DJSCOE CSI STUDENT CHAPTER

PRESENTS

**Different people... Different places...
Same document... Same time!**

Virtual Machines - An OS... Inside A Window

Share your files just with one 'DROP' using

PROTOCOL

(VOLUME 2)

Computer Society Of India

Formed in 1965, the CSI has been instrumental in guiding the Indian IT industry down the right path during its formative years. Today, the CSI has 66 chapters all over India, 381 student branches, and more than 40,000 members, including India's most famous IT industry leaders, brilliant scientists and dedicated academicians. Now, you have the opportunity to be a part of this distinguished fraternity too.

The mission of the CSI is to facilitate research, knowledge sharing, learning and career enhancement for all categories of IT professionals, while simultaneously inspiring and nurturing new entrants into the industry and helping them to integrate into the IT community. The CSI is also working closely with other industry associations, government bodies and academia to ensure that the benefits of IT advancement ultimately percolate down to every single citizen of India.

Faculty Note

I present to you the second issue of 'Protocol', a magazine by DJSCOE CSI.

From the past ten years, the CSI is doing its best at imparting knowledge to students by means of organizing a number of workshops and interactive seminars on the latest technologies. The CSI chapter of our college has been awarded 'Best Regional Student Branch' for the year 2008-09. The endeavour is to spread awareness about the current technologies used in industries and develop all-round skills of engineers, also bearing in mind the interests of students. I am confident that this magazine will be of great benefit to you. Thanks and Best Wishes.

- Prof. A.R. Joshi
(Branch Counselor)

CSI Chairman's Note

On behalf of the all the CSI committee members, I'd like to thank the entire faculty of the I.T. department for their support and encouragement for all the CSI activities that have been held so far and that are to be held in the future. We have successfully conducted workshops on Flash Animation and PC Assembly this term and hope to conduct many more in future.

Also a big thanks to all the members of CSI without who's enthusiasm we would not be inspired to work. We hope that you keep providing us with the incentive in order to organize all kinds of technical and non-technical events which are beneficial to you. I would also encourage you to submit articles to the CSI magazine to share your ideas and views amongst all our members.

Personally, I would like to thank my fellow members of the CSI committee and also of the magazine committee who have worked ever so hard to make CSI the way it is today.

Lastly, in keeping with the theme of this issue of PROTOCOL, I'd like to quote Mr. David Emery -

The only people who have anything to fear from free software are those whose products are worth even less.

- Anuj Mali (TE-IT)

Editor's Note

The first thing that comes to my mind is why Virtual Machines? Why Dropbox? Why Google Docs? You see, today along with food, clothing & shelter, high speed internet has become a basic necessity for us engineers & that's good. Online utilities like Dropbox & Google Docs break free all the limitations & restrictions that come in the way of any creative process. That's what youth wants, we want to break free. We want complete freedom. Many of us don't realize this freedom, but at some point of time, you will.

Virtual Machines take this freedom a notch higher. You can experiment, learn & make as many mistakes as you want - without the fear of your PC or laptop getting spoilt. Read on, some amazing articles await you. Explore the realm of infinite possibilities. Experience and Feel the FREEDOM.

- Harsh Swaminarayan

Our sincere thanks to

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An OS... Inside a Window

- Darshan Valia

Keywords: Virtual Machine, Linux, Windows, VMware, VirtualBox, Server Consolidation, Guest OS, Java Virtual Machine.

Introduction

To install another operating system on your computer, you need to repartition your hard drive and free up enough space so that the other system can use it. For many beginners, repartitioning a hard drive is like walking on a knife edge. One step wrong and everything is gone. Poof. Finished. Unless you are careful enough to take regular backups. But then restoring from a backup may take time. This is just one of the myriad reasons which make a Virtual System such a lucrative option.

What exactly is a Virtual Machine?

A Virtual Machine, in layman's terms, is a computer inside a computer. Two slightly different examples of Virtual Machines will make it clear:

1. Using a Visualization Software (like VMware, Oracle's VirtualBox and many more), you can set up a "guest" operating system (the one you would like to use) on your "base" or "host" operating system, i.e. the OS which you currently use (XP, for most). So, for example, you can try out Windows 7 or Ubuntu in a separate window, without having to repartition your hard drive, or changing your boot sequence. The "guest" system may be allowed access to the hardware on your computer, like your modem for Internet access, your pen-drive, and what not. Its hard drive is just a file on your computer (which you can remove at will if you don't like its user interface, he he). It just acts as any other application or game, does not change much configuration on your computer, and setting it up or throwing it off is child's play. Trying out Windows 7 on XP itself, or using XP within Ubuntu cannot be easier than this. Heck, you can also try out Ubuntu, Fedora, Debian, or even a Mac OS X. You can also try more than one at the same time, if you have enough memory. Easy, innit?

2. The Java Virtual Machine (rewind to second semester) is another example. Instead of a full-fledged OS, the JVM creates a separate system on your computer's base system, where it executes byte code, which, simply put, is equivalent to the back-side operations of running an exe file on your base system.

The first example is of a "System Virtual Machine", while the second one is of a "Process Virtual Machine". We shall be elaborating on the "System Virtual Machines", as they are, uh, more visible to the average user.

Some Popular Virtualization Softwares

We now focus on some of the most widely used Virtual Machine Software which people use. They are free to download and use, but if you want some advanced features, you might have to shell out a lot of money. Fortunately, the advanced stuff is not much important to us simple souls, and the free ones are more than enough.

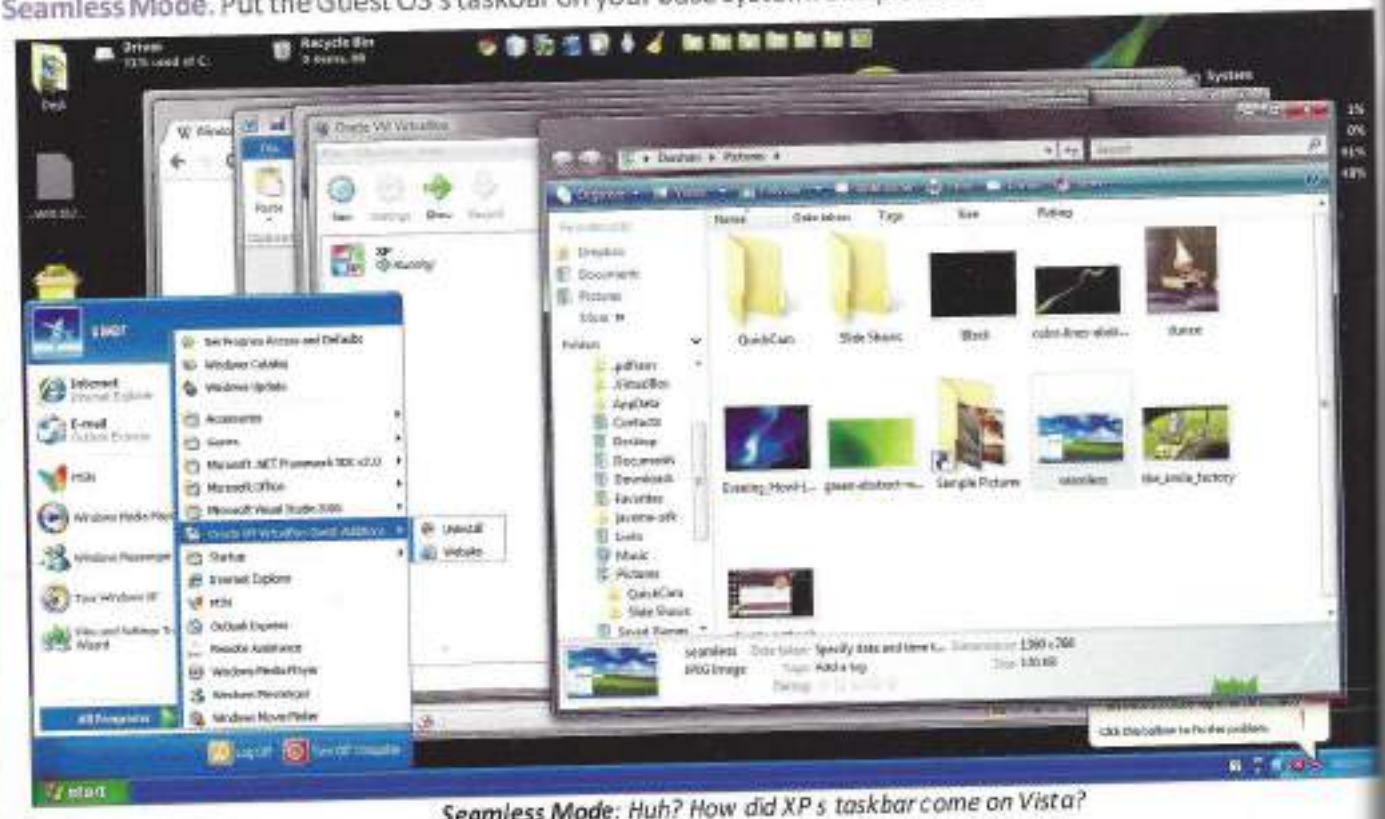
Please note that you need to have an ISO file (i.e. CD/DVD image file) of the installation CD/DVD to install the guest or obviously the CD/DVD itself (Yes, the physical drive can be detected by the virtual machine...). You can get the virtual machine software-specific hard drive file for the guest also (.vmdk for VMWare, .vdi for VirtualBox, etc.).

Oracle VirtualBox

Developed by Sun Microsystems (Oracle bought Sun, so now even Sun Java is Oracle Java), this software is meant for general personal use. The special features:

Snapshots. You want to save your guest machines state, as it is right now? Just take a snapshot (you can take more than one), and the machine state, as it was from the time you started it to the very moment you take the snapshot, will be restored back. You can run your guest in full-screen mode, pause it, close VirtualBox, and when you need it again, it's the same as it was when you left it.

Seamless Mode. Put the Guest OS's taskbar on your base system. See picture.



***Seamless Mode**: Huh? How did XP's taskbar come on Vista?*

Shared folders. You can also share a folder with the host system. Want to share a file with the host whil working on the guest? No problem. You can use a shared folder, which both systems can access. Pu something from any system in this folder, and it can be seen on the other system. But, I bet the VMwar tool's copy-paste feature is far cooler! Keep reading!

Vmware Player

Vmware applicayions are regarded as the best for virtual environments. Developed by VMware Inc VMware player has many similarities with VirtualBox, but has some extra features which are a cut abov Some of them are as follows:

Unity Mode. Similar, but a better competitor to Seamless View in VB. You don't have the guest's taskb superseding the host's. In fact, all the windows shown in the guest's taskbar will automatically be shown the host's! See picture on the next page.

Copy-paste, drag-drop. If you download a certain something like VMware tools for your guest OS, you c copy-paste and drag-drop files between the host and guest.

VMware's Unity Mode: *XP running on Ubuntu Linux. The purple-colored windows are the base system programs. The blue ones are of our very own XP's. And they are freely intermingling, and all windows of XP being seen on Ubuntu's taskbar.*

Windows Virtual PC

This is just for Windows. The latest version runs only on Windows 7, and has support mainly for Windows XP Professional and the creamier versions of Vista. No Linux and other stuff. The previous version Virtual PC 2007 is still available, though, for XP and Vista. Virtual PC lets you share drives, can drag and drop, and do much more, but still limits your experience to Windows.

Spicing 'em up

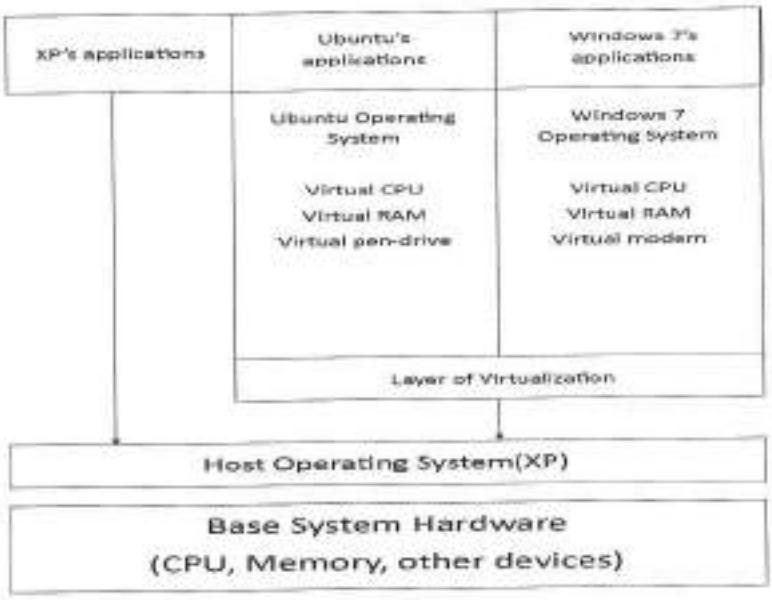
The functionality of virtualization software can be increased by installing certain specific "tools" or "additions" for a particular guest OS, or paying a fee for a better version. Some of them are as follows:

VirtualBox Guest Additions/VMWare Tools:

These help to provide closer integration between the host and the guest. The most visible of these is the drag-and-drop and copy-paste functionality which comes with VMware tools. These extras are different for different types of guests and hosts, so if you have more than one different system, you'll have to install more than one of these.

Converters:

These help, to either translate your base machine to a virtual machine file, or convert one format of virtual machine drives to another. This can be an advantage when dealing with different types of Virtual Machine software, or to translate your actual hard-disk data of your PC to a virtual machine's hard disk. Want to convert your C (physical machine) drive into a virtual machine drive, so that you can access it on your friend's VMware as it is? Or want to convert Microsoft's VirtualPC's virtual hard-drive to VMware's .vmdk one? The VMware vCenter converter is for you.



How a Virtual Machine Works

Developing Virtual Machines is not easy. Every Virtual Machine must feel that it is the only OS running inside your computer, and has access to everything: Your CPU, your RAM and a lot of other stuff. But it ain't so, innit? The base machine is the only "Real" Operating System (the word 'Operating' is important) running on your computer's hardware at this point of time, and only this operating system will have direct access to your hardware resources.

Now the Virtual machines cannot create separate CPUs and RAMs out of nothing, they have to use only those resources on the base system, and, as mentioned above, they must be of the impression that only they are using the system. For achieving this, software like VMware (Layer of Virtualization in diagram) and others provide a virtual copy of the base system's hardware, which they are to use. Managing and mapping of those "copies" with the "original" is done by the Layer of Virtualization; after all, the guest OS is nothing but another application on the host OS, so the base system will appropriately share its resources according to the guests' needs, and these resources are then provided as the Virtual CPU, Virtual RAM, etc. as shown in the figure.

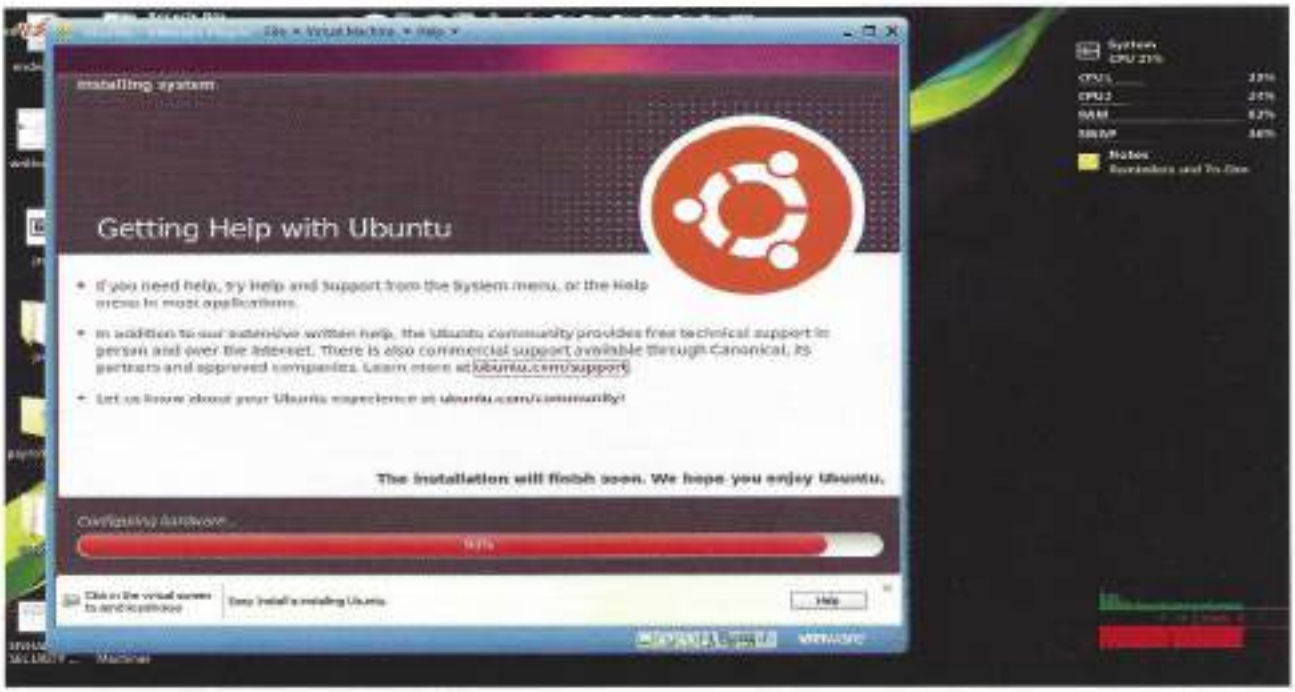
The Good and the Bad (no Ugly)

The Good

No partitioning, boot-sequencing and other complex stuff. Just simple selecting of an ISO image of a Boot CD, setting up of maximum size of the guest's hard disk(this hard disk is just a file on your host system), deciding how much RAM you will provide to the guest, and you are ready to go.

Two or more OSs simultaneously running. This is a huge advantage. You get the ability to share files real-time. Or just have a quick use of the guest, and close it. For example, as Windows viruses don't affect Linux, you can check your USB drive to see whether it has any weird stuff, like crazily named folders, some unknown .exe files... just delete them in the Linux guest, and you are safe. This is a boon for companies deploying servers, as you can reduce system compatibility issues by having all the systems you might ever need running in just one environment, no separate hardware needed for each system. This technique is called "Server Consolidation", and it saves a lot of money which would otherwise have to be spent on buying more servers and other hardware.

Zero risk. As you are not using the host system directly, you are immune to any sort of mistake you make on the guest system. If your guest OS catches a virus, or something weird happens, it does not affect the host. Also, you can use snapshots (described earlier) to revert back in time. No fuss.



Zero risk: Running Ubuntu in VMware, using Easy Install. Extremely easy.

Portability. Just imagine. With a large enough portable storage medium, you can actually carry a full system around, as it is, without any hardware fuss. You just copy the hard disk file, some configuration files on your portable drive, and you can use it on any computer which has the VM software installed. Ubuntu and some other Linux systems also have the ability to "mount" these virtual hard disks, that is, you can directly view all files in this virtual disk on the file explorer, as you see the files on your home system.

The Bad

Slooooww... This is the main disadvantage. Using a virtual machine slows down the experience a few notches compared to directly installing the OS on your main system. The notches depend mainly on how much RAM you give the guest; less RAM means lower performance. However, Virtual Machines are inherently slower. This is because of the fact that the main system tasks of the guest machine (which would have executed faster on the base machine as they are SYSTEM TASKS and thus are of more importance) are reduced to simple application tasks on the base machine, giving them a lower priority, and thus will execute slowly.

Display capability. Enhanced graphics hoopla, already being performed on the host's side, becomes a real pain on the guest's side. Though enhanced 3D acceleration can be enabled, it may not be perfect. So, for optimum experience, users may have to settle for a lower screen resolution and fewer graphics capabilities.

Load on the Host machine. Suppose you have 1 GB of RAM. You configure VMware to make use of 512 MB RAM for the guest. So, when the guest starts, 512 MB of your RAM goes to the virtualization software. This may cause a lot of lag on the host system, particularly if you are multitasking on it. Also, CPU usage by the guest may slow the other host applications down.

Final Words

The invention of Virtual Machines is one of the greatest achievements in Computer Science. It gave us Java. It gave us the cool apps mentioned above. It continues to provide relief and ease of use to innumerable computer programmers, decreases the cost drastically for many tech companies, and largely helps aid faster software testing. But for you and me, it all comes down to practicing Linux shell programs and removing a particularly nasty virus. Indeed, this is real magic.

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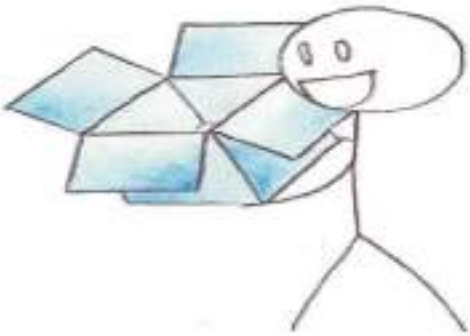
Wisdom...
Do not look back in anger, or forward in fear, but around in awareness – James Thurber

DROPBOX - 'Drop N Share' Easier And More Exciting Than Ever

- Raoul Lopes



Keywords: Dropbox, Shared Resource, File Synchronization, Public Shared Folder

Introduction to the basics

Looking at the picture above and the name itself, you must've created a rough picture of what Dropbox is. Yes... like a box where you can drop your stuff, this is a folder where you can save your information (files). But this folder is special, for all the information can be shared with whoever you like, without having to email or even opening your web-browser for that matter. Amazing huh? This web-based service presented by Dropbox Inc. uses cloud computing to enable users to share files across the web. It is free, simple and practical, especially when there is a need to share large files such as videos and even photographs.

Where it all began

Dropbox was started by MIT graduates Drew Houston and Arash Ferdowsi. Drew Houston was inspired to create Dropbox out of his frustrations with forgetting his USB drive, and that existing services suffered problems with Internet latency, large files and bugs. He began to create something for himself, but soon realized that it could benefit many people facing the same problem. So he founded Dropbox Inc. in 2007. Shortly thereafter, he managed to secure funding from Y Combinator.

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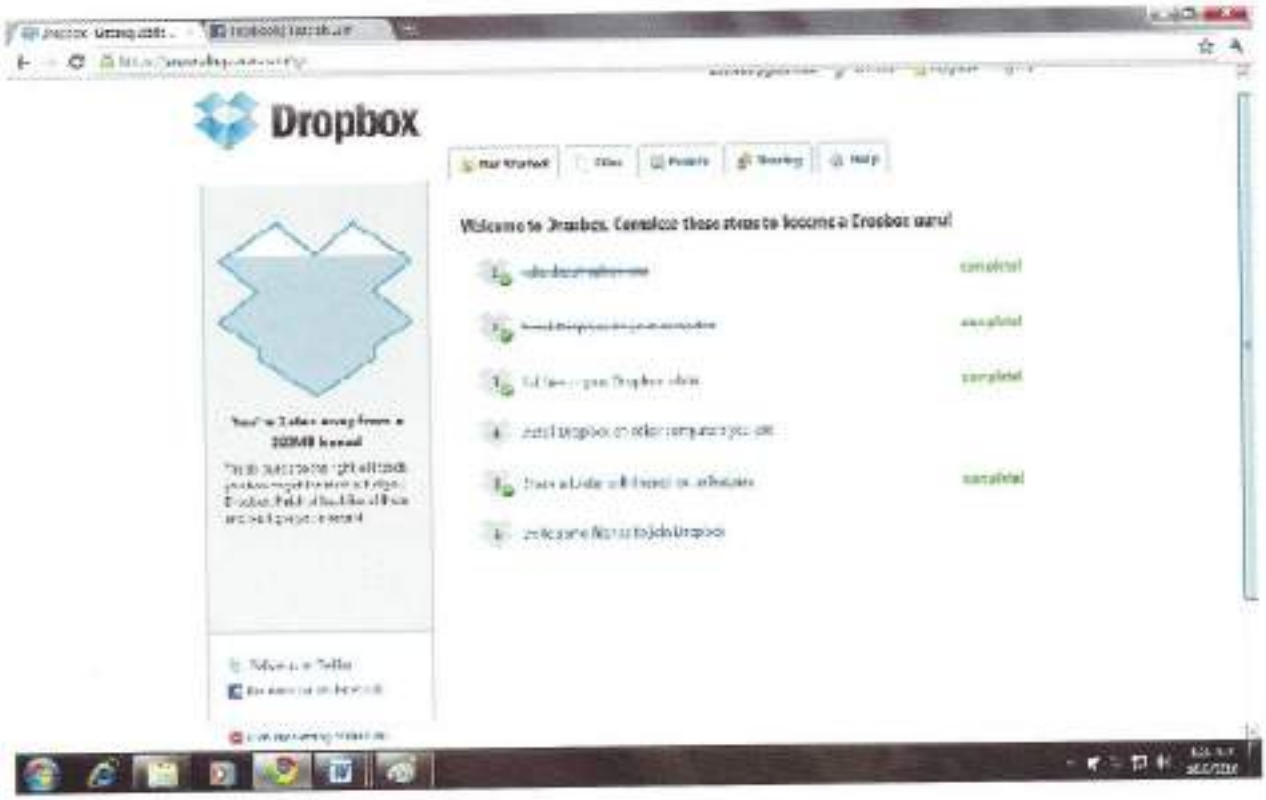
Wisdom...
Students are not here to worship what is known, but to question it - J Bronowski

Dropbox can be used with Windows, Mac and even Linux! And the beauty is that you can also sync it across multiple_computers having any of these operating systems. There are options of both free and paid services. The free service provides 2 GB of free storage, but if you need more, you will have to empty your pockets a little. Dropbox has versions for even mobile devices, such as the iPhone, Android and BlackBerry.



Kick Start

To begin use of Dropbox, one has to first visit the website https://www.dropbox.com/ and the rest is almost done. The website explains every step right from what Dropbox is, to downloading it and using it the best possible way.
One can even choose to take an entire tour of how Dropbox works, explained effectively with the help of a video.

Now, the most important part- sharing data. To share any file, just put them into the Dropbox folder on your computer, and they'll be instantly available on all computers which are shared and have Dropbox installed. It just couldn't get simpler! Also, copies of your files are stored on Dropbox secure servers, so you can also access them from any computer or mobile device using the Dropbox website. To create a new shared folder, click on the ***Create a new shared folder*** button from the Sharing tab of your Dropbox account. To share an existing folder, the folder has to be in your Dropbox folder. You can create a folder in your Dropbox folder just as you would anywhere else on your hard drive.

You can also easily share entire folders or photo albums with Dropbox. Simply put the folders you want to share in your Dropbox, and invite people to them. You can also send people links to specific files within your Dropbox. This makes Dropbox perfect for team projects. Even editing of documents is very easy and changes are reflected immediately across all shared computers. Let's say you're editing a document in your Dropbox folder at home. As soon as you press *Save*, Dropbox will sync this file to all your other computers and mobile devices automatically. It's as if you saved the document to all of your computers. Also, If you wish to know the latest changes made, the Dropbox website has an '*Events*' tab where you can view log of the changes and additions made to Dropbox by any user who shares the same folder. This gives you the freedom to work efficiently, anywhere.

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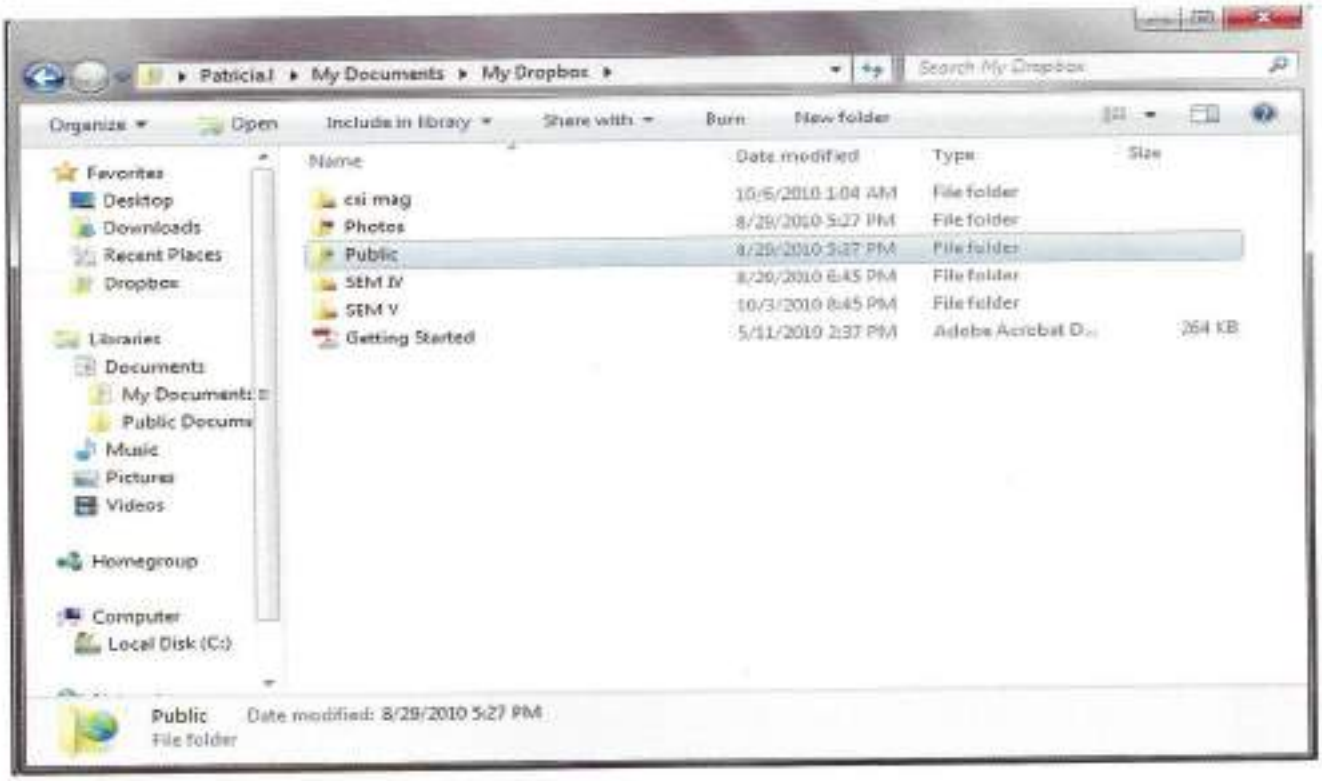


What if my computer crashes or someone deletes my shared resource?

Backup is an important part of Dropbox reliability and security. Any file you put into your Dropbox folder is automatically backed up to the Dropbox servers. Even if your computer has a melt-down, your files are safe on Dropbox and can be restored at any time. While the free 2GB account is perfect for backing up your documents, there are also larger accounts (up to 100GB) offered for backing up your music and video collections.

Also, every time you save a file in Dropbox, it automatically syncs it to secure servers. Dropbox keeps a history of every change you make so that you can undo any mistakes and even undelete files. By default, it keeps 30 days of history for all your files. There is also an unlimited undo option called "Pack-rat". So, this answers the question: if someone deletes your shared resource, you can simply recover it by visiting the Dropbox website where it will be stored.

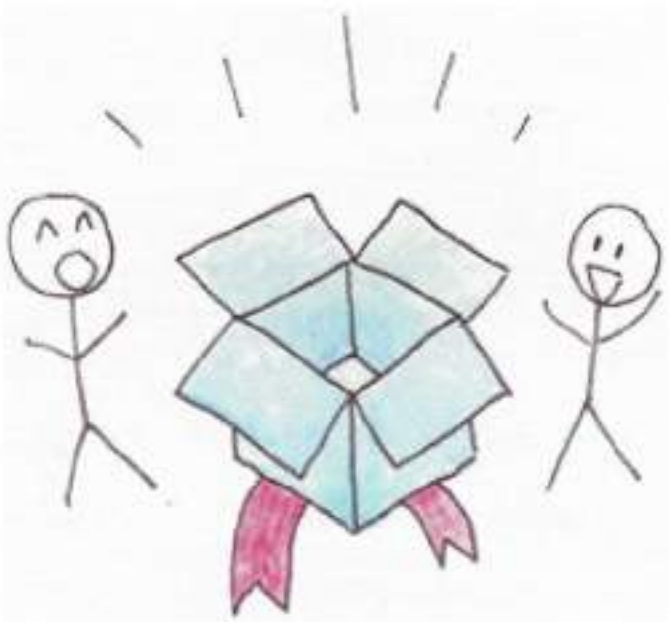
Finally, what's the big deal with Dropbox?

Dropbox is one of the major recent developments in the field of resource sharing. It replaces email of file attachments, using USB drives to transfer files, and use of complicated backup software. In addition, features like synchronization of only edited parts of a file to save time and allowance for setting manual bandwidth limits makes Dropbox very attractive and, may I say, simply irresistible. One can control who is able to access shared folders (including ability to kick people out and remove the shared files from their computers). Other features include security under which authentication (username and password) is required at the website.

Entire class using Dropbox

The entire TE-IT class of our college uses Dropbox to share files and other important data. And through my personal experience and general feedback, I can confidently write that Dropbox has really changed the way we work. Seriously, sharing has never been so easy n effective. Take an example: Any student who has some data useful to the entire class can just upload it in his Dropbox folder and there! Everyone gets the file. Visual-aids, notes, presentations...whatever you want, that you would otherwise email to every single classmate can now be done with comfort and confidence.
Even during the exams, when time becomes more precious than ever, if you do not have important notes usually you would have trouble and even disturb others to send via email or fax. Now, you can just check Dropbox folder where all important notes will be shared. Your problem is solved.

So what are you waiting for? Get going... Drop, edit, share!



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Wisdom...
I cannot teach anybody anything, I can only make them think - Socrates

GOOGLE DOCS

-Vrunda Shah & Yash Joshi

Keywords: Google Docs, Cloud Computing, Text Edit, Web-based, Collaboration

Introduction

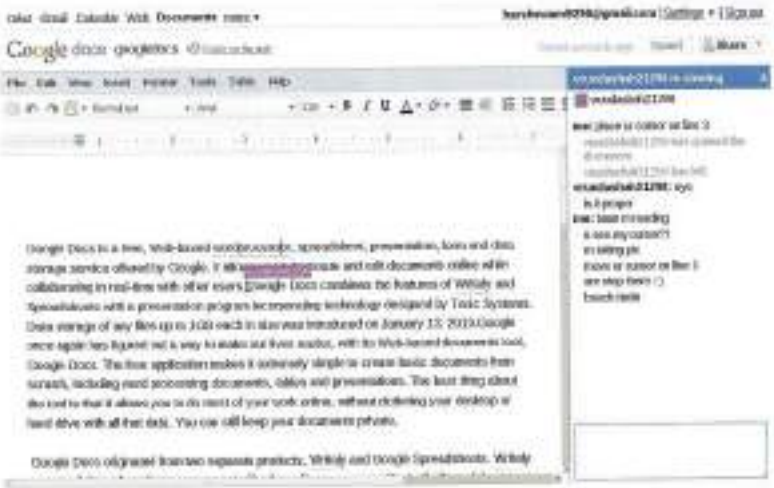
Lately, I seem to be getting more invites to view a Google document (rather than a Word document). I guess I'm not surprised though. It has been just over a year since Google Docs and Spreadsheets was officially released, and it has been just under a year since Microsoft released Office 2007. As many know, Office 2007 includes a whole new interface that is unfamiliar, and potentially frustrating, to the veteran Office user. So, after receiving my 4th invitation to view a Google document in 2 weeks, I decided to take a look at Google Docs.

Use

Google Docs is best described as a web-based and simplified free version of Microsoft Office that provides basic functionality such as word-processing, spreadsheets and presentations. Only, you can work from different places together, thus saving energy of combination of individual ideas. Even when we started work on this issue of Protocol, we used Google docs. And, as we used it more and more, we realized that it improved our team work. It basically saved time. Also, an important feature supported by Google Docs is creation of forms, which can also be done collaboratively. Forms are needed almost in every field, and that Google docs provides such an attractive feature is amazing.

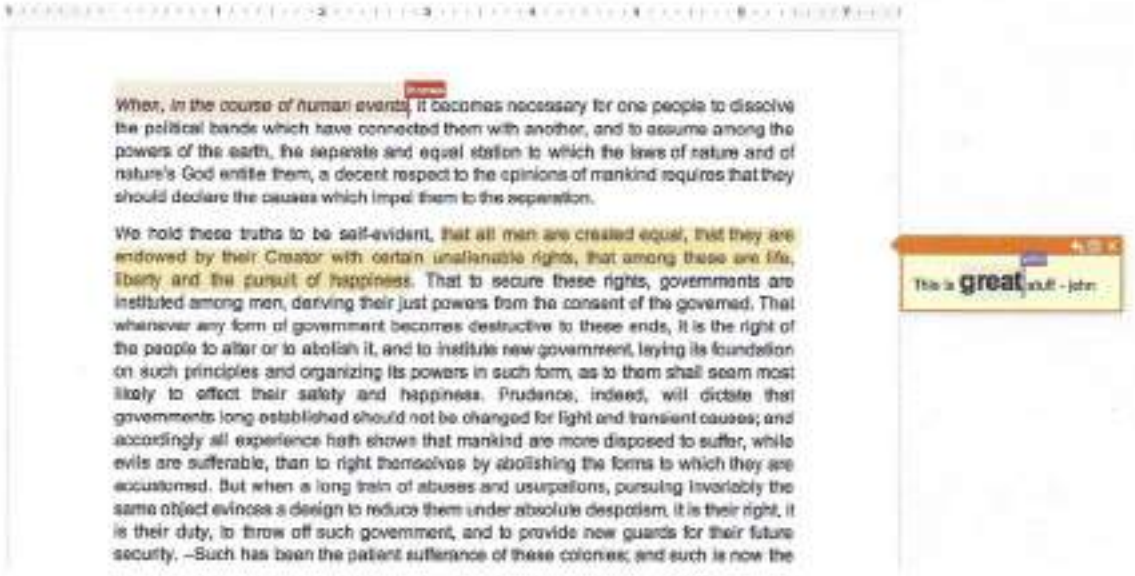
Application for Collaborative Working: Need of the hour

Now days you notice that the way people work is changing. Around ten to fifteen years ago, it was difficult to work together on a document at the same time from different place. But as our communication tools have become better, it's become more common to have a group of people writing a document collaboratively. Google Docs support users to create files. It supports three types of files: Documents, presentations and spreadsheets. Using Google Docs, you can efficiently share and work on documents as it allows owners to provide access rights such as edit, read to different users. In other words, Google docs help in working collaboratively. To increase interaction and clarity between users while editing, Google has even added a chat option. So, you can work on a Google document and chat while editing, making the process even more speedy. Pretty cool, huh?



Main Feature Supported By Google Docs

Working in a team, one can create documents collaboratively using Google docs automatically leading to great results. The best part is you can see your team members' cursors. But to really work together efficiently, it helps to know what they are about to do. So you can now see the text that other editors are highlighting as they select it. So if someone is about to delete something on your screen or drag text somewhere else, you'll see them highlight that text before anything changes



New Sharing Interface

Google docs allows owner to share file with different users and can give different access rights to different users such as read, edit etc.. Google docs allows owner to give three types of permissions:

Private

Documents start out as private. When you first create one, you are the only person with access to it.

Anyone with the link

if you set your doc to "Anyone with the link," it's like anyone who knows the web address or URL of that doc can view it.

Public on the Web

Allows anyone to find and access that particular doc on the web. Public docs are automatically indexed by search engines like Google, so they may appear in search results as well.

Conclusion:

Google Docs is an amazingly useful application that allows real-time collaboration among users situated at distant locations. Google Docs satisfies one need very well: it's the suite to use if you have a bunch of people who need to work on files at the same time (or repeatedly over time). With centralized storage, change-tracking, and easy sharing, Google Docs fills that niche perfectly.

Feel Free to send in your feedback, reviews, etc. to harshswami9290@yahoo.co.in
Thank you.

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Sardar Patel	71%	1420	CMU, TAMU, NYU, etc.
TSEC	71%	1280	CMU, U Penn, NCSU, etc.
Somaiya	71%	1430	CMU, TAMU, NYU, etc.
Somaiya	70%	1300	Cornell, U Penn, Maryland, etc.
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