Windows OS & UNIX Comparison

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Evolution of development and production environments in both Windows and UNIX.

Development Linux vs Windows

I will begin my comparison by discussing the world's first operating system, Unix. Unix was developed by Bell Labs and is often considered the most influential and versatile server operating system in the computing world.

The AT&T Bell Laboratories, the Massachusetts Institute of Technology and General Electric came together in 1960 to develop MULTICS (Multiplexed Information and Computing Service), a time-sharing operating system for mainframes. They worked on this ambitious project for seven years before the management at GE was dissatisfied with this progress and withdrew support to the project. Dennis Ritchie and Ken Thompson were two men programming and researching on the MULTICS project for the extent of the seven years. Aided by Ritchie and a few others, Thompson developed his own operating system from scratch on an old PDP-7 machine.

This operating system was renamed UNIX. The first version of UNIX was released in November 1971. With this they released 'The UNIX Programmer's Manual'. A year later they released a new version of UNIX along with a high-level programming language, B. This language allowed users and researchers to write their own programs. Dennis Ritchie later rewrote B and called it C. C is to this day a very popular programming language due to its simplicity and use in time critical applications.

Windows released their first operating system in 1985. Microsoft founder Bill Gates lead the development. Microsoft took their first true attempt at a 16-bit graphical user interface and succeeded. Windows OS ran on top of the Microsoft Disk Operating System. [3][7]

Production Environments Linux vs Windows

The production environments of Unix and windows vary quite a bit and it is a matter of the user's needs and preferences as to which is best suited. Linux is a command line operating system as opposed to windows which is a GUI (graphical user interface).

Unix is considered a more flexible operating system as it accommodates for different types of machines as opposed to windows which does not but on the other hand windows has an extremely friendly user interface which everyone can use.

When users run into technical issues using windows they are easily resolved as Windows software is supported by Microsoft, comparatively Unix does not go down as often as windows and therefore is considered a more reliable and stable environment. Unix built in security tends to top windows and it also has more permission features which further aids this.

Unix acquire more processing power than Windows while Windows possess a much more extensive variety of software, functions, games. They also excel with their backwards compatibility. Unix operating systems running Apache are used for around 90% of the internet use. In terms of upgrades, Windows often have to be purchased unlike Unix but do provide automatic updates and support in contrast to Unix where updates are required to be done manually. [4][2]

Comparison of Windows and UNIX Environments

A) Process Management

Unix based operating systems are very like traditional sequential processes and subsequently the process management is handled by its kernel. Executing a command or a program is what Unix considers a process.

As Unix is multiprogramming each process is given a 0.1 to 1 second window being processed until the CPU is handed over to another process. In this window of time threads are processed rather than whole processes. Threads are the objects of activity within the process. A thread consists of a program counter, stack and registers. A PID number (process id) is held for each process to ensure the operating system can kept on track of the order.

Windows kernel allows the threads of a process to be scheduled depending on best suitable in relation to availability of resources such as CPUs and physical memory, priority, fairness etc. [1][2][5][8]

B) File Systems and Networked File Systems

Windows began using file managers in their earlier models and have since upgraded to windows explorer, this easily allows the user to create, move, rename, print, copy, delete, and search file and directories. In windows file permissions, read-only, archive, and hidden, can be set by administrative users.

Unix file systems are managed through mainly three commands, ls, cd and rm, respectively allowing the user to list the contents of a directory, move around within directories, and remove files. Like in windows file permissions can be set and manipulated by administrative users done which are also done by a set of commands. [1][2][7]

C) User Interfaces

Windows use Graphical User Interface (GUI). A GUI is a display of graphical icons and visual indicators operated by the mouse and keyboard. GUI's tend to be appealing due to their ease of use, there is very little previous knowledge needed to use them. Despite this advantage the command line is sometimes necessary to perform some tasks which can't be done from the GUI. A very useful element of GUI's is the ability to have multiple windows open at one time, therefore being able to see a number of applications. Another downside to GUI's is with most new versions the interfaces often change making getting familiar to GUI's difficult.

Unix operate completely through a Command Line Interface (CLI) which is their means of interacting with the operating system. It consists of only input from the keyboard. The CLI are inclined to be much harder for new users to get used to due to the need for memorization but faster for experienced users in the long run. CLI users have more control over their operating system and file system in general. A downside to CLI's is the absence of various screens which impacts multitasking a lot. A great feature to CLI's is its constant interface which will never change so it is very easy to become familiar with a CLI. [4][2]

D) Shells & Scripting

Windows PowerShell initially appears very similar to Unix shells as windows created aliases for many of Unix's popular commands. Despite this the aliases in Windows work quite differently in the background. Unix shell processes everything as text, so input is easily piped between commands, still the receiving program must be able to interpret this text.

In contrast, PowerShell creates everything as an object. This makes the processing behind the scenes extremely different. Every time a command is piped to another in PowerShell an entire object is received. The receiving body needs to handle the object, handle the call methods and the properties of the object. [2][6]

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