

Computers are used in our everyday lives. More devices every day are turning into fully fledged computers with operating systems of their own. From pizza boxes to space stations-- nearly everything today has its own operating system on it. Windows has almost always been fighting to be the head of the OS industry against Apple. Windows phones, consoles, servers, and tablets almost all come with Microsoft labled operating systems, and it's a constant fight to have the majority of consumers. There is one operating system who isn't fighting that war though. The one operating system that doesn't care about having a majority of users, but instead cares about being as fast, flexible, and stable as possible. This operating system is Linux. Linux, unlike Windows or MacOS, is a free open-source operating system that focuses on Unix philosophy: "Do one thing, and do it well". Its used in far more places than people would be aware, due to being able to compile to any architecture; Linux exists on Android phones, servers, GPSes (tomtom's and the like), the International Space Station, super computers, cameras, and even some game systems. Only recently has Linux entered the desktop environment, and only recently has it become a viable alternative to Windows and Mac.

Guaranteed the person reading this paper right now is probably a Windows user, since Windows holds more than 90% of the usage share across the globe. This is for a good reason too-- enterprise! Windows has never really been designed with consumers in mind. Steve Ballmer himself admitted Microsoft is an enterprise company, not for consumers. Windows is great for any kind of enterprise work though. Schools and companies use it on a huge scale. Not only does this give the company an easy way to network all of their workers together in a productive manner, but it also is backed by Microsoft itself. If something goes wrong causing the company to lose thousands of dollars worth of data: they can be reimbursed by Microsoft for the damages. As a consumer operating system Windows also has the advantage of being a monopoly. Being a monopoly means any product designed to be ran on a desktop environment will be designed with Windows in mind. This means products almost all work natively on Windows better than any other operating system. Now, since that's out of the way, for

the problems with Windows. Sure Windows is good with enterprise, but this doesn't extrapolate to general desktop use! Due to how Windows programs are distributed, applications usually end up distributed as 32-bit binaries with a plethora of outdated dependencies. Not only does this mean Windows requires to have around 30 different versions of libraries, DirectX, and .Net redistributables installed, but this also means that in order to *keep* these programs working: Windows needs to be backwards compatible with programs made all the way from Windows 3! This has led to a plethora of bad decisions that can't be undone because it would break programs made from back then! It would break far too many applications that rely on them. Also anyone who has installed Windows before knows that Windows itself doesn't come with much. Windows gets internet explorer so it can download the applications it needs: Archive managers, disk image managers, movie players, and music players are all required to be installed manually if Windows wants to work with anything other than zip files. The reason for this is royalties and work that Microsoft doesn't want to put into Windows. Microsoft doesn't want to pay developers to let windows natively open flac, rar, mkv, or iso files.

Now for Linux. The ingenuity and ease of use of Linux can be explained in two reasons: package managers and opensource development. For Linux a package manager is standard in every distribution. It allows applications, libraries, and codecs, or basically any kind of "package" to be installed at a click of a button. Think of it as an "app store", but where every application is free. This allows for some pretty cool features: Linux never has to browse the internet for new applications, applications that rely on other packages have their dependencies calculated and installed instantly (this removes the need of installing 30 different instances of a common library like libpng), all applications that have been installed can just as easily be uninstalled in the same manner so no more worries about an application having a poor uninstaller. This idea of a package manager greatly increases Linux's ease of use. No longer does anyone have to worry about phishing websites, ads, toolbars, trojan horses, slow server downloads, or pressing next 4-5 times for every application installer; just select the applications

wanted and they'll all be installed automatically by the package manager. This is literally just one feature of Linux that already blows the classic desktop environment out of the water, but this is just one feature of many that Linux brings to the table-- Because of open-source development if an application doesn't work the way its wanted: it can easily be changed through the source code of the application. Not only does this mean applications are a collaborative work of hundreds of thousands of people, but since the source is available it can be compiled to any architecture-- including 64-bit. This is why Linux shows up on phones, toasters, cars, and space stations. Linux is a fully fledged operating system that can run on any kind of architecture for free! It's no wonder companies everywhere are using it in their devices. There is a downside to Linux though: games and drivers. Since game developers are oogled by Microsoft into using DirectX for their games; the games are getting secluded to Windows. So not only are games pretty rare on Linux, but the video drivers are hardly supported. While video hardware is so diverse, complicated, and closed that the community can't adequately write their own drivers for them. So games usually have poor performance.

Although Linux has only just entered the modern desktop environment; Linux, for the average desktop user, is a far better desktop operating system than Windows. To compare Ubuntu and Windows 7 in usability: Ubuntu wins. For example if a user wanted to open a .rar file, a common case when working, Ubuntu comes pre-installed with "file-roller", which supports almost every archive file format known to man. It even integrates with the file manager for easy right-click context menu extractions. On the other hand Windows 7 only supports .zip files. In order to open the common .rar file Windows would have to search for an archive manager that can. Which begins the common tedious installation procedure of a Windows application: Find correct installer for the architecture and OS version, run the installer, hit next repeatedly while accepting EULA's and avoiding unwanted toolbars, rebooting after it has completed, and finally would Windows be capable of using .rar files. As for other common video formats, audio formats, disk image formats, which Windows can't open by default.

Linux can easily open any format with ease with a standard Ubuntu install. As such, Linux wins the usability test by far. Ubuntu is one of the operating systems that qualifies for being a granny-os, as a grandma could easily use one.

Now for the power-user test. Operating systems are usually limited by their user's knowledge, but this isn't the case for Windows. More advanced users, or “power-users”, tend to require more control and customization over their OS. This test will encompass efficiency and customization. As for the efficiency differences in Windows and Linux: Windows fundamentally fragments, gets a larger registry, and does a bunch of things secretly (like restore points) over time. Over a few months this impacts the performance largely enough to slow a decent computer to a crawl. The only way to get this performance back is by reinstalling windows, since its the only reliable way to reset the registry. While Linux doesn't have a registry, has a choice between filesystem types (the standard ext4 doesn't fragment), and is capable of “copy on write” which is a free filesystem snapshot technology that deprecates “restore points” and filesystem backups. I personally have never had to reinstall Linux due to creeping performance issues, but for Windows I have. So Linux wins the efficiency test. Now for customization. There's no question Linux has far superior customizations. In a default Linux environment Linux can change icon sets, GTK themes, window managers, desktop environments, login managers, and workspaces. If something is wanted, the sourcecode can be easily edited until the system is exactly the way its wanted. Meanwhile in default Windows environment the most it can do in that regard is change the color of Window borders, unless Windows users attempt installing a custom Windows shell which is dangerous, unsupported, and usually buggy.

Finally for comparing Windows and Linux as a development environment. Of course Linux has its package manager which makes it incredibly easy to install new libraries and tools to work with. Linux has a globalized standard filestructure that keeps all these libraries and tools organized as well. It also comes with a multitude of compilers and cross-compilers that make it easy to develop and

distribute binaries to Windows while Linux can use WINE to test said Windows applications. Linux also comes with one of its very own exclusive memory debugger called Valgrind which works wonders for debugging segfaulting applications. Windows in comparison, if it wants a new library to work with, it has to compile the library manually which is an atrocious task requiring a multitude of applications and configuration. It's tedious, hard, and needlessly complicated. Windows also lacks any cross compiling support and C++11 features. Windows does however, have an excellent debugger, but Linux will get a similarly good debugger when Gabe Newell finally pushes out the LLDB debugger project.

Although Linux has only just entered the modern desktop environment; Linux, for the average desktop user, is a far better desktop operating system than Windows. Linux may lack games and good debuggers, but unlike the problems that plague the Windows desktop environment they are problems that can be and will be solved. Many powerful people like Gabe Newell and John Carmack are abandoning Windows and are investing in Linux. "Systems which are innovation-friendly and embrace openness are going to have a greater competitive advantage to closed or tightly regulated systems." (Gabe Newell, LinuxCon & CloudOpen North America 2013) Steam has come to Linux, and more than 70 games have been ported with it. Hopefully with time the monopoly of Windows will die out, and the age of Open and Free software will flourish.