Introduction

As technology has advanced over time, the needs of the common user have become more demanding and specific. Handfuls of operating systems have been developed as a result, each with its own strengths and attuned audiences. In this day and age, a very large amount of work is done in and around the internet. Google, as an exceedingly large internet-based company, saw this trend as an opportunity and jumped on it. This marked the beginning of a new invention – Chrome OS.

History

Google Chrome OS is the first attempt to invent an operating system that revolves around the internet and its capabilities. Originally announced in 2009, it was revealed to be a minimal, quick-working operating system that relies strongly on internet applications. The source code project, known as Chromium OS, is the basis for Chrome OS, and was released online in November 2009 for developers and manufacturers to access. Although similar in name, these two systems are not the same thing. Chromium OS can be downloaded and compiled from its source code. Chrome OS is the public release form of the Linux-based system, and is exclusive to hardware licensed directly from Google. Even so, systems that carry Chrome OS were not released to the public until mid-2011.

Presentation

When the operating system was originally released, it was presented with a very minimalist approach, showing a web browser as the only available interface. Instead of the usual taskbar located at the bottom of the display, there were a handful of web applications that could be locked in as permanent tabs in the browser. Certain applications, like audio and video files, would pop up as persistent windows in the bottom-right corner of the display. These windows would take priority and would not automatically hide unless specifically minimized or closed by the user. The rest of the interface functioned as a normal web browser, with tabs that could be opened and closed. There was
also an option to open a completely fresh web browser in an adjacent desktop environment, and would enable the user to switch between environments.

In April 2012, Google released a new user interface that presented users with the capability to open, rearrange, and resize separate windows in one desktop environment. This introduces qualities similar to common operating systems like Windows and Mac OS, and was viewed as a step towards making the operating system more user-friendly. The redesign was based off of two Chrome OS projects, named Aura and Ash. Project Aura provided the OS with a hardware-accelerated graphics engine, while Ash provided window management (Shankland). This redesign proved to be a streamlined way of making users more comfortable with the sudden shift from the normal operating systems to Google's web-based system.

**Time Management and Functionality**

One of the main focuses of Chrome OS was to provide users with a simple, fast way to access the internet and related applications. In doing so, Google removed many functions and processes of a normal operating system on start-up, such as splash screens, CPU and hardware initialization, and bootloader initialization. This cuts the time needed to reach the initial login screen down to a few seconds. Once powered on and logged on, Chrome OS automatically boots into its web browser interface, providing users with almost instantaneous internet access. In a matter of a handful of seconds, consumers can access their internet-based applications with little to no hassle.

Applications in Chrome OS are run as a direct counterpart to the web browser. Simple programs such as Notepad are opened as persistent windows in the bottom-right corner of the screen. Files that would normally be opened by installed programs like pdf readers and spreadsheet processors are supported by built-in web applications, provided by internet developers. If a person were to insert a flash drive or a similar form of memory storage into the hardware via USB cable, files could be opened
within the browser as either a persistent window or a new tab, depending on the file type. This cuts out the sometimes laborious process of moving files around and finding the proper applications to open them, and replaces it with a quick, user-friendly way to navigate files in external memory.

**Memory and Cloud Storage**

In the effort to make hardware that carries Chrome OS quick and responsive, many normal features of operating systems have been removed. One of these missing features is internal memory. Items from external storage cannot be kept on the system. Therefore, all memory that does not include essential parts of the operating system itself are saved online through cloud storage. This ties in with the internet-based ideology of Chrome OS in that everything is kept online. Cloud computing is seen as a modern, more futuristic form of secure storage, and integrating it into the operating system is a large feature of Chrome OS.

An integrated file manager allows users to navigate files saved in the cloud through use of various web applications, such as Google Docs. It also includes a media player that allows video and audio playback. Both of these integrated systems were made available offline in 2011, allowing users to access their files without an internet connection. However, as Chrome OS relies solely on cloud-based storage, changes made to files cannot be saved in offline mode.

**Security**

Since most of the Google Chrome OS is based on internet access and web applications, security was viewed as a common concern. To deal with that, Google came up with a sandbox-type security that controls web applications. This security system isolates applications as soon as irregularities are detected, reducing the risk of infectious malware invading the system. These applications become rooted until the problem is resolved, and is granted limited access to system services in order to keep the system secure. Once inserted, all user data is encrypted and stored in multiple partitions of the
system, which makes memory recovery safe and simple. Any system updates are run through a verified boot process built into the Chromium OS source code, which detects any possible tampering to ensure that nothing has been changed in an undesirable fashion. Between the sandbox security and verified boot system, Chrome OS can be viewed as a highly safe and secure user interface.

**Conclusion**

Google's Chromium OS open source project and the publicly released Chrome OS is a futuristic take on the modern operating system. It provides users with a smooth, simplistic interface that offers almost instantaneous access to common internet capabilities. In addition to its focus on web applications, Chrome OS allows users to work from almost any location, utilizing supreme time management and cloud-based storage. It also offers one of the tightest sets of security systems in most modern operating systems. Although young and undoubtedly in on its first shaky foray into the world of operating systems, Google has certainly made an excellent effort to compete with big name companies. With some development time and experience through time, Chrome OS may prove to be a very valid option in the world of operating systems.
Sources


