

Creative Cloud on Apple Silicon: Key Speed Measures

Adobe XD

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

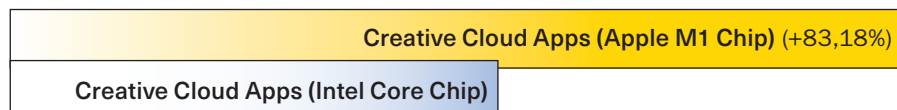


Chart based on the average of all benchmarks of seven essential Creative Cloud apps. A total of **774 individual benchmark measures** were taken. **Longer is better.**

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 14 workflow benchmarks conducted for this research, XD was **almost 80% faster** using 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%

XD Speed on Apple M1

What We Benchmarked

XD draws its strength as a design environment **from an extremely flexible architecture and user interface**, that allows for the program to be used as the backbone for a complete design system. Interestingly, XD can be used for extremely straightforward designs, such as simple web-pages or interactive presentations—but also for extremely complex, multi-platform app development. As a result, **XD prototypes can run into hundreds, if not thousands of individual (but interconnected) artboards**, that usually integrate hundreds of assets from other applications.

Our benchmarks focused on different performance aspects related to different file and asset types, ranging from opening **a complex smartphone app prototype**, to opening or importing **Illustrator or Photoshop files**, and working with **Creative Cloud Library assets**.

Analysis of Benchmark Results

Based on the 14 workflow benchmarks conducted for this project, **XD was on average 80% faster on the M1 system** than on Intel hardware. Opening a complex smartphone prototype with hundreds of artboards was **over 1.5 times faster** using the new Apple hardware; opening **a complex vector illustration or placing an asset from CC Libraries took half the time necessary on Intel hardware**.

These performance gains are **particularly important in the specific context of the typical XD workflow**, which is heavily based on integration with the variety of data-types used to populate XD projects, such as Illustrator or Photoshop assets, and more.

Major Points

- ▶ On average, based on 14 workflow benchmarks conducted for this research, XD was **almost 80% faster** using the Apple M1 system.
- ▶ Opening and displaying a complex app prototype with hundreds of artboards and placed assets was **almost three times faster** on the Apple M1 system, compared to Intel.
- ▶ Opening or importing Photoshop and Illustrator files **was up to two times faster on Apple M1** than on the Intel system.
- ▶ Accessing assets on CC Libraries showed a **performance increase of +70 to over +100%** using the Apple M1 system.

XD: Average of all Benchmarks



Chart based on the average of 14 workflow benchmarks conducted with XD. A total of **84 individual benchmark measures** were taken. **Longer is better.**

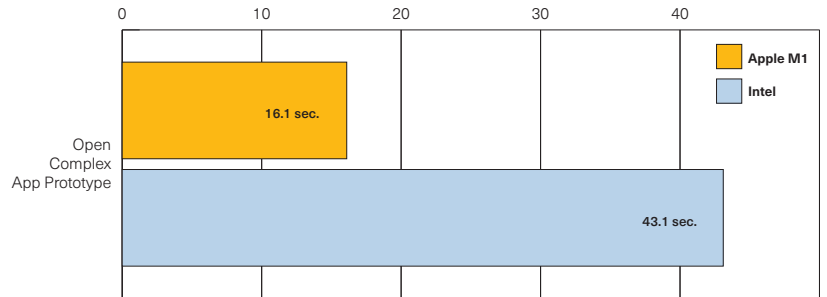
XD on Apple M1: Key Benchmark Results

Open Complex App Prototype: The word 'complex' is an understatement: For the file open benchmark, we used a fully-fledged app prototype for a dating app with hundreds of artboards containing a variety of images and graphic elements each.

Loading and displaying the file took over 40 seconds using the Intel system. XD running on the M1 platform opened the same file **almost three times faster**.

XD Apple M1 Benchmarks: Open Complex App Prototype

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

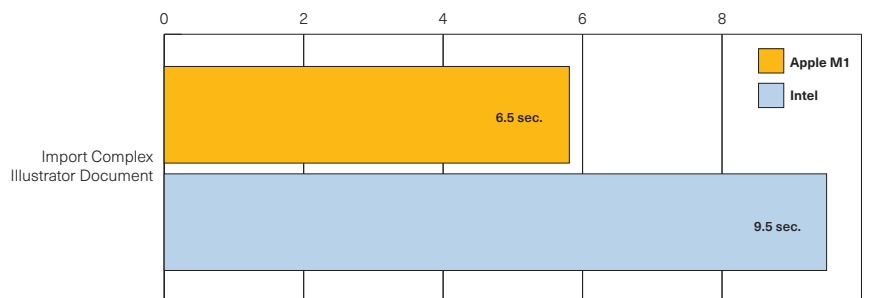


Import Complex Illustrator Document: Integration with Illustrator and Photoshop is key to the XD workflow. The program can both import or directly open files from these programs. This benchmark measured the time to import a complex vector drawing in Illustrator format.

XD on the M1 system was **over 60% faster** completing this task.

XD Apple M1 Benchmarks: Import Complex Illustrator Document

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

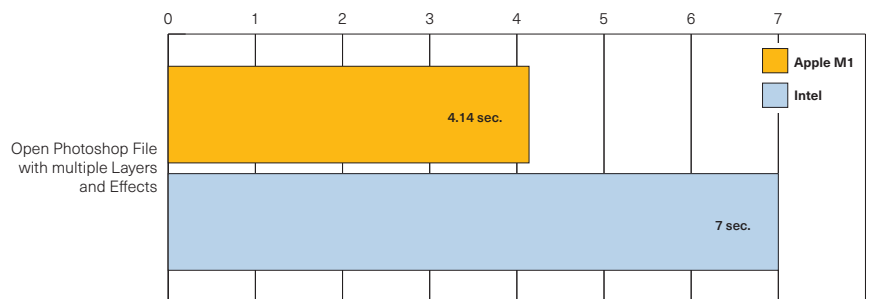


Open Photoshop File with Multiple Layers and Effects: XD can not only import Photoshop files, it can also open them directly, preserving the layer structure of the file in the process. We benchmarked this feature using a high resolution images with several effect- and adjustment-layers.

XD on M1 completed the task **in just over four seconds, compared to seven seconds** running on the Intel system.

XD Apple M1 Benchmarks: Open Photoshop File with Multiple Layers and Effects

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

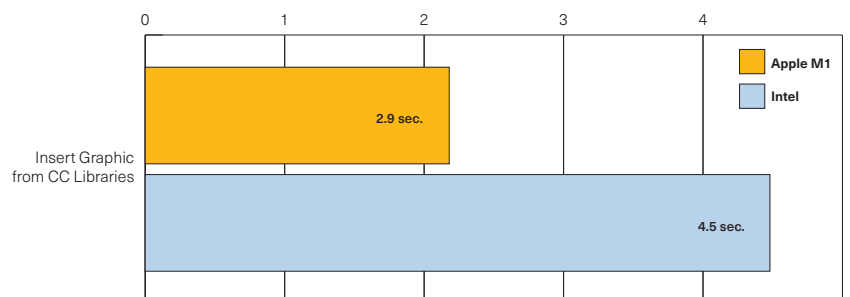


Insert Graphic from CC Libraries: Integration with CC Libraries is another key aspect of XD. In this benchmark, we placed an Illustrator design element from CC Libraries and measured the time for the graphic to display. While an individual instance may only take a few seconds, these performance gains can scale considerably over time.

XD on M1 was **over two times faster** than on the Intel system.

XD Apple M1 Benchmarks: Insert Graphic from CC Libraries

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.

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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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