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JPEG 10
STILL IMAGE CODEC

JPEG Progress in Windows and the Rise of the ARM Platform

In the last year, 2024, article we reported that the Apple Mac platform currently has the most advanced JPEG support integrated in the operating system.
In October 2024 Microsoft released a new platform version of their current operating system, the Windows 11 2024 Update, also called the *Germanium* or *Hudson Valley* platform.
This system has now finally support for advanced JPEG with arithmetic coding (JPEG 7) in the basic system components: File Explorer, Windows Photo Viewer, and Graphics Device Interface (GDI).
We are glad to see that there is finally some JPEG progress in Windows, albeit slowly.

Windows finally made some progress with JPEG, but Mac is still leading.

Apple is still the leader with partial JPEG 8 support in macOS, and Apple also managed to use their own enhanced image functions with their Safari web browser in macOS.
Microsoft is not so smart, they use a vanilla browser engine with inferior image support in their Edge web browser and thus remain on an ancient level of JPEG support (JPEG 6) for use on the Web.

Independent JPEG Group is currently busy completing the new JPEG 10 version as announced for upcoming release, which will further drive the advance in image communication.

The 2024 Windows 11 Update has two other remarkable features.

It is the first *Long-Term Servicing* (LTS) version of Windows 11, thus finally superseding the predecessor Windows 10 after the first Windows 11 release in 2021.
When Windows 10 was first released in 2015, it was at the same time a *Long-Term Servicing* version, thus causing a faster transition period.
The transition from Windows 10 to Windows 11 is slowed down by other factors, notably a regression in the user interface. While there are several improvements as well, the shortcomings are annoying enough to prevent many users from a turnover. Some of the most annoying shortcomings have been resolved over time, making the 2024 platform version somewhat usable, but others are still present, so that many users still prefer Windows 10 due to advantages in the user interface.

The other remarkable feature is the fact that Windows 11 2024 Update is the first release of Windows in history with a publicly available version for another processor architecture beside the common x86/x64 Intel/AMD processor architecture.

This alternative processor architecture is the ARM (*Advanced RISC Machines*) architecture, which rose with the usage of mobile devices. Apple switched over from using Intel processors to in-house designed ARM processors (*Apple silicon*) in their Mac line of computers starting in 2020 and completing the transition in 2023. So any *modern* Mac computer comes with an Apple-designed ARM processor, while Windows computers are still dominated by Intel/AMD processors with ARM being a rare option.

Software and application developers can easily build code for ARM targets by cross-compiling facilities in the Visual Studio Integrated Development Environment, regardless of the host system. But the resulting ARM code can only run on an ARM device, not on x86/x64 Intel/AMD.
On the other hand, x86/x64 Intel/AMD code can be built and run on *any* platform, because the ARM version of Windows has a built-in emulation layer which allows to execute x86/x64 Intel/AMD code.

The lack of the ability to execute ARM code on an x86/x64 Intel/AMD host system poses a problem for the software and application developer who wants to test the built ARM code at runtime.
The developer needs an ARM device to run the ARM code.

At present, Windows ARM devices have only processors designed by the company Qualcomm, and no device equipped with a Qualcomm processor exists which meets the requirements of the Independent JPEG Group for the development of the JPEG software.

Running Windows ARM code requires an Apple Mac computer with a virtual machine

However, we have our reference device to support the Apple Mac platform, which is equipped with an Apple silicon ARM processor. So the question is: Could we use this device with Windows for ARM?
In previous times, when Apple computers still had Intel processors, Apple provided a utility called *Boot Camp Assistant* which allowed to install Windows on Intel-based Mac computers.
Unfortunately, Boot Camp is not available on Apple silicon Macs. But fortunately, it is possible to run the ARM version of Windows via virtualization on Apple silicon.

While several virtual machine solutions exist for the Mac, Microsoft has officially approved only one solution for use with Windows on ARM: Parallels Desktop. So this solution was selected, and the problem was solved: Windows on ARM runs fine as Windows on Apple silicon in Parallels Desktop on macOS, including Visual Studio in the ARM version, allowing to build and run Windows code for *any* desired platform. With this configuration, the Mac turns out to be the most universal single machine for cross-platform software development, allowing to build and run software for macOS with Xcode and software for all Windows platforms with Visual Studio in Windows on ARM under Parallels Desktop.

Author:

Guido Vollbeding, Institute for Applied Informatics (InfAI, infai.org),
Independent JPEG Group (ijg.org, jpegclub.org/reference/)

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