

Creative Cloud on Apple Silicon: Key Speed Measures

Adobe Lightroom Classic

About this Benchmark Project

This report presents the findings of a market-specific benchmarking project conducted by Pfeiffer Consulting for Adobe. The main aim of the research was **to measure the performance of Creative Cloud flagship apps on the newly introduced Apple M1 MacBook Pro**, compared to the performance of these apps running on an otherwise identical, similarly priced Intel MacBook Pro.

Benchmarks were executed using *Pfeiffer Consulting's Methodology for Productivity Benchmarking*, which has been fine-tuned over more than a decade, and measures the time experienced operators take to execute specific tasks. Please refer to the Methodology section on the last page of this document for more information.

About the Apple M1 Platform

In November 2020, Apple started **transitioning the main processor architecture** used in its desktop and laptop computers from the previously used Intel architecture to Apple Silicon to enable **better performance and lower power-consumption** through the use of a more efficient processor architecture.

This benchmark project analyzes in detail how the first generation of Apple Silicon hardware, the **M1 MacBook Pro**, **performs in the context of creative workflows**. Benchmarks covered seven essential Creative Cloud applications: **Photoshop, Illustrator, InDesign, XD, Premiere Pro, Lightroom and Lightroom Classic**. Operations benchmarked covered **a wide range of time-consuming tasks** specific to each individual workflow.

Creative Cloud Apps Performance on Apple M1 MacBook Pro

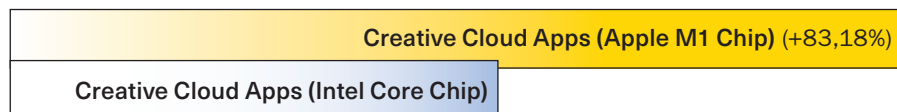


Chart based on the average of all benchmarks of seven essential Creative Cloud apps. A total of **774 individual benchmark measures** were taken. **Longer is better.**

Executive Summary

- ▶ This document presents key results from a benchmark project **comparing performance of Creative Cloud apps** on the recently released Apple M1 hardware platform.
- ▶ On average, based on ten different workflow benchmarks, Lightroom Classic on the Apple M1 system showed **over 2x performance gains** over the Intel system.
- ▶ Individual, segment-specific benchmarks were conducted with **seven essential Creative Cloud apps**.
- ▶ Benchmarks showed that, based on all benchmarks conducted, Creative Cloud is **on average over 80% faster using the Apple M1 system** when compared to an identically configured Intel system.
- ▶ **Adobe Sensei-powered features** that have been optimized for the Apple M1 machine learning architecture can result in **up to 4x - 6x performance gains**.

How fast is it really?

Creative Cloud Application Speed on Apple's M1 platform

The Hardware Conundrum

Reliable, fast hardware is absolutely essential for creative professionals to get their work done. It's not surprising, therefore, that Apple's announcement in 2019 that the company would start transitioning away from the tried and tested Intel architecture used in Macs for almost fifteen years was met with intense interest from professionals around the world.

How smooth could such an important transition be? How long would it be before essential applications such as Photoshop and Illustrator would run natively on the new platform? And, crucially, **how well would these native apps perform**, given the innovative approach Apple was taking?

The Question of Performance

Just seven months after the introduction of the first generation Apple Silicon Macs, **all key Creative Cloud apps are now available** in 'universal binary' versions, meaning that the same program can run on both Intel and Apple Silicon platforms.

But what about performance? **How well do these apps take advantage of hardware features unique to Apple's processor design**, in particular aspects such as unified memory? How does the presence of the **Neural Engine in Apple's chips impact Adobe Sensei-driven features** in Photoshop, Premiere Pro and other apps?

To answer these questions we conducted **comprehensive real-world benchmarks** with seven essential Creative Cloud apps, covering aspects as diverse as application launch, opening and processing complex data-sets, and more. For each individual app—Photoshop, Illustrator, InDesign, XD, Premiere Pro, Lightroom and Lightroom Classic—the **most time-consuming features were measured**.

The results were surprising: There was not a single benchmark where the M1 hardware was slower than the Intel version. There is one caveat, however: to ensure a coherent comparison, **we used identical hardware configurations for both Intel and M1** (See sidebar.) For features that rely heavily on GPU acceleration, however, an Intel Mac with a discreet, powerful GPU can still outperform the current generation of M1 Macs in some areas. There is little doubt, however that Apple will address this in the future as new generations of M1 Macs close any remaining gaps with new Apple Silicon-based Macs.

Benchmark Configurations

▶ **Apple M1:**

13 inch **M1 MacBook Pro**
16GB RAM, 2TB of SSD

▶ **Intel:**

13 inch **Intel Core i5 MacBook Pro**
16GB RAM, 2TB of SSD

Both systems were connected to an **Apple Pro Display XDR** for benchmarks (See last page for complete Methodology.)

How Creative Cloud Applications Perform on M1

	Intel	Apple M1	M1 Productivity gains over Intel
Photoshop – Average of all benchmarks	22,57	11,97	+89%
Top Results Photoshop			
Content Aware Fill 1	37,88	12,62	+200%
Select Subject 1	4,91	1,92	+156%
Illustrator – Average of all benchmarks	25,96	15,73	+65%
Top Results Illustrator			
Scrolling performance (complex vector drawing)	28,15	5,74	+390%
Open file with 31 complex artboards	20,76	9,50	+119%
InDesign – Average of all benchmarks	22,21	13,94	+59%
Top Results InDesign			
Open graphics-heavy file – CPU	6,50	2,28	+185%
Scrolling 100 page book project – GPU	25,23	14,14	+78%
XD – Average of all benchmarks	10,06	5,60	+80%
Top Results XD			
Open complex app prototype	43,11	16,07	+168%
Insert graphic from CC Libraries (copy)	4,48	2,18	+105%
Premiere Pro – Average of all benchmarks	291,31	164,05	+78%
Top Results Premiere Pro			
Scene Edit Detection – 4K	25,51	3,70	+430%
Import XAVC S 4K 100p	19,02	6,63	+187%
Lightroom – Average of all benchmarks	77,00	45,54	+69%
Top Results Lightroom			
Super Resolution	29,87	5,75	+420%
Full-Screen Image Review (Twenty 61MP Images)	71,50	31,74	+125%
Lightroom Classic – Average of all benchmarks	139,60	64,54	+116%
Top Results Lightroom Classic			
Apply Settings (1000 images)	65,23	14,59	+347%
Super Resolution	36,39	9,60	+279%
Average of all benchmarks (774 individual benchmarks measures)	84,10	45,91	+83%

Lightroom Classic Speed on Apple M1

What We Benchmarked

Managing the thousands of photos that professional photographers have to deal with **requires a very specific feature set**, that combines not only powerful database functionality, but has to manage the process of importing, selecting, editing and outputting images in the most efficient way possible—often **working on hundreds of RAW images** at a time.

Our benchmarks covered **typical steps in the Lightroom Classic workflow**, ranging from **importing** a large batch of RAW images, to **synchronizing settings** and **applying a set of meta-data**, and finally to **exporting** a batch of images as JPG files for sharing or distribution. We also covered certain processing options, such as **merging multiple exposures** into an HDR image or a panorama, or **enhancing an image** using the newly introduced *Super Resolution* feature.

Analysis of Benchmark Results

Lightroom Classic on M1 showed remarkable performance gains compared to the Intel system: Exporting 1000 RAW images to full-size JPG files was over twice as fast, while **synchronizing settings between 1000 images was over 3.5 times faster**. This is remarkable considering that both systems use identical SSD hardware, which would indicate that **performance gains stem exclusively from the efficient use of the M1 hardware architecture**.

Likewise (as noted previously with regards to certain Photoshop and Premiere Pro features), **operations that rely on Adobe Sensei show spectacular results**, since they can use the potential of the machine learning cores in the M1 processors. As a result, **the Sensei-powered Super Resolution feature was almost three times faster on the M1** than on the Intel system.

Lightroom Classic: Average of all Benchmarks

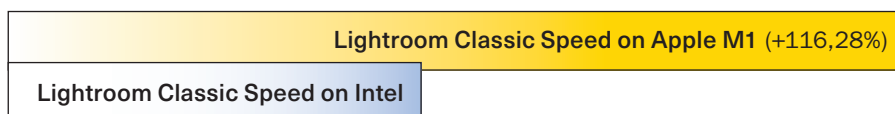


Chart based on the average of 10 workflow benchmarks conducted with Lightroom Classic. A total of **60 individual benchmark measures** were taken. **Longer is better.**

Major Points

- ▶ On average, based on ten different workflow benchmarks, Lightroom Classic on the Apple M1 system showed **over 2x performance gains** over the Intel system.
- ▶ Synchronizing settings on 1000 RAW images was **almost four times faster** when executed on the Apple M1 system.
- ▶ Image enhancement using the *Super Resolution* feature on the M1 system showed a **279% Performance increase** over the Intel system.
- ▶ Exporting 1000 RAW images to full-size JPG files was **over twice as fast** using the Apple M1 platform.

Lightroom Classic on Apple M1: Key Benchmark Results

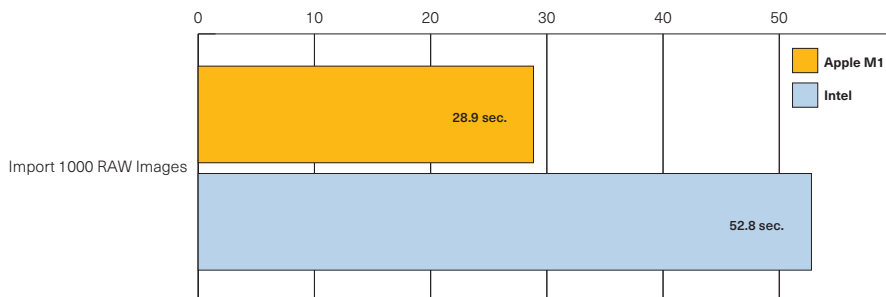
Import 1000 RAW Images: Importing images after a shoot can involve hundreds if not thousands of photos. For our benchmark, we imported 1000 12.4 MP RAW images into a Lightroom Classic catalogue. The timer was stopped when all standard previews had been generated and displayed.

On the M1 system, Lightroom Classic **completed the benchmark in 29 seconds**, compared to **over fifty seconds** on the Intel system.

Lightroom Classic Apple M1 Benchmarks: Import 1000 RAW Images

Time-scale in seconds. All data are the average of 3 individual benchmarks

Shorter is better.



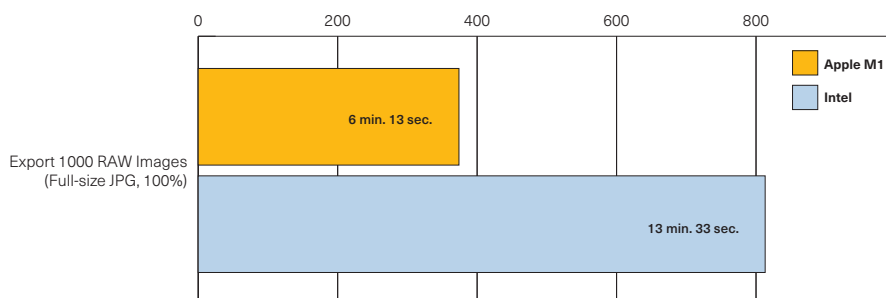
Export 1000 RAW Images: To benchmark the time necessary for exporting the entire series of 1000 RAW images, we chose full-size JPG export at 100% quality, saving the resulting files to the local SSD. The timer was stopped when all 1000 images were visible in the destination folder.

Lightroom Classic on the M1 system was **over two times faster** completing the export.

Lightroom Classic Apple M1 Benchmarks: Export 1000 RAW Images

Time-scale in seconds. All data are the average of 3 individual benchmarks

Shorter is better.



Synchronize Settings (1000 Images):

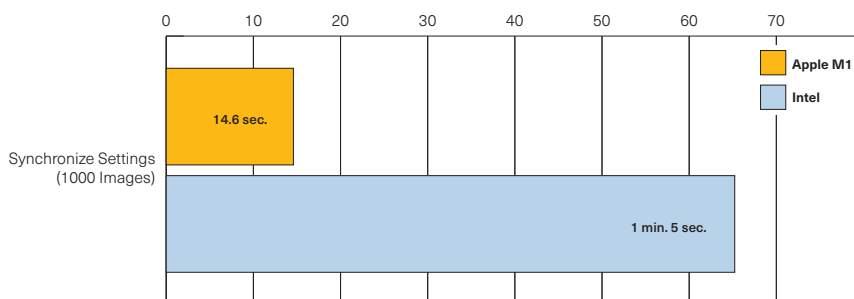
For a batch of images taken in similar conditions, it is common procedure to make adjustments on one image, than synchronize these settings across the whole batch. Our benchmark consisted in synchronizing color adjustments across 1000 images. The timer was stopped when the modified settings were displayed on all previews.

Lightroom Classic on M1 was **over four times faster** in this benchmark.

Lightroom Classic Apple M1 Benchmarks: Synchronize Settings (1000 Images)

Time-scale in seconds. All data are the average of 3 individual benchmarks

Shorter is better.

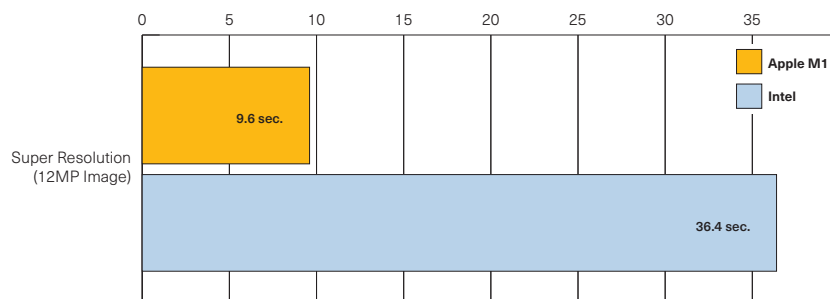


Super Resolution (12MP Image): This recently introduced feature enhances the resolution of an image by using machine learning techniques, providing significantly better results than simply scaling up the picture. The downside can be processing speed: Even for the comparatively small image used for this benchmark, the Intel system took **over 36 seconds**. Lightroom Classic on the M1 system, on the other hand, completed the task **over three times faster**.

Lightroom Classic Apple M1 Benchmarks: Super Resolution (12MP Image)

Time-scale in seconds. All data are the average of 3 individual benchmarks

Shorter is better.



Methodology

This benchmark project was commissioned by Adobe and independently executed by Pfeiffer Consulting.

All the productivity measures presented in this document are based on real-world workflow examples, designed and executed by professionals with many years of experience with these applications and workflows.

How we measure productivity

The basic approach is simple: in order to assess productivity gains that a program or solution may (or may not) bring, we start by analyzing the minimum number of steps necessary to achieve a given result in each of the applications or workflows that have to be compared.

Once this list of actions has been clearly established, we start to execute the operation or workflow in each solution, with the help of seasoned professionals who have long-standing experience in the field and with the solutions that are tested.

Every set of steps is **executed three times**, the average of the three measures is used as final result.

Benchmark Configurations

Apple M1:

13 inch **M1 MacBook Pro**
16GB RAM, 2TB of SSD

Intel:

13 inch **Intel Core i5 MacBook Pro**
16GB RAM, 2TB of SSD

Both systems were connected to a
Apple Pro Display XDR for all benchmarks

Hardware Preparation for Performance Benchmarks

Before performance benchmarks, systems are completely re-initialized. Only apps necessary for the benchmarks are installed.

Only the internal SSD was used for storage and access of benchmark assets.

About Pfeiffer Consulting

Pfeiffer Consulting is an independent technology research and benchmarking operation focused on the needs of publishing, digital content production, and new media professionals.

For more information, please contact
research@pfeifferreport.com

Pfeiffer Report

*All texts and illustrations © Pfeiffer Consulting 2021.
Reproduction prohibited without previous written approval.
For further information, please contact research@pfeifferreport.com.*

The data presented in this report are evaluations and generic simulations and are communicated for informational purposes only. The information is not intended to provide, nor can it replace specific productivity research and calculations of existing companies or workflow situations. Pfeiffer Consulting declines any responsibility for the use or course of action undertaken on the basis of any information, advice or recommendation contained in this report, and can not be held responsible for purchase, equipment and investment or any other decisions and undertakings based on the data provided in this report or any associated document.

Adobe, the Adobe logo, Creative Cloud, Illustrator, InDesign, Lightroom, Lightroom Classic, Photoshop, Premiere Pro and XD are either registered trademarks or trademarks of Adobe Systems Incorporated in the United States and/or other countries. All other trademarks are the property of their respective owners.