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Google's Chrome OS

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***Abstract:** This paper aims at the technology and the design followed by Google to make their own Chrome OS. The Google Chrome OS is one of the latest and advanced operating system which was especially designed for Browser experience on your system, that's why this operating system is called as a web browser operating system. . In Google chrome OS your data will be stored in the cloud so you don't need to worry about antivirus services or software for your system or laptop. The Google Chrome OS is called as a Linux-based open source OS which was centered on Google Chrome browser. So if you are always using internet then the Chrome OS is perfectly good for you..*
***Keywords:** Chrome OS, cloud, Linux, open source.*

I. INTRODUCTION

These days, computing is a Web-centric experience, and you perform many of your Internet tasks through. may be a program such as Firefox or Internet Explorer, helps you retrieve information from the Internet multiple times per day, integrate it with other online documents and share data galore with people all over the planet. Google is trying to reshape the computer experience by using its understanding of the Web to create the new Chrome operating system (OS).Traditional operating systems, such as Windows, require a lot of hard drive space and demand some work on your part. You have to install the programs you want individually, jmanage OS and security updates and manage device drivers, too. Google's Chrome OS aims to overhaul that paradigm. With Chrome, the browser actually is the OS -- in this case, the Chrome OS builds on the Google browser of the same name. In total, the Chrome OS is built on an open-source version of Linux and integrated with the Chrome browser, a simple media player...and that's it.Google embraced the concept of an ultra-simple

Web-centric OS in large part due to the huge recent success of netbooks. Netbooks are small laptop computers that are designed to let users access the Web, and not much more; they're inexpensive and feature-limited hardware

II. FROM CHROME OS TO CHROMIUM OS FOUNDATION

Google announced Chrome OS on July 7, 2009, describing it as an operating system in which both applications and user data reside in the cloud. The concept was new enough to confuse users and analysts, as well as Google co-founder Sergey Brin, who, at first, did not realize his data did not reside on his personal computer, but could be accessed from any machine running the operating system. To ascertain marketing requirements, the company relied on informal metrics, including monitoring the usage patterns of some 200 Chrome OS machines used by Google employees. Developers also noted their own usage patterns. Matthew Papakipos, former engineering director for the Chrome OS project, put three machines in his house and found himself logging in for brief sessions: to make a single search query or send a short email.

III. INTRODUCING CHROMIUM OS

On November 19, 2009, Google released Chrome OS's source code as the Chromium OS project. As with other open source projects, developers can modify the code from Chromium OS and build their own versions, whereas Chrome OS code is only supported by Google and its partners and only runs on hardware designed for the purpose. Unlike Chromium OS, Chrome OS is automatically updated to the latest version
First boot up

At a November 19, 2009 news conference, Sundar Pichai, the Google vice president overseeing Chrome, demonstrated an early version of the operating system. He previewed a desktop which looked very similar to the Chrome browser, and, in addition to the regular browser tabs, also had application tabs, which take less space and can be pinned for easier access. At the conference, the operating system booted up in seven seconds, a time Google said it would work to reduce.

IV. FEATURES AND APPLICATION

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A. Features

Google's successful introduction of the popular Android and Chrome OS strategy has resulted in some critics of the dual open source, client-based operating systems. Microsoft CEO Steve Ballmer accused Google of not being able to make up its mind. Steven Levy wrote that "the dissonance between the two systems was apparent" at the 2011 Google I/O developer conference. The July 2013 press introduction of the Chromecast HDMI stick, which was hosted by Pichai, demonstrated how the two operating systems could work in tandem. The Chromecast device has a cut-down embedded version of Android, which users control using a smartphone or tablet running Android (or Apple's iOS or a PC running the Chrome browser).Gigaom reporter Kevin C. Tofel described the relationship as "a merger of experiences and services", a strategy that "fits with Google's overall theme of increasing user engagement in its ecosystem with Chrome as the underlying platform."

The relationship between Android and Chrome OS became more substantial at Google I/O 2014, where it was announced that Native Android applications would be supported in Chrome OS.

Application

Remote Application Access And Virtual Desktop Access

In June 2010, Google software engineer Gary Kačmarčík wrote that Chrome OS will access remote applications through a technology unofficially called "Chromoting", which would resemble Microsoft's Remote Desktop Connection. The name has since been changed to "Chrome Remote Desktop", and is "probably closer to running an application via Remote Desktop Services or by first connecting to a host machine by using RDP or VNC". Initial roll-outs of Chrome OS laptops (Chromebooks) indicate an interest in enabling users to access virtual desktops.

Integrated Media Player, File Manager

Google integrates a media player into both Chrome OS and the Chrome browser, enabling users to play back MP3s, view JPEGs, and handle other multimedia files while offline. It supports DRM videos.

Chrome OS also includes an integrated file manager, resembling those found on other operating systems, with the ability to display folders and their associated files, as well as preview and manage file contents using a variety of Web applications, including Google Docs and Box.

V. DESIGN

A. Security with Sandbox

In March 2010, Google software security engineer Will Drewry discussed Chrome OS security. Drewry described Chrome OS as a "hardened" operating system featuring auto-updating & "Sandbox" features that will reduce malware exposure.

The concept of sandbox is that if the user opens a site or an application that contains virus then the virus content will not be spread into other part of the system or the Operating system as it happens in the windows operating system. In windows if the file containing virus is run or executed by the user then the virus content will spread into the entire memory of the hard disk and spoils the functioning of the computer. So in order to prevent these phenomena that may damage the PC the concept of SANDBOX is introduced. The total documents, photos all can be stored in the cloud with the use of Picasa web albums and Google docs.

These can be shared with respective friends by adding there email id to the share list or else can be set to private for the use of them only by us. Where ever we need access to our files or photos we can just login using the Gmail id and can have the access of data. So even if we lose our net book our data will be very safe in the server. This facility will help in the prevention of data theft. When we use the normal windows operating system we will be having the risk of data loss if it crashes or if it is lost the personal data or other will be accessed by some other user. So the use of notebooks will prevent this and keep the data safe in the server. Hacking of our personal data from the GOOGLE server is definitely impossible for any expert hacker. Sandbox is hardware backed security.

How does the sandbox work?

When the user opens more than 2 windows or tabs in the browser the chrome operating system treats them as 3 separate windows which will be as below. So even when multiple windows are opened they are all provided with equal security.

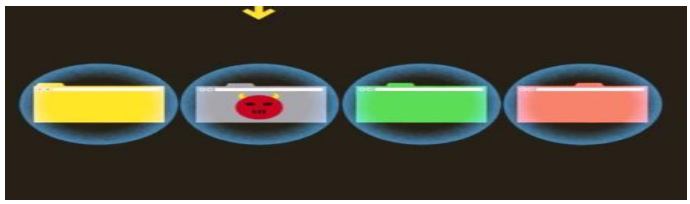

Figure 1: Showing How Sandbox Works On Chrome Os

In this the virus will be immune and will not be allowed to move into the other tab. The tab containing the virus is contained within the tab and then the tab is closed to remove the virus. So, it will be very good to prevent loss of data or crash of the computer when we use the chrome laptops.

Connectivity

No more missed emails. Get the web everywhere. With built-in Wi-Fi and 3G, Chrome books make it easy to get connected anytime and anywhere. 3G models come with flexible internet plans, including a free introductory mobile plan, so you can keep working on the go. Coupled with long battery life, Chrome books enable you to be truly mobile - even without a place to stop and plug in. Chrome books also have Print built in, allowing you to print to any cloud-connected printer from anywhere.. Even if the network connection is lost or interrupted the user need not worry about the unsaved file. Because the data or the document on which the user is working will be instantly saved to the server memory for every 3secs.So this will create the backup copy ready for the user to continue where he stopped his work.

User Interface

Design goals for Chrome OS's user interface included using minimal screen space by combining applications and standard Web pages into a single tab strip, rather than separating the two. Designers considered a reduced window management scheme that would operate only in full-screen mode. Secondary tasks would be handled with "panels": floating windows that dock to the bottom of the screen for tasks like chat and music players. Split screens were also under consideration for viewing two pieces of content side-by-side. Chrome OS would follow the Chrome browser's practice of leveraging HTML5's offline modes, background processing, and notifications. Designers proposed using search and pinned tabs as a way to quickly locate and access applications.

Cloud Printing

Google Cloud Print is a Google service that helps any application on any device to print on any printer. While the cloud provides virtually any connected device with information access, the task of "developing and maintaining print subsystems for every combination of hardware and operating system – from desktops to netbooks to mobile devices – simply isn't feasible." However, the cloud service would entail installing a piece of software, called a proxy, as part of Chrome OS. The proxy would register the printer with the service, manage the print jobs, provide the printer driver functionality, and give status alerts for each job.

Devices currently available on Chrome OS

A. Chrome books

A Chrome book is a laptop running Chrome OS as its operating system. The devices are designed to be used primarily while connected to the Internet, with most applications and data residing "in the cloud". A Chrome book is an example of a thin client. The first Chrome books for sale, by Acer Inc. and Samsung, were announced at the Google I/O conference in May 2011 and began shipping on June 15, 2011. Lenovo, Hewlett Packard and Google itself entered the market in early 2013.This laptop can easily load with Google Chrome in fraction of seconds which do not have hard disk

with it. Google Chrome OS need only 16 GB for storage which is built in with non-volatile flash memory. The cost of chrome OS laptops cost has approximately $300 to$400.

B. Chromebox

A Chrome box is a Computer running google's chrome os operating system. The device is the desktop equivalent of the chrome book laptop. Chrome boxes, like other chrome os devices, primarily support a single application, a browser, thereby relying heavily on an internet connection for software functionality and data storage. That connection, via a local area network, can be wireless or through an ethernet port.

VI. CONCLUSION

There are plenty of challenges for Google to address. One issue that may drive away users is that without an Internet connection, a Chrome computer's capabilities are severely restricted. Sans Web, there's simply not much this kind of machine can do, because it can't access any data or even programs other than the included media player. Many users may also be turned off by the idea of storing all data online. Most people are used to saving at least a few critical documents locally, and being separated from that data may be too much to bear.

There's also the issue of control. People are concerned that Chrome puts them totally at Google's mercy, with less control over their own data. To counter these issues, Google relies heavily on the goodwill it has generated over the years. And because many businesses already rely on a suite of Google products, such as Google Voice, Google Docs and Gmail, Google is betting that people will be likely to adopt the Chrome OS, if only due to inertia. In time, we'll see just how Google's Chrome gamble plays out. The company that revolutionized the way we use the Internet just might transform our concept of computing as a whole, too.

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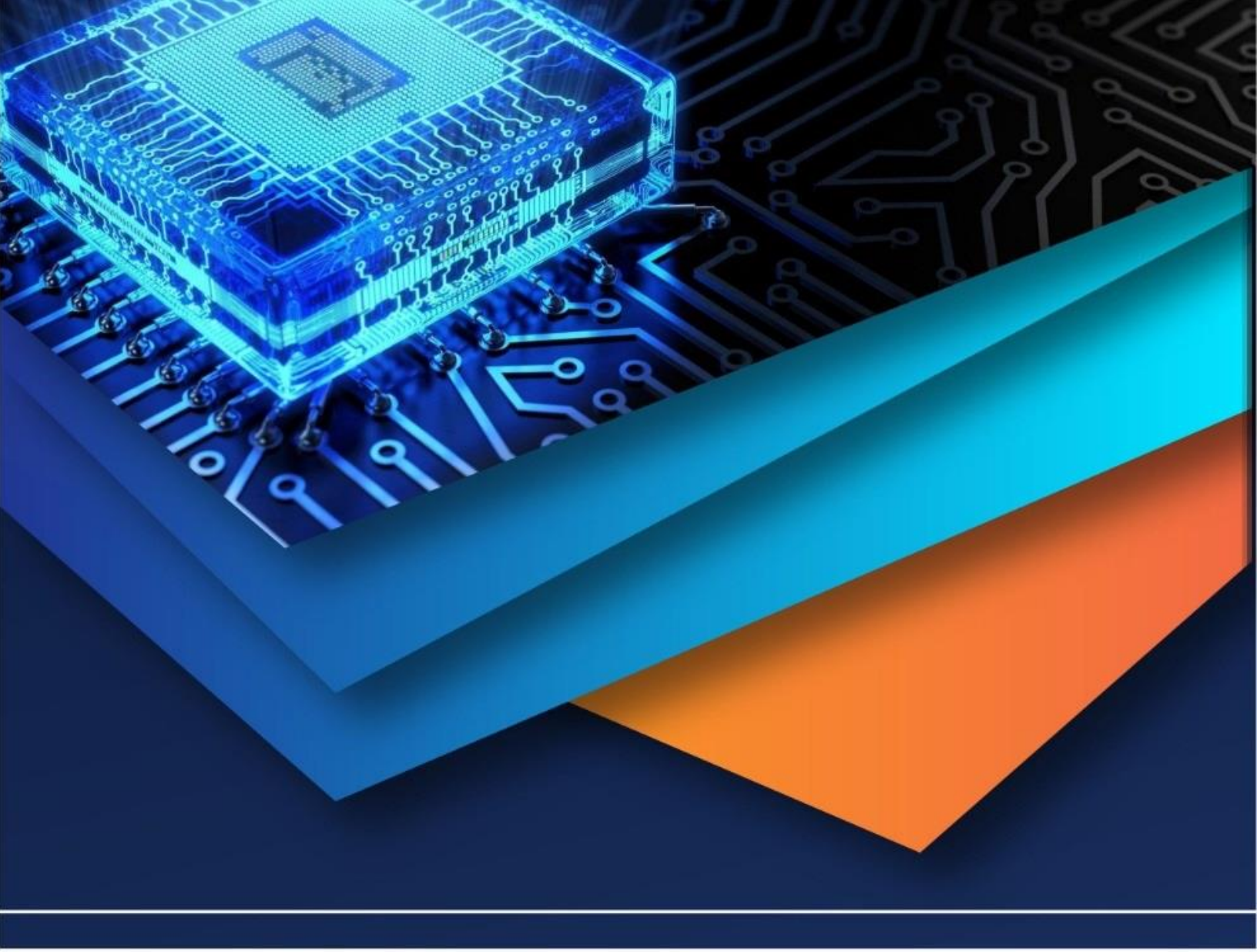

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