**MacOS 10.12**

**History**

MacOS Sierra (version 10.12) is the thirteenth major release of MacOS, Apple Inc.'s desktop and server operating system for Macintosh computers. The successor to OS X El Capitan, it is the first version of the operating system issued under the June 2016 rebranding as MacOS. Sierra is named after California's Sierra Nevada mountain range. The mountain in the default desktop picture is Lone Pine Peak. Its major new features concern Continuity, iCloud, and windowing, as well as support for Apple Pay and Siri.

The first beta of MacOS Sierra was released to developers shortly following the 2016 WWDC keynote on June 13, 2016. The first public-beta release followed on July 7, 2016. It was released to end users on September 20, 2016 as a free upgrade through the Mac App Store.

**Function and features**

*Siri*

A demonstration of Siri on MacOS Sierra Beta.

The user can access the Siri intelligent assistant via the Dock, the menu bar or a keyboard shortcut and results are shown in a window in the upper-right corner. Siri can send messages, search the web, find files and adjust settings. Results can be dropped into other applications or pinned to Notification Center. For instance, pictures from search results can be dragged into a document.

*iCloud Drive and Optimized Storage*

iCloud Drive can upload the user's documents and desktop directories and sync them to other devices. The System Information application has a new section that gives the user detailed information about space usage per application or file and provides tools and suggestions for freeing up space. For instance, the user can let the system upload old files to iCloud Drive and remove their local copies, keeping them available on-demand in Finder. It can also remove old files from trash automatically. iTunes can delete watched, purchased films and TV programs from its library.

*Auto Unlock and Universal Clipboard*

Building upon Continuity, an "umbrella term [for] features that facilitate the communication between [Apple devices]" using Bluetooth and Wi-Fi, Sierra adds two features. With Auto Unlock, the user can unlock their user account by holding a paired Apple Watch close to the device. Time of flight is used to prevent relay attacks. Auto Unlock requires a Mac that was introduced in 2013 or later. With Universal Clipboard, the user can share the clipboard for cut, copy and paste between MacOS Sierra and iOS 10 devices, including text and rich content, such as pictures or videos.

*Tabs and Picture-in-Picture*

Applications that support multiple windows can support multiple tabs within a single window, allowing the user to keep windows organized similarly to Safari. With Picture-in-Picture, videos can be played in a floating window that follows the user across the system.

*Apple File System*

Apple released a preview of a new file system, called Apple File System (APFS), to overcome the limitations of HFS Plus. It is intended for solid-state drives and flash memory and will adopt several features found in modern file systems, such as snapshots and cloning, as well as native support for features that Apple already provides in HFS Plus through supplementary software, such as file-system encryption and trim. The file system is currently experimental and a release is planned for 2017. Apple plans to document and publish the APFS volume format.

*Night Shift*

Night Shift is new in MacOS 10.12.4 beta; it works the same as in iOS. Night Shift reduces blue light at night for better reading; this can be scheduled in the settings app, along with a toggle in Notification Center.

**System requirements**

MacOS Sierra requires at least 2GB of RAM and 8GB of storage space and will run on:

* iMac: Late 2009 or newer
* MacBook and MacBook Retina: Late 2009 or newer
* MacBook Pro: Mid 2010 or newer
* MacBook Air: Late 2010 or newer
* Mac Mini: Mid 2010 or newer
* Mac Pro: Mid 2010 or newer

Sierra is the first version of MacOS since OS X Mountain Lion, released in 2012, that does not run on all computers that the previous version supported. Developers have created workarounds to install MacOS Sierra on some Mac computers that are no longer officially supported.

**Advantages**

1. Simple but powerful user interface: Both macOS and Windows have easy-to-use graphical user interface or GUI. But OS X offers a more straightforward approach to computing. Those who are accustomed with the GUI of iOS found in iPhone and iPad will find macOS somewhat familiar.

2. Fewer viruses and other security issues: One of the advantages of macOS is that it is considerably safer than Windows. Of course, some Apple loyalists would argue that Macs are completely invincible from viruses or malware. This is no longer true.

3. Seamless integration between OS and hardware: Apple is both a software developer and a device manufacturer. This means that they have optimised the macOS to work seamlessly with all of the hardware components of a Mac device. It also ensures that all hardware components work hand-in-hand.

4. Comes preloaded with productivity apps: Standard Windows OS usually does not come with Microsoft Office Suite. Both are sold separately most of the time. In addition, new Windows-based laptop and desktop computers come with random software or apps that merely bloat the entire system and external storage.

5. Effective and unparalleled multitasking feature: Multitasking is another notable advantage of macOS. Mac computers have hardware specifications designed for multitasking. And because macOS integrates seamlessly with Mac hardware components, the overall operation is smooth and responsive.

6. Integration with other Apple products: One of the strengths of Apple is that most of the products under the brand are completely integrated. The iPhone or iPad works best with a Mac computer. This advantage of macOS is exclusive for Apple users—or those individuals with several Apple devices.

**Disadvantages**

1. Mac computers are considerably expensive: The fact remains that Apple sells expensive computers whether it is the new MacBook Pro with Retina or a Mac Mini. This is more noticeable when comparing the price point of Mac computers with their Windows counterpart.

2. Inflexible when it comes to hardware upgrades: A standard Mac computer cannot be upgraded easily because most of its hardware components are integrated both at a design and engineering levels. This is a macOS disadvantage that is unacceptable for hobbyists.

3. Lack of game titles and advanced gaming experience: There are more game titles available for Windows than in macOS. This is another noteworthy disadvantage of macOS. Some titles from independent producers that have gained large following are unavailable for Mac computers.