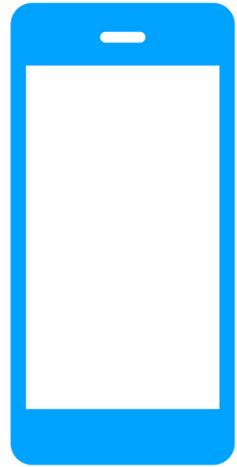
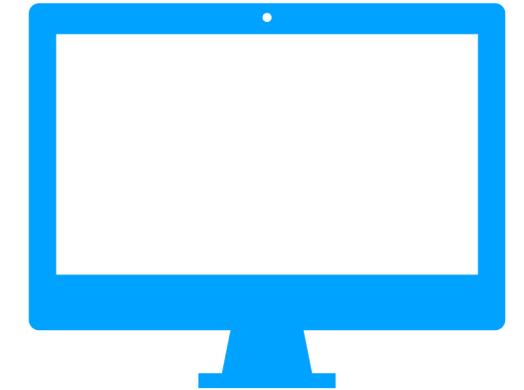


# Backups



**iPhone, iPad, and your Mac**



**March 9, 2020**

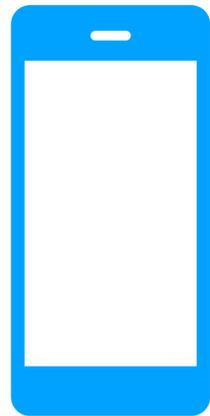


**Bruce Mitchell  
Carol Fortlage**

**Wise are those who back up;  
their device data shall be safe.**



# Agenda



## Apple-provided Backup Tools

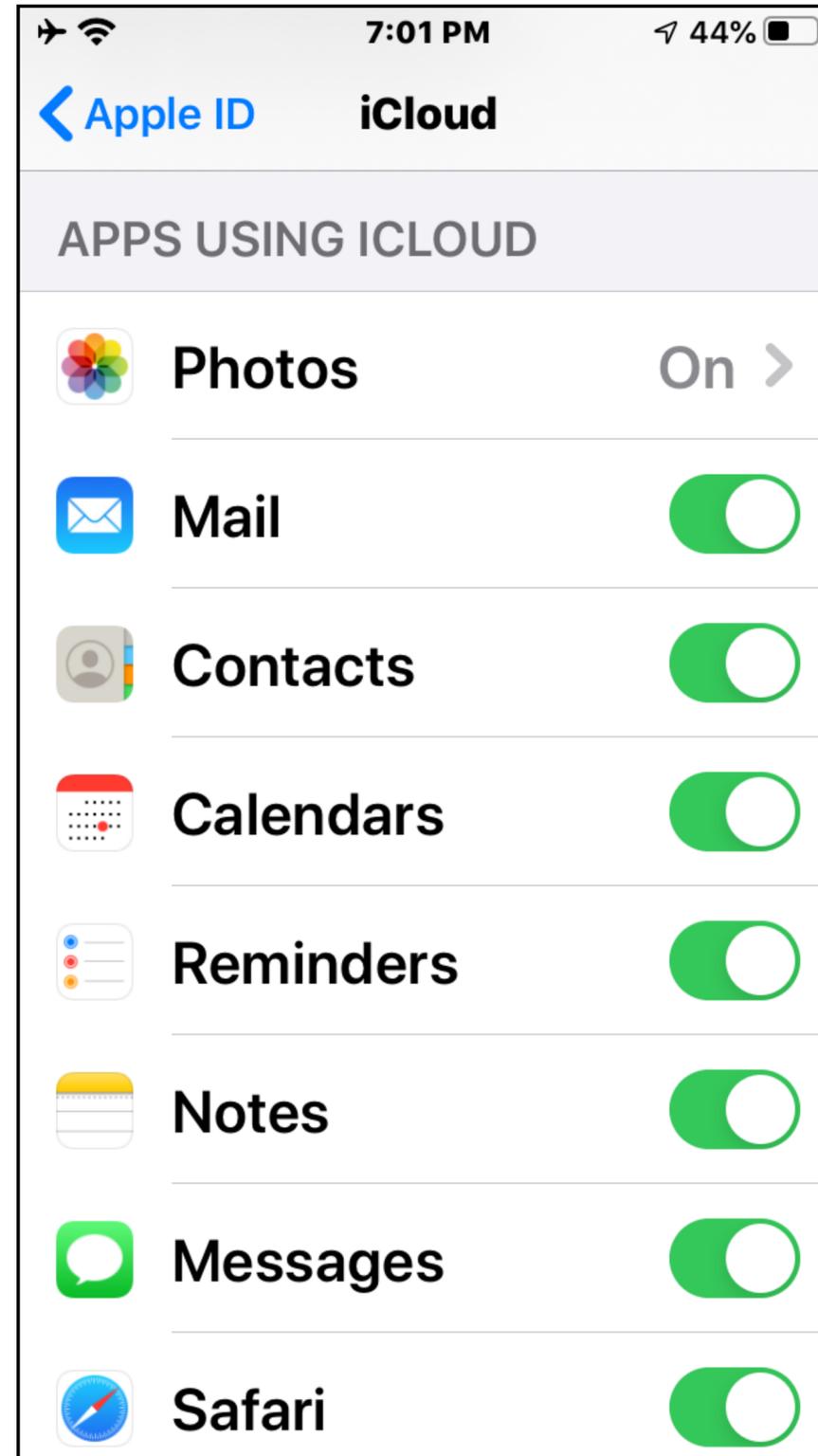
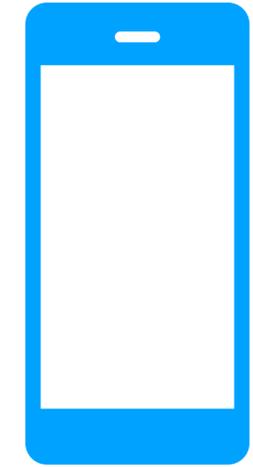
- **Device to Mac**
- **iCloud Backup (iOS/iPadOS)**
- **Time Machine (OS)**



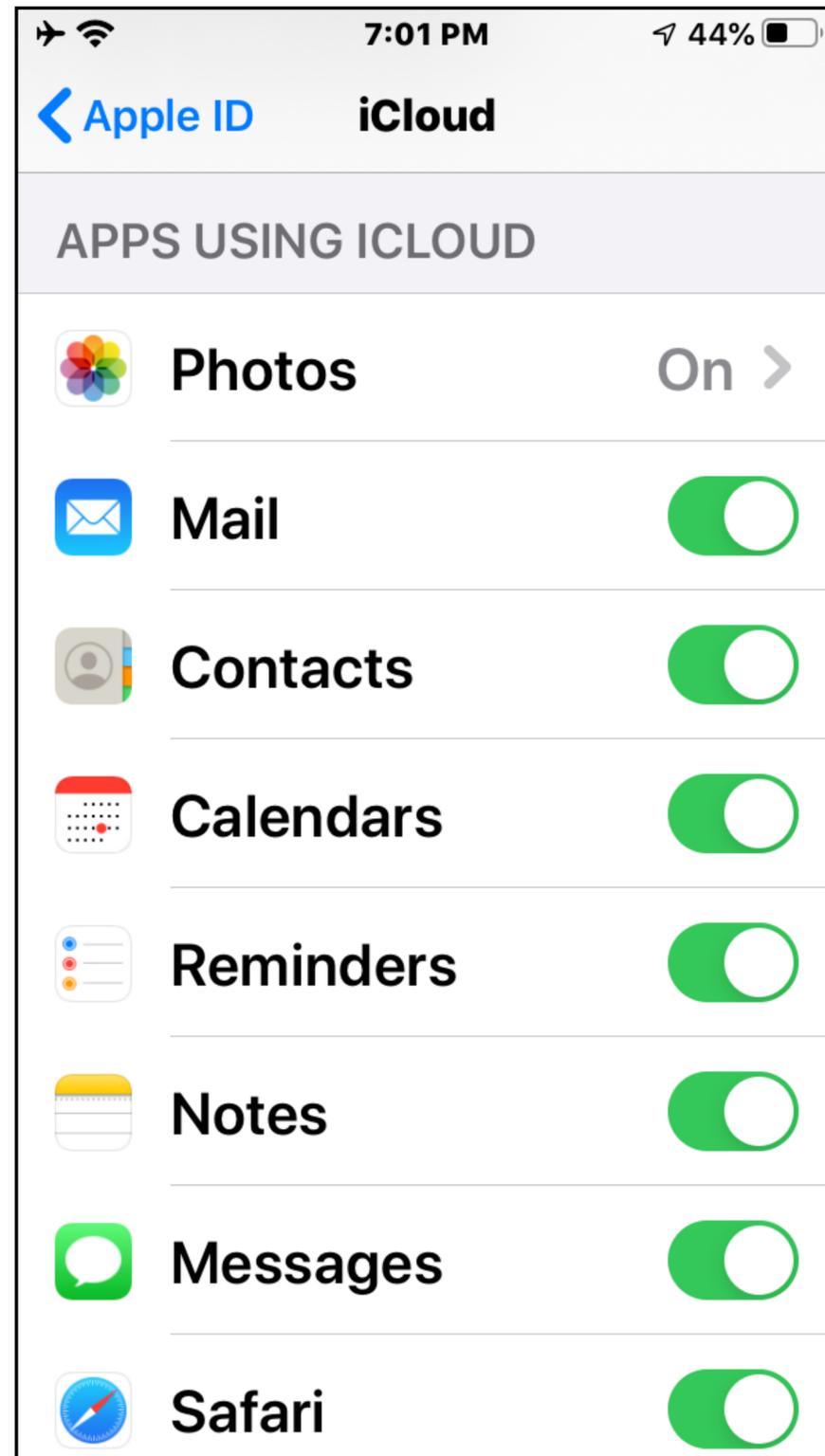
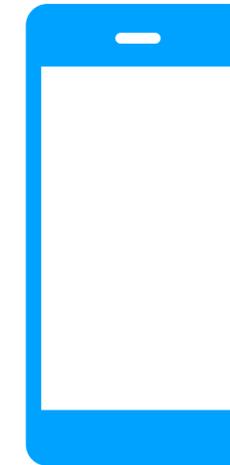
**Cloning your computer**

**Your questions**

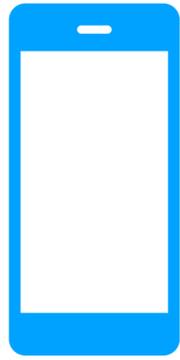
# Sync ≠ Backup



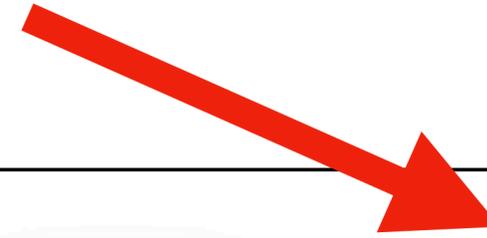
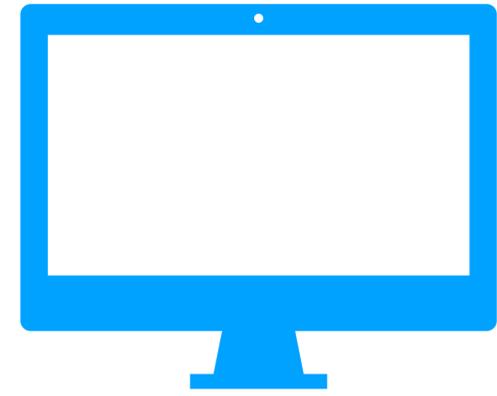
# Sync ≠ Backup

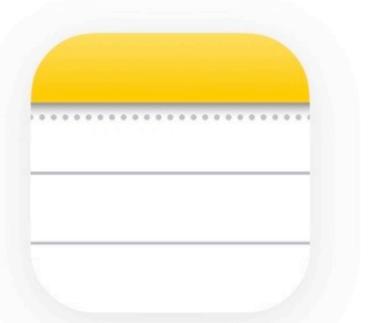


**Not synced**  
**Downloads**  
**Documents stored locally**  
**Music**  
**Settings**  
**Software**  
**System Preferences**

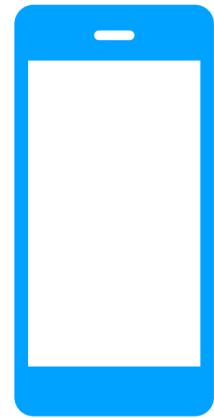


# iCloud Storage $\neq$ Backup



 Mail	 Contacts	 Calendar	 Photos	 iCloud Drive	 Notes
 Reminders	 Pages	 Numbers	 Keynote	 Find Friends	 Find iPhone

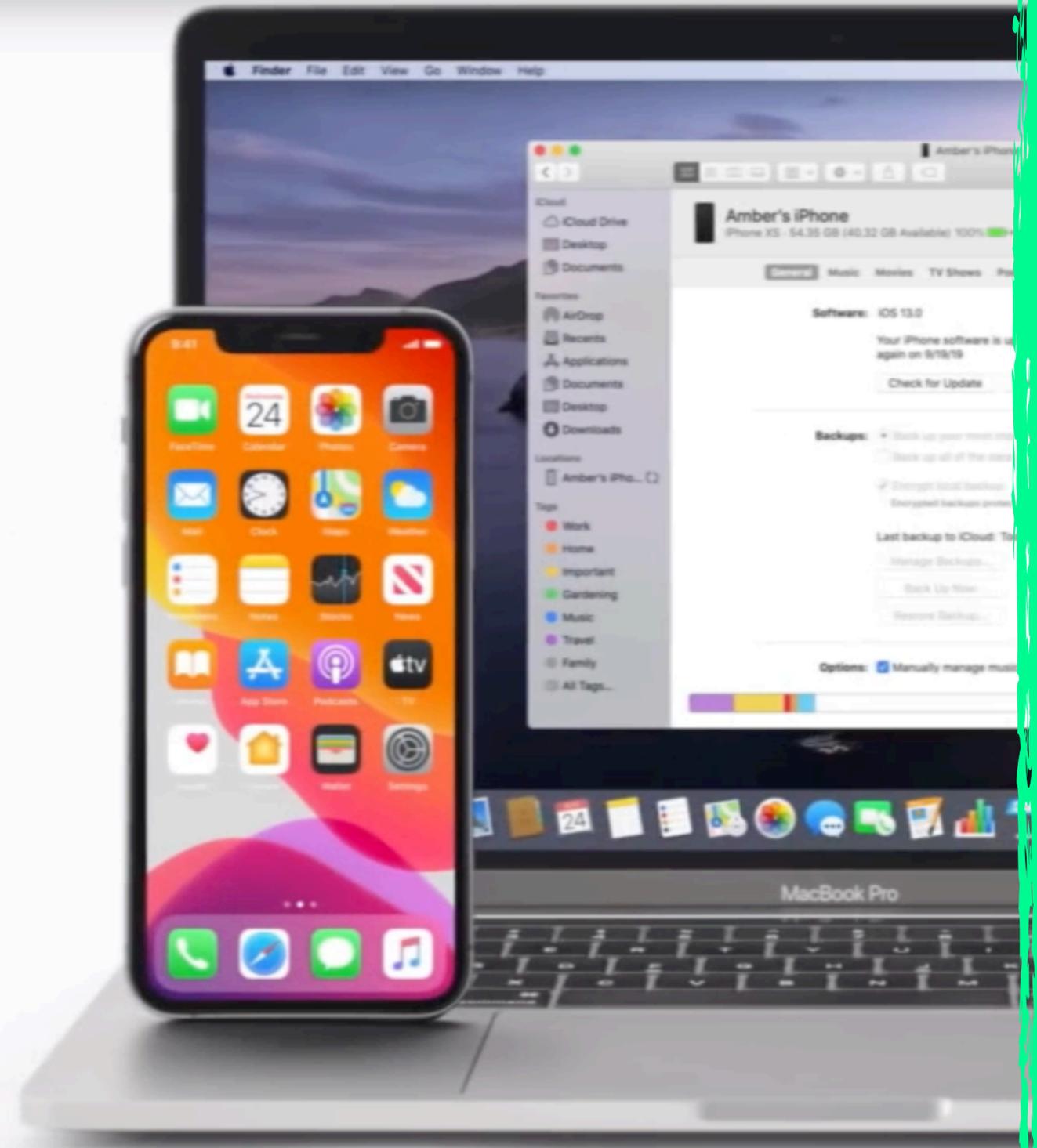
# Backing up to iCloud v. Computer



<b>Location</b>	<b>Cloud</b> 	<b>Your Mac or PC</b> 
<b>Capacity</b>	<b>Up to 2TB (5GB free)</b>	<b>Available space on your Mac or PC</b>
<b>Encrypted</b>	<b>Always</b>	<b>Optional (off by default)</b>
<b>Access</b>	<b>Create and use from anywhere with Wi-Fi</b>	<b>Create and use from your Mac or PC</b>



# How to back up your iPhone or iPad in macOS Catalina

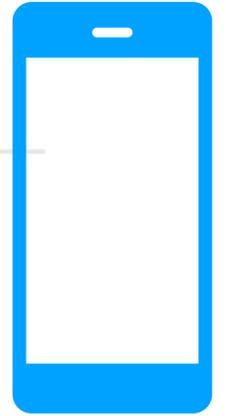


Pause (k)

0:01 / 1:36



# Device to Mac



**Backups:**  Back up your most important data on your iPhone to iCloud

Back up all of the data on your iPhone to this Mac

Encrypt local backup

Encrypted backups protect passwords and sensitive personal data.

Change Password...

Last backup to this Mac: Yesterday, 7:59 AM

Back Up Now

Manage Backups...

Restore Backup...

**Options:**  Prefer standard definition videos

Sync only checked songs and videos

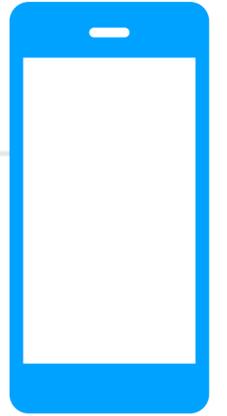
Show this iPhone when on Wi-Fi

Automatically sync when this iPhone is connected

Manually manage music, movies, and TV shows

Convert higher bit rate songs to 128 kbps AAC

# Device to Mac



- Backups:**
- Back up your most important data on your iPhone to iCloud
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- Options:**
- Prefer standard definition videos
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  - Convert higher bit rate songs to

# iCloud Backup



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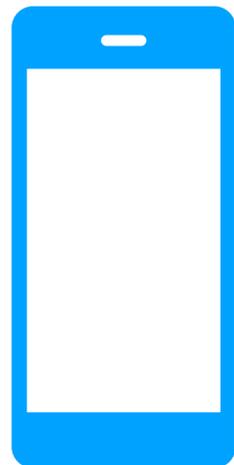
Manage Backups...

Change Password...

Back Up Now

Restore Backup...

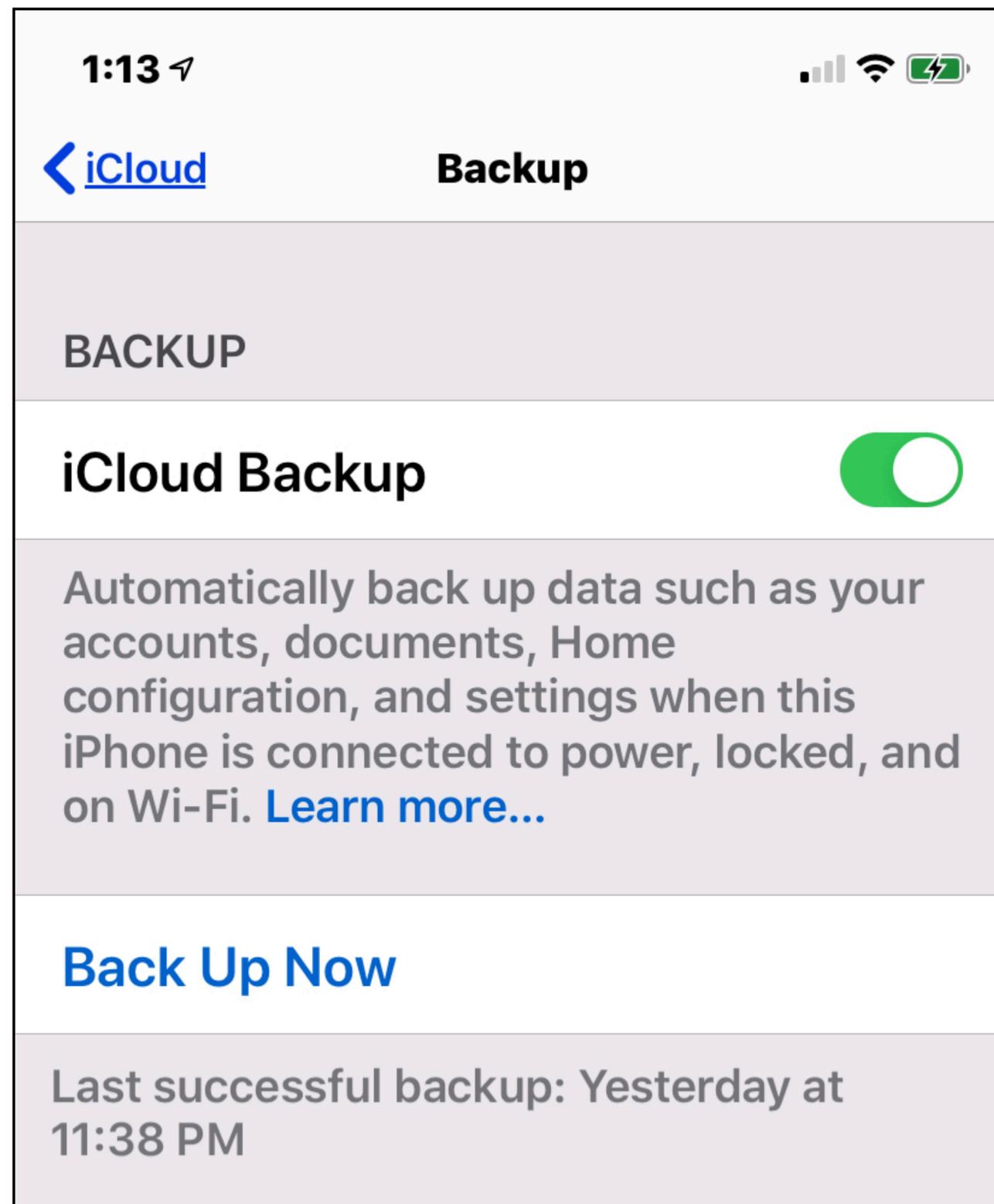
- Options:**
- Prefer standard definition videos
  - Sync only checked songs and videos
  - Show this iPhone when on Wi-Fi
  - Automatically sync when this iPhone is connected
  - Manually manage music, movies, and TV shows
  - Convert higher bit rate songs to 128 kbps AAC



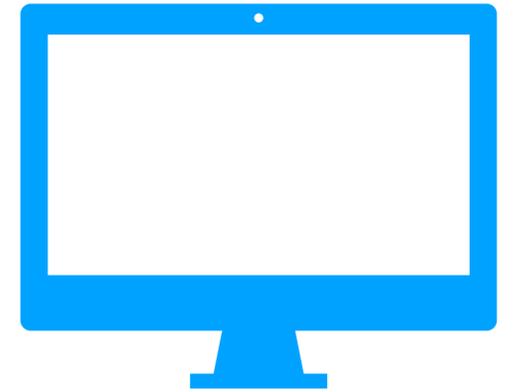
# iCloud Backup

On iPhone/iPad, choose

- **Settings**
- **{Your Name}**
- **iCloud**
- **iCloud Backup**

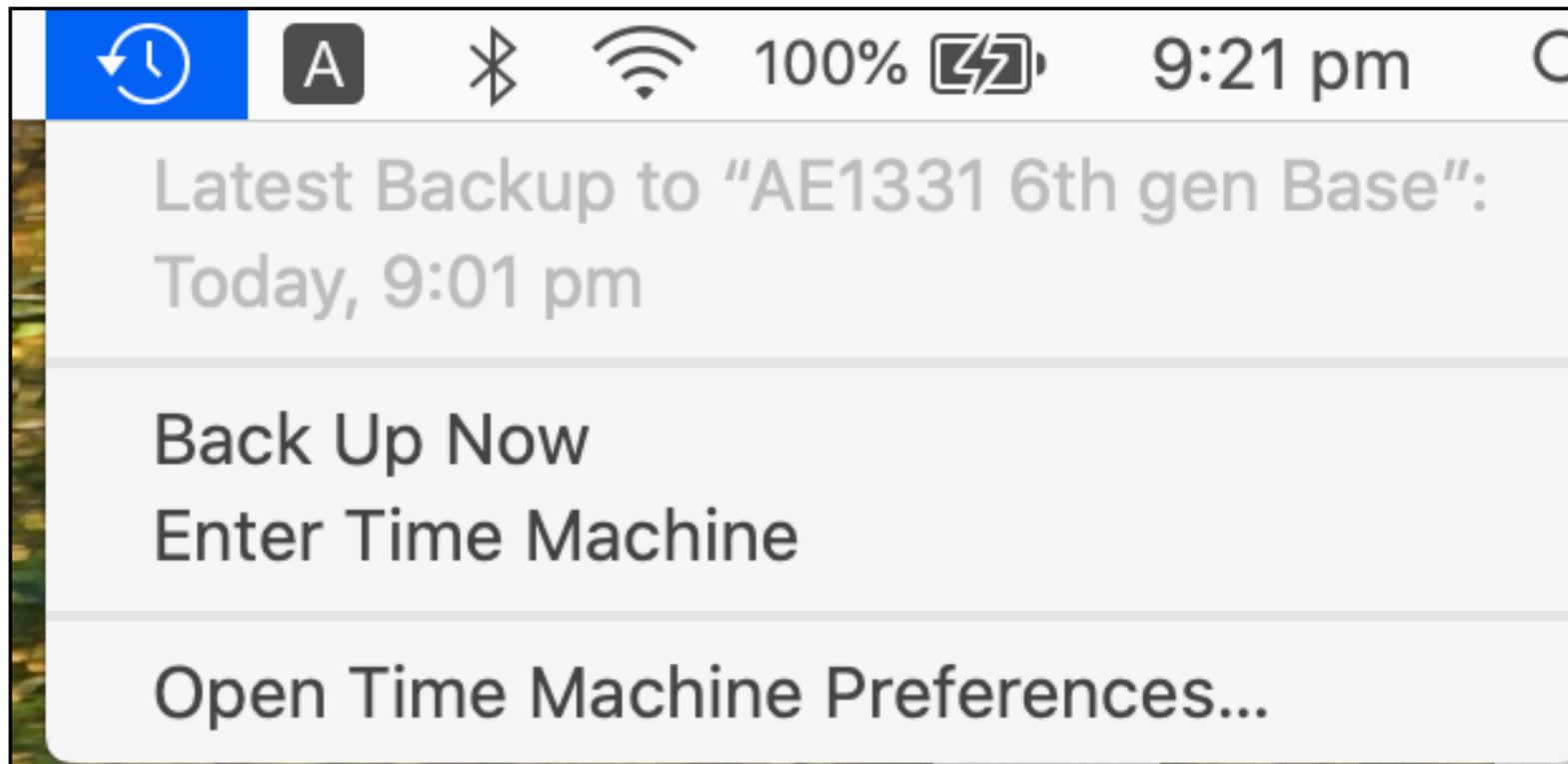
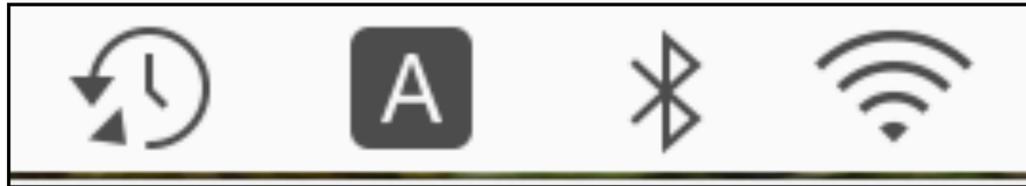
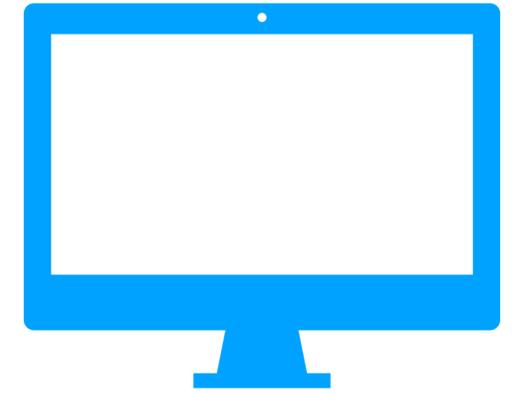


# Time Machine

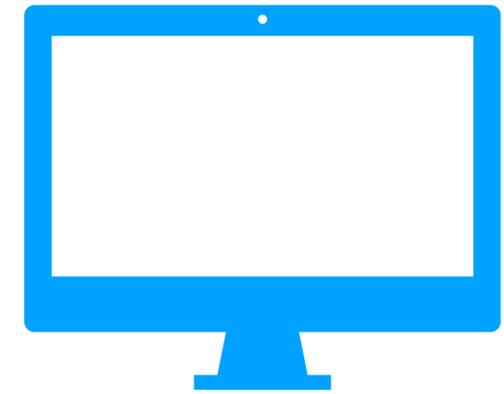


- **Local snapshots as space permits**
- **Hourly backups for the last 24 hours**
- **Daily backups for the past month**
- **Weekly backups for all previous months**

# Time Machine



# Time Machine



Name	Date Modified	Size
Dumpling Soup.docx	Jan 20, 2020 at 2:37 AM	20 KB
dumpling soup.pdf	Jan 19, 2020 at 8:45 PM	3.6 MB
broccoli cheese soup from Chris Ziegler.pdf	Nov 12, 2019 at 9:44 PM	673 KB
Golden baked onions.pdf	Jan 27, 2019 at 11:18 PM	366 KB
chicken paprikash from Kathy Eyerman.pdf	Jan 23, 2019 at 10:37 PM	526 KB
Pie crust.docx	Oct 6, 2018 at 8:59 AM	12 KB
<b>Cauliflower Crust for 8.docx</b>	<b>Oct 4, 2018 at 5:00 PM</b>	<b>15 KB</b>
Tomato Pie.docx	Oct 4, 2018 at 4:38 PM	19 KB
Cauliflower Crust Quiche Lorraine.docx	Oct 3, 2018 at 10:48 PM	14 KB
Cauliflower-Crusted...che Recipe by Tasty.pdf	Oct 3, 2018 at 10:22 PM	72 KB
cauliflower crust.pdf	Oct 3, 2018 at 10:19 PM	60 KB
Easy Cauliflower Riso...all in 15 minutes.docx	Oct 3, 2018 at 10:15 PM	25 KB
Cauliflower Risotto - i...hy Family Recipes.pdf	Sep 23, 2018 at 1:27 PM	127 KB
Low-Carb Seafood Risotto.pdf	Sep 9, 2018 at 9:15 AM	2.3 MB
Chocolate Toffee Crack.docx	Aug 14, 2018 at 5:58 PM	13 KB
Ham Dip.docx	Aug 13, 2018 at 1:26 PM	12 KB

Timeline

Restore

Cancel Restore

# Backing up your Mac



## iCloud Drive

Data from Apple apps

Numbers

Pages

Photos & Videos from iPhone

Contacts

Calendar

Apple Watch

5 GB free

\$12 a year 50 GB

## Time Machine

Incremental backup of documents

Can go back to retrieve/restore

Automatic when connected

Comes with your Mac

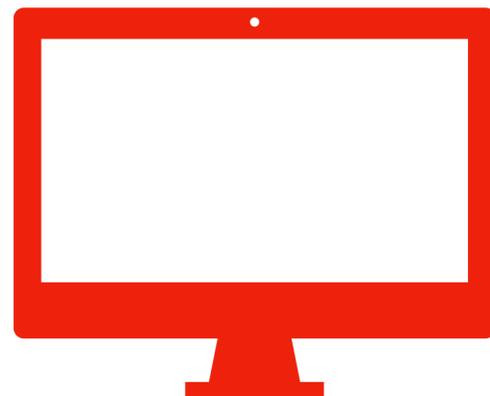
You provide an external drive

## Bootable Back up

**A full backup /clone of HD**

**the whole enchilada**

- **The Mac OS System**
- **User accounts**
- **All your apps**
- **Documents/ passwords**
- **Wi-Fi preferences**

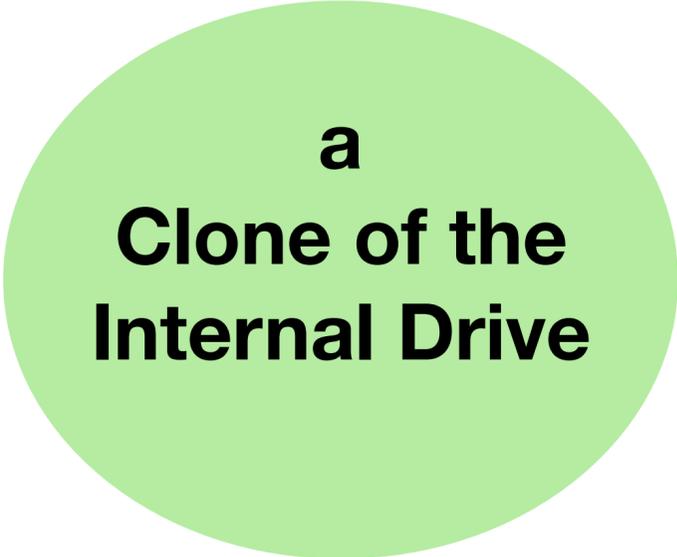


# Bootable Back up

**A full backup /clone of HD**

**the whole enchilada**

- **The Mac OS System**
- **User accounts**
- **All your apps**
- **Documents/ Passwords**
- **Wi-Fi preferences**



**a  
Clone of the  
Internal Drive**

**Bootable backup software**

**third party software not made by Apple**

**We are making a **clone** of the internal hard drive.**

You can restore from Time Machine backup and boot from that disk.  
You can use the recovery partition built in the Mac OS.

But you can't boot directly from Time Machine in order  
to be up and running quickly.

It can take hours to do this.  
Meanwhile you cannot use your Mac.

Time Machine should be **a companion** to a bootable backup.

Take Control of  
Backing Up Your  
Mac (3.1)

Joe Kissell



**Not a substitute.**

# In Disk Utility

**1** Erase

The screenshot shows the Disk Utility interface. At the top, there are buttons for View, Volume, First Aid, Partition, Erase, Restore, and Mount. The Erase button is highlighted with a red circle and the number 1, with a green arrow pointing to it. In the left sidebar, under 'External Drive', the drive 'Micron\_5 100\_...' is selected. The main area shows the Erase dialog for 'Micron\_5 100\_MTFDDAK960TC Media'. The dialog title is 'Erase "Micron\_5 100\_MTFDDAK960TC Media"?' and it contains a warning: 'Erasing "Micron\_5 100\_MTFDDAK960TC Media" will permanently erase all data stored on it. You can't undo this action.' Below the warning are three fields: 'Name' with the value '2nd Backup', 'Format' set to 'APFS', and 'Scheme' set to 'GUID Partition Map'. Each of these fields is highlighted with a red circle and a number (2, 3, and 4 respectively). At the bottom of the dialog are three buttons: 'Security Options...', 'Cancel', and 'Erase'. The 'Erase' button is highlighted with a red circle and the number 5.

**5**

# Internal Drive

# External Drive

A screenshot of the macOS Disk Utility application. The interface is divided into two main sections: a left sidebar and a right main area. The sidebar is titled 'Internal' and 'External'. Under 'Internal', there is a tree view showing 'APPLE SSD SM0512F Media' and 'Container disk1'. Under 'External', there is a tree view showing 'Micron\_5 100\_MTFDDAK96...', 'Container disk3', '2nd Backup', and '2nd Backup - Data'. The 'HD' drive under 'Internal' is selected and highlighted in green. The right main area displays details for the selected 'HD' drive, including a progress bar showing usage, a legend for 'Used' (blue) and 'Other' (grey), and a list of drive statistics: Mount Point, Capacity, Available (271.59 GB), and Used (11.01 GB).

View Volume First Aid Partition Erase Restore Un

Internal

- APPLE SSD SM0512F Media
  - Container disk1
  - HD**
  - HD - Data

External

- Micron\_5 100\_MTFDDAK96...
  - Container disk3
    - 2nd Backup
    - 2nd Backup - Data

**HD**  
APFS Volume • APFS  
macOS 10.15.3

Used 11.01 GB Other 225.8 GB

Mount Point:  
Capacity: 5  
Available: 271.59 GB (8.34 GB p  
Used:

# Third party bootable backup software options



[bombich.com](http://bombich.com)

1



**SuperDuper!**  
Heroic System Recovery  
For Mere Mortals.

[shirt-pocket.com](http://shirt-pocket.com)

2



**Chrono Sync**

[econtechtechnologies.com](http://econtechtechnologies.com)

The thing about a bootable backup is **ease of restoration**.

If you can't restore a backup it's useless.

What I want is a single drive with everything  
that's on my computer, including OS

It must maintain all my permissions, passwords, and admin rights.

Everything is available immediately even if my computer dies.



# CARBON COPY CLONER

30 Day Free Trial Version Available

**\$40**

<https://bombich.com/features>

Household License

	MAVERICKS 10.9	YOSEMITE 10.10	EL CAPITAN 10.11	SIERRA 10.12	HIGH SIERRA 10.13	MOJAVE 10.14	CATALINA 10.15
CCC 5		✓	✓	✓	✓	✓	✓
CCC 4	✓	✓	✓	✓	✓		

Carbon Copy Cloner requires macOS. CCC will not run on Windows.

Mojave and Catalina use version 5

# Launch Carbon Copy Cloner

## Task Plan for "Untitled"

CCC will copy **HD** to **2nd Backup**. Only items that have been modified since the last backup task will be copied. Barring any hardware compatibility problems, **the destination volume should be bootable.**

**Last Run:** Today at 7:38 AM

**Next Run:** This task will run when you click the "Clone" button.

### SOURCE



HD  
229.65 GB used

### DESTINATION



2nd Backup  
959.78 GB free

### SCHEDULE



No schedule specified

 Copy All Files

 SafetyNet Off

 Don't send email

Files unique to the destination will be permanently deleted.

▼ **ADVANCED SETTINGS** ?

Revert

Clone

## Clone Task Settings

Source: **HD**

Destination: **2nd Backup**

Copying: **All files**

Backup style: **SafetyNet Off**

Total size of source data set: **204.82 GB**

Start time: **3/2/20, 1:51 PM**

Elapsed Time: **27:05**

Data copied: **204.8 GB**

Files copied: **1,465,910**

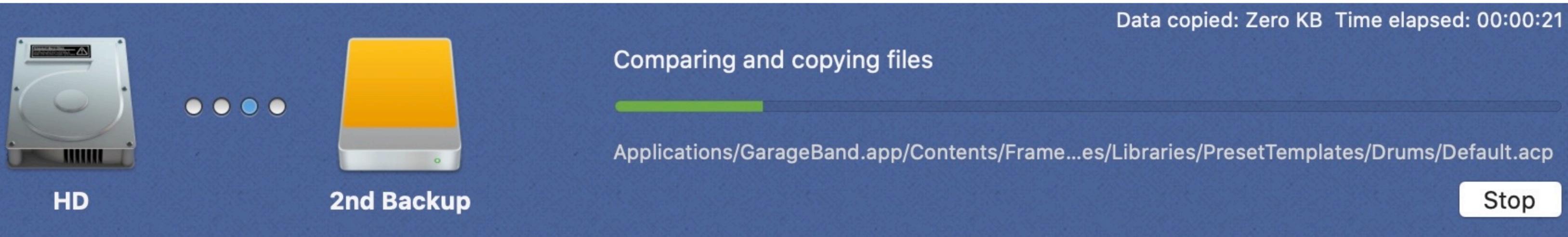
**The backup completed successfully.**

**First Backup  
took 27 minutes**

## Task Log of Backups

Task	Source	Destination	Start time	Elapsed time	Data copied	Status
Untitled	HD	2nd Backup	Today, 9:31 AM	33:51	12.18 GB	✓
Untitled	HD	2nd Backup	Yesterday, 10:11 AM	4:47	12.42 GB	✓
Untitled	HD	2nd Backup	3/2/20, 6:58 PM	4:05	7.94 GB	✓
Untitled	HD	2nd Backup	3/2/20, 6:52 PM	4:16	9.77 GB	✓
Untitled	HD	2nd Backup	3/2/20, 1:51 PM	27:05	204.8 GB	✓
Untitled	HD	Backup	3/2/20, 7:38 AM	4:37	14.22 GB	✓

# A Smart Backup in Carbon Copy Cloner



The screenshot shows the Carbon Copy Cloner interface. On the left, there is a source drive labeled 'HD' and a destination drive labeled '2nd Backup'. A progress bar indicates the task is in the 'Comparing and copying files' stage. The status bar at the top right shows 'Data copied: Zero KB' and 'Time elapsed: 00:00:21'. A file path is visible: 'Applications/GarageBand.app/Contents/Frame...es/Libraries/PresetTemplates/Drums/Default.acp'. A 'Stop' button is located in the bottom right corner.



## Task Plan for "Untitled"

**The backup task completed successfully**

**Completed on:** March 4, 2020 at 5:49 PM

**Time elapsed:** 04:31

**Files copied:** 10,163 (11.88 GB)



**4:31**

# Super Duper



**SuperDuper!**

Heroic System Recovery  
For Mere Mortals.

# Download Now!

You can  
[download](#)  
SuperDuper!  
v3.3.1 right now  
and back up and  
clone your  
drives for **free**—  
forever!



**The free version does not support **smart backups** and **scheduling**.  
The entire source drive is recopied.**

Buy SuperDuper! to unlock **scheduling,**  
**Smart Update**

You can register right from the  
application, or simply [click to  
buy it now.](#)

**Buy Now!**

**US\$27.95**



# SuperDuper!

Heroic System Recovery  
For Mere Mortals.

SuperDuper!

Copy  HD [500.07 GB]  to  2nd Backup [959.99 GB] 

using  Backup - all files 

General

Advanced

## Before copy

Repair permissions on HD

## During copy

Smart Update 2nd Backup from HD 

Smart Update will copy and erase what's needed to make 2nd Backup identical to your selections from HD. The result will mimic "Erase, then copy", but will typically take a fraction of the time.

## On successful completion

- ✓ Do Nothing
- Restart from 2nd Backup
- Set 2nd Backup as Startup Disk
- Eject 2nd Backup
- Shut Down Computer
- Sleep Computer
- Quit SuperDuper!

OK

# SOURCE

# DESTINATION

SuperDuper!

Copy  HD [500.07 GB]  to  2nd Backup [959.99 GB] 

using  

## What's going to happen?

Pressing "Copy Now" will use "Backup - all files" to copy HD to 2nd Backup using Smart Update. All files on HD will be copied to 2nd Backup, except the temporary and system-specific files that Apple recommends excluding.

Smart Update will copy and erase what's needed to make 2nd Backup identical to your selections from HD. The result will mimic "Erase 2nd Backup, then copy files from HD", but will typically take a fraction of the time.



Click to allow copying without password authentication.

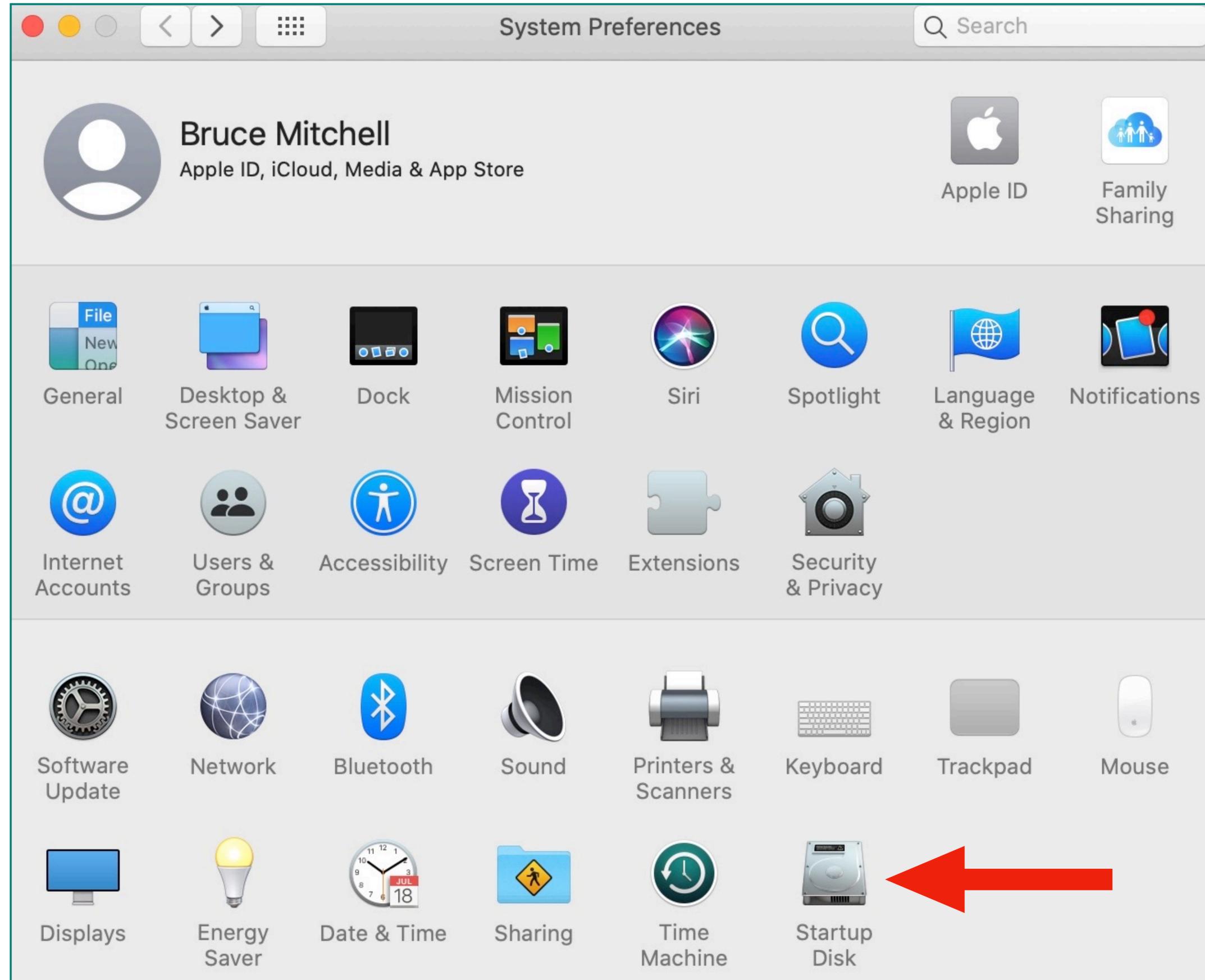
Options...

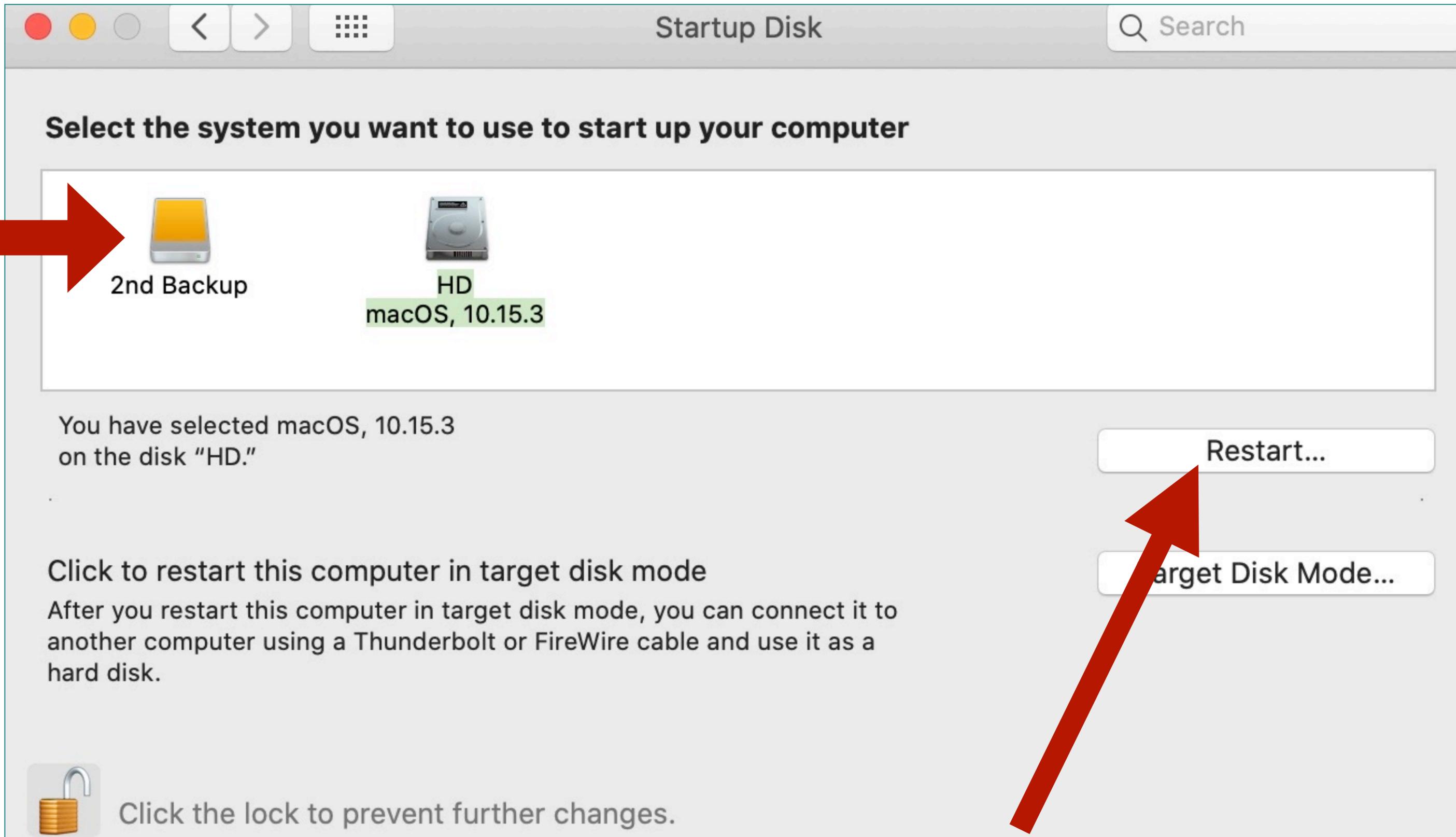
Schedule...

Copy Now 

# Test the Backup

# Change Startup Disk in System Preferences





**Then restart**

# Summary

## Apple-provided Backup Tools

- **Device to Mac**
- **iCloud Backup (iOS/iPadOS)**
- **Time Machine (OS)**

## Cloning your computer

- **Carbon Copy Cloner**
- **Super Duper!**

# Questions

## Appendix:

The next 8 slides explain more about the file systems used by Time Machine and a Mac OS Catalina bootable backup.

The slides explain how to format an external drive.

This is a one-time thing per external drive.

# Drive Formats for Macs



## HFS+ and APFS

What is HFS+???

**Hierarchical File System Plus**

Time Machine only works in HFS+

**APFS replaced HFS+ in 2017 in 10.3 High Sierra**

**APFS is customized to work better  
with SSD solid state drives**

**APFS replaced HFS+ in 2017 in 10.3 High Sierra**

# **AP**ple **F**ile **S**ystem

**Required in Catalina 10.15  
and external backup drives**



**How do you tell if you have a  
APFS or the older HFS+ ?**

**Click on the hard drive icon  
to highlight  
Then. **Command -I****

 **Macintosh HD**  
Modified: January 7, 2020 at 6:48 PM

Add Tags...

▼ General:

- Kind: Volume
- Created: October 31, 2019 at 5:57 PM
- Modified: January 7, 2020 at 6:48 PM
- Version: 10.15.2
- Format: APFS
- Capacity: 2.07 TB
- Available: 1.97 TB (5.88 GB purgeable)
- Used: 92,269,580,288 bytes (92.3 GB)

A blue arrow points from the text 'Then. Command -I' to the 'Format: APFS' line in the screenshot.

**To make a bootable backup the drive needs formatting**

**Get help if not sure.**

## Disk Utility User Guide

for macOS Catalina

[Table of Contents](#) (+)



**<https://support.apple.com/guide/disk-utility/welcome/mac>**

# How to prep an external drive for APFS

- Open **Disk Utility**
- Choose **Show all devices** from Disk Utility's View menu. *This is a very important step!*
- Choose the **parent device** of your destination volume in the sidebar – **don't click on the backup volume itself**, click on its parent device. If you don't click on the parent device, you won't be able to change the partition scheme.
- Click on the **Erase** button in the toolbar. *Don't click on the Partition button!* That would seem like the obvious choice, but you cannot actually change the partitioning scheme in the Partition interface.
- Set the Scheme to **GUID Partition Map** and the Format to **APFS**, then click the **Erase** button.



Disk Utility

# In Disk Utility

View Volume First Aid Partition Erase Restore Mount

Internal

- APPLE SSD SM0...
- Container disk1
  - HD
  - HD - Data

External **External Drive**

- Micron\_5 100\_...
- Untitled

**Erase "Micron\_5 100\_MTFDDAK960TC Media"?**

Erasing "Micron\_5 100\_MTFDDAK960TC Media" will permanently erase all data stored on it. You can't undo this action.

Name: 2nd Backup

Format: APFS

Scheme: GUID Partition Map

Security Options... Cancel Erase

for a more secure erase

5

## Last steps in Disk Utility...



Erasing "Micron\_5 100\_MTFDDAK960TC Media" and creating "2nd Backup"

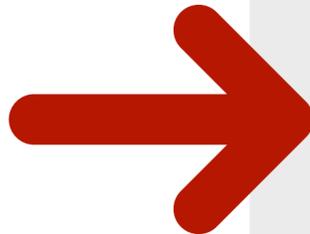


Erase process is complete. Click Done to continue.

▼ Hide Details

Creating APFS Container  
Created new APFS Container disk4  
Preparing to add APFS Volume to APFS Container disk4  
Creating APFS Volume  
Created new APFS Volume disk4s1  
Mounting APFS Volume  
Setting volume permissions

**Operation successful.**



Done

**Formatting an external drive to APFS in Disk Utilities. Then launch Carbon Copy Cloner or Super Duper.**