



Windows 10

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ABSTRACT

Windows 10 is the newly released personal computer operating system from Microsoft Inc. The users who were using Windows 7, Windows 8 or Windows 8.1 have a chance to upgrade their OS to Windows 10 full free version in the first year after launch. With the launch of Windows 10, it embraces all the new released Windows phone and Windows tablet. While Windows 8 tried to unify the tablet and desktop experiences, Windows 10 tries to separate it. This is most evident by having to actually activate a "tablet mode." Windows 10 has a lot of similarity with Windows 7. Windows 10 combines the strengths of its two predecessors Windows 7 and Windows 8.

Keywords:— Cortana; Microsoft Device Guard; Windows Hello; Microsoft Passport; Hyper-V; Continuum interface; Edge; HoloLens; Windows Defender

I. INTRODUCTION

Windows is used by over 1.5 billion people in every country of the world. With the release of the new operating system Windows 10 from Microsoft, millions of users worldwide switched to the new operating system as it will deliver a more personal computing experience across a range of devices. Those who are buying new laptops, desktops today are opting for Windows 10. Windows 10 is familiar and easy to use, with lots of similarities to Windows 7 including the Start menu. It starts up and resumes fast, has more built-in security to help keep you safe, and is designed to work with software and hardware you already have.

Microsoft's personal digital assistant Cortana, comes to PC and tablet for the first time with Windows 10. Cortana learns one's preferences to provide relevant recommendations, fast access to information, and important reminders. The next generation browser "Project Spartan" was built with greater interoperability and

reliability for Windows 10. During the January 21st reveal event Microsoft confirmed that Apps like Word, PowerPoint, Excel and Outlook will look and feel nearly identical to their desktop counterparts, but be optimized for touch and screen size.

Also, through Microsoft's cloud infrastructure, all the files will be accessible through those devices regardless of where it was created. Microsoft is creating universal Office apps that is touch friendly and will run on all devices. From now onwards the Windows mobile phone and tablets that will be released will come with preinstalled office apps. The new universal app platform gives the ability to create one app that will run on mobile, desktop, console, holographic and on IoT devices.

Windows 10 also introduces Task View, which is a virtual desktop system, the Microsoft Edge web browser and other new or updated applications, integrated support for fingerprint and face recognition login, new security features for enterprise environments, DirectX 12 and WDDM 2.0 to improve the operating system's graphics capabilities for games.

Regarding security issues for Windows 10, the security features are combined with the new Windows store for authorized and vetted applications. The three important things for security are Microsoft's Device Guard, Windows Hello and Password. Microsoft's Device Guard prevents attacks to the Windows applications. To protect the users from malware, when an app is executed, Windows makes a determination on whether that app is trustworthy. If it is not Windows 10 notifies the user. Device Guard can use hardware technology and virtualization to isolate that decision-making function from the rest of the Windows operating system, which helps

provide protection from attackers or malware that have managed to gain full system privilege. "Windows Hello" is introduced which aims at password killer feature. With the use of biometric that is with look or touch one can directly log in to Windows. So, without storing password and thereby removing the vulnerabilities one can directly log in to the system. In Windows 10, Microsoft Passport will replace passwords with strong two-factor authentication that consists of an enrolled device and a Windows Hello (biometric) or PIN. Microsoft Passport consists of two services – a single Sign-in service that allows members to use a single name and password to log in, and a Wallet service that members can use to make fast, convenient online purchases.

Windows 10 received mostly positive reviews upon its original release in July 2015 and till date it has been the most popular operating system from Microsoft. It is far more flexible than anything Microsoft has ever built. It is an operating system that runs on everything, from your desktop to a phone and even the Xbox One.

II. WINDOWS 10 EDITIONS

Microsoft has released different editions of Windows that are intended for various devices and uses. These different editions cater to different needs of various users and will power an incredibly broad range of devices – everything from PCs, tablets, phones, Xbox One, Microsoft HoloLens and Surface Hub.

Windows 10 Home is the personal desktop edition. It focuses firmly on the consumer. It gives a personal experience for desktops, laptops and tablets. Along with general propose apps Windows 10 Home will add Xbox One integration allowing gamers to access game libraries. In Windows 10 Home one cannot control the updates that

will be downloaded and installed, since they are done automatically. Other restrictions include the inability to use remote desktop to access a computer that is running home edition

Windows 10 Pro is a desktop edition for PCs, laptops and 2-in-1s which helps effectively and efficiently manage the devices and apps, protect the sensitive business data and this edition take advantages of cloud technologies. Windows 10 Pro lets its customer take advantage of the new Windows Update for Business which reduces management costs, provide controls over update deployments and offer quicker access to security updates. Hyper-V for virtualisation, BitLocker whole disk encryption, enterprise mode Internet Explorer, Remote Desktop, a version of the Windows Store for own business are some of the key features included in Windows 10 Pro.

Windows 10 Enterprise builds on Windows 10 Pro, adding advanced features designed to meet the demands of medium and large sized organizations. It provides advanced capabilities to help protect against the ever-growing range of modern security threats targeted at devices, identities, applications and sensitive company information. Windows 10 Enterprise also supports the broadest range of options for operating system deployment and comprehensive device and app management. The free upgrade to Windows 10 does not apply to Windows 10 Enterprise, because it can only be obtained through a volume license.

Windows 10 Education edition is meant for educational institutions, students, teachers, and administrators. This edition will be available through academic Volume Licensing, and there will be paths for schools and students using Windows 10 Home and Windows 10 Pro devices to upgrade to Windows 10 Education.

Windows 10 Mobile is designed for smart phones and tablets. It offers great productivity, security and management capabilities for customers who use their personal devices at work. Windows 10 Mobile includes the Edge browser and will also include the Continuum interface.

Windows 10 Mobile Enterprise is designed to deliver the best customer experience to business customers on smart phones and small tablets. Windows 10 Mobile Enterprise will incorporate the latest security and innovation features as soon as they are available.

The Windows 10 IoT operating system versions are expected to be built on the new common core (OneCore), share the common Windows 10 Runtime and be available via the coming, unified Windows Store. Windows 10 IoT is for Industry devices, Mobile devices and for small devices.

Windows 7 Starter, Windows 7 Home Basic, Windows 7 Home Premium, Windows 8, Windows 8.1 are all qualified to be upgraded to Windows 10 Home edition. Windows 7 Professional, Windows 7 Ultimate, Windows 8 Pro, Windows 8.1 Pro are all qualified to be upgraded to Windows 10 Pro.

III. WINDOWS 10 FEATURES

Windows 10 comprises the best features both from Windows 7 and Windows 8. With all new features there are things which most users will like and will upgrade. Here, are some of the features of Windows 10 that gives enough reasons for upgradation.

A. The New Start Menu

The Start menu has returned to the lower left hand corner of the interface. Configuring the Start menu can be made

through Setting in the Personalisation group. The Power button of the Start menu can be used for Sleep, Shutting down or Restarting the machine. Here, the color of the start menu can also be changed by going into the Personalization group and selecting the Color option.

B. Windowed Apps

Instead of being dumped into a full-screen app, Windows 10 offer mouse friendly toolbar. These apps will also alter their interface to best fit the size of the user's display. Universal apps will also be released by Microsoft that will run both on PCs and mobile devices.

C. Cortana

Cortana is an intelligent personal assistant created for Windows 8.1 and Windows 10 by Microsoft. One can use Cortana in two ways: using voice commands or type the commands in the Start menu. Cortana can give information to the user about the weather, about his schedule, can show notes etc. Cortana can be used to set reminders, alarms etc.

D. Hello

Hello helps the user to log in to the system without typing password. Windows Hello uses biometric authentication using face, iris or fingerprint. Windows Hello will also be supported in Windows 10 mobile with the right hardware.

E. Edge

Microsoft Edge is the new web browser from Microsoft for Windows 10. Microsoft said it built Edge to be clean, tight, and responsive. When the Edge is opened it greets the user with a clean home page that asks "Where to next?" Edge's built in

search is powered by Bing, which is the search engine from Microsoft.

F. Continuum

Available exclusively on Windows, Continuum is designed to ensure that the best screen is always the one you are on. It has the ability to turn a smartphone running Windows 10 into a PC. Continuum is a way for Windows to detect the hardware you are using and ensure that you always have the optimum interface on your machine. If you are using a desktop with no touchscreen, then Windows will now know this and present the traditional mouse and keyboard interface that works best on that setup. Continuum for phones works wirelessly or through a wired dock.

G. Xbox Streaming

Microsoft has also added an Xbox app. It doesn't do all that much, at present: you're able to see what your friends are doing and send them messages, check out achievements, and look at game clips people have pre-recorded. Microsoft ultimately aims to bring the full Xbox Live experience to Windows 10 PCs, including allowing you to stream games from your Xbox One console directly to your PC.

H. Virtual Desktops

Windows 10 gives the feature to the users virtual desktop. Virtual desktops basically allow users to organized full-screen apps or other desktops as they like, enabling them to switch between these desktops whenever they want.

I. Hologram Technology

Microsoft Holographic was introduced by Microsoft for Windows 10, a set of technologies that will enable 3D imaging and hologram projection for Windows 10

apps. Microsoft will come up with a new hologram device called HoloLens. It is a new holographic computer that requires voice and hand gesture commands for use. The computer is wireless and runs on Windows 10.

J. The new Windows Store

Microsoft has introduced the new Windows Store to give a unified shopping experience across every Windows 10 device. The user can browse the store through his PC, tablet or mobile and can easily download paid and free digital contents including apps, games, music etc.

K. Project Spartan

The new browser that is introduced for Windows 10 is “Project Spartan.” It is compatible with modern web and is built for Windows 10 device family. It is a browser that is made for easy sharing, reading, discovery and getting things done online like write or type on a webpage.

L. Safety and Security

Windows Defender will help defend the system from advanced malware. Windows Defender is constantly updated to meet evolving threats as they are identified. Windows Defender uses a highly scalable and geo-distributed backend service in the cloud.

Microsoft family features, included as part of Windows, help kids safer by blocking adult websites, helping one set good screen time habits for the kids, blocking age-inappropriate apps and games, and providing one to look into their digital world through activity reports.

Apart from these, Windows Hello, Passport and Device Guard also provide security to Windows 10.

IV. FEATURES REMOVED IN WINDOWS 10

With the release of the new operating system Windows 10 some of the features are removed which used to be there in the previous versions. Here are some that are discussed.

Windows Media Centre has been removed and it would no longer be supported in Windows 10. Windows 7 users will miss the Desktop Gadgets, as they have been removed from Windows 10.

The games that were preinstalled in Windows 7 like Solitaire, Minesweeper and Hearts will be removed when Windows 7 is upgraded to Windows 10. New versions of Solitaire and Minesweeper (called the Microsoft Solitaire Collection and Microsoft Minesweeper, respectively) are available in Windows 10 instead.

For USB floppy drive, if the user have one then he has to download the latest driver from Windows update or from the hardware maker’s website to use it with Windows 10. Another essential upgrade feature has been removed from Windows 10 and that is the updates. The Windows 10 Home will have the upgrades automatically, but Windows 10 Pro and Windows 10 Enterprise users will be able to defer the upgrades.

V. SYSTEM REQUIREMENTS FOR WINDOWS 10

The minimum systems hardware requirements and compatibility for windows platform is given as below:

Windows desktop minimum hardware requirements are :

- Memory: 2GB for 64-bit, 1GB for 32-bit.
- Hard Disk Space: 20GB for 64-bit OS, 16GB for 32-bit OS.

- Processor: 1 gigahertz (GHz) or faster.
- Graphics Card: DirectX 9 graphics device with WDDM driver.
- Screen resolution: 800X600 and higher.
- Firmware: UEFI 2.3.1, Secured boot enabled.
- The minimum Windows mobile hardware requirements that run Windows 10 are discussed below.
- Memory: 512 MB for 32-bit.
- Storage: 4GB of flash. SD card required for 4GB devices in order to support updates.
- Graphics: DirectX 9.
- Firmware: UEFI 2.3.1, secure boot enabled.
- The screen resolution along with the memory required for running Windows 10 in mobile is given in a tabular form as below.

Table 1: Screen Resolution and Memory Size Required to run Windows 10 in mobile.

Resolution	Memory
2560x2048 (QSZGA) and higher	>=4GB
2048 x 1152 (QWXGA) to 2560 x 1600 (WQXGA)	>=3GB
1440 x 900 (WSXGA) to 1920 x 1200 (WUXGA) This range includes: 1920 x 1080 (FHD/1080p)	>=2GB
960 x 540 (qHD) to 1366 x 768 (WXGA) This range includes: 1280 x 720 (HD/720p)	>=1GB
800 x 480 (WVGA) to 854 x 480 (FWVGA)	>=512MB

VI. THINGS TO KEEP IN MIND

Back up of everything is essential as sometimes unexpected PC crashes can lead to loss of data. Users may face problems like installing a printer or some hardware might not work properly. One may also face problems like connecting to home or corporate networks.

Some installed apps may not work properly or may not be available in some region. For example, Cortana is currently available in United States, United Kingdom, Germany, Spain, Italy, France and China.

The languages available are English (United States), English (United Kingdom), Chinese (Simplified), Chinese (Traditional), Portuguese (Brazilian), Japanese, Russian, German, French, French (Canada), Korean, Italian, Spanish, Spanish (Latin America), Swedish, Finnish, Turkish, Arabic, Dutch, Czech, Polish, Thai, Catalan, Hindi, and Vietnamese for insider preview.

VII. CONCLUSION

Windows 10 is overall the most promising operating system from Microsoft till date. Microsoft no longer give support to Windows XP and its previous versions but as Windows 10 comprises the best features of Windows 7 and Windows 8 it is recommended to use Windows 10. Here, we give a market research which shows the market share of the operating systems from Microsoft. A pie chart pictorially depicts the same.

Table 2: Operating System Version Market Share

Windows XP	11.68%
Windows 7	55.71%
Windows 8	2.54%
Windows 8.1	10.68%
Windows 10	7.94%
Mac OS X 10.10	3.45%
Mac OS X 10.11	2.18%
Other	5.81%

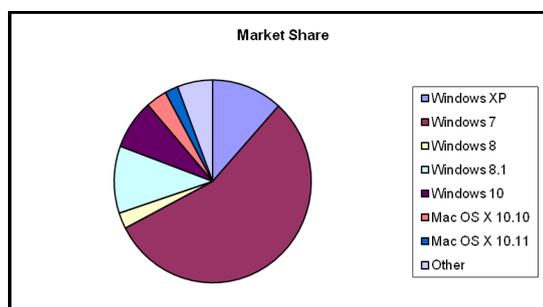


Figure 1: Operating System Version Market Share

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