPhone with Apple Watch.



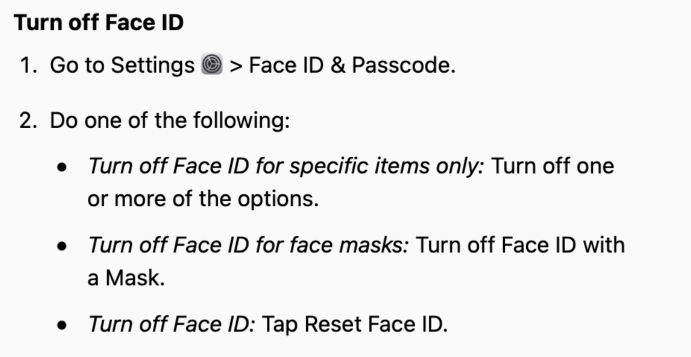
Temporarily disable Face ID

You can temporarily prevent Face ID from unlocking your iPhone.

1. Press and hold the side button and either volume button for 2 seconds.
2. After the sliders appear, press the side button to immediately lock iPhone.

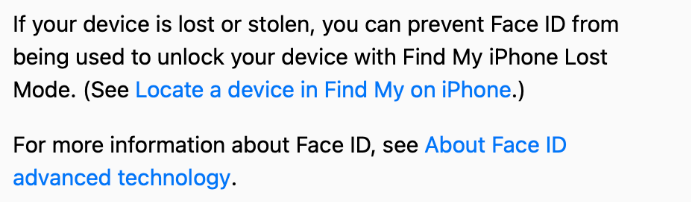
   iPhone locks automatically if you don't touch the screen for a minute or so.

The next time you unlock iPhone with your passcode, Face ID is enabled again.



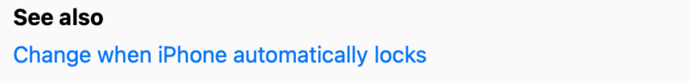
Turn off Face ID

1. Go to Settings ⚙ > Face ID & Passcode.
2. Do one of the following:
   - *Turn off Face ID for specific items only:* Turn off one or more of the options.
   - *Turn off Face ID for face masks:* Turn off Face ID with a Mask.
   - *Turn off Face ID:* Tap Reset Face ID.



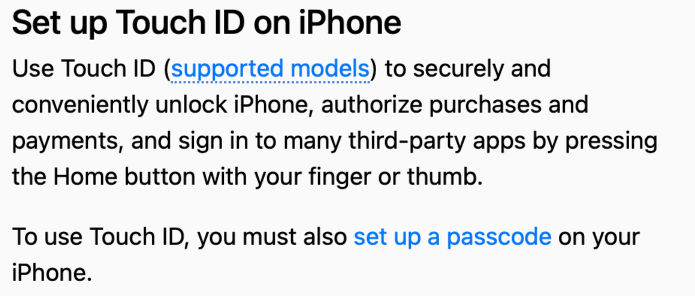
If your device is lost or stolen, you can prevent Face ID from being used to unlock your device with Find My iPhone Lost Mode. (See Locate a device in Find My on iPhone.)

For more information about Face ID, see About Face ID advanced technology.



See also
Change when iPhone automatically locks

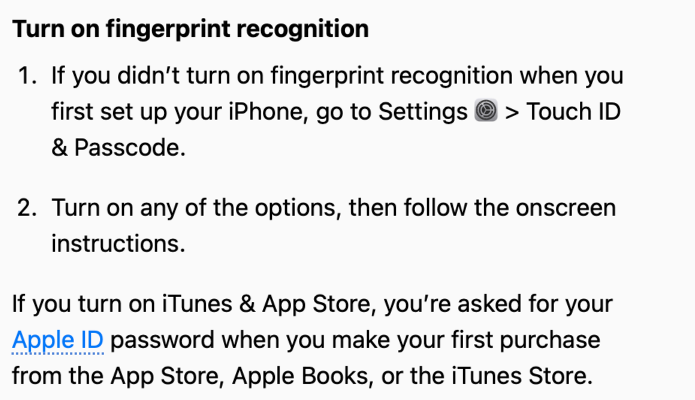
11.10 Set up Touch ID on iPhone



Set up Touch ID on iPhone

Use Touch ID (supported models) to securely and conveniently unlock iPhone, authorize purchases and payments, and sign in to many third-party apps by pressing the Home button with your finger or thumb.

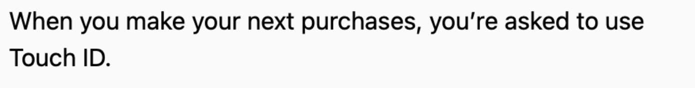
To use Touch ID, you must also set up a passcode on your iPhone.



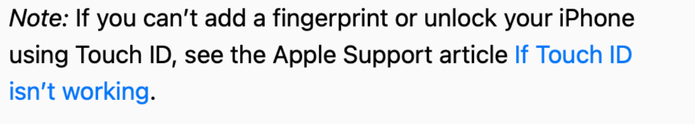
Turn on fingerprint recognition

1. If you didn't turn on fingerprint recognition when you first set up your iPhone, go to Settings ⚙ > Touch ID & Passcode.
2. Turn on any of the options, then follow the onscreen instructions.

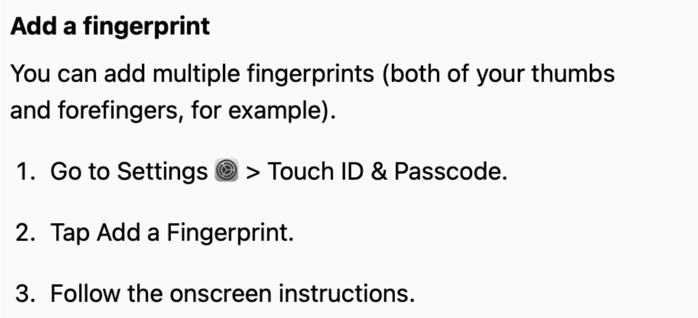
If you turn on iTunes & App Store, you're asked for your Apple ID password when you make your first purchase from the App Store, Apple Books, or the iTunes Store.



When you make your next purchases, you're asked to use Touch ID.



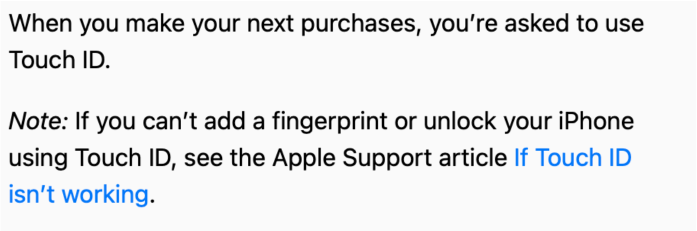
Note: If you can't add a fingerprint or unlock your iPhone using Touch ID, see the Apple Support article If Touch ID isn't working.



Add a fingerprint

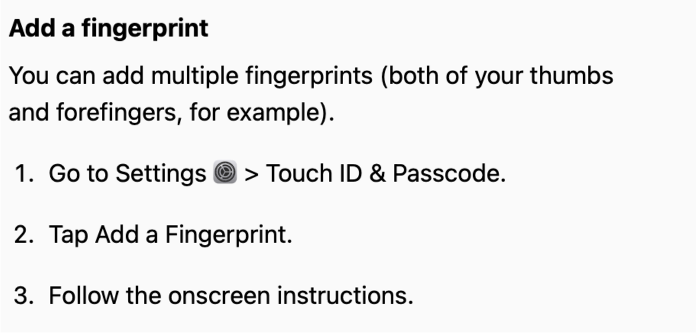
You can add multiple fingerprints (both of your thumbs and forefingers, for example).

1. Go to Settings ⚙ > Touch ID & Passcode.
2. Tap Add a Fingerprint.
3. Follow the onscreen instructions.



When you make your next purchases, you're asked to use Touch ID.

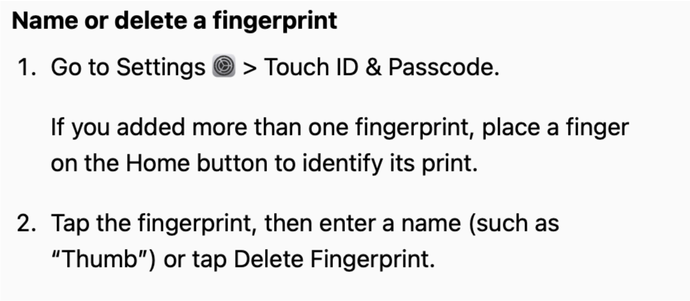
Note: If you can't add a fingerprint or unlock your iPhone using Touch ID, see the Apple Support article If Touch ID isn't working.



Add a fingerprint

You can add multiple fingerprints (both of your thumbs and forefingers, for example).

1. Go to Settings ⚙ > Touch ID & Passcode.
2. Tap Add a Fingerprint.
3. Follow the onscreen instructions.

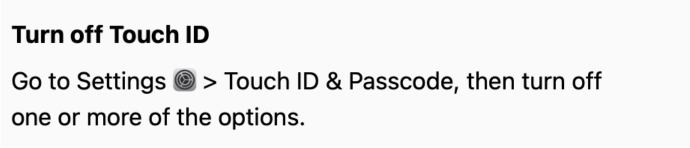


Name or delete a fingerprint

1. Go to Settings ⚙ > Touch ID & Passcode.

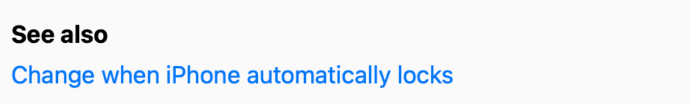
   If you added more than one fingerprint, place a finger on the Home button to identify its print.

2. Tap the fingerprint, then enter a name (such as "Thumb") or tap Delete Fingerprint.



Turn off Touch ID

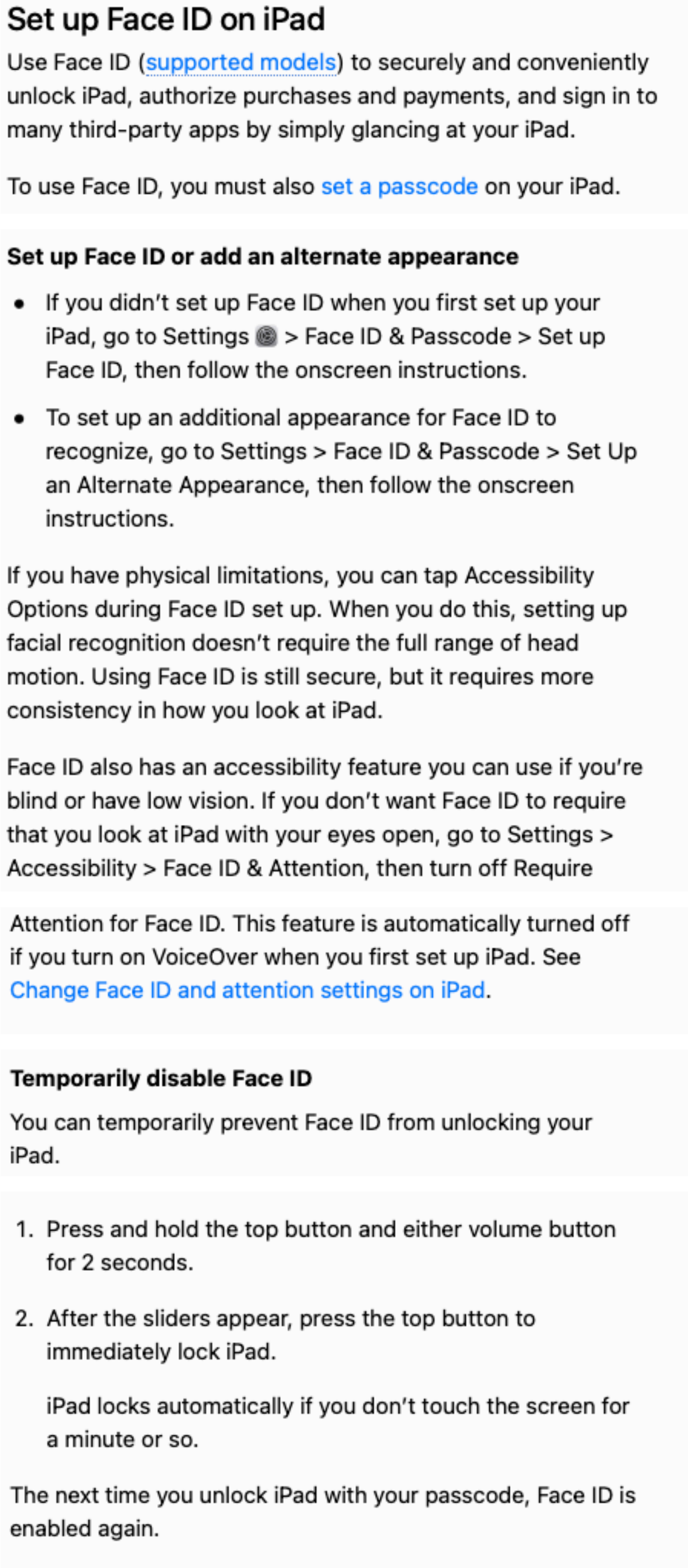
Go to Settings ⚙ > Touch ID & Passcode, then turn off one or more of the options.



See also

Change when iPhone automatically locks

11.11 Set up Face ID on iPad



Set up Face ID on iPad

Use Face ID (supported models) to securely and conveniently unlock iPad, authorize purchases and payments, and sign in to many third-party apps by simply glancing at your iPad.

To use Face ID, you must also set a passcode on your iPad.

Set up Face ID or add an alternate appearance

- If you didn't set up Face ID when you first set up your iPad, go to Settings > Face ID & Passcode > Set up Face ID, then follow the onscreen instructions.
- To set up an additional appearance for Face ID to recognize, go to Settings > Face ID & Passcode > Set Up an Alternate Appearance, then follow the onscreen instructions.

If you have physical limitations, you can tap Accessibility Options during Face ID set up. When you do this, setting up facial recognition doesn't require the full range of head motion. Using Face ID is still secure, but it requires more consistency in how you look at iPad.

Face ID also has an accessibility feature you can use if you're blind or have low vision. If you don't want Face ID to require that you look at iPad with your eyes open, go to Settings > Accessibility > Face ID & Attention, then turn off Require Attention for Face ID. This feature is automatically turned off if you turn on VoiceOver when you first set up iPad. See Change Face ID and attention settings on iPad.

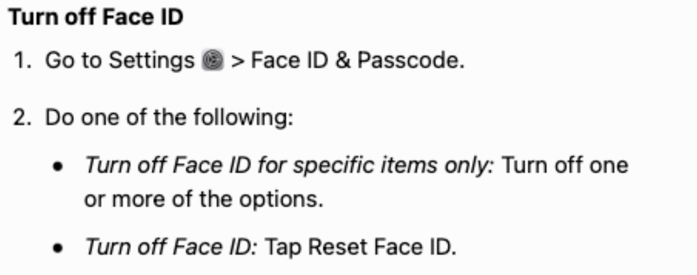
Temporarily disable Face ID

You can temporarily prevent Face ID from unlocking your iPad.

1. Press and hold the top button and either volume button for 2 seconds.
2. After the sliders appear, press the top button to immediately lock iPad.

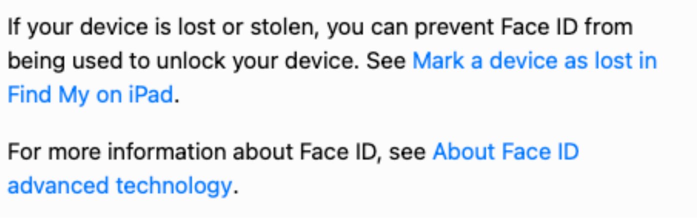
   iPad locks automatically if you don't touch the screen for a minute or so.

The next time you unlock iPad with your passcode, Face ID is enabled again.



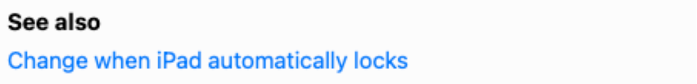
Turn off Face ID

1. Go to Settings ⚙ > Face ID & Passcode.
2. Do one of the following:
   - *Turn off Face ID for specific items only:* Turn off one or more of the options.
   - *Turn off Face ID:* Tap Reset Face ID.



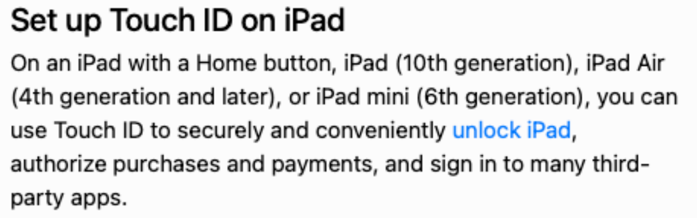
If your device is lost or stolen, you can prevent Face ID from being used to unlock your device. See Mark a device as lost in Find My on iPad.

For more information about Face ID, see About Face ID advanced technology.



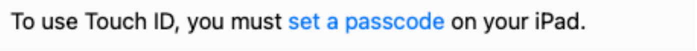
See also
Change when iPad automatically locks

11.12 Set up Touch ID on iPad

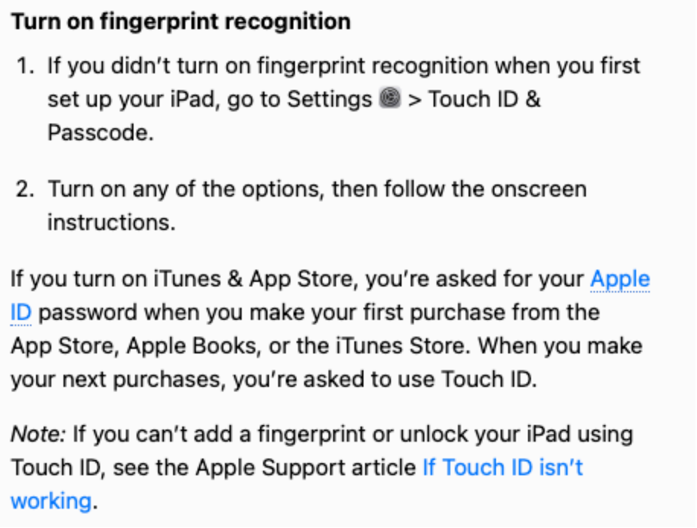


Set up Touch ID on iPad

On an iPad with a Home button, iPad (10th generation), iPad Air (4th generation and later), or iPad mini (6th generation), you can use Touch ID to securely and conveniently unlock iPad, authorize purchases and payments, and sign in to many third-party apps.



To use Touch ID, you must set a passcode on your iPad.

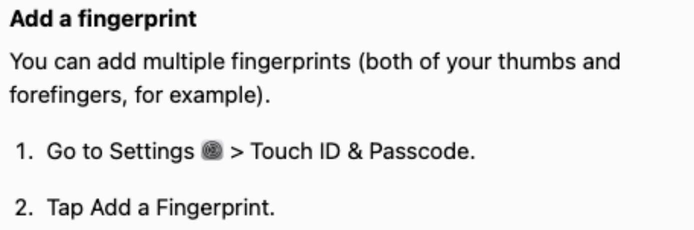


Turn on fingerprint recognition

1. If you didn't turn on fingerprint recognition when you first set up your iPad, go to Settings ⚙ > Touch ID & Passcode.
2. Turn on any of the options, then follow the onscreen instructions.

If you turn on iTunes & App Store, you're asked for your Apple ID password when you make your first purchase from the App Store, Apple Books, or the iTunes Store. When you make your next purchases, you're asked to use Touch ID.

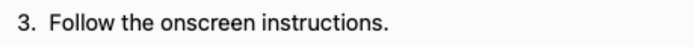
Note: If you can't add a fingerprint or unlock your iPad using Touch ID, see the Apple Support article If Touch ID isn't working.



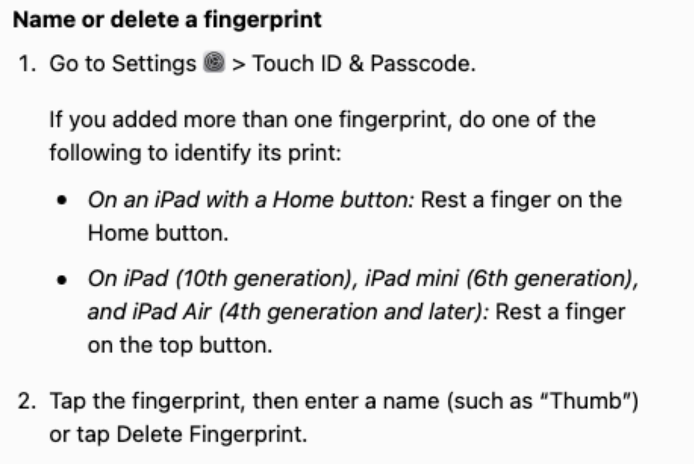
Add a fingerprint

You can add multiple fingerprints (both of your thumbs and forefingers, for example).

1. Go to Settings > Touch ID & Passcode.
2. Tap Add a Fingerprint.



3. Follow the onscreen instructions.



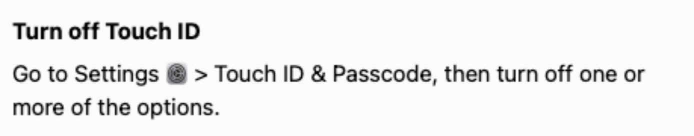
Name or delete a fingerprint

1. Go to Settings > Touch ID & Passcode.

   If you added more than one fingerprint, do one of the following to identify its print:

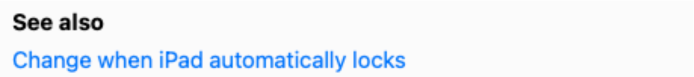
   - *On an iPad with a Home button:* Rest a finger on the Home button.
   - *On iPad (10th generation), iPad mini (6th generation), and iPad Air (4th generation and later):* Rest a finger on the top button.

2. Tap the fingerprint, then enter a name (such as "Thumb") or tap Delete Fingerprint.



Turn off Touch ID

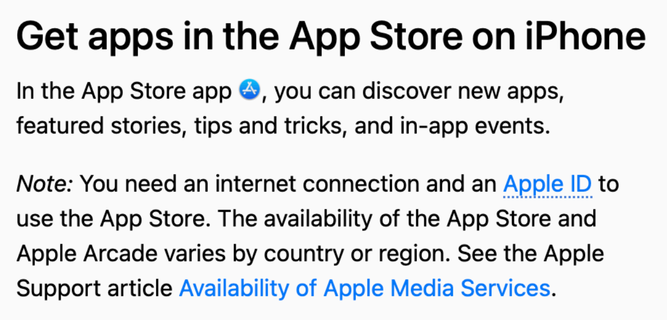
Go to Settings > Touch ID & Passcode, then turn off one or more of the options.



See also

Change when iPad automatically locks

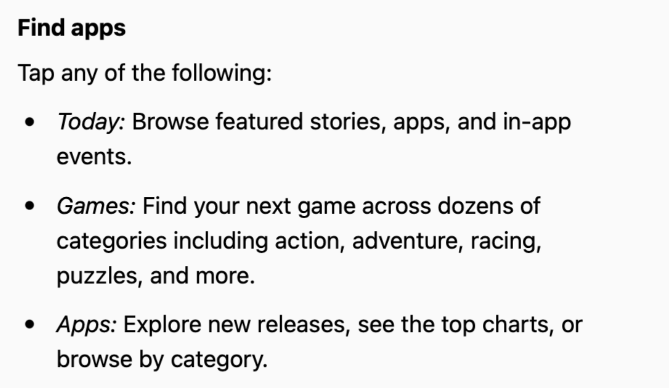
11.13 Get apps in the App Store on iPhone



Get apps in the App Store on iPhone

In the App Store app, you can discover new apps, featured stories, tips and tricks, and in-app events.

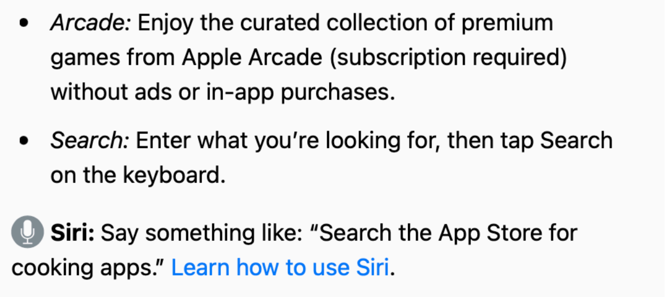
Note: You need an internet connection and an Apple ID to use the App Store. The availability of the App Store and Apple Arcade varies by country or region. See the Apple Support article Availability of Apple Media Services.



Find apps

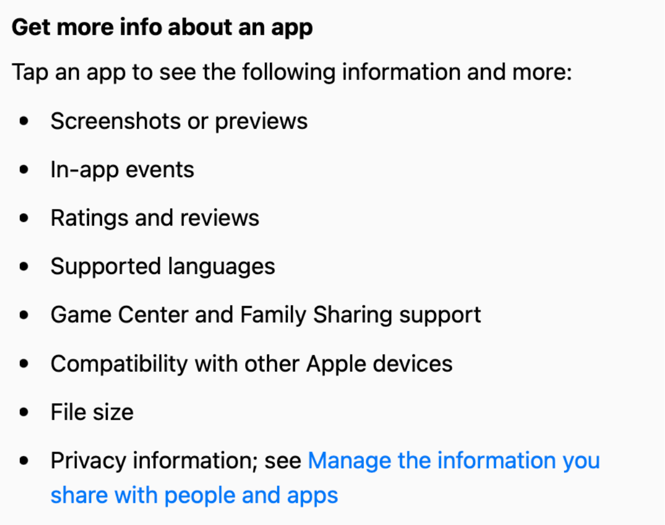
Tap any of the following:

- *Today:* Browse featured stories, apps, and in-app events.
- *Games:* Find your next game across dozens of categories including action, adventure, racing, puzzles, and more.
- *Apps:* Explore new releases, see the top charts, or browse by category.



- *Arcade:* Enjoy the curated collection of premium games from Apple Arcade (subscription required) without ads or in-app purchases.
- *Search:* Enter what you're looking for, then tap Search on the keyboard.

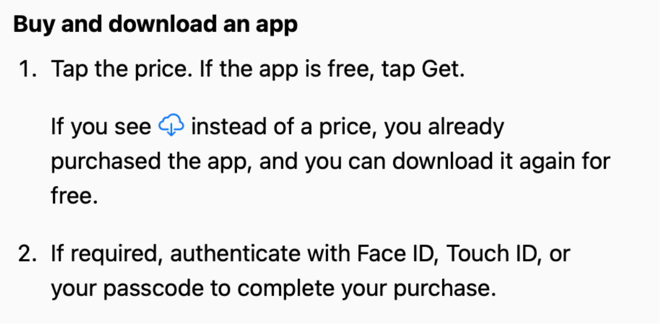
Siri: Say something like: "Search the App Store for cooking apps." Learn how to use Siri.



Get more info about an app

Tap an app to see the following information and more:

- Screenshots or previews
- In-app events
- Ratings and reviews
- Supported languages
- Game Center and Family Sharing support
- Compatibility with other Apple devices
- File size
- Privacy information; see Manage the information you share with people and apps

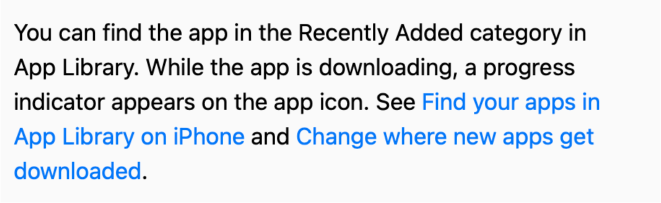


Buy and download an app

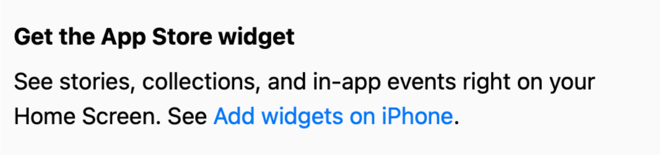
1. Tap the price. If the app is free, tap Get.

   If you see ⤓ instead of a price, you already purchased the app, and you can download it again for free.

2. If required, authenticate with Face ID, Touch ID, or your passcode to complete your purchase.

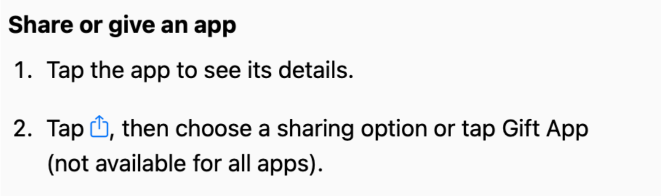


You can find the app in the Recently Added category in App Library. While the app is downloading, a progress indicator appears on the app icon. See Find your apps in App Library on iPhone and Change where new apps get downloaded.



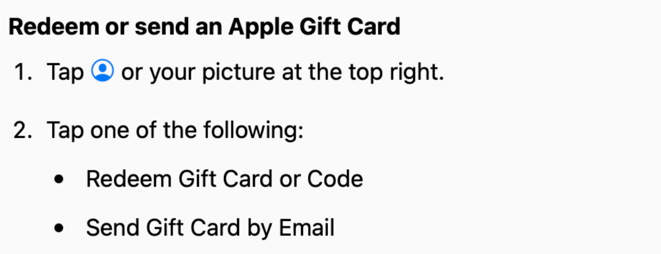
Get the App Store widget

See stories, collections, and in-app events right on your Home Screen. See Add widgets on iPhone.



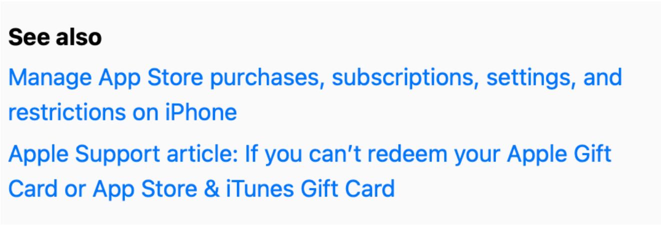
Share or give an app

1. Tap the app to see its details.
2. Tap ⍐, then choose a sharing option or tap Gift App (not available for all apps).



Redeem or send an Apple Gift Card

1. Tap 👤 or your picture at the top right.
2. Tap one of the following:
   - Redeem Gift Card or Code
   - Send Gift Card by Email

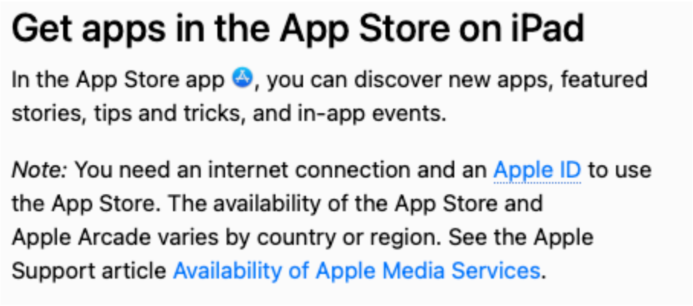


See also

Manage App Store purchases, subscriptions, settings, and restrictions on iPhone

Apple Support article: If you can't redeem your Apple Gift Card or App Store & iTunes Gift Card

11.14 Get apps in the App Store on iPad



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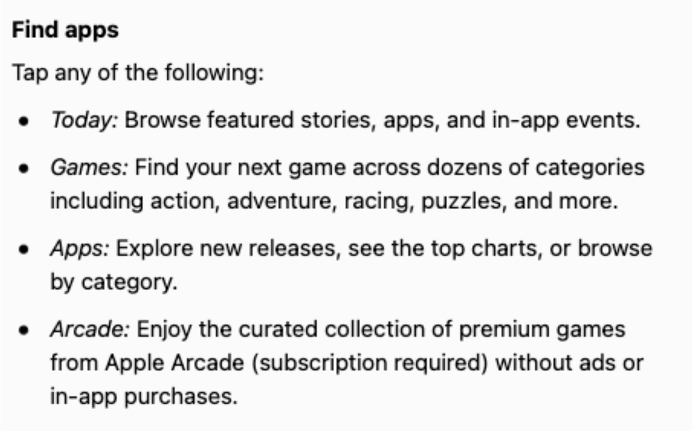

Find apps

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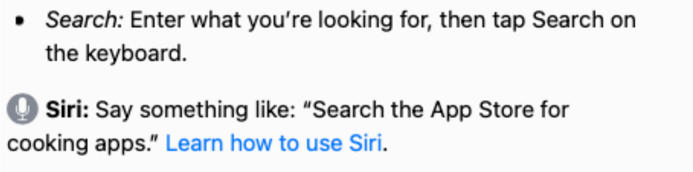

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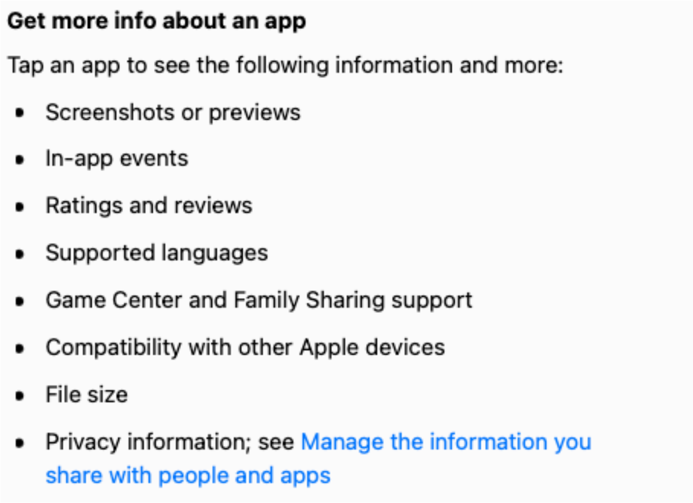

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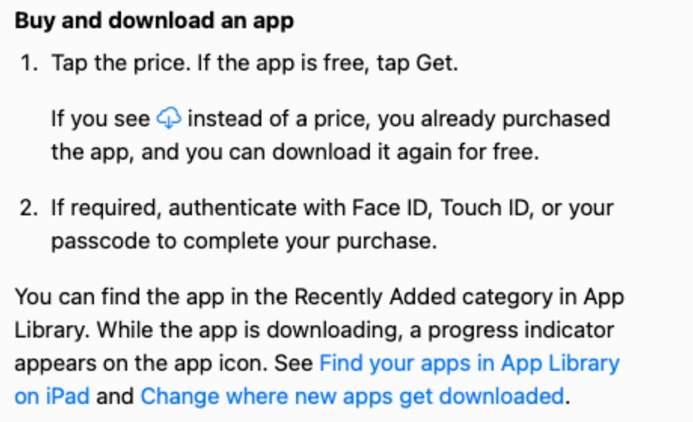

Buy and download an app

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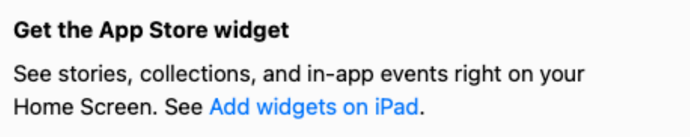
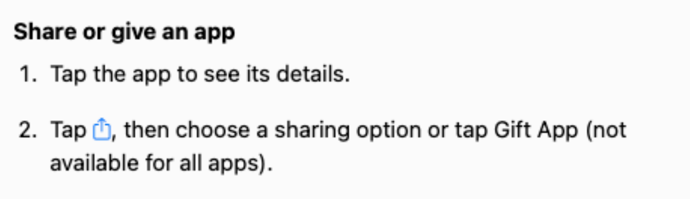
2. If required, authenticate with Face ID, Touch ID, or your passcode to complete your purchase.

You can find the app in the Recently Added category in App Library. While the app is downloading, a progress indicator appears on the app icon. See Find your apps in App Library on iPad and Change where new apps get downloaded.



Get the App Store widget

See stories, collections, and in-app events right on your Home Screen. See Add widgets on iPad.



Share or give an app

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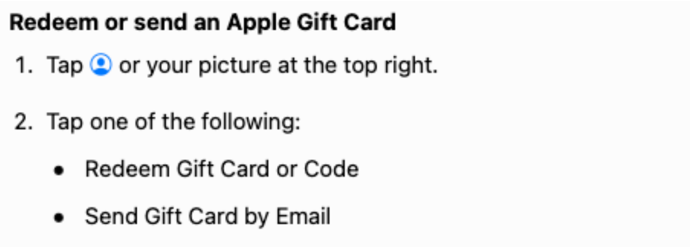

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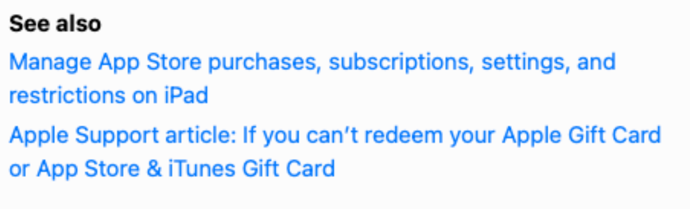
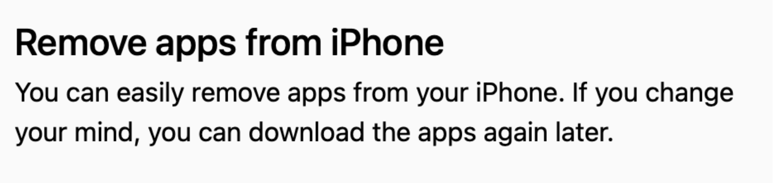


See also

Manage App Store purchases, subscriptions, settings, and restrictions on iPad

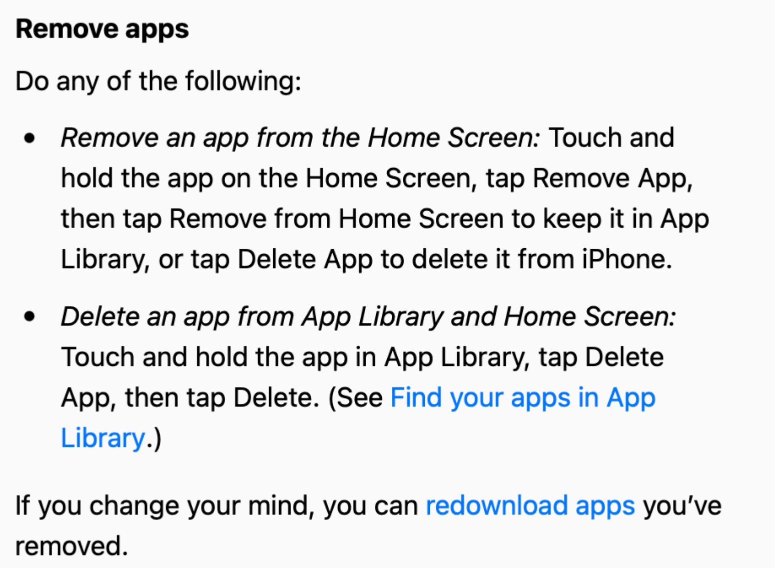
Apple Support article: If you can't redeem your Apple Gift Card or App Store & iTunes Gift Card

11.15 Remove apps from iPhone



Remove apps from iPhone

You can easily remove apps from your iPhone. If you change your mind, you can download the apps again later.

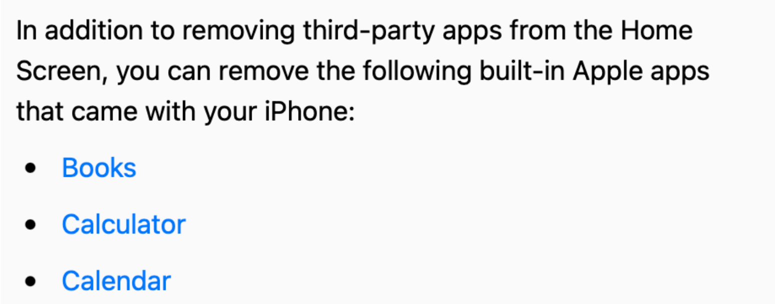


Remove apps

Do any of the following:

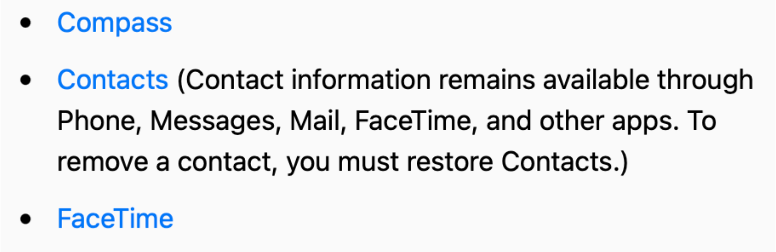
- *Remove an app from the Home Screen:* Touch and hold the app on the Home Screen, tap Remove App, then tap Remove from Home Screen to keep it in App Library, or tap Delete App to delete it from iPhone.
- *Delete an app from App Library and Home Screen:* Touch and hold the app in App Library, tap Delete App, then tap Delete. (See Find your apps in App Library.)

If you change your mind, you can redownload apps you've removed.

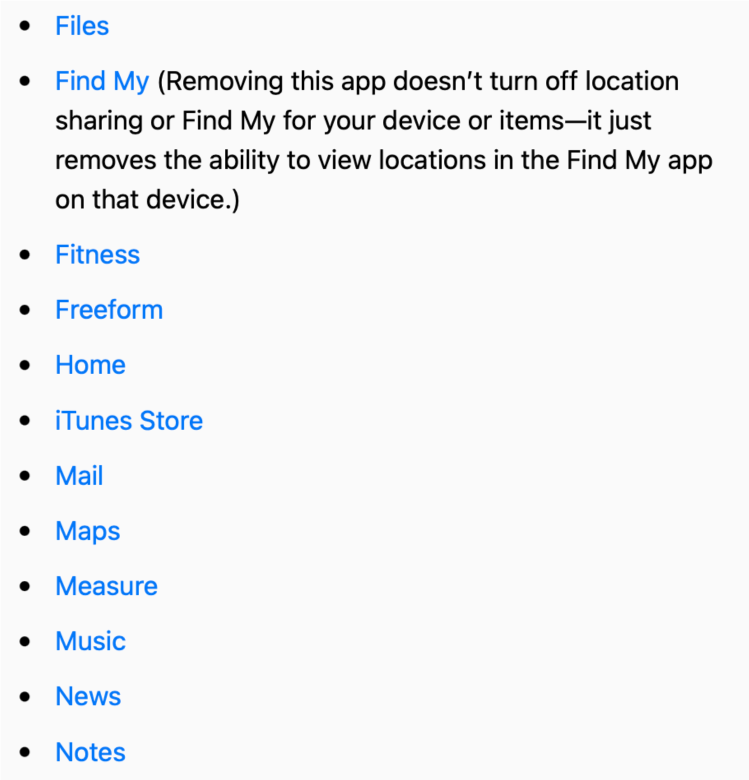


In addition to removing third-party apps from the Home Screen, you can remove the following built-in Apple apps that came with your iPhone:

- Books
- Calculator
- Calendar

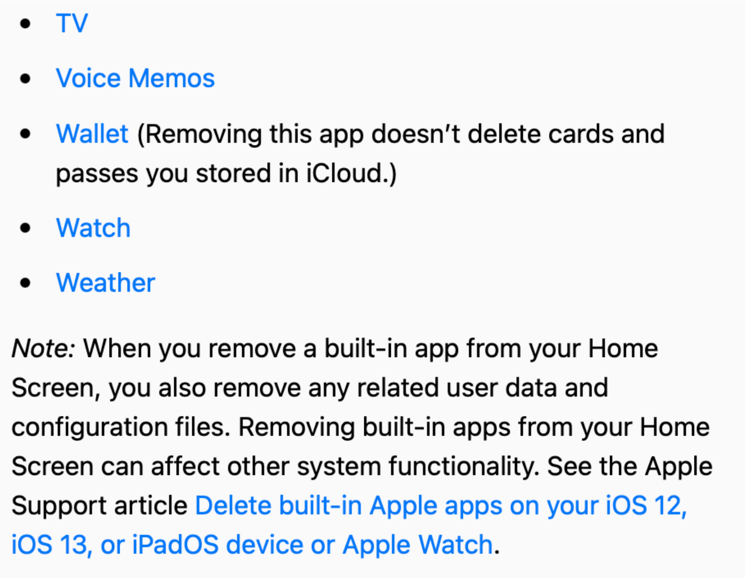


- Compass
- Contacts (Contact information remains available through Phone, Messages, Mail, FaceTime, and other apps. To remove a contact, you must restore Contacts.)
- FaceTime



- Files
- Find My (Removing this app doesn't turn off location sharing or Find My for your device or items—it just removes the ability to view locations in the Find My app on that device.)
- Fitness
- Freeform
- Home
- iTunes Store
- Mail
- Maps
- Measure
- Music
- News
- Notes

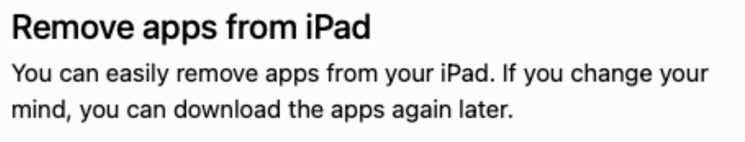
- Podcasts
- Reminders
- Shortcuts
- Stocks
- Tips
- Translate



- TV
- Voice Memos
- Wallet (Removing this app doesn't delete cards and passes you stored in iCloud.)
- Watch
- Weather

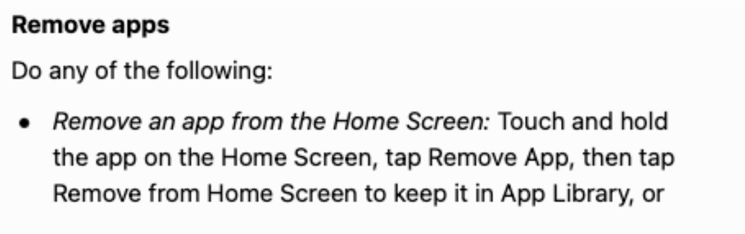
Note: When you remove a built-in app from your Home Screen, you also remove any related user data and configuration files. Removing built-in apps from your Home Screen can affect other system functionality. See the Apple Support article Delete built-in Apple apps on your iOS 12, iOS 13, or iPadOS device or Apple Watch.

11.16 Remove apps from iPad



Remove apps from iPad

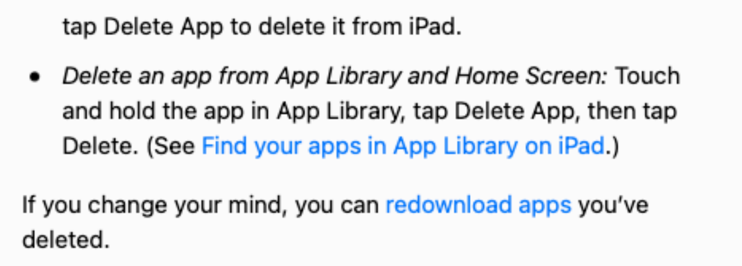
You can easily remove apps from your iPad. If you change your mind, you can download the apps again later.



Remove apps

Do any of the following:

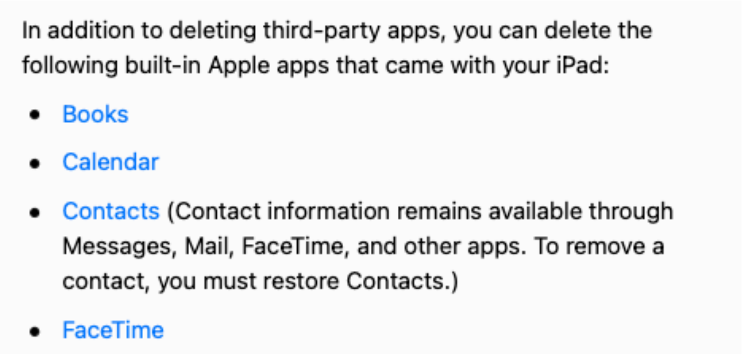
- *Remove an app from the Home Screen:* Touch and hold the app on the Home Screen, tap Remove App, then tap Remove from Home Screen to keep it in App Library, or



tap Delete App to delete it from iPad.

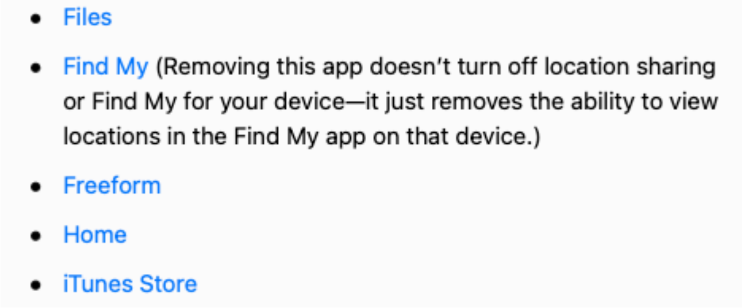
- *Delete an app from App Library and Home Screen:* Touch and hold the app in App Library, tap Delete App, then tap Delete. (See Find your apps in App Library on iPad.)

If you change your mind, you can redownload apps you've deleted.

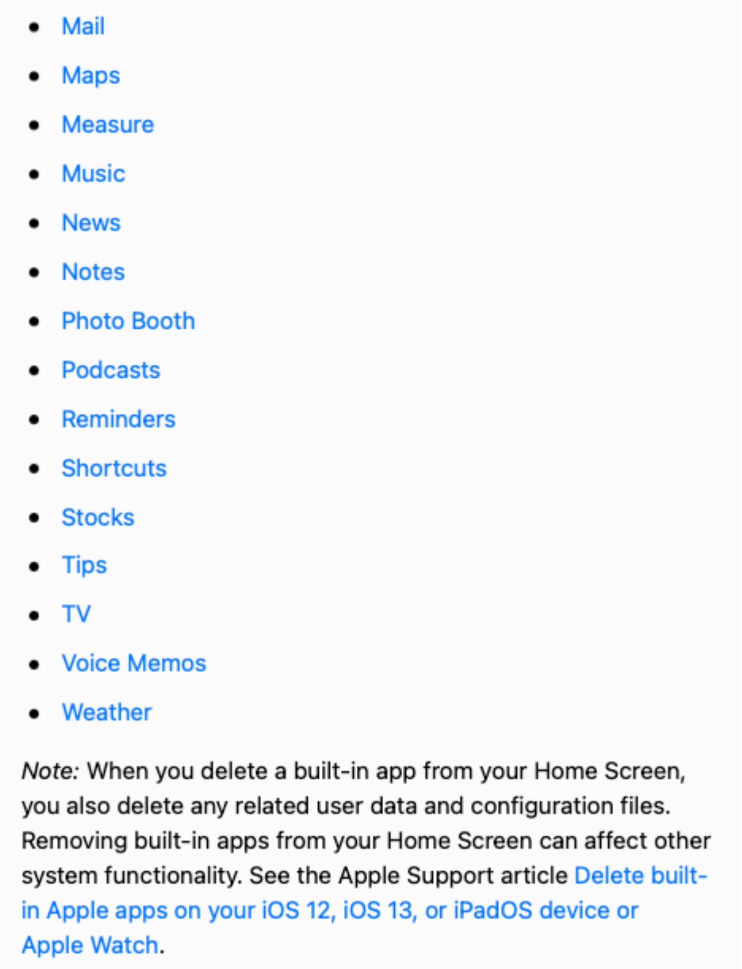


In addition to deleting third-party apps, you can delete the following built-in Apple apps that came with your iPad:

- Books
- Calendar
- Contacts (Contact information remains available through Messages, Mail, FaceTime, and other apps. To remove a contact, you must restore Contacts.)
- FaceTime



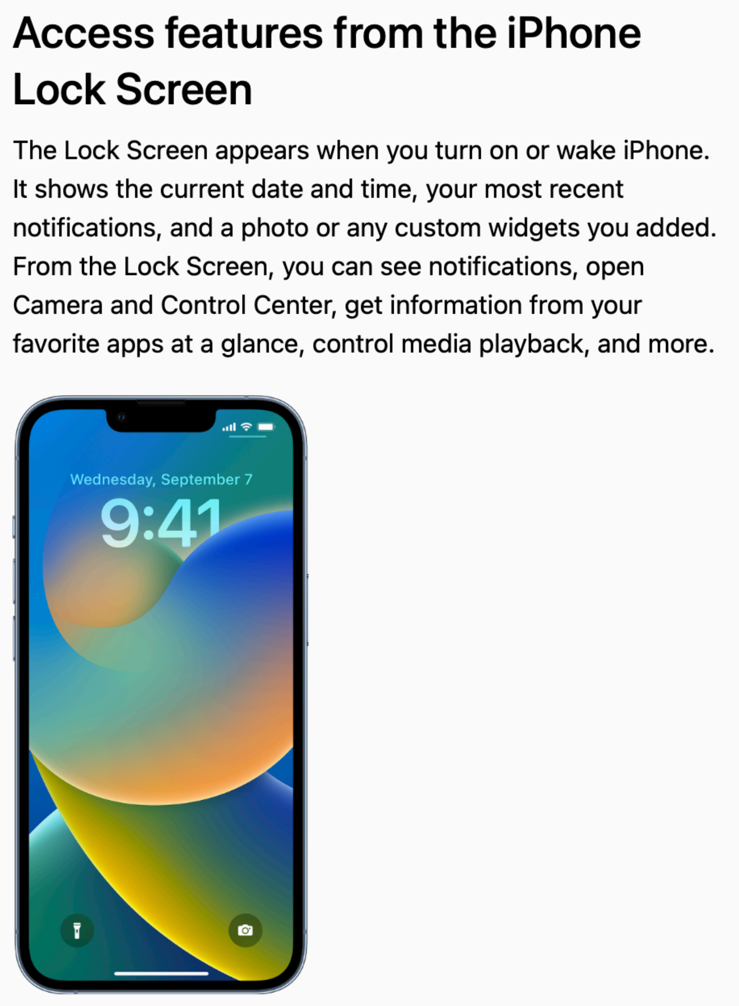
- Files
- Find My (Removing this app doesn't turn off location sharing or Find My for your device—it just removes the ability to view locations in the Find My app on that device.)
- Freeform
- Home
- iTunes Store



- Mail
- Maps
- Measure
- Music
- News
- Notes
- Photo Booth
- Podcasts
- Reminders
- Shortcuts
- Stocks
- Tips
- TV
- Voice Memos
- Weather

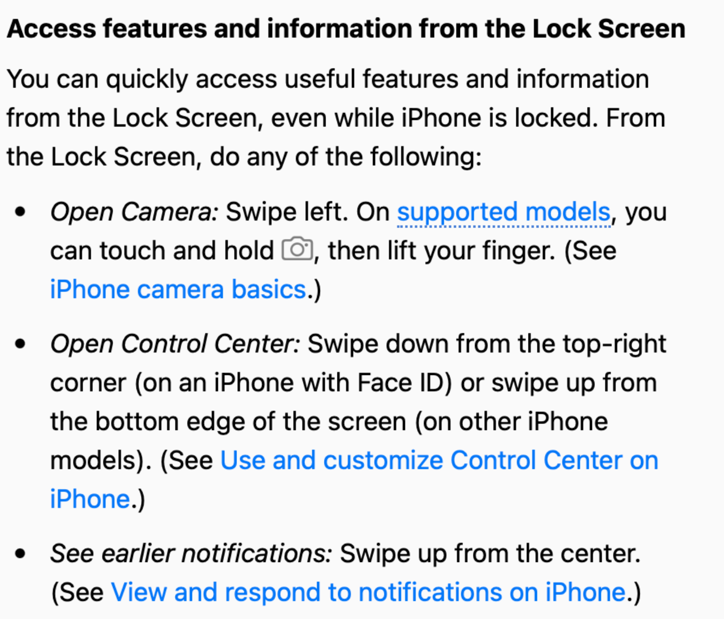
Note: When you delete a built-in app from your Home Screen, you also delete any related user data and configuration files. Removing built-in apps from your Home Screen can affect other system functionality. See the Apple Support article Delete built-in Apple apps on your iOS 12, iOS 13, or iPadOS device or Apple Watch.

11.17 Access features from the iPhone Lock screen



Access features from the iPhone Lock Screen

The Lock Screen appears when you turn on or wake iPhone. It shows the current date and time, your most recent notifications, and a photo or any custom widgets you added. From the Lock Screen, you can see notifications, open Camera and Control Center, get information from your favorite apps at a glance, control media playback, and more.



Access features and information from the Lock Screen

You can quickly access useful features and information from the Lock Screen, even while iPhone is locked. From the Lock Screen, do any of the following:

- *Open Camera:* Swipe left. On supported models, you can touch and hold 📷, then lift your finger. (See iPhone camera basics.)
- *Open Control Center:* Swipe down from the top-right corner (on an iPhone with Face ID) or swipe up from the bottom edge of the screen (on other iPhone models). (See Use and customize Control Center on iPhone.)
- *See earlier notifications:* Swipe up from the center. (See View and respond to notifications on iPhone.)

- *View widgets:* Swipe right. (See Add widgets on iPhone.)
- *Control media playback:* Use the playback controls on the Lock Screen to play, pause, rewind, or fast-forward media playing on your iPhone. (See View and control Live Activities on the Lock Screen.)

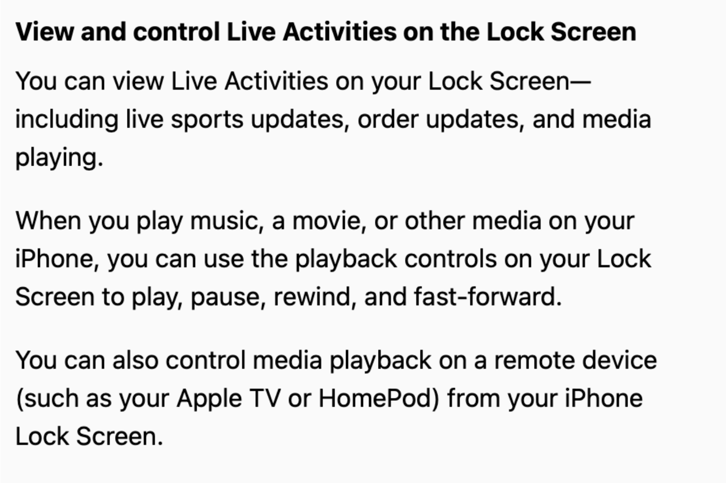
To choose what you can access from the Lock Screen, see Control access to information on the iPhone Lock Screen.

Show notification previews on the Lock Screen

1. Go to Settings > Notifications.
2. Tap Show Previews, then tap Always.
3. Choose how you want notifications displayed on the Lock Screen:
    - *View just the number of notifications:* Select Count.
    - *View the notifications grouped into stacks by app:* Select Stack.
    - *View the notifications in a list:* Select List.

    You can pinch the notifications on the Lock Screen to change the layout.

Notification previews can include text from Messages, lines from Mail messages, and details about Calendar invitations. See View and respond to notifications on iPhone.

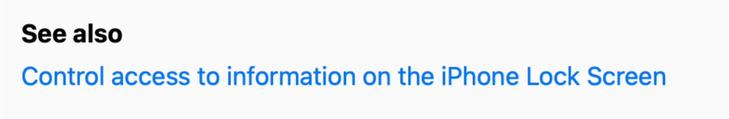


View and control Live Activities on the Lock Screen

You can view Live Activities on your Lock Screen—including live sports updates, order updates, and media playing.

When you play music, a movie, or other media on your iPhone, you can use the playback controls on your Lock Screen to play, pause, rewind, and fast-forward.

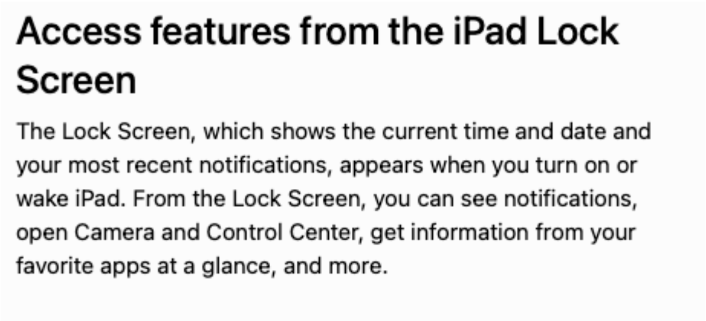
You can also control media playback on a remote device (such as your Apple TV or HomePod) from your iPhone Lock Screen.



See also

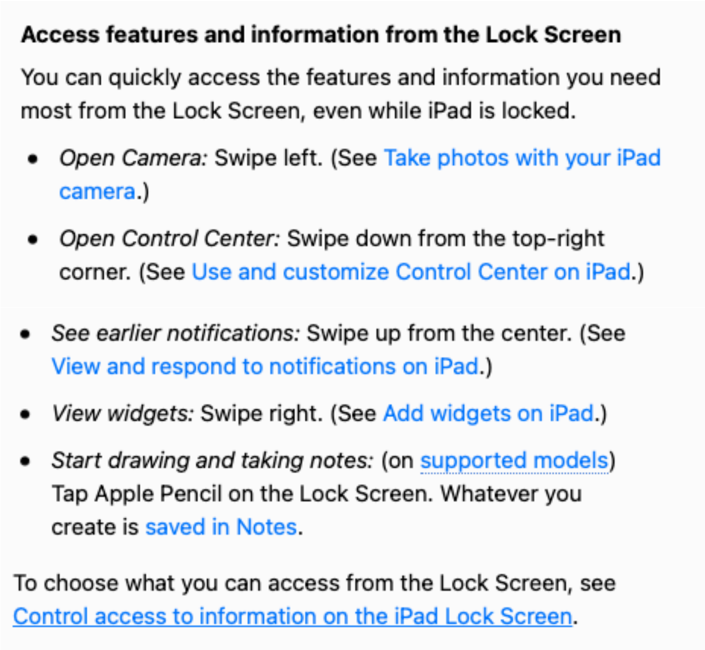
Control access to information on the iPhone Lock Screen

11.18 Access features from the iPad Lock screen



Access features from the iPad Lock Screen

The Lock Screen, which shows the current time and date and your most recent notifications, appears when you turn on or wake iPad. From the Lock Screen, you can see notifications, open Camera and Control Center, get information from your favorite apps at a glance, and more.

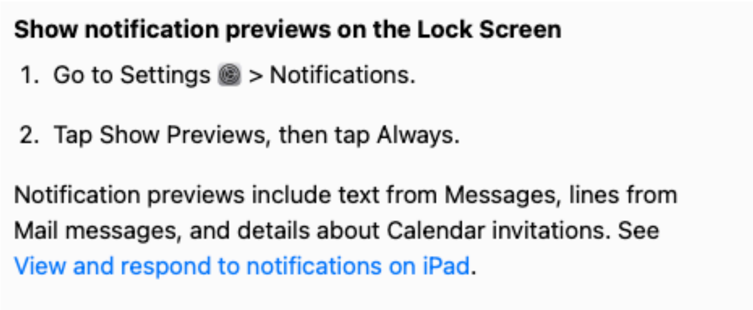


Access features and information from the Lock Screen

You can quickly access the features and information you need most from the Lock Screen, even while iPad is locked.

- *Open Camera:* Swipe left. (See Take photos with your iPad camera.)
- *Open Control Center:* Swipe down from the top-right corner. (See Use and customize Control Center on iPad.)
- *See earlier notifications:* Swipe up from the center. (See View and respond to notifications on iPad.)
- *View widgets:* Swipe right. (See Add widgets on iPad.)
- *Start drawing and taking notes:* (on supported models) Tap Apple Pencil on the Lock Screen. Whatever you create is saved in Notes.

To choose what you can access from the Lock Screen, see Control access to information on the iPad Lock Screen.



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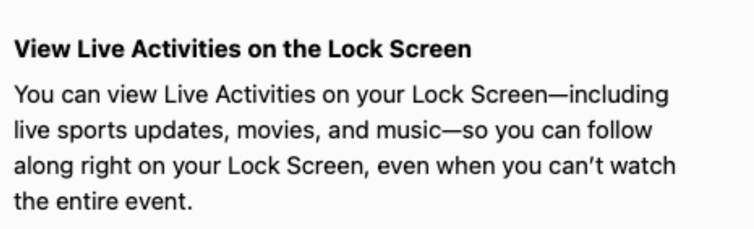
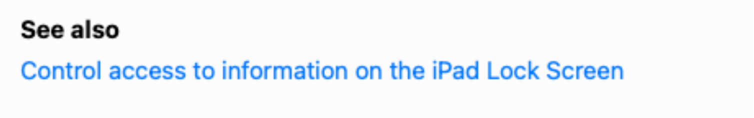
Notification previews include text from Messages, lines from Mail messages, and details about Calendar invitations. See View and respond to notifications on iPad.



View Live Activities on the Lock Screen

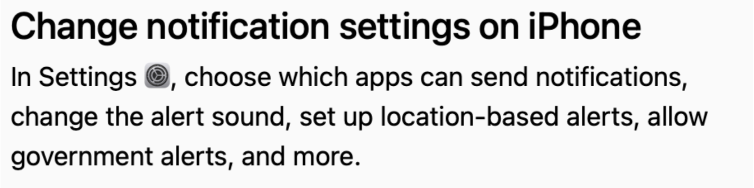
You can view Live Activities on your Lock Screen—including live sports updates, movies, and music—so you can follow along right on your Lock Screen, even when you can't watch the entire event.



See also

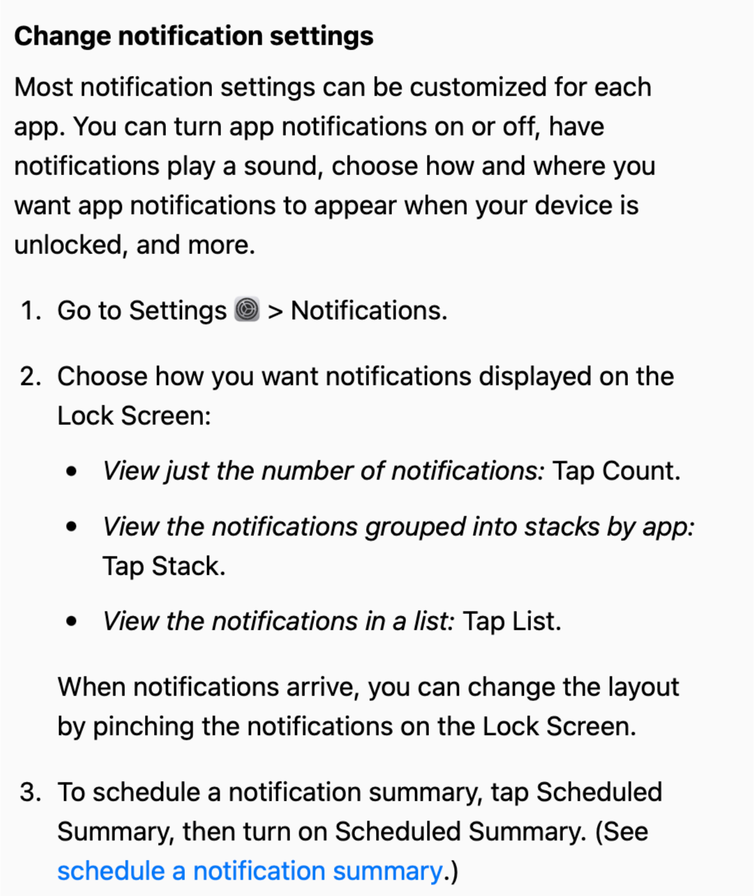
Control access to information on the iPad Lock Screen

11.19 Change notification settings on iPhone



Change notification settings on iPhone

In Settings ⚙, choose which apps can send notifications, change the alert sound, set up location-based alerts, allow government alerts, and more.

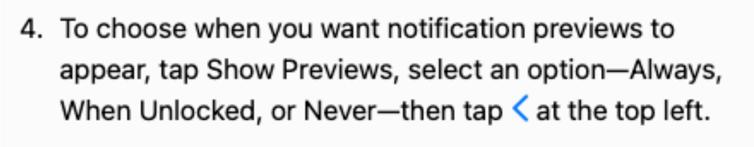


Change notification settings

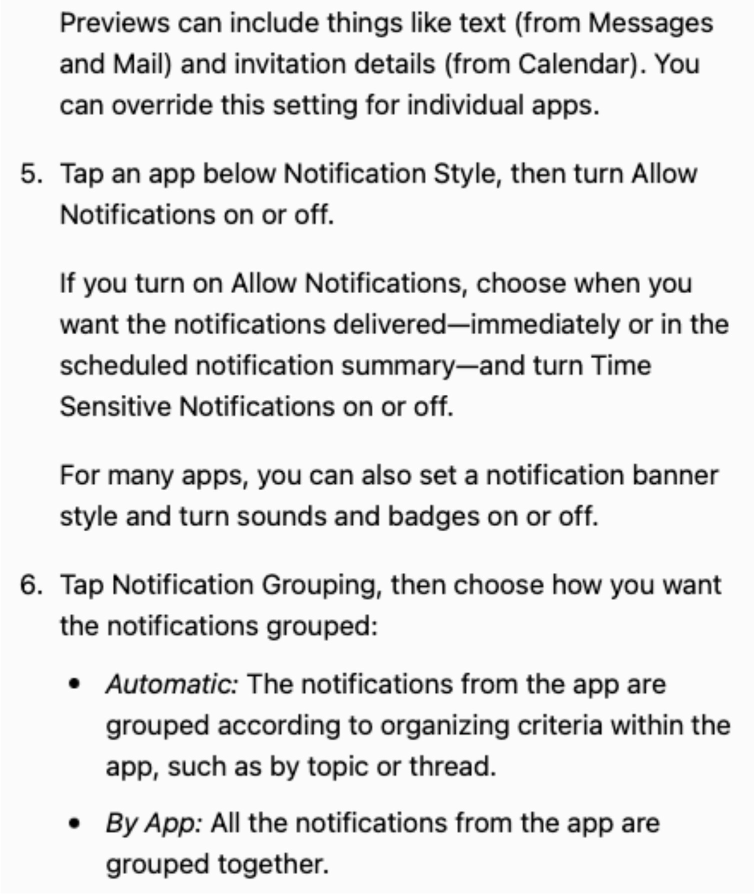
Most notification settings can be customized for each app. You can turn app notifications on or off, have notifications play a sound, choose how and where you want app notifications to appear when your device is unlocked, and more.

1. Go to Settings ⚙ > Notifications.
2. Choose how you want notifications displayed on the Lock Screen:
   - *View just the number of notifications:* Tap Count.
   - *View the notifications grouped into stacks by app:* Tap Stack.
   - *View the notifications in a list:* Tap List.

   When notifications arrive, you can change the layout by pinching the notifications on the Lock Screen.
3. To schedule a notification summary, tap Scheduled Summary, then turn on Scheduled Summary. (See schedule a notification summary.)



4. To choose when you want notification previews to appear, tap Show Previews, select an option—Always, When Unlocked, or Never—then tap < at the top left.



Previews can include things like text (from Messages and Mail) and invitation details (from Calendar). You can override this setting for individual apps.

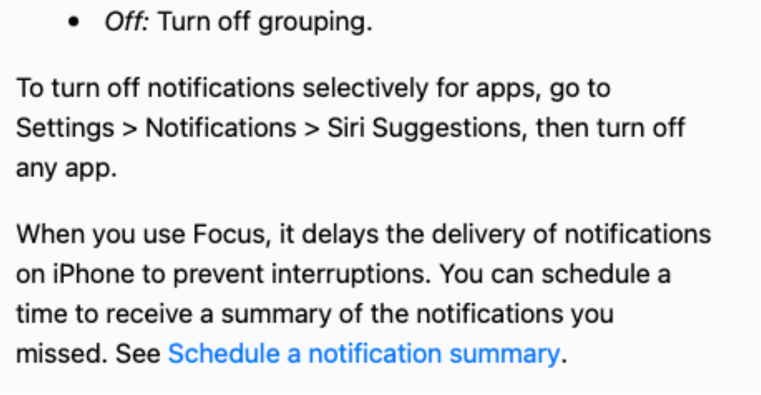
5. Tap an app below Notification Style, then turn Allow Notifications on or off.

   If you turn on Allow Notifications, choose when you want the notifications delivered—immediately or in the scheduled notification summary—and turn Time Sensitive Notifications on or off.

   For many apps, you can also set a notification banner style and turn sounds and badges on or off.

6. Tap Notification Grouping, then choose how you want the notifications grouped:

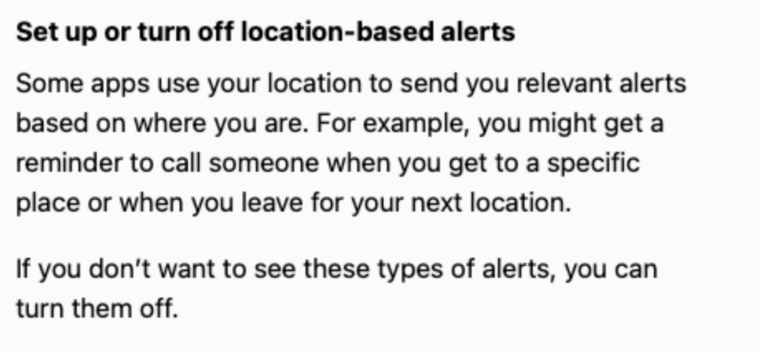
   - *Automatic:* The notifications from the app are grouped according to organizing criteria within the app, such as by topic or thread.
   - *By App:* All the notifications from the app are grouped together.



   - *Off:* Turn off grouping.

To turn off notifications selectively for apps, go to Settings > Notifications > Siri Suggestions, then turn off any app.

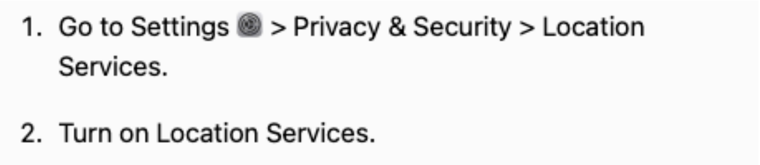
When you use Focus, it delays the delivery of notifications on iPhone to prevent interruptions. You can schedule a time to receive a summary of the notifications you missed. See Schedule a notification summary.



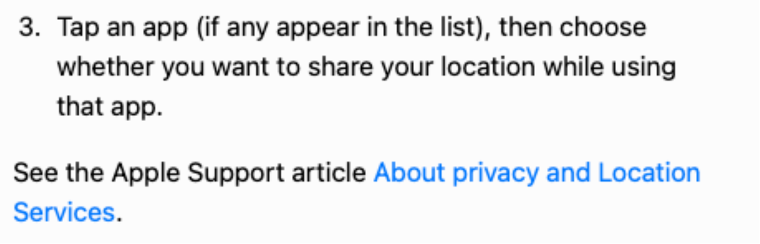
Set up or turn off location-based alerts

Some apps use your location to send you relevant alerts based on where you are. For example, you might get a reminder to call someone when you get to a specific place or when you leave for your next location.

If you don’t want to see these types of alerts, you can turn them off.

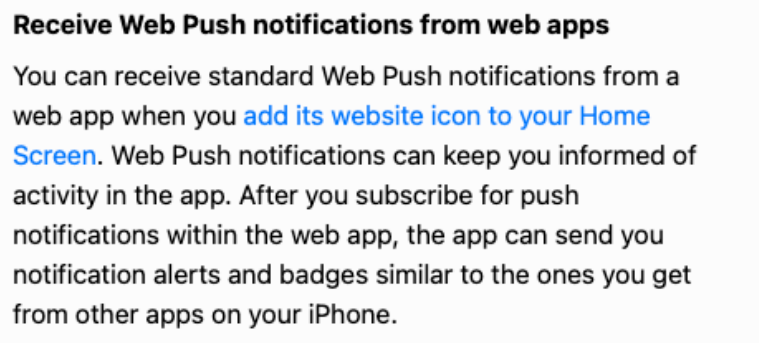


1. Go to Settings ⚙ > Privacy & Security > Location Services.
2. Turn on Location Services.



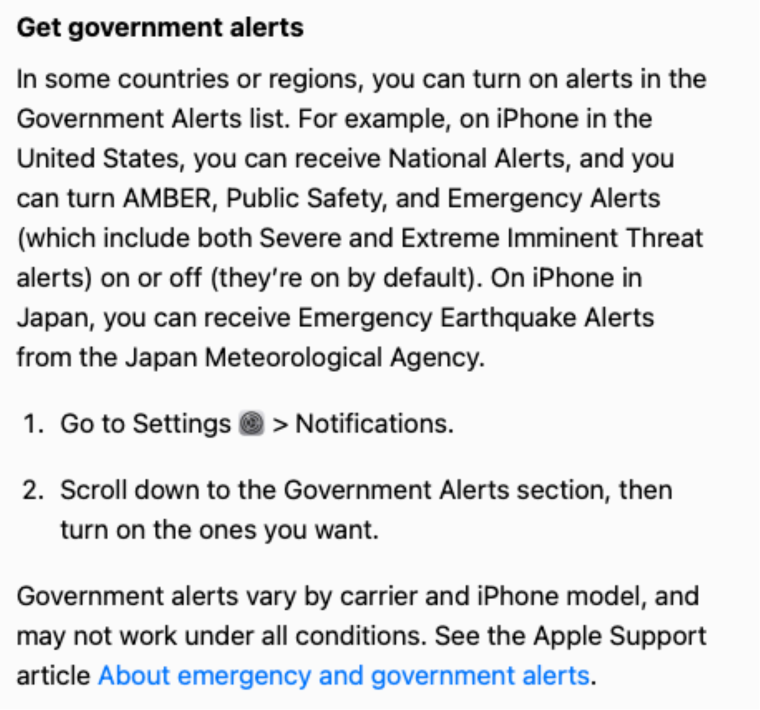
3. Tap an app (if any appear in the list), then choose whether you want to share your location while using that app.

See the Apple Support article About privacy and Location Services.



Receive Web Push notifications from web apps

You can receive standard Web Push notifications from a web app when you add its website icon to your Home Screen. Web Push notifications can keep you informed of activity in the app. After you subscribe for push notifications within the web app, the app can send you notification alerts and badges similar to the ones you get from other apps on your iPhone.

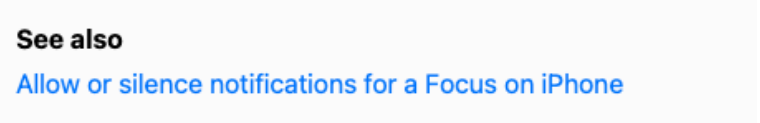


Get government alerts

In some countries or regions, you can turn on alerts in the Government Alerts list. For example, on iPhone in the United States, you can receive National Alerts, and you can turn AMBER, Public Safety, and Emergency Alerts (which include both Severe and Extreme Imminent Threat alerts) on or off (they're on by default). On iPhone in Japan, you can receive Emergency Earthquake Alerts from the Japan Meteorological Agency.

1. Go to Settings ⚙ > Notifications.
2. Scroll down to the Government Alerts section, then turn on the ones you want.

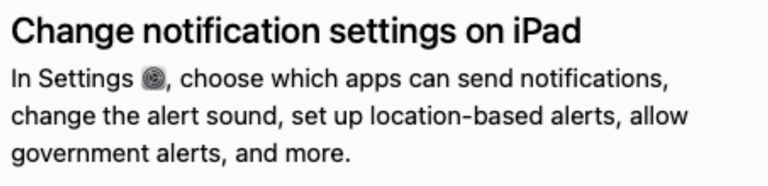
Government alerts vary by carrier and iPhone model, and may not work under all conditions. See the Apple Support article About emergency and government alerts.



See also

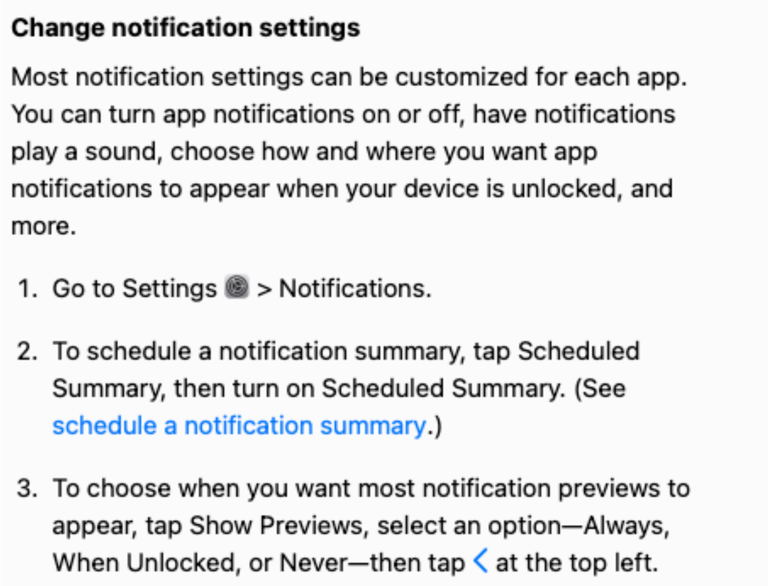
Allow or silence notifications for a Focus on iPhone

11.20 Change notification settings on iPad



Change notification settings on iPad

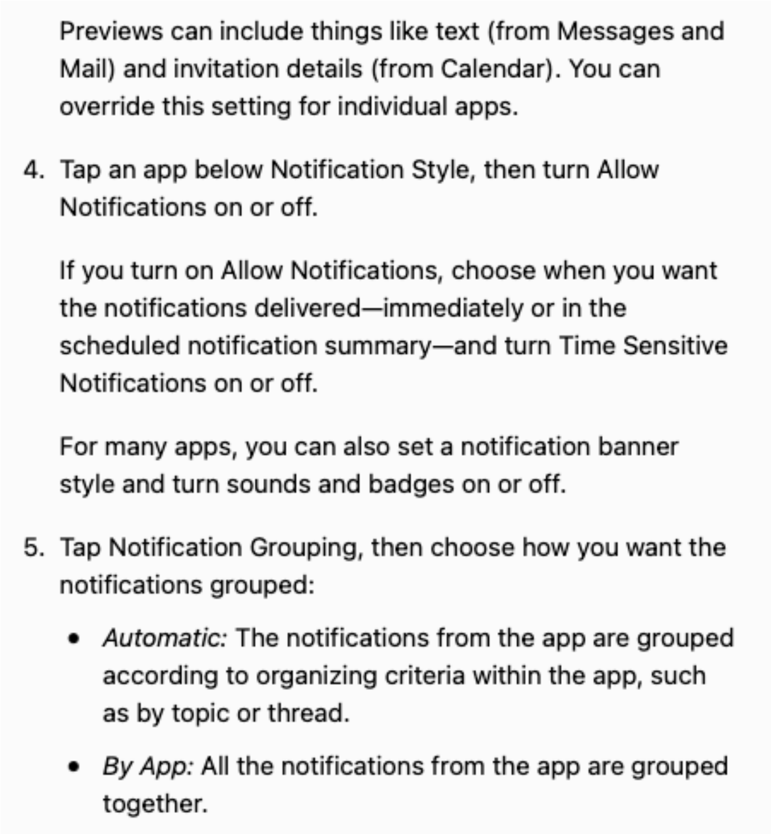
In Settings, choose which apps can send notifications, change the alert sound, set up location-based alerts, allow government alerts, and more.



Change notification settings

Most notification settings can be customized for each app. You can turn app notifications on or off, have notifications play a sound, choose how and where you want app notifications to appear when your device is unlocked, and more.

1. Go to Settings > Notifications.
2. To schedule a notification summary, tap Scheduled Summary, then turn on Scheduled Summary. (See schedule a notification summary.)
3. To choose when you want most notification previews to appear, tap Show Previews, select an option—Always, When Unlocked, or Never—then tap < at the top left.



Previews can include things like text (from Messages and Mail) and invitation details (from Calendar). You can override this setting for individual apps.

4. Tap an app below Notification Style, then turn Allow Notifications on or off.

   If you turn on Allow Notifications, choose when you want the notifications delivered—immediately or in the scheduled notification summary—and turn Time Sensitive Notifications on or off.

   For many apps, you can also set a notification banner style and turn sounds and badges on or off.

5. Tap Notification Grouping, then choose how you want the notifications grouped:
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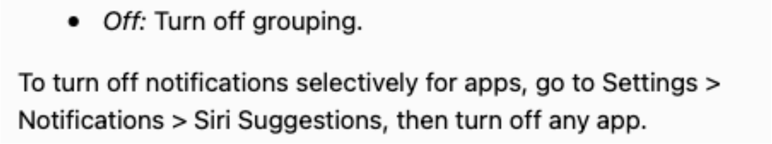

- *Off:* Turn off grouping.

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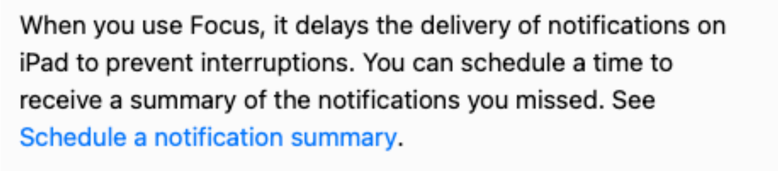
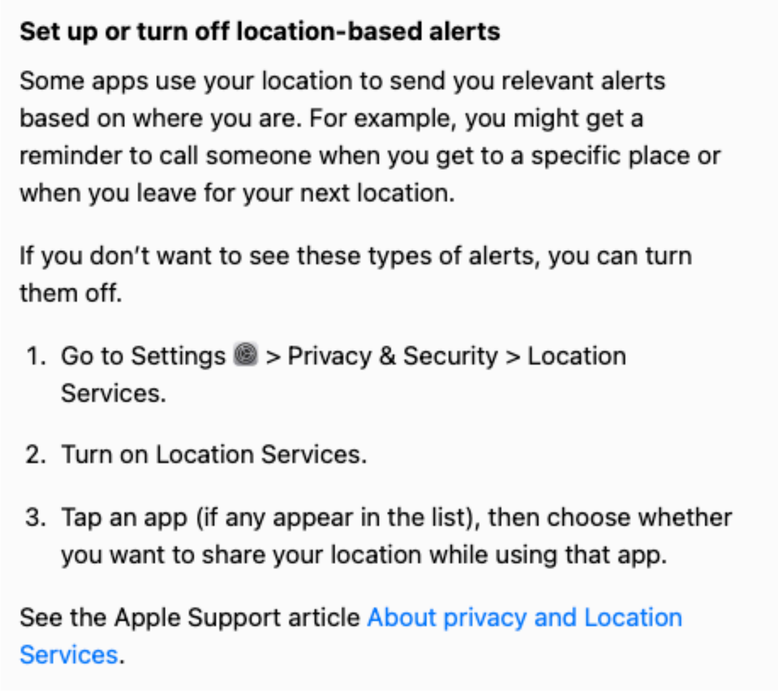


When you use Focus, it delays the delivery of notifications on iPad to prevent interruptions. You can schedule a time to receive a summary of the notifications you missed. See Schedule a notification summary.



Set up or turn off location-based alerts

Some apps use your location to send you relevant alerts based on where you are. For example, you might get a reminder to call someone when you get to a specific place or when you leave for your next location.

If you don’t want to see these types of alerts, you can turn them off.

1. Go to Settings > Privacy & Security > Location Services.
2. Turn on Location Services.
3. Tap an app (if any appear in the list), then choose whether you want to share your location while using that app.

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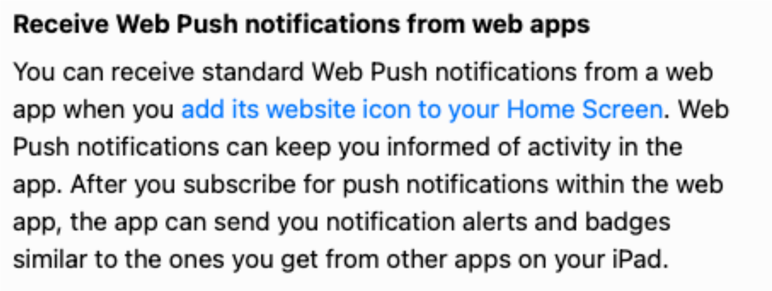

Receive Web Push notifications from web apps

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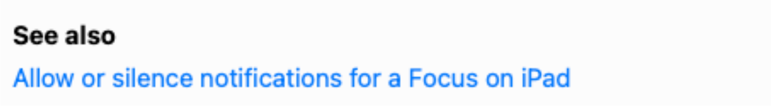
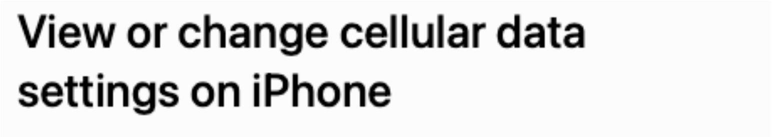


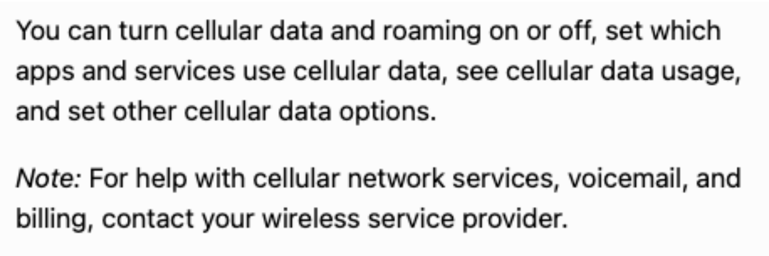
See also

Allow or silence notifications for a Focus on iPad

11.21 View or change cellular data settings on iPhone

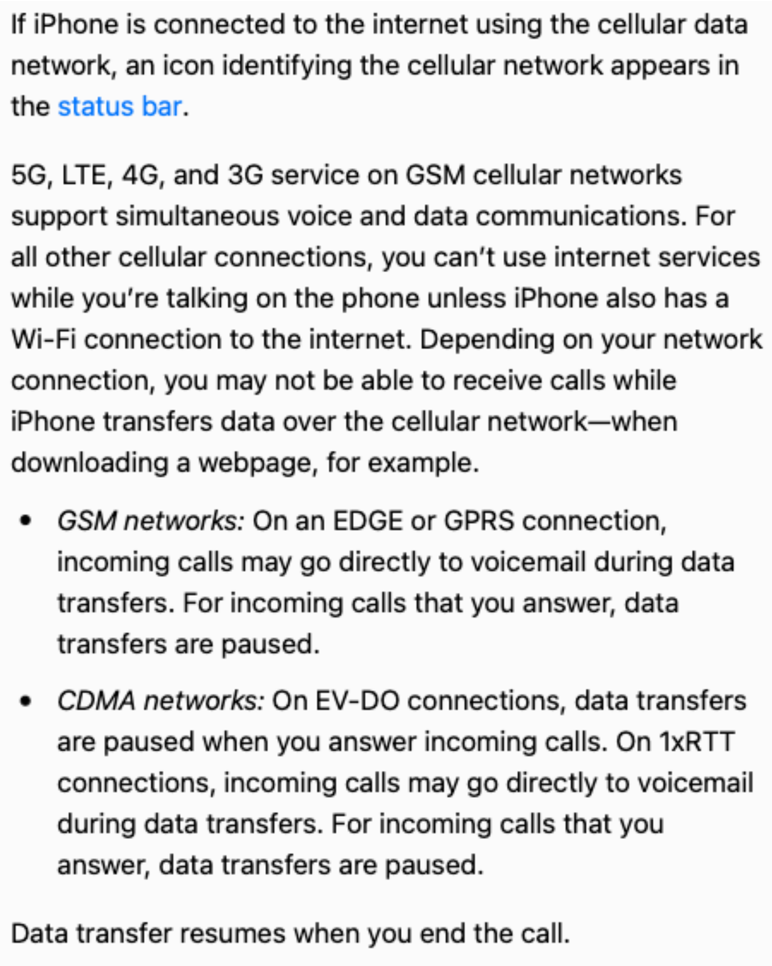


View or change cellular data settings on iPhone



You can turn cellular data and roaming on or off, set which apps and services use cellular data, see cellular data usage, and set other cellular data options.

Note: For help with cellular network services, voicemail, and billing, contact your wireless service provider.

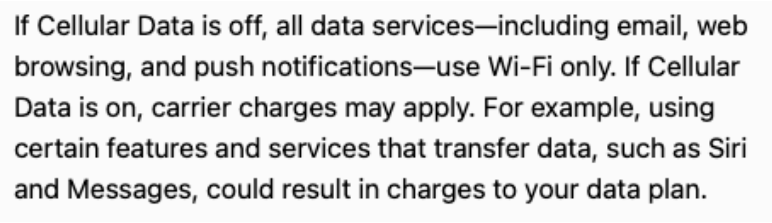


If iPhone is connected to the internet using the cellular data network, an icon identifying the cellular network appears in the status bar.

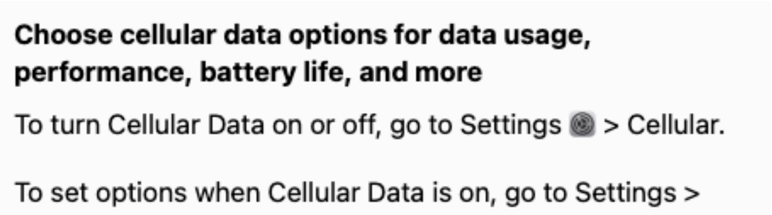
5G, LTE, 4G, and 3G service on GSM cellular networks support simultaneous voice and data communications. For all other cellular connections, you can't use internet services while you're talking on the phone unless iPhone also has a Wi-Fi connection to the internet. Depending on your network connection, you may not be able to receive calls while iPhone transfers data over the cellular network—when downloading a webpage, for example.

- *GSM networks:* On an EDGE or GPRS connection, incoming calls may go directly to voicemail during data transfers. For incoming calls that you answer, data transfers are paused.
- *CDMA networks:* On EV-DO connections, data transfers are paused when you answer incoming calls. On 1xRTT connections, incoming calls may go directly to voicemail during data transfers. For incoming calls that you answer, data transfers are paused.

Data transfer resumes when you end the call.



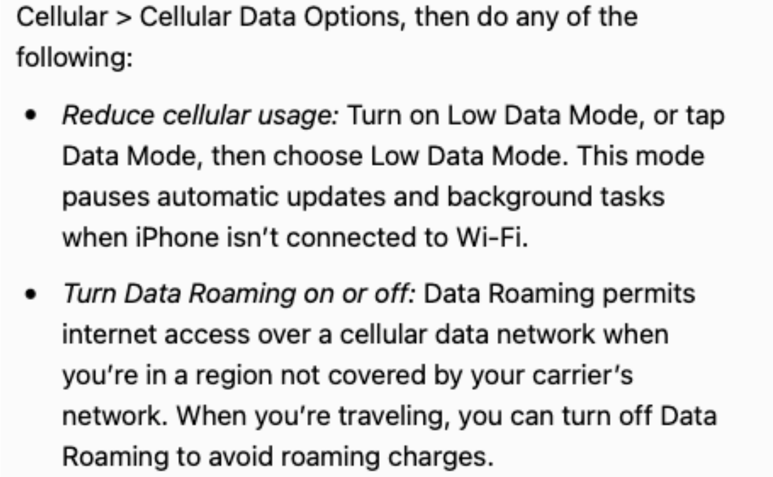
If Cellular Data is off, all data services—including email, web browsing, and push notifications—use Wi-Fi only. If Cellular Data is on, carrier charges may apply. For example, using certain features and services that transfer data, such as Siri and Messages, could result in charges to your data plan.



Choose cellular data options for data usage, performance, battery life, and more

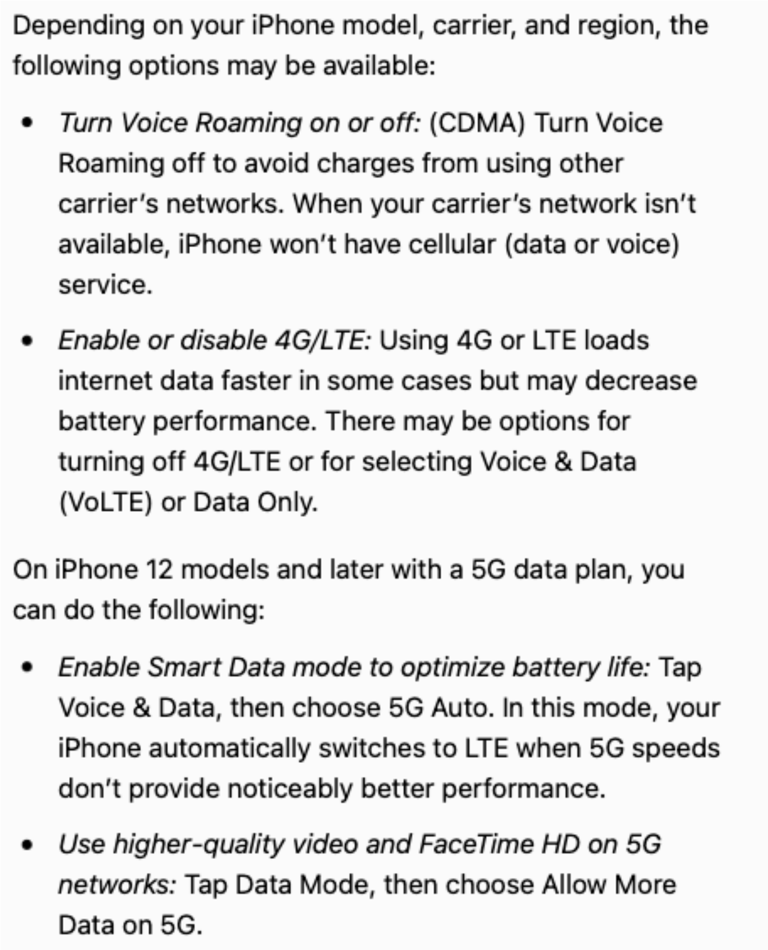
To turn Cellular Data on or off, go to Settings > Cellular.

To set options when Cellular Data is on, go to Settings >



Cellular > Cellular Data Options, then do any of the following:

- *Reduce cellular usage:* Turn on Low Data Mode, or tap Data Mode, then choose Low Data Mode. This mode pauses automatic updates and background tasks when iPhone isn't connected to Wi-Fi.
- *Turn Data Roaming on or off:* Data Roaming permits internet access over a cellular data network when you're in a region not covered by your carrier's network. When you're traveling, you can turn off Data Roaming to avoid roaming charges.

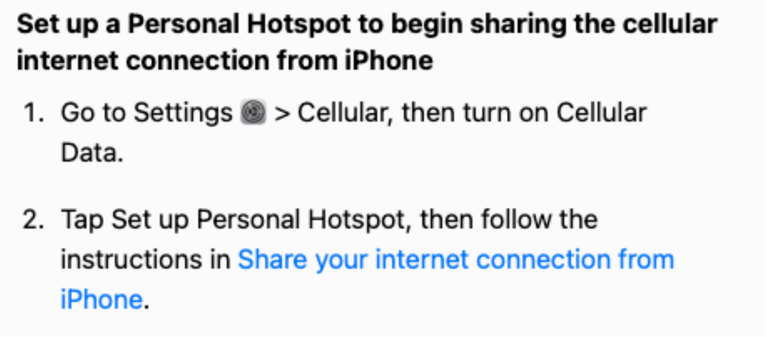


Depending on your iPhone model, carrier, and region, the following options may be available:

- *Turn Voice Roaming on or off:* (CDMA) Turn Voice Roaming off to avoid charges from using other carrier's networks. When your carrier's network isn't available, iPhone won't have cellular (data or voice) service.
- *Enable or disable 4G/LTE:* Using 4G or LTE loads internet data faster in some cases but may decrease battery performance. There may be options for turning off 4G/LTE or for selecting Voice & Data (VoLTE) or Data Only.

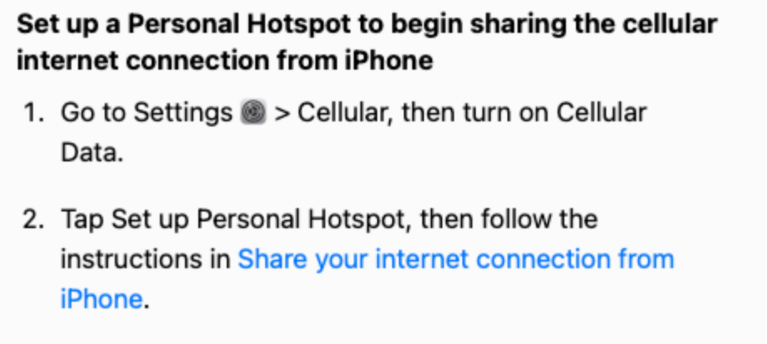
On iPhone 12 models and later with a 5G data plan, you can do the following:

- *Enable Smart Data mode to optimize battery life:* Tap Voice & Data, then choose 5G Auto. In this mode, your iPhone automatically switches to LTE when 5G speeds don't provide noticeably better performance.
- *Use higher-quality video and FaceTime HD on 5G networks:* Tap Data Mode, then choose Allow More Data on 5G.



Set up a Personal Hotspot to begin sharing the cellular internet connection from iPhone

1. Go to Settings ⚙ > Cellular, then turn on Cellular Data.
2. Tap Set up Personal Hotspot, then follow the instructions in Share your internet connection from iPhone.



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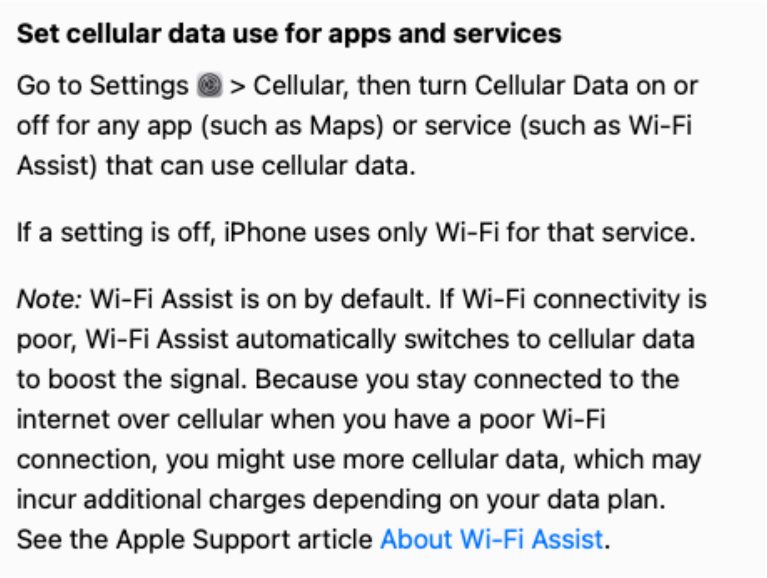
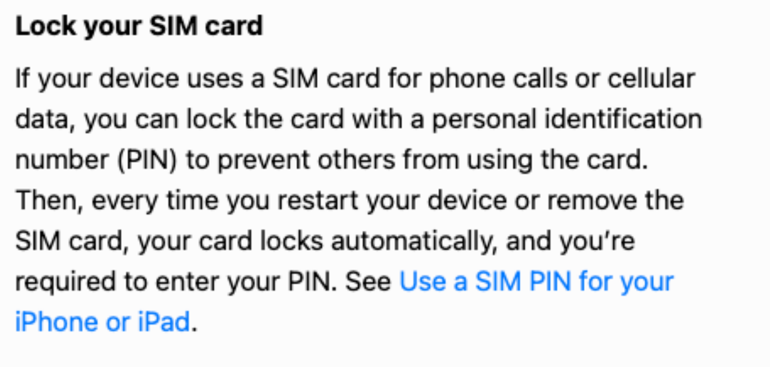


Set cellular data use for apps and services

Go to Settings ⚙ > Cellular, then turn Cellular Data on or off for any app (such as Maps) or service (such as Wi-Fi Assist) that can use cellular data.

If a setting is off, iPhone uses only Wi-Fi for that service.

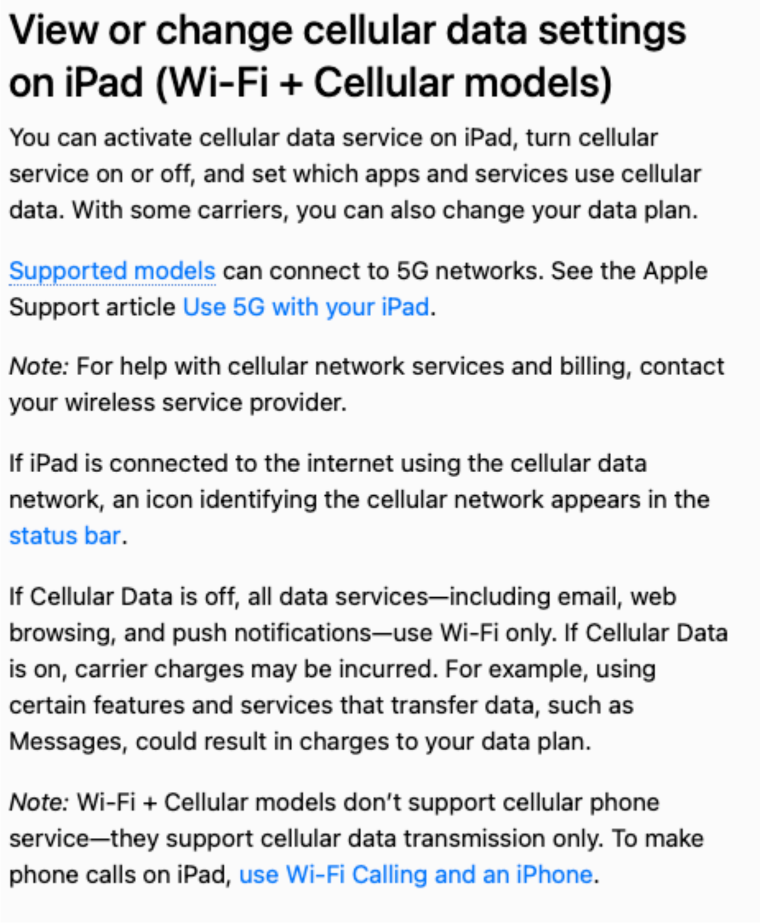
Note: Wi-Fi Assist is on by default. If Wi-Fi connectivity is poor, Wi-Fi Assist automatically switches to cellular data to boost the signal. Because you stay connected to the internet over cellular when you have a poor Wi-Fi connection, you might use more cellular data, which may incur additional charges depending on your data plan. See the Apple Support article About Wi-Fi Assist.



Lock your SIM card

If your device uses a SIM card for phone calls or cellular data, you can lock the card with a personal identification number (PIN) to prevent others from using the card. Then, every time you restart your device or remove the SIM card, your card locks automatically, and you're required to enter your PIN. See Use a SIM PIN for your iPhone or iPad.

11.22 View or change cellular data settings on iPad (Wi-Fi + Cellular models)



View or change cellular data settings on iPad (Wi-Fi + Cellular models)

You can activate cellular data service on iPad, turn cellular service on or off, and set which apps and services use cellular data. With some carriers, you can also change your data plan.

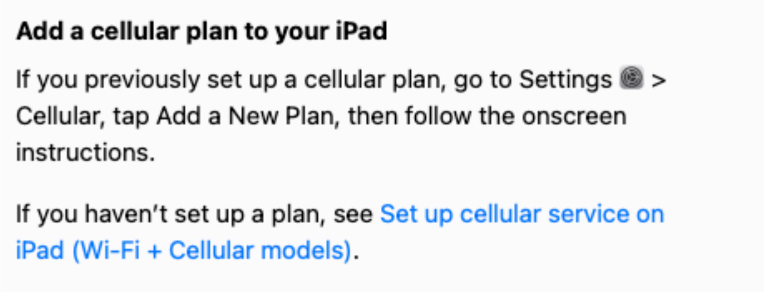
Supported models can connect to 5G networks. See the Apple Support article Use 5G with your iPad.

Note: For help with cellular network services and billing, contact your wireless service provider.

If iPad is connected to the internet using the cellular data network, an icon identifying the cellular network appears in the status bar.

If Cellular Data is off, all data services—including email, web browsing, and push notifications—use Wi-Fi only. If Cellular Data is on, carrier charges may be incurred. For example, using certain features and services that transfer data, such as Messages, could result in charges to your data plan.

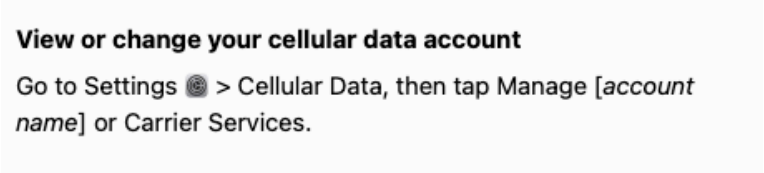
Note: Wi-Fi + Cellular models don't support cellular phone service—they support cellular data transmission only. To make phone calls on iPad, use Wi-Fi Calling and an iPhone.



Add a cellular plan to your iPad

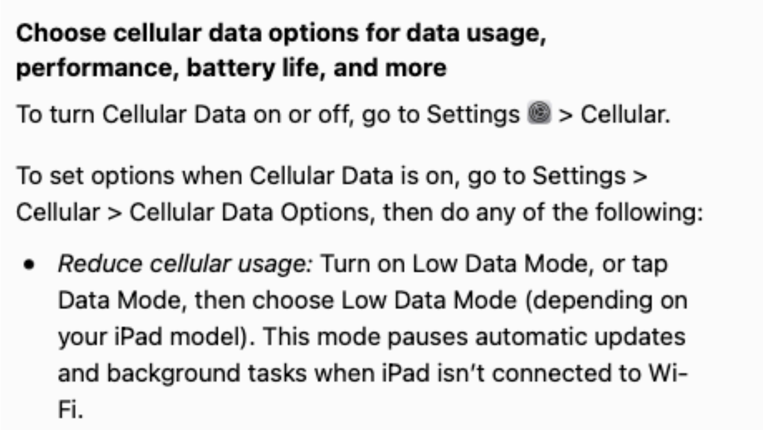
If you previously set up a cellular plan, go to Settings > Cellular, tap Add a New Plan, then follow the onscreen instructions.

If you haven't set up a plan, see Set up cellular service on iPad (Wi-Fi + Cellular models).



View or change your cellular data account

Go to Settings > Cellular Data, then tap Manage [*account name*] or Carrier Services.

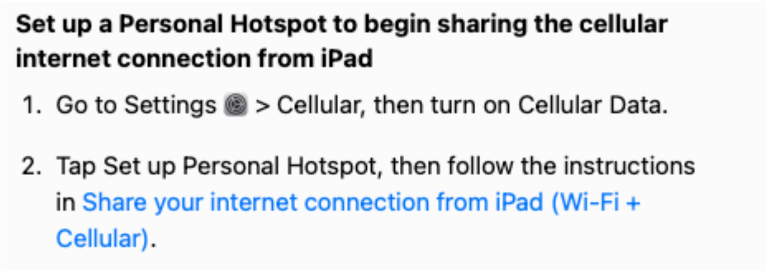


Choose cellular data options for data usage, performance, battery life, and more

To turn Cellular Data on or off, go to Settings > Cellular.

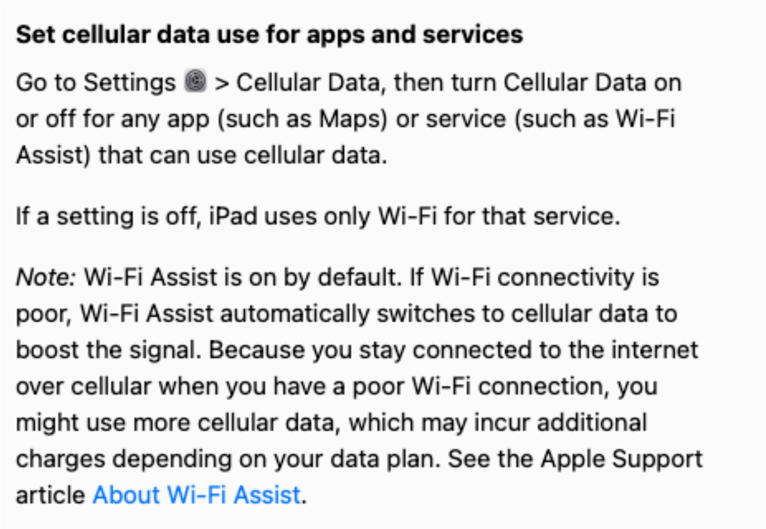
To set options when Cellular Data is on, go to Settings > Cellular > Cellular Data Options, then do any of the following:

- *Reduce cellular usage:* Turn on Low Data Mode, or tap Data Mode, then choose Low Data Mode (depending on your iPad model). This mode pauses automatic updates and background tasks when iPad isn't connected to Wi-Fi.



Set up a Personal Hotspot to begin sharing the cellular internet connection from iPad

1. Go to Settings > Cellular, then turn on Cellular Data.
2. Tap Set up Personal Hotspot, then follow the instructions in Share your internet connection from iPad (Wi-Fi + Cellular).



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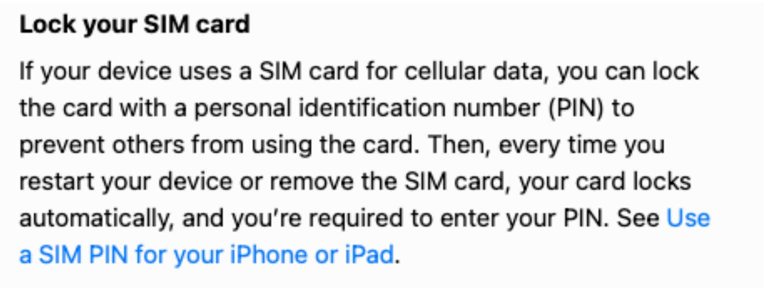

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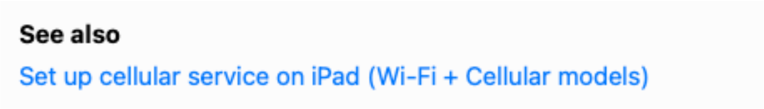
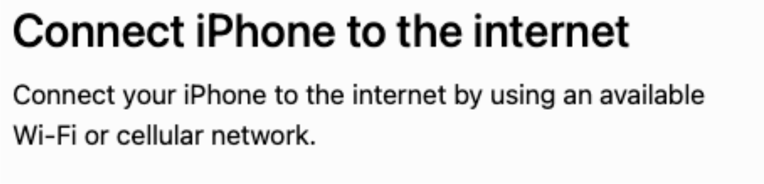


See also

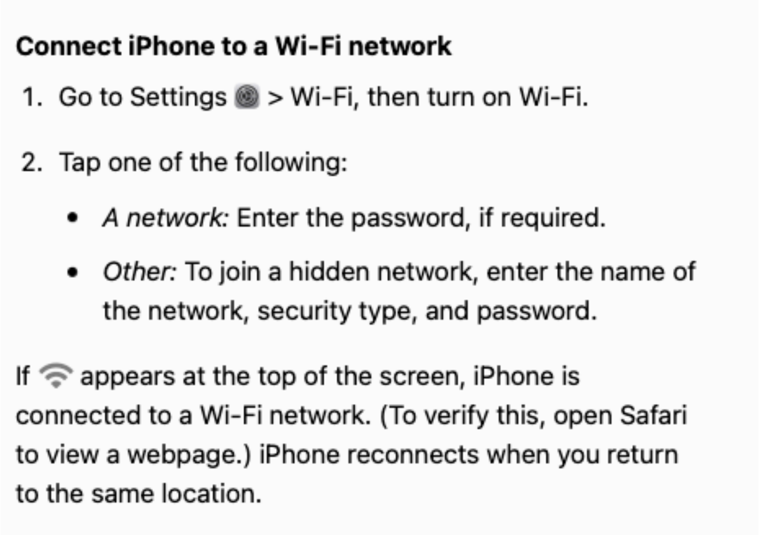
Set up cellular service on iPad (Wi-Fi + Cellular models)

11.23 Connect iPhone to the internet



Connect iPhone to the internet

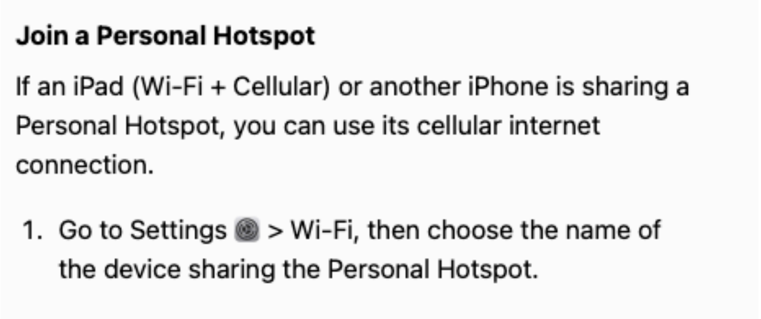
Connect your iPhone to the internet by using an available Wi-Fi or cellular network.



Connect iPhone to a Wi-Fi network

1. Go to Settings ⚙ > Wi-Fi, then turn on Wi-Fi.
2. Tap one of the following:
   - *A network:* Enter the password, if required.
   - *Other:* To join a hidden network, enter the name of the network, security type, and password.

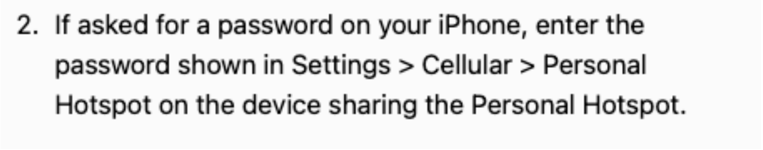
If 🛜 appears at the top of the screen, iPhone is connected to a Wi-Fi network. (To verify this, open Safari to view a webpage.) iPhone reconnects when you return to the same location.



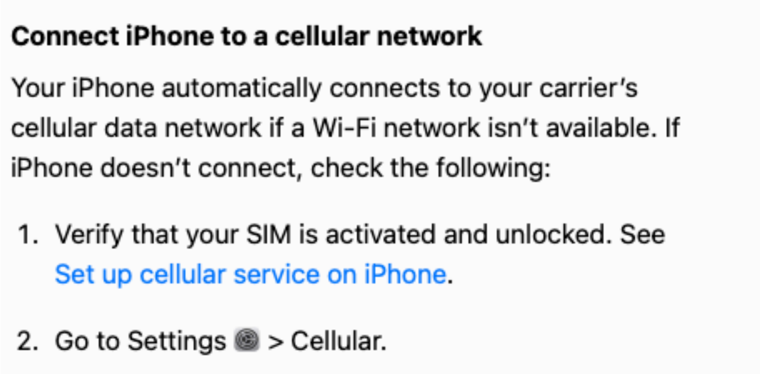
Join a Personal Hotspot

If an iPad (Wi-Fi + Cellular) or another iPhone is sharing a Personal Hotspot, you can use its cellular internet connection.

1. Go to Settings ⚙ > Wi-Fi, then choose the name of the device sharing the Personal Hotspot.



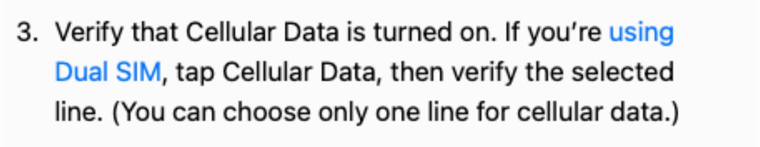
2. If asked for a password on your iPhone, enter the password shown in Settings > Cellular > Personal Hotspot on the device sharing the Personal Hotspot.



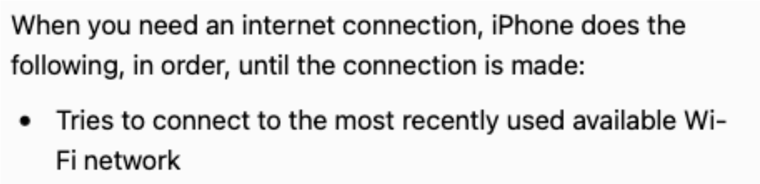
Connect iPhone to a cellular network

Your iPhone automatically connects to your carrier's cellular data network if a Wi-Fi network isn't available. If iPhone doesn't connect, check the following:

1. Verify that your SIM is activated and unlocked. See Set up cellular service on iPhone.
2. Go to Settings ⚙ > Cellular.

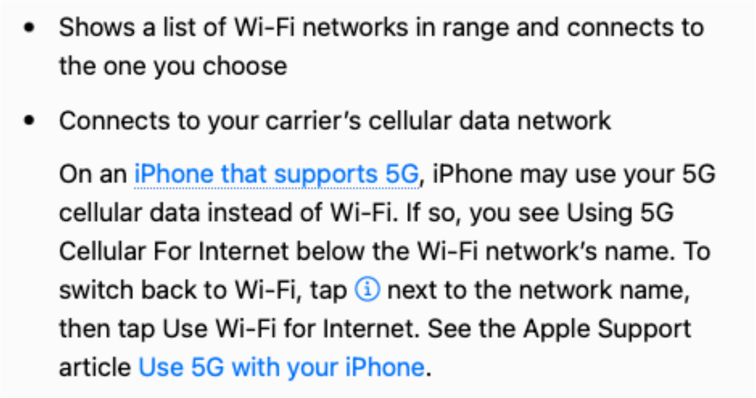


3. Verify that Cellular Data is turned on. If you're using Dual SIM, tap Cellular Data, then verify the selected line. (You can choose only one line for cellular data.)



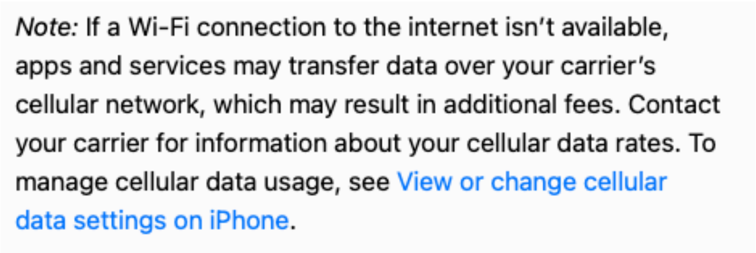
When you need an internet connection, iPhone does the following, in order, until the connection is made:

- Tries to connect to the most recently used available Wi-Fi network

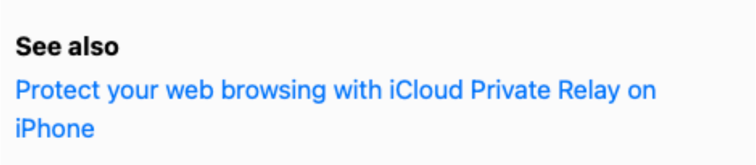


- Shows a list of Wi-Fi networks in range and connects to the one you choose
- Connects to your carrier's cellular data network

  On an iPhone that supports 5G, iPhone may use your 5G cellular data instead of Wi-Fi. If so, you see Using 5G Cellular For Internet below the Wi-Fi network's name. To switch back to Wi-Fi, tap ⓘ next to the network name, then tap Use Wi-Fi for Internet. See the Apple Support article Use 5G with your iPhone.



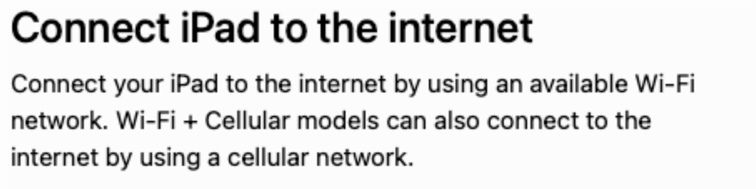
Note: If a Wi-Fi connection to the internet isn't available, apps and services may transfer data over your carrier's cellular network, which may result in additional fees. Contact your carrier for information about your cellular data rates. To manage cellular data usage, see View or change cellular data settings on iPhone.



See also

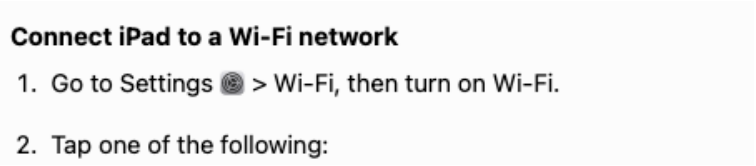
Protect your web browsing with iCloud Private Relay on iPhone

11.24 Connect iPad to the internet



Connect iPad to the internet

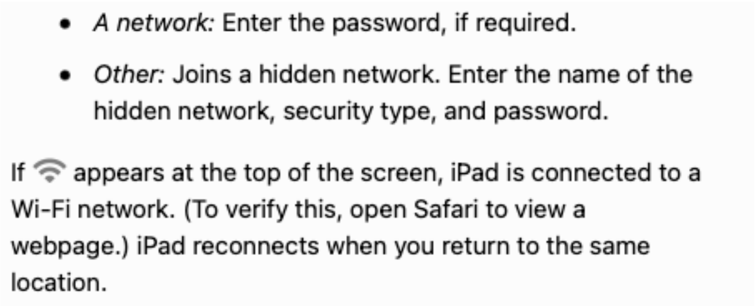
Connect your iPad to the internet by using an available Wi-Fi network. Wi-Fi + Cellular models can also connect to the internet by using a cellular network.



Connect iPad to a Wi-Fi network

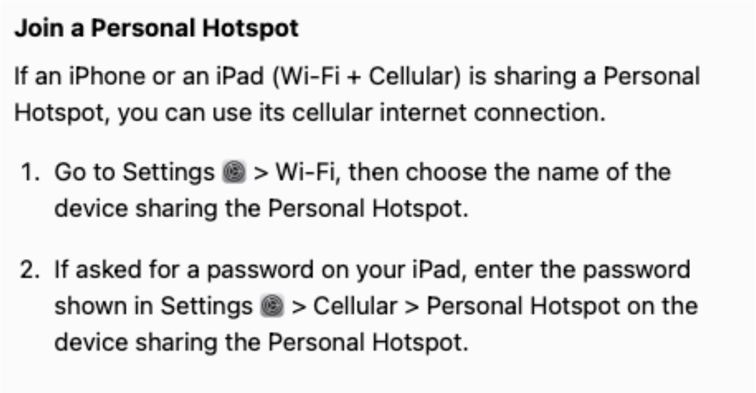
1. Go to Settings ⚙ > Wi-Fi, then turn on Wi-Fi.

2. Tap one of the following:



- *A network:* Enter the password, if required.
- *Other:* Joins a hidden network. Enter the name of the hidden network, security type, and password.

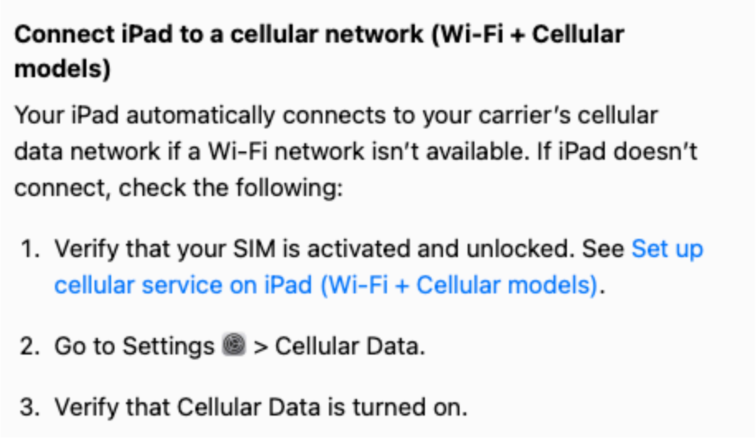
If 📶 appears at the top of the screen, iPad is connected to a Wi-Fi network. (To verify this, open Safari to view a webpage.) iPad reconnects when you return to the same location.



Join a Personal Hotspot

If an iPhone or an iPad (Wi-Fi + Cellular) is sharing a Personal Hotspot, you can use its cellular internet connection.

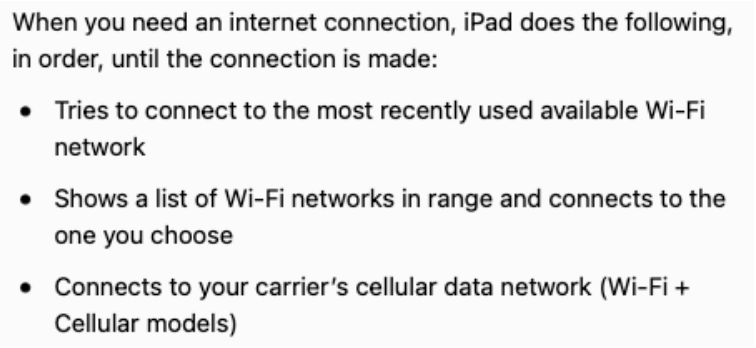
1. Go to Settings > Wi-Fi, then choose the name of the device sharing the Personal Hotspot.
2. If asked for a password on your iPad, enter the password shown in Settings > Cellular > Personal Hotspot on the device sharing the Personal Hotspot.



Connect iPad to a cellular network (Wi-Fi + Cellular models)

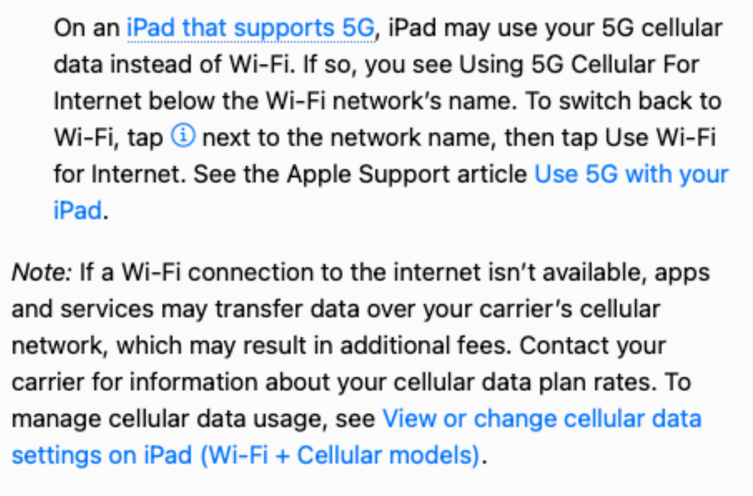
Your iPad automatically connects to your carrier's cellular data network if a Wi-Fi network isn't available. If iPad doesn't connect, check the following:

1. Verify that your SIM is activated and unlocked. See Set up cellular service on iPad (Wi-Fi + Cellular models).
2. Go to Settings > Cellular Data.
3. Verify that Cellular Data is turned on.



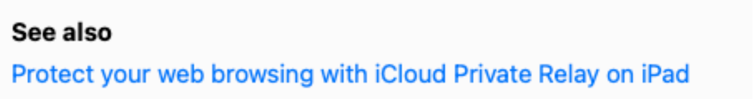
When you need an internet connection, iPad does the following, in order, until the connection is made:

- Tries to connect to the most recently used available Wi-Fi network
- Shows a list of Wi-Fi networks in range and connects to the one you choose
- Connects to your carrier's cellular data network (Wi-Fi + Cellular models)



On an iPad that supports 5G, iPad may use your 5G cellular data instead of Wi-Fi. If so, you see Using 5G Cellular For Internet below the Wi-Fi network's name. To switch back to Wi-Fi, tap ⓘ next to the network name, then tap Use Wi-Fi for Internet. See the Apple Support article Use 5G with your iPad.

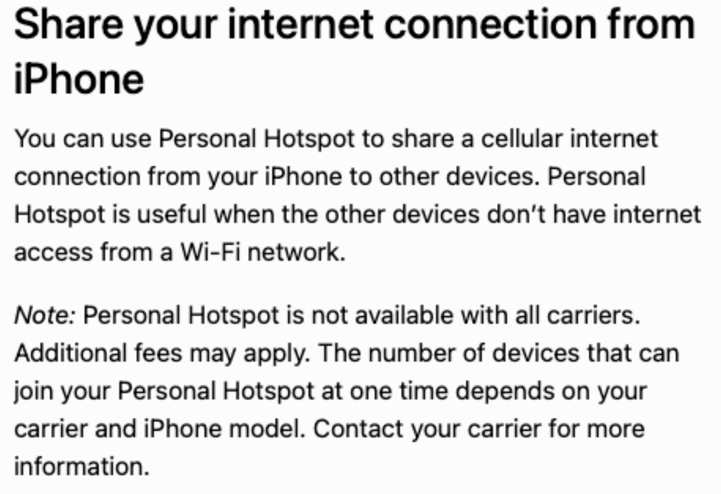
Note: If a Wi-Fi connection to the internet isn't available, apps and services may transfer data over your carrier's cellular network, which may result in additional fees. Contact your carrier for information about your cellular data plan rates. To manage cellular data usage, see View or change cellular data settings on iPad (Wi-Fi + Cellular models).



See also

Protect your web browsing with iCloud Private Relay on iPad

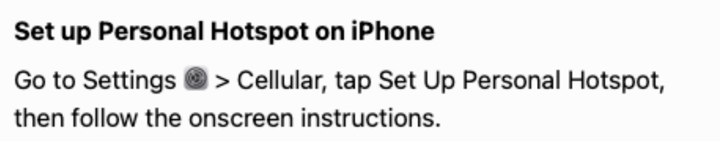
11.25 Share your internet connection from iPhone



Share your internet connection from iPhone

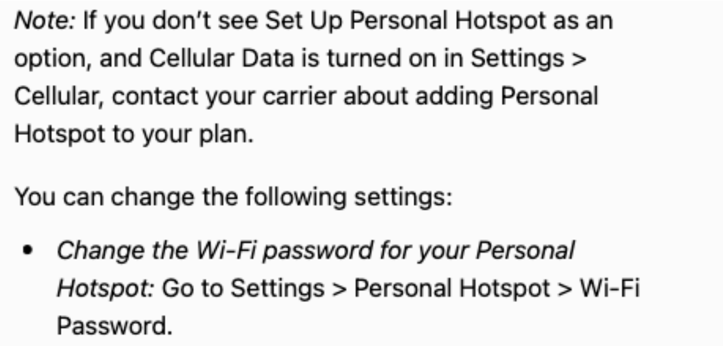
You can use Personal Hotspot to share a cellular internet connection from your iPhone to other devices. Personal Hotspot is useful when the other devices don't have internet access from a Wi-Fi network.

Note: Personal Hotspot is not available with all carriers. Additional fees may apply. The number of devices that can join your Personal Hotspot at one time depends on your carrier and iPhone model. Contact your carrier for more information.



Set up Personal Hotspot on iPhone

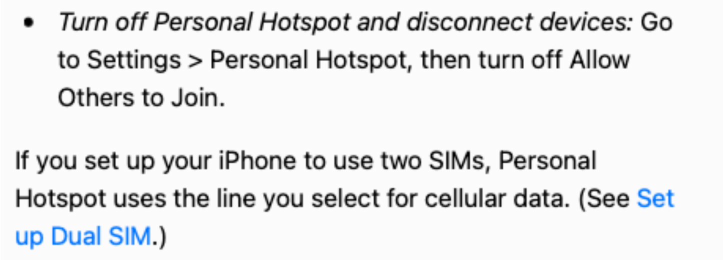
Go to Settings ⚙ > Cellular, tap Set Up Personal Hotspot, then follow the onscreen instructions.



Note: If you don't see Set Up Personal Hotspot as an option, and Cellular Data is turned on in Settings > Cellular, contact your carrier about adding Personal Hotspot to your plan.

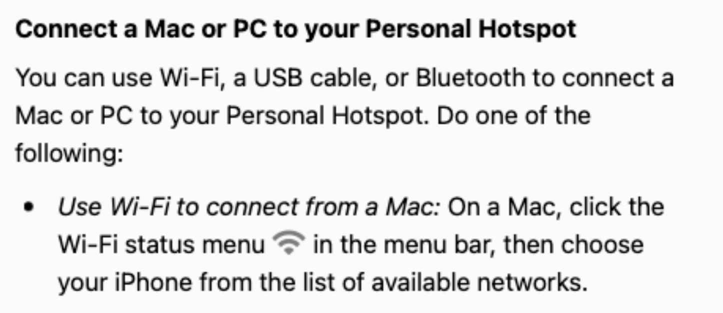
You can change the following settings:

- *Change the Wi-Fi password for your Personal Hotspot:* Go to Settings > Personal Hotspot > Wi-Fi Password.



- *Turn off Personal Hotspot and disconnect devices:* Go to Settings > Personal Hotspot, then turn off Allow Others to Join.

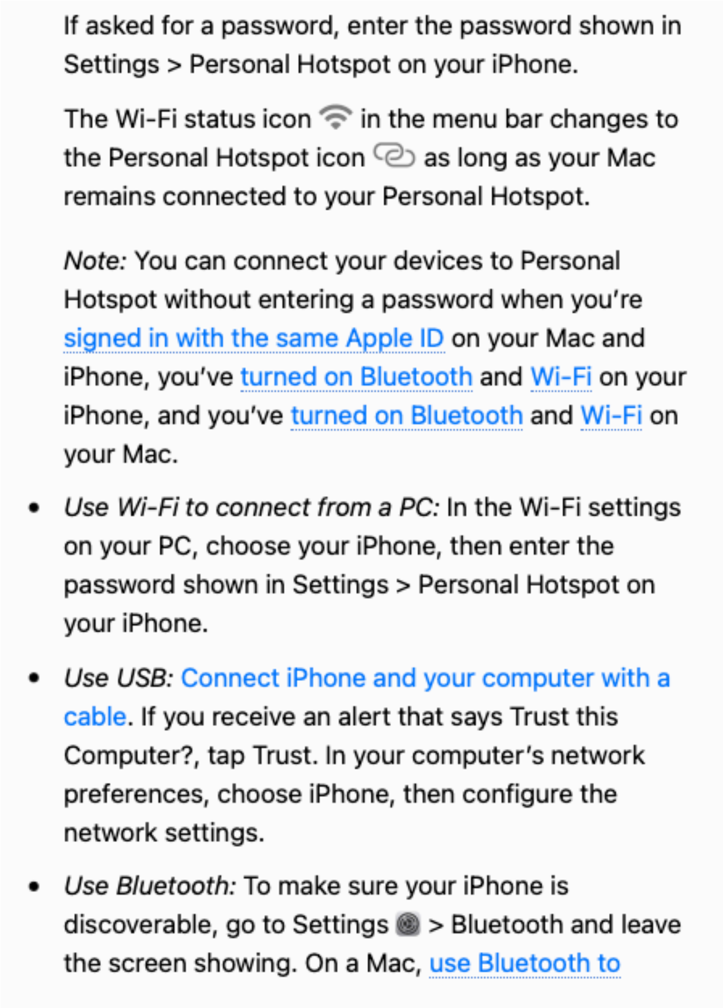
If you set up your iPhone to use two SIMs, Personal Hotspot uses the line you select for cellular data. (See Set up Dual SIM.)



Connect a Mac or PC to your Personal Hotspot

You can use Wi-Fi, a USB cable, or Bluetooth to connect a Mac or PC to your Personal Hotspot. Do one of the following:

- *Use Wi-Fi to connect from a Mac:* On a Mac, click the Wi-Fi status menu 📶 in the menu bar, then choose your iPhone from the list of available networks.

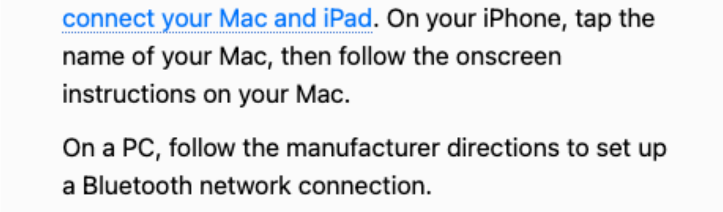


If asked for a password, enter the password shown in Settings > Personal Hotspot on your iPhone.

The Wi-Fi status icon 📶 in the menu bar changes to the Personal Hotspot icon 🔗 as long as your Mac remains connected to your Personal Hotspot.

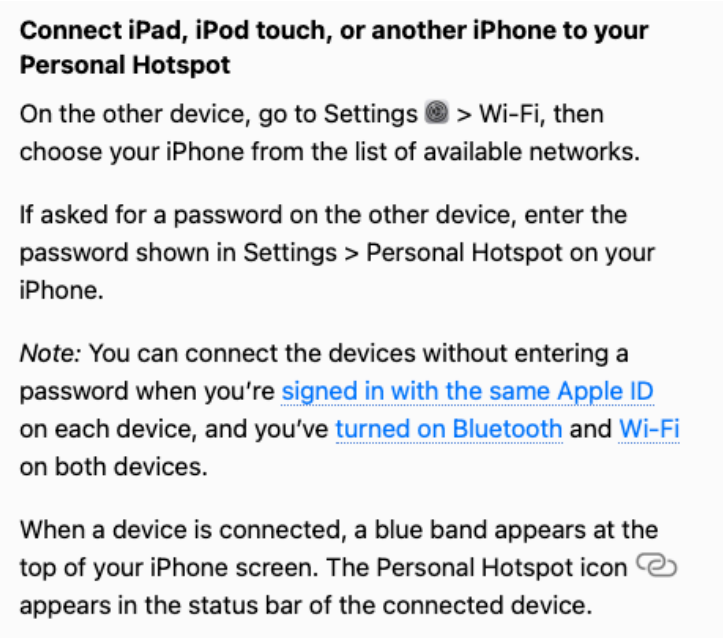
Note: You can connect your devices to Personal Hotspot without entering a password when you're signed in with the same Apple ID on your Mac and iPhone, you've turned on Bluetooth and Wi-Fi on your iPhone, and you've turned on Bluetooth and Wi-Fi on your Mac.

- *Use Wi-Fi to connect from a PC:* In the Wi-Fi settings on your PC, choose your iPhone, then enter the password shown in Settings > Personal Hotspot on your iPhone.
- *Use USB:* Connect iPhone and your computer with a cable. If you receive an alert that says Trust this Computer?, tap Trust. In your computer's network preferences, choose iPhone, then configure the network settings.
- *Use Bluetooth:* To make sure your iPhone is discoverable, go to Settings ⚙ > Bluetooth and leave the screen showing. On a Mac, use Bluetooth to



connect your Mac and iPad. On your iPhone, tap the name of your Mac, then follow the onscreen instructions on your Mac.

On a PC, follow the manufacturer directions to set up a Bluetooth network connection.



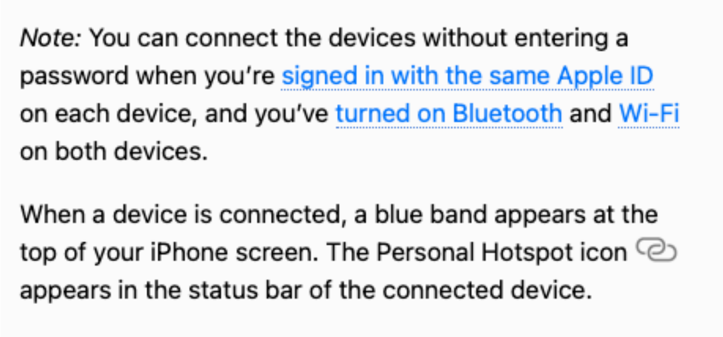
Connect iPad, iPod touch, or another iPhone to your Personal Hotspot

On the other device, go to Settings ⚙ > Wi-Fi, then choose your iPhone from the list of available networks.

If asked for a password on the other device, enter the password shown in Settings > Personal Hotspot on your iPhone.

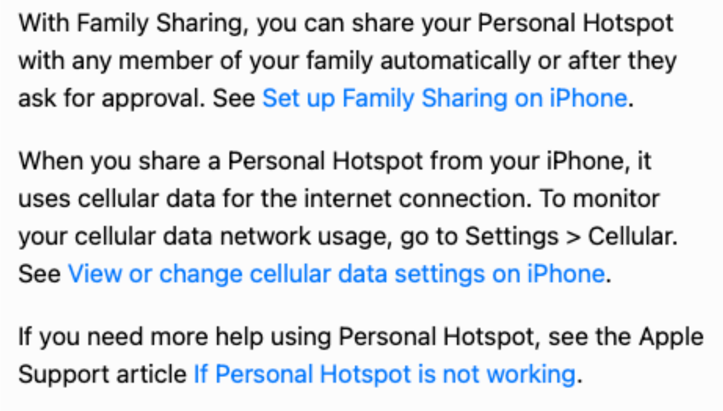
Note: You can connect the devices without entering a password when you're signed in with the same Apple ID on each device, and you've turned on Bluetooth and Wi-Fi on both devices.

When a device is connected, a blue band appears at the top of your iPhone screen. The Personal Hotspot icon 🔗 appears in the status bar of the connected device.



Note: You can connect the devices without entering a password when you're signed in with the same Apple ID on each device, and you've turned on Bluetooth and Wi-Fi on both devices.

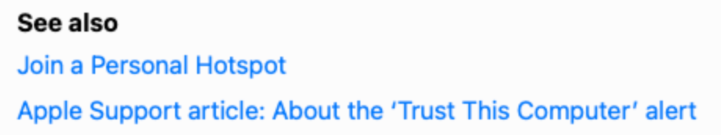
When a device is connected, a blue band appears at the top of your iPhone screen. The Personal Hotspot icon 🔗 appears in the status bar of the connected device.



With Family Sharing, you can share your Personal Hotspot with any member of your family automatically or after they ask for approval. See Set up Family Sharing on iPhone.

When you share a Personal Hotspot from your iPhone, it uses cellular data for the internet connection. To monitor your cellular data network usage, go to Settings > Cellular. See View or change cellular data settings on iPhone.

If you need more help using Personal Hotspot, see the Apple Support article If Personal Hotspot is not working.

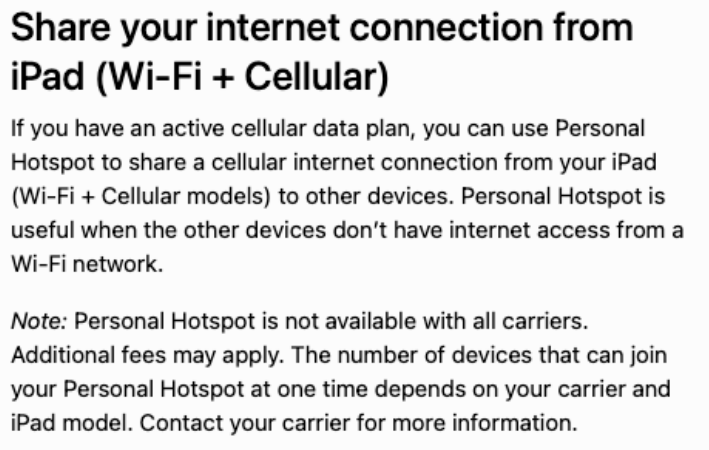


See also

Join a Personal Hotspot

Apple Support article: About the 'Trust This Computer' alert

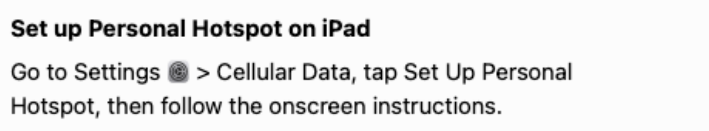
11.26 Share your internet connection from iPad (Wi-Fi + Cellular)



Share your internet connection from iPad (Wi-Fi + Cellular)

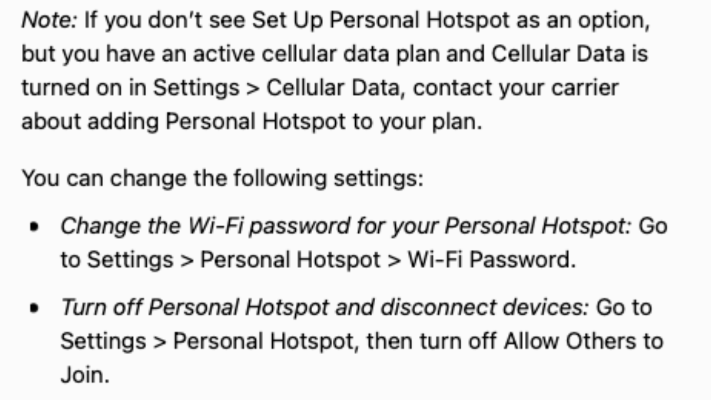
If you have an active cellular data plan, you can use Personal Hotspot to share a cellular internet connection from your iPad (Wi-Fi + Cellular models) to other devices. Personal Hotspot is useful when the other devices don't have internet access from a Wi-Fi network.

Note: Personal Hotspot is not available with all carriers. Additional fees may apply. The number of devices that can join your Personal Hotspot at one time depends on your carrier and iPad model. Contact your carrier for more information.



Set up Personal Hotspot on iPad

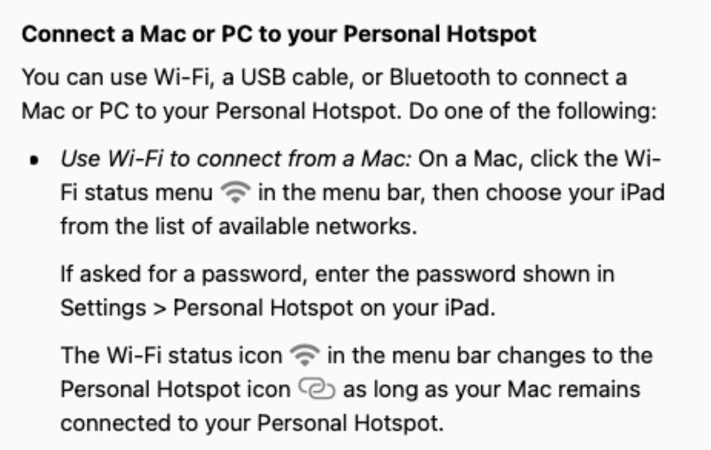
Go to Settings > Cellular Data, tap Set Up Personal Hotspot, then follow the onscreen instructions.



Note: If you don't see Set Up Personal Hotspot as an option, but you have an active cellular data plan and Cellular Data is turned on in Settings > Cellular Data, contact your carrier about adding Personal Hotspot to your plan.

You can change the following settings:

- *Change the Wi-Fi password for your Personal Hotspot:* Go to Settings > Personal Hotspot > Wi-Fi Password.
- *Turn off Personal Hotspot and disconnect devices:* Go to Settings > Personal Hotspot, then turn off Allow Others to Join.



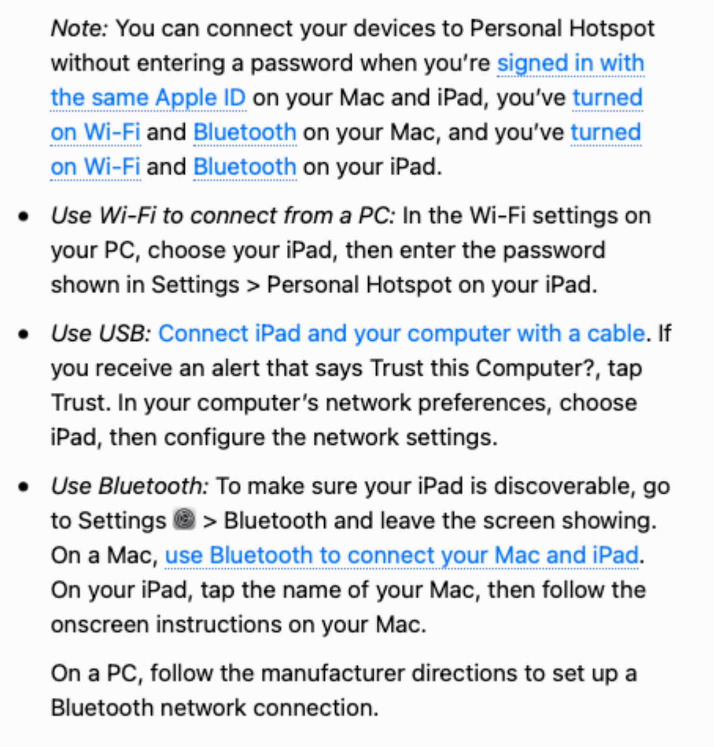
Connect a Mac or PC to your Personal Hotspot

You can use Wi-Fi, a USB cable, or Bluetooth to connect a Mac or PC to your Personal Hotspot. Do one of the following:

- *Use Wi-Fi to connect from a Mac:* On a Mac, click the Wi-Fi status menu in the menu bar, then choose your iPad from the list of available networks.

  If asked for a password, enter the password shown in Settings > Personal Hotspot on your iPad.

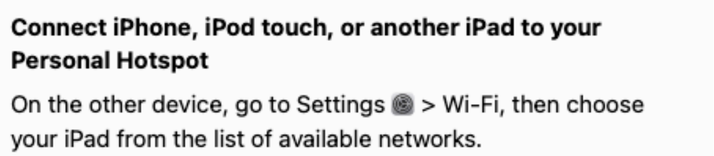
  The Wi-Fi status icon in the menu bar changes to the Personal Hotspot icon as long as your Mac remains connected to your Personal Hotspot.



Note: You can connect your devices to Personal Hotspot without entering a password when you're signed in with the same Apple ID on your Mac and iPad, you've turned on Wi-Fi and Bluetooth on your Mac, and you've turned on Wi-Fi and Bluetooth on your iPad.

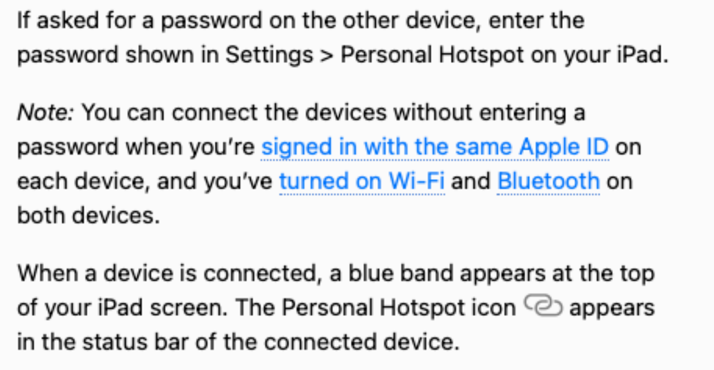
- *Use Wi-Fi to connect from a PC:* In the Wi-Fi settings on your PC, choose your iPad, then enter the password shown in Settings > Personal Hotspot on your iPad.
- *Use USB:* Connect iPad and your computer with a cable. If you receive an alert that says Trust this Computer?, tap Trust. In your computer's network preferences, choose iPad, then configure the network settings.
- *Use Bluetooth:* To make sure your iPad is discoverable, go to Settings > Bluetooth and leave the screen showing. On a Mac, use Bluetooth to connect your Mac and iPad. On your iPad, tap the name of your Mac, then follow the onscreen instructions on your Mac.

  On a PC, follow the manufacturer directions to set up a Bluetooth network connection.



Connect iPhone, iPod touch, or another iPad to your Personal Hotspot

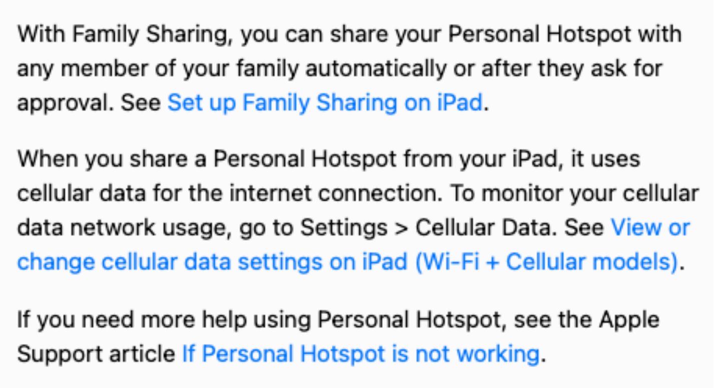
On the other device, go to Settings > Wi-Fi, then choose your iPad from the list of available networks.



If asked for a password on the other device, enter the password shown in Settings > Personal Hotspot on your iPad.

Note: You can connect the devices without entering a password when you're signed in with the same Apple ID on each device, and you've turned on Wi-Fi and Bluetooth on both devices.

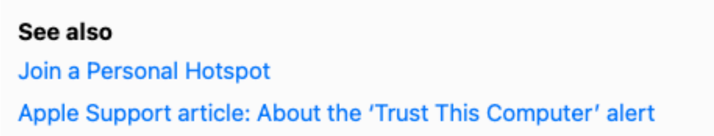
When a device is connected, a blue band appears at the top of your iPad screen. The Personal Hotspot icon 🔗 appears in the status bar of the connected device.



With Family Sharing, you can share your Personal Hotspot with any member of your family automatically or after they ask for approval. See Set up Family Sharing on iPad.

When you share a Personal Hotspot from your iPad, it uses cellular data for the internet connection. To monitor your cellular data network usage, go to Settings > Cellular Data. See View or change cellular data settings on iPad (Wi-Fi + Cellular models).

If you need more help using Personal Hotspot, see the Apple Support article If Personal Hotspot is not working.

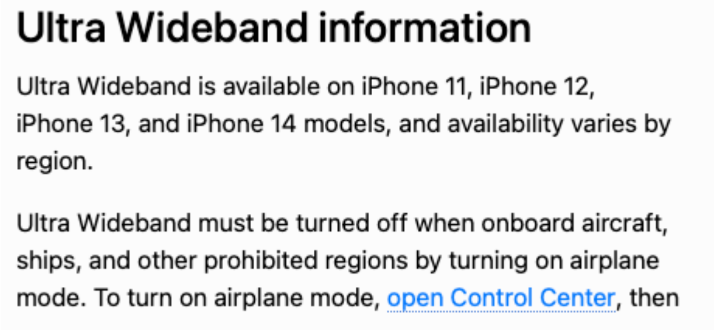


See also

Join a Personal Hotspot

Apple Support article: About the 'Trust This Computer' alert

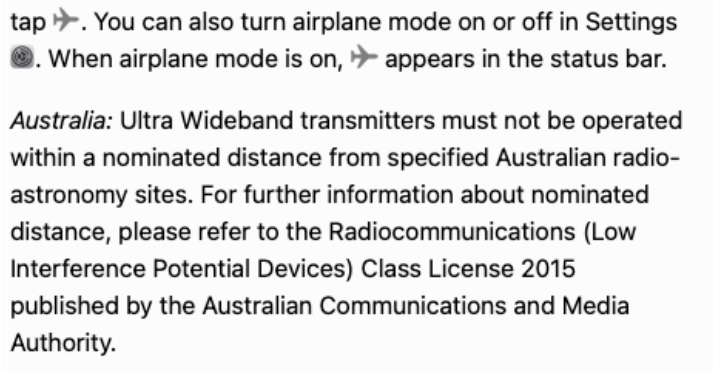
11.27 Ultra Wideband information



Ultra Wideband information

Ultra Wideband is available on iPhone 11, iPhone 12, iPhone 13, and iPhone 14 models, and availability varies by region.

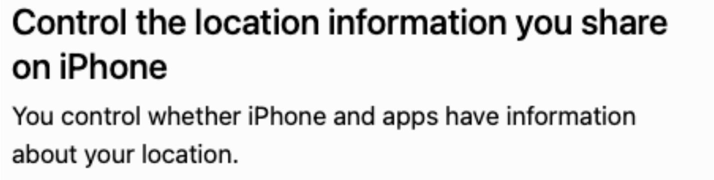
Ultra Wideband must be turned off when onboard aircraft, ships, and other prohibited regions by turning on airplane mode. To turn on airplane mode, open Control Center, then



tap ✈. You can also turn airplane mode on or off in Settings ⚙. When airplane mode is on, ✈ appears in the status bar.

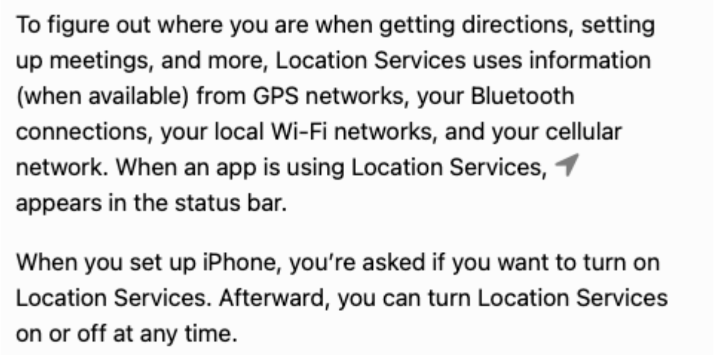
Australia: Ultra Wideband transmitters must not be operated within a nominated distance from specified Australian radio-astronomy sites. For further information about nominated distance, please refer to the Radiocommunications (Low Interference Potential Devices) Class License 2015 published by the Australian Communications and Media Authority.

11.28 Control the location information you share on iPhone



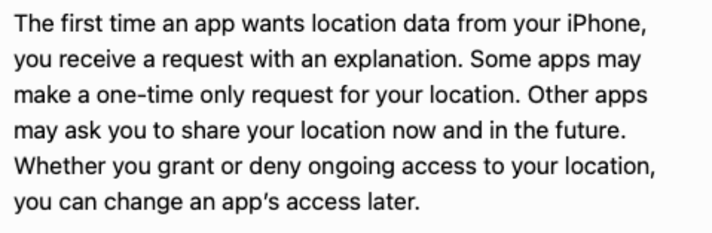
Control the location information you share on iPhone

You control whether iPhone and apps have information about your location.

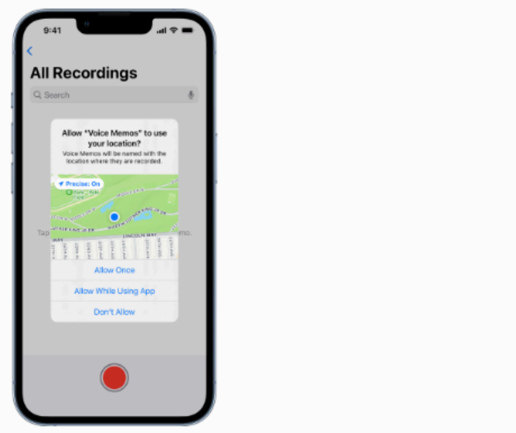


To figure out where you are when getting directions, setting up meetings, and more, Location Services uses information (when available) from GPS networks, your Bluetooth connections, your local Wi-Fi networks, and your cellular network. When an app is using Location Services, ➤ appears in the status bar.

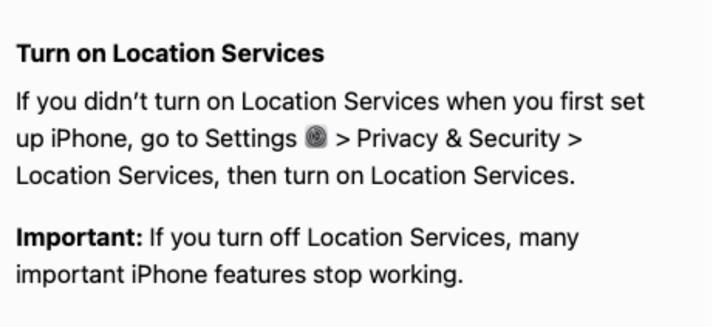
When you set up iPhone, you're asked if you want to turn on Location Services. Afterward, you can turn Location Services on or off at any time.



The first time an app wants location data from your iPhone, you receive a request with an explanation. Some apps may make a one-time only request for your location. Other apps may ask you to share your location now and in the future. Whether you grant or deny ongoing access to your location, you can change an app's access later.



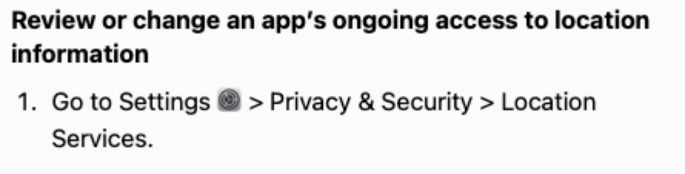
Allow "Voice Memos" to use your location?
Voice Memos will be named with the location where they are recorded.



Turn on Location Services

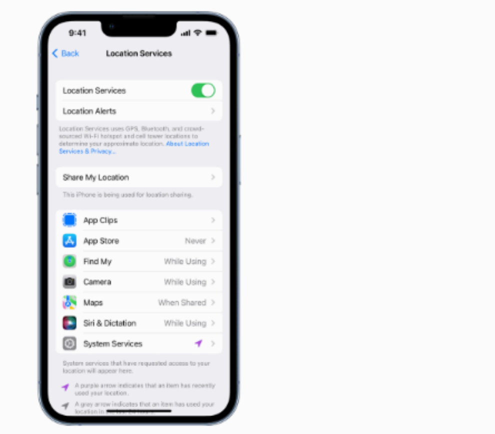
If you didn't turn on Location Services when you first set up iPhone, go to Settings ⚙ > Privacy & Security > Location Services, then turn on Location Services.

Important: If you turn off Location Services, many important iPhone features stop working.



Review or change an app's ongoing access to location information

1. Go to Settings ⚙ > Privacy & Security > Location Services.



Location Services

Location Services	On
Location Alerts	

Location Services uses GPS, Bluetooth, and crowd-sourced Wi-Fi hotspot and cell tower locations to determine your approximate location. About Location Services & Privacy...

Share My Location

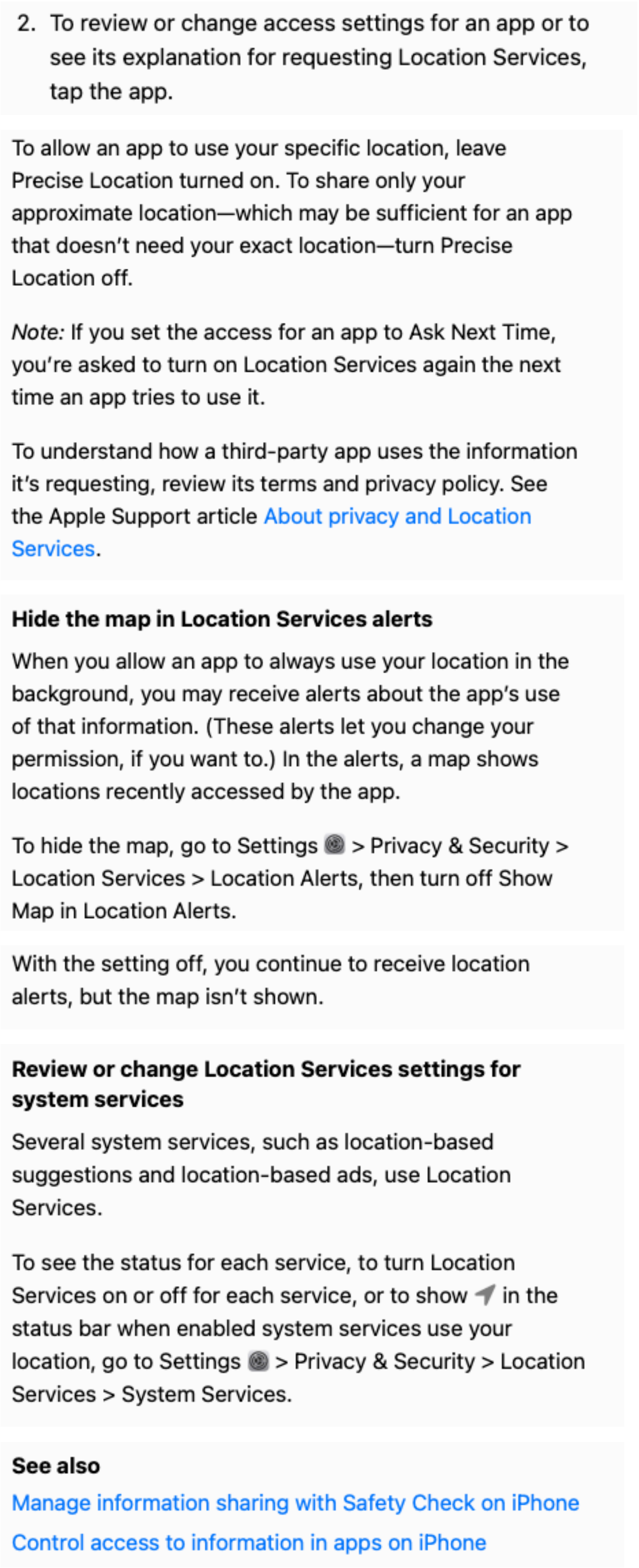
This iPhone is being used for location sharing.

App Clips	
App Store	Never
Find My	While Using
Camera	While Using
Maps	When Shared
Siri & Dictation	While Using
System Services	➤

System services that have requested access to your location will appear here.

A purple arrow indicates that an item has recently used your location.

A grey arrow indicates that an item has used your location in the last 24 hours.



2. To review or change access settings for an app or to see its explanation for requesting Location Services, tap the app.

To allow an app to use your specific location, leave Precise Location turned on. To share only your approximate location—which may be sufficient for an app that doesn't need your exact location—turn Precise Location off.

Note: If you set the access for an app to Ask Next Time, you're asked to turn on Location Services again the next time an app tries to use it.

To understand how a third-party app uses the information it's requesting, review its terms and privacy policy. See the Apple Support article About privacy and Location Services.

Hide the map in Location Services alerts

When you allow an app to always use your location in the background, you may receive alerts about the app's use of that information. (These alerts let you change your permission, if you want to.) In the alerts, a map shows locations recently accessed by the app.

To hide the map, go to Settings ⚙ > Privacy & Security > Location Services > Location Alerts, then turn off Show Map in Location Alerts.

With the setting off, you continue to receive location alerts, but the map isn't shown.

Review or change Location Services settings for system services

Several system services, such as location-based suggestions and location-based ads, use Location Services.

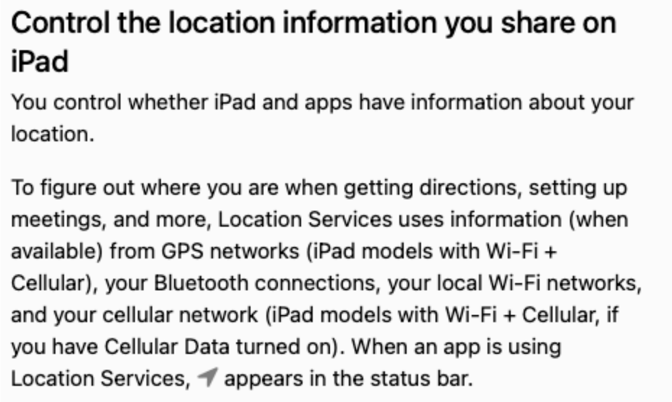
To see the status for each service, to turn Location Services on or off for each service, or to show ➤ in the status bar when enabled system services use your location, go to Settings ⚙ > Privacy & Security > Location Services > System Services.

See also

Manage information sharing with Safety Check on iPhone

Control access to information in apps on iPhone

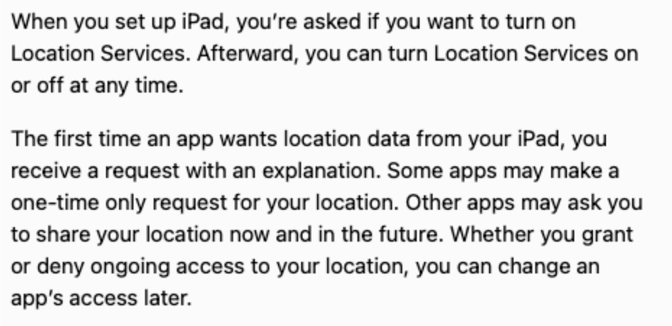
11.29 Control the location information you share on iPad



Control the location information you share on iPad

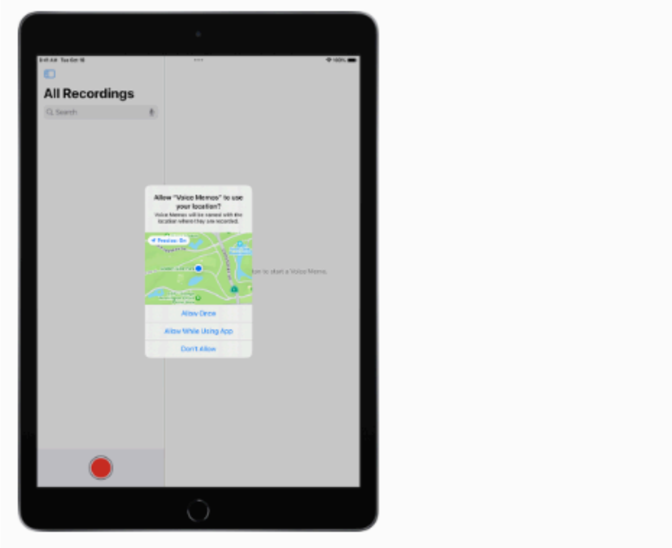
You control whether iPad and apps have information about your location.

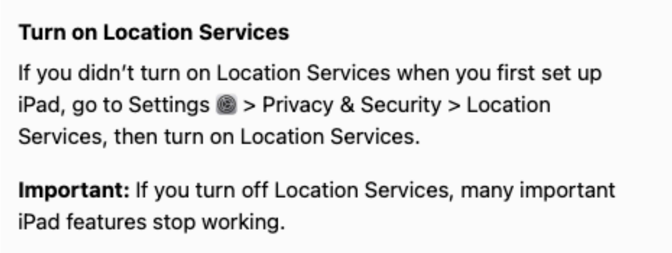
To figure out where you are when getting directions, setting up meetings, and more, Location Services uses information (when available) from GPS networks (iPad models with Wi-Fi + Cellular), your Bluetooth connections, your local Wi-Fi networks, and your cellular network (iPad models with Wi-Fi + Cellular, if you have Cellular Data turned on). When an app is using Location Services, ➤ appears in the status bar.



When you set up iPad, you're asked if you want to turn on Location Services. Afterward, you can turn Location Services on or off at any time.

The first time an app wants location data from your iPad, you receive a request with an explanation. Some apps may make a one-time only request for your location. Other apps may ask you to share your location now and in the future. Whether you grant or deny ongoing access to your location, you can change an app's access later.


All Recordings
Search
Allow "Voice Memos" to use your location?
Voice Memos will be named with the location where they are recorded.
Precise: On
Allow Once
Allow While Using App
Don't Allow



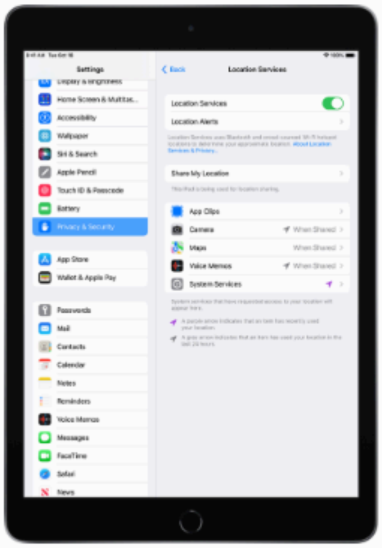
Turn on Location Services

If you didn't turn on Location Services when you first set up iPad, go to Settings ⚙ > Privacy & Security > Location Services, then turn on Location Services.

Important: If you turn off Location Services, many important iPad features stop working.

Review or change an app's ongoing access to location information

1. Go to Settings > Privacy & Security > Location Services.
2. To review or change access settings for an app or to see its explanation for requesting Location Services, tap the app.



To allow an app to use your specific location, leave Precise Location turned on. To share only your approximate location—which may be sufficient for an app that doesn't need your exact location—turn Precise Location off.

Note: If you set the access for an app to Ask Next Time, you're asked to turn on Location Services again the next time an app tries to use it.

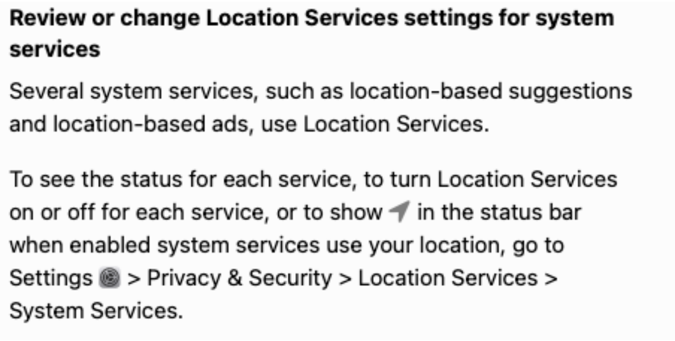
To understand how a third-party app uses the information it's requesting, review its terms and privacy policy. See the Apple Support article About privacy and Location Services.

Hide the map in Location Services alerts

When you allow an app to always use your location in the background, you may receive alerts about the app's use of that information. (These alerts let you change your permission, if you want to.) In the alerts, a map shows locations recently accessed by the app.

To hide the map, go to Settings > Privacy & Security > Location Services > Location Alerts, then turn off Show Map in Location Alerts.

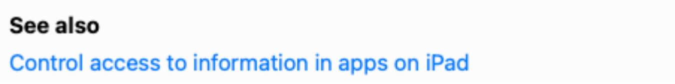
With the setting off, you continue to receive location alerts, but the map isn't shown.



Review or change Location Services settings for system services

Several system services, such as location-based suggestions and location-based ads, use Location Services.

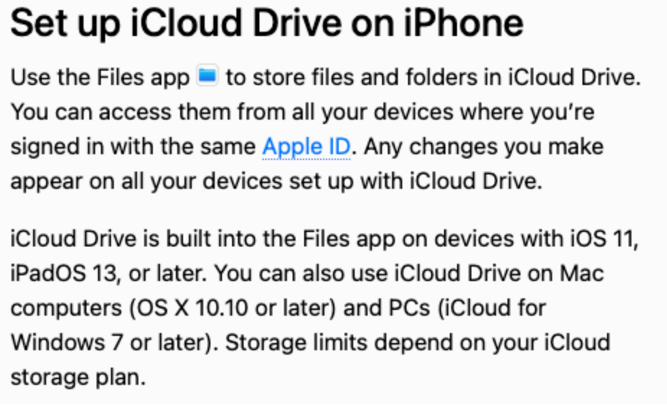
To see the status for each service, to turn Location Services on or off for each service, or to show ➤ in the status bar when enabled system services use your location, go to Settings > Privacy & Security > Location Services > System Services.



See also

Control access to information in apps on iPad

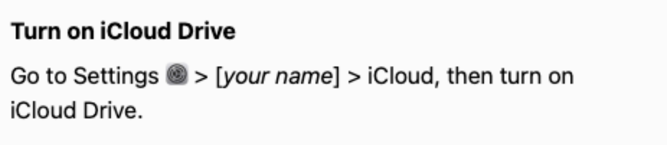
11.30 Set up iCloud Drive on iPhone



Set up iCloud Drive on iPhone

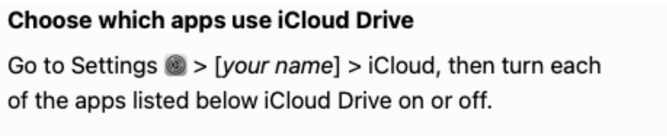
Use the Files app to store files and folders in iCloud Drive. You can access them from all your devices where you're signed in with the same Apple ID. Any changes you make appear on all your devices set up with iCloud Drive.

iCloud Drive is built into the Files app on devices with iOS 11, iPadOS 13, or later. You can also use iCloud Drive on Mac computers (OS X 10.10 or later) and PCs (iCloud for Windows 7 or later). Storage limits depend on your iCloud storage plan.



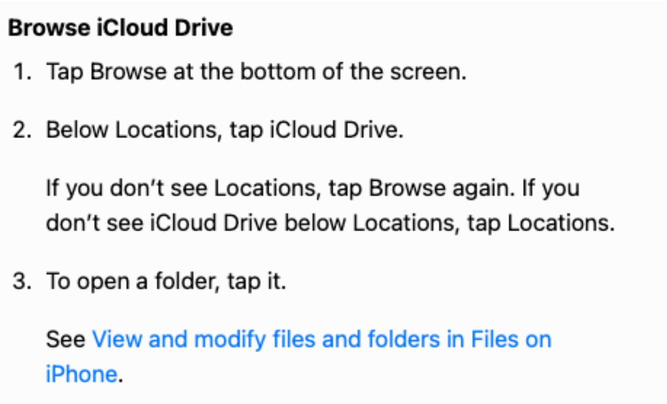
Turn on iCloud Drive

Go to Settings > [*your name*] > iCloud, then turn on iCloud Drive.



Choose which apps use iCloud Drive

Go to Settings > [*your name*] > iCloud, then turn each of the apps listed below iCloud Drive on or off.

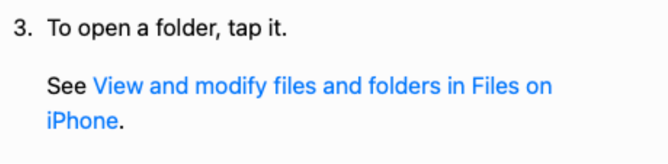


Browse iCloud Drive

1. Tap Browse at the bottom of the screen.
2. Below Locations, tap iCloud Drive.

   If you don't see Locations, tap Browse again. If you don't see iCloud Drive below Locations, tap Locations.
3. To open a folder, tap it.

   See View and modify files and folders in Files on iPhone.



3. To open a folder, tap it.

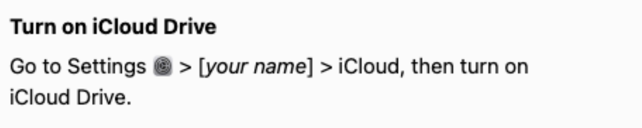
   See View and modify files and folders in Files on iPhone.

11.31 Set up iCloud Drive on iPad

Set up iCloud Drive on iPad

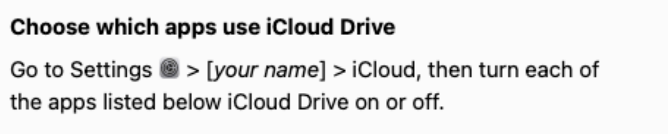
Use the Files app to store files and folders in iCloud Drive. You can access them from all your devices where you're signed in with the same Apple ID. Any changes you make appear on all your devices set up with iCloud Drive.

iCloud Drive is built into the Files app on devices with iOS 11, iPadOS 13, or later. You can also use iCloud Drive on Mac computers (OS X 10.10 or later) and PCs (iCloud for Windows 7 or later). Storage limits depend on your iCloud storage plan.



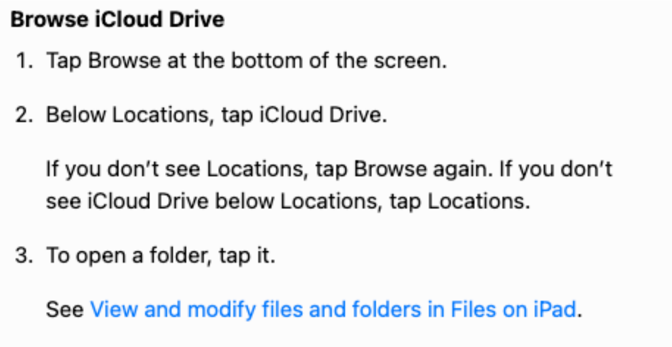
Turn on iCloud Drive

Go to Settings > [*your name*] > iCloud, then turn on iCloud Drive.



Choose which apps use iCloud Drive

Go to Settings > [*your name*] > iCloud, then turn each of the apps listed below iCloud Drive on or off.



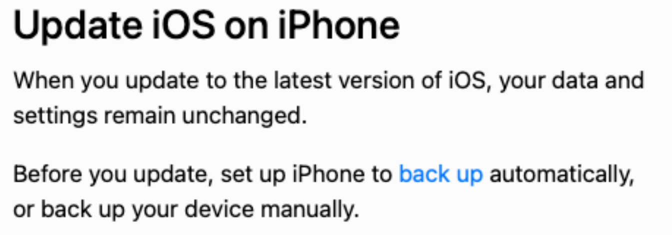
Browse iCloud Drive

1. Tap Browse at the bottom of the screen.
2. Below Locations, tap iCloud Drive.

   If you don't see Locations, tap Browse again. If you don't see iCloud Drive below Locations, tap Locations.
3. To open a folder, tap it.

   See View and modify files and folders in Files on iPad.

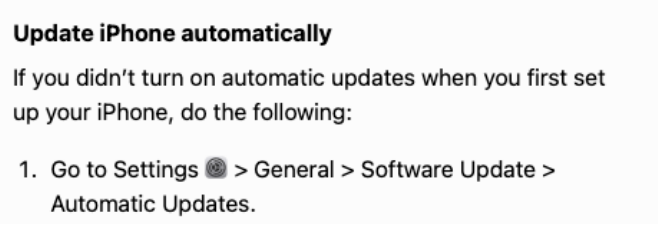
11.32 Update iOS on iPhone



Update iOS on iPhone

When you update to the latest version of iOS, your data and settings remain unchanged.

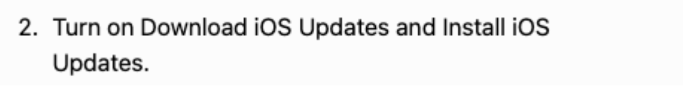
Before you update, set up iPhone to back up automatically, or back up your device manually.



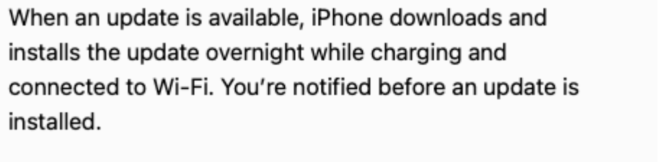
Update iPhone automatically

If you didn't turn on automatic updates when you first set up your iPhone, do the following:

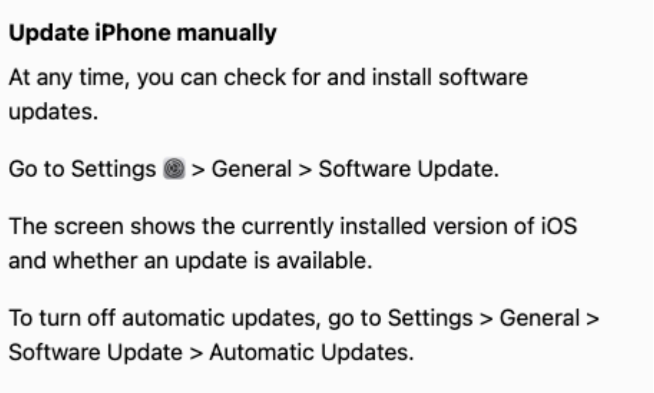
1. Go to Settings > General > Software Update > Automatic Updates.



2. Turn on Download iOS Updates and Install iOS Updates.



When an update is available, iPhone downloads and installs the update overnight while charging and connected to Wi-Fi. You're notified before an update is installed.



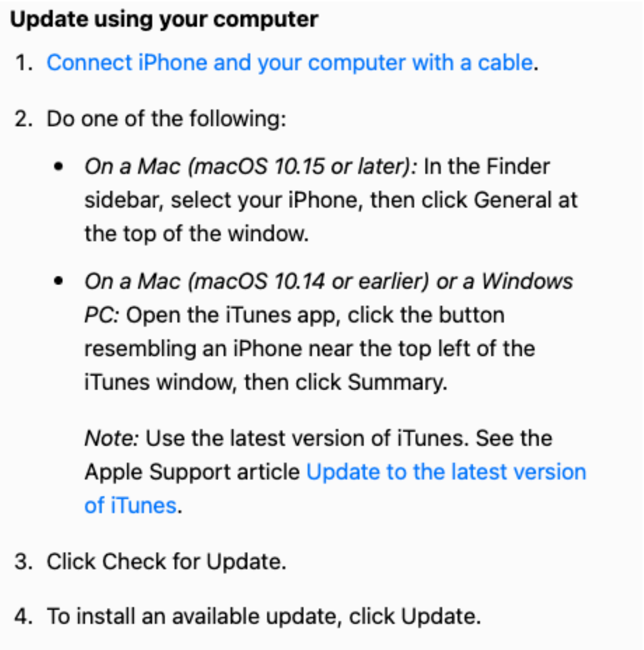
Update iPhone manually

At any time, you can check for and install software updates.

Go to Settings > General > Software Update.

The screen shows the currently installed version of iOS and whether an update is available.

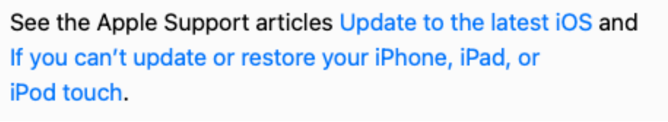
To turn off automatic updates, go to Settings > General > Software Update > Automatic Updates.



Update using your computer

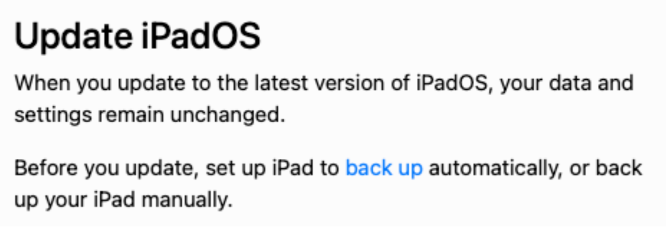
1. Connect iPhone and your computer with a cable.
2. Do one of the following:
   - *On a Mac (macOS 10.15 or later):* In the Finder sidebar, select your iPhone, then click General at the top of the window.
   - *On a Mac (macOS 10.14 or earlier) or a Windows PC:* Open the iTunes app, click the button resembling an iPhone near the top left of the iTunes window, then click Summary.

     Note: Use the latest version of iTunes. See the Apple Support article Update to the latest version of iTunes.
3. Click Check for Update.
4. To install an available update, click Update.



See the Apple Support articles Update to the latest iOS and If you can't update or restore your iPhone, iPad, or iPod touch.

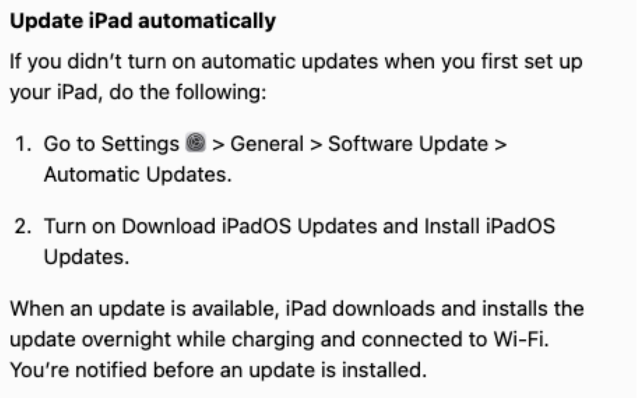
11.33 Update iPadOS



Update iPadOS

When you update to the latest version of iPadOS, your data and settings remain unchanged.

Before you update, set up iPad to back up automatically, or back up your iPad manually.

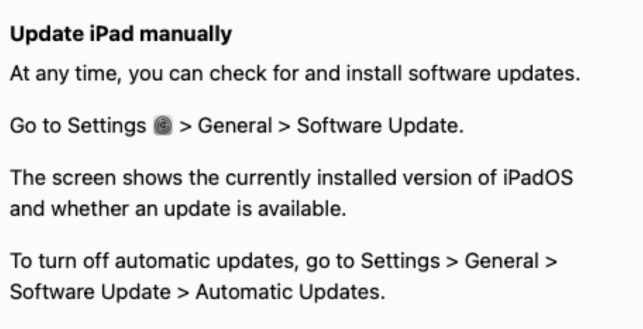


Update iPad automatically

If you didn't turn on automatic updates when you first set up your iPad, do the following:

1. Go to Settings ⚙ > General > Software Update > Automatic Updates.
2. Turn on Download iPadOS Updates and Install iPadOS Updates.

When an update is available, iPad downloads and installs the update overnight while charging and connected to Wi-Fi. You're notified before an update is installed.



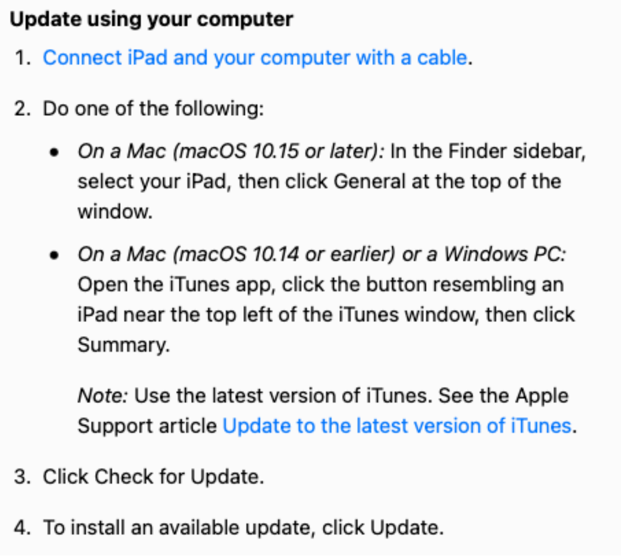
Update iPad manually

At any time, you can check for and install software updates.

Go to Settings ⚙ > General > Software Update.

The screen shows the currently installed version of iPadOS and whether an update is available.

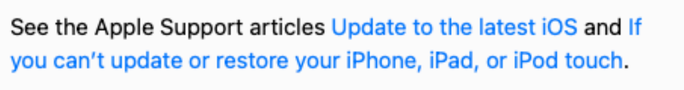
To turn off automatic updates, go to Settings > General > Software Update > Automatic Updates.



Update using your computer

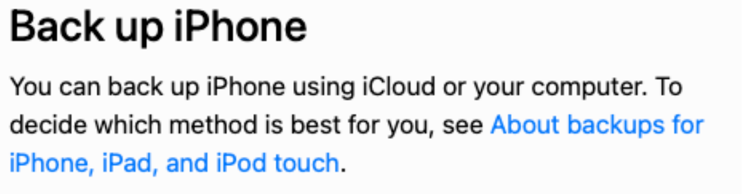
1. Connect iPad and your computer with a cable.
2. Do one of the following:
   - *On a Mac (macOS 10.15 or later):* In the Finder sidebar, select your iPad, then click General at the top of the window.
   - *On a Mac (macOS 10.14 or earlier) or a Windows PC:* Open the iTunes app, click the button resembling an iPad near the top left of the iTunes window, then click Summary.

     Note: Use the latest version of iTunes. See the Apple Support article Update to the latest version of iTunes.
3. Click Check for Update.
4. To install an available update, click Update.



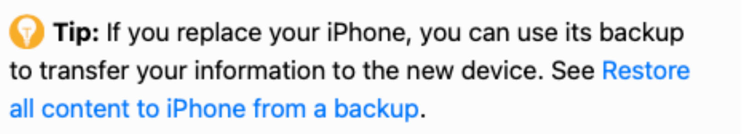
See the Apple Support articles Update to the latest iOS and If you can't update or restore your iPhone, iPad, or iPod touch.

11.34 Back up iPhone

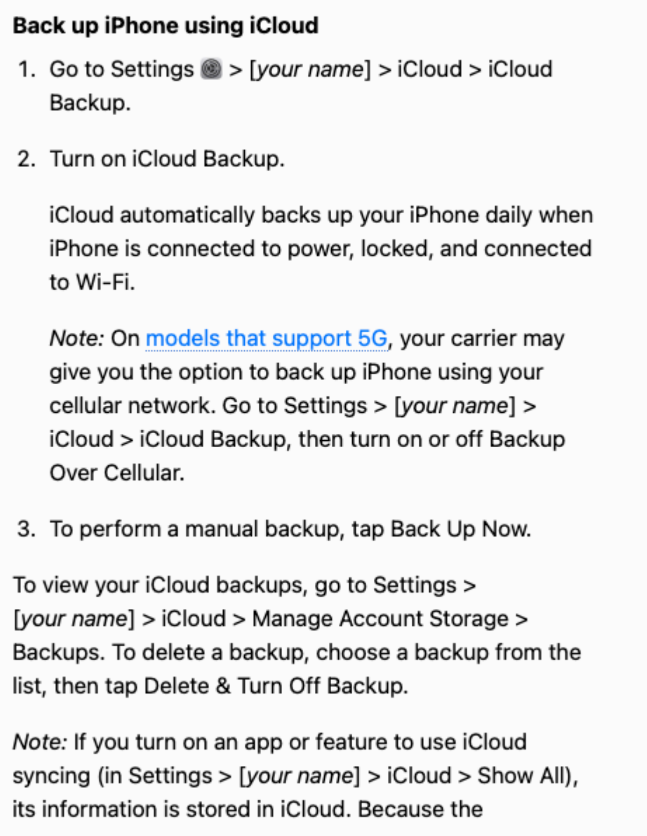


Back up iPhone

You can back up iPhone using iCloud or your computer. To decide which method is best for you, see About backups for iPhone, iPad, and iPod touch.



Tip: If you replace your iPhone, you can use its backup to transfer your information to the new device. See Restore all content to iPhone from a backup.



Back up iPhone using iCloud

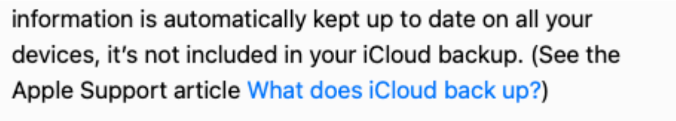
1. Go to Settings > [*your name*] > iCloud > iCloud Backup.
2. Turn on iCloud Backup.

   iCloud automatically backs up your iPhone daily when iPhone is connected to power, locked, and connected to Wi-Fi.

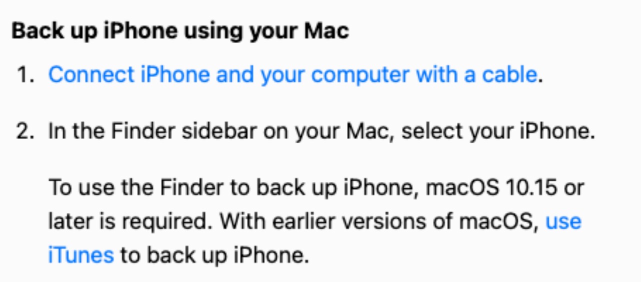
   Note: On models that support 5G, your carrier may give you the option to back up iPhone using your cellular network. Go to Settings > [*your name*] > iCloud > iCloud Backup, then turn on or off Backup Over Cellular.
3. To perform a manual backup, tap Back Up Now.

To view your iCloud backups, go to Settings > [*your name*] > iCloud > Manage Account Storage > Backups. To delete a backup, choose a backup from the list, then tap Delete & Turn Off Backup.

Note: If you turn on an app or feature to use iCloud syncing (in Settings > [*your name*] > iCloud > Show All), its information is stored in iCloud. Because the



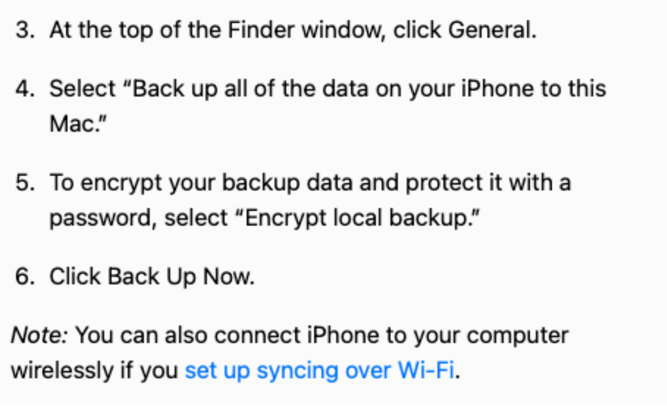
information is automatically kept up to date on all your devices, it's not included in your iCloud backup. (See the Apple Support article What does iCloud back up?)



Back up iPhone using your Mac

1. Connect iPhone and your computer with a cable.
2. In the Finder sidebar on your Mac, select your iPhone.

   To use the Finder to back up iPhone, macOS 10.15 or later is required. With earlier versions of macOS, use iTunes to back up iPhone.



3. At the top of the Finder window, click General.
4. Select "Back up all of the data on your iPhone to this Mac."
5. To encrypt your backup data and protect it with a password, select "Encrypt local backup."
6. Click Back Up Now.

Note: You can also connect iPhone to your computer wirelessly if you set up syncing over Wi-Fi.

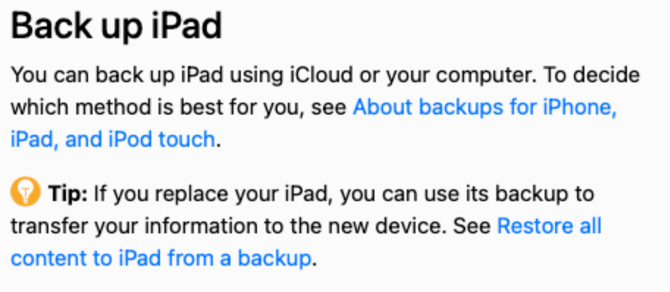
Back up iPhone using your Windows PC

1. Connect iPhone and your computer with a cable.
2. In the iTunes app on your PC, click the iPhone button near the top left of the iTunes window.
3. Click Summary.
4. Click Back Up Now (below Backups).
5. To encrypt your backups, select "Encrypt local backup," type a password, then click Set Password.

To see the backups stored on your computer, choose Edit > Preferences, then click Devices. Encrypted backups have a lock icon in the list of backups.

Note: You can also connect iPhone to your computer wirelessly if you set up syncing over Wi-Fi.

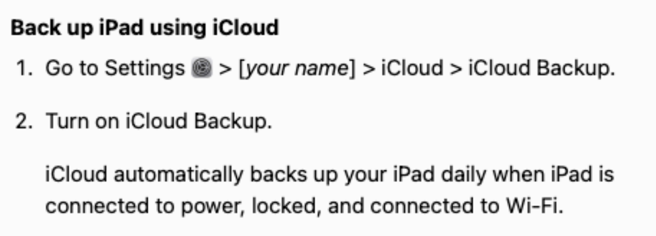
11.35 Back up iPad



Back up iPad

You can back up iPad using iCloud or your computer. To decide which method is best for you, see About backups for iPhone, iPad, and iPod touch.

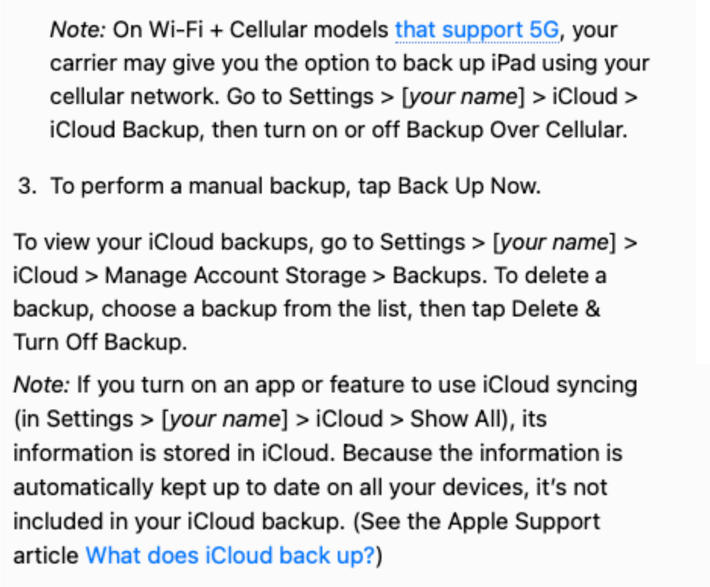
💡 **Tip:** If you replace your iPad, you can use its backup to transfer your information to the new device. See Restore all content to iPad from a backup.



Back up iPad using iCloud

1. Go to Settings ⚙ > [*your name*] > iCloud > iCloud Backup.
2. Turn on iCloud Backup.

   iCloud automatically backs up your iPad daily when iPad is connected to power, locked, and connected to Wi-Fi.

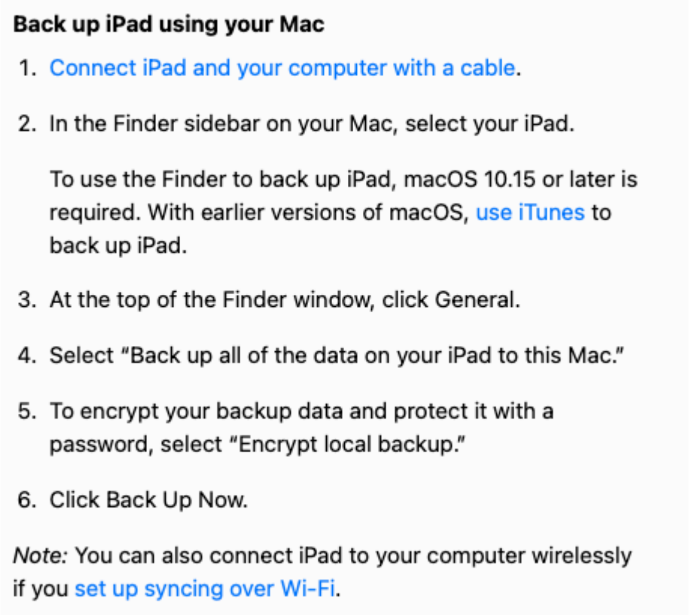


Note: On Wi-Fi + Cellular models that support 5G, your carrier may give you the option to back up iPad using your cellular network. Go to Settings > [*your name*] > iCloud > iCloud Backup, then turn on or off Backup Over Cellular.

3. To perform a manual backup, tap Back Up Now.

To view your iCloud backups, go to Settings > [*your name*] > iCloud > Manage Account Storage > Backups. To delete a backup, choose a backup from the list, then tap Delete & Turn Off Backup.

Note: If you turn on an app or feature to use iCloud syncing (in Settings > [*your name*] > iCloud > Show All), its information is stored in iCloud. Because the information is automatically kept up to date on all your devices, it's not included in your iCloud backup. (See the Apple Support article What does iCloud back up?)

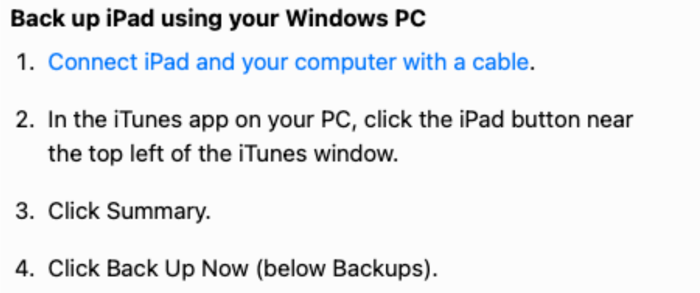


Back up iPad using your Mac

1. Connect iPad and your computer with a cable.
2. In the Finder sidebar on your Mac, select your iPad.

   To use the Finder to back up iPad, macOS 10.15 or later is required. With earlier versions of macOS, use iTunes to back up iPad.
3. At the top of the Finder window, click General.
4. Select "Back up all of the data on your iPad to this Mac."
5. To encrypt your backup data and protect it with a password, select "Encrypt local backup."
6. Click Back Up Now.

Note: You can also connect iPad to your computer wirelessly if you set up syncing over Wi-Fi.



Back up iPad using your Windows PC

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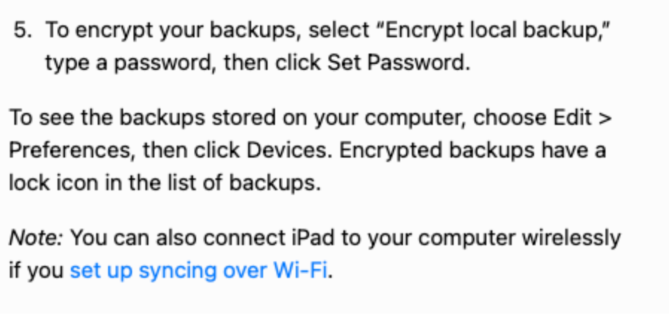
2. In the iTunes app on your PC, click the iPad button near the top left of the iTunes window.
3. Click Summary.
4. Click Back Up Now (below Backups).



5. To encrypt your backups, select “Encrypt local backup,” type a password, then click Set Password.

To see the backups stored on your computer, choose Edit > Preferences, then click Devices. Encrypted backups have a lock icon in the list of backups.

Note: You can also connect iPad to your computer wirelessly if you set up syncing over Wi-Fi.