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# iPhone and iPod touch Networking and Security

iOS 4 EDITION

Glenn Fleishman

$15

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# Read Me First

Welcome to *Take Control of iPhone and iPod touch Networking & Security, iOS 4 Edition,* version 1.0, published in November 2010 by TidBITS Publishing Inc. This book was written by Glenn Fleishman and edited by Tonya Engst.

This book covers how to use your iPhone and iPod touch with iOS 4 on a Wi-Fi or 3G network securely, making connections with ease while protecting your data and your device. It also covers other tasks that rely on a network, such as retrieving documents to read and remotely controlling computers from your iOS 4 device.

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Discounted classroom and Mac user group copies are also available.

## UPDATES AND MORE

You can access extras related to this book on the Web (use the link in Ebook Extras, near the end of the book; it's available only to purchasers). On the ebook's Take Control Extras page, you can:

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# BASICS

In reading this book, you may get stuck if you don't understand a few basic facts related to the iPhone or iPod touch, or a few conventions that the Take Control series uses.

### Software and hardware:

- **iOS 4:** iOS is the name of the operating system (OS) that handles all of a device's operations, managing hardware and software. The latest release of iOS is numbered 4. Apple formerly called iOS *iPhone OS,* which made increasingly less sense given that the iPhone, iPad, and iPod touch all use the operating system. Apple has also now released updates to iPhone OS under the iOS name, such as iOS 3.2.1, an update for the iPad.

- **Supported devices:** iOS 4 is an upgrade for the iPhone 3G and iPhone 3GS and the second-generation (2008) and third-generation (2009) iPod touch models. It's the only supported OS for the iPhone 4 and the fourth-generation iPod touch. The iPad currently runs iOS 3.2.3, and an iOS 4 update is planned for November 2010. The first-generation iPhone and iPod touch (2007) cannot be upgraded to iOS 4. Some features in iOS 4 aren't available to the iPhone 3G and second-generation iPod touch.

- **Radio types:** All iPhone and iPod touch models capable of using iOS 4 have Bluetooth and Wi-Fi radios. *Bluetooth* is a short-range wireless technology for linking audio headsets, wireless speakers, keyboards, and mice. *Wi-Fi* is a high-speed networking standard for moving data among computers and other devices on a local network.

  The iPhone has two more radios: a *cellular modem,* which allows data communications on mobile networks, and a *GPS receiver* for calculating position based on satellite signals, just like with a standalone GPS navigator.

**Information related to 3G networking is highlighted:** I use a special blue box to call out information particular to the iPhone's 3G hardware and 3G service plans.

- **Desktop vs. mobile:** In this ebook, a *desktop device* is either a laptop or a traditional computer that would sit on a desk, typically running Mac OS X or Windows. A *mobile device* means a portable or handheld computer-like device such as an iPhone, iPad, iPod touch, Android phone, Kindle, or Blackberry.

  *Mobile software* or a *mobile operating system* refers to software running on a mobile device, such as iOS or the mobile version of Apple's *desktop* Safari Web browser, which is technically called *Mobile Safari,* even though Apple calls it "Safari" on the iOS 4 Home screen.

### Navigating on the screen and in the menus:

- **Touchscreen:** I often mention tapping an item on the touchscreen, such as "tap the Join button." Occasionally, you may need to double tap, or even touch. *Touching* means putting your finger on the screen and keeping it there until something happens. You may also need to swipe or drag your finger across the screen.

- **Settings app:** I frequently tell you to adjust options in the Settings app. By default, this app appears on the first page of the Home screen. To view the Home screen, press the round Home button on the edge of the device. To open the Settings app, tap its icon.

- **Navigation:** To describe moving around in the iOS 4 interface, I sometimes use a shortcut. For example, if I wanted to tell you to open the Settings app, tap the Wi-Fi option at the left, and then—in the right hand Wi-Fi Networks pane—tap Other, I might instead tell you to "tap Settings > Wi-Fi > Other."

- **Using an external, physical keyboard:** Some directions assume you are using an onscreen keyboard. If you are using a physical keyboard, you may need to press the Return or Enter key to enter certain information, instead of tapping the Join or Search button that would otherwise appear on the onscreen keyboard.

# Introduction

The iPhone and iPod touch are designed to be used on the go: you don't need to clear out space in which to work, put down the device on a table, and stare at it. Instead, you might use your handheld in hundreds of places over the course of a busy day. You want connectivity all the time.

Having connectivity available at all times is more achievable with an iPhone than with an iPod touch. The iPhone has both Wi-Fi and 3G cellular data hardware built in to allow a connection whenever you're within range of either kind of network, assuming the network grants you access.

Using 3G comes at a price, however. Mobile operators worldwide typically sell limited or throttled service plans for 3G. That is, after a certain amount of agreed upon usage in a given billing period (typically a cycle of 30 or 31 days), you pay overage fees that are often considerable, or have your service limited to a very low rate, close to dial-up modem speeds.

In this book, I look at tradeoffs between Wi-Fi and 3G usage, and how to find and pay for the right network connection. I also guide you through how to make consistent and secure network connections, whether over Wi-Fi or 3G, and how to best protect your data and your device from physical or data theft.

With networking comes access, and I guide you through two key and interesting networked uses of your device: accessing and managing documents over a local network and on Internet storage sites; and remote control of a computer's screen on the same or a distant network.

The length of this book may be daunting, but each subject is bite-sized and mostly self-contained. You don't need to be an expert to master the networking and security concepts and tips that follow.

# Quick Start to Networking and Security

This book explains how to use an iPhone or iPod touch safely on a network, including how to connect and customize a connection, and how to secure data that's on your device or that's passing over a network. You can read the ebook in order or skip to topics of particular interest.

To make a connection right away with a minimum of fuss, skip to an option in the "Make a connection fast" list, just below. For Wi-Fi connections, note that Connect to a Secure Wi-Fi Network explains security and password options and Wi-Fi Troubleshooting has advice for fixing problematic connections.

Also, if you have an iPod touch and are wondering how you can make a 3G connection, don't miss Alternatives to Phone Data Plans.

**Make a connection fast:**

- Get on a Wi-Fi network without fuss. See Connect with Wi-Fi at Home or Work.
- Connect to a Wi-Fi Hotspot while you are out and about.
- Add Bluetooth devices to your iPhone or iPod touch.

**Ensure you're secure:**

- Set up a secure Wi-Fi connection. Read Connect to a Secure Wi-Fi Network.
- Prevent others from sniffing your passwords and data over wireless networks. See Transfer Data Securely.
- Don't let your data fall into the wrong hands. See Keep Data Safe.
- Find out what to do When Your iOS Device Goes Missing.

**Learn to use an iPhone's cellular data services:**

- Discover the ins and outs of cellular data plans. See Work with 3G on an iPhone.

- Avoid unexpected data service plan fees. See Keeping Usage Restrained and Choose to Use 3G or Wi-Fi.
- Keep cellular data costs under control outside your home country. See Cross-Border iPhone Use.
- Use your iPhone as a cellular data modem for your laptop. Read Tethering.

**Discover other networked uses of an iPod touch or iPhone:**

- Control a computer's screen and input from an iOS device. See Remote Access and Control.
- Grab and view documents, images, and videos over a network or the Internet with apps. See Access Documents.

**Go under the hood, gain more control, and solve problems:**

- Read Managing Wi-Fi Connections to learn the ins and outs of joining and forgetting hotspot networks, configuring your device to connect in complex scenarios, and work through problems with Wi-Fi Troubleshooting.
- Find tips for setting up a Wi-Fi network to work well with the iPhone 4 and fourth-generation iPod touch in Tweaking Your Network for Faster Performance.
- Get advice on setting up a secure wireless network in Connect to a Secure Wi-Fi Network.
- Learn how to turn off the iPhone and iPod touch's various wireless radios in Airplane Mode.

# Quick Connection Guide

If you have an iPhone or iPod touch in your hands and you want to get on a Wi-Fi network, you can read this chapter to make a connection right away in your home or office, or at a Wi-Fi hotpot. Other parts of the book provide more detailed information about settings, cover less-common connection options, and discuss security.

**The iPhone's Automatic 3G Connection**
Unlike the iPod touch, which can connect to the Internet only via Wi-Fi, an iPhone with an active 3G plan automatically uses its cellular radio to make an Internet connection, so long as the radio is active and in range of its home network, or any compatible network outside its calling area or home country. See Work with 3G on an iPhone for more information about managing 3G service and plans (and, read Your Data Carrier May Connect Your iPhone to Wi-Fi for an exception).

## CONNECT WITH WI-FI AT HOME OR WORK

In this topic, I cover three common ways to connect any iOS 4 device to a home or work Wi-Fi network. (For help with how to Connect to a Wi-Fi Hotspot, perhaps at a café or airport, skip ahead a few pages.) There are three typical approaches for connecting an iPhone or iPod touch to Wi-Fi at home or work:

- Simply tap the name of a network that requires neither a security key nor a password.
- Tap the name of a network that requires a security key or password, and then fill in the required details.
- Enter a network name for a *closed* network that doesn't appear in a list, with or without a key or password.

Let's look at each option in turn.

## Connect by Name (No Password)

To connect your device to a Wi-Fi network that has a publicly available name and no security key, follow these steps:

1. Open the Settings app.
2. Tap Wi-Fi at the top of the Settings list.
3. Tap the network's name when it appears in the Choose a Network list. The device may take a few seconds to complete scanning and showing all networks in the list, during which time it shows a strobing icon.

> ***Your network doesn't appear:*** *You may be too far away from it or have a solid obstruction in the way; or, it's possible the Wi-Fi base station has crashed or been unplugged.*

> ***Lock icon next to the network name:*** *The lock icon indicates a network that requires a password to join.*

Your device should join the network, and an icon showing a Wi-Fi connection should appear near the upper left corner of the screen.

***No Wi-Fi connection icon appears:*** *Consult No Internet Service after Connecting for help figuring out the connection problem.*

## Connect by Name (with a Password)

Many home and business networks use a password or encryption key to limit network access to those who have a valid reason to use the network. To join such a network, you must enter the password when prompted during a connection. If you don't have the password, you can't join the network.

Follow these steps:

1. Open the Settings app.
2. Tap Wi-Fi.
3. Tap the network's name when it appears in the list. The list may take a few seconds to complete scanning and showing all entries.

***Your network doesn’t appear:*** *You may be too far away from it or have a solid obstruction in the way; or, it’s possible the Wi-Fi base station has crashed or been unplugged.*

***No lock icon next to the network name:*** *The lock icon indicates a password-protected network. If there’s no lock, the network isn’t secured, and you can skip Step 4.*

4. iOS 4 prompts you to enter a network password. The device determines which kind of network security is being used; you should be able to enter the password without a prompt to select the security method.

***User name and password prompt:*** *If you connect to a network, typically at a large corporation or university, you may be prompted for a network user name along with a password. That name should have been provided to you at the same time as the password. If not, ask your network’s administrator.*

5. Tap Join on the right side of the keyboard.

Your iPod touch or iPhone should join the network, and an icon showing a Wi-Fi connection 📶 should appear near the upper left corner of the screen.

***No Wi-Fi connection icon appears:*** *Consult No Internet Service after Connecting for help in figuring out the connection problem.*

## Connect to a Closed Network

Some people and companies choose to set up *closed* networks, in which the network name isn’t indiscriminately broadcast.

***No extra security:*** *While closed networks appear to provide additional security, in reality, there’s scant difference except in making a connection harder for those who are entitled to join.*

To join a closed network, follow these steps:

1. Open the Settings app.

2. Tap Wi-Fi > Other.

3. In Other Network, tap the Name field, and enter the network's name as you set it or it was provided to you.

4. If the network has any security option set:

    a. Tap Security

    b. Choose the security method from the list. If a password or a user name plus a password were provided to you, you should have received the security method's name as well. If you set the security method for the network yourself, you must recall which method you used.

    c. Tap Other Network to return to the previous pane.

    d. Assuming you chose a security method other than None, tap the Password field, and enter the password exactly as it was provided.

    e. If you chose the WPA Enterprise or WPA2 Enterprise security method, tap Username and enter the user name you were provided for access.

5. Tap Join on the right side of the keyboard.

Your iPod touch or iPhone should join the network, and an icon showing a Wi-Fi connection 📶 should appear near the upper left corner of the screen.

***No Wi-Fi connection icon appears:*** *Consult No Internet Service after Connecting for help in figuring out the connection problem.*

**Tip:** See In-Depth on Wi-Fi for other Wi-Fi network options, and Connect to a Secure Wi-Fi Network for a full explanation of how to use security options.

## CONNECT TO A WI-FI HOTSPOT

Wi-Fi hotspots are often found in places like libraries, hotel lobbies, and hospitals. When you connect to a network in a Wi-Fi hotspot, it's much like connecting to any network that doesn't require a password. However, most Wi-Fi hotspots require you to take an additional step via a Web browser such as using an account (even a free account), accepting an agreement, or providing payment.

Follow the steps in Connect by Name (No Password), and then:

1. Open the Safari app.
2. If a Web page isn't already in the browser reloading, tap the URL field and enter anything, such as google.com or example.com. Tap Go in the lower right corner.

   A Web redirect page will appear if the hotspot requires that you proceed through an additional step. That page will have information that varies by the kind of site:

   - For a free hotspot without accounts*:* The page explains the terms of service, and it requires that you check a box, enter initials into a field, or otherwise signify agreement.
   - For a free hotspot requiring an account: A page explains that a free account is required to use the wireless connection. The page allows you to log in or set up an account.
   - For a paid hotspot: You should see an explanation of the cost of service, how to pay, and how to login if you have an account. You might also have an account with a service that resells access to the network or allows roaming onto the network, such as Boingo Wireless, Verizon Wireless, AT&T, iPass, or any of several other firms. Pay or enter credentials to proceed. (Read Mobile Device Hotspot Access via Boingo Mobile, a few pages ahead, to learn more about Boingo's offering.)

     Whether you'd prefer not to pay a fee or can't get a hotspot to accept your credentials, you may want to use 3G: Read Select Which Service to Use for advice.
3. Follow the directions provided on the Web page that's loaded to finish establishing your connection.

When you've completed the appropriate procedure, you should be able to visit any Web page.

### Hotspots May Not Send Your Outgoing Email

Some hotspots won't send your outgoing email if your device uses the standard unsecured email port 25. (You can think of a *port* as a kind of cubbyhole attached to an Internet address and assigned to a specific service, like outgoing email.) To work around this problem, either use webmail, which doesn't suffer from that limitation, or configure your Mail account to use an alternative port (587 is common), or, preferably, a secured connection. Consult your email host or Internet service provider for details, and read Transfer Data Securely for more on securing email connections.

### Your Data Carrier May Connect Your iPhone to Wi-Fi

If your iPhone has an active 3G service contract with AT&T, it will automatically connect to any AT&T Wi-Fi network within range, instead of using 3G.

AT&T includes Wi-Fi access at its 21,000 hotspots as part of its cellular data subscription, which typically gives you a far faster upstream and often faster downstream Internet connection. (It also saves AT&T money by moving more traffic off its crowded cellular network.)

If you have a 3G contract outside the United States, the carrier you choose may include limited ("fair use," often just a few hundred MB per month) or unlimited Wi-Fi service, too.

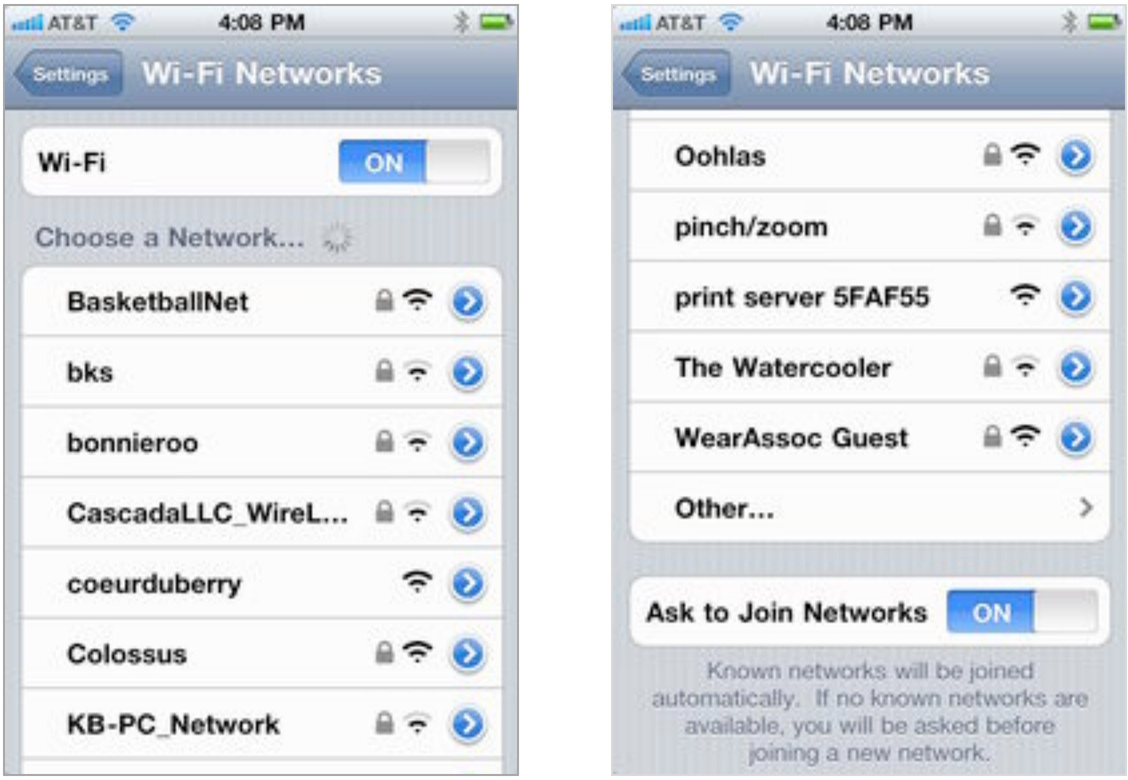
# In-Depth on Wi-Fi

Wi-Fi works quite simply in iOS 4, but there's a lot of hidden detail. In this chapter, you will learn how to interpret the Wi-Fi Networks settings pane, handle automatic hotspot connections, manipulate custom network settings, and troubleshoot common problems.

I also explain how to configure a home or small office Wi-Fi network to best take advantage of the device's Wi-Fi adapter.

## MANAGING WI-FI CONNECTIONS

iOS 4 centralizes all its Wi-Fi management into the compact space of the Wi-Fi Networks settings view. To reach it, open the Settings app and tap Wi-Fi (**Figure 1**).



Wi-Fi ON

Choose a Network...

BasketballNet
bks
bonnieroo
CascadaLLC_WireL...
coeurduberry
Colossus
KB-PC_Network

Oohlas
pinch/zoom
print server 5FAF55
The Watercooler
WearAssoc Guest
Other...

Ask to Join Networks ON

Known networks will be joined automatically. If no known networks are available, you will be asked before joining a new network.

**Figure 1:** The Wi-Fi Networks view (shown with top and bottom portions) lists available nearby networks.

The Wi-Fi Networks view has three elements:

- The Wi-Fi On/Off switch, which is used to disable and enable the Wi-Fi radio.
- The list of Wi-Fi networks beneath the Choose a Network label. Each entry in the Choose a Network list has three or four elements:
    - The network name, which is also called the SSID (Service Set Identifier) in some of the geekier base station configuration tools. This is the name that a network uses to *advertise* itself to Wi-Fi adapters that are looking to make a connection.
    - A lock icon (optional). A lock indicates that there's some form of protection on the network.
    - A signal strength indicator. One, two, or all three of the radio waves in the indicator are lit up (starting with the wave at the bottom) to indicate the strength of the signal being received by the device.
    - A detail › button. Tapping this—carefully, because it's a tiny target—reveals technical details about the network, as well as an option to forget the network. For more about these technical details, see Drilling down to Network Details, a few pages ahead.
- The Ask to Join Networks switch, which lets you choose whether to be alerted about networks in the vicinity to which you have not previously connected successfully.

## Join a Network

The first time you tap a given network name to connect, your device joins the network immediately unless there is encryption enabled on the network. In that case, you are prompted for a password; once you've entered the password and tapped the Join button, you join the network.

***User name prompt?*** *On many corporate and college networks, you are prompted for a user name (typically the first part of your email address or a network login used for file servers) and a password.*

Once you join a network successfully, the network and any associated login information is added to an internal list of networks. Unlike in

Mac OS X and Windows, you can’t examine this internal list and remove entries. The device uses this list to re-join a network whenever you are in range.

**Tip:** You can remove a stored network’s entry only when you’re connected to it. See Forget This Network.

**Tip:** If you set Ask to Join Networks to Off, you won’t be informed of any new network in the vicinity when a known network isn’t available. However, the list always shows all networks around you.

## Auto-Joining a Hotspot Network

iOS 4 has a clever feature that lets you choose to remember the login or other details when joining a hotspot network. Hotspot networks, found in cafés, libraries, airports, and beyond, have an open network to which you connect. Many such networks then require that you launch a browser and view a connection page to proceed. The device can intercept these connection pages and provide a simpler login or approval screen, but Apple has never made it clear which hotspot networks are covered, or in what circumstances a hotspot login interception occurs.

The details for using a hotspot connection page are as follows:

1. In the Settings app, tap Wi-Fi and select the network from the Choose a Network list.
2. After the Wi-Fi signal indicator appears near the upper-left corner of the screen, press Home and then tap the icon for the Safari app.
3. Most of the time, the previously visited page in Safari will try to load once again; if you have a blank page, enter any site address, like example.com or apple.com, and tap Go.
4. The hotspot network will intercept your Web page request and redirect it to a local login or information page. That page will typically ask that you:

    - Read a set of terms and conditions for use, and tap an Agree button, enter an email address and tap an Agree button, or check a box that says I agree and tap a Submit button.

- Require that you register an account to use the network at no cost. With an account, you can log in and use the network.
- Require that you either pay for a connection to the network using a credit card, or enter login information for an active account on the network or an account on a roaming partner.

In each of these cases, Apple may intercept the page and present you with a simplified method of entering any necessary data or approving the connection.

5. After carrying out any of the actions in Step 4, the browser should automatically redirect you to the page you were trying to reach.

The next time you visit a hotspot network that you've previously accessed, iOS 4 will try to log in using the information you provided. This can lead to problems if that information is no longer valid or the device doesn't present it correctly. (iOS 4 is filling out a Web page and submitting it behind the scenes.)

You can disable joining the network again in this fashion by turning off an Auto-Join option. That option is available only when you are connected to the Wi-Fi network, even if you haven't logged in or proceeded past the connection Web page.

To turn off Auto-Join, follow these steps:

1. In the Settings app, tap Wi-Fi.
2. In the Choose a Network list, tap the detail ❯ button to the right of the network name.
3. In the configuration pane that appears, switch Auto-Join off.

**Note:** Once you've connected to a Wi-Fi hotspot, if you can't send email, look for advice in Hotspots May Not Send Your Outgoing Email, a few pages earlier. See also Protecting Particular Services for advice on setting up secured email.

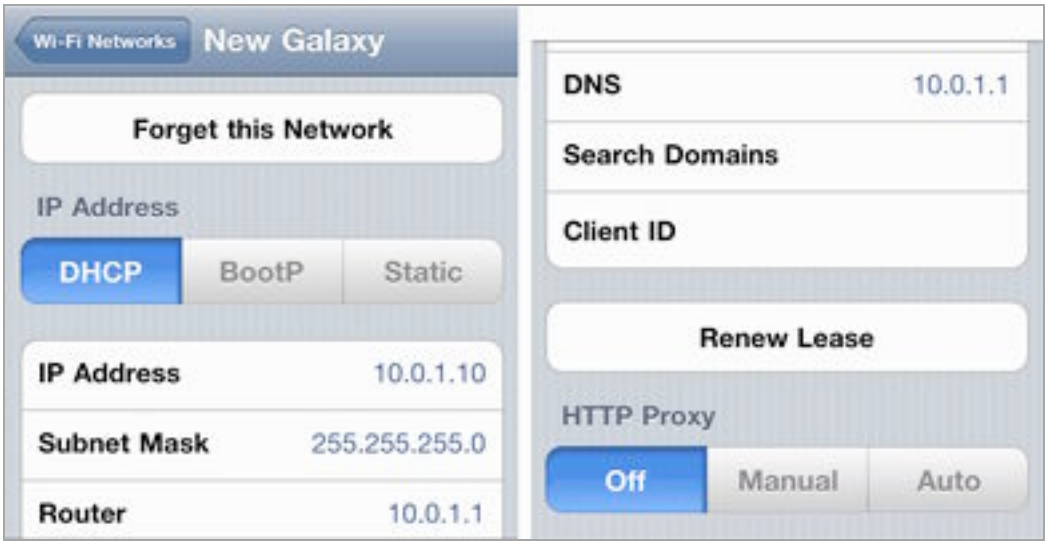
### Mobile Device Hotspot Access via Boingo Mobile

You have an alternative for hotspot access, especially if you use or want to use a lot of for-fee locations. Boingo Wireless resells access at a flat monthly rate to over 120,000 hotspots worldwide. For mobile devices, the fee is $7.95 per month with no contract commitment (http://mobile.boingo.com/). The service is paired with the free Boingo Mobile Wi-Fi app, which allows automated connections to the Boingo network.

Apple doesn’t let hotspot apps run in the background to manage a login to a network. You must launch the Boingo app first before you connect, and it handles getting you in.

## Drilling down to Network Details

For most network connections, you don’t need to go beneath the surface. However, for an unusual connection, such as one requiring a fixed or *static* network address or a different domain name server than the network’s default, to set up the connection details, go to Settings > Wi-Fi, and then tap the detail › button for the current network (a checkmark is by the listing). The resulting view has the network name at its top and three or four configuration areas, depending on the network (**Figure 2**). Let’s look at each in turn.



IP Address 10.0.1.10
Subnet Mask 255.255.255.0
Router 10.0.1.1
DNS 10.0.1.1
Search Domains
Client ID

**Figure 2:** The Wi-Fi Networks view (shown split in top and bottom pieces) lets you view or set network connection values.

### Forget This Network

Tap Forget This Network to remove the network from the list of previously joined Wi-Fi networks. This disconnects your iOS 4 device from the network immediately, and prevents it from joining the network automatically in the future.

***Forget to fix:*** *Forgetting a network may solve network problems. It seems that forgetting allows iOS 4 to store new information.*

### Auto-Join

Auto-Join appears only for hotspot networks for which the device has retrieved certain settings that allow it to make an automatic Web-based login behind the scenes.

### IP Address

The IP Address section covers TCP/IP values used for the Internet's addressing and routing system, divided vertically into sections.

You start with three kinds of standard network connection methods, which you can see as the DHCP, BootP, and Static buttons at the top. Tap a button to display the related choices underneath. You should almost never need to change these values except for a particular home or work network configuration. DHCP is the most common.

The Dynamic Host Configuration Protocol lets your mobile gear request a network address from a router on the network, and then use it to interact on the local network and beyond. When your device uses DHCP to get an address on the local network, you can't change the IP Address, Subnet Mask, or Router fields, as those values are provided by the DHCP server on the router.

### Use Client ID Field for a Fixed Network Address

On a home or work network, you may want to assign a fixed address to your devices. Apple offers this option as DHCP Reservation in the AirPort Extreme, Time Capsule, and AirPort Express base stations.

In your device's DHCP settings, if you set Client ID to a unique value, like `Glenn's iPhone 4`, you can set your base station to assign the same local network address to your iPhone or iPod touch every time it connects over Wi-Fi to the network.

This is useful if you want to use a consistent IP address to connect to certain apps that provide network services, like Air Sharing Pro and GoodReader, for remote access to file storage. See Access Documents for more on this. For details on configuring DHCP Reservation, read my book, *Take Control of Your 802.11n AirPort Network*.

The DNS field in the DHCP settings can be modified or added to; use a comma to separate multiple entries. *DNS* is used to convert human-readable domain names, like `www.takecontrolbooks.com`, into machine-readable IP addresses, like `216.168.61.41`.

You would change the DNS field for two reasons:

- The network to which you're connecting has an internal DNS server, and the necessary network configuration information isn't assigned automatically when the device connects to the network. This is most likely to happen with a network run by a large organization.
- It takes a long time for iOS 4 to "look up" Internet addresses when connecting to the Internet through a particular network. A symptom of long lookups is a frequent, annoyingly long delay before anything happens after you enter a URL in Safari's address field. If this happens, you can switch to a faster DNS server by using a service such as OpenDNS.

Unfortunately, you can't set DNS globally for an iPod touch or iPhone—you can set it only for individual network connections. It may not be worth the effort to set it for connections you use infrequently, but it's worthwhile for a network that you use often, such as your home Wi-Fi connection.

**Tip:** OpenDNS (http://www.opendns.com/), which has free and low-cost options, can be a fast alternative to an ISP's DNS servers, and it offers some filtering and anti-phishing options.

For certain network configurations that you will never have to enter when using a public Wi-Fi network, you may need to tap the Static option and enter settings for IP address, subnet mask, router, and DNS manually. Those values would be provided by a system administrator or an ISP. Likewise, BootP is almost never used any more, but a company or academic institution might tell you to use that setting.

The Renew Lease button is specific to DHCP. A *lease* is the assignment of an address by DHCP to your device, and leases can have a duration (like 15 minutes or 15 days). Occasionally, when you seem to have a network address but can't connect, tapping Renew Lease will obtain a new address, and resume your connectivity.

### HTTP Proxy

This option, located at the bottom of the details pane, is typically used only in companies and schools. It redirects Web requests that you make to the Internet at large to a server that handles them indirectly. This also allows the use of a *caching proxy,* in which recent pages retrieved by anyone in an organization are fed to you from this local server instead of from the remote Web site. This reduces bandwidth consumption.

## Disabling Wi-Fi or 3G

Whenever the Wi-Fi radio is active, even if you aren't connected to a network, it's scanning for networks, which can slowly drain the battery. If you're nowhere near a network you can access or you want to conserve battery life, turn off Wi-Fi as follows:

1. In the Settings app, tap Wi-Fi.

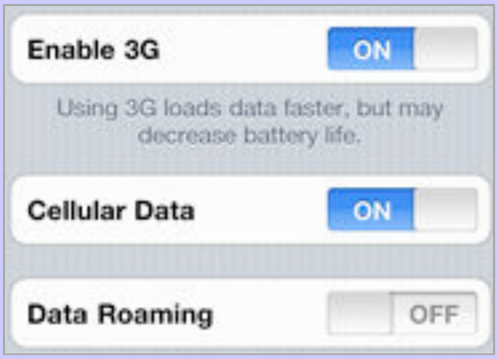
2. Set the Wi-Fi switch to Off.

### Leave Wi-Fi on and Disable 3G

With an iPhone, if you don’t need to make or receive calls, you may want to turn off 3G and leave Wi-Fi on because a 3G radio drains battery life faster than a Wi-Fi radio. You might also want to conserve bandwidth on a 3G plan or be traveling outside your home country.

You can disable the 3G radio in two ways. In Settings > General > Network (**Figure 3**), set the Cellular Data switch to Off, or, in the main Settings list, set Airplane Mode to On. With Airplane Mode on, you can turn Wi-Fi back on by tapping Wi-Fi and setting the Wi-Fi switch to On. (With Airplane Mode on, you can’t enable Cellular Data.) See Airplane Mode for details.

You can also keep cellular data turned on at 2G rates (about 200 Kbps) and for 2G voice calls by flipping the Enable 3G switch to Off in Settings > General > Network. This reduces data usage by making it slower to move data, but also extends battery life, and keeps you from using much data.



Enable 3G ON

Using 3G loads data faster, but may decrease battery life.

Cellular Data ON

Data Roaming OFF

***Figure 3:** The Enable 3G switch lets you toggle high-speed—and high-battery-use—mode on and off, whereas the Cellular Data switch lets you turn* all *mobile broadband access on or off separately from Wi-Fi networking. Data Roaming affects use outside your home country.*

# WI-FI TROUBLESHOOTING

While Wi-Fi generally works well, you may find circumstances in which you don't get the desired result: a live network connection. Here's some troubleshooting advice for common cases.

## Can't See Wi-Fi Networks

If your device can't see a Wi-Fi network that you think should be available, it's possible that you are out of range. To solve the problem, move the device closer to where you know (or think) a base station is located. Although the iPhone and iPod touch sport an excellent Wi-Fi radio, Wi-Fi reception can be blocked by thick obstructions, such as solid stone and brick walls, or by walls made of chicken wire covered by plaster.

Of course, it's also possible the base station is in trouble, not your handheld.

## No Wi-Fi Signal Strength in the Indicator

You've selected a network and, if necessary, entered a password, and tapped Join—but the signal-strength indicator in the upper left still shows gray radio waves instead of black. This means that an initial connection was made, but then you quickly moved too far away from the base station, or the base station was shut down or restarted with new information. If the connection process had failed while underway, you would have seen a notification alerting you.

Try connecting again. If that fails, too, restart your device: Press the Sleep/Wake button until you see a red slider for powering down. Slide it, wait until a spinning indicator disappears and the screen goes entirely black, then hold down the button again for a few seconds. An Apple icon appears and the device starts up.

## No Internet Service after Connecting

You connected to a Wi-Fi network, but cannot access the Internet from any programs you try. Here's how you can figure out what's wrong.

### Check a Web Page with Safari

The most common cause of this problem is that you've connected to a network, likely a hotspot network but possibly a guest network, that requires a password, button tap, or other action. Launch Safari and try to reach any page, such as google.com. If you are redirected to a login page, follow the instructions. You may need to pay for access, or you may have connected to a network that requires a password; consult Connect to a Wi-Fi Hotspot, earlier, for more information.

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***Remember to forget:*** *Because you've connected successfully to the Wi-Fi network, even though you haven't been granted access to the Internet, you need to remove the network from your list of those you've previously joined or you'll have this problem every time you're in range. Tap Settings > Wi-Fi, tap the detail button to the right of the network name, and then tap Forget This Network. Confirm.*

---

If you're not redirected and Safari throws up a connection error, try the next fix.

### Check IP Address Settings

This may sound obscure, but it's an easy way to see if your device is obtaining a network address from the router you've connected to.

To check on your assigned IP address, follow these steps:

1. In Settings, tap Wi-Fi.
2. Tap the detail button to the right of the currently connected network's name.

The IP Address section should be set to DHCP for almost all networks; another value should be chosen only if you've been told otherwise. (See Drilling down to Network Details, earlier in this section.)

If the IP address starts with 169, then iOS 4 wasn't able to obtain an address from the network. The 169 address range is *self-assigned*, meaning the device gave itself an address that can't be used on the network, and stopped checking.

Here are several ideas for fixing the IP address:

- Tap Renew Lease; this causes iOS 4 to ask again for a network address. If successful, the IP address will change from a number starting with 169, to an address starting with another range, typically 198 or 10.
- In the main Wi-Fi Networks settings screen, tap the Wi-Fi switch to Off, wait a moment, and tap it back to On. Tap the network name's detail button to see if the address is now assigned.

- If you're at an event or a hotspot venue, ask the network's operator, the front desk, or whomever. The router may have crashed. (You can look around and see if other people look frustrated, too.)
- Restart the device. Press the Sleep/Wake button until a red slider appears. Slide to power off. Wait until the spinning indicator disappears and the screen turns entirely black. Hold down the button again for a few seconds. An Apple icon appears, and the device starts up.

## TWEAKING YOUR NETWORK FOR FASTER PERFORMANCE

The iPhone 4 and the fourth-generation iPod touch are the first models in their lines to have functional 802.11n networking; the third-generation iPod touch apparently has an 802.11n chip, but that faster mode isn't enabled.

While 802.11n can support two different frequency bands—2.4 gigahertz (GHz) and 5 GHz—Apple opted to include just 2.4 GHz support in the iPhone 4 and fourth-generation iPod touch. But you can still take advantage of 802.11n's improved speed, and rearrange a home or small-office network to boost network performance.

**Note:** The original iPhone, iPhone 3G, and iPhone 3GS, and all iPod touch models before the fourth-generation touch use 802.11g networking in 2.4 GHz.

The two frequency bands allow greater flexibility: the 2.4 GHz range used works over longer distances, but it suffers from interference from nearby networks, baby monitors, microwave ovens, and Bluetooth devices. The 5 GHz range is more effective over shorter distances, offering twice the speed or greater on the same device used in 2.4 GHz.

The 2.4 GHz band was the original Wi-Fi spectrum range, and older 802.11b and 802.11g devices (including original AirPort base stations and 2003–2006 AirPort Extreme base stations) can work only with that networking option. The 5 GHz band is used primarily by 802.11n, but it is also used by an old, still-in-use standard called 802.11a, which is on very few devices.

**Note:** Oddly, certain early Intel-based Macs secretly included 802.11a. My wife, for instance, has an original series MacBook that connects in 5 GHz over 802.11a.

If you have an older base station, replacing it with any 2007-or-later Apple equipment, or buying an 802.11n wireless router from some other manufacturer, can boost your iPhone 4 or fourth-generation iPod touch performance up to 50 percent.

And if your new router can relay traffic in both bands at the same time, you're in even better shape: While your iOS device works over 2.4 GHz, a simultaneous dual-band router can allow equipment that supports 5 GHz networking to shift its traffic to that frequency range, reducing load on the 2.4 GHz network. Any dual-band 802.11n device, including the iPad and most Macs sold since October 2006, will preferentially pick the best network for its location. If an iPad or Mac is close to a wireless router, it will choose 5 GHz for speed; if it is farther away, and it can't get a clean 5 GHz connection, it drops to 2.4 GHz to keep the connection active.

You can create a Wi-Fi network that offers simultaneous use of both bands in one of two ways, either of which may require hardware you don't already own:

- Use a simultaneous dual-band router, such as the 2009 or later models of the AirPort Extreme Base Station or Time Capsule. Such routers have two separate radio systems, and can push out signals over 2.4 GHz and 5 GHz at the same time at full speed on each.
- Use two separate base stations, at least one each for 2.4 GHz and 5 GHz. Attach them with Ethernet to form one network. The 2007 and 2008 models of the AirPort Extreme and Time Capsule, and all 2008 and later AirPort Express base stations, offer 802.11n but work on only one band at a time.

For enormously more advice on setting up various Wi-Fi networks, see my book *Take Control of Your 802.11n AirPort Network*.

# Connect to a Secure Wi-Fi Network

Most home networks are now secured, and nearly all businesses networks employ some way of keeping outsiders out. Connecting to these networks requires a little bit of knowledge and planning to avoid roadblocks. This chapter looks at how to connect an iPhone or iPod touch to a network, and at solving common problems that you may encounter.

Wi-Fi security divides out into three main types:

- **Simple network security:** Since 2003, the best option for a home or small office network is Wi-Fi Protected Access, which comes in WPA and WPA2 flavors. This what's now mainly used, due to Apple and Microsoft improving their operating systems, and wireless router makers improving their devices. See Connect with WPA/WPA2 Personal (next page).
- **Corporate/academic security:** Many companies and colleges rely on WPA/WPA2 Enterprise, a stronger method of security that's fully supported in iOS. Read Connect with WPA2 Enterprise.
- **Outdated, unreliable "security":** This category is where I put Wireless Equivalent Privacy (WEP), a Wi-Fi security method that was broken in 2003, but still is in use. It's also where I put MAC address filtering, in which unique adapter numbers are used to control access. Consult Wired Equivalent Privacy (WEP) and MAC Address Filtering to learn more.

Of course, I'd prefer you always made a secure connection, but you may not have control over how a network is protected.

**Separate security on 3G networks:** 3G networks have their own security methods, which are partly based on the Subscriber Identity Module (SIM). The SIM identifies a phone or data device to a network and is used to make sure that an account is active.

***Hotspots not hot on security!*** *Public hotspots, whether free or fee, typically have no security at all; if they do, it's a shared password that provides no protection from other people on the network. When you connect to a hotspot, I recommend using only secured services or a virtual private network (VPN) connection. Read Transfer Data Securely for details on both topics.*

## CONNECT WITH WPA/WPA2 PERSONAL

The latest and best security method for connecting to a Wi-Fi network in a home or office is Wi-Fi Protected Access. WPA comes in two "personal" flavors: the original WPA and a later revision called WPA2. Nearly all computer hardware with Wi-Fi sold starting in 2003 supports WPA2, including the iPad, iPhone, and iPod touch.

***Impersonal:*** *The complement to* Personal *is* Enterprise*, discussed next.*

The *Personal* part refers to protecting the network with a password—sometimes called a *passphrase* since it can be comprised of multiple words. It can be up to 63 characters long and include punctuation, letters, and numbers. The passphrase is run through mathematical churns to produce something stronger.

A passphrase is set on a base station, and then provided by whomever set it up to anyone who needs permission to connect to the network. If you've set up the network yourself, you're the person who picks the passphrase.

**Tip:** If you're setting up a base station, pick a good passphrase. The best WPA/WPA2 passphrases are at least 12 characters long; 20 is better. Choosing something memorable (like a song lyric) is fine so long as you insert a random character like # or ! as well.

WPA2 includes a stronger encryption type, and given some signs of weakness in WPA, it's best to choose WPA2 as the sole method of encryption, if your clients all support it. If you're working with sensitive material, in the healthcare or financial industry, or if you just want the best security, WPA2 is the only reasonable choice. Make sure that your network is configured to use only WPA2's stronger key type, described in the sidebar just ahead.

Apple hides the complexity of key choice and other variables by presenting a simple Password field when you select a network protected by any WPA Personal or WPA2 Personal combination. Type the password in, tap Join on the onscreen keyboard, and you're done.

### The Keys behind WPA and WPA2

Briefly, the difference between WPA and WPA2 is that the former standard supports a revised basic encryption key type called TKIP (Temporal Key Integrity Protocol); WPA2 includes support for a much more advanced key type called AES-CCMP (Advanced Encryption System…and you don't want to know what CCMP stands for). TKIP is an improved version of Wired Equivalent Privacy (WEP) described in Outdated Methods, shortly ahead.

Some routers ask you to select between TKIP and AES or both; others show WPA, WPA/WPA2, and WPA2, but mean TKIP only, TKIP or AES, or AES only.

Apple's 2007-and-later base stations default to offering a choice of WPA/WPA2 Personal, which allows a computer or device to connect by offering either a TKIP or AES version of the network's password, or WPA2 Personal, which requires an AES transaction.

## CONNECT WITH WPA2 ENTERPRISE

There are stronger ways to secure a network, and if you use your iPhone or iPod touch in corporate or academic settings, you will likely encounter *WPA2 Enterprise*. WPA2 Enterprise is an instance of 802.1X *port-based authentication,* which can be used with Ethernet and older Wi-Fi standards, too. All the flavors of 802.1X let you connect in a limited fashion to a network; this controlled connection only allows you to send your login details. Only when those details are confirmed does an 802.1X system give you access to the full network.

***WPA Enterprise missing?*** *While WPA Enterprise is still in use, any organization that cares enough about its security to use this option will have upgraded to WPA2 unless they have specific older computers or devices for which backward compatibility is needed.*

WPA2 Enterprise networks are most frequently secured by a user name and a password. However, a *digital certificate* (described below) can also be used for login. iOS supports these and other types of WPA2 Enterprise. Let's look at each option in more detail.

**Tip:** Mac OS X Server (10.5 and later) includes full support for setting up WPA2 Enterprise even on the smallest network. The server can be elsewhere on the Internet, too; it doesn't have to be on the same network as the base station.

## User Name and Password Login

In the simplest setup, to connect your device to a WPA2 Enterprise network, you must enter a user name and a password provided by the network administrator or IT department. Often, these are the same credentials you use for file service, email, and other network resource access, such as your email mailbox name (the part to the left of the @) or full address (user@domain.com) for that network.

To connect to a WPA2 Enterprise network of this sort, select the network, enter your user name and password, and tap Join. It's that easy. If you get an error, check your entries. If they are correct, then contact network support: you won't be able to troubleshoot this any further, because there are no settings to tweak in iOS.

***Warning!*** *Some networks may have policies that limit these sorts of logins to specific days and times, among other parameters. That's rare outside of high-security corporate networks.*

## Certificate-Based Login

Some networks rely on digital certificates to handle logins. A *digital certificate* combines an encryption key with information that helps to validate the identity and integrity of that key. That is, the certificate lets a system make sure that the key hasn't been tampered with, and that it was created by the party that the certificate says created it. Digital certificates are used to provide a verified identity for server software, like a mail server, or for an individual.

In the case of WPA2 Enterprise, a certificate is used as an alternative to a user name and login because the certificate can't be written down on a sticky note or extracted in some fashion. An IT worker would create and provide you with a certificate used for WPA2 Enterprise and usually install it for you.

An iOS device can receive a certificate via email, and install it when you tap it as an attachment. However, that might be too much of a security risk. Instead of using email, the IT department could use the iPhone Configuration Utility (http://support.apple.com/kb/DL851). This free tool is available for Mac OS X and Windows, and it allows an administrator to create connection and other profiles and install them directly on any iOS 3 or iOS 4 device—not just the iPhone.

**Note:** To learn about configuring a network with the best security for your situation, consult my two related books, *Take Control of Wi-Fi Security* and *Take Control of Your 802.11n AirPort Network*.

# OUTDATED METHODS

This topic explains how to connect with out-of-date or ineffective security methods that are still, unfortunately, in relatively wide use. If you're using them, please consider upgrading to WPA/WPA2 Personal.

## Wired Equivalent Privacy (WEP)

*WEP* was the first Wi-Fi security method, born in the same standard that unleashed Wi-Fi on the world (as 802.11b in 1999). But the standard had severe security compromises that were exploited by *white hats* (researchers who try to find flaws to fix them) and *black hats* (thieves, villains, and exploiters) alike.

As a result, since 2003, WEP hasn't been a reliable way to secure a network. It's useful as a flag that the network isn't meant for access by outsiders—WEP has been used as the basis for criminal prosecution in some places when a network's been broken into. The other reason you might see WEP is that Mac OS X's built-in software base station (accessible in the Sharing system preference pane as the Internet Sharing service) allows encrypted connections using only WEP. This is a shame, and Apple has been urged to add WPA to Internet Sharing for several years.

***Why share?*** *You might wind up using a Mac as a Wi-Fi base station if that Mac connects to the Internet with a 3G modem.*

**Note:** WEP can be set with either a 40-bit key (older systems were limited to this) or a 128-bit key. The longer key doesn't provide any greater protection against key-breaking systems developed in the last couple of years.

### Saying Goodbye to Weaker Methods

The group that certifies devices as meeting Wi-Fi specifications, the Wi-Fi Alliance, announced in mid-2010 that it was phasing out allowing Wi-Fi adapters and base stations to use TKIP and WEP over the next few years.

That means that eventually, you won't be able to buy a computer, phone, or any other device that can connect to a WEP- or TKIP-protected network, nor a base station that can set up such a network.

While TKIP isn't *broken* in the same way that WEP is, it's considered substantially weaker than AES-CCMP, because it inherits some of WEP's flaws. Choose AES-CCMP (WPA2) whenever possible. Every security expert I know thinks that all businesses and any homes that can should use only WPA2 Personal or WPA2 Enterprise with AES-CCMP.

A problem with WEP can be determining the password. WEP passwords come in three varieties, but iOS devices allow entry only in *hexadecimal,* the base 16 numbering system. In hexadecimal, numbers from 0 to 15 are represented by digits for 0 to 9 and the letters A to F for 10 through 15. A "hex" WEP password must be either 10 or 26 hex numbers long, which correspond to the two forms of WEP encryption (40 bit and 128 bit). Type such a password into the Password field when joining a network. If the person supplying the password isn't clued in, you might instead be dealing with a password in one of two text formats, plain WEP ASCII and Apple's special text format, both of which I explain how to convert.

### Standard WEP ASCII

An ASCII WEP password uses plain text characters only (typically only upper- and lowercase letters along with numerals), and it can be either 5 or 13 characters long. ASCII passwords can be converted directly into hexadecimal. For instance, the password `SOFas` (mixed upper and lowercase letters) is translated into five hex numbers as `534F466173`.

You can convert an ASCII password into hex by visiting this site: http://www.wifizard.com/wi-fi/convert.htm. If you are uncomfortable typing your Wi-Fi password into a Web site, you can also look up each ASCII hex value for each character at http://www.asciitable.com/.

### Apple's Text to Hex

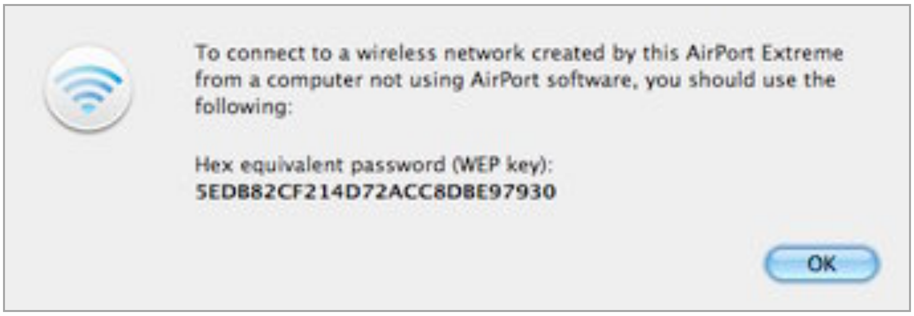
The Apple text-to-hex password style requires an Apple-specific conversion of regular text, which can be any length, into a hex key used internally by Mac OS X and Apple base stations. It requires a more elaborate method than the standard WEP ASCII password to obtain in hex format. You can extract an Apple WEP key created in this fashion using AirPort utility.

**Tip:** On the Mac, AirPort Utility is in the Applications/Utilities/ folder. For Windows, download and install the free program from http://www.apple.com/downloads/macosx/apple/windows/.

To extract the hex key from any Apple base station, follow these steps or provide them to the person who has configured the base station:

1. Launch AirPort Utility.
2. Select your base station.
3. Choose Base Station > Equivalent Network Password.

   A dialog appears from which you can write down or copy the contents (**Figure 4**).



To connect to a wireless network created by this AirPort Extreme from a computer not using AirPort software, you should use the following:

Hex equivalent password (WEP key):
5EDB82CF214D72ACC8DBE97930

**Figure 4:** The Network Equivalent Password dialog gives you the hex key value of a text network key.

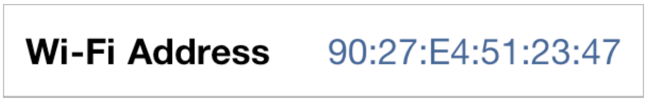
## MAC Address Filtering

The second outdated security method that’s still in use is *MAC address filtering*. MAC in this case means *Medium Access Control,* a technical term for the hardware in a network adapter used to pack and unpack data. The MAC address is a unique number assigned by companies to every piece of equipment shipped. This unique address is used to label data packets as they move around a local network.

**Note:** While there are ways to change a MAC address from the value the company shipped, that’s rarely necessary, and typically causes more problems than it could ever be worth.

MAC address filtering allows a router to restrict access only to devices for which a MAC address has been entered. Many routers, including all of Apple’s gear, support this option. MAC address filtering is easy to overcome. If a network is password protected, then MAC address filtering isn’t necessary. If a network has no password protection, a mildly interested cracker using free software can *sniff* data passing over the network, extract an allowed MAC address, and change the MAC address on his or her Wi-Fi adapter to the allowed address.

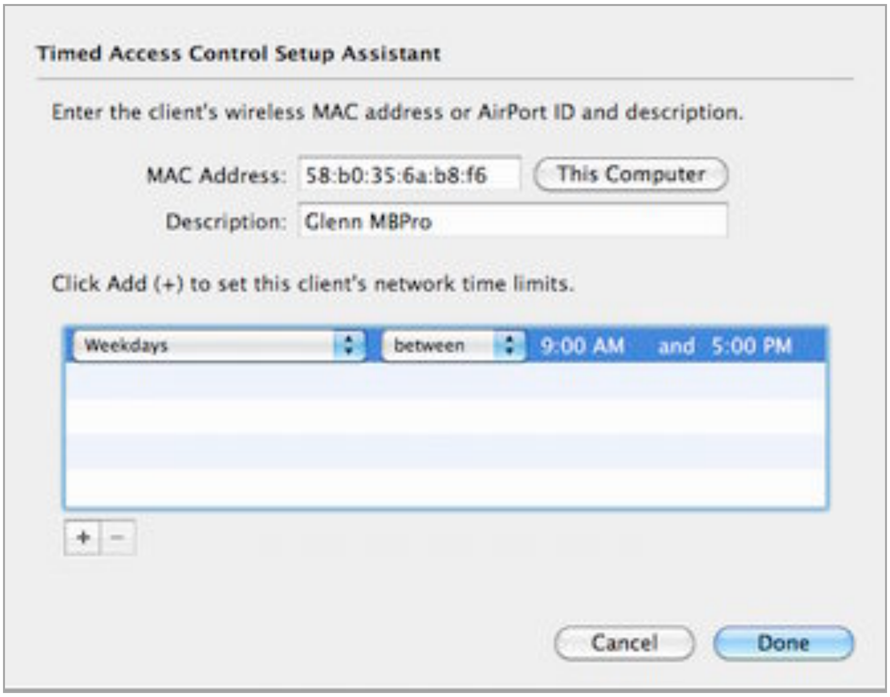
However, some networks use filtering as yet another deterrent and as yet another “no trespassing” sign. To join such a network, you must find your device’s Wi-Fi MAC address and enter it into the network’s configuration. Tap Settings > General > About, and look for Wi-Fi Address (**Figure 5**). Write it down; you can’t copy and paste.



**Wi-Fi Address** 90:27:E4:51:23:47

**Figure 5:** The Wi-Fi Address is the MAC address of the Wi-Fi adapter built into your iPhone or iPod touch.

You can easily set up MAC address filtering on an Apple base station. Launch AirPort Utility, select the base station, and click Manual Setup. In the Access Control view, choose Timed Access. To enter a MAC address, click the plus + button, fill out the details for a device, limit access by day of week and time of day, and click Done (**Figure 6**). You can add as many MAC addresses as you like.



Timed Access Control Setup Assistant

Enter the client's wireless MAC address or AirPort ID and description.

MAC Address: 58:b0:35:6a:b8:f6

Description: Glenn MBPro

Click Add (+) to set this client's network time limits.

Weekdays between 9:00 AM and 5:00 PM

**Figure 6:** AirPort Utility lets you set which MAC addresses may access the network, and, optionally, when they are allowed. Click the plus + button to add multiple limitations for a device, such as weekdays and weekends.

### Closed Networks Provide No Additional Security

You might notice that I don't mention *closed networks* here, networks that are set to not broadcast their names; I describe how to connect to them in Connect to a Closed Network. A closed network gives no proof of its existence until a device connects, making it far harder to connect to than a named network. However, as soon as any device that knows the name accesses the network, a closed network doesn't prevent someone from learning its name.

It's better to use robust encryption than to make a network difficult to find.

# Work with 3G on an iPhone

The iPhone 3G, 3GS, and 4 include 3G networking for voice and data communications. In the United States and many other countries, you must activate a 3G service plan when you purchase or upgrade to a new iPhone.

In some cases, you can purchase an unlocked phone or a phone without a contract at an exorbitant price—but you'll still want to turn on 3G to make calls or transfer data.

This chapter addresses how available service plans work in the United States and elsewhere, and how to manage data without going over limits that would incur costs or throttle your cellular usage.

**Note:** I don't address 3G voice calling, because that's handled somewhat differently than cellular data, even though both voice and data are sent as bits over the network. All mobile plans I'm aware of require at least a basic voice plan to allow the use of 3G cellular data.

## PICK A DATA PLAN

Carriers all around the world offer a sometimes baffling array of plans, nearly all of which limit you to a specific maximum amount of data each month. A cellular service plan for an iPhone typically has multiple elements, and often you can mix and match these pieces:

- **Voice:** Your plan includes a certain number of minutes that you can spend talking each month on the phone in the Phone app. AT&T and some other carriers also offered unlimited voice plans, or unlimited weekends and evenings plans.
- **Voicemail:** Your plan almost certainly includes voicemail. Time you spend listening to your voicemail is not billed. The iPhone

downloads voicemail to itself, although you can also call a number to retrieve it.

- **Messaging:** Some plans include a certain number of free text (SMS) and multimedia (MMS) messages; others charge per message or have tiered charges. There are also unlimited texting plans.
- **Cellular data:** Data is information transferred to and from the Internet, using the cellular network. This does not include data transferred over a Wi-Fi network. Carriers typically count data usage in 30-day periods, although some opt for 31-day cycles or true calendar months.
- **Wi-Fi data:** Some carriers include fixed maximum monthly or unlimited use of Wi-Fi hotspots in a home territory or country.

The options for voice minutes and messaging aren't related to your data use. The rest of this chapter looks just at cellular data plans and their limits, along with associated Wi-Fi access.

### United States

The two contract options from AT&T are (for 30-day usage periods):

- **DataPlus:** 200 MB of usage for $15. Additional data within a 30-day period is $15 for a 200 MB block.
- **DataPro:** 2 GB of usage for $25. Exceed 2 GB, and you're billed $10 for blocks of 1 GB.

***Formerly unlimited:*** *Until June 7, 2010, AT&T offered a truly unlimited 3G plan for the iPhone for $30 per month. If you've signed up for that plan and don't cancel it, you can continue using unlimited data. The unlimited option is not available to new subscribers.*

If you exhaust the data in the plan level you've chosen within a 30-day cycle, you are charged for additional data; unused data isn't rolled over to a subsequent month, and there are no pro-rata refunds.

AT&T offers Internet *tethering,* in which an iPhone acts like a modem for a laptop, but requires the DataPro plan, charges an extra $20 per month for the service, and doesn't include any additional data usage. (See Tethering.)

You can switch between the DataPlus and DataPro plan for any subsequent month, but you cannot swap plans for the current billing cycle.

**Note:** Yeah, don't ask me why AT&T charges $15 for 200 MB in overage on one plan and $10 for 1 GB on another. It's an unfortunate aspect of a lack of competition.

### Worldwide

Outside the United States, plans are more baroque, with all kinds of options, terms, exclusions, and pricing. The most important factor is that, like AT&T, carriers almost always limit usage after a preset point. Once you use the included bandwidth, the carrier either halts your data usage or—in the case of an "unlimited" plan—throttles it to 64 Kbps for the remainder of the billing cycle.

**Tip:** You can find all the carriers that offer the iPhone in a given country in this Apple Knowledge Base note: http://support.apple.com/kb/HT1937.

The plans break down into three categories:

- **Low-bandwidth auto-renew monthly plans:** Carriers are generally offering a low-bandwidth plan of 200 MB to 500 MB for rates close to AT&T's in the United States, although several charge more. Because voice and data are often bundled together, these can be quite cheap deals. Vodafone Australia charges Au$49 (about US$40) for 500 MB in data, unlimited intra-network calling, and three calls to other numbers per day.
- **High-bandwidth auto-renew monthly plans:** Most carriers offer high-capacity plans that can include several gigabytes, and cost about $30 to $50 (in U.S. dollars) per month.
- **Monthly "pay-as-you-go" plans:** Orange UK may be unique in offering a no-contract iPhone plan in which you pay for a month at a time. A variety of voice and text plans include 250 MB in monthly cellular data usage.

Several carriers include Wi-Fi hotspots in their service plans. Orange's UK Wi-Fi is limited to a separate pool of 750 MB per month distinct from its far higher 3G limits, as the company relies on a partner network; other networks have no limits at all.

European carriers typically list restrictions for what you can do with 3G. Many bar the use of VoIP, peer-to-peer file sharing, and odd things like instant messaging and newsgroups. Read the fine print.

**Tip:** Typically, an iPhone is sold *locked,* meaning it cannot use a micro-SIM (iPhone 4) or regular full-sized SIM (earlier iPhones) from any carrier in any country. You can pay more in some countries, or use third-party tools to unlock an iPhone, and then swap to another carrier's plan by swapping in a micro-SIM or SIM from the new carrier.

### Consider Your Likely Usage

You need to match your likely Internet usage to your plan, while considering your budget, of course. You should look at what you think your typical activities will involve. If you plan to use email, surf the Web, and use apps that consume relatively little bandwidth when you're not connected via Wi-Fi, a lower-use plan may suffice. Some countries allow you to change service plans for the subsequent billing period, so you can vary usage by month.

On my iPhone, I average about 100 MB per month, which surprised me since I thought I was a heavy user; but it turns out that most of that use is over Wi-Fi at my home or office. And I certainly wasn't streaming video to the iPhone. A single hour of streaming Netflix video over 3G could chew up 250 MB of usage. That's an expensive hour on a limited usage plan, and not so horrible on a multi-GB usage plan.

**Note:** Video services have to throttle streaming rates over 3G to reduce network usage. Netflix's 250 MB per hour rate is, apparently, the throttled rate! It pulls down even more data over Wi-Fi, if the bandwidth is available.

An iPhone 4 may consume more data than a current iPod touch or any iPhone predecessor because the screen is four times as dense—four times as many pixels are used as in the previous iPhone displays. For Google Maps, Web surfing, and other programs that display images, that could mean four times as much data downloaded for each operation.

To decide which plan makes the most sense for you, keep reading in this chapter to see if the advice for restraining usage could apply to your situation.

### AT&T Automatically Connects iPhones to Wi-Fi

If you're currently paying AT&T for a 3G data plan, your iPhone will automatically connect to any AT&T Wi-Fi network within range, even if there's 3G service available. AT&T includes Wi-Fi access at its over 21,000 hotspots as part of its paid iPhone 3G service, although about 20,000 of those locations (mostly Starbucks and McDonald's stores) have no fee attached if used without a plan.

## KEEPING USAGE RESTRAINED

The cost difference between AT&T's 200 MB and 2 GB plans is $120 per year if you keep a plan active every month. And the difference can be the same or more between a low-usage and high-usage plan on other carriers—and you still face caps on usage even if you choose a multi-gigabyte usage plan. You can have access when you need it without breaking your limits or paying for more chunks of data if you ration usage. What you need is a strategy.

### Turn Cellular Data on Only When You Need It

In the Settings > General > Network, set the Cellular Data switch to Off. Reverse that to On when you need it. For more details, see Choose to Use 3G or Wi-Fi, ahead a few pages.

### Limit Your Activities When Using the Cell Network

Unless you are using Wi-Fi, limit your activities to checking email and Web pages. Don't use video or audio streaming programs (YouTube, Netflix, and others), or programs that load large amounts of image data, such as the Maps app, or navigation programs that load maps live over the Internet as you move about. Don't update apps via the App Store, either.

### Disable Push and Fetch

In Settings, tap Mail, Contacts, Calendars > Fetch New Data. Set Push to Off and Fetch to Manually. This disables server-to-device (push) and device-from-server (fetch) automatic retrieval of messages, event updates, and contact changes. You can run through megabytes of data a day by leaving these on. Or, for a more nuanced approach, in the case of MobileMe, for example, turn on only those over-the-air features that you especially need. For example, you might leave Find My iPhone and Calendars on, but sync contacts and other options via iTunes.

***Warning!*** *Disabling Push and Fetch prevents Find My iPhone from working.*

### Find Free Wi-Fi

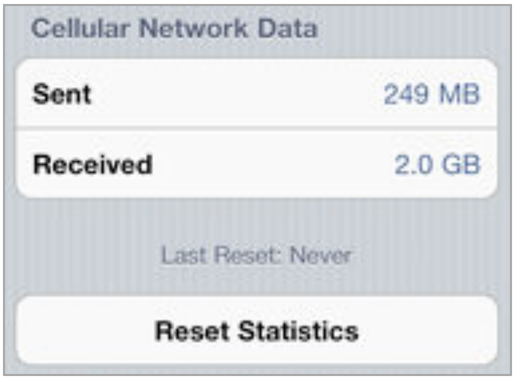
There's an increasingly large amount of free Wi-Fi around North America, and in some countries in Europe. In the United States and Canada, about 7,500 company-owned Starbucks stores offer no-strings-attached free Wi-Fi (a change from a previous limit of 2 hours per day combined with use of a stored-value card). McDonald's in the United States provides free Wi-Fi at about 12,000 company-owned and independent outlets.

Airports have joined the free Wi-Fi bandwagon as well. A host of smaller and some larger airports charge nothing, although many make you view ads with your no-cost access. Libraries also often offer free Wi-Fi, typically for all comers, not just those with a library card.

See my *TidBITS* article, "Find Free and Inexpensive Wi-Fi," for more advice: http://db.tidbits.com/article/10872.

### Check Data Usage Regularly

On an iPhone, the usage is since you last reset the counter in Settings > General > Usage (**Figure** 7). (This differs from a 3G iPad, in which usage appears for the current billing period.)



Cellular Network Data

Sent 249 MB

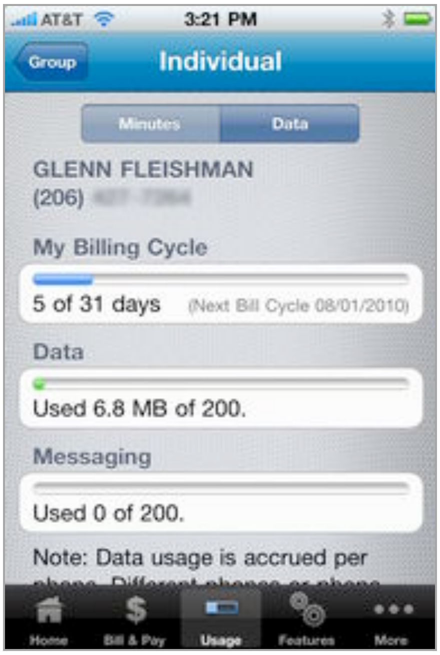
Received 2.0 GB

Last Reset: Never

**Figure 7:** The iPhone's Cellular Network Data counter has to be reset manually to track usage over a given period.

You could set yourself a reminder to reset your counter each month, but you should also be able to consult your carrier's Web site for a reasonably up-to-date accounting. To reset your counter, at the bottom of the Usage view, tap Reset Statistics and then tap again to confirm and zero out the values.

AT&T offers a free myWireless app that lets you see current and past month's usage (**Figure 8**). Launch the app, log in, tap the Usage icon at the bottom, then tap the Data tab. If you have multiple lines in an account, tap the line for which you want to see data usage.



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(206) [redacted]

My Billing Cycle

5 of 31 days (Next Bill Cycle 08/01/2010)

Data

Used 6.8 MB of 200.

Messaging

Used 0 of 200.

Note: Data usage is accrued per

**Figure 8:** You can check the myWireless app to see intra-month data usage. This information could help you avoid exceeding your allotted amount and paying overage charges.

Alternatively, you can find a chart of previous months' usage at the AT&T Web site. AT&T doesn't make it easy to find this chart (**Figure 9**), but you can follow these steps:

1. Start at http://www.att.com/, and click the Log In link near the upper right of the page (between Find a Store and Register).
2. Click Login beneath the Wireless section at left.
3. Enter your user name and password, then click Login.

4. On the resulting My Account page, click the Usage & Recent Activity link, in the middle of the Account Overview navigation bar near the top.
5. Finally, click View Past Data Usage at the right. (This link, as well as the rest of the AT&T interface, may have moved once again by the time you read this text.)

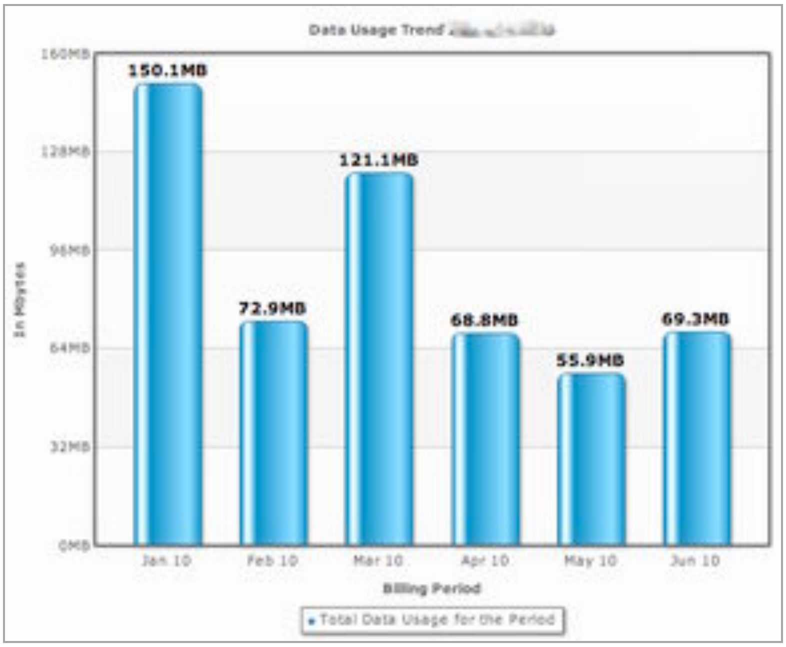


**Figure 9:** My monthly 3G usage turns out to be low on average.

### You Were Warned

Your iPhone will warn you if you start running out of data during a billing cycle. These warnings are intended to come when you pass 65, 90, and 100 percent of data used in a billing period. However, if you're burning through data quickly, you may have used significantly more data before the message arrives.

## CHOOSE TO USE 3G OR WI-FI

There are good reasons to pay attention to whether your iPhone is accessing the Internet via a Wi-Fi network or mobile broadband. You may need greater bandwidth than the available cellular network can provide, you could be budgeting data on a low-bandwidth plan, or you might be outside your home carrier territory and want to keep usage low. Whatever the reason, Apple provides several tools and controls to help you know what network you're on, and you can set the type of network to which the iPhone connects.

## Which Network Are You On?

The iPhone has an indicator in the status bar (near the upper left) that shows which network connection is active. See **Table 1** for an explanation of these indicators.

### Table 1: Deciphering Indicator Icons

| Icon | Explanation | Bandwidth |
|---|---|---|
| -----<br>Dashed white line | The iPhone can't connect to any network. | N/A |
| 📶<br>White waves | The iPhone is connected to a Wi-Fi network. The number of white waves, from one (shown as a small dot) to three, indicates relative signal strength from weakest to strongest. | A maximum of 30 to 40 Mbps, but it's limited by the broadband connection |
| 3G<br>3G | Connected via 3G (either 3.6 Mbps or 7.2 Mbps downstream). | Downstream rates up to 1.7 Mbps on "3.6" network, 4 Mbps on "7.2" network*; upstream, as high as 5 Mbps** |
| E<br>E for EDGE | Connected via EDGE, a 2.5G standard. | Roughly 200 Kbps |
| O<br>O indicates GPRS | Connected via GPRS, a 2G standard. | Roughly 40 Kbps |

* AT&T hasn't yet enabled all the pieces needed to offer 7.2 Mbps speeds in most of the United States. Many carriers in other countries operate networks at 7.2, 14, and 21 Mbps, with backward compatibility for 7.2 Mbps. The iPhone works at a maximum of 7.2 Mbps.

** AT&T has enabled a 1.4 or 1.9 Mbps upstream 3G technology, while carriers elsewhere in the world may allow up to 5 Mbps upstream. An iPhone 4 is required; the 3G and 3GS work at a maximum of 384 Kbps upstream.

### Select Which Service to Use

You can force an iPhone to use either cellular or Wi-Fi service instead of letting it automatically switch depending on whether or not a suitable Wi-Fi network is available. Because the iPhone doesn't offer network profiles as in Mac OS X, which would make it easy to switch, you must use the Settings app to enable or disable a service.

To enable or disable 3G service:

- To use a 3G cellular connection solely and avoid Wi-Fi, perhaps to keep a continuous VPN connection or for security reasons, tap Settings > Wi-Fi, and then set the Wi-Fi switch to Off.

  ***Avoid a flaky Wi-Fi network:*** *If a Wi-Fi network is acting flaky, you can avoid the problem by switching Wi-Fi Off. Alternatively, use the method noted in Forget This Network to forget the network.*

- To rely only on Wi-Fi, accepting that you will have times in which you have no Internet connectivity, tap Settings > General > Network, and then set Cellular Data to Off. This disables only data features; voice calling, voicemail, and messaging remain available.

  ***Keep usage low on a low-usage plan:*** *The option to switch off cellular data is marvelous when you've chosen a service plan with a relatively modest amount of data usage, because it lets you parcel out when you use cellular networks. See Keeping Usage Restrained, a few pages earlier.*

## CROSS-BORDER iPHONE USE

Seemingly everyone knows that placing or receiving phone calls, sending or receiving text or multimedia messages, and checking voicemail while outside of your home country can rack up excessive charges. That's true at an order of magnitude higher for data. When you roam to another land, you can accidentally run up huge international data roaming fees—and I mean enormous. People have received bills for thousands of dollars for a few days of roaming use.

***Away from home:*** *"International" is often used erroneously to mean "not in the United States." Here, I'm talking about using a mobile data service while you are outside the "home" country for your iPhone.*

The iPhone is currently sold in the United States only on a *postpaid* service basis. Postpaid plans paradoxically require that you pay for basic service each month before you receive that service, but pay after the fact (the *post* part) for overages, such as extra voice minutes or, in some countries, extra data usage. In contrast, *prepaid* plans let you use service only up to the level for which you have already paid. Beyond that, your service no longer works and you aren't charged. (That's how most iPad plans work around the world, including AT&T's two options.)

Horror stories of huge bills came not long after the iPhone appeared, when people took an active iPhone outside the United States and used its data connection. AT&T happily charged customers without warning them that such charges would be forthcoming.

Perhaps in response to these stories, Apple updated the iPhone OS to provide the Data Roaming switch which, when set to Off (the default when you first get an iPhone), disables roaming outside the area covered by your carrier's service plan (see Settings > General > Network).

Let's look at two options to roam outside your home country.

## International Plans

For its U.S.-based customers, AT&T offers four usage packages with different amounts of data for use with a host of partner mobile networks around the world. You can access these plans by logging in at Settings > Cellular Data > View Account.

***Warning!*** *Plans must be activated before leaving the United States.*

The rates are insanely high—at least, insane for anywhere but the cellular industry. Despite in-country rates in many places similar to AT&T's, AT&T's plans are $24.99 for 20 MB, $59.99 for 50 MB, $119.99 for 100 MB, or $199.99 for 200 MB—nearly 17 times more per megabyte than the 250 MB plan AT&T offers domestically.

Plans renew automatically at the end of each billing cycle, and if you start a plan in mid-cycle, service and data allocation are prorated for the remaining time. (For example, if 15 days into a 30-day cycle you add 200 MB of data for $199.99, you're allotted 100 MB and charged $100.)

Carriers outside the United States have a vast array of bewildering, overpriced options, too.

## ALTERNATIVES TO PHONE DATA PLANS

Even though you're required to have an active 3G data plan with a current iPhone, there are other options for 3G access that may be more affordable or flexible. They can be a good choice for an older iPhone that is no longer under contract, and they can work for an iPod touch or iPad, too. These options are helpful if you're not near a free or sufficiently cheap Wi-Fi hotspot, too.

***Mostly United States:*** *The alternatives aren't only available in the United States, but the details are specific to each country, and thus the advice is only generally applicable outside the United States.*

These options require that you sign up with a carrier other than AT&T and carry at least one more piece of equipment. Each option gives you Internet access for multiple devices—including any iPhone, iPod touch, or iPad—over Wi-Fi to a laptop, mobile phone, or portable cellular router that has a 3G Internet connection. The advantage of these options is that you can provide 3G access to multiple devices while paying a single fee. See **Table 2** for a quick comparison of options.

### Laptop Connections with an iPhone

Some of the alternatives discussed here let you share a data connection *to* an iPhone as well as other devices. The iPhone can also be used itself to share its 3G connection with a Mac or Windows laptop. See Tethering for an explanation of costs and how to set it up.

**Table 2: 3G iPhone Cellular Alternatives**

| Method | How It Works | Tradeoffs |
|---|---|---|
| Broadband Modem in a Laptop | Buy 3G laptop service from a carrier, plug a modem into a laptop, and share the service with other devices via Wi-Fi | Most require 2-year contract; must carry laptop around; prepaid usage capped at 5 GB/month. |
| Cellular Router | Buy the router from a carrier, share with nearby devices. | Compact, but most require 2-year contract; prepaid usage capped at 5 GB/month. |
| Phone as Portable Hotspot | A cellular phone acts like a cell router; no caps on usage with currently available plans | Requires one of a specific small set of models; requires phone data plan, typically with a 2-year contract; monthly tethering fee except with Verizon |
| Alternative Domestic Carrier | Use a micro-SIM from another carrier. | Competition has yet to emerge. |

## Broadband Modem in a Laptop

I list this first because it's straightforward. All four U.S. carriers and many outside the United States offer direct Mac OS X support for a variety of ExpressCard and USB broadband modems.

You can use a 3G modem as a conduit to the Internet for devices with Wi-Fi by sharing the connection from a laptop. You plug the 3G modem into the laptop, and connect it to the cellular network using the modem's driver software. Then you share the laptop's 3G connection to the Internet over Wi-Fi. If your laptop is a Macintosh, open the Sharing system preference pane and set up the Internet Sharing service. If your laptop is running Windows XP, Vista, or 7, set up Internet Connection Sharing.

**Tip:** Nova Media's launch2net Premium automates turning a Mac into a 3G gateway; the software includes drivers for most popular USB modems (http://www.novamedia.de/en/mac-launch2net-premium.html, $49).

In the United States, despite the fact that T-Mobile is the smallest of the four national carriers, it's the one I recommend for speed, cost, and flexibility with national coverage. Another national alternative is Virgin Mobile (a division of Sprint), which has a fixed-rate prepaid 3G offering for more limited use. Finally, in parts of the country, Sprint's Clearwire division is cheaper and better than any alternative.

### T-Mobile

AT&T, Sprint Nextel, and Verizon Wireless offer 5 GB per month 3G service for $60 per month and require a 2-year contract, while charging 5 or 10 cents per MB for usage beyond 5 GB. T-Mobile has alternatives to all of that.

T-Mobile charges $50 per month if you purchase a $100 to $130 modem in advance, and then offers a month-to-month plan that you can cancel without penalty. The company recently switched to a 5 GB and throttle plan, in which after 5 GB of usage, the firm reserves the right to lower your throughput to a few hundred Kbps for the remainder of the 30-day billing cycle, but it doesn't charge you overage fees.

T-Mobile also has the fastest 3G network. The firm has HSPA 7.2 (roughly 7.2 Mbps raw, and 1 to 4 Mbps real) service across most urban areas, and is in the process of updating to HSPA+ (21 Mbps raw, and perhaps 3 to 6 Mbps real).

### Virgin Mobile

If you want broadband on demand, Virgin Mobile has a plan that's similar to AT&T's for the iPad (http://www.virginmobileusa.com/mobile-broadband). The Broadband2Go offering requires that you purchase a $99.99 USB modem, which comes with drivers for Mac OS X and Windows. You can also buy a MiFi; see Cellular Router, shortly ahead.

With a modem or MiFi in hand, you can purchase one of two data plans. The plans are either $10 for 100 MB over 10 days, or $40 for unlimited data within 30 days. When you run out of days or data, you can purchase another plan, or just go on your merry way.

Usage is limited to Sprint Nextel's network, which isn't available everywhere in the U.S. For Sprint's phones, you can roam (without necessarily knowing it) onto Verizon Wireless's compatible network. With these data plans, that's not an option.

There's neither a contract nor a cancellation fee; it's a pay-when-you-want-it offer, like the iPad.

### Clear from Sprint/Clearwire

The Clearwire division of Sprint Nextel offers a so-called fourth-generation (4G) networking service in a number of U.S. cities, with coverage expected to pass 120 million people by the end of 2010. The 4G WiMax flavor that Clearwire has deployed (under the brand name Clear, http://www.clear.com/) offers 3 to 6 Mbps downstream with peaks as high as 10 Mbps; upstream rates are as fast as 1 Mbps. The service can be used as a fixed home broadband offer with no caps using a home gateway, as well as via a USB modem in a laptop. (It also works with a portable cellular router.)

If you're in an area that Clear covers—like my home region in the Puget Sound in Washington state—this may be the cheapest and fastest way to go. You need to purchase a USB modem. Clearwire offers 4G only ($49.99 or $69.99) or a combined 3G/4G modem that can work over 3G networks outside 4G territory (a whopping $224.99!).

You pair the modem with a service plan. Depending on your area and other factors, you may see different offers. At this writing, I'm offered service over 4G at $40 per month with no caps. For $55 per month and the 3G/4G modem, service is unlimited in 4G areas, and capped at 5 GB in 3G areas with a 5 cent per MB overage fee.

## Cellular Router

Three carriers offer *cellular routers,* which are portable, battery-powered 3G and 4G modems with a built-in Wi-Fi radio (**Table 3**). These routers are quite small and hold a charge for 3 or 4 hours, although they can be plugged into a car via an inverter or to AC power and used while charging. The MiFi fits in a shirt pocket. Up to five or eight devices can connect over Wi-Fi at once, depending on the device.

Except with Virgin Mobile, each device requires a 2-year contract to obtain the pricing shown in **Table 3**; some are available only under a 2-year contract with early cancellation penalties.

**Table 3: Cellular Router Options**

| Carrier | Router | Devices | Initial Cost | Per Month |
|---|---|---|---|---|
| Virgin Mobile | MiFi | 5 | $139.99 | On demand* |
| Clearwire | Clear iSpot (4G) | 8 | $99.99** | $25 |
| Clearwire | Clear Spot (4G) | 8 | $189.98/ $209.98† | $40 |
| Clearwire§ | Clear Spot (3G/4G) | 8 | $364.98† | $55†† |
| Sprint§ | MiFi | 5 | $0 | $59.99†† |
| Sprint§ | Overdrive 3G/4G | 5 | $99.99 | $59.99†† |
| Verizon | MiFi | 5 | $49.99 | $59.99†† |

* Virgin Mobile has a 10-day plan ($10 for 100 MB), an unlimited 30-day plan for $40.

** The iSpot must be purchased outright, but comes only with a month-to-month commitment.

† The Spot is $139.99, but it requires one of the two 4G-only USB modems ($49.99 or $69.99) or the 3G/4G combo modem ($224.99). Rental prices are also available, but require a 2-year service contract.

†† 3G usage in a 30-day period over 5 GB combined is 5¢ per MB.

§ Sprint covers much of the United States with 3G, but also roams onto Verizon’s network in some areas. Sprint allows only 300 MB per month of such roaming.

The Clear iSpot is unique among these devices in allowing connections only from iOS devices (http://www.clear.com/spot/ispot). All other devices will be rebuffed. Clearwire has priced the device low (under $100) and requires only a month-to-month service plan for $25. However, the router works only on Clearwire’s 4G network.

**Tip:** Apple’s FaceTime video chat feature can be used only when the device is connected to a Wi-Fi network. But a cellular router (and mobile hotspot) appear just like a regular Wi-Fi network to FaceTime. This allows you to use FaceTime over 3G and 4G networks without any hacks. (FaceTime works with the iPhone 4 and the fourth-generation iPod touch, but not with older models.)

## Phone as Portable Hotspot

A phone has both cellular and Wi-Fi radios built in. Why not turn the phone into a router? That's what a mobile hotspot is all about. A phone uses its Wi-Fi radio as a sort of base station, relaying traffic among connected devices to the Internet via its cellular data connection. (This option is distinct from tethering, which relies on USB or Bluetooth, and works only with specific drivers typically found only in desktop operating systems.)

Apple doesn't offer this feature in the iPhone, and it makes little sense to have an iPhone and purchase another mobile phone for this offering. But if you own an iPod touch or iPad and need connectivity on the go, you might buy an Android 2.2 phone, a Sprint Evo 4G, or the Palm Pre Plus or Pixi Plus (Verizon option only).

Those operating systems and phones turn the devices into cellular routers, a clever notion. Pricing for mobile hotspot service is all over the place. Verizon offers a free mobile hotspot feature with its Palm Plus models, but isn't allowing Android 2.2 tethering or mobile hotspot service at all at this writing.

Sprint adds $29.99 per month for mobile hotspot service with the Evo 4G with unlimited use on Sprint's 3G and Clearwire's 4G networks, but only 200 MB/month when roaming on Verizon's network, and T-Mobile offers a portable hotspot with several Android 2.2 phones for $14.99 per month when paired with an unlimited data plan.

## Alternative Domestic Carrier

Yet another alternative is a competitive carrier in the country in which you live that uses the same cellular networking technology and that offers a micro-SIM (or SIM) card for data use. This should be a viable option in most countries except the United States.

In the United States, one legal and two technical differences prevent effective competition for 3G service, and, in the case of the iPhone 4, it's not a lack of micro-SIM cards:

- First the legal: AT&T sells only locked phones, even if you buy one without a 2-year service contract. A *locked* phone uses encryption to prevent the phone from working on the network of any other carrier. The Digital Millennium Copyright Act makes breaking this encryption illegal, although the U.S. Registrar of Copyright approved an exemption several years ago that's still in effect to allow individuals to break such encryption.

To unlock your phone, you must first jailbreak it, a technically tricky process that you undertake at your own risk. Available jailbreaking software, while possibly illegal to offer, might be legal to use on your own phone. (This is not legal advice, just my current understanding; you are responsible for your own choice.) Jailbreaking software is akin to drug paraphernalia, which is often legal to possess, despite the illegality of drugs you might use with it in most countries.

- Now the technical reasons. First, AT&T and T-Mobile are the only two national U.S. networks that use GSM, the dominant worldwide mobile standard, and the only cell flavor supported by the iPhone. This excludes Verizon Wireless and Sprint Nextel, which use a different standard. Second, even though AT&T and T-Mobile both use GSM, each uses a slightly different set of licensed frequencies for 3G. A device made for T-Mobile's network, unless it's also designed for AT&T and international use, can communicate only at 2G (EDGE) speeds over AT&T's network.

  Worldwide *quad-band phones* and similar devices such as the iPhone support the four most common frequency bands used around the globe. But because those bands aren't used by T-Mobile, such devices can work on T-Mobile's network only at 2G (EDGE) speeds. Although you could sign up with T-Mobile (T-Mobile doesn't yet have micro-SIMs available), you wouldn't want to, because it would cost too much, it would require you to unlock your phone, and it would be too slow.

# Tethering

The iPhone has a 3G modem built into it that lets the phone access high-speed mobile data and voice networks. So why can't we use that same built-in modem with our laptops when we're traveling instead of having to buy a separate 3G modem or cellular router for the computer and pay a separate monthly service fee?

The good news is that you can, more or less, using *tethering*. Tethering lets you turn a phone into a cellular modem, but with substantially more limits than alternatives such as cellular routers or mobile hotspots. Tethering is one to one (you connect a phone to a laptop), and the laptop must have the right drivers to make it work.

In contrast, cellular routers, which are standalone devices, and mobile hotspots, which are a feature on some cell phones, share a cellular connection via Wi-Fi. (I discuss both those options earlier, in Alternatives to Phone Data Plans.)

Carriers outside the United States started offering tethering with the 2009 release of iPhone OS 3 (now called iOS 3). AT&T promised tethering, but didn't deliver until iOS 4 shipped in 2010.

The system requirements for iPhone tethering are Mac OS X 10.5.8 or later (though 10.4.11 may work for Bluetooth); or Windows XP SP3, Vista, or 7. You'll also need iTunes 9.2 or later, as well as a USB 2.0 port or support for Bluetooth 2.0. (In case you were wondering, you can't tether an iPhone to an iPad or vice versa with a 3G iPad. It's a shame, because otherwise you could own a cheaper iPad—the Wi-Fi only model—and use the iPhone as its data source instead of managing two separate 3G plans to have active service.)

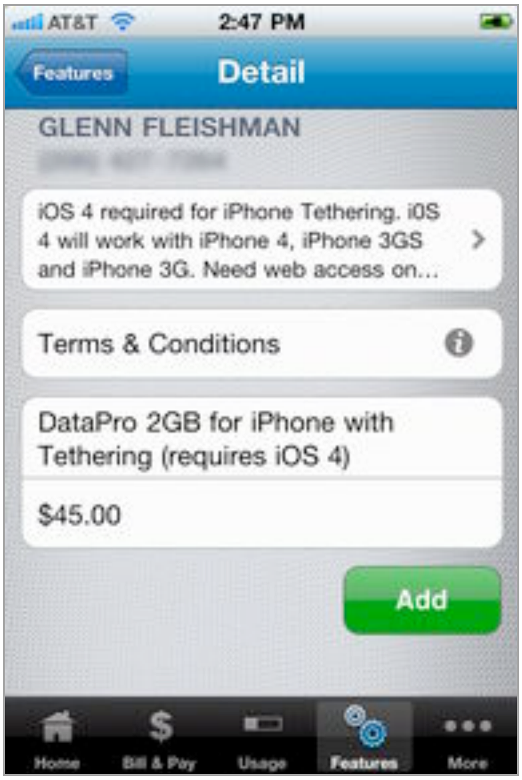
**Note:** You can use tethering with a desktop computer, but you're unlikely to travel with one. Tethering is meant as a nomadic option for mobile use because it is more expensive than most other options. For a stationary computer, look into fixed wireless service or WiMax if wired broadband isn't an option.

## PAY FOR TETHERING

To my knowledge, every carrier in the world charges a fee to enable tethering on the iPhone, even though you're already paying the carrier for data consumption. In the United States, AT&T once had an argument for charging for tethering when it offered unlimited data plans. But now that AT&T has discontinued those plans, there's no excuse for the fee it charges.

AT&T charges its U.S. customers $20 per month for each month in which tethering is active. Further, you must also have the higher price DataPro plan at $25 per month, instead of DataPlus at $15 per month. You can switch between DataPlus and DataPro and enable or disable tethering a month at a time, however. Tethering eats up data from the same pool as your regular phone-based mobile broadband use. The DataPro plan includes 2 GB of use each month; additional bandwidth costs $10 per 1 GB.

AT&T customers use the company's myWireless app (free) to change a data service plan and toggle tethering on or off. It's far simpler than using AT&T's Web site (**Figure 10**).



GLENN FLEISHMAN
[redacted]

iOS 4 required for iPhone Tethering. iOS 4 will work with iPhone 4, iPhone 3GS and iPhone 3G. Need web access on...

Terms & Conditions

DataPro 2GB for iPhone with Tethering (requires iOS 4)

$45.00

**Figure 10:** The myWireless app lets you change billable account features like tethering.

If AT&T is not your carrier and you carrier offers tethering, follow instructions in the Settings app. Tap General > Network > Set Up Internet Tethering.

## TURN ON TETHERING

After you've added tethering to your data carrier account, go to Settings > General > Network > Internet Tethering. In the Internet Tethering pane, tap the Internet Tethering switch to On.

With tethering on, you can plug an iPhone into a laptop via USB or pair the phone's tethering service with your computer over Bluetooth:

- USB gives you a high-speed data connection that you know works as long as the cable isn't bad. The downside? Being literally tethered.
- Bluetooth requires more steps to make a connection active, but it gives you the cable-free flexibility.

Once you make the connection, a blue pulsing banner will appear across the top of the screen (**Figure 11**).

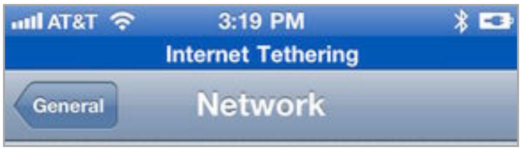


**Figure 11:** A banner lets you know whenever your phone is acting as a cellular modem for a computer, whether over USB or Bluetooth.

If the phone is on standby, a larger banner appears on the Lock screen when you wake the phone (**Figure 12**).

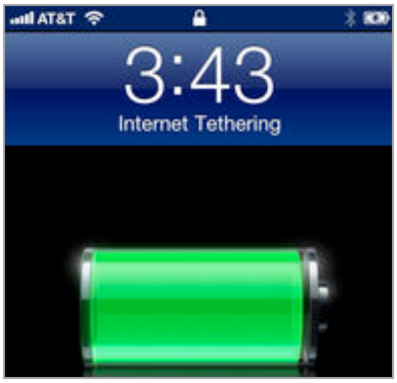


**Figure 12:** The Lock screen also shows whether tethering is active or not.

I explain how to make the each type of connection next.

## Tether with USB

With tethering enabled on the iPhone, connect your iPhone to your computer using a USB cable.

Oddly, you must launch iTunes after connecting your iPhone for the first time, even if you don't normally use this computer for syncing. I've found that you must launch iTunes only once after connecting via USB; on subsequent occasions, the system remembers that it can use a tethered phone. (If you don't have iTunes installed already, download it from http://itunes.com/. It can take several minutes to install, and the installer will prompt you a few times to approve various components.)

Once you've launched iTunes, follow the directions below for either Mac OS X or Windows.

### USB Tethering in Mac OS X

The first time you enable tethering and plug an iPhone into a Mac via USB, Mac OS X alerts you that the interface is added and the Mac's Network system preference pane adds an adapter entry (**Figure 13**).

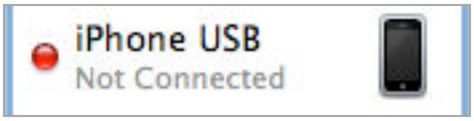


**Figure 13:** An entry appears in the adapters list.

Mac OS X automatically activates a tethered link, and turns that red dot in **Figure 13** green.

***Not active?*** *Make sure you've launched iTunes, a required step, even though iTunes doesn't seem to have anything to do with tethering.*

To halt the active tethering connection, you can do any of the following:

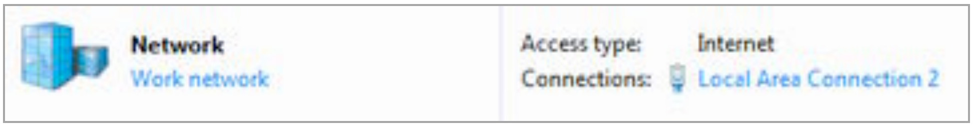
- On the iPhone, tap Settings > General > Network > Internet Tethering and set the Internet Tethering switch to Off.
- Disconnect the USB cable.

- In the Network preferences pane in Mac OS X, select the iPhone USB adapter, and then from the ⚙ gear menu, choose Make Service Inactive. Click Apply in the lower-right corner.

### USB Tethering in Windows 7

Windows 7 should automatically add the iPhone tethered network, and set up the network connection. You can check on this by looking for the blue tethering bar on your iPhone (see **Figure 11**, slightly earlier).

You can also check on your connection by choosing Start menu > Control Panel > Network and Sharing Center. You should see a generically named Local Area Connection in the View Your Active Networks list (**Figure 14**).



Network
Work network
Access type: Internet
Connections: Local Area Connection 2

**Figure 14:** Windows 7 shows the USB-tethered iPhone as a generically named local area connection when active.

Disconnecting from within Windows is trickier. Windows doesn't have a simple network on/off switch; you have to disable an interface, which could cause a problem the next time you want to use USB tethering.

You can disconnect through either of these methods, however:

- On the iPhone, tap Settings > General > Network > Internet Tethering and set the Internet Tethering switch to Off.
- Disconnect the USB cable.

## Tether with Bluetooth

On your iPhone, make sure Bluetooth is turned on—look in the Settings app, in General > Bluetooth. Once you're sure it's enabled, turn on tethering on your Mac or in Windows, as I describe next.

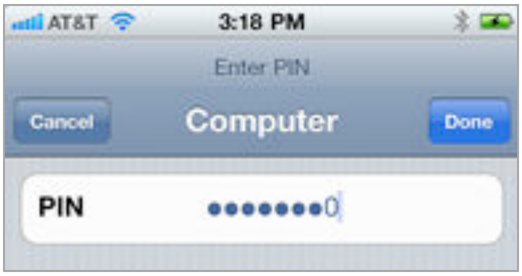
### Bluetooth Tethering with Mac OS X

Follow these steps to set up a Bluetooth connection between your iPhone and a Mac:

1. Launch System Preferences, and select the Bluetooth pane.
2. Click the plus + button to the lower left. This launches the Bluetooth Setup Assistant.

3. Your iPhone should appear in the list of devices; if not, check that Bluetooth is enabled on the iPhone and that it's within a few dozen feet of your computer. Select the phone, and click Continue.

   On the assistant's next screen, an 8-digit code appears. On the iPhone an entry dialog pops up (**Figure 15**).



PIN ••••••••0

**Figure 15:** Enter the Mac-generated PIN on your iPhone.

4. Enter the assistant's code on the iPhone, and tap Done.

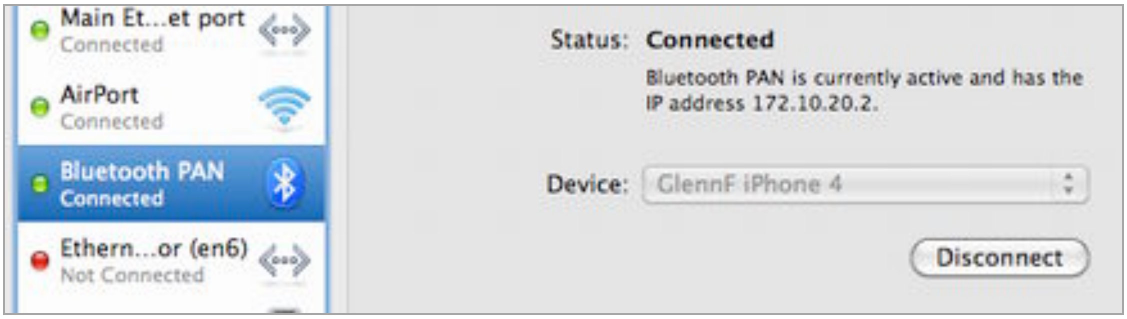
   If you entered the PIN code correctly, in a moment, the assistant tells you "Congratulations!".

5. Click Quit.

6. Now, in System Preferences, click Show All, then select Network.

7. In the adapters list at left, you'll notice a new Bluetooth PAN entry; *PAN* stands for personal area network, and it's the kind of network that Bluetooth is. Your iPhone should be selected in the Device pop-up menu. Click Connect.

On the Mac, you'll see the Status label set to Connected (**Figure 16**). On your iPhone, the Internet tethering banner will appear.



Status: Connected

Bluetooth PAN is currently active and has the IP address 172.10.20.2.

Device: GlennF iPhone 4

**Figure 16:** The iPhone is now tethered to the Mac and active.

To disconnect Bluetooth tethering, you can do any of the following:

- In the Network preference pane, with Bluetooth PAN selected in the adapters list, click the Disconnect button.
- On your iPhone, in the Settings app, tap General > Network > Internet Tethering and tap the Internet Tethering switch to Off.
- Turn off Bluetooth networking on either the iPhone (Settings > General > Bluetooth) or Mac (Bluetooth system preferences pane).

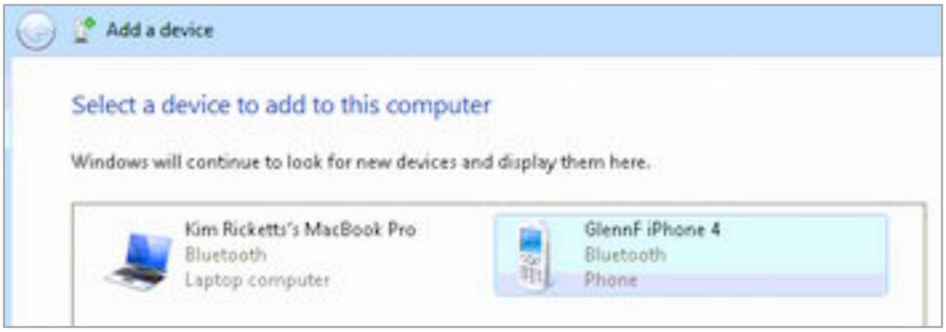
### Bluetooth Tethering with Windows 7

Follow these steps to make a Bluetooth connection between your iPhone and a computer running Windows 7:

1. In the system tray, right-click the Bluetooth icon, and choose Add a Bluetooth Device.

> ***No Bluetooth icon:*** *If you don't have a Bluetooth icon in your system tray, open the Control Panel folder, and search on Bluetooth to find the Bluetooth utility, then launch the utility to find the Add a Bluetooth Device option.*

2. The Add a Device wizard shows available devices (**Figure 17**). Select your iPhone and click Next.



Add a device

Select a device to add to this computer

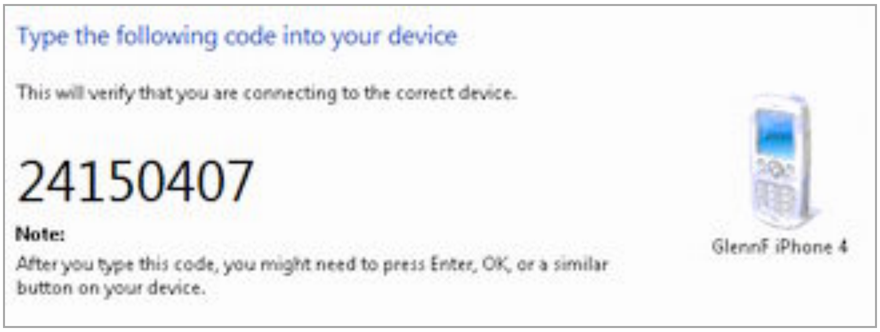
Windows will continue to look for new devices and display them here.

Kim Ricketts's MacBook Pro
Bluetooth
Laptop computer

GlennF iPhone 4
Bluetooth
Phone

**Figure 17:** Select your phone from the devices list.

3. Windows 7 prompts you to enter a code that it's generated and displayed (**Figure 18**). Type that in on your iPhone and tap Done.



Type the following code into your device

This will verify that you are connecting to the correct device.

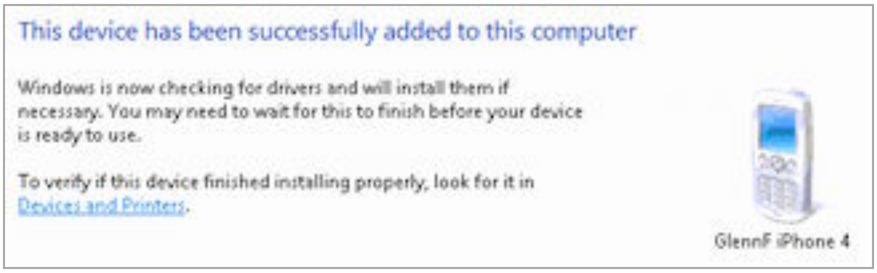
24150407

Note:

After you type this code, you might need to press Enter, OK, or a similar button on your device.

**Figure 18:** Enter the code that Windows 7 displays in a dialog that appears on your iPhone.

4. Windows 7 confirms that the entry was successful and your iPhone is now paired (**Figure 19**).



This device has been successfully added to this computer

Windows is now checking for drivers and will install them if necessary. You may need to wait for this to finish before your device is ready to use.

To verify if this device finished installing properly, look for it in Devices and Printers.

**Figure 19:** Success!

***Warning!*** *My phone paired successfully, and Windows 7 tried to load some associated driver. The driver loading failed, but it didn't affect my ability to tether over Bluetooth in the following steps.*

5. Now, open Control Panel > Devices and Printers. Your iPhone appears in the Devices list.
6. Select the iPhone and choose Connect Using > Access Point from the top navigation bar (**Figure 20**). This starts up the tethered Bluetooth connection.

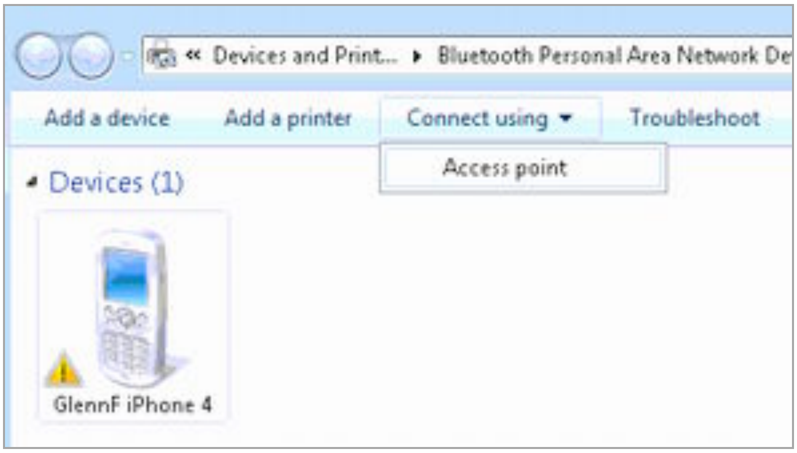


**Figure 20:** The iPhone acts as an Internet conduit through the Bluetooth interface.

The Bluetooth connection appears as another local area connection in the Networking and Sharing window.

To disconnect Bluetooth tethering, you can do any of the following:

- In the navigation bar in Devices and Printers, click the Disconnect button.
- On your iPhone, in the Settings app, tap General > Network > Internet Tethering and tap the Internet Tethering switch to Off.
- Turn off Bluetooth networking on either the iPhone (Settings > General > Bluetooth) or under Windows.

# Bluetooth

Bluetooth wireless networking lets you connect peripherals like battery-powered headphones, keyboards, earpieces, and headsets to an iPhone or iPod touch for listening to music, entering text, and handling voice over IP (VoIP) phone calls.

Read this chapter to learn how to set up and manage Bluetooth devices.

***Tethering:*** *If you want to set up an iPhone to act as a modem for a laptop, see Tethering.*

## BLUETOOTH BASICS

The Bluetooth SIG, a trade group, certifies devices as Bluetooth compliant for particular *profiles,* which include things like text entry, stereo audio, file transfer, and modem access. The iPhone and iPod work correctly with any device that meets the Bluetooth spec for several profiles, including audio, peer-to-peer transfer, and external keyboards. Bluetooth hosts, like these devices, aren't required to support all profiles.

Not every device or model supports all available profiles. iPhones, for instance, allow access to the Hands-Free Profile to use a headset or earpiece for phone calls, while the iPod touch (and iPad) omit such support—even though it would be useful for VoIP (voice over IP) apps, such as Skype. Apple documents iOS device compatibility in a support note at http://support.apple.com/kb/HT3647.

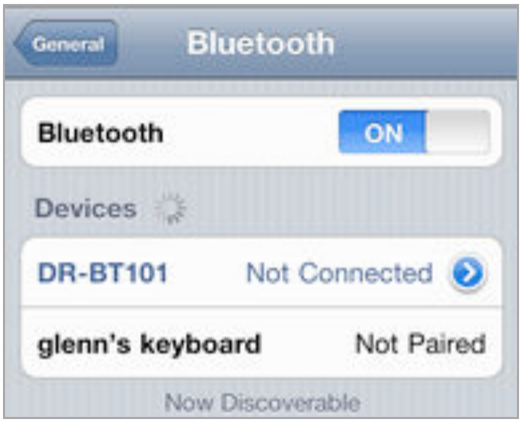
When you connect with Bluetooth, the process is known as *pairing*. Some devices can be paired with several hosts (like computers or mobile devices); others can pair with only one host at a time, and must be re-paired to switch. Bluetooth devices are *discoverable* when they are set to allow a pairing connection.

In iOS 4, Bluetooth is handled from the Bluetooth view (Settings > General > Bluetooth). This view lets you turn Bluetooth on and off and displays a list of (under Devices) of Bluetooth peripherals. The list shows any devices that have been previously attached to an iPhone or iPod touch and the current status of such device. The list also displays any discoverable devices in the vicinity.

## PAIRING ANY DEVICE

To pair any device, follow these general steps; the specifics for particular profiles follow.

1. Launch Settings, tap General > Bluetooth.
2. Activate Bluetooth discovery on the device with which you want to pair your device. This varies by device; check the manual. Typically, you hold down a button (sometimes a special pairing button) for several seconds.
3. The Bluetooth hardware appears in the Devices list on your iOS device (**Figure 21**).



Bluetooth ON

DR-BT101 Not Connected

glenn's keyboard Not Paired

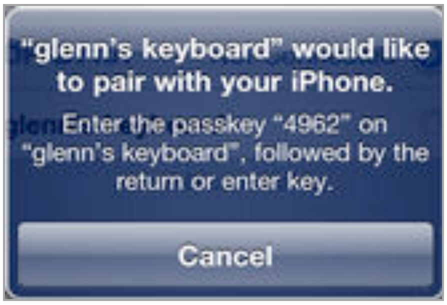
**Figure 21:** An unpaired device (glenn's keyboard) is discovered.

4. In the Devices list, tap the device with which you want to pair.

   iOS attempts to connect.

5. Depending on the device, iOS will offer one of three prompts:
   - A field in which you enter a code: The code will be provided either by the other device, or—in the case of a peripheral without a way to choose or display characters—noted in its manual. It's typically 0000.

- A code that you enter on the other device: Your iPod touch or iPhone generates a PIN to be entered in the pairing device (**Figure 22**).

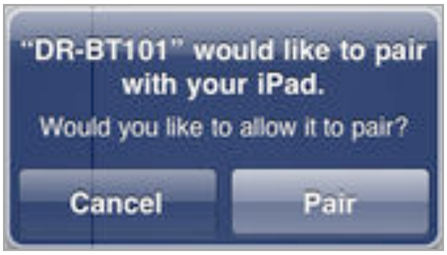


“glenn’s keyboard” would like to pair with your iPhone.

Enter the passkey “4962” on “glenn’s keyboard”, followed by the return or enter key.

**Figure 22:** Enter this code on the other device to complete the pairing process.

- A dialog with a Pair button: For some devices, you don’t need to type a pairing code, but you may get a dialog like the one in **Figure 23**. In this case, the headset DR-BT101 wants to pair with an iPad, and tapping Pair completes the process.



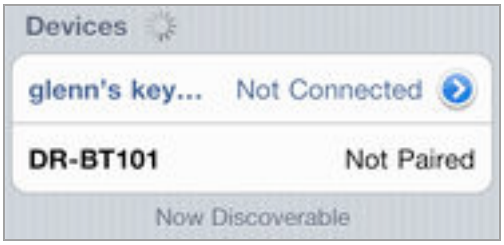
“DR-BT101” would like to pair with your iPad.

Would you like to allow it to pair?

**Figure 23:** Some devices, such as my headphones, merely ask for confirmation to pair, rather than a code.

The paired device is now shown as Connected in the list. In the future, the device appears as available when it’s turned on and within range.

iOS shows Connected for paired devices that are turned on and available, and Not Connected for those that aren’t in range or turned off (**Figure 24**).



Devices

glenn’s key... Not Connected

DR-BT101 Not Paired

Now Discoverable

**Figure 24:** The keyboard is paired but not connected; the DR-BT101 (a set of headphones) is not yet paired.

**Tip:** You can remove a pairing by selecting the peripheral in the Devices list, tapping the detail button, and then tapping Forget This Device.

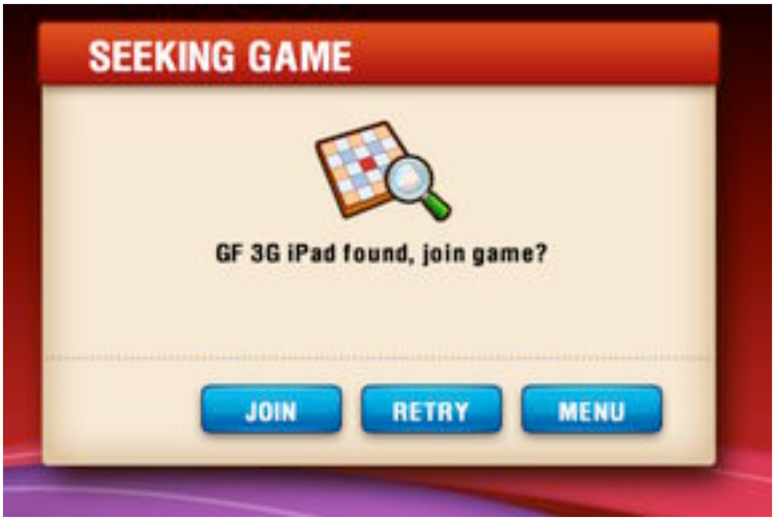
## PEER-TO-PEER PAIRING

Apple lets iOS 3 and iOS 4 devices communicate for games and file transfer via Bluetooth through an aspect of the Personal Area Network (PAN) Profile: peer-to-peer networking.

Every app handles this a little a differently, because Apple makes this option available directly to developers without requiring configuration in the Settings app. For instance, the Scrabble for iPad app works with Bluetooth to allow iPhones and iPod touches running the Tile Rack app to act as tile racks. Scrabble requires that you turn Wi-Fi off and have Bluetooth on for this mode to work.

***Warning!*** *On an iPhone, remember to turn Wi-Fi back on when you're finished, or you might rack up (pun intended) 3G charges instead of using your home Wi-Fi network for data.*

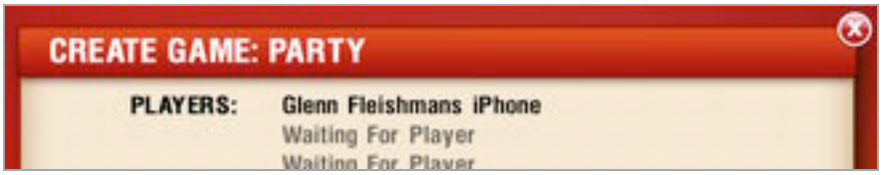
Launch Scrabble on an iPad and tap Party Play, and then on an iPhone or iPod touch, launch Tile Rack, and tap Menu, then Seek Game. When Tile Rack finds the active iPad game waiting for connections, it alerts you (**Figure 25**). Tap the Join button, and you're joined to the game (**Figure 26**).



SEEKING GAME

GF 3G iPad found, join game?

**Figure 25:** Tile Rack alerts you to an open game over Bluetooth.


CREATE GAME: PARTY

PLAYERS: Glenn Fleishmans iPhone
Waiting For Player
Waiting For Player

**Figure 26:** On the iPad, once the Tile Rack player is accepted, Scrabble shows that player in the list.

## HANDS-FREE CALLING AND TALKING

The Hands-Free Profile in Bluetooth lets you use a variety of devices, usually over-the-ear or in-air headsets, for phone calls. Only the iPhone (every model) supports this profile. You pair a device just as described in Pairing Any Device, earlier.

Once a device is paired, you can answer incoming calls by tapping the appropriate answer button on the headset. When you place a call, you're given a choice among the available options; in the example in **Figure 27**, I could choose among the headphones/headset combo I have from Sony, the iPhone's earpiece/mic, or the speakerphone option on the iPhone.

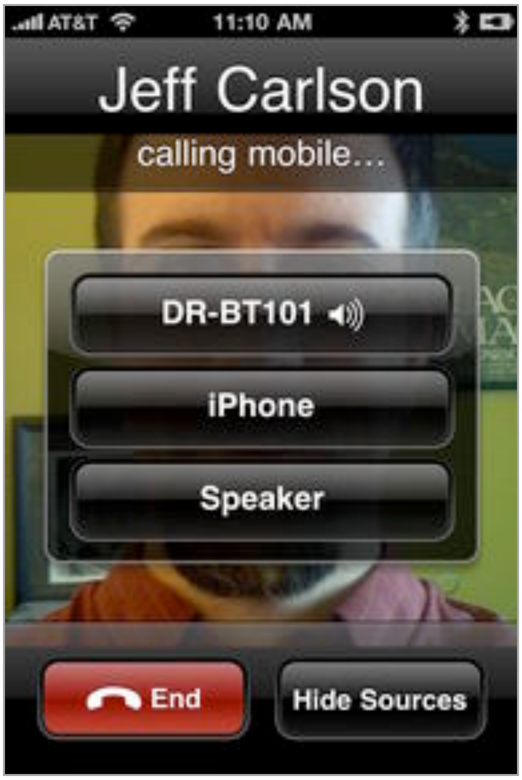


**Figure 27:** With a Bluetooth headset paired and available, you can choose how audio is handled for an outgoing call.

# APPLE WIRELESS KEYBOARD

The iPad was the first of its family of devices to support external keyboards, which includes both an Apple-branded keyboard/dock combination and any Bluetooth keyboard. With iOS 4, the iPhone and iPod touch can also use keyboards and other input devices.

***Original iPhone and iPhone 3G left out:*** *The original iPhone can't be upgraded to iOS 4, and the iPhone 3G can't use an external keyboard even when it has iOS 4 installed.*

The $69 Apple Wireless Keyboard is one of many Bluetooth keyboards that works with an iOS device. It's stylish, compact, and easy to hook up (http://www.apple.com/keyboard/). To pair the Apple Wireless Keyboard with an iPhone or iPod touch, use the general steps given just previously. In Step 2, press the power button on the keyboard's right upper side (**Figure 28**) until a green light flashes (**Figure 29**).

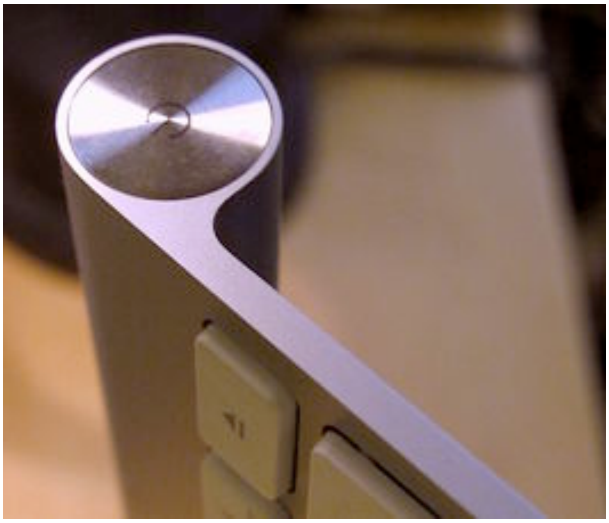


**Figure 28:** The power button is located on the right upper side of the Apple Wireless Keyboard.

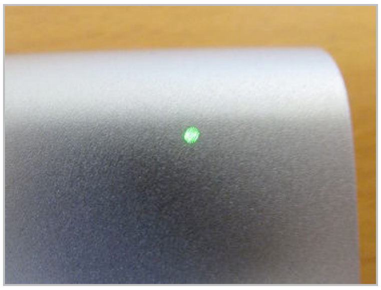


**Figure 29** The green light that flashes while the keyboard is ready to be paired is tiny; the LED is invisible when the light is off.

### Previously Paired Keyboard May Need Handholding

The Apple Wireless Keyboard can be paired with multiple computers and devices, but it can be tricky to make sure that the keyboard connects with the one you want if more than one paired device is in radio range.

To test this, I tried to pair a keyboard that was already associated with an iPad and iPhone 4 with a Mac Pro. I found that I had to turn Bluetooth off on the iPad and phone (Settings > General > Bluetooth) and then turn the keyboard off (described on the next page) before it could pair with the Mac Pro. Pairing then worked fine. (You can’t disconnect a Bluetooth device on an iPad or in iOS and leave it paired for future use; only Forget This Device exists.)

After re-enabling Bluetooth on the iPhone, I turned the keyboard off and then back on to see which device it associated with. The Mac Pro grabbed it first. From the Mac Pro’s system menu bar, I opened the Bluetooth menu and chose Disconnect from the keyboard’s submenu (**Figure 30**).

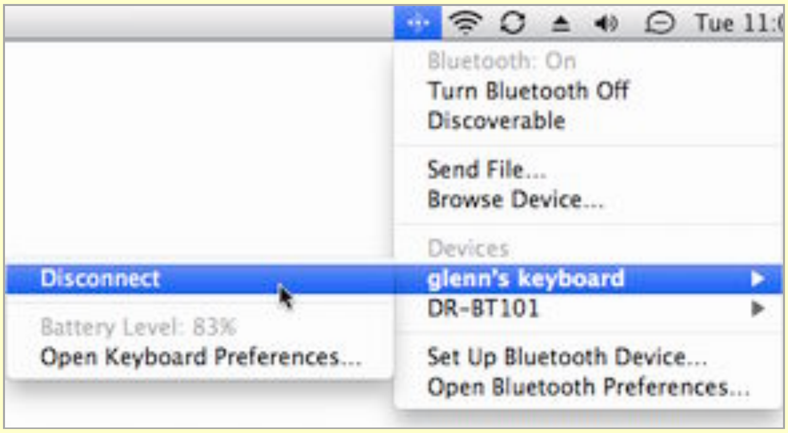


***Figure 30:*** *You can disconnect a keyboard on a computer to then connect to it on an iPhone running iOS 4 or another device.*

Then, on the iPhone, in the Bluetooth settings, I tapped the keyboard’s item in the Devices list, and the iPhone associated with the keyboard.

This is a little tedious, I know, but it’s manageable if you want to use the keyboard with multiple devices.

Once paired, you can use the keyboard just as if it were directly connected to the device. Many of the special keys work, although you must touch the screen often to activate fields for entry or select certain kinds of buttons.

***Warning!*** *If you walk away from a Bluetooth keyboard while it's still on, it can maintain a connection over a surprising distance. I was mystified why I couldn't get an onscreen keyboard to appear when I was two rooms away from an Apple Wireless Keyboard until I recalled that I hadn't turned it off.*

You'll also encounter situations where your iPhone or iPod touch presents a dialog of fields to fill out, but provides no OK or Close button to tap. In cases like this, press Return on your keyboard to exit the dialog. Further, you may read directions telling you to tap a button on the virtual keyboard, such as Go or Join, that you can't access because the virtual keyboard is not showing. In such cases, press Return on your keyboard instead.

**Tip:** To make the onscreen keyboard appear while a Bluetooth keyboard is connected, press the Eject button on the Bluetooth keyboard. This toggles display of the touch keyboard, but the Bluetooth keyboard can still be used.

To turn the keyboard off, hold down the power button for several seconds. The green indicator light stays steady while the power button is held down, and then goes out when you release. Press the button once to turn the keyboard back on.

## AUDIO DEVICES

Both the iPhone and iPod touch support two of the three common audio profiles for Bluetooth: one for stereo audio playback, and another that allows remote control (pause, play, and stop).

**Note:** The technical names for these two profiles—useful if you're examining the spec of Bluetooth gear to buy—are the Advanced Audio Distribution Profile (A2DP) and the Audio/Video Remote Control Profile (AVRCP).

Once you’ve paired stereo headphones, you can use them just as you would headphones plugged into an iPhone or iPod. You can use the start, stop, and other controls in an app playing back audio, or, if your Bluetooth headset has these controls, you can handle those options remotely.

Apps that allow audio playback should display a special Bluetooth destination icon. Tap it to choose between one (or more!) active Bluetooth headsets (**Figure 31**). Tap a source to choose it, or it tap Cancel. Audio continues to play throughout and seamlessly switches when you tap.

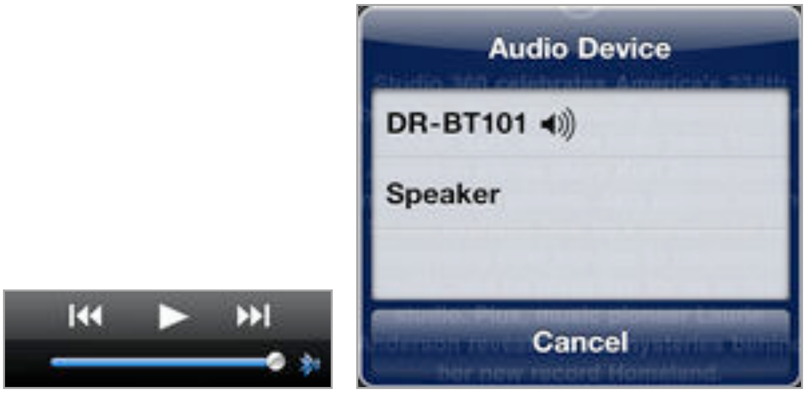


**Figure 31:** Tap the Bluetooth button in the audio playback controls, in this case located at the right edge of the volume slider (left) to choose among available Bluetooth and other output methods (right).

You can stop using a Bluetooth headset at any time with one of these three methods:

- Turn off the Bluetooth headset using its power button.
- In Settings > General > Bluetooth, in the entry for the headset, tap the detail button, tap Forget This Device, and then tap OK.
- Move the iPhone touch or iPhone and the Bluetooth headset out of range of the other. I like this option least, because Bluetooth can work over quite a long range. If you leave a headset at home and take your mobile device with you, then this option makes sense.

In all cases, audio output reverts to speakers or headphones automatically.

# Airplane Mode

Before you're flying so high with some guy in the sky, you need to disable radio communications from your iPhone or iPod touch. The Airplane Mode switch makes this simple.

Contrary to urban myth, cellular phones don't cause planes to crash. That's good, because researchers empowered by a joint government-airport study group that sets standards for airworthiness found that at least one mobile phone is left on during nearly all flights. (They also found no cause for alarm; you can read the whole report at http://spectrum.ieee.org/aerospace/aviation/unsafe-at-any-airspeed/0.)

The reason that the FAA and worldwide flight authorities demand that most kinds of electronics that produce or receive radio signals be turned off during a flight, as well as all electronic devices while flying below 10,000 feet, is because of a slight potential for risk that hasn't entirely been teased out from the reality of risk.

All electronic devices produce some emissions, and it's thought from years and years of testing that certain *avionics*—aircraft electronics—may be susceptible to some radio signals that are otherwise benign. Under 10,000 feet, a particular reading being knocked for a loop could be extremely dangerous. Hence the desire to reduce such risks.

## WHAT'S AIRPLANE MODE?

The Airplane Mode in iOS, found in all iPhones and the iPod touch, is a simple way to set your device to a legally required quiet mode during flight.

***Now on the iPod touch:*** *The iPod touch omitted the Airplane Mode switch before iOS 4, ostensibly because it didn't have a cellular radio. But it's a nice way to disable both iPod touch radios and graphically show a flight attendant that you're complying, if asked.*

***Saves battery life, too:*** *If you don't need to use any of the radios for network access, peripherals, or location, Airplane Mode is an effective way to extend battery life, too.*

***Warning!*** *Airplane Mode disables Find My iPhone. If you're concerned about losing your iPhone or iPod touch and being able to find it later, note that Airplane Mode disables all the necessary network access and GPS data to allow location tracking.*

When you turn on Airplane Mode in the Settings app, iOS turns off four separate radio systems on an iPhone: cellular, GPS, Wi-Fi, and Bluetooth. On an iPod touch, Wi-Fi and Bluetooth are disabled. Put the device to sleep, and you're in compliance.

***Sleep doesn't disable radios or activity:*** *When you push the power button on the top of your iPhone or iPod touch to put the device to sleep, you might think it's suspended. But this standby mode is pretty active. Certain background operations continue, and an iPhone can receive email and other updates via push over a cellular data connection. On the iPhone and iPod touch with iOS 4, Wi-Fi connections are maintained. Sleep is more like lightly daydreaming for an iOS device.*

On flights on which Wi-Fi is available for Internet access—this option is now available on nearly 1,000 aircraft, mostly bigger jets on major routes—you can separately tap Wi-Fi in the Settings app and turn that radio back on when you're above 10,000 feet and have been notified that it's ok. You can also re-enable Bluetooth, which airlines typically do not specifically prohibit: tap General > Bluetooth; set the Bluetooth switch to On.

When you turn Airplane Mode back to Off after leaving a plane, all your previous settings for access are flipped back on.

## TURNING RADIOS OFF SEPARATELY

The Settings app lets you separately turn off both radios in an iPod touch and all four radios in an iPhone without engaging AirPort Mode:

- **Wi-Fi:** Tap Wi-Fi, and set Wi-Fi to Off.

- **Bluetooth:** Tap General, then tap Bluetooth. Set Bluetooth to Off.
- **Cellular:** Tap Cellular Data, and set Cellular Data to Off.
- **GPS:** Tap General, then set Location Services to Off.

***Is GPS really off?*** *GPS is a receive-only system; with Location Services off, ostensibly, the GPS receiver isn't powered up and attempting to find data, so it's "off" in that sense.*

***Warning!*** *Disabling Location Services prevents iOS from using GPS, Wi-Fi, and cell-tower based information to provide location data to apps and the operating system.*

# Remote Access and Control

If you told me in 2006 that I would regularly use a handheld communicator to control a remote computer, I would've assumed that you were talking about an expensive tablet PC (few of which ever sold), or I'd tell you that maybe in 2010 or so there would be the right combination of software, hardware, and network robustness to make that work. I was off by a few years.

Since Apple began allowing third-party developers to write software for the iPhone and iPod touch in 2008, there has been strong demand for apps that let you view or control a computer's screen from an iPhone, iPad, or iPod touch, but not vice-versa. In this chapter, I discuss two remote access apps that work on all iOS devices:

- In iTeleport (Formerly Jaadu VNC) (next page), I look at how this app provides remote access and control with the Virtual Network Computer (VNC) protocol that's a standard across many platforms and built into Mac OS X.
- In LogMeIn Ignition, I discuss how this app employs LogMeIn's proprietary system for remote access and control.

Both apps offer similar feature sets and performance, and each app does a reasonable job, especially if the iOS device is connected to an external Bluetooth keyboard or keyboard dock. I've left my laptop behind on multiple trips since starting to use these programs, not only with my newer iPad, but also with my iPhone. If you are trying to decide which one to purchase, I suggest you read this entire chapter to get a feel for which one is right for you.

### Mocha VNC?

The other major remote-access program for iOS is Mocha VNC, a universal app by MochaSoft. It has similar functionality to iTeleport but costs $5.99 instead of iTeleport's $24.99 or LogMeIn Ignition's $29.99. Even though they cost more, I prefer both iTeleport and Ignition because they allow access to computers without publicly reachable Internet addresses, and they work easily with, or include by default, strong encryption.

### Input Replacement Apps

These remote screen control programs are distinct from the input replacement apps, such as Mobile Mouse Pro (RPA Tech, $1.99) and TouchPad Elite (iTeleport, $0.99), which control mouse input and let you type, but which don't show you the remote computer's display. Input-replacement apps work only over a local network and are intended for use with a computer that has a monitor, but for which it's difficult to use a mouse and keyboard. The apps in this chapter are full screen-sharing apps that work over local networks and over the Internet.

## iTELEPORT (FORMERLY JAADU VNC)

iTeleport is a robust $24.99 universal app for remote screen viewing that can connect to either Mac OS X's built-in VNC server or free server software provided by its developer. iTeleport also connects to any device running a Virtual Network Computer (VNC) server.

To use iTeleport, you first set up the computer(s) that you want to reach, and then connect to them via the iOS app.

**Note:** The company that originally made iTeleport was called Jugaari, and its software was named Jaadu VNC. Now both the company and the software are named iTeleport. You may still see the old names on the Web site or in iTunes.

## Enable Remote Access

You have three choices for making a Macintosh available for remote access via the iTeleport app:

- Use the built-in VNC compatibility mode in Mac OS X 10.5 Leopard or 10.6 Snow Leopard. This is required if you want a mobile device to access multiple monitors on a remotely controlled Mac, but it may not work unless the mobile device and the Mac are on the same Wi-Fi network. In the Sharing system preference pane, select Screen Sharing, and check the box next to it.

- Use Mac OS X's built-in VNC mode, plus a free utility from iTeleport that can make your Mac available for remote screen sharing over the Internet to a copy of iTeleport on an iOS device by using a Google account to connect the computer and your device. Instructions are at iTeleport's site under the "quick method," linked in the Tip below.

- Use a combination of two free software packages from iTeleport: Vine-Jaadu Server and iTeleport Connect for Mac. This can work well for remote access, but the iOS device can access only the Mac screen on which the menu bar is located. It doesn't require a Google account, and the Vine-Jaadu Server software offers more configuration options and security options. The explanation is under the "recommend method," linked in the Tip below.

Under Windows, the easiest course of action is to install iTeleport's free remote access software.

Whichever method you enable, you'll need to set a server password. Later, when you connect, you'll enter the password.

**Tip:** For more about setting up the quick and recommended methods on the VNC server side of the equation, see iTeleport's setup instructions at http://www.iteleportmobile.com/iphone/support/mac/step1 or consult my book *Take Control of Sharing Files in Snow Leopard*.

## Set Up the iTeleport App

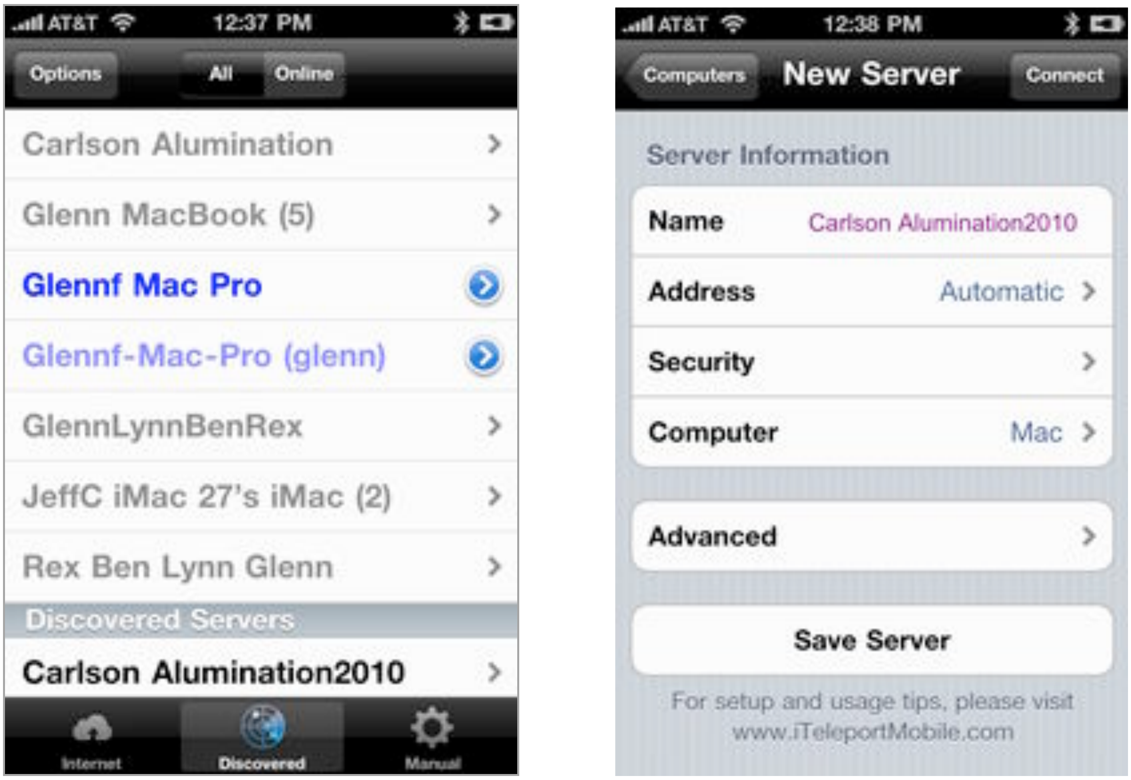
To get started with iTeleport, visit the iTunes Store or App Store to purchase the software and make sure it's installed on your device.

Now that you've enabled remote access using one of the options just discussed, follow these steps the first time you connect:

1. Launch iTeleport.
2. In the default Discovered view (**Figure 32**, left), tap the server on the local network under the Discovered Servers label. Servers labeled in blue are using iTeleport Connect.

   (Servers are listed above the Discovered Servers label if the software has previously connected to them.)

   The New Server screen appears (**Figure 32**, right).



Name: Carlson Alumination2010
Address: Automatic
Computer: Mac

**Figure 32:** Local servers are shown in a list (left). Tap a server in the Discovered Servers list to set up a new server entry (right).

3. Optionally change the server's name instead of using the Bonjour name, choose security options, and save the configuration without connecting. If you do this, back in the main iTeleport view tap the detail › button to access the Server Information view for Step 4.

4. Enter the VNC server's password, and to enable encryption if the server's configured for it:

*Warning! I highly recommend using encryption. Otherwise, your sessions are entirely unprotected and can be monitored over open Wi-Fi hotspots. See Transfer Data Securely.*

   a. Tap Security.

   b. In the Password field, enter the VNC server's password.

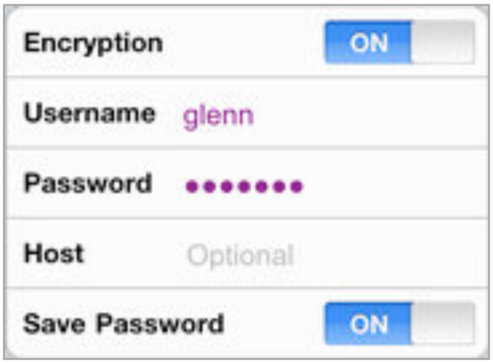
   c. I recommend setting Save Password to On.

   If you do not have encryption set up on your server, you can skip to the next step. Otherwise:

   d. Tap Encryption.

   e. In the next view, tap the Encryption switch to On.

   f. Enter the user name and password for the machine to which you want to connect (**Figure 33**). In Mac OS X, that's a regular user account. (If you limit access in the Sharing preference pane to specific users, the user entered here must be in that list.)



Encryption ON

Username glenn

Password •••••••

Host Optional

Save Password ON

**Figure 33:** Enter encryption details.

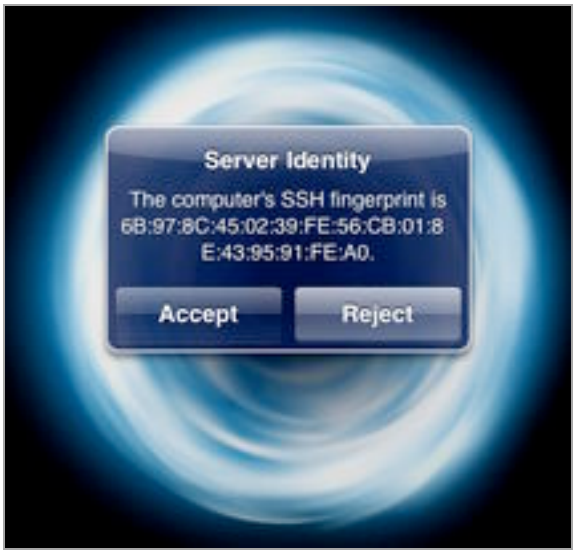
***To save this profile without connecting:*** *Tap Security at the top left, and then New Server. Tap Save Server. You can skip the rest of these steps.*

5. Tap Connect.

6. If you're using encryption, the first time you make a connection the software prompts you to verify the *SSH fingerprint,* a kind

of unique identifier, of the computer you're connecting to (**Figure 34**). Tap Accept.

***No worries, in general:** If your machine is under your control, there's no reason to worry about this; just tap Accept. This approval is stored for future connections.*



Server Identity

The computer's SSH fingerprint is 6B:97:8C:45:02:39:FE:56:CB:01:8 E:43:95:91:FE:A0.

**Figure 34:** The Server Identity message is an extra check that the remote computer is the one you believe it is.

After a short pause, the remote screen should appear with a fascinating visual display. In the example in **Figure 35**, the server that's being viewed is a Mac OS X Snow Leopard machine with built-in VNC compatibility.

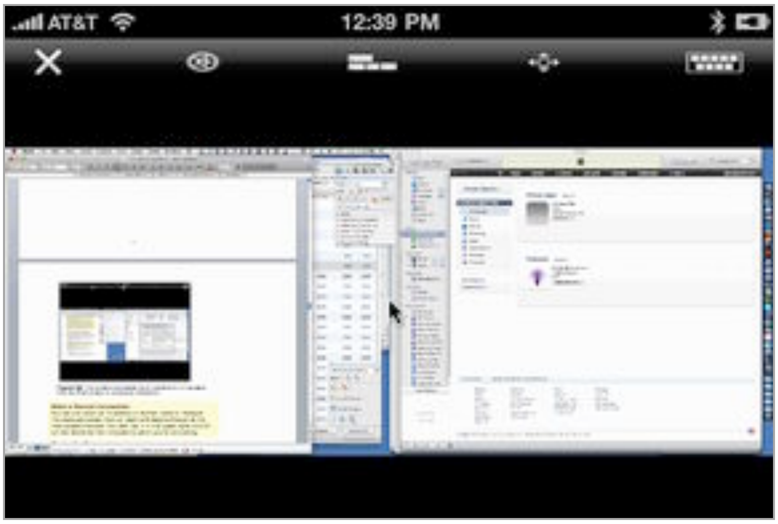


**Figure 35:** Two screens are scaled down significantly to squeeze into the iPhone display in landscape orientation.

### Make a Manual Connection

You can also enter an IP address or domain name in iTeleport. The steps are similar, but you start with tapping Manual at the main screen's bottom. You then tap plus (+) in the upper right, and fill out the details for the computer to which you're connecting.

## Control a Computer

All the above merely gets you started with using iTeleport to remotely control a computer. Once you've connected, you can do something! Your finger is your navigation tool. The virtual screen moves under your finger, and the mouse pointer follows your finger (**Figure 36**). Tap, and it's like single-clicking. Use pinch and expand gestures to zoom in and out on the remote screen.

iTeleport is rotation aware, so you can tilt an iPhone or iPod touch to switch from landscape to portrait at will. Screen refresh is relatively fast even over 3G connections.

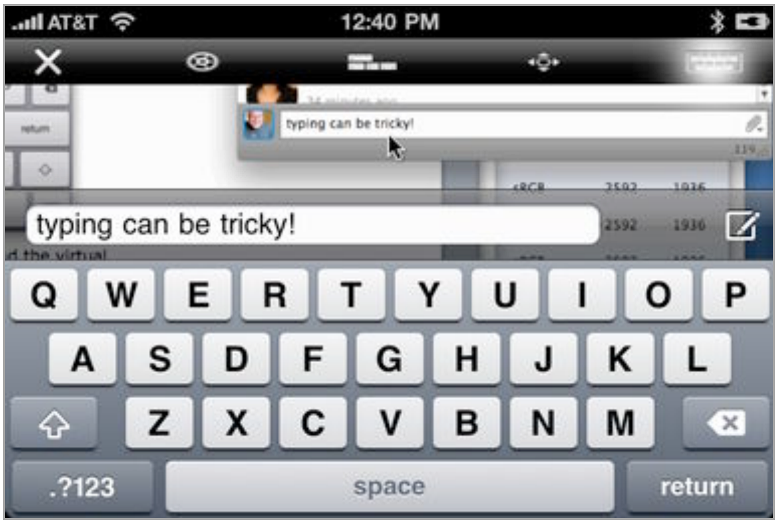


**Figure 36:** Move your finger to move the mouse and the virtual screen slides beneath. Tap the keyboard icon to bring up a keyboard for typing.

A row of buttons along the top of the screen provides access to a few special options and keyboard features. From left to right, these are:

- **Disconnect:** Tap Disconnect to end the session and return to the connection screen at which you started.

- **Settings:** You can set options such as locking orientation, so that switching the device from landscape to portrait doesn't rotate the display of the remote screen.
- **Modifier keys:** Tapping this button brings up onscreen Shift, Control, Command, and Option buttons for one or more combinations with keyboard letters.
- **Extended keyboard keys:** iTeleport neatly hides five screens of elements such as arrow keys, function keys, and media-control keys (such as play/pause) that you access by swiping through the screens. Arrow keys are intermingled with Escape, Back, Tab, and Space bar.
- **Keyboard:** This display lets you type directly on screen. iTeleport includes its own area to show what you're typing so that you can see what you've entered even if it's not visible on the remote screen (**Figure 36**, above this list).

In most cases, to dismiss a mode enabled by a button, tap the button again.

## LOGMEIN IGNITION

LogMeIn makes remote-control programs that come in many versions for Windows, including "help desk" flavors designed for tech-support staff to offer remote assistance through remote screen control (https://secure.logmein.com/). LogMeIn has a free option for general use for Mac and Windows: LogMeIn Free. This service works spectacularly at providing remote access through all sorts of network weirdness, including cases where Back to My Mac doesn't work well. A Web-based account lets you manage which computers belong to you for remote administration.

**Note:** A Pro version of LogMeIn carries a monthly fee, but adds file transfer, guest access, and a number of other features.

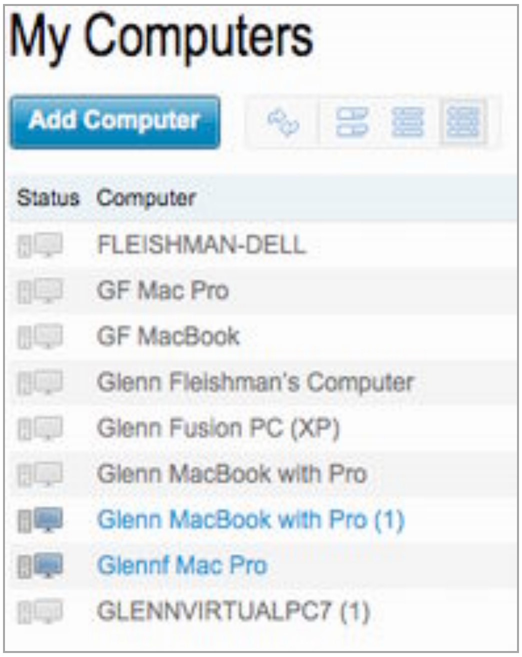
The service became even more useful when the company released LogMeIn Ignition for iPhone and iPod touch, which is now available as a universal app for $29.99. Ignition uses your LogMeIn account to connect to any LogMeIn client machines on any supported platform.

It’s a powerful tool, and it works fine over 3G and Wi-Fi. In many ways, it’s similar to iTeleport. However, instead of using the standard VNC specification and a variety of software packages to gain remote access to otherwise inaccessible computers, LogMeIn uses its own protocols and software. This makes it simpler to configure and use.

***No extra step for encryption:*** *You need take no additional steps to enable security with LogMeIn, which always uses strong encryption for Web and mobile connections.*

Here’s how to make your first LogMeIn connection:

1. Set up an account at LogMeIn (https://secure.logmein.com/). As part of the account set up, you’ll be walked through downloading and installing LogMeIn software on one or more computers. I won’t reproduce the instructions here because LogMeIn’s process is so straightforward. After you have at least one computer configured with LogMeIn, your account at the Web site will look something like the one in **Figure 37,** showing a list of computers and the accessible status of each.

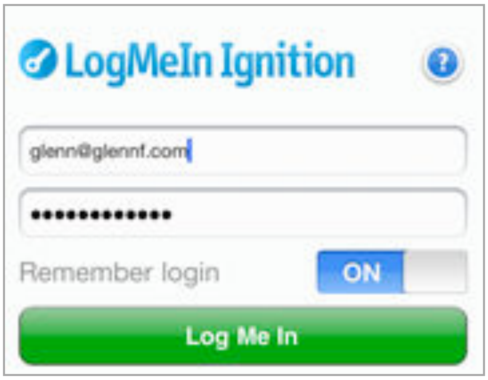


| Status | Computer |
|---|---|
| | FLEISHMAN-DELL |
| | GF Mac Pro |
| | GF MacBook |
| | Glenn Fleishman's Computer |
| | Glenn Fusion PC (XP) |
| | Glenn MacBook with Pro |
| | Glenn MacBook with Pro (1) |
| | Glennf Mac Pro |
| | GLENNVIRTUALPC7 (1) |

**Figure 37:** After logging in to LogMeIn’s site, you see a list of your devices and their respective status. Clicking a server starts the steps of remote viewing in a desktop browser.

2. Launch Ignition on your iOS device to start a remote session.

The app displays a login screen (**Figure 38**).



glenn@glennf.com

•••••••••••••

Remember login ON

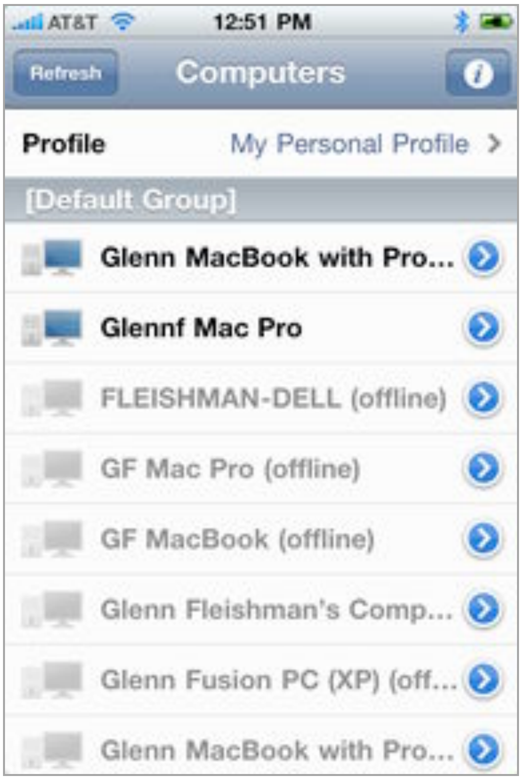
**Figure 38:** The main login screen lets you store your password for future sessions.

3. Enter your login credentials. They are the same as those you used to set up your LogMeIn account.

4. If you like, tap the switch to have LogMeIn remember your password. This is useful if you've chosen a strong password that you don't want to re-enter regularly.

***Warning!*** *I suggest storing your password only if you also use the iOS passcode lock (configured in Settings > General > Passcode Lock). See Keep Data Safe.*

5. In the Computers list that appears after a successful login (**Figure 39**), tap the computer that you want to start a session with. (This is the same list you would see if you logged in to your account at the LogMeIn Web site.)



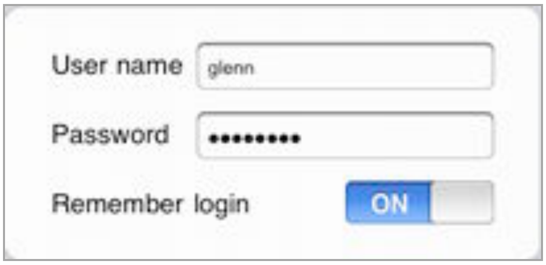
Profile My Personal Profile

[Default Group]

- Glenn MacBook with Pro...
- Glennf Mac Pro
- FLEISHMAN-DELL (offline)
- GF Mac Pro (offline)
- GF MacBook (offline)
- Glenn Fleishman's Comp...
- Glenn Fusion PC (XP) (off...
- Glenn MacBook with Pro...

**Figure 39:** My various computers associated with LogMeIn.

6. Enter the same user name and password as you would to log in to an account on the machine itself. You can optionally store the password (but see the ***Warning!***, earlier in these steps). (**Figure 40**).



User name: glenn

Password: •••••••••

Remember login: ON

**Figure 40:** Enter the user name of an account on your computer and the password and tap Log In, and Ignition starts up a connection.

**Tip:** If you store the password, LogMeIn connects directly without prompting the next time.

7. Tap Log In.

The connection process can take from seconds to tens of seconds depending on your network connection.

Once you are connected, the remote screen appears. A row of buttons at the bottom of the screen in either orientation lets you control session behavior (**Figure 41**).

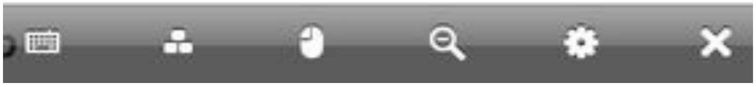


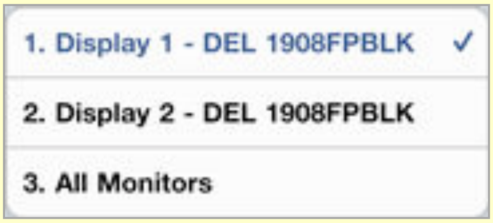
**Figure 41:** Controls from left to right are:

- **Keyboard:** Brings up a keyboard for typing and to gain access to modifier keys (**Figure AT**, next page).
- **Platform-specific key combinations** (pyramid of three keys)**:** This button brings up Command-Tab and Command-` (back tick) buttons when connecting to a Mac.
- **Mouse button:** Lets you change a tap from a left click to a right click. It can be hard to see, but there's a little upper-left divot out of the toolbar's mouse icon for left click; tap it, and the divot moves to the right side for right- or Control-click actions.
- **Magnifying glass:** Toggles between 100-percent view and a fit-in-window view.
- **Settings:** Visit the settings screen to change configuration midstream.
- **Disconnect:** Ends the session with a prompt to confirm.

As with iTeleport, you use your finger to drag the virtual screen around with the pointer appearing where you drag. You can pinch and expand to zoom in or out.

## Multiple Remote Screens

A single screen appears by default for a remote system with multiple displays, but you can bring up another screen by shaking your iPhone or iPod touch, or set a preference to show multiple screens at once (**Figure 42**).



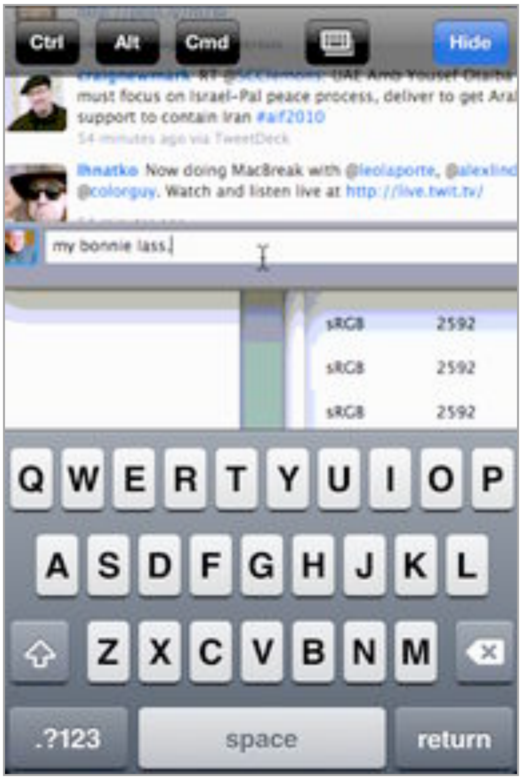
1. Display 1 - DEL 1908FPBLK ✓

2. Display 2 - DEL 1908FPBLK

3. All Monitors

***Figure 42:*** *You can pick which of multiple monitors to display, or all of them.*

When typing, as in **Figure 43**, you can type modifier-key keystrokes by tapping Ctrl, Alt, and Cmd at the top of the screen in any combination, and then pressing keyboard keys. The overlapping windows icon at the top brings up a set of additional keys you can swipe through, including function and arrow keys.



must focus on Israel-Pal peace process, deliver to get Ara
support to contain Iran #aif2010
54 minutes ago via TweetDeck

lhnatko Now doing MacBreak with @leolaporte, @alexlind
@colorguy. Watch and listen live at http://live.twit.tv/

my bonnie lass.

| | |
|---|---|
| sRGB | 2592 |
| sRGB | 2592 |
| sRGB | 2592 |

**Figure 43:** The keyboard lets you type directly as if you were in front of the computer you're controlling.

The folks behind LogMeIn take security quite seriously, which is why they offer an additional option for protecting your data. Tap the info ⓘ button on the main Computer screen, and you can erase any stored account logins—either for LogMeIn or for your remotely controlled computers.

# Access Documents

No iOS device is an island; each is part of the main—the main set of files you maintain on multiple computers and storage locations. As a result, you can use a handheld computer not so much as a file repository, but as a view into your file storage.

Several third-party apps and two Apple apps make it possible to access and sometimes aggregate access to files stored all over.

In this chapter, I look at five programs that you might consider for accessing files stored in various locations: Air Sharing Pro, GoodReader, iBooks, Dropbox, and iDisk. Air Sharing Pro and GoodReader can store documents across many sources and servers, and let you view (or play) certain stored files; iBooks is an EPUB and PDF reader, as well as a bookstore; Dropbox and iDisk are portals into one kind of storage with more limited viewing options.

## WHAT KINDS OF STORAGE

These apps give you access to four kinds of storage, with some apps handling more than one kind:

- **Over-the-air downloads:** In an app, you can view remote files and choose a file to download and optionally store in the app's local storage. The file is transferred via Wi-Fi or 3G from an email server, a file server, or other services. All programs covered in this chapter can retrieve documents wirelessly, except for iBooks, which can wirelessly retrieve only titles you've previously purchased from the iBookstore.
- **Networked:** Air Sharing Pro and GoodReader can act as WebDAV file servers while launched, allowing other computers on the local network to use Bonjour or an IP address to access their file stores. With a file store accessed, you can transfer files to and from the iOS device. (WebDAV is a popular method of accessing files from other servers; see What's WebDAV?, next page.)

- **iTunes file transfer:** With an iPhone or iPod touch connected to a computer running iTunes, an app may expose its internal document storage list. You can manage files in that list, including dragging documents into it. Air Sharing Pro and GoodReader support iTunes file transfer. iBooks works with iTunes, too, but is slightly more complicated and restrictive. See Manage and Copy Files via iTunes, next page.
- **Attachments:** Email attachments can live in limbo in iOS 4. In the Mail app, an attachment that is larger than a relatively small size is downloaded only when you request it. A downloaded attachment is then stored temporarily in Mail, but you can also choose an external program—Air Sharing Pro, iBooks (PDF only), and GoodReader are options—to open it, thus transferring the attachment to the device and storing it there. To learn more, read Open Email Attachments in Another App, a few pages ahead.

***Limits in Safari:*** *Safari allows links to document files to be opened in another program, but it's unclear how to control which options appear for which file types. GoodReader has a neat workaround through a built-in browser that can download directly into the app.* See *Download from the Web*.

### What's WebDAV?

In the coverage of Air Sharing Pro and GoodReader ahead, you'll read about using WebDAV to retrieve files into the apps, as well as how to share files from the apps over a local network to computers or other iPads, iPhones, and iPod touches on that network. But what is WebDAV?

The name is long: Web-based Distributed Authoring and Versioning. WebDAV was intended to let an ordinary Web server act as a file server, allowing access over a network to retrieve, modify, delete, and add files.

WebDAV and FTP are the most widely used methods to retrieve files remotely. Apple's built-in file-sharing flavor, Apple Filing Protocol (AFP) can work over the Internet, but is rarely used for that kind of remote access. Apple uses WebDAV for iDisk and supports it through Mac OS X.

### Supported Formats

All the programs except iBooks can read many different document, image, and movie file formats. Apple has provided this support in the iOS and makes it available to any app that wants to use it.

Apple currently supports these file types:

- **Movies:** H.264 and MPEG-4 (as .m4v, .mp4, and .mov), Motion JPEG (.avi); see http://www.apple.com/iphone/specs.html for specifics on frames, resolution, and audio encoding.
- **Images:** JPEG, TIFF, and GIF.
- **Documents:** Apple iWork ’08 and ’09 (Keynote, Numbers, and Pages); Microsoft Excel, PowerPoint, and Word (including 2008 formats like .docx); Acrobat PDF; Rich Text Format (RTF); and the VCF contact information format.

iBooks supports just PDF and EPUB format documents. EPUB is an industry-standard document format for books that allows media and supports some formatting.

## Manage and Copy Files via iTunes

Moving files in and out via iTunes requires much less effort than the other options, although it ties you to a computer. The process for third-party apps is different than the process for iBooks.

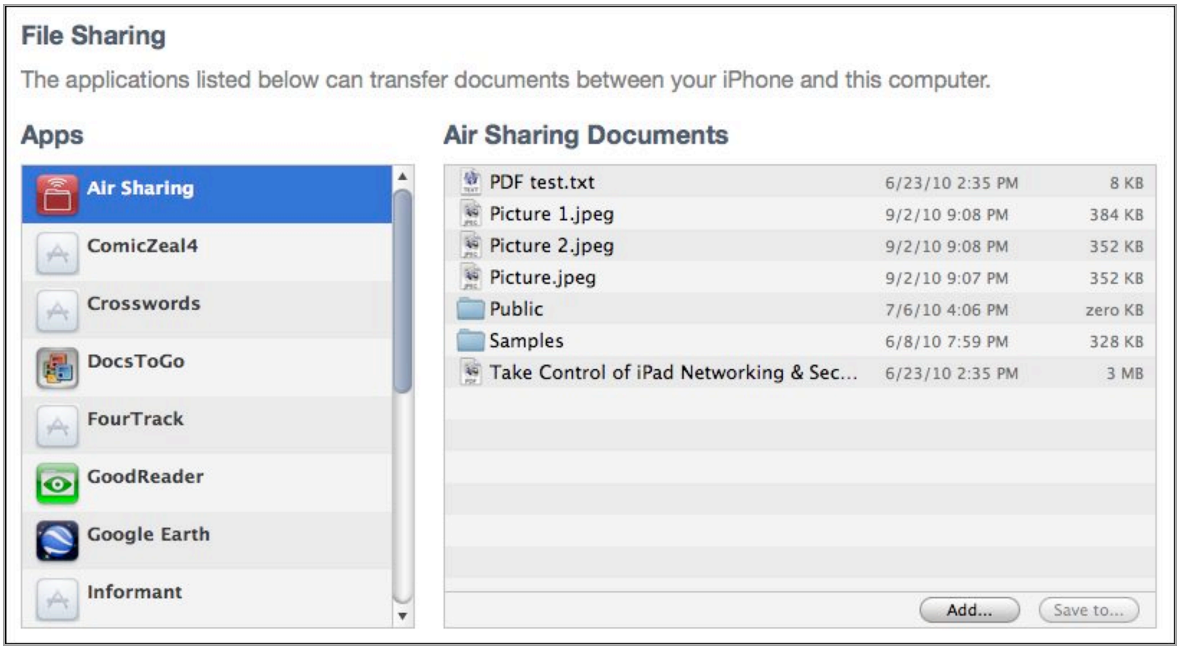
### Third-party App File Handling

1. Connect your device to a computer to or from which you want to copy files, and launch iTunes.

> ***Warning!*** *If this isn’t the primary computer to which the device normally syncs, pay attention to any dialogs that might pop up asking you about syncing. To be extra safe, turn off automatic syncing in the iTunes preferences, in the Devices pane, before making the connection.*

2. In the sidebar, select your unit in the Devices list.
3. Click the Apps button.
4. Scroll down below the layout editor to the File Sharing section.

5. Select the appropriate app in the Apps list. The folders and files available in the data store are shown in the *App Name* Documents list to the right (**Figure 44**).



File Sharing

The applications listed below can transfer documents between your iPhone and this computer.

Apps

Air Sharing
ComicZeal4
Crosswords
DocsToGo
FourTrack
GoodReader
Google Earth
Informant

Air Sharing Documents

| | | |
|---|---|---|
| PDF test.txt | 6/23/10 2:35 PM | 8 KB |
| Picture 1.jpeg | 9/2/10 9:08 PM | 384 KB |
| Picture 2.jpeg | 9/2/10 9:08 PM | 352 KB |
| Picture.jpeg | 9/2/10 9:07 PM | 352 KB |
| Public | 7/6/10 4:06 PM | zero KB |
| Samples | 6/8/10 7:59 PM | 328 KB |
| Take Control of iPad Networking & Sec… | 6/23/10 2:35 PM | 3 MB |

**Figure 44:** iTunes controls how you move files in and out of the data store for the app.

Now, you can carry out a variety of actions:

- **Add files:** Click the Add button beneath the documents list or drag files from the Desktop into the documents list. You can’t create folders or put the items in a folder.

- **Rename an item:** Select a file or folder in the documents list, wait a second, click it again, and you can rename the item.

- **Copy files to your computer:** Select a file or folder, and click Save To; you can also drag files or folders (including multiple selections) to the Desktop. You can’t copy items from inside a folder selectively.

***Warning!*** *A bug in the version of Air Sharing Pro that I tested didn’t refresh the display of files in the My Documents directory after making changes in iTunes. You must go back to the Servers list and then return to My Documents to access the changed data store.*

***Warning!*** *You don’t sync from iTunes to copy files; the files copy immediately when you add them to an app’s file store. However, if you aren’t using the copy of iTunes that your device normally syncs with and accidentally click Sync, you’ll be prompted to copy purchases or erase and sync anew. If that happens, click Cancel.*

### Manage Files with iBooks

iBooks doesn’t let you manage PDFs and EPUB using the File Sharing area in the Apps tab; rather, you transfer them to and from your iOS device similarly to how you transfer music. You use two entirely separate areas of iTunes to manage iBooks storage:

- **The Books portion of your iTunes library:** To view the books in your iTunes library, click Books in the iTunes sidebar under Library. Books get added to your library in two ways:
  - When you buy an ebook using iBooks on your iOS device, the ebook will transfer to your iTunes library when you next sync the device. As of this writing, all ebooks available in the iBookstore are in a locked EPUB format.
  - If you have an ebook on your computer, but not in your iTunes library, you can add it to iTunes by dragging it into the Library area of the iTunes sidebar or into the Books view (**Figure 45**). This ebook could be a PDF or an unprotected EPUB file. (If you want to add a Take Control ebook to iBooks, you can use this technique.)

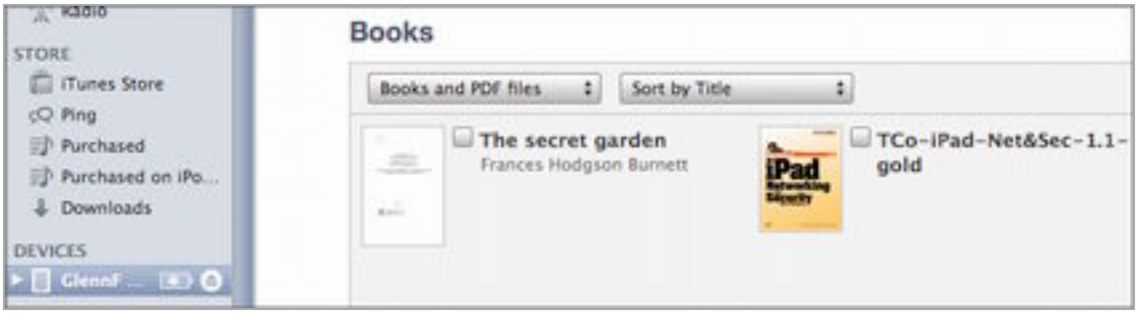
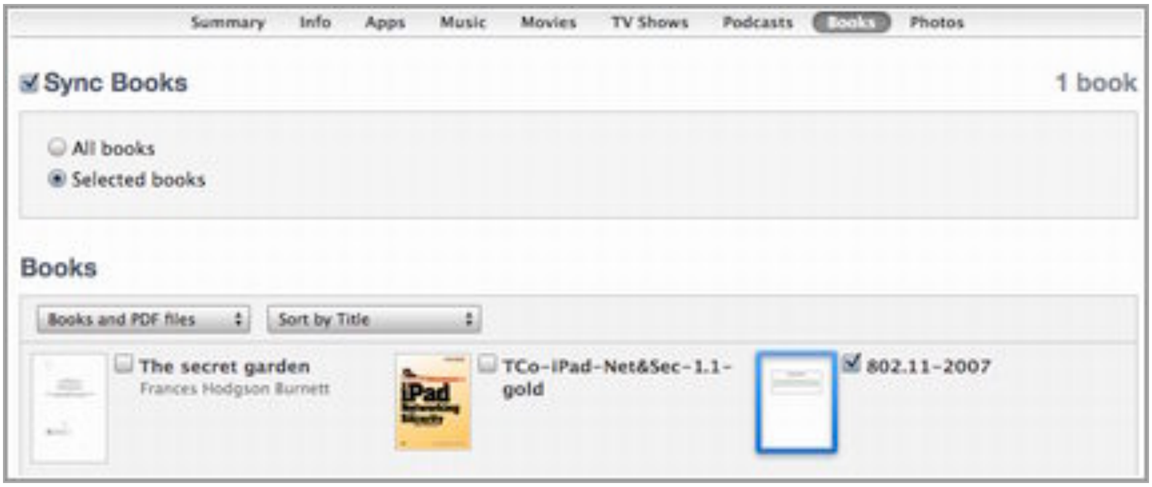


**Figure 45:** The Books section of the iTunes library stores items you’ve synced from a device or dragged into the view.

- **The Books pane for your iOS device:** To sync books to an iOS device, plug your hardware into the computer. In iTunes, select your mobile gear in the Devices list in the sidebar, and click the Books button. You can choose to sync all books, or just those you select (**Figure 46**). Make your choice or choices, then click Apply.



☑ Sync Books 1 book

○ All books
● Selected books

Books

Books and PDF files
Sort by Title

□ The secret garden
Frances Hodgson Burnett

□ TCo-iPad-Net&Sec-1.1-gold

☑ 802.11-2007

**Figure 46:** The Books view handles sync of EPUB and PDF files to and from an iPhone and other iOS devices.

**Note:** You can't, as of this writing, purchase books from Apple in iTunes; you can purchase only via the iBooks app.

## Open Email Attachments in Another App

iOS recognizes that certain programs are designed to view or edit particular document types. In the Mail app, you can use this feature to transfer attachments to GoodReader and Air Sharing Pro among other apps.

The steps to use this feature are simple:

1. In the Mail app, select a message with an attached document.
2. Touch the attachment icon to reveal a menu (**Figure 47**) showing two or three options:
   - Quick Look, which previews within the Mail app.
   - Open in "*app name*", which copies the file to that app.
   - Open In, which brings up another menu that lets you select among multiple options for viewing the file. You may not see this option, depending on what iOS has decided can open the given file.
3. The file opens in the selected program for viewing.

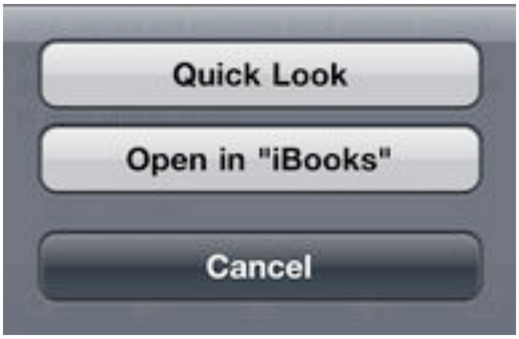


**Figure 47:** Mail offers multiple ways to view attached documents.

***Can't choose which apps open:*** *There's no way in iOS 4 (or iOS 3) to choose which programs can open a given file. For instance, while iBooks, GoodReader, and Air Sharing Pro could all open the PDF in the example in* ***Figure 47****, iOS showed just iBooks as an option in the menu. I hope this will be fixed.*

**Tip:** To transfer an attached photo from an open message in Mail to the Photos app, tap the Reply ↩ icon and then tap Save Images or Save *X* Images.

## AIR SHARING PRO

Air Sharing Pro from Avatron Software (http://avatron.com/, $6.99) offers several broad categories of features for retrieving files (as well as viewing them):

- Access Remote Files: Air Sharing Pro can access many types of remote servers, including iDisk and Dropbox accounts, as well as FTP, SFTP, FTPS, and WebDAV servers—a Mac can be easily set up as a WebDAV server—and mail servers. You use the mail server option to view and download email attachments.
- Save Files Locally: Air Sharing Pro can copy or move files from remote servers (or a few other apps, such as the Mail app) to its local file store, making it easy for you to view or listen to those items at any time, even if you don't have network access.
- View or Play Files: Once you have access to a file, whether it's stored remotely or locally, you can "open" it and then view it or play it, depending on its file type.

***Air Sharing Pro can also print:*** *If you can open a document in Air Sharing Pro, you can print it on a local printer. Other apps can also facilitate printing from iOS, and iOS 4.2 will include built-in printing options.*

- Set Up Air Sharing Pro as a Server: If a file is stored *in* Air Sharing Pro, you can set up Air Sharing Pro as a *local* WebDAV server and then access that file from other local computers, including not only Macintoshes and Windows computers, but also other iOS devices running Air Sharing HD or Air Sharing Pro or other WebDAV clients. And, if that wasn't enough, you can also access Air Sharing Pro's file store through iTunes.

  Once you've set up Air Sharing Pro as a server or connected it to iTunes, you move files not only from it, but also *to* it. This more or less takes you full circle back to the first bullet item in this list, giving you another way get remote files into Air Sharing Pro, except this time you are actively working on a device that is not your iPhone or iPod touch.

### Air Sharing Pro Adds Other Formats

Beyond Apple's Supported Formats, Air Sharing Pro can handle items in these formats:

- Web Archive (.webarchive), the offline storage format for Web pages (including images) created by Safari.
- RTFD, TextEdit documents with optionally embedded images.
- Source code in the form of text files with syntax-based color coding.

**Note:** Avatron makes three versions of the app: Air Sharing ($2.99) and Air Sharing Pro ($6.99) for the iPhone and iPod touch, and Air Sharing HD ($9.99) for iPad. Air Sharing Pro and Air Sharing HD are nearly identical except for layout; Air Sharing is a good viewing app, which lacks file transfer and advanced PDF viewing features. You can also upgrade Air Sharing to Air Sharing Pro for $3.99 as an in-app purchase.

When you launch Air Sharing Pro, it shows two folders, both located in its "My Documents" local file store: Public and Samples (**Figure 48**).

Public is for files that you want to share over a local network, while Samples has a few items that show how Air Sharing Pro handles navigation and document display.

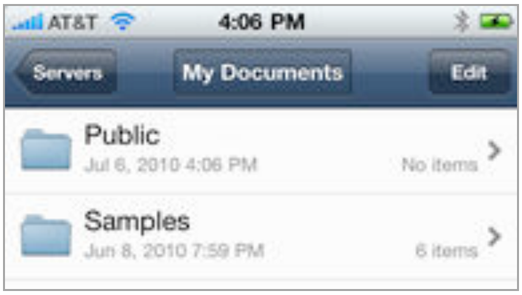


**Figure 48:** The default setup in Air Sharing Pro shows two folders in the app's data store. (You can change the appearance of this" File Browser" list by tapping the wrench 🔧 icon at the lower right.)

## Access Remote Files

To see a list of servers accessible to your copy of Air Sharing Pro, tap Servers in the upper left. To add a source, tap the plus ➕ button. Choose the server type to which you want to connect (**Figure 49**), and then enter the required credentials for access.

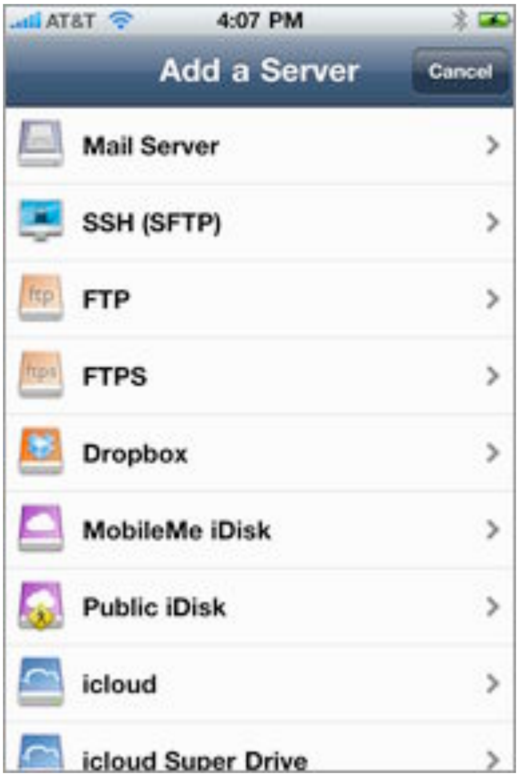


**Figure 49:** Air Sharing Pro offers a cornucopia of server types, including three flavors of FTP, MobileMe, Dropbox, a few hosting services, generic WebDAV, and Mail Server access (POP and IMAP).

***Warning!*** *Most remote access to servers isn't secured, and I don't recommend accessing servers from Air Sharing Pro on public networks. The exceptions are mail servers for which you have Use SSL enabled, SSH (SFTP) and FTPS, Dropbox (all transfers), and WebDAV servers that have URLs that start with https. See Transfer Data Securely.*

For example, to add a mail server, follow these steps:

1. In the Add a Server view, tap Mail Server.
2. In the Add Account screen, choose the kind of email service (**Figure 50**). For a popular service, such Gmail or MobileMe, tap that button. Otherwise, tap Other.

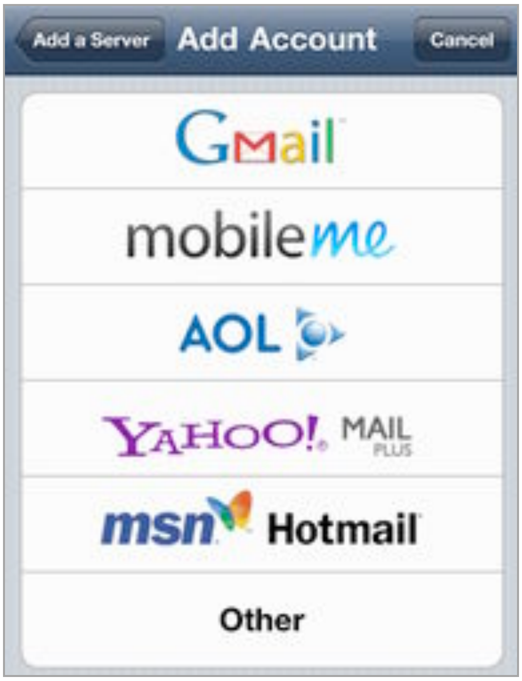
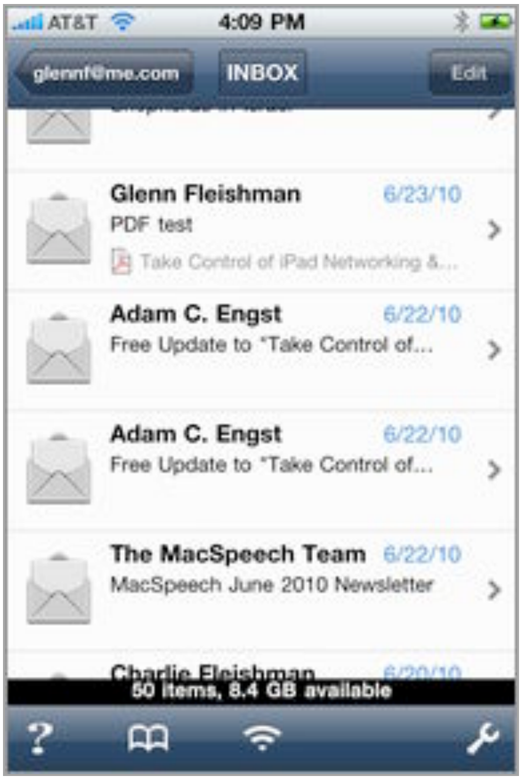


**Figure 50:** Choose the mail server type.

3. Enter the configuration details for the mail server; for Other, you select between POP and IMAP as the server type, too.
4. Tap Save.

You can now tap the server's entry in the main Servers list to see what attachments are available for viewing for that account. A given message may have multiple attachments (**Figure 51**).



Glenn Fleishman 6/23/10
PDF test
Take Control of iPad Networking &...

Adam C. Engst 6/22/10
Free Update to "Take Control of...

Adam C. Engst 6/22/10
Free Update to "Take Control of...

The MacSpeech Team 6/22/10
MacSpeech June 2010 Newsletter

Charlie Fleishman 6/20/10

50 items, 8.4 GB available

**Figure 51:** This list view shows the inbox for my MobileMe account, including a preview of a PDF file attachment on one message.

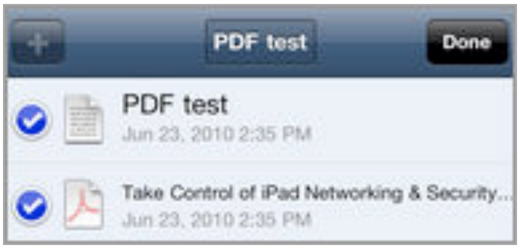
## Save Files Locally

Air Sharing Pro stores files from remote servers oddly. When you view or play a file by tapping it in a remote server's directory, the app makes a temporary local copy, but doesn't store it.

To store a file locally in Air Sharing Pro's My Documents file store, follow these steps:

1. In any file list view, either touch and hold down on a file in the list or tap the Edit button in the upper right corner.
2. Tap one or more items in the list.

   A blue checkmark appears beside each selected item (**Figure 52**).



PDF test
Jun 23, 2010 2:35 PM

Take Control of iPad Networking & Security...
Jun 23, 2010 2:35 PM

**Figure 52:** Items are selected for an action, such as copying.

3. When you’ve completed your selection, tap the gear ⚙ icon in the lower right corner.

4. From the menu that appears, Choose Copy or Move.

   Both Copy and Move create an internal list of items to copy; Move optionally deletes them (if you have permission) from the original source. A Clipboard icon appears to the right of items that are slated to be copied (**Figure 53**). An image of a clipboard with a paperclip appears in the upper right corner of the window, too.

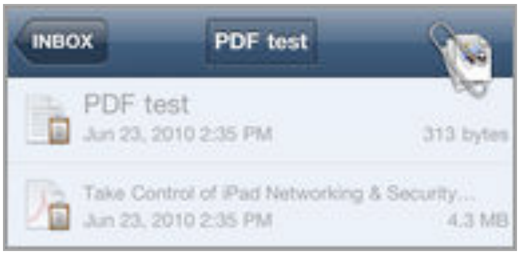


**Figure 53:** A clipboard icon appears on files that have been marked for copying or moving (left); the upper-right corner of Air Sharing Pro shows a icon to remind you that files are ready for placement.

5. Navigate to a location, such as the My Documents folder, into which you want to copy the files. (You can instead choose a directory on another service for which you have permission to add files).

6. Tap the clipboard icon, and then tap Paste *X* Items (**Figure 54**). The items are now copied or moved.

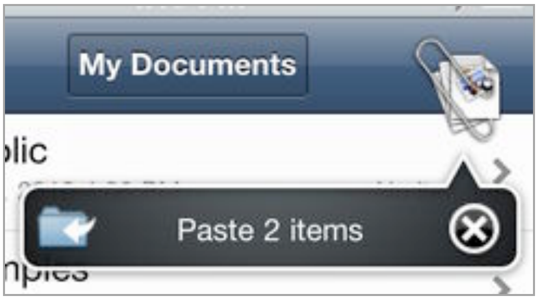


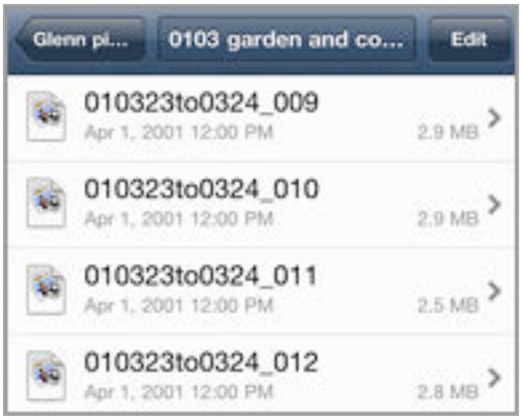
**Figure 54:** The Paste command lets you drop those files in any directory, including local storage or another server.

This process is a bit awkward if you simply want viewed files to be easily available in Air Sharing Pro’s file store. A developer at Avatron Software told me that the company plans to simplify the process in the next release.

## View or Play Files

To access a file so you can view it or play it:

- If the file is stored locally, from the main Air Sharing Pro screen, tap My Documents and then navigate to and tap the file name.
- If the file is stored on a remote server listed on the Air Sharing Pro Servers screen, select the server from the Servers page in order to connect to it, then navigate to and select the file (**Figure 55**). Air Sharing Pro downloads it temporarily.



010323to0324_009
Apr 1, 2001 12:00 PM 2.9 MB

010323to0324_010
Apr 1, 2001 12:00 PM 2.9 MB

010323to0324_011
Apr 1, 2001 12:00 PM 2.5 MB

010323to0324_012
Apr 1, 2001 12:00 PM 2.8 MB

**Figure 55:** Browsing a folder on a file server.

In all supported document types where it makes sense, you can scroll, and pinch in and pinch out to zoom the display. But support for PDF documents goes a bit further—tap the screen when viewing a PDF to reveal a toolbar. Tap the gear ⚙ icon on the toolbar to open a menu of PDF-related commands (**Figure 56**).

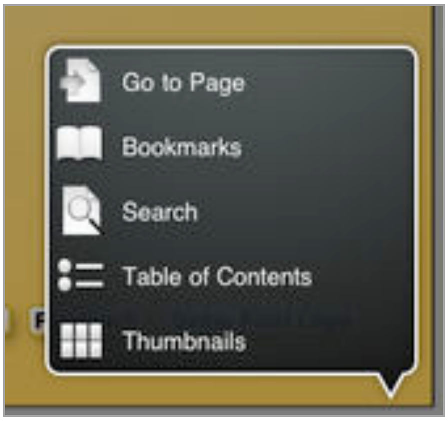
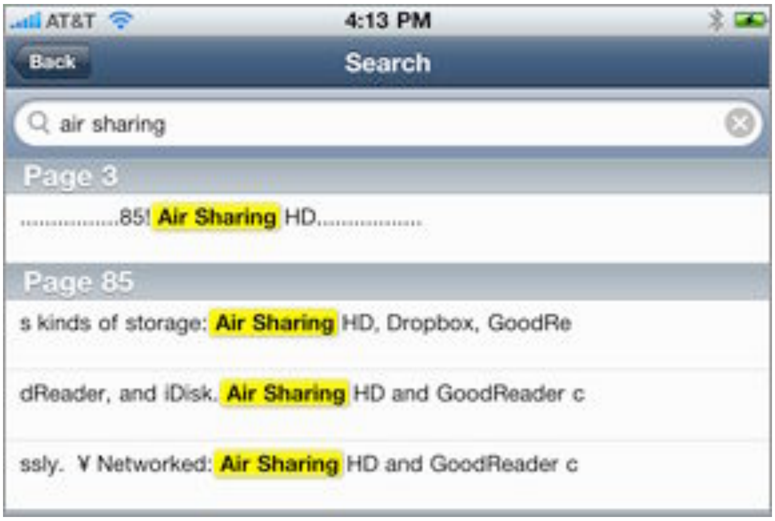


**Figure 56:** Air Sharing Pro adds controls for looking through PDFs.

For example, you can search within a PDF file and tap on a result to jump to that part in the document (**Figure 57**).



air sharing

Page 3

................85! Air Sharing HD..................

Page 85

s kinds of storage: Air Sharing HD, Dropbox, GoodRe

dReader, and iDisk. Air Sharing HD and GoodReader c

ssly. ¥ Networked: Air Sharing HD and GoodReader c

**Figure 57:** Search results in a PDF.

You can also navigate in the document by viewing and tapping thumbnails (**Figure 58**) or by tapping entries in the table of contents.

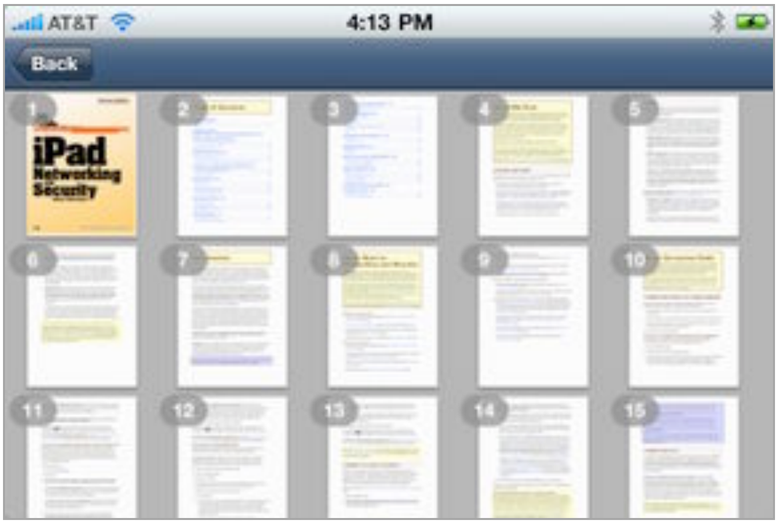


**Figure 58:** Air Sharing Pro can show thumbnails of pages in a PDF.

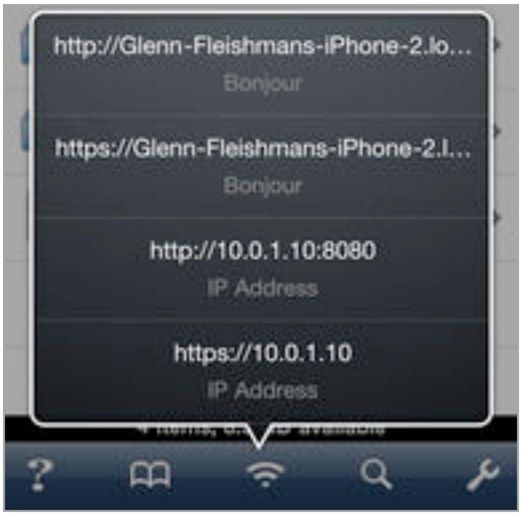
## Set Up Air Sharing Pro as a Server

You can also add, retrieve, and remove files from Air Sharing Pro's file store using either a local file-sharing connection or iTunes via USB. iTunes details are explained earlier, in Third-party App File Handling.

When you're connected to a Wi-Fi network, Air Sharing Pro makes itself available as a WebDAV server to computers and other devices that can browse for WebDAV access.

**Not over 3G:** Air Sharing Pro can't share files when connected via 3G because it relies on a locally accessible IP address or Bonjour networking to let other devices make a WebDAV connection.

In Air Sharing Pro, tap the Wi-Fi icon at the bottom of the screen, and the four local network methods by which you can access the app's storage appear (**Figure 59**). It's really two methods—Bonjour and an IP address—doubled up between plain and secure (https for SSL/TLS) methods. I recommend using the secure forms, especially at a Wi-Fi hotspot. (See Transfer Data Securely.)



http://Glenn-Fleishmans-iPhone-2.lo…
Bonjour

https://Glenn-Fleishmans-iPhone-2.l…
Bonjour

http://10.0.1.10:8080
IP Address

https://10.0.1.10
IP Address

**Figure 59:** The various ways to connect over a local network appear when you tap the Wi-Fi icon.

This access can be restricted with a password, which I recommend if you are connecting in a public place. To set a password in Air Sharing Pro, follow these steps:

1. Tap the wrench icon at the right of the Air Sharing Pro toolbar.
2. Tap Sharing Security.
3. Set Require Password to On.
4. Although filling in the User Name and Password fields is noted as optional, you should complete them for better compatibility for remote access.
5. Set Public Access On or Off. With Public Access enabled, anyone on the local network can connect and see files or put files in the Public Folder.

Now that you've set up Air Sharing Pro as a server, you can connect to it over the local network, as I explain in Connect to an iOS App WebDAV Server, later in this chapter.

# GOODREADER

GoodReader has the most features and options of any of the reader software I've tested, and this is both good and bad. Good, because the app can do most anything; bad, because it can be confusing to figure out which option you need at times. GoodReader comes in separate versions, both $1.99: GoodReader for iPhone (and the iPod touch), and GoodReader for iPad.

Like Air Sharing Pro, GoodReader can access files in any of the standard iOS Supported Formats from a variety of servers, store them on your device, and let you view them. GoodReader can serve as a viewer for many file types, but its specialty is long PDFs. It can also open and store Google Docs. Also like Air Sharing Pro, GoodReader can act as a WebDAV server, letting you access items in its file store from other devices on a local network. Stored files can also be managed in iTunes.

## Main Navigation

GoodReader's main screen shows three folders, only the first of which is really a folder (**Figure 60**).

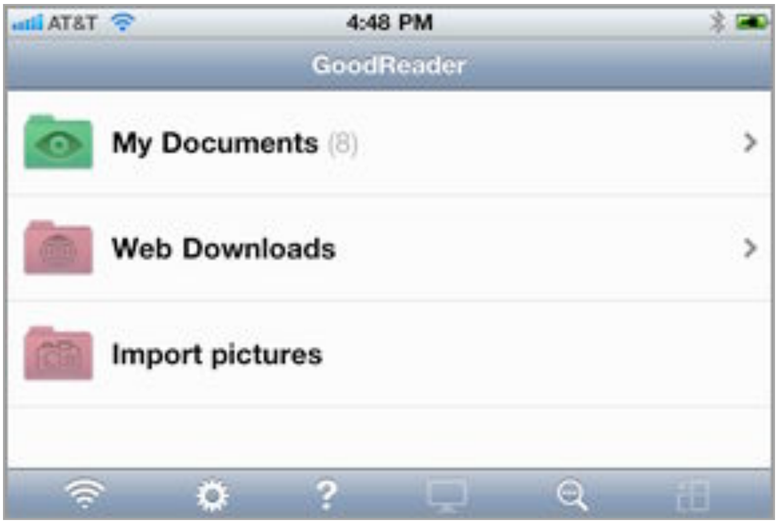


**Figure 60:** The GoodReader main screen lets you view and manipulate downloaded items (My Documents), access files from the Web and various servers (Web Downloads), and import items from Photos (Import Pictures).

Here's what you can do with each folder on the main screen:

- View locally downloaded files: Tap My Documents. (For details on viewing PDFs, see Read PDFs, several pages ahead.)
- Access a server or Web site: Tap Web Downloads. (For directions, read Download from Remote Servers and Download from the Web, immediately ahead.)
- Import an image or video from the Photos app: Tap Import pictures.

At the bottom of the main screen, a button bar common to all navigation views provides access to a set of features that you might need anywhere in the app (**Figure 61**).

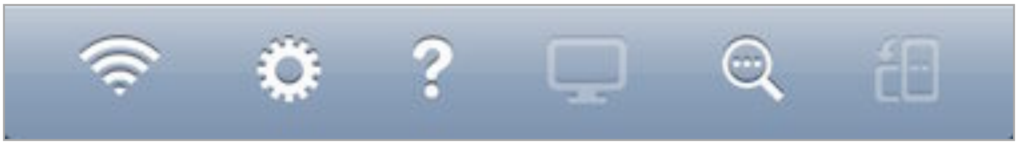


**Figure 61:** A button bar at the bottom of all navigation views provides access to common features. From left to right: turn on a WebDAV server, access settings, get help, control output (for showing photos or videos, for instance), search for documents, and lock the device's rotation to the current orientation.

## Download from Remote Servers

GoodReader can download files from a wide variety of servers—WebDAV servers, Dropbox, mail accounts, MobileMe's iDisk, Google Docs, FTP servers, and more.

To connect to a server:

1. From the main GoodReader screen, tap Web Downloads > Connect to Servers (**Figure 62**). (Why GoodReader has this option under Web Downloads is a mystery to me.)

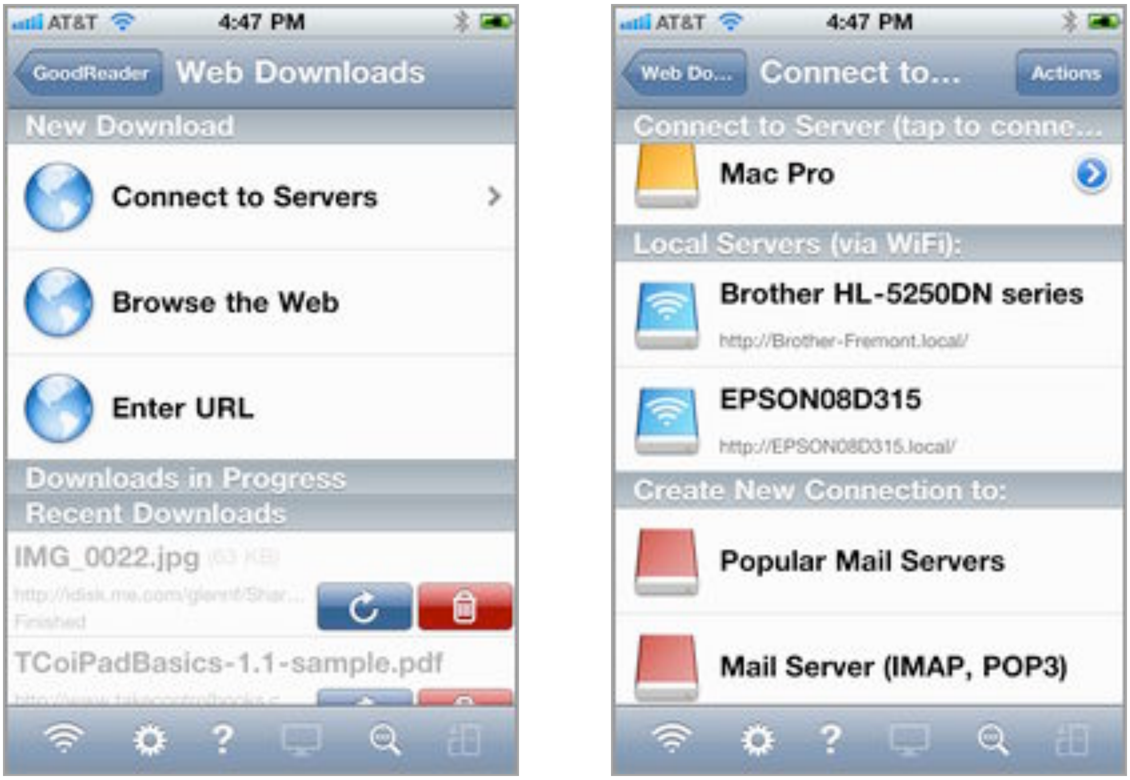


**Figure 62:** The Web Downloads view (left) paradoxically includes as its first link the only way to bring up server connections (right).

2. Make your connection:

   - To connect to a server that you've already "created" in GoodReader, tap its name under Connect to Server.

   - To connect to a local server over Wi-Fi, tap its name in the Local Servers list. (These are WebDAV servers that are advertising their availability via Bonjour.)

***Warning!*** *Most remote access to servers isn't secured, and I don't recommend accessing servers from GoodReader on public networks. The exceptions are mail servers in which you have SSL enabled, Google Docs (for login but not file transfer), Dropbox (for all transactions), and WebDAV servers that have a URL starting with https. See Transfer Data Securely.*

3. If you couldn't locate your desired server in Step 2, you need to create a new connection:

   a. In the "Create New Connection to" list (**Figure 63**), tap the name of the server or service that you want to connect to.

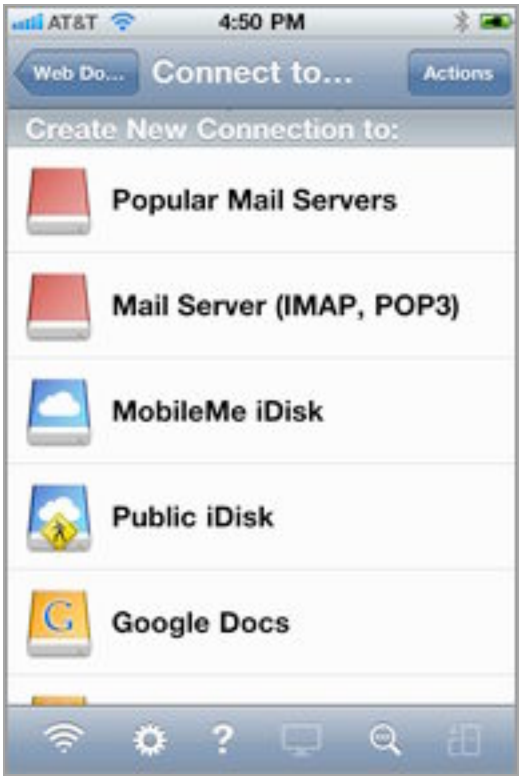


**Figure 63:** The list goes on far below the available space. Keep flicking.

b. Enter the necessary information for the particular connection method, typically a user name and a password.

c. Tap Add.

   The server now appears in the Connect to Server list (you can tap the detail button to change server connection details).

d. As in Step 2, in the Connect to Server list, tap the server name to connect.

Now that you're connected, GoodReader splits the view into one unfamiliar to Mac users, but common under Windows: folders at the top, files below (**Figure 64**).

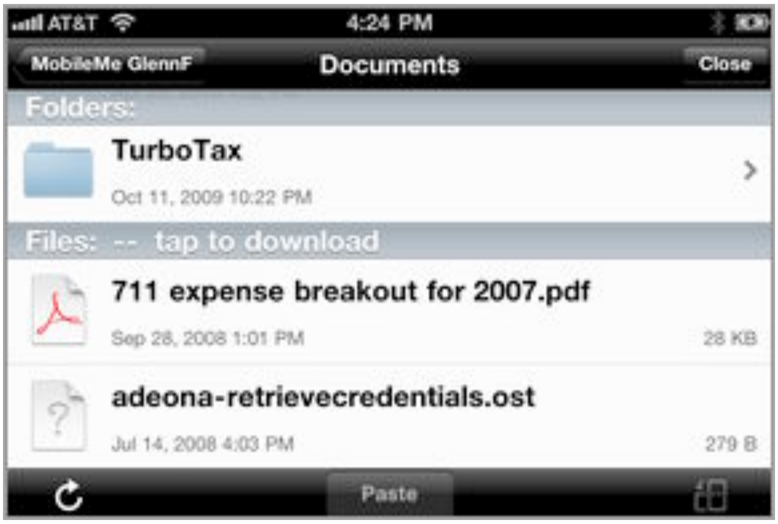


**Figure 64:** GoodReader shows the folders (top) and files (below) at a remote server.

You can tap a folder to drill down further; tap a file to retrieve and store it locally on your device. You can find the file via the My Documents folder on the main GoodReader view, or in the Recent Downloads list in the Web Downloads view.

***Warning!*** *Unlike Air Sharing Pro, GoodReader doesn't just temporarily store files; it downloads them and retains them until you delete them.*

## Download from the Web

GoodReader has an additional trick up its sleeve: it can connect to a regular Web server and display Web pages from which you can download files. This is useful when there's a PDF or other file that you want to retrieve quickly into a better viewing environment than Safari.

There are two ways to pull this off. The first is more obvious within the GoodReader app, but the second (A Trick in Safari) may be more efficient.

### Web Downloads Option in GoodReader

1. If you don't want to key in the URL for your download in GoodReader, you can copy it from the Safari app and store it in the clipboard. To do so, open the Safari app, load a Web page, and then to copy that page's URL, tap the URL area, tap again, tap Select All, and tap Copy.

Alternatively, to copy the URL for a link, hold down on a link, wait a moment, and then tap Copy (**Figure 65**).

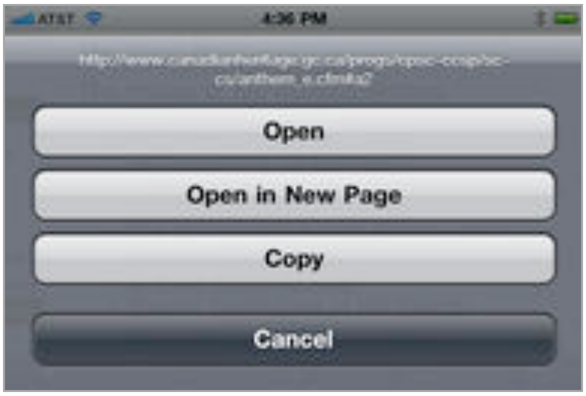

AT&T
4:36 PM
http://www.canadianheritage.gc.ca/progs/cpsc-ccsp/sc-cs/anthem_e.cfm#a2
Open
Open in New Page
Copy
Cancel

**Figure 65:** Use Copy in Safari to grab the link you need to download a document in GoodReader, such as a PDF file.

2. From the main GoodReader view, tap Web Downloads.
3. Do one of the following:
    - Tap Browse the Web to open GoodReader's browser and navigate to a Web page. You start by entering (or pasting) a URL in a blank browser window, and then you navigate from there. Each time you tap a link, GoodReader gives you tappable options for following the link, downloading, or cancelling (**Figure 66**).

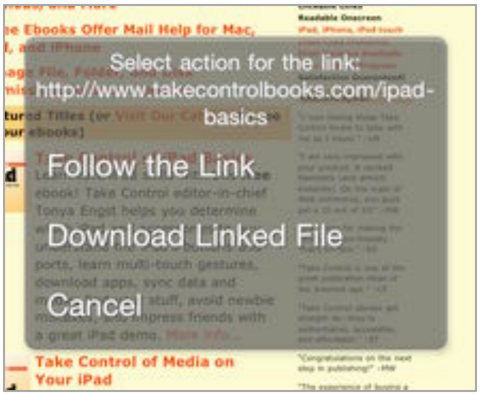

Select action for the link:
http://www.takecontrolbooks.com/ipad-basics
Follow the Link
Download Linked File
Cancel

**Figure 66:** Choose to navigate (Follow the Link) or retrieve (Download Linked File). Cancel keeps you on the page.

- Tap Enter URL to type (or paste) a URL for a specific file to download from a Web site.

**Downloading From Your Take Control Ebooks Account**
To download a Take Control ebook to an iOS device, log in to your account via a standard Web browser app, not GoodReader (http://www.takecontrolbooks.com/account). Once you are logged in, you can download directly to GoodReader by tapping in the correct column—don't use the procedure given just above or just below this tip. (This behavior may change in the future, making it possible to download directly from GoodReader.)

### A Trick in Safari

GoodReader registers a special URL identifier with iOS so that when the particular text at the start of a URL is entered, Safari automatically launches GoodReader to open that URL. GoodReader's trick? The developer added a `g` for GoodReader's registered identifier to the beginning of `http` and `https`, as in `ghttp` and `ghttps`. This lets you edit a URL in Safari to change it to a GoodReader format.

For instance, if you wanted to download a PDF while viewing the PDF in Safari you would touch the location field and hold down until the magnifying glass appears. Drag left to get the insertion point to the left of the `h` in `http` or `https`. Now type `g` and tap Go.

## Access GoodReader Storage Remotely

You can use several techniques to transfer files between GoodReader's file store and another computer or device. As with Air Sharing Pro, you can transfer files when the device is connected to iTunes with USB; for more details, read Manage and Copy Files via iTunes, earlier in this chapter. Also like Air Sharing Pro, GoodReader has a built-in WebDAV server. Unlike its competitor, however, GoodReader's WebDAV server has two distinct limitations:

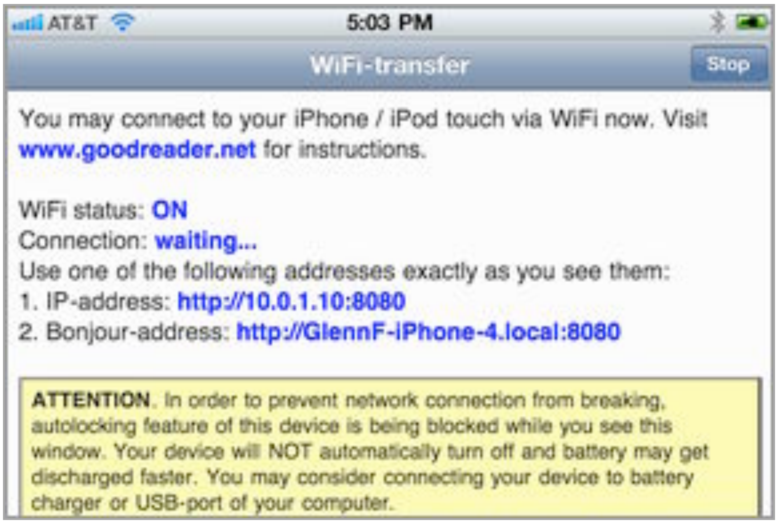
- It operates only when the WiFi-transfer [sic] window is displayed. You can't use other GoodReader features on the device when that window is showing.
- It doesn't offer secure modes of WebDAV for moving files over an open network. (Why is that a problem? See Transfer Data Securely.)

Nonetheless, GoodReader's WebDAV server works just as expected, and is a perfectly reasonable way to move files in and out of the app.

**Note:** The WebDAV server works only over a local network to which an iPhone or iPod touch is connected via Wi-Fi.

To use this feature, follow these steps:

1. Tap the Wi-Fi signal icon at the bottom left of any navigation view.
2. The WiFi-transfer window appears. It shows the information you need to enter on another system to gain access to the files and folders available from GoodReader (**Figure 67**).



You may connect to your iPhone / iPod touch via WiFi now. Visit www.goodreader.net for instructions.

WiFi status: ON
Connection: waiting...
Use one of the following addresses exactly as you see them:
1. IP-address: http://10.0.1.10:8080
2. Bonjour-address: http://GlennF-iPhone-4.local:8080

ATTENTION. In order to prevent network connection from breaking, autolocking feature of this device is being blocked while you see this window. Your device will NOT automatically turn off and battery may get discharged faster. You may consider connecting your device to battery charger or USB-port of your computer.

**Figure 67:** The details shown in this screenshot let you access GoodReader's file store from elsewhere on a local network. A red warning appears if the network connection is in active use.

Until you tap Stop, disconnect from a Wi-Fi network, or exit GoodReader, the program's WebDAV server is available on the local network. For how to connect to a WebDAV server from a desktop computer, see Connect to an iOS WebDAV Server, later in this chapter.

## Read PDFs

When you tap most types of files in the My Documents folder, GoodReader displays them without any special editing or navigation features. However, when you tap a PDF file, GoodReader overlays a template over the PDF viewing area for more efficient navigation (**Figure 68**). It takes a little getting used to, but it's available to view when you tap Help > Show Tap Zones.

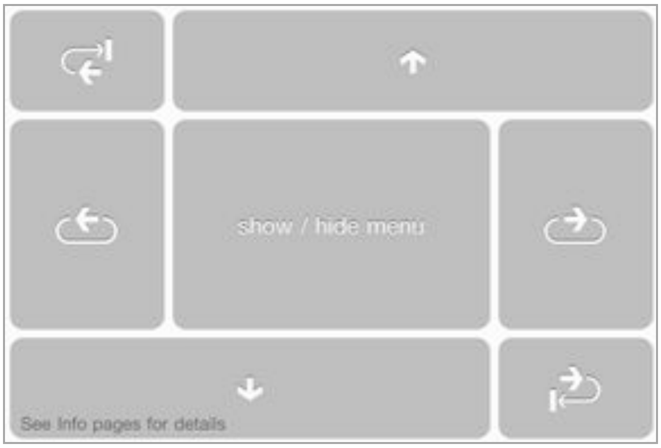


**Figure 68:** The Tap Zones overlay allows navigation based on where on the page you tap (landscape orientation shown).

***Don't miss the show/hide menu zone:*** *Perhaps the most important tap zone to keep in mind is the vertically and horizontally centered box in the middle: the show/hide menu zone. You must tap this zone to reveal the interface around the page, and go beyond reading the PDF and turning its pages.*

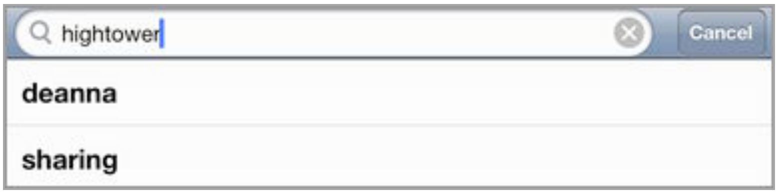
To search within a PDF, follow these steps:

1. In the toolbar at the bottom, tap the Search 🔍 button.

   You may have to tap the show/hide menu zone to see the toolbar.

2. Tap Find Text.

3. Enter search terms (**Figure 69**), and tap Search.

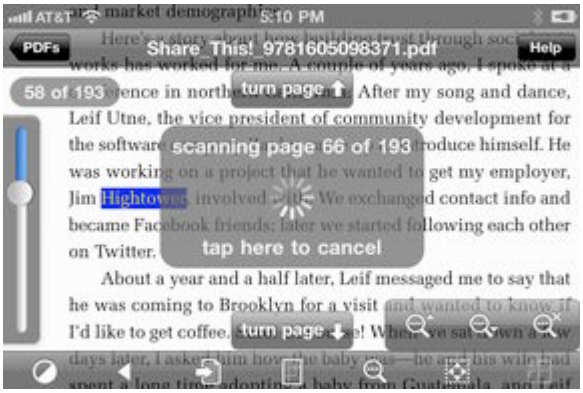

hightower

deanna

sharing

**Figure 69:** Enter search terms, and then tap Search in the keyboard (not shown).

GoodReader searches through the PDF (**Figure 70**) until it finds a matching result, then displays the page with the result highlighted.



market demographics

Here's a story about how building trust through social works has worked for me. A couple of years ago, I spoke at a ence in north After my song and dance, Leif Utne, the vice president of community development for the softwar roduce himself. He was workin on a project that he wanted to get my employer, Jim Hightower involved We exchanged contact info and became Facebook friends; later we started following each other on Twitter.

About a year and a half later, Leif messaged me to say that he was coming to Brooklyn for a visit and wanted to know if I'd like to get coffee. e! When we sat down a few days later, I asked him how the baby was—he and his wife had spent a long time adopting a baby from Guatemala, and Leif

**Figure 70:** GoodReader scans for the next match.

You can now navigate back and forth through results (**Figure 71**).

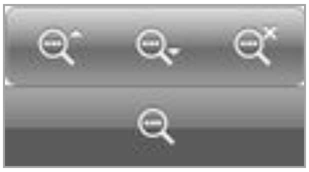


**Figure 71:** The magnifying glasses with up arrow (for back) and down arrow (for forward) step you through matches. Tap the glass with an X in the corner to cancel the search.

To access the table of contents or any bookmarks, tap the Search button on the toolbar, and then tap Bookmarks & Outlines (**Figure 72**).

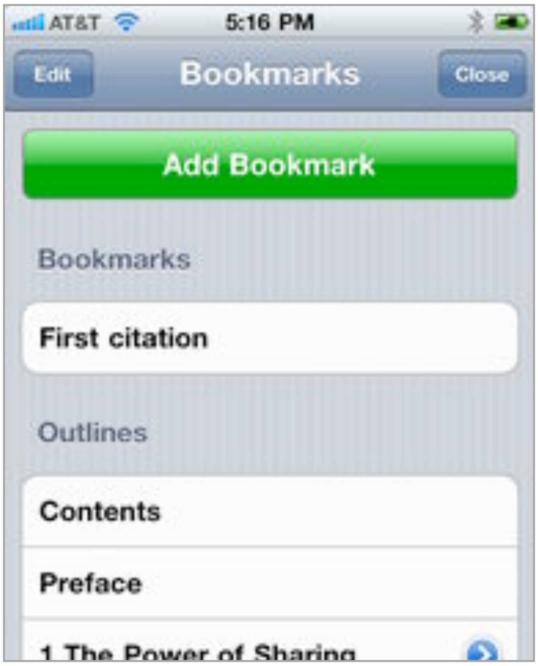


**Figure 72:** You can navigate via a table of contents developed by the PDF file's creator, or set bookmarks for yourself.

Tap an item in the list to jump to the location in the PDF. You can also create and then open your own bookmarks.

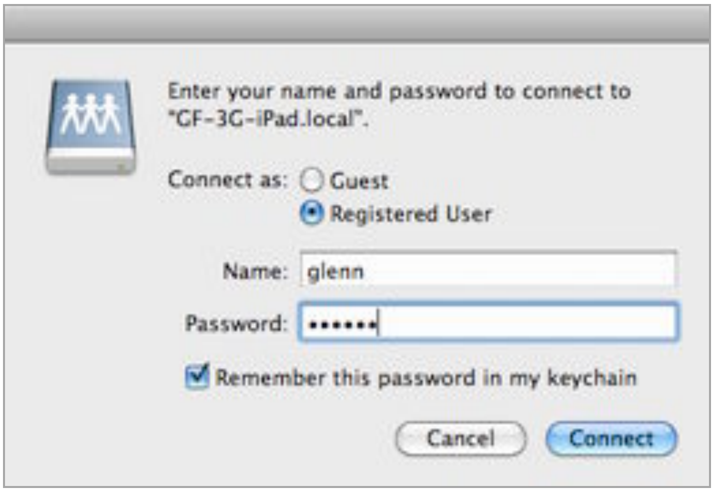
**Tip:** You can also tap the Go to Search button, then tap GoTo Page to enter a page number and jump directly to it in the PDF.

## CONNECT TO AN iOS APP WEBDAV SERVER

On a Mac, you access WebDAV servers from the Finder. Follow these steps:

1. In the Finder, choose Go > Connect to Server (Command-K).
2. Type in precisely the name or number provided by the iOS app running the server to which you are connecting. Typically you can find this information by tapping a Wi-Fi button on a toolbar in the app.

   Entering the server's name, while it takes more keystrokes, lets you bookmark the iOS app's server address for later access whenever the app's server is active.
3. In the login dialog, either:
   - If you haven't set up security as I advise for WebDAV access, click Guest and then click Connect.
   - Otherwise, enter the details you set in the app's Sharing Security settings (**Figure 73**) and click Connect.



Enter your name and password to connect to "GF-3G-iPad.local".

Connect as: ○ Guest
● Registered User

Name: glenn

Password: ••••••

☑ Remember this password in my keychain

**Figure 73:** Log in with the details you set in the app, if any.

***Invalid certificate?*** *If you connect with either secure (https) address offered by Air Sharing Pro, Mac OS X warns you about an invalid certificate. That's because Air Sharing Pro uses a digital identity that's not registered with an external certificate authority. But you know it's fine, because you're controlling both ends of the connection. Click Continue to bypass the warning, or, if you also want to skip the warning in the future, click Show Certificate, expand the Trust section, and from the When Using This Certificate pop-up menu, choose Always Trust.*

4. The app's file store appears as a volume on the Desktop (**Figure 74**).

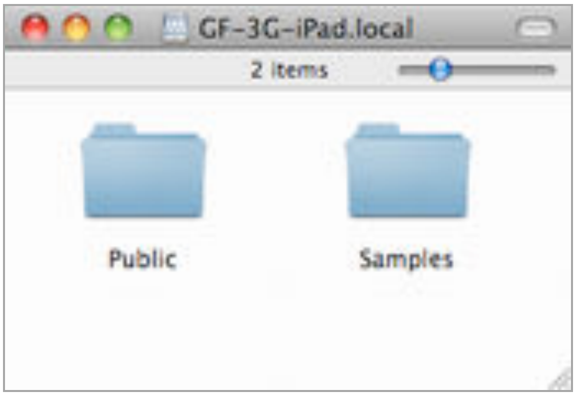


**Figure 74:** The app's storage mounts and appears on the Desktop.

**You Can Connect from Any Apple Device!**
On another Apple networked device, including another iPhone, iPod touch, or iPad, you can also connect to your iOS app's WebDAV server and then transfer files between the devices using Air Sharing Pro, GoodReader, or other software that handles WebDAV serving and access. You set one device to share; you connect from the other using the information the sharing device provides. Nifty!

In Windows, there are several ways to access an iOS app's WebDAV server; here is some general advice.

To make the connection:

- In Windows XP, from the Start menu, click My Network Places. In the My Network Places dialog, in the "Network Tasks" section near the upper left, click Add a Network Place.

***Windows XP note:*** *The folks at Good.iWare and Avatron recommend that XP users install the Microsoft Software Update for Web Folders; find it at http://support.microsoft.com/kb/907306.*

- In Windows Vista or 7, from the Start menu click Computer. From the toolbar at the top of the Computer window, click the Map Network Drive button. Click the "Connect to a Web site…" link.

Now, follow the prompts in the Add Network Place wizard, making sure (if it comes up) to uncheck Log On Anonymously.

# iBOOKS

You might think of iBooks as a program to read, well—books! But it's become a bit more following the 1.1 release of the app that added support for devices running iOS 4.

Let's look first at the process of getting files into iBooks, and then at how you use the reading features in iBooks.

## Get Documents into iBooks

iBooks can accept either EPUB or PDF files; at this time, the Apple iBookstore delivers books solely as encrypted (or digital rights managed) EPUB files, though the word on the street suggests that the iBookstore will sell PDF files in the future. If you want to go beyond shopping in the iBookstore, unfortunately, you're far more limited with how you get documents into iBooks than with any of the other apps in this chapter.

You have three options:

- Use iTunes in a rather restrictive way to synchronize EPUB and PDF documents (see Manage Files with iBooks).

- Transfer a PDF that you're viewing in the Safari app to iBooks.

- Pass an attached PDF from Mail to iBooks.

Let's walk through a workflow for getting a PDF into iBooks using Safari and Mail.

### Transfer a PDF via Safari:

1. Launch Safari.
2. Navigate to a PDF link and click it, or enter or paste a URL that points directly to a PDF file.
3. Safari displays a special dialog with an Open In button at the top left and Open in iBooks button at top right (**Figure 75**). (These buttons could vary depending on what apps you have installed.)

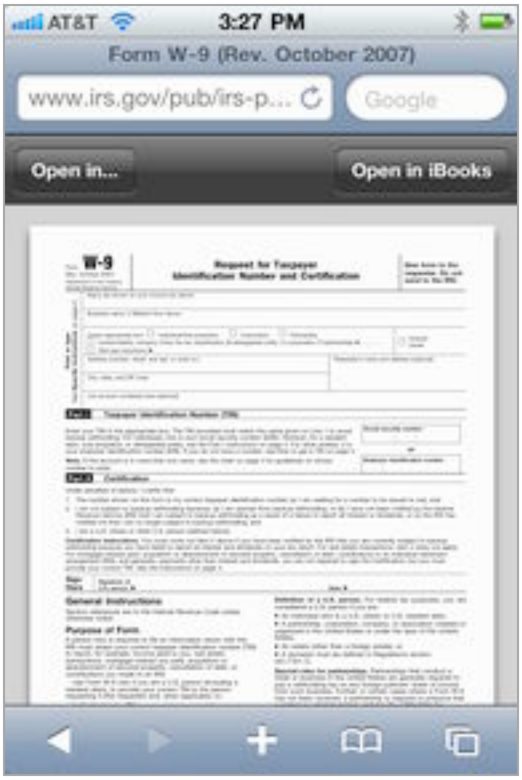


**Figure 75:** Safari presents a special view for PDFs. These PDFs can be opened in other apps that support PDF viewing, and with one tap in iBooks.

iOS switches you to the iBooks app and, after a moment of copying in the background, briefly shows the PDF you selected on the bookshelf (**Figure 76**), and then opens the PDF to its first page (**Figure 77**).

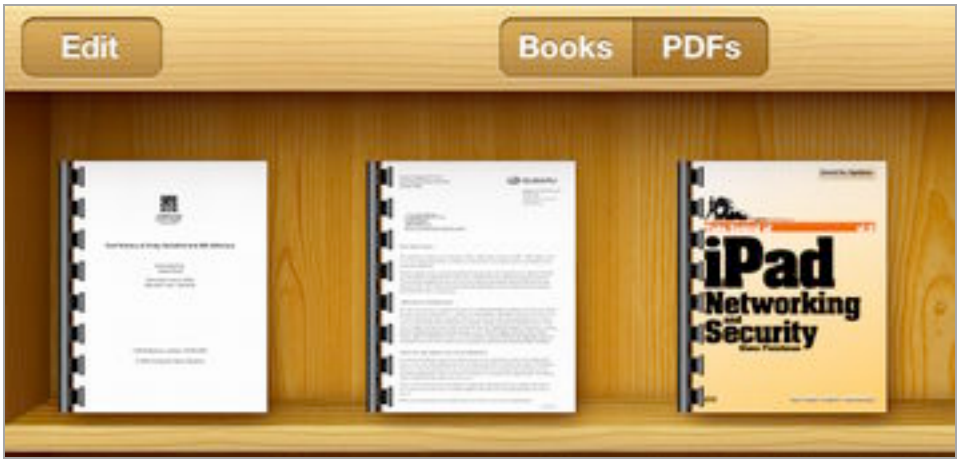
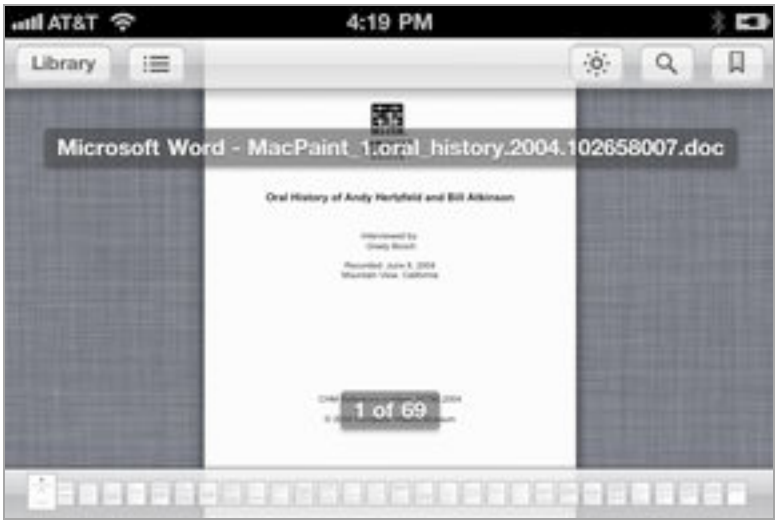


**Figure 76:** The copied file (at far left) appears on the bookshelf.



Microsoft Word - MacPaint_1.oral_history.2004.102658007.doc

Oral History of Andy Hertzfeld and Bill Atkinson

**Figure 77:** iBooks opens the copied file to its first page.

### Transfer a PDF via email and Mail:

1. In any email client (Web, desktop, or mobile), create a message to yourself, and attach one or more PDFs to the message.
2. Send the message.

> ***Warning!*** *Many email services limit total message size to 10–20 MB. If the PDF isn't locked, you may be able to open it in Preview or Adobe Acrobat, and save it in an optimized format that compresses images more highly, but that will be fine for mobile reading.*

3. Launch Mail in iOS, and check for new messages. Select the message with your PDF attachment.

4. If the attachment is too large to download automatically, tap its name in the message to complete the download (**Figure 78**).

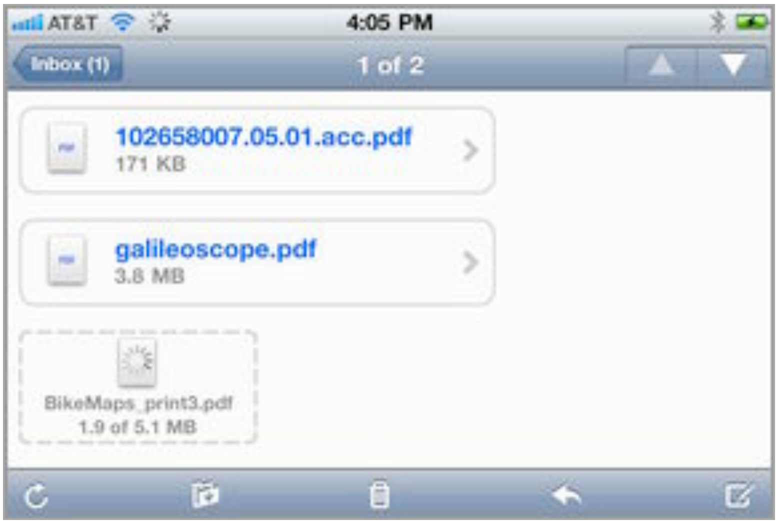


**Figure 78:** A list of attachments to an email message in the Mail app. Tap larger attachments to download them; "BikeMaps print3.pdf" is downloading in the figure.

5. Tap and hold on the name of a downloaded attachment.

   A dialog appears, allowing you to choose an app to open the document (**Figure 79**). Tap the name of the app you want, or tap Open In to get more choices.

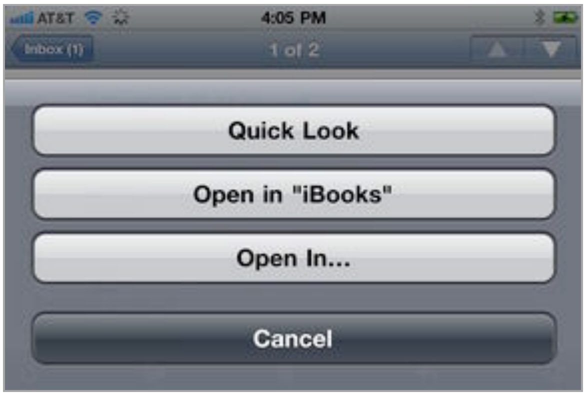


**Figure 79:** Tapping and holding brings up an option to open the document (really, copy it) in iBooks.

iOS switches you to the iBooks app and, after a moment of copying in the background, briefly shows the PDF you selected on the bookshelf (**Figure 76**, earlier), and then opens the PDF to its first page (**Figure 77**, earlier).

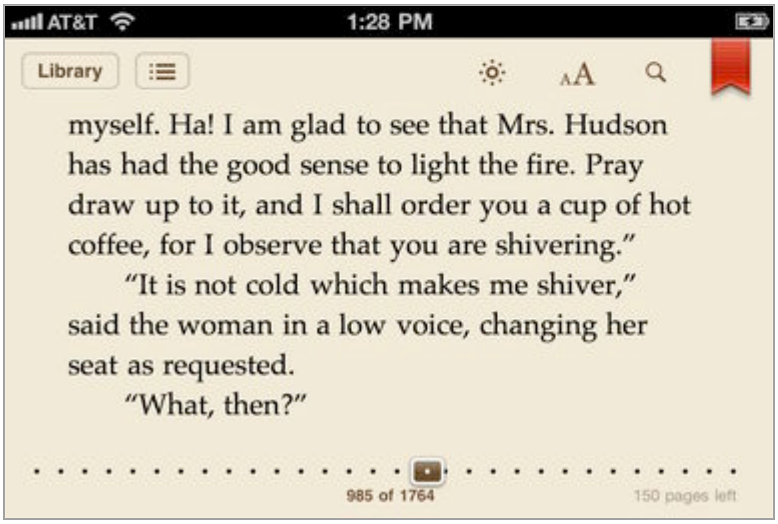
## Read EPUBs and PDFs

iBooks has straightforward controls for navigating a book or other document, and for searching the contents. The controls are slightly different for EPUB and PDF files.

### Read an EPUB

EPUB documents are formatted to include information about line breaks and where images are placed, but they don't describe the appearance of a page precisely. That allows book-reading software like iBooks to let you set the typeface, size, and other parameters of a display (**Figure 80**).

With a book open, you can tap or tap and drag left or right to move forward and back through the book one page at a time. A slider at the bottom that appears a few moments after a book is loaded—iBooks is paginating the book based on display settings in the background—lets you move rapidly through the entire book. Tap the center of the page, and the interface buttons disappear to reduce clutter.



myself. Ha! I am glad to see that Mrs. Hudson has had the good sense to light the fire. Pray draw up to it, and I shall order you a cup of hot coffee, for I observe that you are shivering."

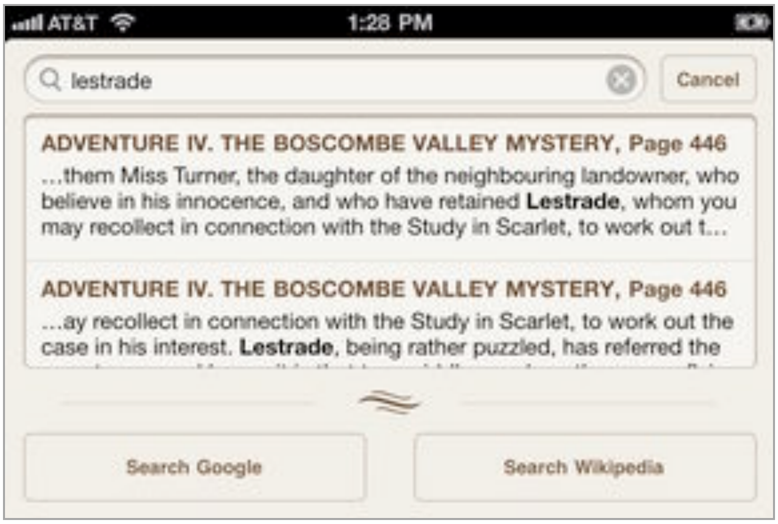
"It is not cold which makes me shiver," said the woman in a low voice, changing her seat as requested.

"What, then?"

**Figure 80:** The top of an EPUB displayed in iBooks has options for navigation and display control, while the bottom has a position indicator that can be used to move rapidly through the book, along with virtual page and fixed chapter information.

From left to right at top: Library returns you to the bookshelf view; ☰ shows the table of contents and bookmarks list; ☼ controls brightness; ᴀA lets you set font size and typeface; and 🔍 lets you search through the book. A red bookmark icon appears if a bookmark is set on the page.

iBooks also lets you search through an EPUB, showing the results in a list. EPUBs lack pre-computed indexes of words, and searches aren't speedy (**Figure 81**).



ADVENTURE IV. THE BOSCOMBE VALLEY MYSTERY, Page 446

...them Miss Turner, the daughter of the neighbouring landowner, who believe in his innocence, and who have retained **Lestrade**, whom you may recollect in connection with the Study in Scarlet, to work out t...

ADVENTURE IV. THE BOSCOMBE VALLEY MYSTERY, Page 446

...ay recollect in connection with the Study in Scarlet, to work out the case in his interest. **Lestrade**, being rather puzzled, has referred the

**Figure 81:** Searching within an EPUB shows a list of matching headings and pages with the words highlighted. You can also search Google or Wikipedia; iBooks launches Mobile Safari, which sends the search term to the chosen site.

### Read a PDF

In contrast to the EPUB format, PDFs preserve the precise appearance of the document from which the PDF was created. That prevents you from reformatting the contents, but it also typically provides a better looking view than a comparable EPUB version.

The available controls for PDFs are identical to those for EPUBs, with the exception of the font size and typeface button, which is missing (**Figure 82**). A series of image previews along the bottom of a PDF show a glimpse of the book evenly spaced across its full page length. You can tap a thumbnail, or tap and drag to move among pages. Pages can be pinched or expanded, too.

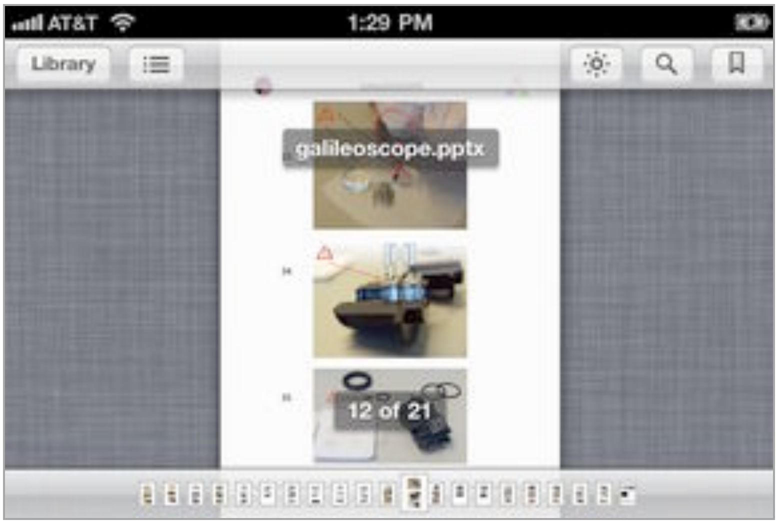


**Figure 82:** iBooks shows PDFs in a view similar to EPUB. You can pinch and expand PDF pages.

## DROPBOX

The Dropbox ecosystem lets you store items in a folder on any computer on which you have Dropbox software installed, and have any changes to items in that folder immediately synchronized, not only to Dropbox's cloud-based servers, but also to all registered computers.

You can also share individual folders within the Dropbox folder on your computer to another person or a group of people, thus making a "local" copy of that folder on the computer of each person it is shared with. Changes in any such local folder are copied right away to a Dropbox server and then relayed to each corresponding local folder as fast as each Internet connection allows. Dropbox includes 2 GB of free storage and charges monthly fees for larger quantities (http://dropbox.com/).

***Inherently secure:*** *Dropbox uses only secured transfers. There's no need to worry about files being seen in the clear on open networks when you use the service. However, for maximum security, you'll want to protect your Dropbox files in case your device is borrowed or stolen by the wrong person. To do so, in the Dropbox app, tap the Settings ⚙ button and then tap Passcode Lock. Of course, the best protection in the case of theft will be to wipe the device with Find My iPhone (see Find My iOS Device via MobileMe), and change your Dropbox password on the Dropbox site.*

It's natural to want a portal into Dropbox from an iPhone or iPod touch, and Dropbox obliges. You can access Dropbox files using the free, universal Dropbox app, which works well on any iOS device.

***Warning!*** *The Dropbox app can't automatically update its file store. See https://www.dropbox.com/help/82 for details. You use the Favorites popover to update files, described later.*

Alternatively, some apps have added Dropbox support, allowing you to access Dropbox files via the Internet, without opening the Dropbox app. In particular, Air Sharing Pro and GoodReader both support Dropbox. Compared to the Dropbox app, they both have superior document reading features, so you may prefer to use them.

### Dropbox Can Aid in Automatic Photo Uploads

Dropbox includes a feature that lets you take pictures within the app and upload them directly to your Dropbox storage at the level of compression you specify. That alone could be very useful to you, but you can go further. Because Dropbox automatically syncs to any active computer or device using the same account, you can use Mac OS X's Automator program to perform actions when the Dropbox folder's content on your Mac is changed.

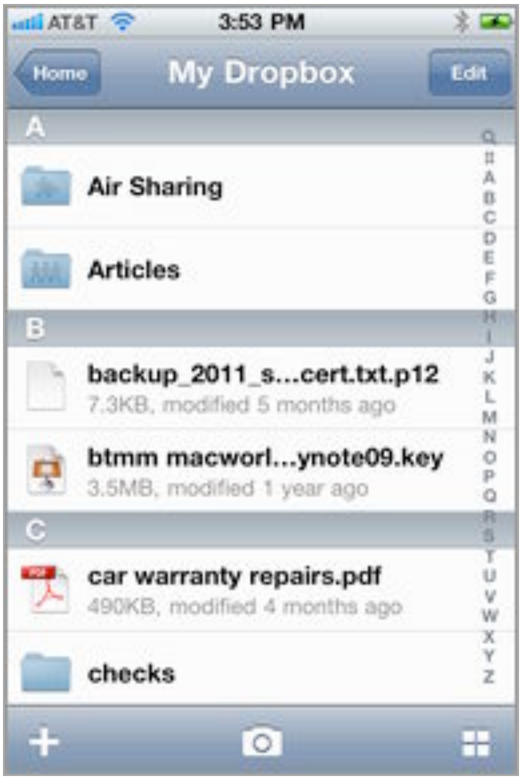
For example, Automator can watch the folder, and then rename each image that appears there with an appropriate file name (Dropbox names uploaded photos Mobile Photo plus the date and time), import the image into iPhoto, upload it to Flickr, and send email to you to let you know that these things have happened.

While you can also publish photos in a variety of ways from the iOS Photos app, Dropbox automation could offer many more choices and less manipulation on the iPhone.

## Access Files

When you first launch the Dropbox app, you enter the user name and password associated with your account. That information is stored for later logins. (To make the app forget your login credentials, tap the Settings ⚙ button and then tap Unlink Device from Dropbox.)

To access available files, tap My Dropbox on the Home screen, and then scroll through the My Dropbox list, navigating into folders by tapping them (**Figure 83**).



A

Air Sharing

Articles

B

backup_2011_s...cert.txt.p12
7.3KB, modified 5 months ago

btmm macworl...ynote09.key
3.5MB, modified 1 year ago

C

car warranty repairs.pdf
490KB, modified 4 months ago

checks

**Figure 83:** The My Dropbox view shows you the contents of your synchronized Dropbox storage.

In longer file lists, tap letters on the view's right to zip through the list. (A sort by date or category option would be welcome!) The Search field at the top of the view lets you rapidly find files by partial filenames, too.

To view a document, tap it. The Dropbox app's viewer lets you scroll through multi-page documents, but it has no search or other features for reading PDF or other file formats.

Here are a few important Dropbox tips:

- Delete multiple files by tapping Edit at the upper right in any view, and then selecting files to remove. In the regular view, you can also swipe right over a file name to get a prompt to delete a single file, as in most apps.
- To add photos or videos stored in the Photos app to your file list, tap the plus + button in the My Dropbox view at the top right. In Settings (reached via the Home screen), you can choose the compression level for uploaded photos and video.

- To share a link to a file, tap the Link 🔗 button while viewing a file. You can choose to email a public link to the file, or copy that link to the Clipboard.

- To open a file in another program, tap the Open In button while viewing the file. For images, Dropbox asks if you want to save the image in your photo library; for other kinds of files, programs like GoodReader or iBooks are suggested.

- When you are viewing an image, you can preview a folder of images or PDFs as thumbnails by tapping the Thumbnails ▦ button that appears to in the upper right of the image view (**Figure 84**).

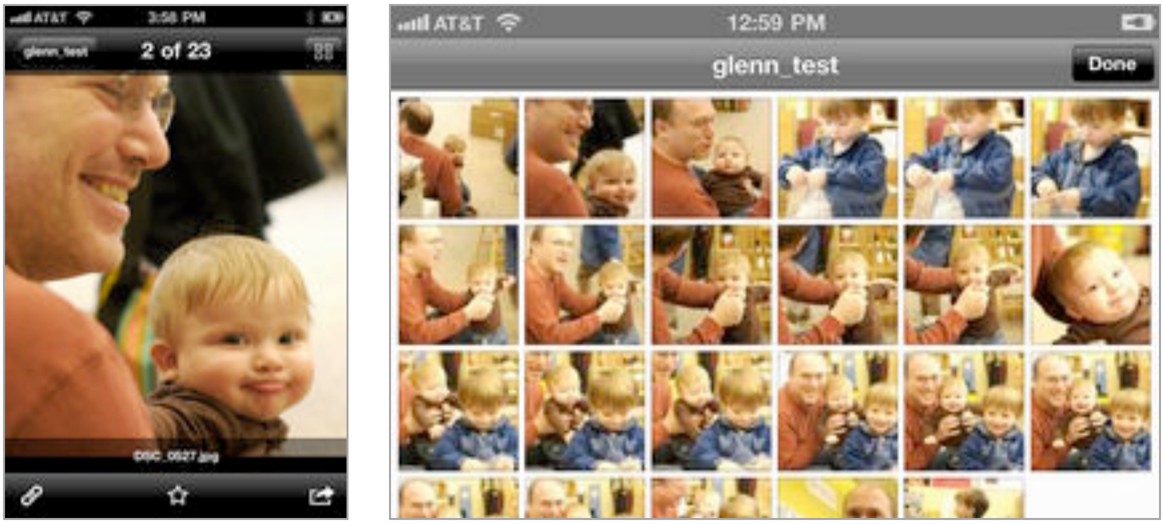
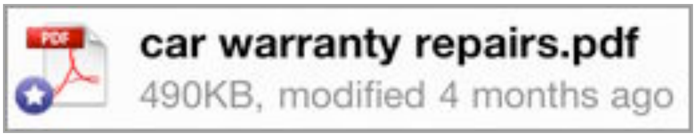


**Figure 84:** When you are viewing an image, the Thumbnails ▦ button appears in the upper right (left). Tap the button for the thumbnail view (right), which displays all images in the folder; tap any image to view it.

## Keep Files Locally

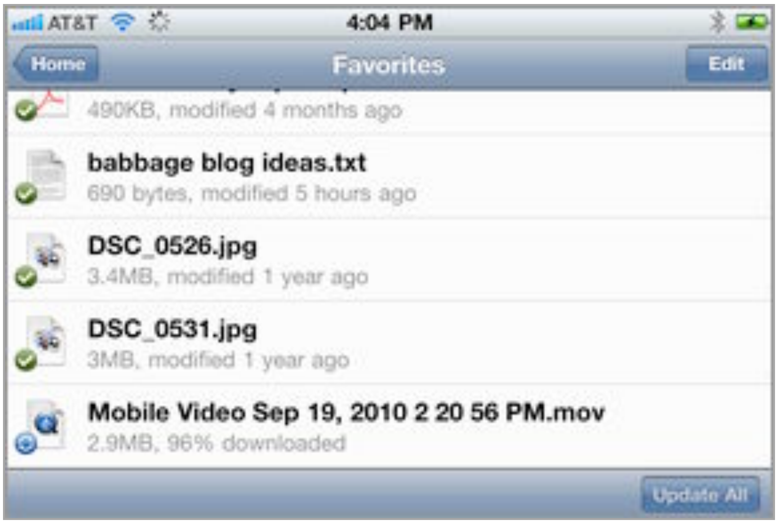
Dropbox temporarily downloads any file you tap to view (if it's a supported file format), but you can store that download on your device by tapping the Make Favorite ☆ button beneath the view. Files marked as favorites receive a tiny star as part of their icon (**Figure 85**).



car warranty repairs.pdf
490KB, modified 4 months ago

**Figure 85:** Dropbox puts a white star in a blue circle on files that are marked as favorites.

Tap the Favorites icon on the Home screen to see items you've marked to keep. Files that are currently downloading have a blue rotating badge (just as with Dropbox in desktop operating systems); a green checkmark badge indicates a fully downloaded file (**Figure 86**).



490KB, modified 4 months ago

babbage blog ideas.txt
690 bytes, modified 5 hours ago

DSC_0526.jpg
3.4MB, modified 1 year ago

DSC_0531.jpg
3MB, modified 1 year ago

Mobile Video Sep 19, 2010 2 20 56 PM.mov
2.9MB, 96% downloaded

**Figure 86:** Files with a green checkmark are fully downloaded. Tap Update All to refresh the downloaded content.

Dropbox files stored on an iOS device aren't automatically updated when they change elsewhere, due to restrictions in how Dropbox can operate under iOS, the company says. But you can update your Dropbox files manually in the Favorites list, and the app does note those files that need updating.

The Favorites list has three features bundled into two actions:

- Tap Edit to remove files from the local data store or to change their listed order. You can also swipe over a file from left to right in the regular view to remove it. In both cases, the term *remove* is carefully used; you aren't deleting from your central Dropbox storage.
- Files that are out of sync are marked with a green arrow. Tap an individual file to download its latest version, or tap Update All to refresh the contents of all stored files.

## iDISK

The free MobileMe iDisk app provides a view into your MobileMe iDisk storage. Because iDisk files can be accessed with apps like

GoodReader and Air Sharing Pro, there's no compelling reason to use the iDisk app unless you frequently need to share iDisk files or you want to delete items from your iDisk.

The main view lists the folders on your iDisk. Tap a folder to navigate down; tap a file to view it (**Figure 87**). Files that you view aren't stored locally, just downloaded temporarily.

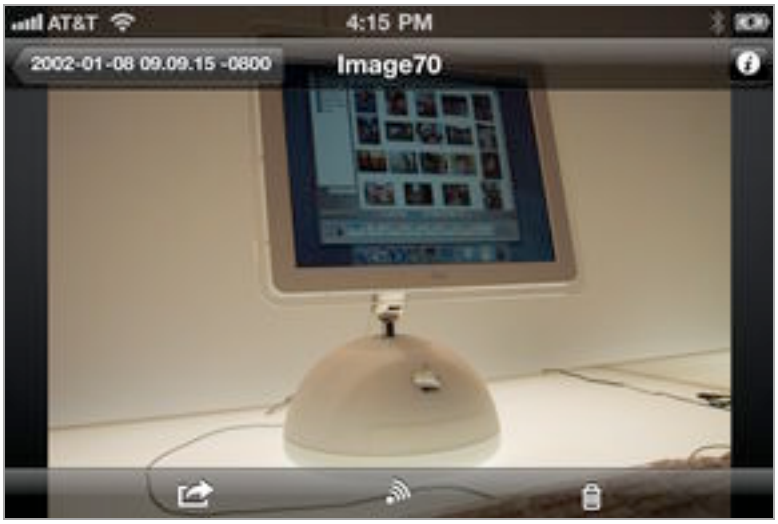


**Figure 87:** You can view photos stored on your iDisk.

Four other iDisk features extend the app's usefulness:

- **Share a file:** You can share a file stored on your iDisk by sending an email message containing a download link to that file. To do so, either tap the Share icon to the right of the filename in the list view, or view the file and tap the Sharing icon at the bottom of the screen (**Figure 87**, above). Files you've shared with the iDisk app or via Me.com in a Web browser are shown in the Shared Files view. You can re-share items for which the expiration date has passed by using that view, too.

- **Open a file in another app:** While viewing a file, tap the Open In icon.

- **Delete a file:** You can delete a file either in the list view (tap Edit) or while viewing the file (tap the Trash icon).

- **Connect to other MobileMe Public folders:** Tap the Public Folders button on the toolbar, then tap the plus + button to add the Public folder of another user.

# Transfer Data Securely

Any networked mobile device, whether an iPhone, laptop, Nintendo game player, or what have you, can be in constant communication with a network, which means that you could unintentionally reveal a lot about yourself—including passwords and private data—as it flows between a central hub and the device. With an iPhone, that hub is either a Wi-Fi router or a 3G base station on a cell tower nearby; with an iPod touch it's a Wi-Fi base station.

On an open public network, such as the Wi-Fi found in restaurants, cafés, and airports worldwide, anyone in your vicinity can use free, simple *sniffing* software to capture all the data passing by, extract passwords and personal information, and use it to wreak havoc, commit identity theft, and order goods and services for themselves. While it may sound paranoid, there's no built-in protection for some of your data, and you thus have to assume from the perspective of risk that someone is always trying steal your data.

Fortunately, it's easy to overcome this problem with a small amount of preparation and configuration. Here's what you need to know to stay protected while using local networks and the Internet.

## EXPOSURE

To figure out how to respond to the risk of data being captured as you transfer it, let's first consider what precisely is at risk and not at risk.

***Cellular data is far less risky:*** *Cellular data is encrypted by default, and cell networks have far less risk for use. See 2G and 3G Data Networks for more details, later in this chapter.*

### What's at Risk?

When you're connected via Wi-Fi, the risk is both in data passing over the air from an iPod touch or iPhone to the Wi-Fi router, and data passing between the Wi-Fi router and a broadband modem over Ethernet. Malicious software that's found its way onto a computer that's connected via Ethernet to a Wi-Fi router could sample all data coming and going between Wi-Fi–connected devices and the Internet.

Here's a short list of what a sniffer could extract from the data passing over a Wi-Fi network and beyond to and from your iOS device:

- Email passwords for accounts that aren't protected with SSL/TLS.
- WebDAV accounts, used for file-server access in many iOS apps (including accessing MobileMe), unless the WebDAV server's URL starts with `https`.
- Files stored on WebDAV servers running in an app on your iOS device. If you have GoodReader or Air Sharing Pro or any of several other apps active, and have WebDAV sharing enabled *without a password,* anyone on the same network may have easy access to all the files stored with the active app.
- The contents of Web pages viewed and forms submitted, unless the URL starts with `https`.
- Screen sharing via VNC, unless SSH encryption is also enabled (see Remote Access and Control).
- FTP has various risks:
  - Passwords and data sessions are exposed with plain FTP.
  - Data sessions are exposed with FTP over SSH (which is distinct from Secure FTP and FTP over SSL, explained just ahead).

More generally, unless a developer discloses the information, we don't know whether an app that communicates with remote servers encrypts logins and data in transit.

***Logins protected:** Most Web sites and apps encrypt logins, even if they aren't consistent enough to protect data exchanges after login.*

## What's Not at Risk

A large set of data is not at risk, because it's protected by strong encryption that prevents anything but the server on the other end of a connection (a mail server, Web server, Internet telephony node, and so on) from deciphering and interpreting the results.

***Ask the developer:*** *If you don't know whether or not a particular app or service uses encryption and it's not described ahead, ask the developer! If you don't get an answer, or find that it's not secured to your liking, find an alternative.*

Let's take note of three types of communications that you don't have to worry about.

### SSL/TLS-protected Sessions

Hey, you say, that's a mouthful! Let me break it down. *SSL* (Secure Sockets Layer) is the name for older versions of a security method that were updated. It is now known as *Transport Layer Security*. It's a basic means of protecting a connection between two parties, usually a client (like a mail program) and a server (like a mail server). SSL/TLS connections use certificates and outside verification of those certificates' validity, making SSL/TLS connections quite secure and reliable.

SSL/TLS is used for the following kinds of things:

- **Email connections:** In iOS, the default mail services that Apple lists in the Add Account view of the Settings app (except Microsoft Exchange) are secured by default. Exchange may or may not be secured depending on your network administrator. You can also create an email connection to other mail hosts and enable SSL/TLS.

  ***Dump non-secure hosts:*** *If your mail provider doesn't offer secure email connections, switch providers. There's no excuse.*

- **Web sessions:** If the URL in your browser's location field starts with https and there's a lock icon somewhere in the Web browser's interface, then you're on a secure site (**Figure 88**). Any data sent and received is secure from prying eyes.

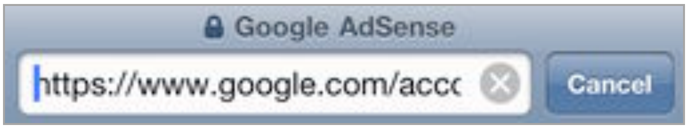


**Figure 88:** The lock by the title of the page and the https in the location field indicate that this site uses SSL/TLS to protect data in transit. (The https isn't shown in the URL by default; I had to tap then tap and drag in the URL field to scroll back to the URL's start.)

***Smart sites use protection:*** *Ecommerce sites, pages on which you enter credit cards, banking sites, stock-trading sites, and many email hosts use encryption by default, and have no other way to access information.*

- **WebDAV:** The file-transfer protocol used by MobileMe and other sites, *WebDAV* is widely supported in file-viewing apps (see Access Documents). It can work in a plain, unprotected mode or over SSL/TLS. The URL for an SSL/TLS-protected WebDAV site will start with `https`, just like a secure regular Web site.

***Warning!*** *Some WebDAV servers may use a certificate that was generated without verification by a third party (called a* certificate authority*). If you access one of these on a mobile device or desktop operating system, the device will warn you to make sure there's no skullduggery involved. When connecting between two machines right in front of you, there's no risk in accepting a so-called* self-signed *certificate.*

- **FTPS:** *FTP,* a file-transfer standard, comes in many forms. *FTPS* (FTP over SSL/TLS) is a secure method for transferring files, but not in nearly as wide use as SFTP.

### SSH-protected Sessions

*SSH* (Secure Shell) was developed for terminal sessions, where you control a system through command-line instructions. Its use is now widespread for certain kinds of session-based software, especially when two computers, neither of them used as network servers, connect to one another.

***No certificates:*** *SSH doesn't require a third-party signed certificate to start up a connection as does SSL/TLS, which removes some of the overhead of having a third-party involved in verifying the connection. SSH security can be just as strong as SSL/TLS.*

In iOS, typical uses of SSH include:

- **VNC (virtual network computer) remote access:** VNC itself lacks strong encryption (it uses a breakable password method), but programs like iTeleport allow a connection to open first using an SSH session, after which VNC starts up inside an encrypted *tunnel*.

- **SFTP:** SFTP isn't really FTP; it's a different protocol that's widely supported. SFTP uses SSH to handle file transfer securely. (There's also the infrequently used FTP-over-SSH, which encrypts only the control part of FTP, such as logins and requests for specific directories, leaving all data transfer unprotected.)
- **Terminal connections:** There are a handful of terminal apps for iOS that you might use for command-line sessions for Unix and Mac OS X systems that support SSH.

### Proprietary Services

Several apps that connect to special services feature end-to-end encryption, although it must be enabled in some cases. Here's a partial list, based in part on services I've tested on an iOS device:

- Dropbox uses strong encryption for data transfer. SSL/TLS is used for file transfers, and files are stored in encrypted format locked with your account password (https://www.dropbox.com/help/27).
- Google logins are protected, but not necessarily the contents of Google-browsing sessions. See Secure Solutions, shortly ahead.
- iTunes purchases and downloads are protected by Apple, likely using SSL/TLS for logins. Apple doesn't disclose its methods.
- LogMeIn remote access sessions are secured by SSL/TLS, layered with other security methods (https://secure.logmein.com/US/security.asp).
- Skype's voice and other communications tools are secured by a proprietary system which involves several components to secure logins and the contents of sessions (https://support.skype.com/faq/FA145/What-type-of-encryption-is-used).

## What Networks Are Risky?

As I noted in the introduction to this chapter, public hotspots are risky. Outside of public Wi-Fi networks, however, you have enormously lower general risk, and very little practical risk of having data intercepted.

### Wi-Fi at Home or Work

At home, your data will likely remain safe as long as you've secured the network with WPA Personal or WPA2 Personal; at an office, either of those or WPA2 Enterprise will protect your data.

Offices that handle sensitive data should opt for WPA2 Enterprise because it allows individual user names to be set for network access, access can be tracked and revoked, and it likely conforms to rules requiring extra protection for firms handling legal, medical, and financial records.

For someone to capture data at home or at your work, that person would have to stake out the network, break your encryption method, and get something useful during the period of time he or she is observing. If someone were targeting you personally due to a grudge, a court case, or another reason, WPA/WPA2 encryption would protect your networks.

***Warning!*** *WEP is effective only as a no trespassing sign. It's quick and simple to use free software to crack a WEP-protected network, so WEP is no good even as a thin shield.*

**Tip:** See Connect to a Secure Wi-Fi Network for more details.

### 2G and 3G Data Networks

2G and 3G GSM data networks always secure all the data passing over them, partly using information on the SIM (Subscriber Identity Module) that's part of any phone or device, such as the iPhone.

Some exploits have cracked and read 2G data, but they've required a fair amount of concerted effort, unlike a sniffer at a hotspot. Someone has to target you or a particular area for a period of time and have a reasonable amount of gear.

The encryption system used for 3G GSM networks has some flaws, but they are not broken yet (and can be improved for flaws that were found). Even if broken, someone would need to exercise serious and specific scrutiny to obtain your data.

# SECURE SOLUTIONS

In cases in which some kind of security isn't in place by default, you can turn on protection. Let me start with an overall method, and then look at individual switches and controls for particular services.

## Umbrella Protection with a VPN

A *virtual private network* (VPN) connection is a nifty way to prevent any sniffing of your local network hookup. A VPN encrypts all the data coming and going from a device, such as an iPod touch or iPhone, creating a *tunnel* that extends between the device and a VPN server somewhere else on the Internet, traversing with protection any local network and hubs as well as every node on the Internet between the two points.

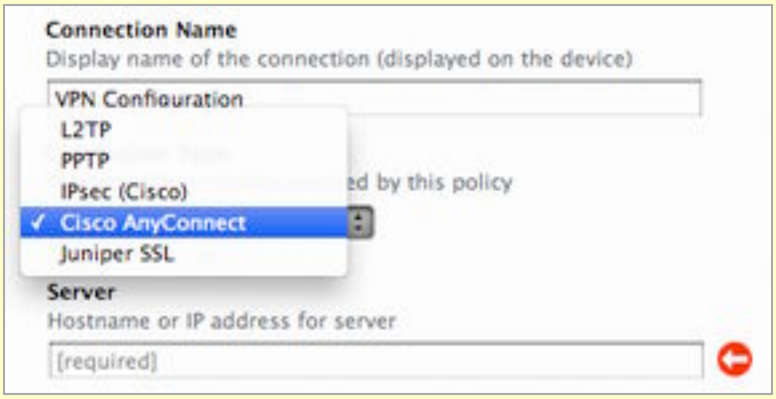
For corporations, VPNs provide a way to extend the aegis of corporate security to remote devices and computers. For individuals, that's less the case. With a company, the VPN server is within the corporate network and any data leaving that server is protected by company firewalls and intrusion prevention.

But if you're using a VPN just to protect your local link, data remains encrypted only until it hits the VPN server, usually located in a data center. From that data center to its destination, data is unprotected (unless wrapped in methods described earlier), but that's typically just fine. The point of risk is the local link. Before you can set up your device, however, you need to find a VPN service.

There are several kinds of VPN protocols, and iOS 4 supports the most popular: L2TP, PPTP, and IPsec. The first two are generic, widely used standards. The IPsec label actually works only with a specific Cisco VPN version, even though the term *IPsec* is a standard term in the security industry. (Apple, like many companies, spells IPsec with a capital S, even though that's the wrong capitalization.)

### Two New Kinds of VPN Flavors

In iOS 4, Apple added two new VPN types that use SSL/TLS, one by Cisco and one by Juniper. However, to use either of these new types, you must also use a separate configuration program called iPhone Configuration Utility (it works with any iOS device). It's a free download from http://www.apple.com/support/iphone/enterprise/. The software was designed to be used by network administrators, but average mortals may find a little benefit (**Figure 89**).



Connection Name

Display name of the connection (displayed on the device)

VPN Configuration

ed by this policy

✓ Cisco AnyConnect

Server

Hostname or IP address for server

[required]

***Figure 89:** The iPhone Configuration Utility lets you set up Cisco or Juniper SSL/TLS-based VPN profiles.*

Mac OS X Server and Microsoft Windows Server in any recent vintage (since about 2004), include VPN server software you can use without turning to a third party. Ask your network administrator (if one exists), or find a consultant to help configure the VPN services securely.

## Find a VPN Service

Several firms offer "VPN for hire," letting you pay a monthly or yearly fee for VPN service to their data center servers. Here are two that I've had experience with:

- **WiTopia's personalVPN:** WiTopia offers a PPTP-based VPN service for iOS. Some hotspots block PPTP for reasons that are unclear to me. That said, I've rarely had trouble using PPTP on the road (http://www.witopia.net/index.php/products/, $39.99 per year).
- **PublicVPN.com:** This firm uses another popular VPN method called L2TP-over-IPsec (L2TP in the iOS interface). L2TP seems

to be more broadly passed through public networks than PPTP (http://publicvpn.com/, $6.95 per month or $69.95 per year,).

## Set Up a VPN Profile

It's quite easy to set up VPN profiles on an iOS device. Start by making sure you have all the server settings provided by your VPN host or network administrator at hand, since you'll need to enter several pieces of data.

To set up a VPN profile, follow these steps:

1. Launch the Settings app, and tap General > Network > VPN.
2. Tap Add VPN Configuration (**Figure 90**).

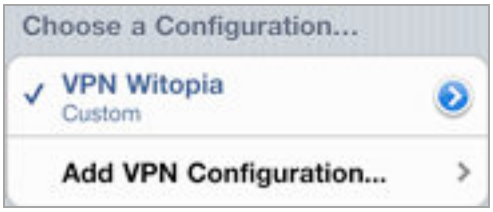
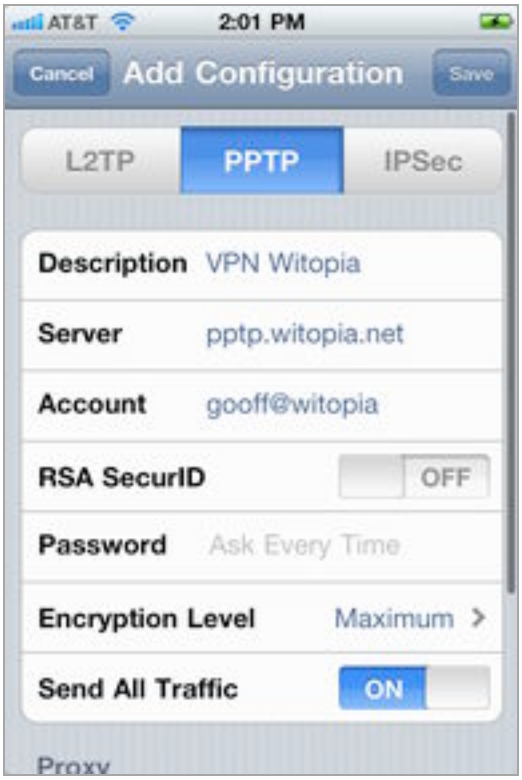


**Figure 90:** Add a VPN configuration here.

The Add Configuration view appears (**Figure 91**).



Description VPN Witopia

Server pptp.witopia.net

Account gooff@witopia

RSA SecurID OFF

Password Ask Every Time

Encryption Level Maximum

Send All Traffic ON

**Figure 91:** Enter the details you were given.

3. In the Add Configuration view, fill in the settings:
    - Pick L2TP, PPTP, or IPsec, whichever is appropriate. The choice here affects which options appear below the header, as each standard has different requirements for configuration.
    - The description appears in the VPN view after you create the configuration, so enter something short and expository.
    - Server, Account, and Password tells iOS which Internet host to connect to using which credentials.
    - RSA SecurID (L2TP and PPTP) should always be off unless your employer provided you with a physical key fob.
    - Secret (L2TP and IPsec) is a shared bit of text that's used as an extra level of security.
    - Use Certificate (IPsec only) is enabled when you have a stored certificate to validate your identity.
    - Group Name (IPsec only) is set if a network administrator provides a group.
    - Encryption Level (PPTP only) is typically left set to Auto.
    - Send All Traffic (L2TP and PPTP) is typically left on. If it is off, you can filter which traffic is not encrypted and which is.
    - A Proxy option (not shown) can be ignored unless you've been told otherwise.
4. Tap Save.

You now have a configuration profile that you can use.

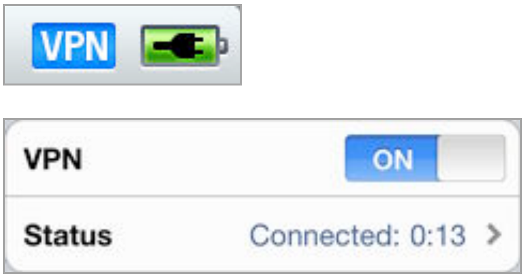
### Make a VPN Connection

In the Settings app, in the General > Network > VPN view, set VPN to On, and iOS will connect using the profile; if there's more than one VPN profile, you'll be prompted to choose one.

You can tell that a VPN connection is active in two ways:

- A VPN indicator appears in the status bar beside the battery icon (**Figure 92**, top).

- A Status entry appears in the VPN view in the Settings app and shows how long you've been connected (**Figure 92**, bottom).

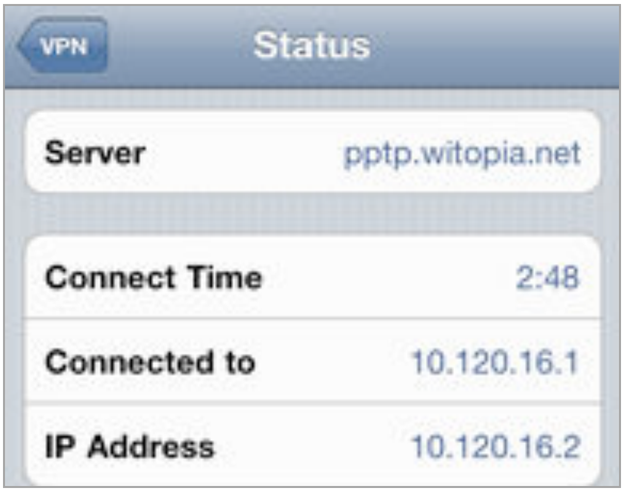


VPN ON

Status Connected: 0:13

**Figure 92:** The status bar shows an active VPN connection (top), while the VPN view shows how long you've been connected (bottom).

To check the status of your VPN connection, tap the current connection time in the VPN view to open the Status view (**Figure 93**). The IP Address field is a clue to the facility at which your VPN terminates.



Server pptp.witopia.net

Connect Time 2:48

Connected to 10.120.16.1

IP Address 10.120.16.2

**Figure 93:** Connection details reveal a little more information about where the VPN terminates.

***Warning!*** *VPNs are typically disrupted when you move between networks. If this happens to you, flip the VPN switch to Off and back to On to reset the connection.*

You can cancel a VPN connection in process (before the connection is completed) by tapping the Cancel VPN Connection button that appears in the VPN view. To disable a VPN connection, set VPN to Off at the top of the main view in Settings, or in General > Network > VPN.

**Note:** With a VPN profile configured, the VPN switch appears in the Settings app near the top, below Airplane Mode and Wi-Fi. You may have to exit and return to the Settings app to see the switch.

## Protecting Particular Services

You can avoid the cost and configuration needed for a VPN by making sure each service you need is secured, or by only using secured services on public Wi-Fi networks.

Here are three tips:

- Make sure you're always using SSL/TLS email connections. There's no good reason not to. If your mail host doesn't provide secured email for your incoming email (POP or IMAP, likely IMAP in iOS) and for your outgoing email (SMTP), find a new host. Email programs otherwise may send passwords in the clear or with weak encryption, and likely send all data in the clear. Refer back to What's Not at Risk, earlier in this chapter, for a few more details.
- Set Google to use secure services for Web access, something the company doesn't provide by default:
    - ◊ With Gmail, start in Safari by entering https://mail.google.com/ to connect to your account. Log in. If the Settings link does not appear at the top right of the screen (it won't in Mobile Safari), at the bottom of the screen, tap the Desktop link to access settings.

      Now, at the top right of the page, tap Settings. In the General settings tab, in the Browser connection option, tap the Always Use https radio button. Tap Save Changes.
    - ◊ For other Google services that aren't secured by default in a browser, precede the address with https, as in https://docs.google.com/. Google then uses a secure connection.
- Only use a secured alternative to plain FTP. FTP programs otherwise send passwords and data in the clear.

# Keep Data Safe

Someone using a completely unprotected iOS device can access any precious information stored on it and access accounts related to apps and Web sites. You can prevent other people from having access to that data, whether you leave your iPhone or iPod touch on a living room table or your office cubicle and walk away for an hour, or if your device is stolen.

## EXPOSURE

Let's start with your exposure. iOS keeps relatively little data accessible; rather, what's at risk is access to resources. A person who uses your device without permission cannot, for instance, recover your email account password, but could use your email account to read your email and send email purporting to be from you, or view any document in a word-processing program and view your photos.

### What's at Risk?

Someone with physical access to your iOS device could access a large variety of information that you've stored on it, as well as act as if he were you via email or within certain apps. Here are some examples, but it's only a partial list:

- Read your email and send new messages.
- Access the content in any app that does not have password protection, such as Photos.
- Access, and potentially change or delete, files on any server you linked to in programs for remote file access, such as Air Sharing Pro and GoodReader.

***App passwords:*** *Air Sharing and GoodReader let you set a passcode to prevent unauthorized access separately from any iOS passcode. Many programs offer this option, sometimes hidden in their settings. In Air Sharing, tap the wrench 🔧 icon at the lower right of the main screen, tap Application Lock, and turn the passcode on; in GoodReader, tap the settings ⚙ icon, tap General Settings, and scroll down for several options.*

- In an app that provides access to a password-protected account, view the content (but not the password) associated with the account, and possibly create new content. This could happen if you set the app to log you in automatically. Examples include Netflix and myWireless (**Figure 94**). In the case of myWireless, any phone number you've called or that's called you via your iPhone can be viewed and a malicious thief could also charge a number of AT&T services to your account.

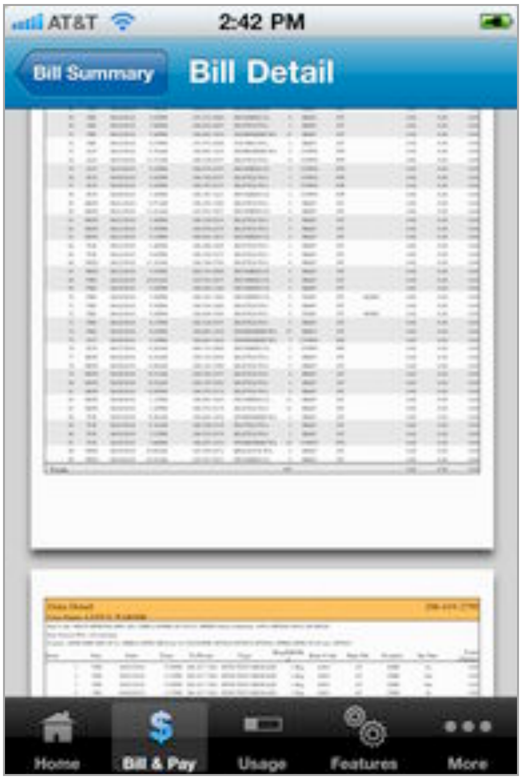


**Figure 94:** AT&T's myWireless app gives anyone access to a PDF of your bills, which include every number you have called or texted, or from which you've received a call or text, if you store the password in the app.

- Access Web sites for which you have stored login information in Safari. (See The Danger of Safari's AutoFill, shortly ahead.)

In the first four cases above, a thief likely cannot view your password, but if you've set up the account using an email address that is receiving email on the iOS device, the person using your device could likely change your password. And, in some cases, that person could pretend to be you, a drama that you might not appreciate in your Facebook account.

### Real World Example

A friend recently had her Gmail account hacked—probably by having the password sniffed—and the hackers sent out a scam message to all her friends asking for them to help her by wiring £1,500 to London where all her stuff had been stolen. The scammers changed her Gmail settings to forward email to an address of theirs, too. It took her days to get things back under control.

This could easily happen with an iPhone or iPod touch with a stored email password either in Safari (where Gmail can be set to "remember" you) or via the Mail app.

Further, if you save your login information in Safari for an ecommerce site, and then a thief logs in to that site, orders items, and changes the delivery address, even if the site confirms the address change via email, the thief could access your email to acknowledge that confirmation.

***Amazon's clever approach:*** *Even if you've stored your login data for Amazon.com, the company uses extra security checks for orders when addresses are changed. Sometimes, you have to re-enter some credit-card information, or log in again on a different secure page on which a password might not be cached for use. That's what 15 years of experience selling on the Web brings to an ecommerce site.*

*This is also why Apple prompts you to enter your password again when you're already logged in to access certain features at MobileMe via me.com, such as Find My iPhone and billing settings.*

### What’s Not at Risk?

Here’s a quick list of data that’s not at risk of being accessed by the wrong person:

- Passwords for App Store, iBookstore, and iTunes Store purchasing. Apple prompts for your password if it hasn’t been entered recently.
- Your stored passwords. Mail, Safari, and all the apps I’ve used over the last few years store passwords but don’t reveal them.
- Apps on which you’ve enabled specific passcode or other security precautions specific to the app, like a passcode you can set for viewing files in Air Sharing Pro.
- Apps for which you’ve disabled storing a password for access, such as the AT&T myWireless example noted previously.

## THE DANGER OF SAFARI’S AUTOFILL

With the Names and Passwords AutoFill option turned on, you can save a lot of time by not re-entering the same routine login information for Web sites. The iPhone or iPod touch retains information that you enter with your permission. However, someone who gains access to your device can also log in to your account on the various sites for which you’ve used AutoFill to store user name, password, and other authentication data.

You can disable this option in the Settings app. Tap Safari > AutoFill, and set Names and Passwords to Off.

## MITIGATION

There are two ways to lock down your data. The first is the built-in passcode system that can prevent unauthorized access to your device overall. The second is a third-party password safe that can lock away information from prying eyes.

### Set a Passcode

Your best single protection against anyone unauthorized having access to data is enabling the passcode lock. This allows you to set a four-digit code required to wake and gain access to the device.

To set the passcode lock, follow these steps:

1. In Settings, tap General > Passcode Lock.
2. Tap Turn Passcode On.
3. Enter a four-digit passcode, and re-enter when prompted.

You can also enable the passcode lock remotely if you have an active MobileMe account and Find My iPhone enabled on the device. See Find My iOS Device via MobileMe, ahead.

**Tip:** Is four digits not good enough for you? In Settings, tap General > Passcode Lock, and set Simple Passcode to Off.

### Passcode Options

The Passcode Lock screen offers a few additional security options. You can set the interval after which you must enter a passcode from Immediately to After 4 Hours:

- Immediately means that you're always asked for the passcode any time the device goes to sleep. You can put your handheld to sleep manually, of course, by pressing the Sleep/Wake switch on the top edge, but you can also set it to sleep automatically, with the General > Auto-Lock option in the Settings app.
- Longer intervals let the device be unlocked without a passcode for up to the time duration you've chosen from the list.

As a nuclear option, you can set your device to self-destruct—destroy its data, at least—if there are more than ten failed attempts to enter the passcode correctly. What do you lose? Only items created since the last backup and sync; see Remote Wipe.

***Warning!*** *A dedicated cracker can use easily available tools to bypass your passcode and examine the contents of an iOS device's data storage in a couple of minutes. However, starting in iOS 4, Apple began encrypting email in a manner that can't be cracked by bypassing the passcode. Apple said that other data would also be protected, and that App Store developers could use this encryption, too. However, it's unclear precisely what's left open and what's not in iOS outside of the Mail app; an app that encrypts data with its own or Apple's approach typically advertise this in its description.*

## Store Information in a Password Safe

Several apps let you store private data securely, including passwords for access to email, Web sites, and financial services. This offers an easy way to travel with the data you need without fear of having it extracted. These apps include mSecure, eWallet, 1Password, and many more. They lock your data using internal encryption separate from anything Apple provides. The best of these apps work with desktop software, too, letting you regularly sync your data over a local Wi-Fi network with a desktop machine. Whichever of these programs you use, you get the complementary advantages of exposing less to casual access while having what you need available wherever you go.

I'm most familiar with 1Password from Agile Web Solutions, which comes in three iOS releases (http://agilewebsolutions.com/), and which offers Dropbox-mediated syncing. My fellow Take Control author Joe Kissell, who wrote *Take Control of Passwords in Mac OS X*, recommends 1Password as his top pick.

### 1Password Editions

You can pay $9.99 for an iPhone/iPod touch designed version of 1Password, which works in emulation on an iPad, or an iPad-only release. For $14.99, you can purchase 1Password Pro ($14.99) the universal edition. The pro version works on whatever device you have, and it has better Safari integration than its cheaper siblings. If you own multiple iOS devices, Pro makes sense since it will work on all units.

You enter a four-digit "unlock code" when launching the 1Password app (**Figure 95**), but to access a password within the app, you must also enter your 1Password "master password." Both the unlock code and master password can be set to lock out usage after a certain period of time that you can configure, requiring re-entry of the respective codes. (You can disable the unlock code and use just the master code, but that gives open access to your list of stored entries, keeping only the passwords and secure notes safe.)

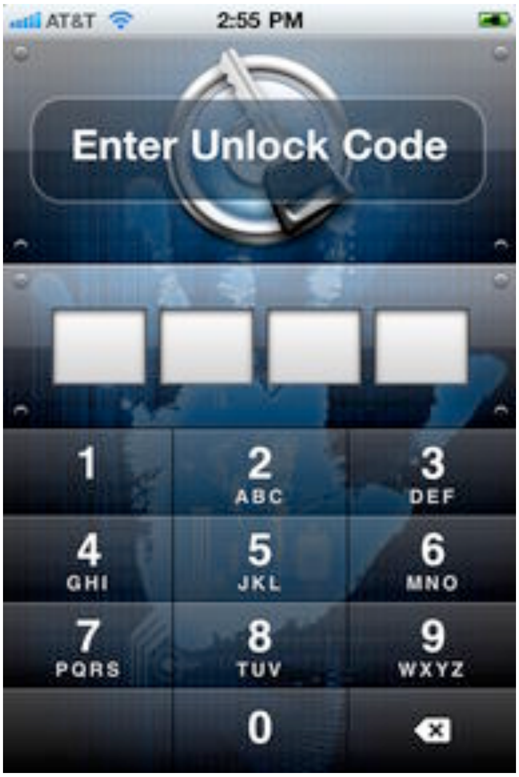
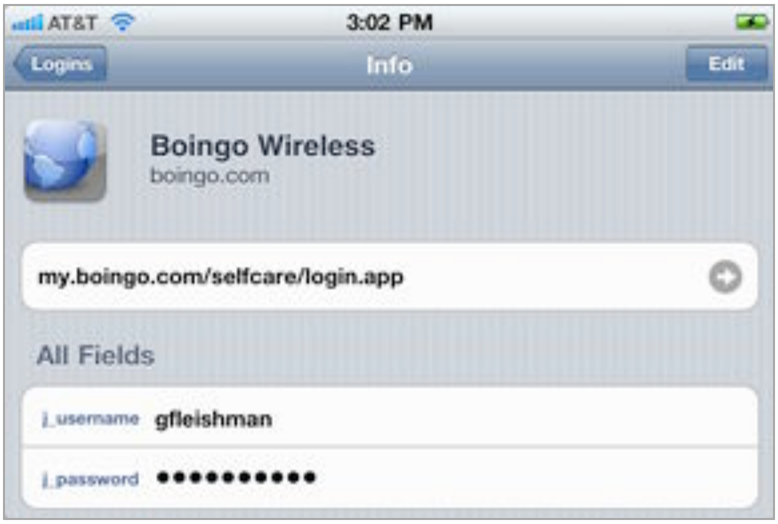


**Figure 95:** A passcode is the first bar to entry.

Stored passwords and information are divided into categories in 1Password, each one accessible from the tab bar at the bottom of the main 1Password view. For example, Web accounts are stored in the Logins view. Within the Logins view, if you tap an entry, and tap the right arrow ➜ (as shown for Boingo Wireless in **Figure 96**), a Web browser sheet opens inside 1Password and the app logs in to the site.



Boingo Wireless
boingo.com

my.boingo.com/selfcare/login.app

All Fields

i_username gfleishman

i_password ●●●●●●●●●●●

**Figure 96:** Within a login entry, you can you tap the arrow ➜ to log in to the site using a browser sheet inside 1Password.

Macintosh users can also set up 1Password Pro to work directly in Mobile Safari via a *bookmarklet*. To set it up, first use the 1Password desktop application to add the bookmarklet to Safari on your Mac. After that, sync your Safari bookmarks to Mobile Safari using iTunes or MobileMe. In Safari, when you want to use a stored login, tap the bookmark, tap through any resulting dialogs, and you're logged in.

**Note:** The Windows version of 1Password is currently in beta testing (http://agile.ws/onepassword/win).

# When Your iOS Device Goes Missing

Your iPhone and iPod touch are desirable items for thieves. They're compact, they have high retained value, and there's a huge market for used models.

Without freaking you out about theft, I want to tell you how you can make it impossible for a thief to use your device, protect your data when it's disappeared, and find your device if it's stolen or lost.

## SAFETY TIPS WHILE OUT AND ABOUT

Let me start with a few practical tips, applicable to any mobile device:

- **Don't pull out your device outdoors or in large open public spaces indoors if you can be approached from behind:** I don't suggest always keeping your back to the wall, but if you're in a crowded railway station and whip out the unit, it would be easy work for someone to run by and snatch it.
- **Don't set it down and turn away:** Leaving it on a table at a café while you turn away to talk to someone could provide a thief with a good opportunity to relieve you of your device.
- **Lock your device when you're not using it:** If you use the passcode lock described in Set a Passcode and hit the Sleep/Wake button when you're not using the device, it's more likely that a thief couldn't access your data.

## FIND MY iOS DEVICE VIA MOBILEME

In 2009, Apple added a clever feature that combines the location awareness of iOS devices with MobileMe: Find My iPhone. Despite that name, which is how it's labeled at the Me.com site, you can find the last reported position of any iPod touch, iPhone, or iPad, so long as you've set up a MobileMe account on the device and turned on the tracking feature. You can also take action remotely, choosing among options to play a message and optional sound, lock the device with a new four-digit passcode, or wipe all its data!

Finding a device's current location and taking a remote action can be accomplished either via Me.com, or using the free Find My iPhone app. (Yes, there's circular logic in requiring an iOS device to run an app to find another one.)

***One name for clarity:*** *For simplicity's sake, I'm calling the service Find My iPhone, but remember it works with an iPod touch (and an iPad), too.*

**Note:** A MobileMe account costs $99 per year from Apple for a single user, but less if you buy a serial number in a box from Amazon.com for a new account or a renewal. Family packs are $149 for five accounts from Apple, and less from online retailers.

## How It Works

The feature relies on a device sending MobileMe's servers a regular update of location information derived from Wi-Fi (all iOS devices), cellular (2G and 3G iPhones, some iPads), and GPS (iPhone 3G, 3GS, and iPad with 3G).

Wi-Fi positioning is derived by scanning for nearby networks and then using an online database to approximate a position based on network details, including the name and some less-apparent unique hardware identifiers. That lookup requires an active data connection, which is fine for any iPhone (which can use 2G or 3G data). But for an iPod touch, the device must be actively connected to a Wi-Fi network to retrieve Wi-Fi–based position information, as well as to send it or respond to queries from MobileMe.

You can enable the feature on multiple devices from one MobileMe account.

## Enable Find My iPhone

Find My iPhone requires that either Push or Fetch be enabled for interaction with MobileMe's servers. *Push* lets MobileMe and other servers connect to your device to transfer data such as email, calendar events, and contacts as soon as the data arrives on the server. It also enables MobileMe to obtain the current position for Find My iPhone. *Fetch* allows you to set an automatic recurring interval at which iOS retrieves new information and updates any remote settings.

***Push is better than Fetch for finding a device:*** *Push is better here because it allows an instant request from Me.com to get your device's current location. With only Fetch enabled, Me.com waits until the next interval specified to fetch new updates.*

To configure your Push/Fetch settings:

1. In the Settings app, tap Mail, Contacts, Calendars.

2. Tap Fetch New Data.

3. Now, either set Push to On or set Fetch to Every 15 Minutes, Every 30 Minutes, or Hourly. (If you set both Push and Fetch, iOS chooses Push for apps or services that allow it.)

Now you need to set up your MobileMe account to use Find My iPhone.

### If you haven't set up a MobileMe account on your device:

1. In the Settings app, tap Mail, Contacts, Calendars > Add Account > MobileMe.

2. Enter your name, MobileMe email address, and password, along with an optional description of the account. Tap Next.

   If you've entered everything correctly, the device shows that the account has been verified, and you see an Edit view that lets you choose to sync Mail, Contacts, Calendars, and Bookmarks, with the Find My iPhone option last.

3. Tap the Find My iPhone switch to enable the feature.

### If you have set up a MobileMe account on your device:

1. In the Settings app, tap Mail, Contacts, Calendars.

2. Tap your MobileMe account name.

3. Set Find My iPhone to On.

4. Tap Done.

***Warning!*** *In iOS 3, turning off Push and setting Fetch to Manually (in whichever order) prompted a warning explaining that Find My iPhone would be disabled. In iOS 4, this warning is absent. This makes me wonder if iOS always sends location information regardless of Push/Fetch settings, since the amount of data transmitted is so tiny. There's no documentation about this behavior.*

## View Your Device's Location

To view your device's location, you can choose between two similar tools: the Find My iPhone app on the MobileMe Web site or the Find My iPhone app on an iOS device. Because the two options have nearly identical interfaces and features, you should use whichever one is easier for you to access.

### Find My iPhone on the Web

To find your devices via a Web browser, follow these steps:

1. Go to http://www.me.com/.
2. Log in with your MobileMe account name and password.
3. Click the cloud ☁ icon at the left edge of the top navigation bar, and then click the Find My iPhone button in the application switcher that appears.
4. You're prompted for your password again; re-enter it and click Continue.

***Apple's being smart about unattended machines:*** *Me.com lets you stay logged in for 2 weeks at a time, but it prevents unauthorized access to Find My iPhone by asking for your password first. The secondary login times out after 15 minutes.*

The Find My iPhone Web app lists your devices along the left edge of the window, automatically selecting the first unit that it has a fix on (alphabetically if more than one has its whereabouts) to show its position (**Figure 97**).

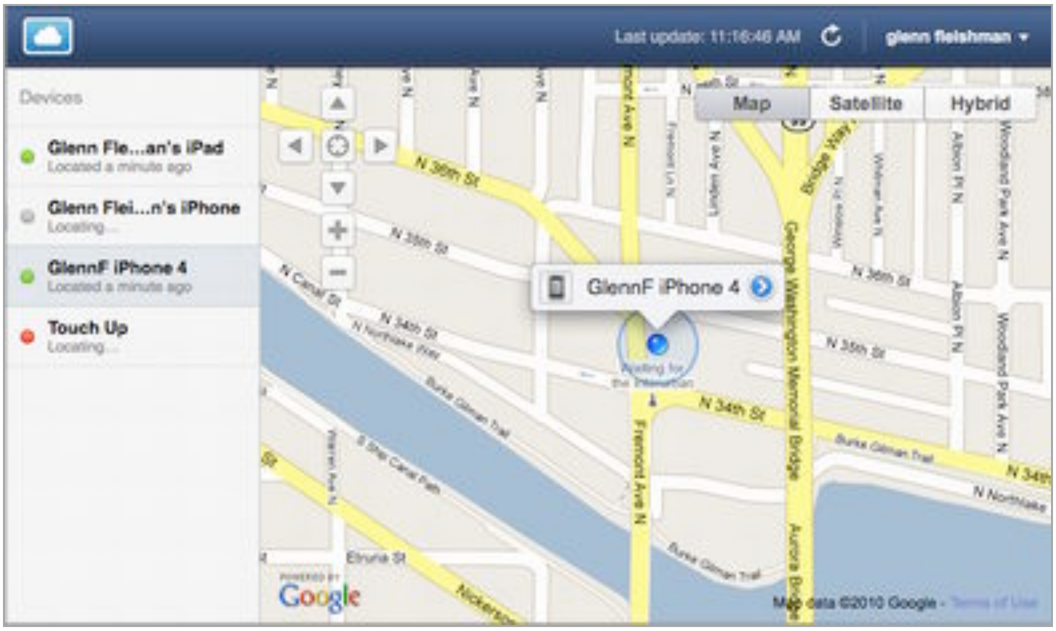


**Figure 97:** The Find My iPhone Web app shows devices at left; position at right. Click the detail ➲ button to reveal remote action options.

In the Devices list, the dot beside each device name indicates the status: gray ● means trying to connect, red ● means offline, and green ● means online. It may take Find My iPhone up to three minutes to fix a precise location for a device, even if the device has Push turned on.

5. Select a device in the list to see its location.

Find My iPhone shows the location of the device as a blue dot within a blue circular outline. The outline indicates the amount of confidence in the location. For a device with a GPS, like an iPhone 4, the blue dot appears without a blue perimeter when the GPS finds a precise position and reports it to MobileMe. (In **Figure 97**, the phone is still having its position refined.)

If the device has just been found, a detail ➲ button appears next to its name on the map; if the device was previously found but can't be found now, a clock 🕒 icon appears beside it instead, indicating that this is the device's last known location.

Now that Find My iPhone has done what it can to find your device, you can perform remote actions on your device (**Figure 98**). Your choices may appear without your taking further action, or you may need to click the detail ➲ button or the clock 🕒 icon beside the device's name on the map to reveal your choices. I explain the choices a page or so ahead, in Take Remote Action.

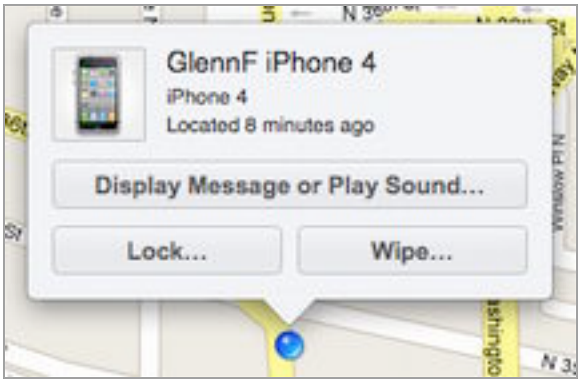


**Figure 98:** The popover dialog lets you choose among various remote actions to apply to the device.

### Find My iPhone app

You don't have to use the MobileMe Web site to run Find My iPhone. Instead, you can download the free Find My iPhone app to an iOS device, launch it, and then enter your MobileMe account name and password. The app works similarly to the Find My iPhone Web app, although its interface is a little different depending on which iOS device you're working with.

***Password not stored:** The app doesn't save your MobileMe password, and it caches it for only a short time. If you borrow someone's iOS device to run Find My iPhone, you don't have to worry about that person finding your iOS devices in the future. And, to reverse the situation, if a thief steals your iPhone, the thief can't use the app to locate more of your devices—or figure out where you are!*

## Take Remote Action

You can now take action on your iOS device, choosing one or more of three options that vary in utility based on whether your device has fallen behind a couch cushion, or has been misplaced or stolen (**Figure 99**). Whatever action you take, MobileMe sends an email message to your me.com address, notifying you.

***Call the police first!*** *If you know your phone or music player was stolen, you should consider taking location information to the police—calling an officer if you have a report already opened—before trying to entice the thief to give it up. Although electronics are stolen all the time, reports from all over indicate that law enforcement responds favorably to being given a map and other data. That can, in turn, lead police to find a cache of other stolen hardware.*

***Works even if offline by acting the next time it's online:*** *You can pick any of the below options even if the device is shown as offline, and MobileMe will trigger them when the device comes back online—if ever. Stolen hardware tends to be wiped as soon as it's practical. An iPhone or iPad with an active 3G plan would receive an update over the cellular data network when it came back online; any device, if it connected first to Wi-Fi, could have remote behaviors triggered over that kind of network, too.*

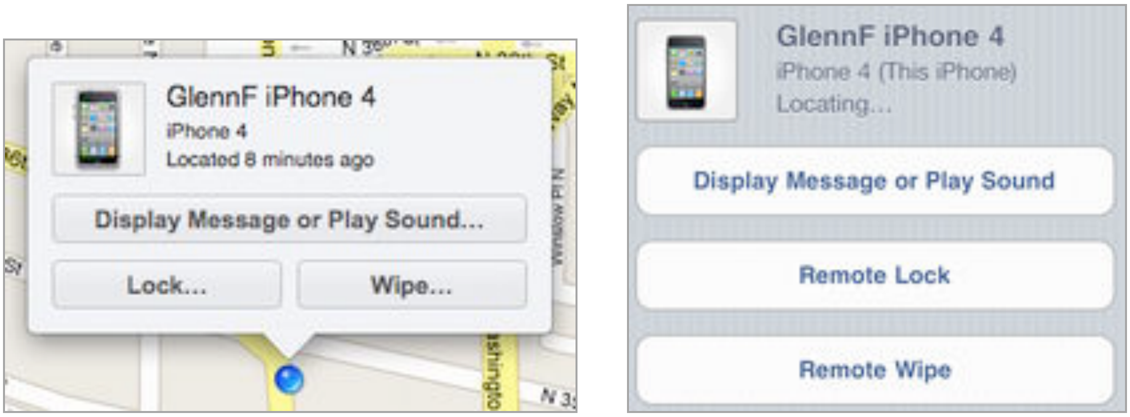
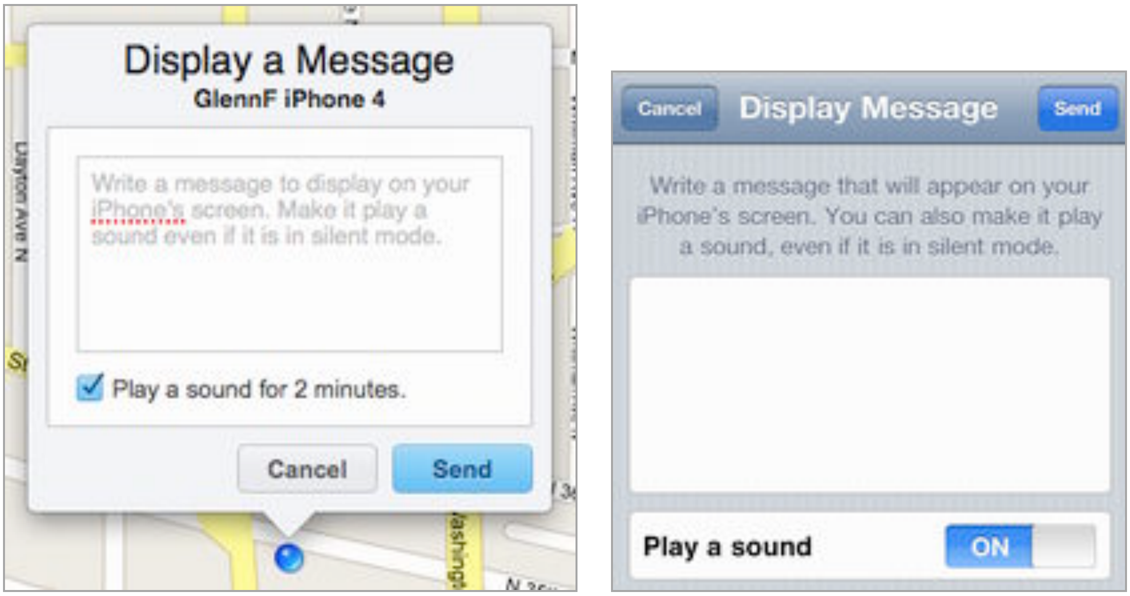


**Figure 99:** The three remote actions you can take shown in the Web app (left) and iOS app (right).

## Display a Message or Play a Sound

Click Display a Message or Play Sound, and you can enter text that will display on the device's screen (**Figure 100**). You can also play a sound for 2 minutes. The sound will override any mute settings on the device.



Display a Message

GlennF iPhone 4

Write a message to display on your iPhone's screen. Make it play a sound even if it is in silent mode.

☑ Play a sound for 2 minutes.

Display Message

Write a message that will appear on your iPhone's screen. You can also make it play a sound, even if it is in silent mode.

Play a sound ON

**Figure 100:** Enter text and/or check the Play a Sound for 2 Minutes box to trigger a remote message or sound.

This option is designed for three purposes:

- If you left your iPhone, iPod touch, or iPad somewhere in your house or office, and can't find it, this lets you trigger a sound you can use to home in on it.
- If you left your device somewhere else, the sound and noise can provoke someone to take a look. You can offer a reward and provide your phone number. It also puts the finder on notice that you know approximately where it is.
- Were your hardware stolen, this is a way to tell a thief that you've got their location and other data, and advise them to give it up.

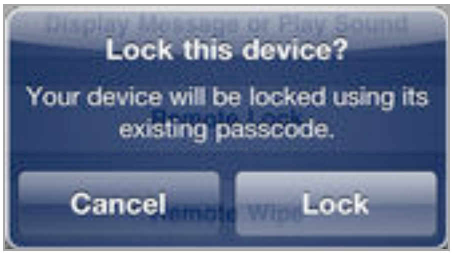
Even if you use the next feature to lock the device remotely, the message still appears on the locked screen.

### Remote Lock

This option activates a four-digit passcode lock on the device. If a code is already set, you're prompted to lock the device with that code (**Figure 101**).

***Use a passcode:*** *See Set a Passcode for more details on how the passcode works.*

**Note:** Before iOS 4, this feature required that you set a new four-digit passcode, and would reset more complicated codes. Now, you're prompted to activate whatever code you have, simple or not.

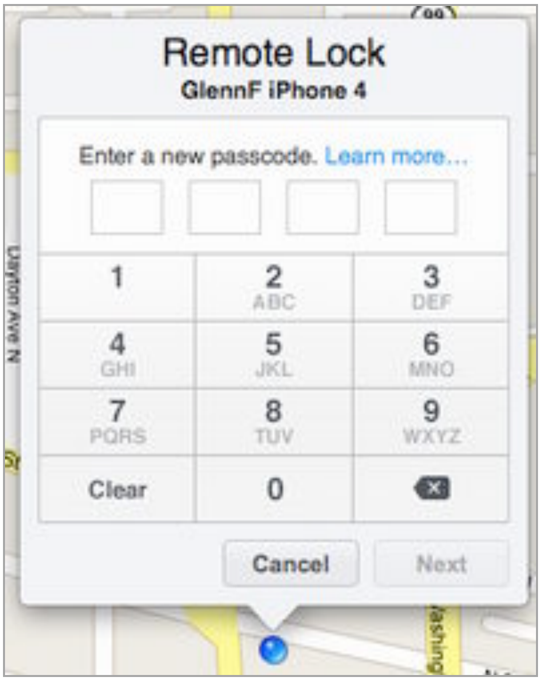


Lock this device?

Your device will be locked using its existing passcode.

**Figure 101:** Find My iPhone prompts with this option if you have a passcode already set on your device.

If there's no code set, you're asked to create a four-digit password, which you enter and then re-enter to make sure you didn't mis-tap (**Figure 102**).



Remote Lock

GlennF iPhone 4

Enter a new passcode. Learn more...

**Figure 102:** Enter a code to lock your device immediately.

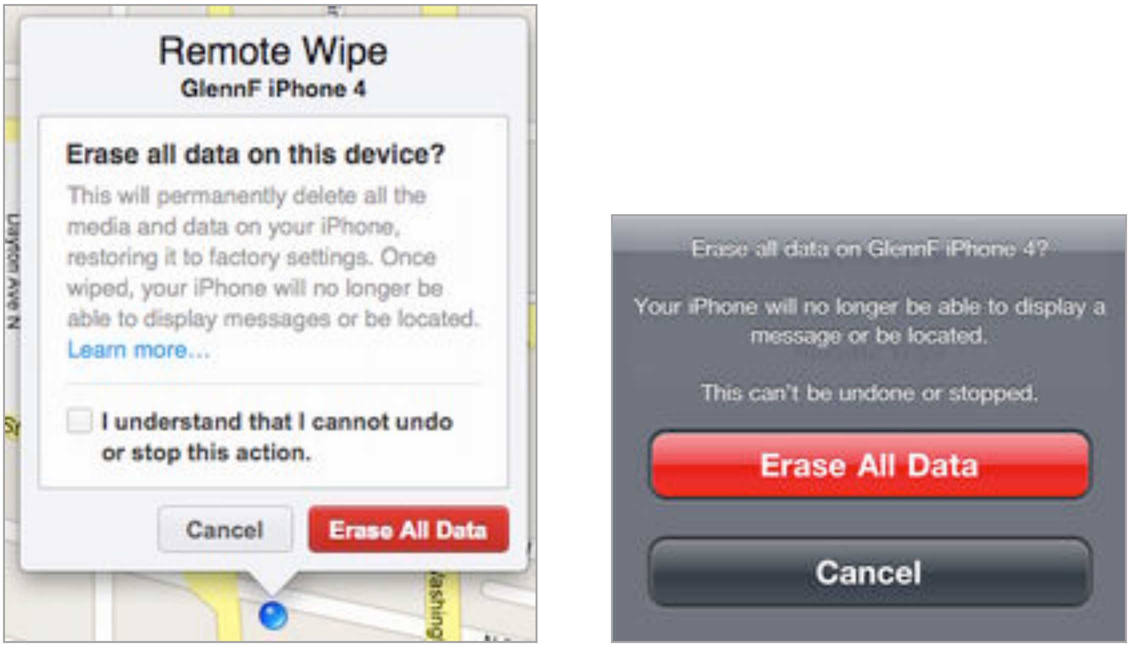
The action or action plus code is passed to the device, and email is sent to your MobileMe account confirming the action.

Once the code is sent, one of the following behaviors occurs:

- If the device is connected to a wireless network and asleep, the next time it’s woken, the current possessor must enter the passcode to gain access.
- If the device is online and in use, the operating system drops the user into the Slide to Unlock standby screen.
- If the device is offline, the next time it accesses any network with an Internet connection, the passcode lock is put into place.

### Remote Wipe

The last resort in some cases (or first in others) is a *remote wipe*, in which all the user data on the iOS device is erased. The Web app offers a longer explanation, and it requires you to click a checkbox as well as the Erase All Data button; the iOS app is more terse and you need just tap Erase All Data to proceed (**Figure 103**).


Remote Wipe

GlennF iPhone 4

Erase all data on this device?

This will permanently delete all the media and data on your iPhone, restoring it to factory settings. Once wiped, your iPhone will no longer be able to display messages or be located. Learn more…

□ I understand that I cannot undo or stop this action.

Erase all data on GlennF iPhone 4?

Your iPhone will no longer be able to display a message or be located.

This can’t be undone or stopped.

**Figure 103:** The Find My iPhone Web application and iOS app each explain what happens when you click or tap Erase All Data slightly differently, but the action is equally irreversible.

### Hardware Encryption

Apple includes hardware encryption on the iPhone 3GS, iPhone 4, third- and fourth-generation iPod touch (2009 and 2010 models), and the iPad. To "erase" all the device's stored data, just the encryption key has to be thrown away and a few other settings rewritten. On the original iPhone and iPhone 3G and first- and second-generation iPod touch models (2007 and 2008), which lacked this hardware feature, each byte of data must be reset, which can take hours. With hardware encryption, "erasing" takes only a minute or two.

However, wiping your device isn't quite as bad for your data as it sounds. This is because when you sync your iPhone or iPod touch with iTunes, iTunes automatically backs up all your user data and syncs any media you bought on the device to the iTunes library on the computer. And, if you've configured iTunes to sync data like calendar entries or contacts with your device, any new data on your device transfers to your computer as well. If you remote wipe your device, and then either recover it or obtain a new device, when you sync it with the same copy of iTunes, you can restore the latest backup, sync any media stored in the computer's iTunes library, and sync back other data like calendar entries and contacts.

If you were syncing any data wirelessly through a MobileMe or Exchange account, you won't have lost any of that data; once the account is back online on a recovered or new device, your data will flow back in. You will lose any changes made between the last sync (push, fetch, or manual) for each account and the remote wipe.

## REMOTE TRACKING SOFTWARE

Until iOS 4, Apple didn't allow any third-party software to work in the background. This prevented theft-recovery software from functioning as it does on certain cell phones and most computer operating systems. Those third-party packages on other platforms check at regular intervals to see whether a device has been reported missing. If so, the software goes into overdrive, snapping pictures (if the device has a built-in webcam), making screenshots, sending network data, and using Wi-Fi and GPS positioning to send location information.

iOS 4 gives software writers a variety of limited background task processing options, one of which is a location update that communicates GPS or other positioning information at regular intervals. This was designed to allow navigation software to maintain your current position, so that when you switch to the app, the software knows where you are, and can send route alerts while under way. This information is used just locally to keep providing instructions.

But it's also possible (and companies intend) to use background location updating for remote updates: that is, to send a device's current position to a server connected with a theft-recovery app. This background tracking is opt-in, of course: you must give the app permission. And you must be sure the app is running. Apple lets third-party apps stay paused in the background and use background-processing services only until memory runs out, and apps are shut down in something like last-used order.

At this writing, only iHound has this background tracking feature. The program is largely designed to track people and behavior, such as alerting another party when a child has left a proscribed area (like a school) or arrived home. By default, it checks in with a central server every 10 minutes, but it can send updates as often as every 30 seconds. You can send an alarm and alerts to a phone that's being tracked.

iHound includes 3 months' service as part of its $3.99 purchase price. In-app purchases of additional service are $3.99 for another 3 months up to $19.99 for 2 full years.

Two firms that offer desktop and laptop theft-recovery software, and mobile apps for platforms other than iOS, have apps that are compatible with iOS 3 and 4. They use clever workarounds to avoid needing background location tracking, but I hope they will be updated to take advantage of this improved feature. (At this writing, they had not been.)

- GadgetTrak for iPhone has an icon that makes it look like it might be a Web browser. The app uses Apple's WebKit software to seem just like Mobile Safari. A thief might launch this app, which causes it to send location information in the background. (GadgetTrak, free)

- Orbicule created the universal Undercover app, a mobile version of its Mac OS X software, which uses push notifications to provide location data. If your device is lost or stolen, you use Orbicule's recovery Web site to mark the unit as missing. You can then set a notification that tries to get the current possessor to tap the View button, such as saying that mobile banking credentials are available for viewing. If the View button is tapped, this launches Undercover, which then transmits the location to Orbicule's servers and provides it to law enforcement. The device's user sees a Web browser interface pointing to a Web site. It's a beautiful form of misdirection. (Orbicule, $4.99)

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## ABOUT THE AUTHOR

Glenn Fleishman started writing about technology in the late 1980s for his college newspaper, where he had a lot to do with setting up and running Macs using PageMaker 1.0. His professional career began with Aldus Magazine in 1994, with a feature about font management. Glenn writes about technology and its implication for people for The Economist and the Seattle Times. He also contributes regularly to Macworld, BoingBoing, Ars Technica, and many others.

Glenn has been an editor at TidBITS for umpty-ump years, and runs the back-end technology. He developed a content-management system used for TidBITS editors to publish articles and that feeds out content on its live site. Glenn also edits his own blog, *Wi-Fi Networking News,* and runs isbn.nu, a book price shopping engine.

Glenn lives in Seattle with his wife and two sons. He has more computers than he can count and has written more books than he can remember.

## AUTHOR'S ACKNOWLEDGMENTS

I dedicate this book to my wife, Lynn, and sons, Ben and Rex. They keep me sane and happy, and keep me from spending my entire day thinking about and using digital devices. A big thank you also to the tireless Tonya Engst.

## ABOUT THE PUBLISHER

Publishers Adam and Tonya Engst have been creating Macintosh-related content since they started the online newsletter *TidBITS,* in 1990. In *TidBITS*, you can find the latest Macintosh news, plus read reviews, opinions, and more (http://www.tidbits.com/).

20 YEARS TidBITS Apple news for the rest of us

Adam and Tonya are known in the Mac world as writers, editors, and speakers. They are also parents to Tristan, who thinks ebooks about clipper ships and castles would be cool.

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