



TAKE CONTROL OF

Apple Screen AND File Sharing

by **GLENN FLEISHMAN**

\$14.99

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Read Me First

Welcome to *Take Control of Apple Screen and File Sharing*, version 1.1, published in October 2025 by alt concepts. This book was written by Glenn Fleishman and edited by Joe Kissell.

This book helps you understand several ways you can access screens of your devices when not in front of them, share your own screen or view and control those of other people, and share and access files on network storage and in cloud storage.

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Updates and More

You can access extras related to this ebook on the web (use the link in [Ebook Extras](#), near the end; it’s available only to purchasers). On the ebook’s Take Control Extras page, you can:

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If you bought this ebook from the Take Control website, it has been added to your account, where you can download it in other formats and access any future updates.

What's New in Version 1.1

This version updates the book for all changes related to the new spate of fall 2025 operating system releases: iOS 26, iPadOS 26, macOS 26, and watchOS 26. This revision adds or updates screen captures and ensures that you can still find settings in the same place you expected.

Note: In fall 2025, Apple started numbering their operating systems' new releases with the last two digits of the following year, like auto model years. Following iOS 18, iPadOS 18, macOS 15 Sequoia, and watchOS 11, we have iOS 26, iPadOS 26, macOS 26 Tahoe.

Here are a few other changes you will find:

- **iPhone Mirroring notification controls:** Apple moved the per-app option with iPhone Mirroring for seeing notifications on your Mac from macOS to iOS. See [Change Mirrored Notifications](#).
- **Registered user on a Mac:** After feedback from a reader about the term “registered user” in using file sharing to access a remote Mac, I realized that I needed to provide a clearer explanation of which account Apple referred to. I revised part of the section [Browse for a Server and Connect](#) to elaborate on what account to enter and why.
- **AFP retirement:** I also added a note in [Access Networked Files from Other Systems](#) about Apple’s May 2025 announcement that their old AFP file-sharing protocol will be removed at some point in the future from macOS.

What Was New in Version 1.0.1

This minor revision fixed some typos and grammatical errors. It also expanded into a sidebar an explanation of how Apple keeps type legible on higher-resolution displays; see [HiDPI Solves Tiny Type by Default](#).

Introduction

From the moment graphical user interfaces came into being, people had the desire to access them remotely and to share them with other people. In the first case, so their stationary access at an office was also available when at home or on the road; in the second, for presentations and demonstrations.

Ditto, once you have both a network in place and computers with storage, the next logical action is to find a way to let people access files stored on one computer from another, whether they were reaching out across a room or across the world.

These urges have not abated over time as we've grown to have vastly more power in mobile hardware (laptops, tablets, and phones) and vastly more storage, particularly with the ease of having terabytes on tap on our home and work computers and via cloud services.

It might seem peculiar that the Take Control Books lineup has lacked a dedicated title about screen sharing or file sharing for the last several years. Two of the earliest books released under the Take Control moniker about 20 years ago were *Take Control of Screen Sharing* and *Take Control of Sharing Files*. After those aged out, publisher Joe Kissell's *Digital Sharing for Apple Users: A Take Control Crash Course* filled a larger gap for a while, encompassing many kinds of sharing beyond screens and files.

The reason is that things changed so radically that it became hard to keep up to date, while Apple dropped options people relied on, such as [Back To Your Mac](#), without replacing them. Networks also became more byzantine and hard to pierce through to reach remotely.

In 2025, I'd argue things are better than they have been in some time. By better, I don't mean simpler, sad to say. But we finally have a number of ways to share screens and files among our own devices and with other people that work reliably and may have a positive impact on your working life or relaxing entertainment time.

Take Control of Apple Screen and File Sharing takes advantage of enormous under-the-hood and interface changes Apple made in iOS 18, iPadOS 18, macOS 15, and tvOS 18 starting in late 2024. These changes allow much greater fluency in sharing your own or viewing someone else's screen, as well as mirroring a window, app, or screen of an iPhone, iPad, or Mac to another device. (Apple didn't trumpet these changes, an odd omission given the remarkable improvements. Perhaps they were too focused on Apple Intelligence.) Since iOS 16 and watchOS 9, you can also mirror an Apple Watch on an iPhone.

Note: Due to those changes, this book mostly looks at those releases and iOS 26, iPadOS 26, macOS 26 Tahoe, and tvOS 26.

File sharing has remained relatively static over the years, but the last few releases of macOS and improvements in cloud-storage services make it easier to tell you how to configure options, and I'm more willing to make recommendations than I have been in years past. The book brings together network file sharing on a Mac, server-based sharing available on an iPhone, iPad, or Mac, and cloud file sharing via iCloud Drive, Dropbox, Google Drive, and OneDrive.

No Mac (or iPhone or iPad) is an island, and I hope *Take Control of Apple Screen and File Sharing* helps you build an archipelago of connections.

Sharing Quick Start

This book divides quite neatly into different kinds of tasks you might want to accomplish, such as viewing the display of an iPhone on your Mac or sharing your screen into a FaceTime session.

Share the screens of your own devices:

- Master the Screen Sharing app; see [Make a Screen Sharing Connection](#).
- Look into alternatives; see [Examine Third-Party Apps](#).

Mirror your mobile devices:

- Work with iPhone Mirroring; see [Mirror Your iPhone to a Mac](#).
- Discover the benefits and limitations of mirroring an Apple Watch; see [Mirror an Apple Watch to an iPhone](#).

Share your screen with others:

- Share with one other person; see [Share Your Screen with Others](#).
- Let a group see your screen; see [Share with Group FaceTime](#).

Manage file sharing:

- Reach your own files and those of other people; see [Share Files over a Network](#).
- Understand cloud file sharing; see [Share Files in the Cloud](#).

Learn advanced sharing topics:

- Find out about more advanced options in the Screen Sharing app for Mac; see [Dig Deeper into Screen Sharing](#).
- Connect to your screen with an industry-standard protocol; see [Consider VNC](#).
- Bypass remote network access limitations; see [Appendix A: Enable Inbound Access](#).

How the Book Divides Sharing

Apple now offers several kinds of built-in screen sharing and mirroring and many third-party apps provide screen-sharing options. On file sharing, I cover multiple forms that include built-in methods provided by Apple in their operating system and third-party options.

I break out screen sharing and mirroring into these categories:

- **Personal screen sharing:** You want to use another device that you own or control over a network.
 - ▶ *LAN screen access:* You gain access to a device locally on your network so you can perform actions or view the screen of these devices. See [Access Your Mac's Screen over a Network](#).
 - ▶ *WAN screen access:* You may be able to connect via the internet (a Wide Area Network) to your device, too. While Apple offers solid support over a wired or wireless local area network (LAN), the company's products are weak for remote access—you typically need third-party support for remote network sessions. See [Examine Third-Party Apps](#) and [Appendix A: Enable Inbound Access](#).
- **Personal screen mirroring:** You want to have the screen of one of your devices appear on another of your devices.
 - ▶ *iPhone Mirroring (with screen-sharing elements):* Apple added an app in macOS 15 Sequoia called iPhone Mirroring that allows direct access to use an iPhone as if you were holding the device. While it shares features with Mac screen sharing, it has unique extras. See [Mirror Your iPhone to a Mac](#).
 - ▶ *iPhone/iPad mirroring:* You can mirror directly to an AirPlay video destination, like a Mac, Apple TV, or compatible third-party software or hardware. See [Mirror from an iPhone or iPad](#).

- ▶ *Apple TV mirroring:* You can share an iPhone or iPad screen or Mac window, app, or display to an Apple TV along with sound. See [Mirror Displays via AirPlay](#).
- ▶ *Apple Watch mirroring:* A limited form of mirroring lets you see and control your Apple Watch on its paired iPhone. See [Mirror an Apple Watch to an iPhone](#).
- **Sharing with others:** You want your screen to appear on that of one or more people in a session.
 - ▶ *One-to-one screen sharing:* You or someone else in a one-to-one session, such as via Apple's Messages app, share the contents of a local display (or part of it) with the other party. The party viewing the screen may be an observer (making it mirroring) or may be able to take control and use the mouse, keyboard, and clipboard of the screen they see (making it full screen sharing). See [Share via Screen Sharing App](#) and [Share Solo via Messages or FaceTime](#).
 - ▶ *Session mirroring:* You share a screen into a video conferencing session in which one or more other people can view the screen and see what you see. But you can't offer and they can't ask to control the screen. See [Share with Group FaceTime](#).

Some mirroring modes do, in fact, have options that allow control. iPhone Mirroring is not just a replication of your iPhone screen, but it's a full one-directional control of an iPhone. The Zoom video conferencing software lets you share your screen into a session (mirroring), but can be configured to let any session participant ask for or obtain control without asking. I try to keep this clear throughout.

File sharing represents an easier case with just two major types discussed in the book:

- **Network file sharing:** Using built-in software and third-party software on a Mac, you can access resources on a local or remote network. You can also share files from your Mac with other people locally and remotely. See [Share Files over a Network](#).

- **Cloud file sharing:** iCloud Drive may be the top option for Mac users to share files with others, but Dropbox, Google Drive, and OneDrive are also popular. See [Share Files in the Cloud](#).

Access Your Mac's Screen over a Network

For several decades, the most common use of screen sharing has been accessing another device we control or to which we have access but which has one of these limitations:

- We're not sitting in front of it. We might be in a different room, on a different floor, or on a different continent.
- It lacks a display. (It's *headless*, like a Mac mini used as a media hub or a server in a data center rack.)
- It might be nearby, but we want to interact with its interface on the screen we're currently using for convenience or efficiency.

All screen-sharing methods send an image of the remote screen as bitmaps—a pixel-for-pixel version of the interface—as well as passing to the remote device your local keyboard, mouse, trackpad, and other input device activity.

Apple has offered Mac users many options over the years for this kind of access. In the last several years, that's been a system utility called Screen Sharing.

Note: macOS 15 Sequoia made only cosmetic changes from previous versions. I describe the Sequoia and Tahoe versions in this and subsequent chapters, but you will be able to follow along and use most features from 14 Sonoma, as well as earlier releases that include the Screen Sharing app.

The Screen Sharing app provides tools to observe or control other screens for devices that are configured to allow remote, unattended access. This includes any device that's set up to allow remote industry-standard connections using *VNC (Virtual Network Computing)*; see [Consider VNC](#), later in the book.

Tip: Apple has no built-in Screen Sharing app for iPhone/iPad, but VNC apps let you use those devices to access screens, too.

I'll explain how to set up unattended access and the basics of connecting via Screen Sharing using the Finder.

Remote Access over the Internet

If you want to understand how to set up a local network to allow Screen Sharing access from the broader internet and a third-party subscription won't work, refer ahead to [Appendix A: Enable Inbound Access](#). That chapter provides details and step-by-step instructions to ensure that devices can be made accessible. Also read it if you have difficulties connecting within your LAN.

Some Devices Have Limitations in Sharing with a Mac

It's easy enough—sometimes with extra configuration and some provisos—to view and control a computer's screen remotely. However, other categories of Apple devices are harder to reach:

- ✦ **iPhone:** You cannot access an unattended iPhone through Screen Sharing, but you can with iPhone Mirroring, introduced in macOS 15 Sequoia and iOS 18. The feature is similar to Screen Sharing but has a different setup, limitations, requirements, and controls. See [Mirror Your iPhone to a Mac](#).
- ✦ **iPhone/iPad:** You can create a one-to-one control session or a one-to-many view session by initiating the action from an iPhone or iPad. This might work for your purposes, depending on what they are! See [Share Your Screen with Others](#) and [Share with Group FaceTime](#).
- ✦ **Apple Watch:** An Apple Watch can be remotely viewed and controlled—but only from a paired iPhone that's nearby and meets a host of conditions. See [Mirror an Apple Watch to an iPhone](#).

Enable Screen Sharing

To use Apple's built-in screen-sharing system, you must enable sharing on all the Macs you want to reach. On each one, go to System Settings >

Examine Third-Party Apps

You're not limited to Apple's Screen Sharing service to connect to your Macs remotely. Many, many companies have developed screen-sharing ecosystems often coupled with file sharing and other options. Their interfaces vary tremendously, as do extra features.

A key element of these services is that they let you connect from the internet into your LAN without additional network configuration or software. (I describe alternatives for rolling your own bypass in [Appendix A: Enable Inbound Access](#).) That's part of what you're paying for with a subscription: install-and-go simplicity.

I look at three popular options below that fill different needs, and that editor Joe Kissell and I have had personal experience with.

View with Apple Remote Desktop

Before getting to my recommendations below, I wanted to mention a parallel experience for Screen Sharing that Apple offers via [Apple Remote Desktop](#) (\$79.99). It's a classroom- and enterprise-oriented tool. ARD lets a system administrator access screens of managed devices without requiring individual accounts on each device. That manager can install software, blank the screen of devices while working on them, schedule automated tasks, and generally carry out operations useful for running a lab or company full of Macs.

Most of us don't need those capabilities—we're just trying to reach our own screens, and often just one or maybe two of them. If you have more extensive needs, ARD might be worthwhile.

As noted earlier, ARD and Screen Sharing conflict with each other. In Settings > General > Sharing, you can either have Screen Sharing or Remote Management turned on, but not both.

RealVNC

[RealVNC](#) was founded decades ago by some of the people who developed the original VNC (Virtual Network Computing) protocol, now industry-standard (see [Consider VNC](#)). The company organizes its products as RealVNC Connect, RealVNC Viewer, and RealVNC Server. The Connect app is the portal through which you find devices in your account, and which coordinates encrypted connection.

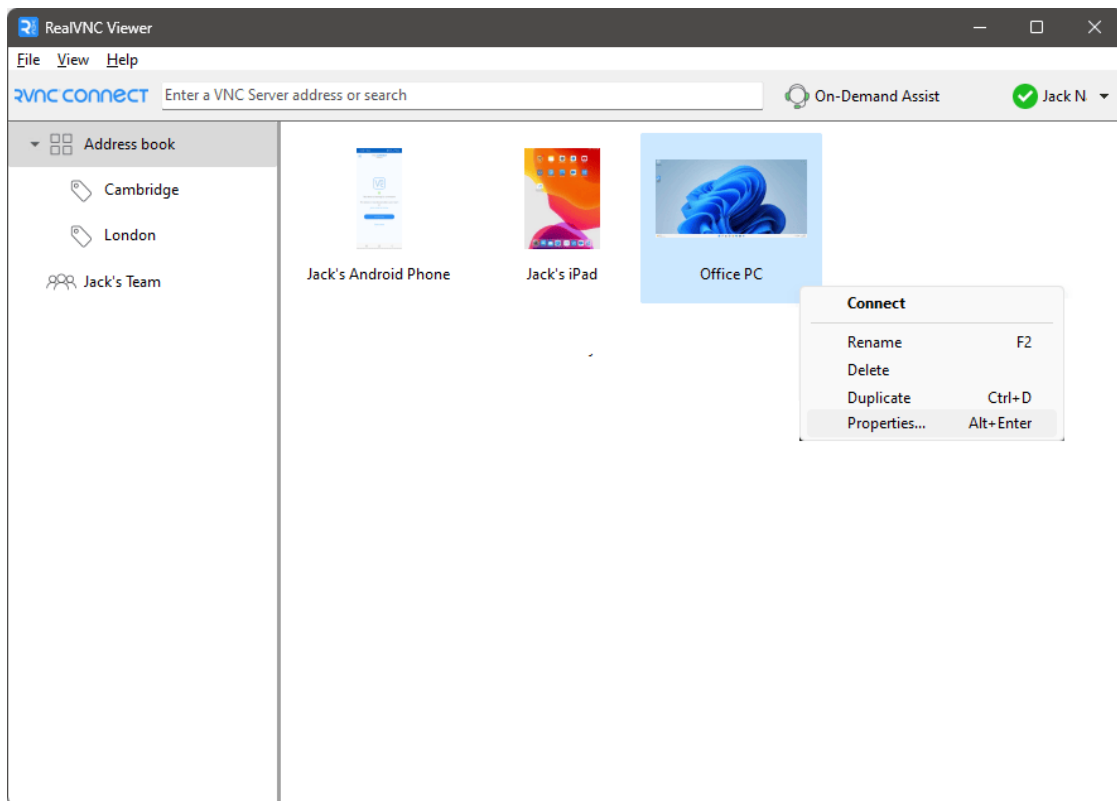


Figure 16: Use the RealVNC Viewer to access servers that are registered with a corresponding VNC account or group you're part of.

Tip: The VNC Viewer app noted later, in [Use VNC To Access Other Devices](#), and a similar [VNC Server app](#) can be downloaded and used at no charge for standard VNC connections. No encryption is included. However, they don't include internet-to-LAN passthrough support.

RealVNC is an absolute rock of a VNC system, designed best for when you have lots of different kinds of devices you need to connect to remotely. It also supports file transfer through a clunky dialog and allows remote printing.

Dig Deeper into Screen Sharing

The Finder-based Screen Sharing approach using the default Standard mode for connection may be enough for you. But if you want more options and control or better image fidelity on supported devices, or are remotely connecting to many different Macs or accounts, this chapter guides you through advanced options.

This chapter also looks at the industry-standard VNC (Virtual Network Connection) protocol that the Mac's screen sharing service and the Screen Sharing app are built on top of.

Let's start with using the Screen Sharing app in a freestanding way.

Use Screen Sharing via the App

While you can access Screen Sharing via the Finder, you can also open it as an app directly. Go to Applications > Utilities and double-click Screen Sharing. You can also use Spotlight and search for "Screen Sharing," then press Return to open the app.

The app is elegant in its single-mindedness and simplicity. The primary interface is the Connections window (**Figure 19**). With All Connections shown in the sidebar, the window shows a list of computers available via local Bonjour networking, and that you have previously connected to. The list always shows connections from newest to oldest.

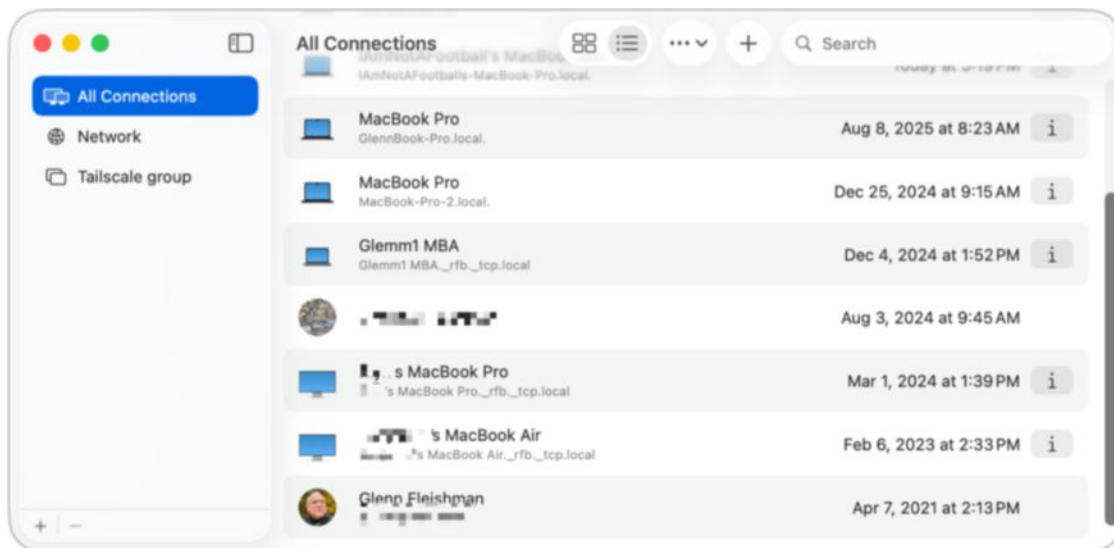


Figure 19: The Connections window lets you view, manage, and connect to available systems.

Hello, Bonjour! Let's Rendezvous on the Network

Bonjour is Apple's name for a service that broadcasts information about what kind of services are available on devices on a local network. (Technically, this is a form of multicast DNS or mDNS; it was originally called *Rendezvous*. Bonjour is better!)

Bonjour allows *discovery*: apps on the LAN "listen" to the broadcasts and create a list of devices that have a compatible service. You can then connect from a list without knowing IP addresses or device hostnames. With Screen Sharing (or file sharing), you can see any devices on the LAN that accept sharing connections.

Interact in the Connection Window

To connect, hover over a name and click Connect, double-click the entry to connect, Control-click/right-click an entry and choose Connect, or select an entry and choose Connect from the more icon.

Here's what else you can do in this window:

- Click the plus icon in the upper-right corner to add a new entry by pasting in an address. I explain that further below.
- Click the icon or list view icon to switch between those views. The icon view shows the Mac or generic icons for the remote hosts as reasonably large graphics.

Mirror Your iPhone to a Mac

When Apple introduced the Apple silicon M series of chips, they came with an interesting extra: iPhone and iPad apps could run on a Mac! This seemed like it might open a new world: developers could write an iPhone/iPad app that someone could use across all their devices, albeit in a strange window format on a Mac. In the end, I don't know of any significant new utility for most people.

However, many of us do wish we could access our iPhone—not just apps—on a Mac. Starting in iOS 18 and macOS 15 Sequoia, Apple opened up that possibility for most current iPhone and Mac users with the iPhone Mirroring app; see the requirements in the sidebar.

iPhone Mirroring is an app that runs on your Mac that provides full interface access to your iPhone. You can perform any task just as if you had an iPhone in your hand. You can also see a mirror of notifications from your iPhone as they come in.

iPhone Mirroring Requirements

While the app seems simple, it has a pile of requirements. As noted, you need iOS 18 or later installed on the iPhone and Sequoia or later on your Mac, which has to be an M-series model or an Intel Mac with a T2 Security Chip.

Continuity requirements apply: your iPhone and Mac have to be signed in to the same Apple Account (with two-factor authentication), and have Bluetooth and Wi-Fi enabled. Apple doesn't note this, but the two devices need to be in proximity, too.

And there's more! Your iPhone must be locked, though it can show a StandBy display. Your Mac can't be using AirPlay or [Sidecar](#) (using an iPad as a second display), or be sharing its internet connection. And you can't be in the European Union—sorry. VPN software or intensive use of Bluetooth could also prevent it from working. Whew!

Note: This app leans heavily on the new FaceTime-oriented screen-sharing software I discuss in the following chapters, even though it's dedicated to mirroring an iPhone.

Configure iPhone Mirroring

Once you've reviewed the requirements above and are sure you meet them, you can turn on the feature.

Enable iPhone Mirroring

To get started with iPhone Mirroring, follow these steps:

1. Open iPhone Mirroring on your Mac from the Dock or the Applications folder.
2. The app may prompt you to unlock your iPhone. Enter your passcode on your iPhone.
3. Your Mac asks you whether you want to allow notifications. You can opt for Allow or Don't Allow; I discuss further below.
4. You may be asked whether you want to approve each mirroring connection or automatically connect in the future. Make a choice; you can change this later.
5. A connection screen appears, showing a subtle animation of the text of the iPhone's name filling up from bottom to top, and then the iPhone screen appears.

Mirror Your Watch to an iPhone

You can't mirror your Watch to a Mac, but you can to an iPhone. By enabling Settings > Accessibility > Apple Watch Mirroring, you can use your Apple Watch from the Lock Screen over AirPlay. However, you can't nest mirroring: when iPhone Mirroring is active, Apple Watch Mirroring can't connect to your Watch from your Phone. See [Mirror an Apple Watch to an iPhone](#).

Mirror an Apple Watch to an iPhone

Mirroring an Apple Watch to your iPhone might at first sound redundant. What can you do on an iPhone that you can't on an Apple Watch? The feature is designed primarily for people with physical or motor disabilities, Apple says, extending the utility of the Apple Watch's monitoring, voice-activated, and other features without a requirement of having to always interact with the watchOS tap, rotate, and press interface. Activating mirroring lets you use Voice Control, head tracking, and other assistive features available only through an iPhone.

Accessibility features often extend their utility far beyond their core audience, however, and many people may find it useful to access their Apple Watch via mirroring on an iPhone to adjust settings or perform actions that are fiddly, appear with very small type, or require more precision than we can pull off at a given time.

Go to Settings > Accessibility > Apple Watch Mirroring on your iPhone to enable mirroring (**Figure 35**).



Figure 35: The switch acts like a launcher rather than existing in a settable on/off state.

Apple Watch Mirroring requirements

Apple Watch Mirroring requires an Apple Watch Series 6 or later (excluding the Apple Watch SE) running watchOS 9 or later, paired with an iPhone 8 or 8 Plus or later with iOS 16 or later installed. Your Apple Watch and iPhone must be on the same Wi-Fi network, and both must also have Bluetooth enabled and be near each other.

Use Apple Watch Mirroring

The Apple Watch Mirroring feature is unique among all screen-sharing and mirroring options Apple offers and among nearly all Settings switches. The switch to enable it acts more like a launcher for the service.

On your iPhone, after you enable the feature at Settings > Accessibility > Apple Watch Mirroring, mirroring begins immediately (**Figure 36**). The lower portion of your iPhone screen now shows the Apple Watch display with a label beneath it that reads AirPlay Mirroring.



Figure 36: When mirrored, your watch appears within a window on while viewing Settings (left); when disconnected, it's a blank screen.

Mirror Displays via AirPlay

AirPlay is a great way to see what's on an iPhone, iPad, or Mac somewhere else—often on a larger display attached to an Apple TV. But it's sometimes been frustrating to get exactly what you want to appear.

Mirroring also includes audio from the mirrored device—keep that in mind when you share.

Tip: You can accidentally share way too much when mirroring to a display other people can see. For peace of mind, consult [Disable Revealing Information When Mirroring](#) at the end of this chapter.

Mirror from a Mac

If you've used AirPlay to share your screen or a media player on a webpage before Sequoia, get ready for an actually *good* experience. Apple dramatically improved the feature in late 2024 with macOS 15 Sequoia. Tahoe made minor tweaks.

Mirror a Mac via Control Center

Control Center lets you mirror a display by clicking the Screen Mirroring  button. You can also select this option by going to System Settings > Displays and clicking the plus  icon to the right of the display arrangement preview. Click an AirPlay display and, after the connection starts, you can choose what you want to show there (**Figure 37**). Here's where it gets fun in Sequoia and Tahoe.

Note: Tahoe lets you choose what appears in Control Center, so you may have removed the Screen Mirroring  button. You can restore or it or choose where it goes by clicking Control Center and then clicking Edit Controls. Drag it into position to move or search in the controls list for Screen Mirroring to add it back.

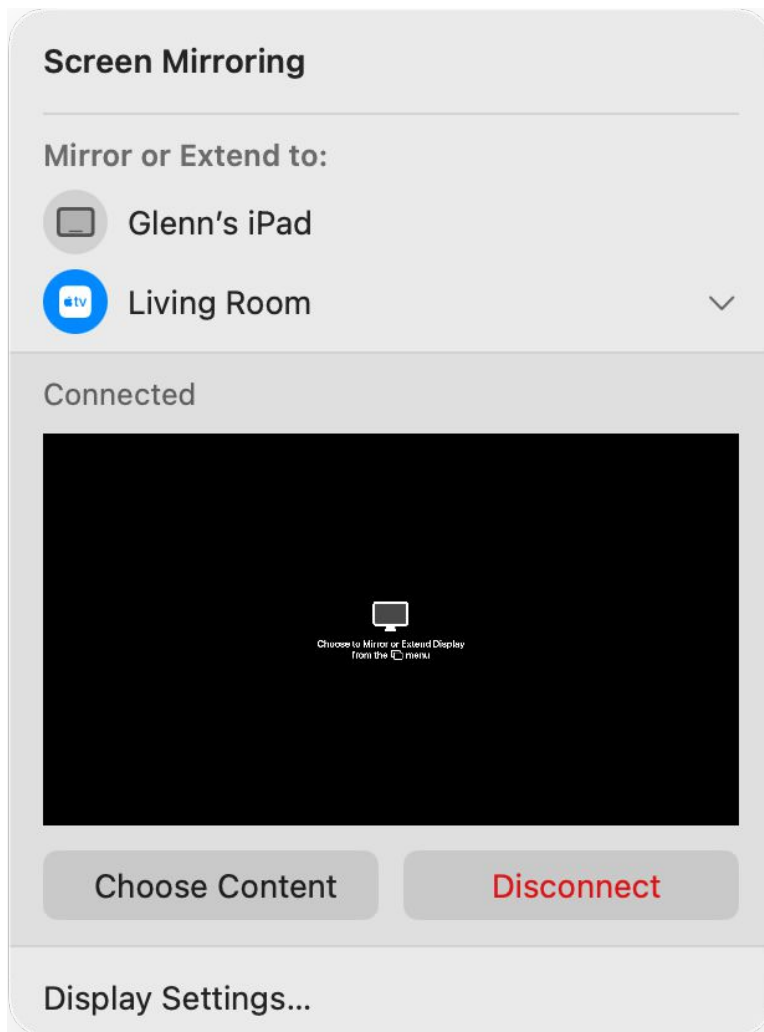


Figure 37: After connecting over AirPlay, you can choose what part of the interface (“Content”) to share.

Click Choose Content and you’re presented with three choices to select from and then click the corresponding button (**Figure 38**):

- Entire Screen does what it says on the tin: it shares everything on the display onto the AirPlay display. Click Start Mirroring.
- Window or App brings you to a secondary selection after you click Choose Windows or App.
- Extended Display is beyond the focus of this book, letting you extend your desktop with additional displays as you might with an iPad (using [Sidecar](#)).

If you pick Window or App and click its button, you can then choose *which* window or app by using the App Switcher or directly clicking on any app’s window.

Share Your Screen with Others

Sharing your screen for controlling or viewing your own device scratches one itch. But what if you want to let another person access your screen to view or control or share your screen with a group? Apple has you covered. In fact, there are two distinct methods:

- **Screen Sharing app:** Use the Screen Sharing app and someone's iCloud-associated email address, IP address, or host name to connect to a Mac.
- **FaceTime or Messages:** Use FaceTime or Messages to initiate a session. This uses the Screen Sharing app, too, but provides a slightly different set of controls. Any combination of device types can observe. Remote control works only with one-on-one Mac-to-Mac connections or between an iPhone or iPad and another iPhone or iPad.

Note: Don't ask me why Apple limited remote control by type!

- **Group FaceTime:** You can use FaceTime to share your screen into a group call, although others cannot control it. This form of sharing offers an additional feature: Presenter Overlay, similar to that found in other videoconferencing apps for putting yourself alongside what you're sharing.

Share via Screen Sharing App

Using the Screen Sharing app to share someone else's Mac is nearly identical to using the app to reach your own unattended Macs. Instead of using Bonjour or typing in an address, you can use someone's Apple Account-registered email address or phone or a contact entry that contains either (**Figure 47**). Unlike standard Screen Sharing, Apple

manages creating a secure connection to the other person, so the other person doesn't need to have a publicly routable IP address.

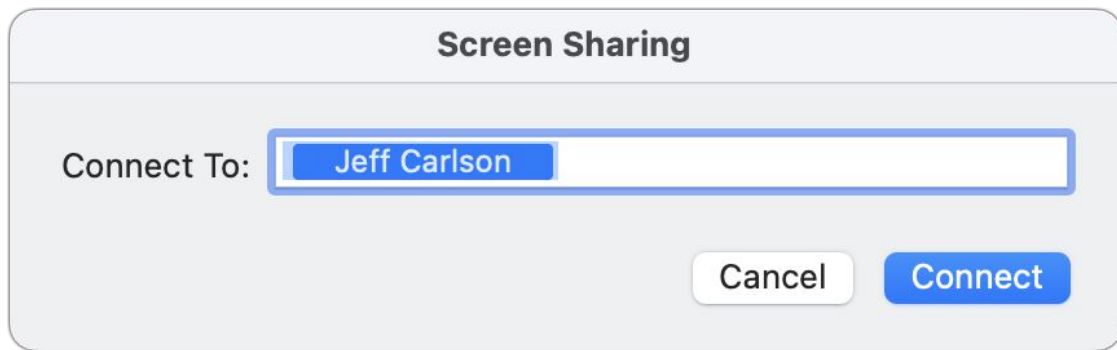


Figure 47: You can enter a contact's name to connect.

On your Mac, you're told you're waiting for a response (**Figure 48**). The remote party sees a request to share (**Figure 49**). Apple wisely tells people not to allow randos to connect and also provides a choice between controlling and viewing.

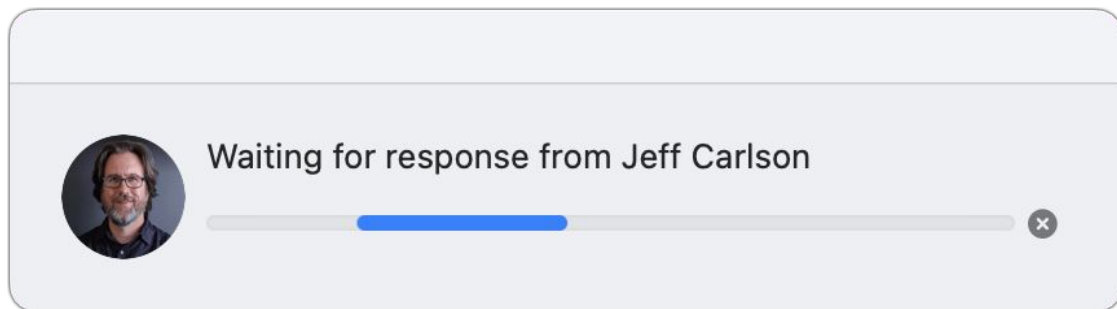


Figure 48: The connection requires a reply from the other side.

Typically, the session begins with the equivalent of a FaceTime Audio call using your default or currently selected audio input and output devices, though you don't see the usual FaceTime interface. The audio call starts before you see the remote screen.

Share Files over a Network

Network file sharing is the reason networks were built in the first place—that and chat. Even though there are many other ways to exchange files in these modern times, drives on a local or remote network that are fully under your control can still be a significant way to access data.

Apple offers robust built-in file sharing on Macs that requires minimal configuration and allows permission-based access for other people. This includes special sharing-only accounts.

Turning on file sharing is a simple operation:

1. Go to System Settings > General > Sharing.
2. Click the info ⓘ icon to the right of the File Sharing.
3. Enable File Sharing. When enabled, you see “File Sharing: On.”

With those steps accomplished, you can access files over a local network. I explain ways to tune access to your Mac if you make it available to other people later in the chapter, in [Control Disk Access](#).

Note: The Mac sharing files is called the *host*; the Mac or other device accessing files on the host is a *client*. I use these terms occasionally below to avoid writing “the Mac from which you’re sharing files” and “the Mac accessing shared files” repeatedly!

Access Networked Files from a Mac

As with screen sharing, the host Mac has to be reachable remotely by whatever device you’re connecting from. Let’s start with the simplest case, selecting a Mac on your LAN, then look other ways to connect.

Tip: When outside your LAN, you need your host Mac (or other devices described later) to be reachable via some publicly routable address. See [Allow Incoming Network Sessions](#) in [Appendix A: Enable Inbound Access](#) for the details on setting up inbound access.

Browse for a Server and Connect

You have two ways in the Finder to connect to a file server:

- In a Finder window, select a device that appears under Locations in the sidebar. Then click the Connect As button (**Figure 66**).

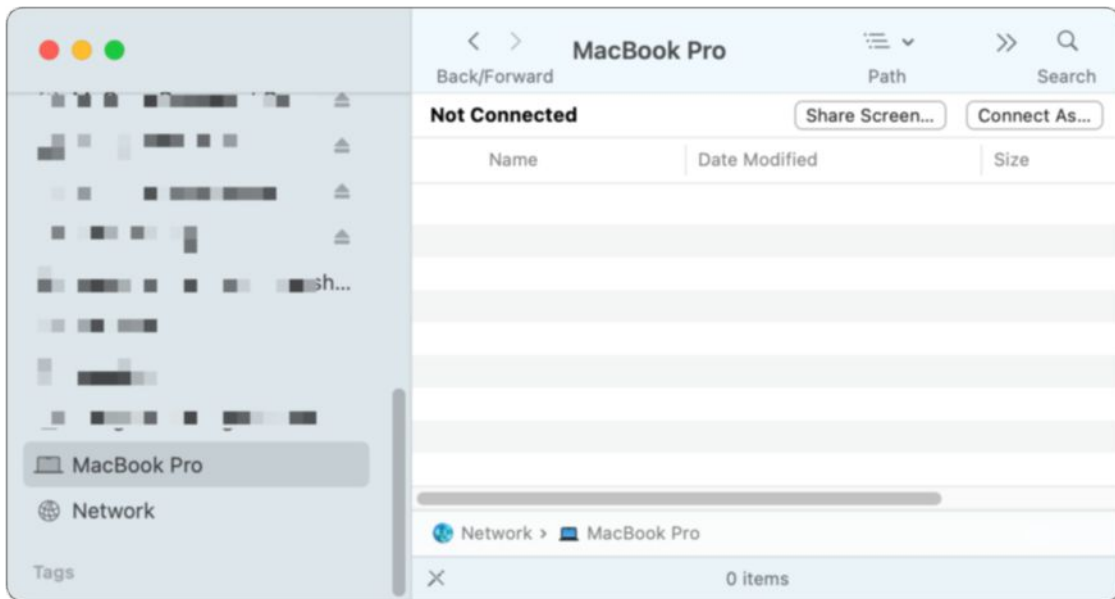


Figure 66: The Finder lets you select a server and click Connect As.

- Select Go > Connect to Network (⌘-Shift-K) in the Finder and Macs with Bonjour appear (**Figure 67**). Double-click the one you want.

Tip: See [Hello, Bonjour! Let's Rendezvous on the Network](#) on the Network for more on Bonjour.

Share Files in the Cloud

In the last chapter, I explained the ins and outs of sharing files from or to file servers. Hold onto your hats for a change of focus: this chapter looks at cloud-based storage. While it seems quite different, it can serve the same purpose from a sharing perspective: you want to store or access files in a way that you or others have access to them. When a LAN-based server doesn't work, the cloud can.

Note: The cloud is a catchall term for “servers you don't run, don't know about, appear monolithically as one thing even if they are dozens or millions of pieces of hardware, and which you access over the internet.” That one word does a lot of work.

Cloud storage is a great help in sharing files because you don't need to operate your own hardware, open up your network to outside use, keep a computer or other device running 24 hours a day, or configure fiddly settings to control access if you need to limit what other people can get their hands on.

In this chapter, I show you how to share folder access and copy files for others through major cloud storage offerings from Apple, Dropbox, Google, and Microsoft. Each service offers minimal storage in their free tiers: 2 GB (Dropbox, with ways to earn more), 5 GB (Apple, Microsoft), and 15 GB (Google). You can purchase more, or it may come with a subscription package.

Note: While you can use cloud storage to access your own files, that's more like *syncing* than *sharing*—you're replicating your files and accessing them in multiple locations plus, typically, making them available via a web app when you're logged in to your account.

Sharing files via cloud services is often the best method compared to two main alternatives:

- **File servers:** Most of us don't want to operate our own file server, between keeping access available and troubleshooting access issues

and maintaining security. This is especially an issue if you want to avoid figuring out how to set up remote access into your LAN, as discussed in [Appendix A: Enable Inbound Access](#).

- **Email attachments:** Email is a terrible way to share most files except casually because it leads to many copies of the same file circulating around, and many email servers (for sending or receiving) won't accept large attachments, limiting you to small files.

Many of us use one or more cloud storage options. Each of them has its own approach to sharing files with other people. In all cases, you can opt to send a link to download files or share access to files in your storage area.

iCloud Drive is obviously deeply integrated with iPhones, iPads, Macs, and iCloud.com. But the other three cloud services I feature here also offer direct Finder integration in Mac, iPhone, and iPad apps, and robust web apps.

Note: Finder integration on a Mac of Dropbox, Google Drive, and OneDrive requires installing software from each company.

Share with iCloud Drive

Nearly all Apple users gain an iCloud Drive account when they register an Apple Account, although storage is only 5 GB unless you upgrade to a paid iCloud+ tier. iCloud Drive is so deeply integrated into Apple's operating systems that it's often the best option for cloud-based storage and sharing.

Here's where you find iCloud Drive:

- **Mac:** It appears in the Finder sidebar under iCloud as iCloud Drive (**Figure 82**). A Shared folder below iCloud Drive reveals all the items you've shared for collaborative access with others.

Appendix A: Enable Inbound Access

The main body of the book covers the most common and standard situations for most people, largely focused on either LAN-based access or using Apple or third-party tools that manage accessing your resources from outside your LAN.

However, what if you want to make your Macs or other devices accessible when you're remote? This appendix provides everything you need to know.

Address the Internet

I've written about internet-based networking for local area networks (LANs) and the broader interconnected global network for decades now. To understand how screen sharing and file sharing work over a local or global network, we always have to start with fundamentals.

Every internet-connected device requires a unique address that's manually entered or, more frequently, dynamically assigned. This Internet Protocol (IP) address can be *publicly routable* (reachable from anywhere on the internet) or from a *private network range*, which is used exclusively within LANs.

An address allows *routing*, or traffic to be sent to the correct destination, much like a mail carrier needs a house number on a street to deliver letters to the intended location.

IP addresses are generally shown in the pattern `x.x.x.x`, where each `x` can be a number between 0 and 255 (sometimes shown in base 16, or hexadecimal [hex], as 00 to FF). They look like `192.168.0.1`. This is the internet's *IPv4* protocol, deployed in 1982, which still dominates.

What About Next-Generation IP Standards?

Twenty years ago, *IPv6* was introduced for a variety of reasons, including massive internet growth. (IPv5 was a dead end.) IPv6 addresses are in the form `x:x:x:x:x:x:x:x`, though each number here can be from 0 to 65,535. An IPv6 address is almost always shown in hex like `FE80:CD00:0000:0CDE:1257:0000:211E:729C`. You will likely never need to type in or pay attention to an IPv6 address, even if it's used behind the scenes for any portion of a connection.

Why hasn't IPv6 taken over? The failure for it to replace IPv4 is so fraught, it would require a book on its own.

Note: I'm calling out IPv4 and IPv6's technical names only because you might see them as labels for network and router fields.

Private Networks Aren't a Firewall But an Accident

Private network addressing arose from a problem after the internet started experiencing rapid growth. IPv4's total number of possible unique addresses is about 4.3 billion, though reserved numbers and other factors mean far fewer are available. They are also assigned in clumps of at least 256 and sometimes far more, meaning many are unused within networks assigned those ranges. IPv6 has 3.4×10^{38} addresses—an absurdly large number. But IPv6 didn't exist when the internet first bloomed in the late 1990s.

The solution was to deploy gateways that translated between internal addresses drawn from a set of reserved ones for private networks and an external, internet-routable public address. The private network addresses had to be unique only within a given LAN; they could be reused (and have been by the hundreds of millions) across unconnected LANs. (It's called Network Address Translation or NAT.)

As a result, you'll see the same private address numbers during your configuration. The most common look like `192.168.x.x` or `10.0.x.x`. There's a third range that's in less common usage, and lots of additional IP addressing details that are beyond the scope of what you need for remote screen or file sharing.

Appendix B: Encrypt Your VNC Session

VNC was developed in a far earlier era in which encryption was computationally expensive, particularly on servers providing access to lots of different people—one of VNC’s big initial purposes.

All VNC traffic using the standard, compatible version of VNC is sent in the clear (**Figure 125**). While the login password is encrypted, it uses a poorly implemented algorithm and the password is generally truncated to eight characters no matter how many you set in the server. Passwords are also stored insecurely on the server—they are *obfuscated* but not encrypted, making them recoverable. All these aspects are true even with Apple’s built-in VNC server on Macs.

Note: Screen Sharing uses a different connection process to establish an encrypted link. It also relies on Mac account passwords, preserving security in storage and transmission.

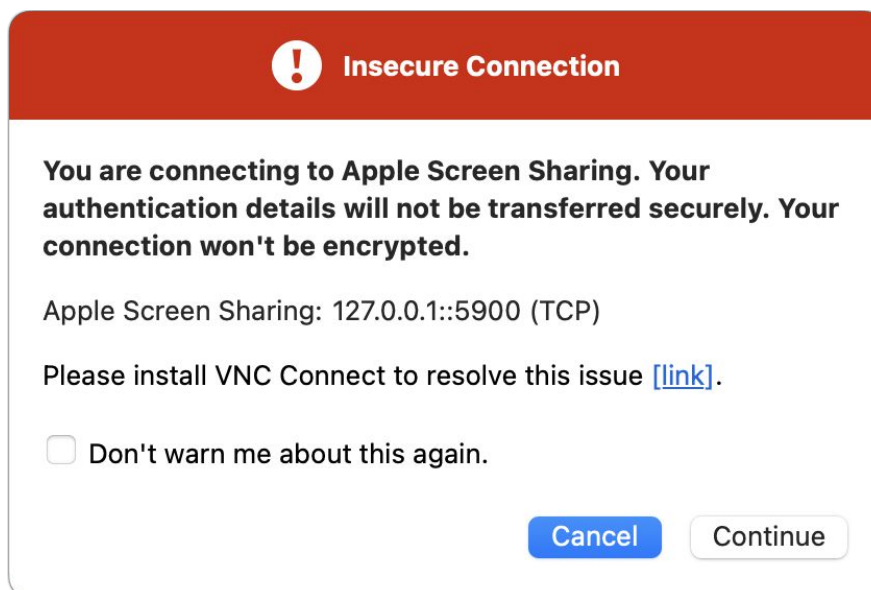


Figure 125: This warning in the free-to-use RealVNC client software about connecting over plain VNC to a Mac is absolutely correct. (VNC Connect is the company’s secure product.)

There are two primary ways to avoid this problem:

- Set up a secure connection with the device sharing its screen over VNC. While complicated, it's worth it if you want to access platforms other than Mac without paying for a subscription.
- Don't use any built-in VNC servers—Apple's or otherwise. Instead, install a robust third-party server, such as that from RealVNC, which incorporates encryption as an overlay. Because RealVNC requires a central account for secure access, I discuss it in [Examine Third-Party Apps](#).

So, let's look at setting up your own secure connection.

You shouldn't expose a device with VNC service on a publicly reachable IP address because of the potential for a crackable password giving someone access. But you have a couple of pathways to wrap the insecure VNC connection inside a secure one.

Start by preventing public access to your LAN on VNC ports:

1. On your router or using a network-based firewall on a device, block access to inbound ports [5900–5910](#) (**Figure 126**). This will prevent any accidental exposure to the outside world. (If your LAN relies on DHCP and NAT for private address assignment, you might skip this step, but I think it's better to batten down the hatches.)

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Take Control Books Executive Editor Glenn Fleishman never stops writing about technology and its implications. He's in his third decade of writing for publications as varied as *American History*, *Fast Company*, the *Economist*, *Increment*, the *New York Times*, *Macworld*, and *TidBITS*, and many others. In 2012, he was a two-game champion on *Jeopardy*!

You can find Glenn on [Mastodon](#) (@glennf@zeppelin.flights) and [Bluesky](#) (@glennf.com). Reach him by email at glenn@glennf.com.

Shameless Plug

I don't write just ebooks—I also produce ones of actual physical matter. My latest two are [How Comics Are Made: A Visual History from the Drawing Board to the Printed Page](#), about the production and reproduction of newspaper comics; and [Six Centuries of Type & Printing](#), tracing the evolution of type and printing technology across 600 years.

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