

Creative Cloud on Apple Silicon: Key Speed Measures

Adobe Lightroom

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

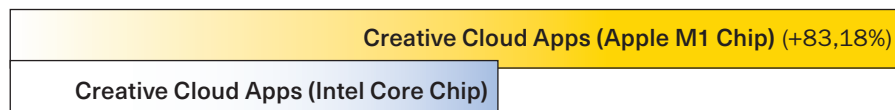


Chart based on the average of all benchmarks of seven essential Creative Cloud apps. A total of **774 individual benchmark measures** were taken. **Longer is better.**

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, Lightroom was close to **70% faster on Apple M1** than on Intel in these benchmarks.
- ▶ 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 Speed on Apple M1

What We Benchmarked

Lightroom is available not only as the desktop application benchmarked here, it also exists on **mobile platforms such as iPhone and iPad**, and is **geared towards cloud storage** as repository, allowing users to work from different devices on the same set of images. (Benchmarks for this project were conducted using local storage only, however, to avoid possible fluctuations in network bandwidth to skew results.)

Benchmarks of Lightroom covered the essential aspects of RAW image management: **Importing** 1000 RAW images, **synchronizing settings** between the same set of images, **full screen image selection** as well as **JPG export**. Finally, **Merging** and **enhancing RAW images** was also covered.

Analysis of Benchmark Results

On average, **Lightroom was almost 70% faster on M1** than on the Intel system. **Importing and exporting RAW files showed roughly a +40% to +60% performance increase**, while the full-screen selection and rating process, which consists in displaying images to be sorted full screen, moving from one to the next only when it is fully resolved, **took less than half the time necessary on the Intel system**. (See next page for details.)

Processing operations, such as **merging several RAW images into a panorama or into a HDR images were over twice as fast** than using the Intel system. As with Photoshop, Premiere Pro and Lightroom Classic, **Sensei-powered features produced the most spectacular performance gains**: Enhancing a RAW image using **Super Resolution was over four times faster on M1**, underlining the potential of the M1 platform for features relying on machine-learning.

Major Points

- ▶ Lightroom on the Apple M1 platform showed **significant performance gains** in many common time-consuming operations.
- ▶ On average, Lightroom was close to **70% faster on Apple M1** than on Intel in these benchmarks.
- ▶ Full-screen review workflow benchmarks provided an **over 2x performance gain** over the Intel-based system.
- ▶ Adobe Sensei-powered features such as *Super Resolution* could be processed **up to five times faster** on the Apple M1 system.

Lightroom: Average of all Benchmarks

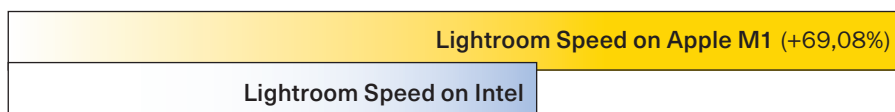


Chart based on the average of 9 workflow benchmarks conducted with Lightroom. A total of **54 individual benchmark measures** were taken. **Longer is better.**

Lightroom on Apple M1: Key Benchmark Results

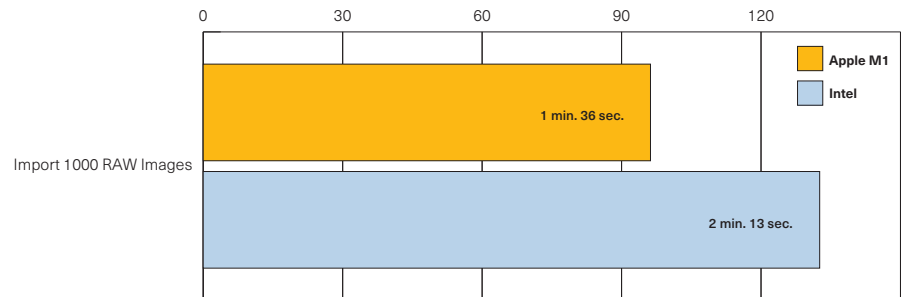
Import 1000 RAW Images: For our benchmark, we imported 1000 12.4 MP RAW images into a Lightroom Classic catalogue. The benchmark result included the time necessary to generate and display previews for all imported images.

On the M1 system, **Lightroom was almost 40% faster** completing the import than on the Intel hardware.

Lightroom Apple M1 Benchmarks: Import 1000 RAW Images

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

Shorter is better.



Export 450 RAW Images (JPG-Small):

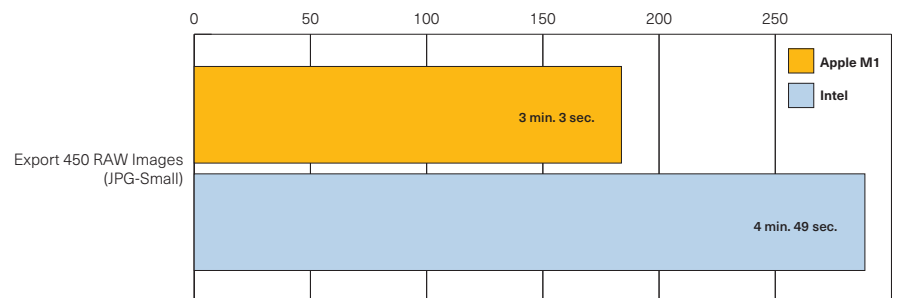
The export benchmark consisted in saving 450 Images as JPG files to the local SSD, using the JPG-Small preset at 90% quality. The timer was stopped when all images were displayed in the destination folder.

Lightroom on the M1 system **took just over 3 minutes** for exporting 450 images. On the Intel platform, processing the export required almost five minutes.

Lightroom Apple M1 Benchmarks: Export 450 RAW Images (JPG-Small)

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

Shorter is better.



Display and rate 20 Images (61MP):

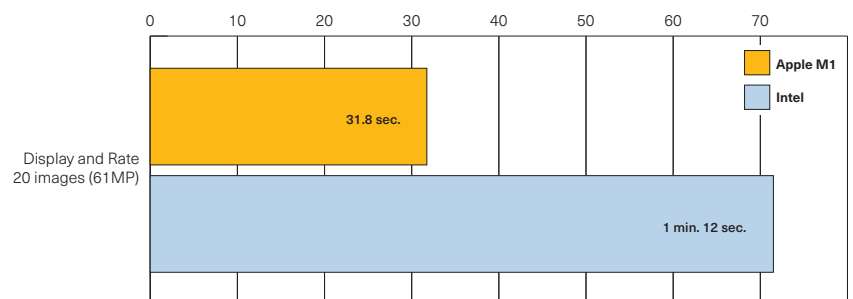
Sorting pictures after a shoot is an essential part of the photography workflow, and requires checking images individually at full resolution. To benchmark this process, we displayed images in *Detail* mode, waited until the image was fully loaded, then switched to the next image until all 20 images were reviewed.

Lightroom on the M1 system completed this process **over two times faster** than on the Intel hardware.

Lightroom Apple M1 Benchmarks: Display and Rate 20 images (61MP)

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

Shorter is better.



Super Resolution (12MP Image):

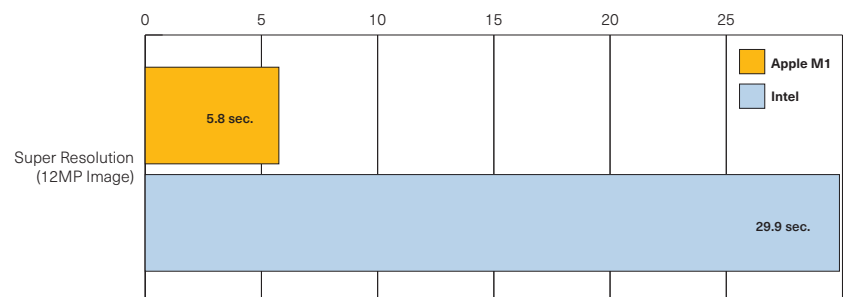
Lightroom shares this feature for enhancing the resolution of RAW images (without introducing the artefacts image resampling would introduce) with Lightroom Classic.

On the M1 system, Super Resolution was processed **over five times faster** than on Intel, demonstrating again that M1 acceleration of Adobe Sensei features can produce very impressive results.

Lightroom 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.

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Pfeiffer Report

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