Pfeiffer Report

Creative Cloud on Apple Silicon: Key Speed Measures

Adobe Premiere Pro

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

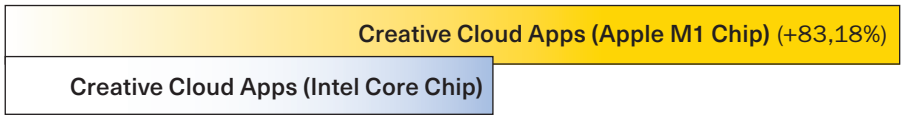


Chart based on the average of all benchmarks of seven essential Creative Cloud apps.
A total of **774 individual benchmark measures** were taken. **Longer is better.**

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 23 workflow benchmarks conducted for this research, Premiere Pro was **almost 80% faster** on the Apple M1 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%**

Premiere Pro Speed on Apple M1

What We Benchmarked

Few areas of content production require as much computing power as video: Given the variety, complexity and large file sizes of modern video formats, fast processing is essential when editing and outputting professional video.

Our benchmarks of Premiere Pro focussed on exactly these aspects: **Importing** a variety of video formats in different frame rates; **encoding video** to commonly used codecs (such as H265 or ProRes), as well as **effects performance**, and finally **playback performance** with different video formats, measured in terms of frames per second (FPS) .

Analysis of Benchmark Results

On average, based on 23 workflow benchmarks, **Premiere Pro was almost 80% faster on M1** than on Intel hardware. What is remarkable, though, is the acceleration of specific operations and effects that fully leverage features of the M1 hardware platform.

The **most spectacular cases are features that are powered by Adobe Sensei**, such as *Scene Edit Detection,* a feature that inserts cut-points at each scene change in a video: In our benchmarks, this feature was **over four times faster on M1** when working with a 4K video stream, and **almost six times faster** working with HD.

While playback performance was faster on M1 with all formats used for benchmarking, it varied depending on the type of footage used: **XAVC S 100p played back at almost 98 FPS** on the M1 system, compared to only 18 FPS on Intel, while **iPhone 4K 60p footage played back at 60FPS**—compared to 48FPS on the older hardware. (See next page for details.)

Major Points

- On average, based on 23 workflow benchmarks conducted for this research, Premiere Pro was **almost 80% faster** on the Apple M1 system.
- Importing footage in four different video formats showed **performance gains ranging from +67% to +187%** over the Intel system.
- Playback performance of footage showed that Premiere Pro on Apple M1 can **play back 4K high-framerate video without dropped frames**.
- Adobe Sensei-powered features such as *Scene Edit Detection* can be processed **up to five or six times faster** on Apple M1 systems.

Premiere Pro: Average of all Benchmarks

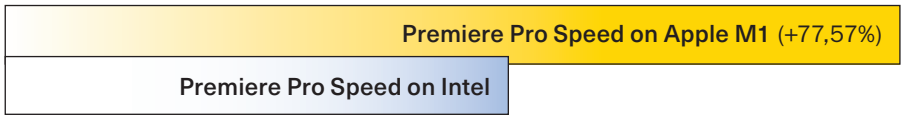


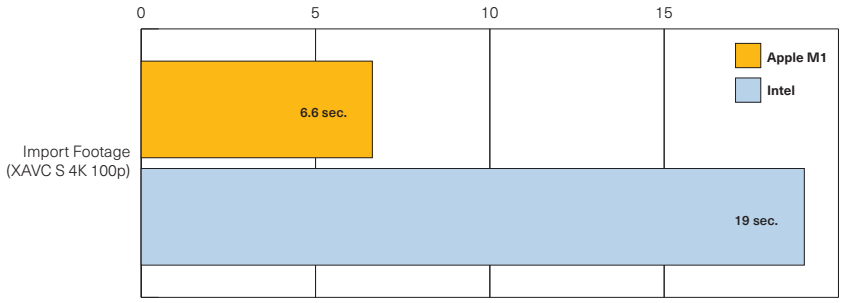
Chart based on the average of 23 workflow benchmarks conducted with Premiere Pro.
A total of **138 individual benchmark measures** were taken.
Longer is better.

Premiere Pro on Apple M1: Key Benchmark Results

Import Footage (XAVC S 4K 100p): Given the amount of media modern video pros need to manage, importing speed is essential. This benchmark consisted in importing twelve XAVC S 4K 100p clips to the media bin. The timer was stopped when all clips displayed the preview images.

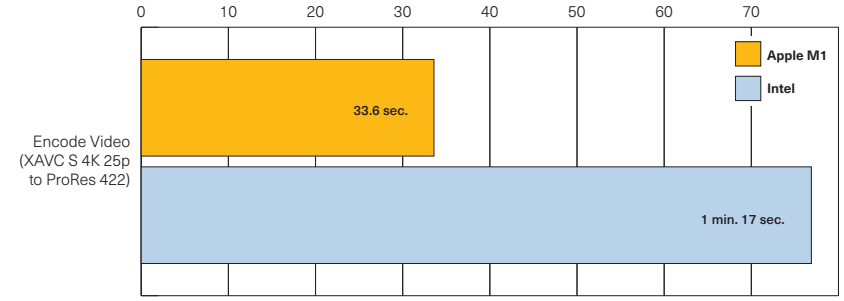
Premiere Pro on the M1 system **was almost three times faster** completing this task.

Premiere Pro Apple M1 Benchmarks: Import Footage (XAVC S 4K 100p)
Time-scale in seconds. All data are the average of 3 individual benchmarks
Shorter is better.



Encode Video (XAVC S 4K 25p to ProRes 422): Encoding video is dependent both on the source footage and the chosen export codec. Our benchmarks showed improved performance for all codecs we benchmarked with Premiere Pro. While some show only modest performance gains, other formats, such as ProRes, render significantly faster: **XAVC S 4K 25p encoding to ProRes 422 was over two times faster** on the M1 system in our benchmarks.

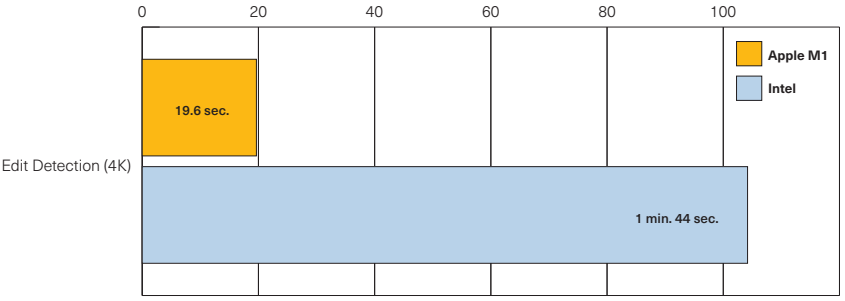
Premiere Pro Apple M1 Benchmarks: Encode Video (XAVC S 4K 25p to ProRes 422
Time-scale in seconds. All data are the average of 3 individual benchmarks
Shorter is better.



Scene Edit Detection: This feature, powered by Adobe Sensei, automates the tedious task of inserting precise cut-points at scene changes in a video.
For the benchmarks of this feature, we used a minute-long 4K video containing a dozen different individual scene changes.

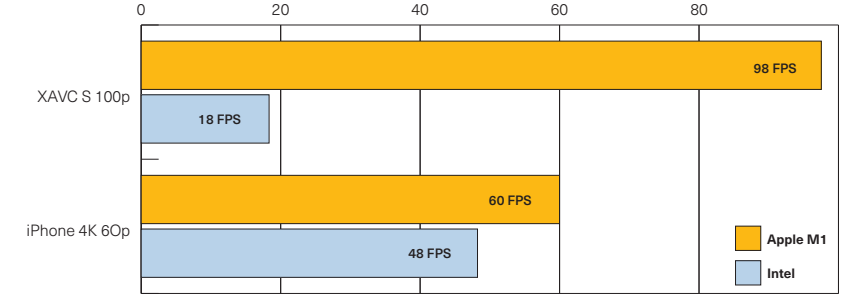
On the M1 system, Premiere Pro managed to perform the task **over five times faster** than on Intel.

Premiere Pro Apple M1 Benchmarks: Scene Edit Detection (4K)
Time-scale in seconds. All data are the average of 3 individual benchmarks
Shorter is better.



Playback Performance (FPS): We used Premiere Pro's Debug Monitor to measure the actual frame-rate displaying different types of footage. While some of the highest-quality recording formats (such as XAVC HS 4K 50p) require top of the line hardware to display fluidly, Premiere Pro on M1 managed to **display both XAVC S 100p and iPhone 4K 60p footage at their nominal speed**. By comparison, the Intel system only managed 18FPS and 48FPS, respectively.

Premiere Pro Apple M1 Benchmarks: Playback Performance (FPS)
Time-scale in seconds. All data are the average of 3 individual benchmarks
Longer 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