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► details on pg 38

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Under the hood of Open Source cars

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AGENT 001 HUNTS FOR COOLING SOLUTIONS | TIPS N TRICKS: GNUMERIC, 7ZIP

Open source, closed minds

Robert Sovereign-Smith, Editor

I hate the term "evangelist" – it's basically a word used to describe someone who tries to convert you to their "religion"

As you've probably figured out, we're celebrating open source this month, and no, we're not talking (just) about software. You've known us encourage the use of open source in the past, but this time we wanted to highlight all the other aspects of the open source philosophy. It's not just about software, or Linux distros, but more about a way of life. Open source has extended to cars, gadgets, hardware, cooking, music, movies and much more. Although we're covering all of the above in this issue, to help you understand how basically anything you can think of can be "open source" and community driven, including our own *Digit Open Source Project* (details on page 38), there's still some confusion about how open, open source really is.

What started in 1985 as a paper titled the GNU Manifesto, by Richard Stallman, has grown exponentially, under the GNU license and the Free Software Foundation, into the biggest community initiative of all time. Now Stallman is (in)famous for being absolutely against all software with closed source, including freeware. His view has always been that unless the source is shared, software just isn't truly free.

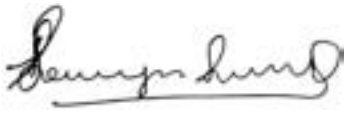
In very public arguments, Stallman has been criticised by other "evangelists" for being too rigid with his thoughts. To be honest, I'm inclined to agree with these criticisms. There's no doubting the accomplishments of Stallman, and we probably wouldn't have open source of any kind if it wasn't for radical thinkers like him, but with the rate the world and its requirements are changing, can we continue to stick to ideals like an ancient religion's diktats? This is why I hate the term "evangelist" – it's basically a word used to describe someone who tries to convert you to their "religion".

Over the years, I've avidly read views from both sides, as both have argued over the definition of common everyday words such as "free", "freedom" and drawn distinctions between "free as in beer" and "free as in speech". However, all this makes absolutely no difference to you and I, the everyday computer users. A lot of us use IrfanView, but it isn't free for commercial use, or open source, so should you stop using it? Of course not – use what ever you feel like, and pay for things if you feel they will help you get your work done. That's because, unlike the evangelists, we live in the real world, where we never get free beer, and rarely speak our minds – either for fear of insulting someone's sentiments, or getting beaten up.

Free software is good, and open source software even better, but some of the pontifications of the evangelists are just plain silly. Somewhere along the way, everyone's forgotten that in 1985, the computing world was made up of mostly developers and other computing specialists, and it is just the opposite today. If we're ever going to get the open source and collaborative philosophy to spread, and apply it to all the other facets of our lives that aren't displayed on a monitor, we should first be allowed to think openly. Instead of bickering about whether a particular Creative Commons licence is truly open or not, or trying to classify an author based on the way he wants to share his works, why can't we just applaud the desire to share? Isn't some sharing better than none at all?

As open source moves away from software, the "rules" seem less realistic. It's why the Creative Commons licences make more sense. Besides, as some people have put it, shouldn't the proponents of "free as in speech" allow those who choose to keep their source closed to co-exist with open source? The Indian pharmaceutical industry seems to be the only ones to have it right – the laws were altered to distinguish between methods and end results. Basically, if X cures a certain disease, you can patent the way in which X is delivered to the body, or the way in which you manufacture X, but you cannot patent X itself. The government did this to make medicines more accessible to everyone, and save lives.

Personally, as a long time admirer of Stallman, I think he's created something that's outgrown everything else, including himself, and is now too big to control, much like the internet. Like the net, free and open source needs to be freed of shackles and allowed to ascend – with good, bad, and sometimes ugly results, if need be. Let's remember that the basic principle behind open source, the FSF and GNU are pretty much all the same – let's all work together and make life a lot easier for ourselves and everyone around us.



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Disclaimer: For every *Digit* contest, there will be only one winner, unless specified otherwise. In the event of a dispute, the Editor's decision shall be final.

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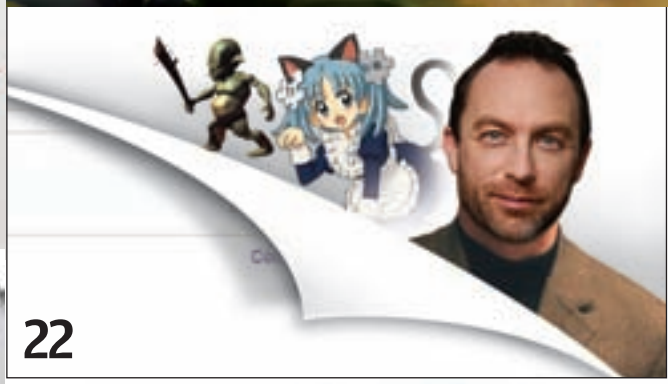
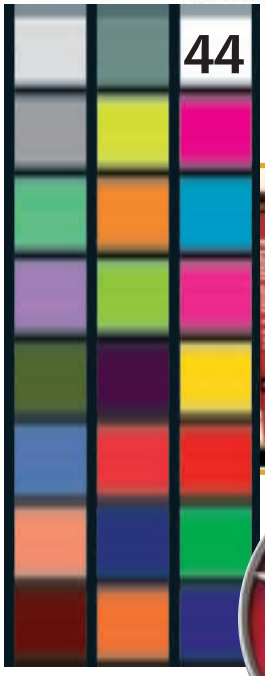




Tools

Multimedia

Agares RackA3 1.0

Agares RackA3 is a collection of 6 VST effects. Featuring triple distortion, triple delay, triple reverb, triple pitch shifting, triple chorus, and triple phaser effects, the Agares RackA3 includes 6 VST effect units that are designed to provide the basic effects toolkit that every musician needs.

- FastPictureViewer
- Ashampoo Burning Studio Free
- BonkEnc Portable 1.0.12
- BurnAware Free 2.3.6
- Contenta-Converter Basic 4.5
- Cool Flv Player 1.0
- DDJ Suite 2.9.169
- Dynamic Range Compressor
- FastStone Image Viewer 3.9
- FLIP Flash Album Free 1.9
- Foobar2000 0.9.6.8
- Fotografix 1.0 beta 3
- FoxRecorder 1.3
- i3D Photo 3.4
- IdPhotos 2008 3.6.3
- iDump Build 29
- JetAudio Basic 7.5.3
- Kantaris Media Player 0.5.4
- Kigo Video Converter 1.0
- Leap Free Audio Converter 5.0
- Life Photo Maker 1.4
- Lossless JPEG Rotator 1.01
- MediaCoder 0.7.1.4450
- MediaInfo 0.7.17
- MediaMonkey Standard
- MetatOGGer 3.9.1.0
- Moovida Media Center 1.0.3
- Pdf To Jpeg Converter 3000 7.4
- Photobie 6.0
- PhotoOnWeb 0.9.1
- Photoshop Camera Raw 5.4
- Pi-Vu Basic 1.6.2.1
- Similarity 0.9 build 310
- Songbird 1.2.0
- Soundbase 2009.06.27
- Videora iPod Converter 4.08
- VIP Rumor Player 2.6
- VSO Image Resizer 2.2.0.4
- Windows Live Photo Gallery

Internet

TweetDeck 0.26.3

TweetDeck is your personal browser for staying in touch with what's happening now, connecting you with your contacts across Twitter and Facebook. TweetDeck shows you everything you want to see at once, so you can stay organized and up to date.

- Boost Machine 1.5.6
- Bywifi 1.5.3
- CoffeeCup Free FTP 4.2.1526
- CraigsList Reader Pro 3.32
- Download Accelerator Plus
- FileZilla 3.2.6
- GetGo Download Manager
- Gladinet Cloud Desktop
- KooLoader 1.3
- MobileWitch Pass Safe 1.9
- Music MP3 Get 4.0.1.9
- OnLine TV Live 7.1.2
- Phazer 1.0
- RapidShare Downloader 4.10
- SeaMonkey 1.1.17
- Transmute 1.56
- TrayTweet 1.2
- TubeSucker 5.2.002
- TwittX Twitter Client 1.0.0.38
- Weather Watcher Live 6.0.30
- Writemonkey 0.9.4.0
- ZapShares 2.4
- Zultrax P2P 4.35

System

CPU Speed Professional

CPU Speed Professional is an application that measures the real speed of your Intel or AMD central processor unit (CPU). Click the Test My Speed button and watch as CPU Speed ramps up your computer's processor to full throttle.

- Advanced SystemCare Free
- Asoftech Photo Recovery 2.0
- Auslogics Disk Defrag 2.0.0.15
- Baku 4.0.3466
- Batch File Modifier 2.4.3466
- Belarc Advisor 8.1b
- BestSync 2009 4.2.04
- CCleaner 2.21.940
- CrashPlan 6.11.20009
- Endpoint Security Manager
- Eusing Free Registry Defrag 1.0
- File Backup Watcher Free
- Edition 2.8.25
- Fresh Diagnose 8.10
- Hawkscope 0.6.2
- HWiNFO32 3.00
- JaBack 8.24
- Limagito Lite 7.6.4.0
- MapSphere 0.97.161
- Memory Improve Master Free
- Version 6.1.2.136
- Moo0 RightClicker 1.27
- MuvEnum Address Bar 5.0.5.0
- pcBaseline 1.0.3
- Registry Flashlight Fixer 1.4
- Screenshot Captor 2.67.01
- SE-Explorer 0.0.29.590
- Super Finder XT 1.6.1.1
- TeraCopy 2.01
- TreeSize Free 2.3.2
- TweakNow PowerPack 2009
- TweakNow RegCleaner 4.4
- UltraExplorer 2.0.1
- Universal Viewer Free 4.0.2
- WinStart Manager 1.4
- Wise Disk Cleaner 4.52

Entertainment

Games

Dawn of Discovery

- Return to Mysterious Island II
- Trine

Trailers

- 2012
- Amelia
- Daybreakers
- GI Joe
- Inglourious Basterds
- It might get loud
- Ponyo
- Shutter Island
- The Last Airbender
- Zombieland

Music

- August Moon
- For those who can't wait
- Halo Fauna
- How do we jump this high
- Pink Houses

Videos

Linux Journals

- Advanced Firefox configuration
- Bash Startup Scripts
- Firefox addons - it's all text
- Protect files with Chattr
- Schedule commands
- Texting without cellphones
- Using ARP

Things

CCC-Trier Welcome Video
How to Make a Single Speed Bike
Lasercut Butterfly Knife
Martha Vader - A MakerBot sings the imperial march and makes a Darth Vader Head
Resizing Objects in Blender

Astronomy 160

Lecture 14 - Pulsars
Lecture 15 - Supermassive Black Holes

Open Source

Development

- ADempiere ERP Business Suite
- Arianne RPG
- Bouml
- BugTracker.NET
- devkitPro
- eXist
- Exuberant Ctags
- Flex Formatter
- IDThemes
- IXThemes
- jEdit
- Quex
- Microlog
- Notepad++ 5.4.4
- Openbravo ERP
- RODIN
- Scintilla
- ScummVM
- TortoiseSVN
- WinMerge

Multimedia

LiVES

LiVES is a Video Editing System. It is designed to be simple to use, yet powerful. It is small in size, yet has many advanced features. LiVES is part editor, part VJ tool. It will run under Linux, BSD and UNIX. Compilation from source necessary.

- Album Art Downloader
- Asymptote
- aTunes
- Audacity
- Coppermine Photo Gallery
- Data Crow
- DVDx
- eLibrary
- ffdshow
- FreeMind
- Inkscape
- MP3Gain
- Mumble
- SmartCam
- SMPlayer
- SoX - Sound eXchange
- Tux Paint
- VirtualDub
- Wings 3D
- XBMC Media Center
- xVideoServiceThief
- Zina is not Andromeda

Internet

- aria2
- AutoWikiBrowser
- Azureus
- Dooble: Secure & Open Source Web Browser
- FreeImageMapper
- FreeWRL VRML/X3D browser
- KeePass Password Safe
- K-Meleon
- MindTouch
- MySecureShell SFTP-Server
- Privoxy
- Quechua
- RSS Bandit
- Safe Exam Browser
- Shareaza
- Zenoss Core

Enterprise

- Adaptive Planning Express
- Alfresco
- Buddi
- Collabtive
- ControlTier
- CuteFlow
- DavMail
- FGMP - Hotel Management
- hipergate CRM
- Hyperic
- Inforama
- JStock - Free Stock Market
- Software
- LimeSurvey
- MailArchiva
- Nagios
- OpenGoo: The Open Suite
- Osmius
- OSS Open Search Server
- PDFCreator
- Pentaho - Business Intelligence
- Piggydb
- PNotes
- Task Coach
- TUTOS

FOSS Gaming

Games

DarkWorld

DarkWorld is a space based massively multiplayer realtime strategy game. What makes this game unique is that the game is always running at a very slow speed even when you are not connected. When you send a ship to another planet it may not arrive for hours or days and likewise the message it sends back may not arrive for hours or days. This allows many players to engage in a realtime strategy game that could last for months.

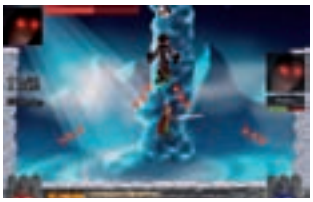
- AssaultCube
- Bos Wars
- BZFlag - Multiplayer 3D Tank Game
- Digital Paint: Paintball 2
- DooM Legacy
- Enigma
- Epiar
- F.L.A.W.
- Final Frontier Trader
- GL-117
- Glaxium
- HapticBillard
- Hot Potato
- Krystal Drop
- OGL_Planets
- OpenLieroX
- OpenTTD
- Pingus
- Spice Trade
- Warzone 2100
- Wormux
- Zombies

Engines

- Car Racing Project 2010
- Crystal Space 3D SDK
- Cube 2: Sauerbraten (Engine and game)
- GLOBE_3D
- No Gravity
- QuakeForge
- The EDGE Project
- The Quake Army Knife

Source Code

Ardentryst



Ardentryst is an action/RPG sidescoller, focused not just on fighting, but on story, and character development.

- Allegiance
- BloodFrontier
- Globulation
- Widelands

Digit

Tools

- DVD Flick
- 7-Zip
- Android 1.5 SDK
- Gnumeric
- MeCat
- Open Movie Editor
- Digit Archive V2
- FLV Player 2.0.25

Videos

- Avitel Showreel
- GeForce 3D
- Nokia N97
- Razer Moray

From this month onwards, we will be accepting user made content for the DVDs. Send in animations, artwork, videos or any kind of content to cdcontent@thinkdigit.com

✉ Well I am a regular reader of Digit from last year. I am a big fan of Digit and live in Nepal. I really love the information that you provide in your magazines. You really have no competition. You have been able to make a unique mark. I used to see your magazines in the newsstand but I wasnt really interested until curiosity got the best of me and I bought my first issue of Digit then I knew why its so good. I became drowned in the articles. Still I continue reading the articles of previous months. You have been improving with time. Your new website is also very good. Well I hope you get even better and entertain us. Some guy was complaining about the text size but I think it is OK. Do you suggest macbook 15 inch or a Dell XPS Studio 16 laptop? Not taking price into consideration and may you blossom even more. egarding gaming section in the DVD.

Anish Dhami

Every person has different requirements and the notebooks from Apple and Dell are better suited for some people. I could go on forever explaining all the scenarios and why you'd prefer one notebook over the other but I'm going to keep it short. There isn't a 15-inch Macbook, so I'm assuming you mean the 15-inch Macbook Pro. If you want to use Mac OS X, there's really no choice - Macbook Pro 15 is the way to go. It's an excellent piece of hardware. You can also install Windows on it using Bootcamp. The Dell Studio XPS 16 is also a very good laptop - it's stylish, is built well and performs well. I know you've asked not to take price into consideration but you can't ignore the fact that the Dell is a lot cheaper than the Macbook Pro.

Rossi

✉ I liked the E3 videos, I was eager to view some videos about project Natal but I didn't find it in the DVD. I hope you'll give details regarding this in future. Also I want that you must review full HD LCD monitor in test center.

Bhupinder Sidhu

We carried some E3 videos, our sister publication, *SKOAR! had a more comprehensive E3 coverage. Rest assured that we will continue to provide quality gaming content in our DVDs and between the pages of our magazine. You will be pleased to know that this month's issue has the LCD test you wanted.

Aditya and Michael

✉ I have been reading Digit for a quiet a long time and I can assure you that you are the best among all other. With Digit I always up to date with all the latest technology and have enough knowledge to be the geekiest among my friends and often solve their problems. The new look of the magazine is superb.

I would like you to give comparisons between various different types of software to help us choose if we are up to buying software (do include comparisons among the freeware counterpart). It would be great if cover the different Linux flavors.

You seem to have stopped giving archives of the Digit and fast track, I am a student and it easy to carry soft copy of them, and be able to check it any time and I also miss out to buy some of the issues since I buy Digit from store, so with the archives I don't miss anything. The HD trailers are awesome but you could give interesting tutorials or hardware installing videos tips instead of the unboxing videos.

You guys there are doing a great job. I wish best of luck a you will always remain the top tech magazine and our technology navigator.

Vishal

This month's Fast Track has a very thorough and comprehensive listing, guide and infromation about a whole bunch of Linux flavors. The Fast Track and Magazine archives will be given in the PDF form in the December issue. The harware tutorials is a great idea! There are some webinars in this month's DVD, and we will work on your suggestion while making the videos for the DVD.

Aditya

✉ Great surprise for us! After a great anniversary issue, I did not expect issue dealing with security. Ethical hacking, Enter the mobile virus , A secure digital identity, were outstanding. You guys gave me good options for antivirus. Bloatware replacements are light and fast. Printers just made me crazy as you tested were cheap and affordable. Agent 001 suggested good configuration for new PC's. Games reviewed were good. Thanks for Open Solaris in DVD. Fast track on security of all day-to-day technologies was useful. Videos on DVD were as usual mind blowing. Please don't provide full length movies. You can provide e-books dealing with programming, Linux and other various technological topics. Please provide some topics dealing with command-line handling of linux. Editor-in-Chief has covered problems faced by all of us while dealing with service providers. Thanks for that article and this excellent issue.

Mayur Gaikwad

Thanks for all the praise. Full length movies are a common request, and although some of them are old and outdated, many still enjoy watching them. There are instructional command line videos in almost every issue, included in the Linux-Journals podcasts section of the DVD. We will keep your suggestion of e-books in mind.

Aditya

✉ Kudos to you and to the team Digit for delivering such a fabulous June and July issue. As I also share my birthday with Digit (17th) it makes the month of June very exicitng for me . Tons of information and entertainment keeps me glued to the mag. I've never set eyes on other mags as I know Digit is the best. I've been reading Digit since March 2006 and have seen many changes in the mag. Beside the font size I really liked the new layout of the mag. The articles surely have increased in number and also information. Please continue the good work

Taking suggestions from your March's Fast Track on Photography I tried Time Lapse Photography. The resulting videos are very good (according to me) and would have liked to share with you and with the other readers but because of the large resolution and file size I'm unable to forward the files through E-mail.

Utsav Nath
Bhilai, C.G

We'd love to see the results, why not try zipping the files and uploading them to a service like

Write to us

We would love to hear from you. Write to us at editor@thinkdigit.com and let us know your feedback

Digit open source project

For more information, go to Page 38, or visit www.thinkdigit.com/dosp

yousendit.com, so that we can also have a look?

Robert

✉ Last month the review for different antivirus was superb but I don't know why you missed Avast antivirus from the tests. Here are some suggestions that are strongly recommended.

a. Front page of the July magazine was not up to the mark, please focus on front page of the magazine as mostly new buyers attracted mainly by the front page after all we (Digit family) are no.1 in India so it's a major issue. Check the quality of April isssue that was great as well as attractive too.

b. There is not much issue with the content of magazine. You already provide lot of nice stuff each month. But I may suggest you to add something more. I know you can't add much pages in magazines that might be costly to you but you can add tech articles on the DVD itself from various sources (like Wikipedia and ezine articles if they agree). As our tech hunger grows up so much that I will finish up your whole magazine within two days from the date I bought it after that I get bored. However the DVDs take time to explore.

c. Digit archive is your responsibility make it yours.

d. I will be very happy if you provide us the latest BackTrack distro.

Shishir Priyadarshi

We kept the cover dark and mysterious because of the topic. Let me know how you like this month's cover. We will take your other suggestions into consideration and try and implement them all.

Robert

✉ Firstly I'd like to congratulate you on the success of being India's favourite Tech Magazine for 8 long years. You must be aware that Digit readers become Tech Gurus in their locality very soon after being a consistent reader. You are the only Magazine, that is so much connected with its subscribers. You have listened to our demands and have changed continuously to fulfill our requirements. I bet no other mag does that. I am regular reader since four years. Like other Digitians, I am also considered the Tech guru among my friends. I really loved the design of the July issue and the new look of thinkdigit.com is fabulous. I also have some suggestions that I've listed for you since long:

The movies that you provide in the DVD, are either too old or worn out. Subscribers rarely watch them. Its better to replace them with Tech videos of the same size. Like you gave videos about "Things" in June issue. Well movies have nothing to do with Tech!

We are waiting for a changed and more beautiful UI of the DVD as the new Website and design of the mag.

Unboxing videos are a new innovation but the videos get hazy at times and sometimes lighting is poor. The camera is too shaky sometimes. Also try to give a brief intro of the product before unboxing it.

You could try to build a social networking site for Digit readers, where we can be friends and have discussions more than forums. Who knows, you could be the next 'myspace'!

Suggestions on Content

You should focus more on open source software and tools rather than hardware. It goes simple: "If someone already has a notebook, he wont buy another one, even after reading about better ones. Indians don't replace electronic equipment too often. But in case of software, one would definitely switch to a better software if he finds it featured on Digit."

Please provide content about history of computing and technology as a new section, as we know the future is lame without study of history. Please try to include some for the sake of completeness. (For Ex: How was the internet invented, The evolution of Mac, Bill Gates Biography etc.)

Please give us more on Web 2.0 applications. Because if I'm not wrong web 2.0 is going to be the part and parcel of our lives soon.

Please provide articles that can teach Linux (Linux Commands, functions, tips and trick etc.) to laymen, as we are promoting the open source culture.

Rest assured, you guys are the best and unbeatable.

Biswaranjan Rout

You will like this month's issue, which focuses on Open Source software, with a lot of the DVD content dedicated to Open Source tools. In our mission to help technology consumers make educated decisions, our tests of a wide range of hardware is helpful in many ways to make buying decisions over time.

A DVD UI change is a common request, and we will look into it.

Robert

LETTER OF THE MONTH

✉ I have been a subscriber to your esteemed monthly publication for at least two years now, and believe me when I say that since I have done so, I have never felt the need to subscribe to any other magazine. The quality of your opinion is always held by me in the highest regard and you have one of the best writing styles I have seen anywhere, let alone among tech magazines.

It is really amazing how you balance introducing new concepts, technology and competitors and helping us to fully understand and utilize our usual, everyday technology. Even more amazing is how you have now started interacting with your readers more often through webinars, bootcamps and workshops, and even helping us with customer service-related issues. You have always been helpful with your advice on tech problems in your 'Your Questions, Our Answers', and this is taking it to the next level. I like!!!

Your issue on security (July 2009) has been a real eye-opener, both for me and undoubtedly so many more. You have lived up to the Ubuntu ideal in your own way- 'technology for human beings' and this ideal helped me to get everything that you intended to say, and rest assured I will think twice while working on the Internet from now on.

That said, everyone has room to improve, and I do not doubt that you know that very well. Hence, may I add some suggestions that may be found worth your while.

In your 'Killer Rigs' section, kindly break categories into 1-2 more; there is a category of readers who would like a graphic card, but simply can't dole out Rs. 18,100 for the same, and also who want something between 18 grand and 30 grand.

Kindly provide Nvidia and ATi graphic card drivers (the latest) in your essentials, as well as MediaMonkey (free). These practically have to be used many times for graphic card owners and music enthusiasts.

his actually is more a question for your QnA section: - Kindly inform me of a free software alternative to iTunes to transfer videos to your iPod Touch.

Kindly, at the end of each year, list the best and worst following of the year: -

- o Video Games
- o Free Software
- o Big Release Software

Also, cut the Vista-look-alike DVD interface. Honestly, it is irritating.

Congrats on completing eight years, and hope for many more years of quality decoding :)

Chinmay Pai

For the first time in history, Microsoft logged a full-year revenue drop, while Apple posted profits for the same period

One of Twitter's mysterious revenue generating approaches has been revealed, as special tools for businesses

The drama unfolds

We spoke to Mr. Sunil Nair, CEO and founder of Nautanki.tv, about online streaming and the response to it by the Indian audience

Kumar Jhuremalani
kumar.j@thinkdigit.com

Mr. Sunil Nair, CEO & Founder of Nautanki.Tv

How did Nautanki.tv start?

In 2006 there was a growing movement towards UGC. Our thought process was to use low cost content to create a base for Indian content on the internet. We moved to Indian independent content and eventually to branded content. The company started with a clutch of media and advertising professionals coming together to experiment with content and technology.

Tell us more about the technology behind your services? the servers, configurations, platforms, etc

We have three 64-cluster servers in place, two of which operate out of the USA and one from Mumbai. The complete content and ad-serving mechanism has been built by us from scratch. We have the capability of serving ads on content dynamically, which only a few ad-networks in the world can boast of. We have a real-time reporting system that is pretty robust and provides the highest levels of transparency to the client whose campaign is running live. We share the same with the client. The algorithm is built such that it runs in the best interest of both the viewer and the advertiser.

Which places in India consume the most video content? What do they watch?

From India, the top seven cities that consume 68 per cent of the videos are: Delhi, Mumbai, Hyderabad, Chennai, Bangalore, Pune and Kolkata (in that order). In fact, quite surprisingly, there is 32 per cent consumption from the rest of the cities and the tier-2 belt.

What is the typical Indian's favourite video content?

This question's been answered so many times before. The content that has always worked in India is Fashion and Bollywood. FTV and Bollywood Hungama get the highest views on our network. In fact youth-centric content like that of MTV and Channel V are catching up very fast.

With services such as YouTube for video hosting, why should companies prefer a service provider such as Nautanki.tv?

There are enough case-studies in the market to prove that YouTube is facing difficulties in monetizing content due to their infrastructure. Even though YouTube also serves videos, but when you get into the details of each one intricately, you realize that YouTube has user generated content, which is an advertiser's nightmare.

Nautanki.tv on the other hand has premium-legal content which is easy to target. The brands know exactly what they want to be associated with. In fact, we are a network where we have strategically given out our video players (widgets) to multiple destinations. So, we are not restricted to Nautanki.tv for consumption. We have tapped the long-tail of the internet and believe in taking content to where you are and not try and bring you to a destination site called Nautanki.tv

Over the last few years, we have read about the success of so many of the big players on the internet and today seem to have forgotten them. This is the risk you run when you have a destination site, which fades away like a pattern on the internet. But as long as you are present where the consumer is, you do not get obsolete. We keep innovating and changing with the times!

Moreover, the types of advertising opportunities that Nautanki.tv can provide, ranges from vanilla pre-rolls to a 360-brand solution to events to social media-optimisation.

Consumermate.com
now has reviews of LCD/Plasma TV and mobile phones

OpenID
Google to enable OpenID logins to enterprise users of their services

Google's Chrome OS

Just when the crowds were getting excited about Google's mobile operating system, Android, there came some even more exciting news from Google. Google is developing an operating system based on the Chrome browser. Users are not just content with the free services, and many have hoped that Google would create an operating systems; and it's finally happening!

While many have their fingers crossed that Chrome OS will take on Microsoft's Windows operating system, it's highly unlikely there'll be such a confrontation. Google would need to use its power to convince developers to port applications previously developed for Windows over to its platform. That's a tall order. If Google integrates its online services with the local operating system, it could take a large chunk from the netbook OS market and also many Linux distributions.

Not much is known about it yet. It will be built on a Linux kernel and will be designed for low power computing devices – netbooks. The OS is said to be developed together with companies such as HP, ASUS, Adobe, Texas Instruments. Chrome OS will be coded for the ARM processor.

Google says that it doesn't want people to be spending all their time waiting for computers to boot up and load software. It also doesn't want people to lose any data. It is clearly suggesting that the cloud is the way to go, and if so, powerful hardware isn't required. Our only concern is the poor internet connectivity options available in our country. With most users on connections with ridiculous download caps and limited speeds, running an operating system that depends heavily on the internet might not be practical.

Chrome OS will be free because it will be open source. Many say that the code for the OS will be made public already this year. It should be available for public release in the later half of next year.

Amazon pulls a disappearing act

Imagine you pay for something and one fine day the vendor who sold it to you, just takes it away. Amazon recently did precisely that with one of the books sold to customers on the Kindle ebook reader. Ironically, the book that Amazon chose to erase from customer's devices was 1984, the George Orwell classic which depicts a totalitarian era where this sort of a thing would've been commonplace.

Apparently, Amazon discovered that the copy on sale with them was a bootleg version. When the original copyright holder notified Amazon about this, Amazon decided not to just discontinue selling it but also to pull it out of customers' Kindles. As compensation, Amazon refunded the customers. Still, as expected, the incident generated a lot of gripe online. It is generally agreed that Amazon handled a genuine problem, very badly indeed.

Customers buy ebooks for the Kindle device over a wireless network, but who knew the device had hidden functionality built in that could invoke a reversal remotely? Another title by the same author, Animal Farm, was also zapped in this sweep. And as it turns out this is not the first instance of Amazon pulling this stunt. Customers voicing their complaints on forums have pointed out earlier instances of Harry Potter books disappearing. Several users likened it to stealing property from their bedside table, while they were asleep. Kindle owners have first to contend with the fact that ebooks, however tangible, have certain limitations when compared to physical books. These include not being able to lend books, to resell or donate them once read, and also the inability to display them on a bookcase. Now they even have to live in fear of the books disappearing from their devices at the will of the seller. Another twist to this incident is that the books that were forcibly recalled are freely available for download on websites from countries where the copyright has expired, example Russia.

Microsoft donates code to Linux

Microsoft did something that few could have predicted: it submitted 20,000 lines of code to the Linux community under a GPLv2 license.

The code is meant for four drivers which allow Linux operating systems to run on the latest version of the Windows Server using virtualisation. It's code-named Viridian and commonly called Hyper-V. With this code Linux servers should be able to run on Windows Server 2008's Hyper-V virtualisation system with a minimal performance loss. So why is Microsoft apparently trying to help Linux? With better support and performance for Linux on its Windows servers, it might be hoping to improve sales. On the other hand, Microsoft has been saying that Linux violates 235 of its patents, ranging from the kernel right up to the user interface.

This move seems to have put some pressure on VMWare which is a major player in the virtualisation scene. It has

Facebook recently crossed one billion views for its video service ◆ The 802.11n Wi-Fi standard is nearing final ratification ◆ Yahoo! to buy Xoopit, to add new photo

Blizzard confirms no LAN support for Starcraft II

Sony might develop a phone component to their successful Playstation Portable handheld

had support for Linux for a while but this code could help Microsoft's own servers to take a leap in performance and surpass VMWare's offerings.

The code handed over will be integrated in the next Linux kernel, release 2.6.32, slated for December this year.

The Pirate Bay to go paid

The Pirate Bay, one of the largest bittorrent trackers on the internet is set to go commercial after it was taken over by a company by the name of Global Gaming Company. The plan is to charge users a fee and collect money in order to pay people who own the content. Details of the payment aren't known yet but the plan is to charge people less the more they share. All existing members will have to shell out a monthly fee. There are plans for trying to work with ISPs to optimise traffic by 80 per cent. The changes are expected to come into effect around the end of July.

Kazaa is a P2P service which came up after Napster shut down. Kazaa was also forced to shut after several lawsuits and settlements. Kazaa is also now back, but with a fee charged to subscribers. They will be able to download unlimited tracks for a fixed monthly fee. Kazaa had a reputation for being a major home for spyware.

A new meaning to movies on-the-go

Here's an interesting step taken by the Japan Unit of Walt Disney Co., as it plans to sell its movies on a new medium – flash memory cards. The sizes of memory cards varies, but Disney has selected the microSD memory card size as the choice to go with for this venture. It initially plans to bundle these memory cards with pre-recorded content along with DVDs of the same movies.

MicroSD was selected because it is the most common type of mobile phone storage; so with this new package, you can watch the movie at home or on your mobile phone when on the move.

The microSD cards are going to be provided by Panasonic, while the price of the pack is set to be approximately Rs. 2,500.

This new medium seems certainly more practical than streaming movies on the go.

Walt Disney Studios plans to launch this new service in November, and the first movie titles are going to be the Pirates of the Caribbean series and the National Treasure series.

Digit's list of young Indian innovators who are changing the world

This Independence Day, celebrate the great Indian minds with us

This August 15, it will be 62 years since India's independence from British rule and its birth as a sovereign nation. However, our Bharat has long been a crucible of innovation, invention and technology in South Asia – from the ancient scholar Pingala, who was the first to describe a binary numeric system, to the great mathematician-astronomer Aryabhata. Modern India has also given birth to luminaries whose work has shone brightly and contributed much to the advancement of society: Sir Jagadish Chandra Bose and his work on microwaves, Srinivasa Ramanujan and his contributions to analytical number theory, Satyendra Nath Bose and his famous work on photons that form Bose statistics, Homi Jehangir Bhabha, Subramaniam Chandrasekhar, Har Gobind Khorana, Amartya Sen – the list is as endless as our people are timeless.

Your nominations

Help Digit identify young Indian innovators who are changing the world. Read this story and send in your nomination to yii@thinkdigit.com. Head to www.thinkdigit.com/YII for more information

For our 62nd year of Independence, Digit would like to look ahead to a new India, an India shaped by young minds innovating in the realm of technology. This is a brave new era of nano-machines and micro-blogs, an age when thought travels at the speed of light and changes the world overnight. In this age, India has a new tryst with destiny when we once again "step out from the old to the new", with the help of young Indian innovators. Digit would like to identify, recognise and felicitate these young minds who will shape our destiny through their work.

It is a vast undertaking and one that would benefit immensely from contributions from our community. So we would like to take this opportunity to extend an invitation to you, our readers, to help us undertake this mission. You can contribute via nominations: do you know a young Indian innovator who has birthed a vital algorithm, designed a world-changing chip, or written a vital component of a search engine? Let us know. There are rules though:

1. Since this is a list of young Indian innovators, the person nominated should be under the age of 40.
2. The young Indian innovator you nominate must, of course, be of Indian origin.
3. The person you nominate should have made a meaningful and substantial impact on our lives.
4. When we say "innovator", we mean someone who has made a contribution to technology, no matter what kind – from processors to alternate fuels, and everything in between

Based on your contributions and our own research, we will prepare Digit's list of young Indian innovators who are changing the world. This list will then be shared with everyone of you online at www.thinkdigit.com/YII. For the next phase of this exercise we will invite your votes to decide the most influential amongst the list of Digit's young Indian innovators.

To nominate one or more persons to the list, write to us at yii@thinkdigit.com and visit us online at www.thinkdigit.com/YII for more information.

sharing features to its services The deviant toilet on the ISS was fixed, after a spacewalk mission Microsoft pulls down Soapbox, YouTube's rival, no one really notices

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A look at the business of iPhone apps and the nearly indestructible phone from Nokia

22 **Wikipedia: Behind the pages**
How Wikipedia works? The technology behind one of the largest web sites on the internet

Browsers ahoy

Filled with activity in the browser industry, internet users have increased options to choose from. We look at the latest happenings with Opera, Safari and more

Opera Unite

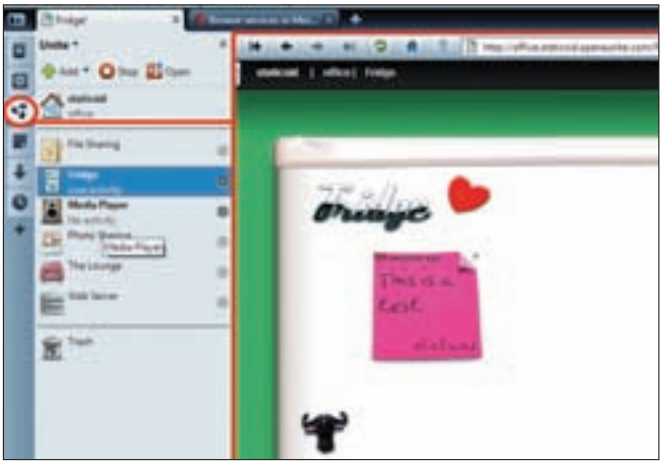
Browsers have witnessed significant changes in recent times. Whether it's a boost in speed or some added functionality, browser developers are pulling out all the stops to come up with the most superior product. Opera developers also came out with their bid – Unite, a technology that they claim will turn a computer running the Opera browser into a web server. Contrary to the traditional client-server approach, Opera claims to place the user in control of his / her own data, by allowing users to connect directly to their friends for sharing files and also allowing several other activities such as networking and more. But who really wants so much control? More importantly, does anyone care? People are very comfortable having hundreds of photos hosted on third party servers. Most average users won't even understand the difference between sharing content from hosted services and their own hard drive. If Opera wants to succeed with Unite, it'll have to move past flogging this concept and playing on users inherent fears about privacy and control. Besides, many online bloggers have pointed out that given the centralised routing of data, you eventually do end up relying on Opera proxy servers, making this an indirect approach after all.

We seriously doubt all the hype that Unite will reinvent the web. Services such as Windows Live Sync and Dropbox have been allowing file-sharing and similar services for a long time, albeit without browser integration. In fact, many of the little services offered by Opera Unite are already being offered by different players independently. All Opera is doing is consolidating all of them under its browser's umbrella – hardly ground breaking.

These services include file sharing, photo sharing, note sharing, remote media player, a chat room service and a web server. The first two are too familiar. The Fridge is a service that seems fun at first, but makes you wonder if it is really useful. Opera describes it as "A fun place for people to leave notes on your computer." It is the virtual equivalent of leaving notes on the refrigerator door. Except on your virtual fridge, it's not only you but a whole lot of your contacts online that can leave you notes. All they have to know is the unique URL that gets created, which goes something like **http://compname.username.operaunite.com/fridge/**.

The Media Player service allows you to access your complete home music library from wherever you are, without having to upload it. The web server allows you to host web sites off your PC. To try out Unite, head over to the Opera web site and download the latest alpha build. In the left panel, you will find the Unite button which gives you access to these services. You will need to register an account with Opera, if you don't already have one.

Opera is also offering the API to developers to create their own Unite services. So far, there are no new services added to the Unite repertoire. The bottom line is that Opera makes one of the most stable, fast and light browsers in the market. They should probably focus on that core strength instead of tangential experiments.



Opera Unite showing the Fridge service

Safari 4

Yes, we know it released at the beginning of June but it's never too late to take a crack at something that claims to be the "World's fastest browser". Also, the recent update (4.0.2) to the browser's Java engine released mid-July, is supposed to make it stable, and so, worthy of being pitted against fellow contenders in the browser world. Whether it lives up to Apple's ambitious claim, we shall see later; for now let's look at the user experience that the browser provides and the improvements it offers over the previous release. Even with a cursory glance, you'll see the similarity with Chrome. In particular, the page control and settings buttons at the top right corner of the screen. The drop down menus that they produce are almost identical. So is the position of the forward / back navigation button as well as the refresh button. The only difference in the navigation bar is that the search field is independent of the Address Bar, while in Chrome they're clubbed into one.

The visual effects are spectacular, as with any Apple product. The home screen which shows the most visited sites or favourites, looks stunning. It's a change from the older concept of having the most recently visited sites. But navigating from here seems sluggish when compared to Opera or Firefox (when running on a Windows 7 system). The start page is fully customisable, in terms of sites you want displayed, size of the panes and arrangement on screen. Going into the edit option will bring up a pinning tack icon that makes the site a permanent one, while the X will get rid of it. Also, it appears Apple's affinity for coverflow continues. The feature has now been ported into Safari to let users browse through history using the coverflow style. So web pages in your browser history will be smoothly gliding past at your will. Speaking of history, if you

Google recently unveiled plans to introduce an operating system for netbooks based on the Chrome browser ◪ Michael Jackson's memorial boosts global web traffic

Safari 4 home screen showing the Top Sites

don't want to leave a digital trail behind, there's the option of using Private Browsing akin to Chrome's Incognito mode.

The improvements however are not all visual dazzle. There are improvements under the hood and even in terms of usability. An example of a usability tweak is the ability to grab tabs into new windows; again this one comes from Chrome. The Java script engine Nitro, has gone through a revamp with this version contributing greatly to its speed and stability.

Now for the speed. Since Safari is so similar to Chrome (uses the same rendering engine) we decided to pit it against only that browser for the speed comparison. Besides, Chrome is also regarded as the strongest contender to the title of "fastest browser around" so we figure it should be an interesting bout. For some quick results we put both browsers through a benchmark and a real world page loading test. The browser benchmark tool from future mark is quite popular. It is a six step test process that takes the browser through the grind of loading, sorting and searching for data and even measures your browser's ability to render and modify specific HTML elements used in typical web pages, amongst other things. On a P4 system running Windows 7 Safari 4 secured 1,999 Points, while chrome got 1,748. Interestingly, the overall scores accumulated on the web site also showed Safari to be the fastest browser. The scores were from PCs based on the most popular processors around (i7 920, Core 2 Duo E8400, and Phenom II X4 940). Another interesting point to be noted in terms of rendering benchmarks is that Chrome scores 99 (with a linktest fail) on an Acid 3 test while Safari gets a complete 100. This makes it only the second browser yet to hit the mark.

As for the page loading test we decided to note the time taken to load a single tab of thinkdigit.com. To time it we used the XNote stopwatch application which was started simultaneously with a mouse click corresponding to hitting the enter key for the address bar of the browser. The results were quite inconclusive as both browsers did a mighty fine job of rendering the page quickly. As for start up time however, Chrome was much faster on our system.

What about memory usage? Some memory usage charts online showed Safari 4 to be significantly low on resource consumption, coming in very close to Opera. When we checked our process manager with three tabs open pointing to thinkdigit for both Safari and Chrome, we found Chrome to be lighter. Oh well, the complaint for bloatware is always there, but as long as the application is fast and does what it's supposed to, we're not too bothered.


Zimblee ad creator in action

Indian web startups back again?

Since the dot com bust of yesteryears, several interesting concepts remained just that – interesting concepts. For a while now webpreneurs have been venture shy, but things have probably started looking up. This month, we came across two new startups that seem quite interesting and worth checking out.

TweetKnot is a Bangalore-based web startup that offers a simple way of creating groups or communities on Twitter. The groups are called Knots. Every member of Knot can send messages to all other members. There are options to make private knots and even select the members whose updates will appear in a knot. To use the service you will have to give TweetKnot access to your Twitter account. TweetKnot seems somewhat similar to another service we had come across called Twibe. Yet, unlike Twibe's clunky appearance, TweetKnot's interface seems like a natural extension of Twitter. You can post updates to groups from tweetknot.com or even from your Twitter account using the syntax [D TweetKnot <knotname>]. Now, although it's a fun utility, what comes to mind is whether the creators have any revenue model in mind, since that is a question even Twitter itself is still struggling with.

The other startup, Zimblee.com, isn't confused in that area at all. Zimblee is a tool that allows you to create online ad campaigns and schedule them to appear on different social networking web sites such as BigAdda. Apparently, it's the world's first custom online ad creator platform that is meant for use by advertisers, including individuals and small businesses. The tool is intended to be a do-it-yourself ad maker. The service itself seems pretty easy to use. The online demo gives a complete walk through of how advertisers can create their display ads, literally within a few clicks. And all this doesn't cost the earth. They have packages that start from as low as Rs. 12,000.

Ashwini Baviskar

by 33 per cent because of people watching it online Billboard.com relaunched recently in a new flash based avatar, bringing its chart info out into the open

Symbian Horizon
An application publishing platform supported by the Symbian Foundation, that provides assistance to app developers to be available by October.

Radio Gaga
Web radio services and music industry made peace recently. Former agrees to pay 25 percent of revenue or pay a per-stream rate of 0.08 whichever is greater.

Handle without care

Phones are some of the world's most used and abused gadgets. Unfortunately, most of them are so delicate that you need to be careful with them. With the latest 'rugged' phone from Nokia, you won't have to worry about any of those things. The phone has IP54 certification, which indicates it's completely dust and water resistant. Nokia has even enhanced its shock protection.

There are several videos online of the phone enduring torture, including being completely submerged – not only in water, but even jelly and beer. All the while the phone was switched on and received calls! After getting drenched in beer, it could act moody, call random people, and not make phone calls in a straight line, but it certainly functions. It was even shot with a paintball gun. And those that have been hit with a paintball pellet will tell you that it hurts like hell even through protective overalls and is known to chip wood with the impact. The phone has steel parts in the body that are sealed all through. The back cover opens only by unbolting a metal screw lock. In keeping with the rugged nature of the phone, the 3720 comes with an LED torch light that also doubles up as a flash for its 2-MP camera. The phone is a Symbian series 40 device, that comes with a 2.2-inch QVGA TFT display, FM and Bluetooth . What about looks? The lineage that the phone comes from dates back to the 5140. The phones from this rugged bloodline have always been above average in the looks department. And the 3720 does not disappoint. On the negative side, however, the phone doesn't have 3G. Reportedly the phone will retail for around

Reliance to send novels via SMS

We've all heard of audio books, ebooks and more recently 'classic' old school paper ones. But the latest innovation to hit the written word is SMS books! That's right, Reliance Communications plans to dole out SMS novels in India. Perhaps this move is in light of the dearth of data-enabled cell phones in the country, and the small fraction actually connected to data services. The novel *Deaf Heaven* will be sent to subscribers through a total of 90 SMSs over a period of thirty days. The pricing is affordable; subscribers will be charged Rs. 30 for the full book, which works out to an affordable Re. 1 per day. The only trouble is that while reading an actual book we tend to keep it aside when we want, not when there are no more pages continuing the story. So in this SMS delivery mechanism there should be a way for subscribers to ask for the next set of messages, since most people wouldn't want to wait until the next day to continue the story.

The novel *Deaf Heaven* will be sent to subscribers through a total of 90 SMSs over a period of thirty days

Reliance also plans to make the book available as an *adult* audio book. The audio book would be available on a multimodal number where subscribers would be charged Re. 1 per minute. The audio book will have a duration of 60 minutes with a subscription fee of Rs. 30. This is apparently a first for publisher HarperCollins – looking at expanding reach and finding innovative ways of creating synergy through related media. It hopes there will be many more such releases for the Indian market. The book itself is a story "of optimism over a life-changing weekend, culminating on the day of a total solar eclipse" and is by the award winning author Pinki Virani.

The business of iPhone apps

July marked one year since Apple began allowing independent developers to sell their apps through the iTunes App Store. During this year that passed by, we have witnessed a frenzy from geeks all over the world to create a variety of applications for the iPhone. But are any of these geeks becoming millio naires selling inane applications such as "Rate a Fart 2.0", which, incidentally, is selling for 99 cents? All logic points towards a firm no. Still that hasn't stopped the App Store's repertoire from reaching well over 50,000 apps and more than 1.5 billion downloads. The base and top of this pyramid consists of applications that cost less than a dollar. One might in fact be inclined to think Apple is running a digital dollar store.

The best seller lists titles such as GloBall and Flight Control – both games. These are hardly the building blocks of something that can become as big as an Amazon or eBay. Besides, most veteran app developers around the world are saying that the app store is now very crowded. Getting noticed is therefore becoming even more difficult. There are sites such as **148Apps.biz** that even give app makers tutorials on how to market their applications. Tips include getting your app reviewed on some of the dozens of app review sites that have sprung up, such as **AppScout.com**. Making apps might be serious business or just something that geeks do on the side for fun or popularity. Yet, there are signs that more serious and utility-oriented apps are on their way. For example, the Quickoffice Mobile Office Suite that has crept in at the ninety-ninth position on the top 100 list. It's a $12.99 application for creating, editing and synching documents and spreadsheets. There is also a $100-million dollar venture capital fund called iFund, that intends to "fund market-changing ideas and products that extend the revolutionary new iPhone and iPod touch platform". However, the fund has so far managed to fund only five ventures. Considering the competition from Pre and Android that is expected in the near future, let's hope the enthusiasm of app makers continues undampened.

LG to release the next generation version of Chocolate sometime this month | Kindle's biggest competition Plastic Logic's eReader will have access to 7,00,000 books from

No iTunes for you

That's what Apple's new update to its iTunes software, is saying to Palm Pre. The update cuts off devices that pretend to be iPhones

Blinkx

Try this specialised search engine that scours the web specifically for videos. It has catalogued more than 35 million hours of video

Cellphones can predict floods

As outrageous as the above headline sounds, it seems to be true. At least according to the research scientists at Tel Aviv University who published their findings in an issue of Atmospheric Chemistry and Physics journal. "By monitoring the specific and fluctuating atmospheric moisture around cell phone towers throughout America, we can cheaply, effectively and reliably provide a more accurate 'critical moisture distribution' level for fine-tuning model predictions of big floods," says Prof. Pinhas Alpert, a geophysicist and head of Tel Aviv University's Porter School for Environmental Education.

That means that they can predict the intensity of the flood too. The premise is based on the fact that signal strength diminishes due to moisture present in the atmosphere. Combining this with rainfall distribution data, scientists were able to predict flash floods that happen frequently in the Judean Desert in Israel. With this new piece of information provided by cell phone towers, the world's weather bureaus that are usually under a lot of flack for poor predictive ability, will have an edge. Since cell phone towers are available in plenty all over most regions, implementing this system should also be quite simple. Considering the amount of mayhem caused by floods in Mumbai, the city should be the first candidate for installing such a system.

Mobile users concerned about security

In our last issue we reported that the rapid growth of smart phones, with mobile applications that connect to the web, has set the stage for mobile viruses to disrupt things in this sphere. Now we hear of two new reports that are indicative of an impending crisis in this arena. The first is a finding by US-based Cloudmark Inc., which states that "nearly two thirds of mobile device owners are concerned about the security of their devices." This report is based on a survey of 1,812 U.S. adults. The survey also found that such concerns are restraining users from opting for new mobile services for financial transactions and shopping. This is interesting from the point of view of the revenue loss to the industry at large as a result of on-the-go users not feeling secure enough to transact from their mobile phones.

The other report is of Trend Micro announcing that it has spotted the first mobile botnet. Botnets have till now only been seen in the PC world. According to TrendMicro's Research Lab, the Symbian-based malware, labelled SYMBOS_YXES.B, could be downloaded from malicious mobile sites by unsuspecting users. "A Symbian Information Source file collects phone and subscriber ID and network information on affected devices, and connects to a web site in order to send the information on. In addition, it can also send spammed SMS to the user's contacts acquired from the web site it connected to earlier", states Trend Micro Labs. In short, it appears to be a botnet for mobile phones. It will be interesting to see what the future holds for the open source mobile OS Android, in terms of malicious attacks like these.

Google Voice now truly mobile

Google Voice, the invitation only service launched by Google a while ago has now been ported to Android and Blackberry. The service basically lets you have one "Google Voice" number which is connected to your other numbers such as your office, home and mobile number. You can choose which of the phones you want ringing when someone calls. One of the features it boasts is caller groups, with restricted access to certain phones. For instance, friends can have access to all three numbers while your pesky neighbour can be allowed to bug you only when you are at home. The best part is that people only have to remember a single number. The number stays with you for life, so even if you change your other numbers it doesn't make a difference. Simply update the new numbers with the service.

Google Voice also gives you other services such as voice mail and automated transcripts of the same.

With the newly released Google Voice mobile app for Blackberry and Android, placing outgoing calls from a Google Voice number has become easier, said a blog post from Google. The app is fully integrated with contacts on the phone. For the thousands of people who don't have an Android or Blackberry device, Google has a mobile web version which can be accessed by typing **www.google.com/voice** into your mobile phone's browser. The blog post also says that "currently, Google Voice is only available in the US". Let's hope it comes to our shores soon.

Barnes & Noble "Sexy Space" is the first Symbian trojan, experts say a mobile botnet is in the offing Adobe to release a version of Flash for touchscreen platforms

Wikipedia mobile
On July 9, Wikipedia moved the mobile version of the site out of beta testing. The site is available at m.wikipedia.org

WIKIPEDIA
behind the pages

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A quick and dirty history of wikis

Wikis are web pages that allow visitors and users to change the content of the web page. This is achieved through the agency of server-side programs that are known as wikis. Every Wikipedia-like web site is based on a wiki engine, that allows users to edit the content. The first wiki engine was written in Perl by Ward Cunningham, for his programming web site. This was way back in 1995, and the web site was used by programmers for sharing ideas. This was called the WikiWikiWeb, and the name was chosen from the Hawaiian word for "quick". This simply intended for content to be generated rapidly, but Ward Cunningham had no clue how rapidly. Wiki-based sites took quite some time to take off though. Between 1995 and 2000, a few other wiki-based web sites came out, many written in other languages, but none of these really reached out to a massive number of people.

This was still the first decade of the web's existence, and we should factor in the lack of penetration of the web on a global scale. Wiki engines were written in PHP, Java, Perl, and a number of other programming languages, and were used by some web sites with a mediocre amount of success. Wikis at that time didn't stand out as an innovative new approach to content generation, and as such, their potential was not realised. A notable exception was senseis.xmp.net, a large web site dedicated to the chequers-like game of go, which has a large number of tactics, strategies and playing configurations.

Enter Jimmy Wales, who worked on a free online encyclopaedia project called Nupedia. The content was generated by readers, and moderated by editors chosen for the job. To increase the number of articles, Jimmy Wales started a wiki-based encyclopedia, called it Wikipedia, and launched it in January 2001, just when internet junkies around the world where logging on to web 2.0. Wikipedia used MediaWiki, a PHP-based wiki. Six months and a thousand articles later, a link to Wikipedia was put up on Slashdot. Hoards of users jumped into the fray, and increased the article count to a staggering 20,000 articles by the end of the year. Wikipedia has been growing at an exponential rate ever since.

All of this, however, is ancient history. The nature and philosophy of wikis has evolved since 2002, a culture, a complex system of rewards and a set of protocols have evolved since then. Wikipedia has spawned a number of sister sites, including WikiNews, WikiText and WikTionary. Wikis have grown beyond Wikipedia too, with hundreds of highly specific and fan-run wikis always in continuous movement. A large number of people know Wikis from the outside, and have no clue about the drama behind the pages they refer to.

The Wiki hierarchy

Despite all it's apparent openness, the wikipedia editors have a notoriously strict set of principles, an irritating sense of altruism, and a strange and semi-official hierarchy based on their contributions to Wikipedia. Many editors casually change a few wrong spellings, improper language, or factual errors as and when they come across them. There are however, a dedicated number of editors who have taken it upon themselves to be responsible for the Wikipedia of their language. Disputes are not infrequent, and are often settled using votes.

Editors are also democratically chosen and promoted to higher levels – these give them more access to the web pages, power over other editors and users, and a host of tools to use at their disposal. The editors are at the lowest rung here, and many are happy to stay there. However, quite a few ascend to the level of Sysop or administrator. These are editors with extra powers over Wikipedia. They can change the locked or "protected" pages on Wikipedia, including deciding what goes on the home page of the web site. In the beginning of Wikipedia, all users had universal access, and everybody functioned as Sysops. In theory, this is still true, but in practice, some people have more privileges because of the size and scope of the project.

Bureaucrats are far fewer in number than the Sysops or editors, and have more power. They can settle disputes, appoint other bureaucrats, and have more

Some service awards

The categorisation Barnstar
The categorisation Barnstar, awarded by editors to people who categorise articles, or maintain and structure the existing category pages on Wikipedia

DYK Medal
The DYK medal, awarded to those editors with significant contribution to the Did You Know section of Wikipedia. These appear as pointers right below the featured story of the day on the front page of Wikipedia]

Senior Editor
The badge editors can display on their user pages after 24,000 edits on Wikipedia after four years. The editor is considered to be either the senior editor or have the improbable title of "Grand and Glorious Tutnum of the Encyclopedia"

Video on Wikipedia
Wikipedia is all set to offer video as a part of the content on the encyclopedia pages, using partners such as Archive.org and Metavid

Beware of Trolls
Trolls on Wikipedia are likely to be most active when a particular subject, place or personality is in the news. So be careful of what you read then, and always check the edit history

administrative responsibility over the Sysops and other editors. They can for example, ban IP ranges, protect pages, block vandals and the like. Sysops can also do some of these things, but to a lesser degree. Bureaucrats manage, appoint and handle bots, which are scripts that automatically tweak, correct or change content on Wikipedia. Above the bureaucrats is the Arbitration Committee, known as the Arbcom. The Arbcom handles and settles disputes, and takes policy decisions across the project. The Sysops, bureaucrats and the members of the Arbcom are all democratically elected from the levels below. Sometimes, bureaucrats can appoint other bureaucrats when necessary. There is a pyramid structure to the organisation, with around 15,000 Sysops, around 30 bureaucrats and 15 people in the Arbcom.

Above the Arbcom are the stewards. These are very rare, are involved more actively in the sister projects of Wikipedia, simply because the lower levels can operate Wikipedia efficiently. The stewards are also voted, and are called in when very important decisions have to be taken or disputes within the Arbcom have to be settled. These are high level policy decisions and the like. Above the stewards are the Founders, Jimmy Wales is one of these, but he is also a steward.

All of this might not affect the readers of Wikipedia, but drastically affect the editors. There is an inherent bureaucracy in the functioning of Wikipedia, and new editors might not be able to exploit the system as well as the old ones. Many editors tend to think of pages they have started as their pet projects, and follow it closely across the edits. There may be people with a different point of view who boldly change the content, as one of the policies encourages them to. This results in edit wars, and editors may revert pages to their original states, known as revert wars. There is a three time revert rule, after which the page is automatically locked, and requires higher authority to clear things up. Ideally, Wikipedia ensures that the articles have vastly different points of view, and cover the subject completely. However, practically, this is not true. A huge chunk of the content on the English language Wikipedia is biased towards America, and has content geared towards American users, and "reads" as if an American is reading it. Also, the content that is created about remote locations, little-heard of people and subjects, are almost always biased in some way or another, and often not accurate or comprehensive. The best way to find out how thorough an article is, is to check the number of edits using the history tab on any page. The rule of the thumb is that the greater the number of edits, the greater the accuracy of the article.

Vandals and Sock Puppets

There are vandals that sometimes get loose on Wikipedia. These are sometimes drastic, and deface a public personality, or the page of a corporation. The PR personnel of small and large organisations often edit the pages that they are interested in, in a way that benefits them. For large, multinational companies, a bias is not possible, but for smaller companies, slyly putting in a critical line about competition, or making bold claims without references or proof, is not difficult. Other kinds of vandals spread misinformation, most of which is hidden in a line somewhere and not easily detectable, even by experts on that subject. This can include propagation of myths, rumours and debatable information.

Another breed of editors is not above using multiple accounts to edit the same page, or keep a watch on content. This may be to influence voting, or to make it appear as if the majority of editors have a particular consensus about an article. Official policy requires all editors with alternate accounts to declare these accounts by linking to them from their user page, but this is not often done. Such accounts are known as "sock puppets", "socks" for short, and the activity known as "socking".

Thinkdigit.com
The editors of Wikipedia are a strange species, and are classified into different real and mythical creatures depending on their behaviour within Wikipedia. Check out the more interesting specimens from this zoo at thinkdigit.com/d/13740

If you care to follow Wikipedia editors and users on IRC (#wikipedia on irc.freenode.net), it becomes easy to follow some of the problems that Wikipedia editors and users face. Most of the chat is about certain articles, cleaning up portals, requests by editors for Sysop action and the like. Now and then, however, a new editor faces certain problems, and the shortcomings of Wikipedia become apparent. Reporting sock accounts for example, even after they are identified, is a long process, and the sock can do considerable damage before they are officially banned. There is a certain amount of red tape, and a procedural slowness for taking actions, which may be in place for the security of Wikipedia, but at the same time serves to slow down improvements of the encyclopaedia. The bureaucracy is often resented, and most editors don't even take the trouble to follow the procedures required to safeguard even their pet project, often requiring more effort than casual editors are willing to make.

Ribbons, barnstars and service awards

Wikipedia has a number of devices for appreciating the efforts of individual editors. Even if they are not promoted to Sysop status or beyond, other editors can put up barnstars to acknowledge the user's contributions. Service awards are given to editors who dedicatedly reach a certain edit count, over a specific span of time. Ribbons are used to display barnstars or service awards in as little space as possible, so as not to clutter a particular user page.

There are eleven levels of editorial contribution service awards. From the lowest to the highest, these are Burba, Novato, three Grognard levels, and five Tutnum levels. When a particular number of edits are reached in the stipulated time period, editors can add the relevant badges, books or ribbons to their user pages. The books range from The First Book of Wikipedia for Novices, or Burbas, to the Book of All Knowledge for the highest level Tatnum. The editors on these levels can alternatively place service badges on their user profiles, the Tatnum levels have metal stars for each of the levels. These are iron, bronze, silver, gold, platinum and plutonium.

Wikilove and Wikiquette

Despite all shortcomings, Wikipedia is still the most visited reference source on the internet. Browsing a few pages every now and then does not give a true idea of the size and scope of the project. It is one of the biggest success stories of web 2.0, and the project is truly a political statement that people living in the last half of the twentieth century thought could never be made.

The project is non-commercial, with a creative commons licence, and is considered by many as proof that human beings can create something for free that is better than commercial counterparts. The fact that Wikipedia put Encarta out of business vindicates this feeling, and Wikipedia editors have been generally functioning with good cheer and a strong communal feeling. It is still growing at a rapid rate, and there is a lot of ground left to cover.

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Sweet Android
Android versions are named after desserts, 1.5 is Cupcake. Donut, Eclair and Flan releases are scheduled this year

Pop Cap
One of the biggest games in the casual gaming market, it's all set to release a bunch of games for Android devices

Android: Google again?

A closer look at Android and the Open Handset Alliance. Will it change the way we look at phones?

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It all started in October 2003 as Android Inc., co-founded by Andy Rubin, Rich Miner, Nick Sears and Chris White. All four of them went on to join Google. Before we heard of them, Google bought Android and added it to their list of services – Google was entering the wireless world. When Google considers buying you, either you're very good, or Google has heaps of cash to splurge. In the case of Android, we're still figuring which holds true. Based on the Linux kernel and released as an open source platform under the Apache licence, Android is attracting wide industry backing.

The Open Handset Alliance was born on November 5, 2007. Google, HTC, Motorola and Qualcomm, among others, forged a 34-member strong conglomerate. Nevertheless, Android faces a battle against industry heavy weights such as Symbian and Windows Mobile who are certainly in no mood to take the threat lying down. In this age of cost and features, mechanical design, style and class are important criteria for today's borrow-and-spend customer. "What's inside doesn't really matter. Except for the geeks, but those are not mainstream customers," explains Eric Bustarret, an active mobile developer in France. With so much hype of surrounding Android, we got in touch with several personalities, including entrepreneurs, developers and critics associated with Android and the mobile platform.

Alexander Muse is the founder of Big in Japan, winner of Google's 2008 Android Developer Challenge and developer of ShopSavvy. According to Muse, "the first Android handset was released almost a year ago. Since its launch, millions of handsets have been sold in the North American and European markets. Besides, thousands of applications have been built for the Android platform."

In fact, this year, more than 12 carriers are launching 15 different handsets running Android. Muse fervently vouches for Android, "Imagine a free, open source

Symbian already has a market share of more than 70 per cent. Thinking it might be able to retain that market share is foolish. The iPhone and Android are already taking significant share. Can Symbian turn the momentum around? Sure, but it is unlikely

Chaitanya Surpur

thinkdigit.com For more news doing the rounds on Nokia and Android, go to www.thinkdigit.com/d/27163/
For more on Google's Chrome operating system, go to www.thinkdigit.com/d/71565/

operating system, every bit as powerful (in some ways more powerful) than the iPhone platform. Will it be big? Yea, really big."

Among the other prominent mobile platforms, the latest rage is Apple's iPhone, which developers claim is sturdier both in terms of hardware and software. Additionally, the large pool of independent developers that create appealing applications for the iPhone make it a killer. From an Indian perspective, however, the iPhone couldn't recreate the American magic. Factors such as cost deeply affected the design marvel this side of the globe.

Eric Bustarret, a mobile application developer based in France, believes no one has the true answer to the most promising mobile application in the future. According to Bustarret, while Windows Mobile seems to be out of the game for now with no major update for more than a year, Windows Mobile 7 might change this.

Among the various mobile platforms today, Symbian enjoys the privilege of the highest market share. Android is popularly seen as the major competitor to Symbian today. According to various developers, while Symbian has market dominance on its side, it suffers from heavy complexity, poor toolkits and a restricted independent developer base. In order to better deal with such threats as the iPhone and Android developer base, Symbian would have to move towards a widget-based business and design model, which seems highly unlikely at this point, considering its saturation.

Muse voices the same concerns, "Symbian is too fragmented and does not support developers. The success of the iPhone can be traced to a nascent developer community that builds cool applications for the phone. There is no such community for Symbian." The opinions don't end here. The feeling is that Linux mobile is a joke without traction. At the end of everything, Android has received unwavering patronage with backing from Google and the OHA. Comparing the two, Linux is all hype with no shepherd and Google on the other hand is a trusted shepherd, gigantic, huge and with some really deep pockets.

Android has been touted as the long term winner. Symbian, today's market leader, is backed (and now owned) by one significant handset manufacturer – Nokia. Compare this with Android – Sony Ericsson, LG, Samsung, Acer, ASUS, Motorola, Toshiba and Huawei, besides Intel, ARM and Texas Instruments. Last year, we all witnessed what happened to the DVD format battle of alliances with HD-DVD losing out to Blu-ray, that was promoted by a prominent list spearheaded by Sony Corporation.

Eric Bustarret, mobile application developer

Owing to its support from the open source community, Android is more stable when it comes to security threats, according to Xerxes Mullan of XTPL, an Indian company that develops applications for all mobile platforms including Android.

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We were specifically interested in knowing what this meant for some other mobile platforms such as Windows Mobile. With players such as HTC actively participating in the Open Handset Alliance, HTC said it saw the open-source Android platform as a good opportunity to showcase innovation in its products and an upcoming technology to complement its portfolio. Ajay Sharma, Country Head, HTC India, agrees with this opinion. He claims service personnel associated with HTC have been imparted the technical skills to ensure there will be no limitation in the servicing of Android handsets in India.

Sharma adds, "Android is a platform with extremely tight security features, the operating system incorporates a sturdy architecture that offers enhanced data protection." Sharma added they also have a very strong relationship with Microsoft, and Windows Mobile will continue to grow stronger and our focus will remain on both platforms and not single out any one of them.

Finally, we spoke to the king himself. When posed with our queries, a Google spokesperson said, "Android is built on openness – it's a free, open source mobile platform that any developer can use, and any handset manufacturer can install. Android is the first mobile operating system built specifically with the web in mind. Over 4 billion people now have mobile phones and it's estimated 1.2 billion more will be sold in 2009. Mobile phones are sophisticated computers with access to the internet, but the vast majority of today's innovative web applications are still built for PCs. Android aims to change all that. We believe that by opening up mobile devices to all developers we can encourage innovation, benefiting users everywhere. A better web, whether people access it via PC or mobile, is not just good for users but also good for Google, because as the internet grows so do our opportunities.

Handset costs haven't hurt Android because Google has helped the open source solution gain traction. All European carriers have offered Android phones for a dollar – just as they have for the iPhone. Which carrier offers a subsidised Linux mobile solution? Linux mobile is dead

Ajay Sharma, Country Head, HTC India

Therefore, from a consumer point of view, all the hype put to rest, Android is not here to transform the industry nor revolutionise it in any way. All other platforms are here to stay. In fact, irrespective of the operating system, all manufacturers are walking hand in hand protesting the government's decision to increase VAT. Beauty is skin deep, probably doesn't hold entirely true when it comes to mobile phones! Geeks and techies apart, no one else is really interested in the OS of the phone. What we do know though, is that mechanical design, style and available applications will drive this industry in the days to come. We believe this will drive software platforms and handset manufacturers to promote the developer community for their respective handset models to grow in number.

To extend your desktop experience online, visit thinkdigit.com/d/23077/ for our weekly series "The Online Desktop Experience"

There is a large community of developers for applications that run on eyeOS at www.eyeos-apps.org/

Rohit Chandwaskar

My eyeOS

Have your head in the clouds? It's time to move our operating systems there

Kshitij Sobti
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My OS

A few decades ago, people would have to book time on the computer in their organisation or university and await their turn. Today, most people have their own dedicated computers, so much so that we can choose to donate our free computational time for use in projects such as Seti@Home or Folding@Home.

In today's world, the computer has evolved from its geeky roots as a computational device, to one which is responsible for a considerable part of our entertainment and social interaction. It has become much more personal.

Thanks to your operating system, the complexities of millions of mathematical calculations to bring you each and every pixel you see on your screen are neatly abstracted away from you. All you see are objects on screen that you can relate to better than blobs of binary information. Operating systems too, have evolved to better suit to our personal needs. As our sphere of interaction with the computer, we tend to treat it much like we do our room or house. We put up our own wallpaper, install applications of our choice, customise the settings in order to have them suit our needs better.

Yet we also live in a mobile world, where we need to be connected to *our* information *our* way anywhere we go. We do everything to take our experience with us. We can use laptops / netbooks or other portable computers to physically take our computing environment with us, or we can merely take our operating environment, by installing it on a portable device such as a USB drive. Another option that we can have now, is keep our operating environment in the clouds, thanks to software such as eyeOS.

Cloud OS

There is a plethora of online applications to perform the tasks that you need. In fact, alternatives for most offline tools are available online. If you can access a web browser, it's quite easy to perform all your tasks online.

In our operating system, we organise our data in our own special manner. When we work online, we begin to lose certain privileges. We first need to download our data from our storage service to the computer, then upload it to the service capable of handling files of that nature, and after modifying it we need to download the modified file again, and upload it back to our storage.

Although many online services are now integrated, it is no match for the level of integration and choice we are accustomed to while working on our own desktops. Wouldn't it be much better if our entire OS was online?

...the computer has evolved from its geeky roots as a computational device, to one which is responsible for a considerable part of our entertainment and social interaction...

Cloud OSs are the answer to this need. By keeping your data and your application on the server side, they move your entire application sphere online. You can now have the same benefits of personalisation and integration that we see in our desktop OS online.

Introducing eyeOS

There are a number of online operating systems available today, and the number is steadily growing. eyeOS is one of the few that is not only provided for free as a service complete with online storage, but is also open source under AGPL3, so you can install it on your own server.

eyeOS is built on PHP and uses a combination of web standard technologies such as HTML, JavaScript and CSS to create the UI. This means that it will run on any standards-compliant browser. By itself, it doesn't require any extra plugins in order to work. All it needs is a PHP 5 capable server, which is the common denominator for just about any hosting package – it doesn't even require a database.

Installing eyeOS

You can run eyeOS on your own computer using Apache with the PHP plugin. The best way is to just install AMP (Apache, MySQL, PHP) solution such as WampServer or XAMP, (although eyeOS does not require a database server).

You can begin by installing an AMP stack on your computer. While we'll consider WampServer as an example, the installation procedure is similar for most AMP packages.

After WampServer is installed, you can start it from the program menu. Since MySQL won't be used, it can be turned off to save resources.

The eyeOS installation package is a ZIP file, which will need to be extracted to a directory under the server root. In the case of WampServer, it is the www directory in the installation folder (by default "C:\wamp\www\"). This folder is where the files that will be served by Apache need to be stored. If you wish to install other applications on the same server, you will be better off installing eyeOS in its own directory (here, we've chosen the default eyeOS directory).

You can now start the installation procedure by entering **http://localhost/eyeOS/installer/** in your browser. It's a single step installation and it only asks for a root password and a hostname. You can also enable users to create their own accounts.

eyeOS comes with its own GUI builder! An application called eyeDesigner allows you to design application GUI straight from eyeOS.

Office online
Microsoft to offer web version of their office suite for free

Adding a new user

You're now all set! In a couple of minutes you will be greeted with a login screen. If you enabled user account creation, you can now create your own account by clicking on the "New User" button. Again, the procedure is as simple as entering a username and a password (and perhaps a default language).

In case you didn't enable account creation by users, you can login into the default administrator account, with a username of "root" and the password you entered while installing eyeOS. Shortly, you will be greeted with your own desktop, on the clouds.

The desktop as you can see is quite similar to the standard UI layout we are all used to.

eyeOS features

eyeOS tries to provide most of the functionality that we are accustomed to in any operating system.

The eyeOS desktop

- A powerful, highly configurable access control system, with heavily customisable ACLs (access control lists), and support for user groups and a user management system.
- Support for assigning user quotas for disk space.
- An inbuilt configurable cache system.
- Support for office document formats using OpenOffice.
- A file association management system.
- Support for auto-launching application on startup.
- Fully theme-able, and comes with a few themes with its default installation.

A default installation eyeOS also comes with quite a few bundled applications to get you started. Most basic computer applications such as creating / editing documents, surfing the web (a browser in a browser!), viewing images, and even playing games are covered.

You don't need to settle for the applications that come with the installation though. eyeOS has a large repository of online applications that can be accessed via an inbuilt software management application. The system is quite similar to the kind of package managers available on most Linux systems (and is infact based on partage the package management system for Gentoo Linux). It's a one stop place for listing, downloading and installing applications, and for managing already installed applications.

As for the eyeOS package manager, naturally we went straight for the "Games" section

eyeOS your OS?

We all understand the power of internet applications. Many of us use them everyday, and heavily depend on them for our work. Whether you are creating a presentation along with other people of your group on Google Docs, or adding / editing pages on Wikipedia, the sheer power of collaboraiton that the internet brings can do wonders to an operating system environment that we are used to. Already Google has its Chrome operating system that relies on the power of internet applications to provide functionailty to computers instead of the traditional desktop applications. The power and scope is all there.

We constantly need to remind ourselves though that we still live in a country where we get excited with a 512 kbps connection, while developed countries get higher speeds on their cellphones. For us, having an online operating system can only be of limited use.

This is not to say that such a system would be entirely useless in India. For an organisation, having an eyeOS installation on an intranet server can mean everyone has access to the same resources and interface, where everyone is working on the same environment and there're no compatability concerns. We can look to such solutions in the future – it always looks brighter, but until our infrastructure doesn't reach parity with the developed nations these are solutions to problems we haven't had yet.

OPTIMISED PHP SETTINGS FOR EYEOS

eyeOS is an unusual application for a server. Since it is an operating system and people are expected to be using it all the time for their work, unlike a normal web site it is bound to get a different kind of traffic.

To optimise the performance of eyeOS, you can make some changes to your PHP configuration by editing the setting in 'php.ini'.

For people using WampServer, you can find this file in the following directory inside the WampServer installation folder:

\bin\php\php5.2.8\php.ini

(For a default installation "C:\wamp\bin\php\php5.2.8")

The following setting can now be changed to better suit your requirements (the defaults listed are for a WampServer installation and may differ for other AMP stacks):

`max_execution_time`

This defines how much time (in seconds) that a script can for execution. The default is 30. However, a setting greater than 60 is recommended, as the server will be running applications. Finally, it depends on how powerful the server is.

`max_input_time`

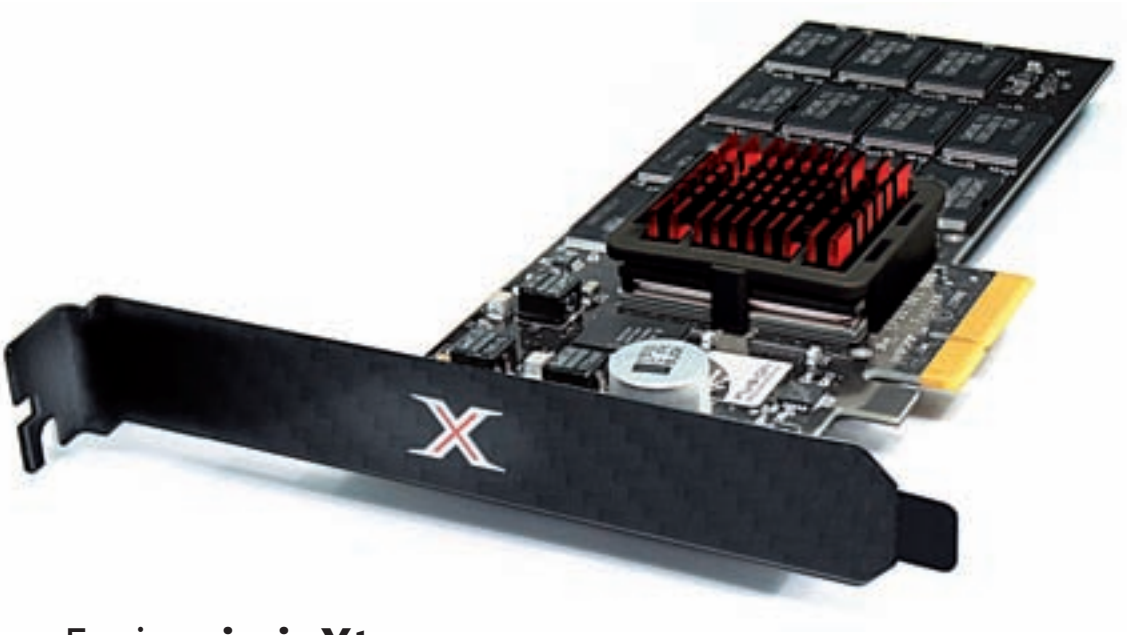
This defines how much time (in seconds) a script can take for processing the data it is receiving. The default is 60. However, if you need to upload large files, which you will if you use it as your OS, this may not be enough. For a local installation, this would mean that a script can only accept as much data as can be transferred in 60 sec. You should set it based on your requirements, connection speed and server speed.

`memory_limit`

This one is for setting how much memory a script can consume while running. Since eyeOS runs complex applications, it might need more at its peak times. Set this based on how much is available and how heavily you will be using eyeOS.

`post_max_size & upload_max_filesize`

These define the maximum size for the files you upload on your server. If you need to upload audio and video, then set it to how much you might need and a bit more. past_max_size should at least be slightly larger that upload_max_filesize, as it includes other data from the upload request.



Fusion-**io ioXtreme**

Solid state drives might take a while before they go mainstream, but Fusion-io doesn't really seem to care. The ioXtreme is a PCI-Express x4 card unlike other SATA-based SSDs. The limitations by SATA aren't applicable, so Fusion-io comfortably claims that the drive is a lot faster than the others. The performance numbers are as extreme as the name and so is the price tag. It's just Rs. 45,000 ($895) for 80 GB of space.

Klipsch **Heritage**

It's 2009 and Klipsch has launched their Heritage speakers for the second time. The first time was back in 1946. The top of the line model in the series is the Klipschorn which is priced at £6,000 or Rs. 4,75,000. A 15-inch woofer is at the heart of the system. You'll need to spend a little more on people to help take the speakers up to your apartment. This is after all, an 80-kg set that stands more than a metre in height

Olympus **E-P1**

The E-P1 has been designed to give SLR-like performance from a compact camera. For those who love their lens kits a lot, you'll be happy to know that you can change lens on this point and shoot. The performance isn't limited to just photos. This camera can even shoot 720p resolutions. The E-P1 will be out soon and the photography community is already very excited. Prices will be between Rs. 37,500 to Rs. 45,000 ($750 to $900) depending on the model you go for

Edelweiss **PC**

The Edelweiss PC is actually a mod created by a designer called Pius Giger. Cables are almost completely eliminated. Those visible are channeled around to add to the style of the product. The drives are mounted with the most basic of support beams and the cooling is done using water. Coloured pipes with liquid run all around the PC and give it a very futuristic and almost a coffee-machine look to it. With such an impressive design, system specifications aren't really on anyone's mind. You should be content knowing that the PC has two powerful graphics cards in SLI.

The **Peregrine**

The Peregrine is an input devices shaped like a glove. No, it's not meant to your hands warm but you can actually use it in games of all sorts. There are 30 touch points all over the glove that can be configured to allow 30 different gestures. When your hands get sweaty, there are pockets to let air circulate. And for the times when you soil the gloves, you can easily wash it with water after you've disconnected the fancy connector pod.

Applications Ahoy
New applications for the iPhone and Android OS are being created by the 3,000 new employees at Appcelerator, creator of open source applications.

Botnet alert
Trend Micro has spotted the first mobile phone based botnet named SYMBOS_YXES.B. This botnet currently is known to affect Symbian-based mobile phones.

Myths about Open Source

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I recently met an old school friend over a cup of coffee and we spoke about life, movies and music. Then the topic moved on to technology, the best graphic card and I suggested what motherboard he should buy. Giving such advice just never gets me tired. Anyway, the conversation moved to open source and how he really didn't get the concept of it and he was just against it. This friend of mine was a loyal one operating-system man and didn't want to move away from his comfort zone. He also had a few doubts about open source in general – but these were just myths and random rumours heard from others that I'm sure many people have come across. So I decided to go through them and be a myth buster of sorts. Maybe he won't use open source, but at least he won't be against it, is what I thought.

It's not that I don't use open source, I do use many free programs, so you could say I'm not against it.

Ah, that's where you are mistaken. You see, everything free is not open source and everything open source is not necessarily free. An open source project is first started off with an idea from somebody. Of course nobody will just jump on the bandwagon immediately, as first that person will have to create the application or operating system he is making. From then on, an announcement can be made where in people will form a community around that project and help develop it. There is a licence called the GPL (GNU General Public Licence) under which there is something known as copyleft, which lets the creator have rights over the software, but at the same time it can be used, modified and distributed freely.

So where does money come into play?

Open source has licences that can be beneficial to the creators. Some companies have dual licences, which allows them to charge for their product or services. So their trademark is in place and they can sell their product. If there are individuals who are doing the same for their distributions or software, then it is basically the cost of the media that you will be paying for. (Eg. CDs, DVDs, etc.)

Sounds fair, but what about support for all this? I've heard so many complaints from friends that they keep getting stuck while using Linux either at work or at home. Not everybody went to engineering college and studied programming, you know.

You don't really need to have an engineering degree to use Linux for day to day computing. The desktop environment has evolved considerably and is now very usable. Some might even say distributions such as Linux Mint resemble the Microsoft Windows desktop environment. The fact here is that your basic tasks really don't need any support as they are quite simple, but when you do need support for anything, you just need to look to the internet. Each open source project usually has a community built around it that helps develop that particular application. So whenever you are stuck, you can always go back to them and they are normally quite friendly. The best thing about open source is that there will be multiple communities for the same thing. So there is support, although it is scattered.

Thinking from a corporate point of view, I really don't think companies would advise their staff to go and look for a solution to a problem themselves. What would the IT department be doing in this case?

If you look at things from that perspective then there is a solution, but cost comes into the picture here. When shifting to an open source infrastructure, the IT staff will have to undergo training for open source. But if you are starting from scratch, then you just need to pick up those who already have knowledge in that field.
Also some enterprise level solutions such as Red Hat provide support, according to the subscription you opt for.

But, how can I just trust any version of Linux to download, I mean since the source code is open to all, how do I know someone has not modified it to put in a trojan or something?

Well there have been many arguments about the risks of open source and how by distributing the source code itself, you give the evil-minded people a chance to create havoc. At the same time, a closed source project is prone to a similar case, but in this case the evil-minded person could be, for example, a disgruntled and frustrated employee.

So what about the viruses and worms running around in cyber space? Won't I get attacked if I'm using Linux?

Actually you won't. Permissions work differently in Linux, you are not always logged in as the Administrator, or in Linux – Root, so there is a smaller chance to install any malicious software on your PC. On top of that, the viruses being created are more Windows-oriented and even with the current anti-virus applications available for Linux, they all mostly scan for Windows-based viruses which don't even affect Linux users.

I guess I am seeing the bigger picture about open source here, but seriously, the one major problem I see with open source is gaming. I need some time to play games, and I'm sure many others also want some games in their life, and I'm not talking about something like Minesweeper or Solitaire or even those web sites with flash-based games. How am I supposed to play Counter Strike, for instance, if I am running a Linux distribution?

That is a tough one, but can I offer you Quake 3 Arena instead? You're right about one thing, that not all games are able to run on Linux systems. But at the same time, there are a few good Linux titles out there. As mentioned earlier, Quake 3 is one of them. There are MMORPGs such as Second Life and Vendetta Online that one could try out too, and don't forget America's Army, that works well on Linux too.

Yes, fine, there are alternatives, but what about Counter Strike or even Crysis?

Fine, you got me stumped on that for now. But it won't be too long before these games will be working on any PC in the world, be it Mac, Windows or Linux. This is all thanks to the upcoming virtual gaming concept such as On Live, where all the hardware is taken care of. Think of it as cloud gaming. I'm sure you've already heard of Quake Live, that's a good example of what I'm talking about. So there, it's not going to be too long before everybody can game on an equal level, no matter what hardware is present.

Yea, yea, there's still time for that. But you have changed the view I had about open source in general though, maybe I'll try it out.

Don't rush into it though, you could always start off with something small, like say Open Office which is the open source equivalent to MS Office. You will see changes, but I'm sure it's nothing you can't handle. Maybe from there you could move on to Ubuntu or Linux Mint.

THE BAD SIDE OF OPEN SOURCE

We aren't talking about the drawbacks of open source here, but instead we are talking about how the whole concept of open source can be used for evil. The way open source works is that the source code of an application or project is distributed freely in such a way that others can modify and reuse it. But what happens when this is done by the villains, in this case hackers or script-kiddies? Hackers have not only been spreading viruses and other malicious threats, but in fact have been also spreading the whole recipe of how to create them. It all comes down to programming, and once the code is freely distributed, along with instructions on how to use it, there's no stopping them. There are even communities based around this sort of open source activities where people discuss building new internet threats together. These communities are still present on various IRC channels, but don't expect to join such groups in an instant, as they aren't as easy as joining a community on Facebook.

Wikipedia prefers Ogg
An open source video codec that is supported natively by the latest version of Firefox

Open App builder
The Appcelerator Titanium open source platform allows developers to rapidly build apps for the iPhone and Android

Living on Open Source

Open source is no longer just about software. It's now a way of life. Be it movies, music, hardware, gadgets, education, news, governance and even beer; everything around us is swaying to the symphony of the open source mantra

Siddharth Parwatay
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What started of as a revolution in software development, wherein the source code was bundled with software so as to enable modification and collaboration, has now evolved into a philosophy that pervades almost every aspect of our lives. From art to mass media, and from governance to even beer; free and open source culture is now a way of life. Where the traditional way of doing things was to closely guard the building blocks of a product, the new way is to open everything to the community, resulting in the obvious outcome – collaboration leading to a much better product. But do too many cooks spoil the broth? No they don't. That axiom surely looses its potency when it comes to this emerging culture. The philosophy being applied to the non-software world has achieved tremendous success. It is quite clear that a few thousand heads are definitely better than one.

Sweet FM
An open source client for last.fm allows for much better functionality, such as station shuffle, superior album art, and remote control support

The origins

This new wave began sometime in the mid-80s when Richard Stallman quit his job at MIT and set up the Free Software Foundation. His belief was simple – create high quality software that is freely available to everybody. But what was wrong with corporations making software back then? Commercial companies constrict their software with patents and copyrights and keep the source code–the original program code, a closely guarded secret. Even the processes and approaches to doing things were locked away, and many developers found themselves stifled and shackled. Software thus being created was not of the best possible quality and definitely poorer than what could've been achieved though collaboration. There was no free flow of ideas, and if programmers had no way to learn from previously written code, the art of programming was likely to stagnate.

Folklore attributes the turning point in this revolution to one fateful day when Stallman wanted to modify the source code of a printer to make it perform a specific function, but was denied the right to do so. In an interview he says, "The issue with the printer was that I wanted to make it possible for the system to notify users when a job was printed, or if the printer was in trouble. That would have allowed people to go and collect their output only when it was complete, rather than having to guess." To do so, Stallman needed the printer's source code, which was denied on the grounds that it was proprietary information – making him "very angry".

Eventually, the internet ushered in the era of collaboration, sharing, the free flow of information and the modular approach to working on projects. Stallman, however, later became a proponent of the free software movement, that believes in complete freedom, while the culture that has evolved over time is about cultural openness rather than strictly open source.

The culture of the masses

Perhaps Wikipedia is the quintessential open philosophy project. This form of open philosophy later became known as crowdsourcing. The collaboration success story is a massive endeavour driven by a legion of contributors who work for nothing more than a desire to disseminate accurate information. The web site has close to 10 million registered users, many of whom not only use it as a resource, but also contribute towards expanding it.

People are increasingly using the internet and contributing in their own little way to many such projects that run on the open source mantra. Under the provisions of the Creative Commons licence, creators can put up their work on a platter for anyone to comment on, improve, modify and use, if they so wish. **Flickr.com** at last count had some 2 billion pictures (in November 2007) and has been growing steadily since then at the rate of about five million photos a day! The better works amongst them (that are released into the public domain) are finding their way into popular culture to be forever immortalised. The recent album cover of a quite well known indi band, Bon Iver, is an arresting picture of an object almost completely submerged under thick snow. The image didn't come from one of those great artists of yesteryear who designed the cover art for albums like Dark Side of the Moon. Instead it came from the flickr posts of Lauren Hudgins, a nondescript English teacher living in Japan.

THE BIRTH OF THE PHILOSOPHY

With the sour incident in Stallman's life began the counter culture of the 'free and open source' philosophy. To better articulate the philosophy, Stallman laid down the "Four Freedoms of Free Software". These are: the freedom to run a program as you wish; the freedom to study the source code and change it to do what you wish; the freedom to make copies and to distribute them to others; and the freedom to publish or, more generally, distribute modified versions.

Open source journalism

Instances of the culture can be found even in mass media. Earlier, the power to publish was in the hands of a few. With platforms such as blogs coming into existence, that allow for push button publishing, citizen journalism is on the rise. Now, these may not necessarily be open source in the literal sense; they are however tools that facilitate cultural openness and freedom. Tools such as these have helped deliver news at some very critical times. The source of such news is completely open, ie. it comes from the global collective. For instance, mainstream publications such as the New York Times picked up news trickling out of Iran via twitter. The news was modified, pieced together to join the dots and made into a meaningful picture of events, before being published – all this involves the fundamental tenets of open source – collaboration, modification, and freedom.

But for reasons that are somewhat justified, bloggers and citizen journalists are not highly regarded as far as news value is concerned. The concerns are mainly about accuracy of their sources. Yet, there are several benefits that greatly outweigh these flaws. For instance, open journalism will take up causes that news corporations will be extremely reluctant to tackle; vested interests and controversy always get in the way. But speaking of quality there are web sites that get their content from the open world but adhere to internationally accepted reporting standards. The content that they receive is vetted, edited and modified. Editorialised web sites like **globalvoicesonline.org**, backed by Harvard Law, is one such example. This phenomenon is also called crowdsourced journalism and **nowpublic.com** is regarded as the leader in this field. "NowPublic is a participatory news network which mobilizes an army of reporters to cover the events that define our world. In twelve short months, the company has become one of the fastest growing news organizations with thousands of reporters in over 140 countries", says the award winning web site. Now it will take some time before such blog-based web sites become a mass culture since no single blog post will get as much coverage as, say, an article on the front page of a national daily. But it's culture driven by the masses.

Where the traditional way of doing things was to closely guard the building blocks to a product the new way is to open everything to the community, resulting in the obvious outcome – collaboration leading to a much better product

PROSUMERISM

An offshoot of the open source movement is the rise of the prosumer. A prosumer can mean several things. One is a mixture of a professional and consumer. In this capacity the prosumer is viewed as a segment by marketers and generally refers to a discerning, or high-end consumer. The other meaning is derived from the mashup of a producer and a consumer. This definition is more in line with the open source philosophy. The prosumer thus is a consumer who takes part in the production of a product, instead of the traditional passive role that he was expected to play earlier. With the rise of mechanisms for collecting consumer opinions through the internet, consumers can now influence the research and development (R&D) of a product. Companies pay special attention to the needs of customers and make products to fit those needs. This participative form of product development is derived from the FOSS movement.

Several companies have taken to crowdsourcing their research & development. Even the

We want Firefox

That's what employees from the US state department told Hillary Clinton. The browser is apparently approved by the entire intelligence community.

suggestions forum at thinkdigit is a form of crowdsourcing. At the same time there are specialised crowdsourcing communities such as **cambrianhouse.com** and **crowdspirit.com**. The former is a thinktank for developing software products while the latter is involved in bringing to the market innovative real world electronics; all based on the collective intelligence of the crowd.

Other than idea generation, crowdsourcing has been used in rather interesting ways. **Meritocracy.com**, a research company, called for amateur portfolio managers to register and run a virtual fund with a million dollars. Eventually, it mirrored the stock positions and trades of the top hundred users on the site into a real world fund with real money. The fund has beaten the S&P 500 Index in 8 out of 11 quarters since inception. Wikipedia is an excellent example where crowdsourcing has resulted in *creation* – and no small feat at that. The sea of knowledge amassed by the crowdsourced power of Wikipedia, exceeds any other man made repository of information available to the public. Even social bookmarking like Digg or StumbleUpon is also a form of crowdsourcing that leads to *discovery*.

For more on how the open source philosophy is gaining ground, read the article on the OScar project. Flip to page 40

Open Music

One of the trends we've seen in music is of bands giving away music for free, directly from their web sites. The trend was started by bands like Radiohead and Nine Inch Nails when they began releasing albums on the internet. The latest one to follow suit is Coldplay with the release of its latest album LeftRightLeftRightLeft, which we gave out on last month's DVD. Now this phenomenon of artists giving away music is certainly not open source in the strict sense, but rather a part of free culture, since the songs cannot be modified and distributed further. Although free, the approach is, strangely enough, paying off! Radiohead's In Rainbows album, which was released digitally, went on to sell three million copies (digital and physical format sales). Of the roughly 30 per cent who did pay, said they'd paid around $5, on average. One of the more lavish spenders, Nigel Regan, donated £4.27, "I reckon this is a shade more than they would take from a label on a per unit sale. More to the point I wanted to reward the highly creative approach; next time I'd pay less but ultimately would buy more music", he says on a blog.

The trend is catching on in India, too. Last month some of the guys from team digit went for a rock concert featuring Mother Jane. After a blitzkrieg performance, the frontman went on to tell the crowd to visit the band's web site and download their music. "Pay us whatever you feel like, to support the band", he said. This is so much in contrast to just a few years ago when bands were crying their lungs out about piracy and the menace of downloaders. The paradigm shift is perhaps a result of the open mentality.

Another area of open source music, more in line with OSS, is the remix culture. Here people access music released under a creative commons (CC) licence and modify it to create mashups made from original productions of music. Freesound.org is a collection of almost 20,000 such sound clips which may be remixed and used freely under the free CC licence. The clips are only sounds, not songs. They may be those of natural origin such as birds or frogs croaking, or electronic origin like synthesised sound. A more musical project is **ccMixter.org**, where all kinds of tracks are available to either listen to or make new music from.

One of the most notable creations coming out of the remix culture – and one that will be close to our geek hearts – is Dark Side of Phobos. It's an album consisting of 23 tracks that are rearrangements of tracks featured on the original DooM game, remixed by the OverClockedRemix community. The original music was a mixture of rock music and the "creepy" brand of music made by creator Robert Prince, which we now know so well as "DooM style" music. The remixed album in its current form is free to distribute and is the result of the collaborative effort of 19 artists. We've included the album in the June issue DVD. Check it out.

Dark side of phobos

Megatunes.com tries to straddle the line between free and commercial music. The web site is like a record label itself that signs artists from all over. The model is very simple: You can listen to a song for free by simply streaming it. If you want to keep the song, you pay a suggested price. Still, the suggested price is only indicative. You're free to pay anything, higher or lower.

Open movies

The world of motion pictures has always been dominated by big studios, because let's face it, to make blockbusters you need tons of moolah. Which small time amateur movie maker will have access to the resources that the big guys have? That is perhaps one of the reasons why an open source infusion was much needed in this domain as well. Take for example, Elephants Dream, an animated short film created entirely using open source software. Now, purists would have you believe that Elephants Dream is the one true open source movie, precisely because it was almost completely developed using open source software such as Blender, a 3D graphics suite. Well, it is surely an open movie, perhaps the first, but not for the reason cited. The more appropriate ground for it being open source has more to do with its collaborative element, modular approach towards workflow, and free release over the internet.

The film reportedly brought together the talents of a team of artists from countries as diverse as Syria, Germany, Australia, Finland, and the Netherlands. In addition to the performances of the cast and creative efforts of the lead artists, Elephants Dream was a collaboration of hundreds of individuals across the world who contributed a variety of work such as programming additional functionality for Blender, creating textures used in some of the scenes, and providing international translations for the DVD release. The films main aim was to showcase the power of open source software, and in this case Blender, the film's primary piece of software, got several features added to it during the film's development. These included an integrated node-based compositor, hair and fur rendering, rewritten animation system and render pipeline, and many workflow tweaks and upgrades. Yet this is not the only open movie project, although it is the most famous.

DID YOU KNOW?

Jamendo.com is a community of free, legal and unlimited music, published under Creative Commons licences. Here you can download and listen to over 15,000 albums, all for free. It is probably the world's largest collection of DRM-free music. Artists can directly upload their music to the website under the creative commons licence. Another web site to help you navigate the world of free music is gratisvibes.com. The website "aims to lead readers to the best of free or Creative Commons licensed Electronic Music on the web, spreading the word for greater musical freedom for both artists and listeners alike."

Google Reader Notifier
A free and open source system tray, Notifier tells you of unread items in the RSS feed of the reader.

Open source Symbian
The Symbian foundation recently released an open source software package, the first in its plan to eventually make the entire operating system open source.

While Elephants Dream was a short film, Valkaama is a full feature film being developed in Finland. Content for the movie has already been shot and subsequently published on the project's home page. Everyone is encouraged to contribute to the post-production process in order to complete the movie. The movie is near completion and the community is currently working on the music score. The community's work flow is managed quite well by constantly updating a list of work to be done for the film. Currently, apart from the music score, there is some amount of compositing left according to the list. Any takers? Community members discuss the work and ways to approach it in the forums.

The Digital Tipping Point is another such collaborative project. It's a documentary about open source. What better subject matter to be showcased via an open movie, right? The raw footage for the film consists of hours and hours of interviews. This presents a really good opportunity for wannabe editors to snip it into meaningful content. When the final product is released, it's bound to be a tight film, thanks to so many heads involved in the post production process.

Elephants dream post

Open source cinema also involves the remixing culture that is pretty common in music, and is catching up in the images/pictures space. The idea is to create original clips of video and offer it to the community to remix and republish. Some of these mashups make for some interesting viewing. However, for this trend to catch on there are a few hurdles. Video editing is not everybody's cup of tea and besides, meaningfully using canned clips requires quite a creative bent of mind. The hotspots for open cinema are **opensourcecinema.org**, **freecinema.org**, and **straycinema.com**. Be sure to watch "A remix Manifesto 2.0" on opensourcecinema.org – an open source documentary about copyright and remix culture. Created over a period of six years, the film features the collaborative remix work of hundreds of people.

Eat, sleep, DRINK open source

Right next to the open source kitchen sink (if ever there will be one), is the idea for open source beverages. Now you've made drinks at home, right? As children, come summer, we all remember making a cool batch of Rasna. But can you make Coke or Pepsi? Nope, you can't. Perhaps the same gripe drove people to come up with the concept of open cola. A cola for which the recipe is openly available for anyone to modify or improve. But the project started off, not as a backlash, against big cola but as a promotional tool for FOSS. The idea was such a hit that the cola by itself sold more than 1,50,000 cans. The company backing the project became more famous as a cola company than as a company formed for the promotion of open source concepts.

Soon, open source tentacles extended further into the beverage kingdom and entangled themselves on to Free Beer. Before you get excited the 'free' here is like the one in Free Speech; not beer that you don't have to pay for. As they say, there's no such thing as a free beer, but here at least the recipe is free! The concept came about when a group of students from the IT University of Copenhagen decided to take licencing frameworks from the digital world and apply them to an analogue, real-world product. The recipe for Version 1 contained a South American stimulant that gives a caffeine hit to counter the drowsy effects of alcohol, or so the creators hope. The recipe is published under the Creative Commons licence, which means that any brewing enthusiast can brew his or her own batch so long as the new recipe is published along with the beer. Similar projects came about later; one was a Doppelbock (dark type beer) backed by flying dog brewery (called the Open Source Beer Project), while another one was backed by Brewtopia. The Brewtopia project from Australia took the open source concept even further by letting customers own part of the company. They are even consulted on important decisions regarding their beer with a strange name – Blowfly.

THE BUNNY STORY

Following the release of Elephants Dream, the Blender foundation released a second animated film called Big Buck Bunny and an open game titled Yo Frankie. In the movie, bunny is harassed by three rodents (Frank, Rinky and Gamera) who are bullies. After a particularly dreadful event, Bunny sets out for revenge. The game too is based on the universe created in the movie and follows the character of Frank. The Blender institute, that was instrumental in these two projects, was created as a division of the foundation to specifically create open content films and games.

Mod away

Perhaps the most interesting field touched by open source is hardware, since its so diametrically opposite to the culture's software origins. For long, hardware manufacturers have had those little stickers across the seams of their products, exalting the warning "do not open, warranty void if seal broken". It's quite clear that they don't want you to fiddle with their product or modify it in any way; even if you're resourceful enough to modify it to make it better. Thus enters open source hardware – designed to be physically modified or reprogrammed to make it easy to install custom firmware and software to create entirely new products. The way this works is by the sharing of schematics, hardware design, PCB layout data and the free release of any other information that will help further development, such as the bill of materials. The idea behind this is the same as with software; opening up development will see innovation in never before seen ways.

The spectrum that open source hardware covers is huge. It includes small programmable gadgets, do-it-yourself kits, and a host of other modular devices. The field spans from machine tools to robotics to wind turbines. There is even open source chip-processor architecture for graphics cards and core logic design for CPU cores. Many of these projects have gone on to great success, many have not seen the light of day, but all have given the community surrounding them a great deal of learning.

Take the case of the Open Graphics Project (OGP), which aims to design architectures and standards for graphics cards which will be used

DO this

Release your own cinematic masterpieces into the open world. If you want to release the creative bug in you, a good place to begin is makeinternettv.org. There are other such sites that offer tutorials on publishing video content online under a creative commons licence. As for publishing vehicles, you of course have YouTube, which has a lot of CC licensed material. And then there are more specific CC oriented video publishing websites such as revver.com, blip.tv and ourmedia.org. Check them out!

What's the FOSS about?

The inaugural issue of the International Free and Open Source Software (FOSS) Law Review launched recently. It will be a forum for discussions on issues regarding best practices in open source and FOSS implementation.

in OS Operating Systems and eventually morph into full-featured and competitive end-user graphics cards. The first board prototype dubbed OGD1, is an FPGA chip. Field Programmable Gate Arrays (FPGAs) can have their circuit pattern altered by programming, much like a Flash memory chip. Thus the circuit itself is firmware. The trouble is that such a board will be very expensive. But once the chips are out, developers will be able to try out their existing 3D acceleration designs. Once a stable enough design is created and tested, the cards can be mass manufactured.

The BUGlabs project is another interesting open source hardware platform. It can best be described as Lego for the serious geek. These are basically modular computing devices that can be programmed and attached to each other to make devices that perform specialised specific tasks. The main building block, or the central piece, comes with an ARM processor (530 MHz), memory (128 MB), a rechargeable battery and several ports where other bug devices can be attached. The device can then be modded to perform tasks by attaching modules; say a motion sensor module for some security purpose. The modules available from the company include GPS, camera, and screens for added functionality. The open source hardware project is enabling a new generation of engineers to tap their creativity and build any type of device they want, without having to solder, learn solid state electronics, or "go to China" as it says on its web site. Snap on gadget building – that's the concept. Arduino is similar open-source physical computing platform with a development environment for writing software for the board. For more details visit **www.arduino.cc**.

OpenMoko Smartphone is a notable project aimed at building an open source smartphone that could rival the likes of the iPhone. The project has run into trouble recently thanks to the plummeting economy. The company backing the project had to hand over the entire project, including the brand name, to the developer community, but it will still provide limited support. The OpenMoko phone is meant for a niche audience comprised of technology enthusiasts. All information relating to the project such as schematics and CAD files have been released into the public arena under open licences to be further modified and redistributed.

The CEO of OpenMoko, Mr. Sean Moss-Pultz has coined an interesting phrase for this phenomenon. He calls it "social electronics" – an approach that bridges the gap between the developer community and consumers. The project has been quite successful, with multiple widget kits and UI interfaces already developed to run on the OpenMoko hardware.

Open science

Traditionally, scientists have been known to be very secretive about their research until it is finalised and published. But things are slowly changing and many initiatives have sprung up that mirror the open source way of doing things. There are many databases set up that provide open access to the scientific community and students alike, to be able to access information for research. Why did the conservative scientific community that would earlier thrive on "eureka" breakthroughs decide to go open? Perhaps the telescoping nature of scientific advancement in today's era made research stagnant and there was no other option than to pool resources. When it comes to publication of scientific research, a notable project is the Budapest Open Access Initiative (**www.soros.org/openaccess**). So what kind of material is available here? As the site explains "BOAI makes an explicit and fundamental distinction between writings that scientists and scholars do and do not wish to give away for free. BOAI applies only to the former. The objective is that readers should not have to pay access tolls to read them.-" And though this project facilitates free access, scientists still retain copyrights, and citing references pointing to sources is important when using any of it. Then there is lalisio.com, that calls itself a social knowledge network. It allows registered users to exchange "Grey Literature", which includes access to each others papers, idea outlines and slides.

Open source kitchen sink

Open source has reached so many different facets of life that experiments with the concept are taking place in almost every field. There's open source education, wherein a category of community developed study material has evolved called OSC (open source curriculum). OSC signifies any online instructional resource that can be used for free, is free to distribute and can be modified. The seminal work in this field dates back to 2003 with MIT starting the OpenCourseWare project. This provided students with open access to class syllabuses, and lecture notes amongst other resources. Another project, known as the Global Education and Learning Community, is busy bringing out online books and other curriculum material for students from kindergarten up to class 12. A similar project that has managed to create over 10,000 pages of curriculum is being used successfully by a school district in Alaska. The same benefits of open source collaboration, are realised here – content that is produced is of the highest quality, up to date (obsolescence is a major affliction for text books), and led by a community of dedicated educators. Through the free and open source philosophy, there has emerged what economists are beginning to call a "new segment of global public goods". According to them, even simple comments we make on YouTube, forums and message boards, are part of the fabric of the global collective. Those comments together make a product; they enhance the original product and form an integral part of the sum total of human knowledge. In a world where there is growing distrust of corporate entities and restrictive IP rights, the ownership of knowledge and how we use it will define the next era of development. Who knows, open source may some day lead us to a Utopian society of abundance, freedom and liberty only envisaged by philosophers.

thinkdigit.com Discuss this article at www.thinkdigit.com/d/62007

DID YOU KNOW?

There is another project called Open Beer Project, that basically facilitates meetings between geeks from all over the world over a mug of beer. The concept, says the website (openbeer.dk), is this: "If you know you are going somewhere, you check if anyone you know from IRC lives there. If anyone whom you would care to meet lives there, arrange a meeting. When you get there, you meet and drink beer in a joint appointed by the local geek.

DIGIT'S OPEN SOURCE PROJECT

In a first of its kind project Digit plans to crowd source its January Fast Track (FT) to our very vibrant and active community. The FT to Trouble Shooting Your PC, will be developed piece by piece, under the control of digit readers and forum community. The community has been very active lately, especially in giving us a lot of constructive criticism for the Fast Track. So, what we figure is it's time to come together, and build a better product – collaboratively. You get to create, collaborate, and control everything from cover to the contents. Each and every one who contributes meaningfully to the project (for instance with answering even a small trouble shooting query) will get a mention in the Fast Track. Project details will be released soon on www.thinkdigit.com/digitosp

Open ride

Agent 001 wants more than open source cars – he wants to get under the hood and see their "source"

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We've been rather liberal with our praise for open source – not to mention the warm fluffiness of "community" – in these pages, you might have noticed. But this month, I wanted to more than just review the result – I wanted to see this "source" they keep telling me about, and even contribute to a project, if I could (I probably can't, but you never know).

And it wasn't open source software that I was interested in – in this new world where everyone is touting an open source something-or-the-other, I thought I'd go poke around for one of the other somethings. A couple of open source car projects have been in the news recently – so I knew that they'd be my target. While I'm all for the idea of a car everyone can contribute to, I've always thought that the term "open source car" is rather fishy (and not just because I can't download one of these), so investigations are in order.

OScar

(www.theoscarproject.org)

It seems that the OScar (for Open Source Car) project was the first on the scene – it started in 1999, which not long after it became fashionable to call yourself open source. It went the "everyone's invited" way in 2006, and we gave it a nod in our seventh anniversary issue in 2008.

The featured design – and what I can only assume is the most popular – is a three-wheeled affair, which apart from looking oddly cool, is also a rather shrewd approach. In several countries, three-wheelers get classified as motorcycles, and hence aren't subject to stringent safety laws – which means that the cost of producing one of these gets dramatically lowered; that it may end up being the first community-built death trap shall not be commented upon. But enough of that. Time to get my hands dirty with some open source car designs.

Turns out that all the information I need is in the forum – everything from the body to the engine to the safety system. Pity, then, that the forum is "offline for maintenance" for the third week running, as of this writing. This does not bode well at all.

I decided to register on the site anyway, and found that there's a "Wiki Test" link for registered users. "Aha!" I thought, in the manner of Captain Obvious, "a wiki!" The "Car Content So Far" section is meticulously categorised, and contains such insightful comments as "Level 1 Headline", "lalala" and ":)", thus adequately explaining the "Test" part of the title.

This is the part where I am overcome by that creepy feeling that I'm staring at a corpse that I shouldn't really be staring at. Surely the project didn't just roll over and die? Ah, well. Time to look away.

C,mm,n

(www.cmmn.org)

The annoyingly named c,mm,n (pronounced "common"; but seriously, what if we called ourselves D,g,t and asked you to "pronounce it right"?), unlike OScar, has a physical embodiment. In March 2007, c,mm,n became the world's first open source car at AutoRAI, the Amsterdam car show.

The c,mm,n car runs on hydrogen fuel cells, has an iPhone-like dashboard that "flows through the car like a river", and has the audacity to look like this:

But no, we must not focus on that annoying name or that silly design. It's already one-upped the OScar in that it actually exists, and we must credit the project for that. Unlike the minimalist OScar, the c,mm,n is neck-deep in technology. There's the aforementioned "river" dashboard, which will give you all the usual car features – speedometer, odometer and GPS route planner – and adds to it a news and email reader for when it's in "convoy mode". That, too, is an interesting part of the project – you can join a group of c,mm,ns and drive around as a convoy, where the cars communicate with each other and put appropriate distances between themselves, while you kick back with your New York Times newsfeed. The source for this is bound to be intriguing.

The c,mm,n project lets you join

TronBikes.com
A blog about building an open source motorcycle. All the specs are up online, so you can make one of your own if you want

the c,mm,nity through its "online web platform", where you can choose the parts of the project you want to contribute to, and this process is frustrating at best. You first choose a project – interior, exterior, and so on – which consists of workspaces that users have created. Interior, for example, might have workspaces such as dashboard design. If you want to see the solutions people have come up with, you need to ask for access to a workspace, and then start contributing. It doesn't look like I'm getting any workspace access soon, though – the workspaces are rated from red to green, where green is most active; I haven't yet seen a green workspace.

I can understand the need to prevent unqualified people from contributing nothing but hot air, but I'd have assumed that the source was more ... well ... open.

Riversimple

(www.riversimple.com)

The Riversimple Urban Car, too, is an open source car project that's made it to the physical world. The designs came from the 40 Fires Foundation (40FF), and in late June, Riversimple spewed out a working prototype of the Urban Car.

Like the c,mm,n, the Urban Car runs on hydrogen fuel cells, which will take it to a speed of 80 km/h and cover 320 km without refuelling. The body is a light carbon composite, which makes it fuel-efficient and easier to produce. But Riversimple isn't all about making cars – their aim is to turn cars into a "service". The company wants to lease cars to users, so when you're done with your current car, you can give it back to the company and they'll lease it to someone else.

40FF's definition of open source is rather liberal – in fact, the car's designs are only open source in that everyone can see them. They're under a Creative Commons non-commercial licence, so if you want to build a car based on these designs, you have to cough up a nominal licence fee. The car itself isn't entirely built with open source parts either – the hydrogen fuel cell that powers it is proprietary, as are most of the electronics.

While Stallman followers are probably tut-tutting and waggling their fingers, I must point out that this approach is only practical. Unlike software, you can't build hydrogen fuel cells in your home with no financial investment, so to expect a working fuel cell to come out of a community of benevolent volunteers is unrealistic at best. The approach also eliminates the need to wait for that fuel cell. It's like using proprietary drivers on Linux – if NVIDIA is developing Linux drivers for its hardware, it's better than letting their customers wait for a reverse-engineered open source version.

As of this writing, 40FF hasn't set up an open discussion forum for designs, so I couldn't access the designs. I'll let you know when I find out.

The open source green vehicle

(OSGV; www.osgv.org)

The Society for Sustainable Mobility's Open Source Green Vehicle is a concept SUV built around their Kernel Barebone Electric Vehicle. It's essentially a design for a driving system that'll accept any power source – battery, hydrogen fuel cell generator, CNG power generator, and so on. If it can generate electricity, it can be stuck into the Kernel.

I like this project – rather than taking the touchy-feely "we want to change the world" approach, it takes the "the world isn't going to change, so let's fit our ideas into it" angle instead. They noticed that people (Americans, rather) love their SUVs, so instead of getting them to settle for a teeny two-seater, they'd give them an SUV: "If our SUV could run at four times the energy efficiency of the most passenger cars today, then – why not SUV?"

But here's why I really like this project: they actually have the gall to say this in their FAQ section: "although electric vehicles are roughly 40 per cent more energy efficient than conventional gasoline vehicles, electric vehicles cause more sulphur oxides emissions (measured well-to-wheel) than its conventional counterpart."

At a time when you're regarded as demon spawn for not worshipping the electric car, it's heartening to know that someone hasn't been blinded by the advantages.

And then I saw the dates. Apart from a news blurb about the founder releasing a book in December 2008, the site's been silent since October 2007. Another ill-fated project? Who knows?

Journey's End

Two prototypes whose "source" I can't see, and two mothballed projects – this didn't end well at all. There's only one unfortunate conclusion I can draw from this exercise – the "open source" in open source car is more about giving the internet something to gush about than it is about making designs available without restriction. They're all noble intentions – simply because they're not about "corporate greed" (yet) – but calling them open source cars probably doesn't reflect the best judgement.

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48 **Touchscreens**
Catch up with the latest in tactile touchscreen technology

Kodak
Largely hit by the recession, is expanding into the InkJet printer market to turn up revenue

COLOUR MANAGING PRINTERS

Vijay Padaya

In the process of colour management, the single most tricky aspect is dealing with the printer. This article describes the issues involved, and illustrates the use of printer colour management using the Spyder3Print from Datacolor.

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We reviewed the Spyder3 Elite back in the May 2009 issue of Digit. That device is for calibrating and colour managing monitors. The two devices for both monitor and printer are packaged together in the Spyder3 Studio, and come with a sturdy metal carrying case – they are both sensitive measuring devices, after all. This package has a recommended price of Rs. 52,000.
It will be assumed in what follows that your display has already been calibrated properly. You can also calibrate your camera, but this is not normally done as lighting conditions and colour balance vary so much. Many digital cameras default to a colour space defined as sRGB, and more advanced cameras allow also for the use of Adobe RGB. The information about which is used is embedded within the image file that is created.

So, what does all this mean? If you take a photo of a patch of colour that is known to be primary red, this should be represented in your computer image as the RGB (red green blue) value of 255,0,0. When that colour value is then sent to a screen for display or to a printer, the colour that results should also be primary red.

There are two main ways in which the digital values and the actual colours imaged or reproduced do not match up: the range of colours – known as the gamut – that can be represented by any device varies, and the accuracy of matching colours to RGB values is off. The way in which this is managed is by the use of profiles. Basically, a profile is simply a file (with extension .ICC or .ICM) that contains a numerical description of the range of colours that a device can handle. It gives the range of colours, together with the numbers – RGB values – that are associated with them. The profile describes the device's colour gamut, and the associated numerical values.

Using the profile, software can then make adjustments accordingly. To give an over-simplified example, if its profile makes it clear that a particular scanner gives RGB values in which the red is over-emphasised, the software reading the file, something such as Photoshop, perhaps, can adjust the values it receives – it corrects the values that it stores for the peculiarities of the scanner.

When that software then displays the image on screen, assuming that the display device has also been calibrated, it will use the screen profile to adjust the values that it sends to the display. Keeping to a simple example, if the display profile indicates that the display tends to create blues that are too weak, the software will send to the display blue values that are increased by an appropriate amount. A similar process will apply when sending the image to a printer.

By making these adjustments based on the devices' profiles, the image that is displayed or printed comes much closer to representing the same colours as in the original scanned subject – instead of having reds that are too strong due to the idiosyncrasies of the scanner, and blues too weak thanks to the display.

Of course, it is more complicated than this. The relationship of the numerical values to the range of colours is not simply one such as "over-doing the reds". The relationship is described either in terms of steps or algebraically. But the biggest problem lies when the gamut of one device is considerably different from another. we'll come back to this point.

The approach taken a few years ago with Windows and general computing devices was really to reduce everything to a lowest common denominator. This meant assuming a rather narrow colour space that just about every device could be expected to cope with, and the use of generic profiles for devices that expressed colours in terms of that colour space. This colour space is sRGB, properly known as sRGB IEC61966-2.1, and was based on the typical characteristics of a cathode ray monitor of a few years ago. This was devised by Microsoft and Hewlett-Packard and is the expected colour space for use on the internet – if you plan to publish any images on the web, always convert them to sRGB before doing so; this should ensure the best results on the widest range of viewing equipment. Typical digital cameras use sRGB by default – but it is worth checking.

It is generally considered that the sRGB colour space includes about a third of all possible real-world visible colours – although the definition of the maximum possible number of colours varies. A third

Additional reading
For detailed information on sRGB, see the Microsoft and HP document "A Standard Default Color Space for the Internet - sRGB", available at www.w3.org/Graphics/Color/sRGB.html

Eco-friendly printing
According to a study by Lexmark, although consumers dispose cartridges responsibly, they take paper wastage casually

may not seem very much, but it is certainly good enough for most purposes – except professional graphics use, and that is where Adobe RGB came in. This is a larger colour space than sRGB, and was created by Adobe – the developers of graphics software such as Photoshop – to match the colour space that could be reproduced my most colour printers – a little less than double the number of colours of sRGB. Adobe sRGB is available for use in many higher-end digital cameras, and should be used if you plan on printing your images.

Using these two colour spaces, sRGB for use on general displays on the internet and Adobe RGB for colour printing, one can gain reasonably satisfactory results without the use of any calibration or specific profiles. But even these two can show up considerable differences, and one should check which is in use at any time. Consistency is vital. For example, load an image into Photoshop and then switch between colour spaces – the difference will be immediately obvious, and one image will be more true-to-life than the other.

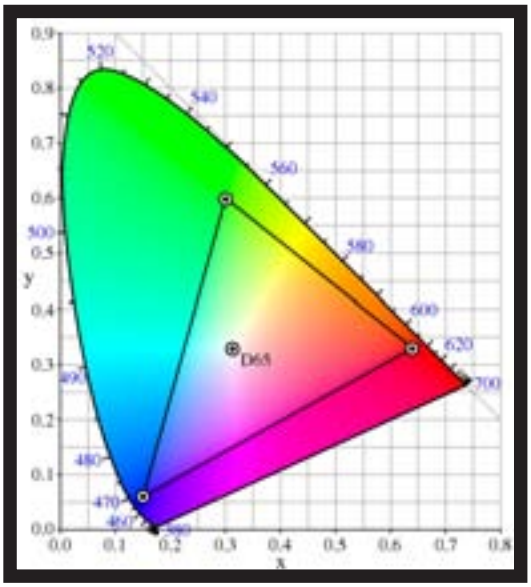
However, hardware is improving with time, with camera sensors becoming more sensitive, monitors gaining much greater contrast range, and the gamut of printers increasing. These improvements, which show no signs of slowing down, give good reason for looking into more sophisticated forms of colour management than simply relying on sRGB and Adobe RGB.

As mentioned before, one major problem lies when you move from a device with one gamut, to a device with a smaller gamut. This is typically the case when printing. In a PC, an image file is held in RGB format. On your display, the varying values of red, green and blue combine to give the full range of colours. But printers work subtractively – you print onto a white surface, and subtract colour from it. The colour information is converted into a CMYK colour space – cyan, magenta and yellow – together with black. This subtractive process results in the printer gamut being smaller than other typical devices.

This is why Adobe took this colour space for the definition of Adobe RGB – its lowest common denominator. If you set your camera to use the Adobe colour space, a good quality PC and monitor can easily handle this, and little conversion is needed when printing – except from RGB to CMYK. This is a good choice for amateur photographers to print out their photos.

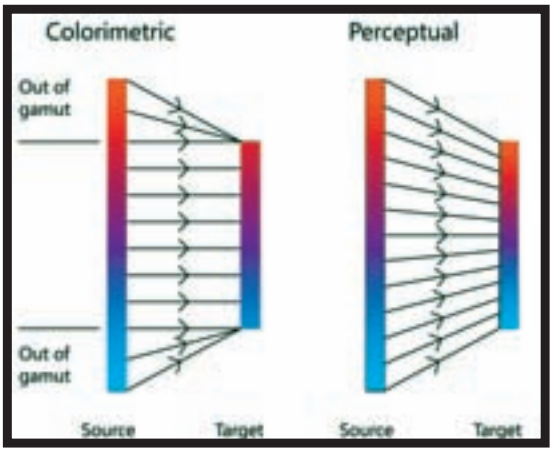
But the next step up entails some complications, and choices that need to be made. Perhaps the most important entails the concept of mapping "intent". There are three main methods, called colorimetric, perceptual, and saturation. (We shall not cover saturation, which is most useful when going from a small colour space to a larger one.) Of the first of these, there are two variants, known as absolute and relative. The easiest to describe first is perceptual intent.

With perceptual intent, the colour range from the larger source gamut is scaled down to match the smaller target colour space. The "distance" between the colours is reduced, but their relative positions remain essentially the same. This method gives the best results from the point of view of human perception – hence the name. The two types of colorimetric intent handle the colours that are shared in both gamuts by mapping them directly – actually, there is a difference in the two variants here regarding this, with relative colorimetric not doing a direct mapping, but this need not concern us for now.



A 2D representation of the CIE XYZ standard colour space. It is intended to represent the entire gamut that human vision can perceive. The triangle overlaid on it is the approximate extent of the sRGB gamut.

The important feature lies with those colours in the source gamut that lie outside of the target gamut – they are all simply mapped to the nearest colour point within the target gamut; what one might think of as the edge of that gamut. In this way several colours in the source colour space are all mapped to the same colour in the target. It is important to consider the colours that are actually in use in a particular image – many cameras and imaging software give different ways of displaying this information, and it is worth taking the time to understand this information.



A simplified 2D representation of mapping from one colour space to another which is smaller. On the left, with colorimetric intent, colours that are outside of the target gamut are mapped to the same colour at the edge of that gamut. On the right, with perceptual intent, the colour space is scaled down to fit the target gamut

If, for example, the great majority of the colours in an image lie within the gamut of the target printer device, then using absolute colorimetric intent will be the most accurate – there is no point in scaling them down if they already fit, as you would do with perceptual intent. However, the greater the difference between the source and target gamuts, then the more important become those colours that lie outside of the target gamut. Think of an outdoor shot with much detail in green foliage, many different shades of dark green – colours that might well be outside of the printer gamut. Using colorimetric intent with this image would likely have most of those colours end up the same, losing all the detail. In that instance, perceptual intent would preserve more detail and yield a more satisfying result.

So, having described the main issues involved with colour management, and particularly with printers, we will now look at a practical example using the Spyder3Print.

Using the Spyder3Print

The main component of the Spyder3Print is the colorimeter that is used for taking measurements of colour patches that have been printed. There is also a guide that you lay down on the paper under inspection, a stand into which the device sits and also a CD containing software. The colorimeter is shaped rather like a large mouse, and the pointed end contains the sensor – just a few mms across – that is used for taking colour measurements. Unfortunately, there is zero documentation, and the user is expected to

CIE XYZ colour space
One of the first mathematical descriptions of a colour space, based on a three-colour additive model, this was devised in 1931 by the International Commission on Illumination (CIE)

Why Red-Green-Blue?
Our eyes have three different sensors for colour, They have peak sensitivities in the red, green and blue ranges of the visible spectrum

use the help system to learn how to use the device. This does not contain enough much information – not by a long way.

The software itself does not give the user much information either – we also found with the Spyder for calibrating monitors that the data derived by the system is not really accessible to the user. You can see what the developers are trying to do – make the system easy to use and not confuse things with too much information; but this is a device for enthusiastic amateurs and professionals – just the kind of people who are likely to want at least the ability to dig deeper under the hood.

The process of calibrating a printer contains many details, but it is simple to describe overall. You print out a test page that contains a large number of defined colour patches, and then each of these is read by the Spyder colorimeter. When all have been read, the software compares the expected colours with those that have been detected, and then proceeds to create a profile for use when printing. On the Windows XP system we used, the profile was placed in the windows\system32\spool\drivers\color\ directory. (For some bizarre reason, different version of Windows use other directories.) From there it is readily found by programs such as Photoshop. And now for the details.

One important issue with calibrating a printer is that if you can, turn off any colour management that the printer driver itself might otherwise be trying to do. It is not always easy to check this, and it is not always possible to turn it off. For trying out the Spyder, we used an HP Photosmart C8188 All-in-One. Its printer driver gives two options under colour management – Adobe RGB or ColorSmart/sRGB. We used Adobe RGB as this has the largest gamut.

The Spyder colorimeter set up for calibration. The laptop screen shows the same set of colour patches as on the test print that is being measured

In a recent document, HP has described that a new, third, option is being added to its printer drivers: "Managed by application". This turns off printer driver-based colour management, and the printer will not make any colour conversions to the image data. This of course assumes that you will be using software that will be able to handle the colour management, using the profile that you create with the Spyder or other colorimeter. If you are going to buy a colour printer, make sure that the colour management can be turned off.

Needless to say, not just the driver colour management, but also any other printer driver settings need to be the same when you perform the calibration and create the profile as when you later use the printer. If you intend to use different paper and ink combinations, and want accurate colour with these, each combination will need to be profiled separately.

The next step is to run the Spyder software and calibrate the colorimeter. The small stand in which the Spyder can sit when not being used contains a small white patch under the Spyder sensor. When you start the software, you check that it can see the colorimeter, seated in its stand, and then select a menu option for calibration. Of course, it makes more sense to calibrate using the paper that will be used in printing. I have been told this will be particularly beneficial when there are high levels of optical brighteners in the paper, but it seems better to do this all the time.

After noting details regarding the printer and media to be used, you are lead through the process of checking the printer's quality and media settings; you then come to print out the print sample that will be used for calibration. There are five from which you can choose:

Fast target – 150 patches
High quality target – 225 patches
Expert target – 729 patches (on three sheets, small paper)
Expert target – 729 patches (on three sheets, large paper)
Extended Greys – for black and white printing

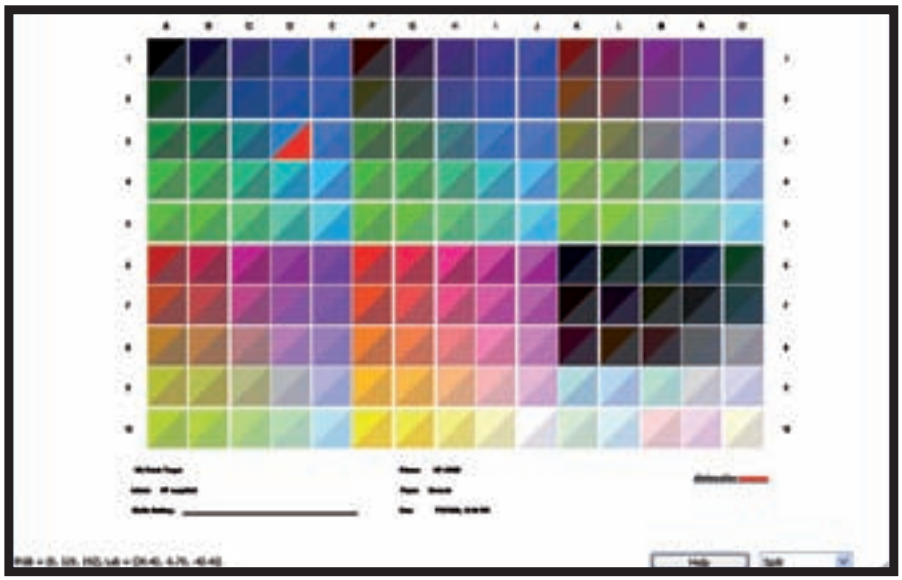
For our testing, we used the fast target with 150 colour patches. Time did not allow us to compare the results from using the 150 patch calibration against the 225 or 729 patch methods. There are other factors coming later that perhaps might make a great difference.

When you perform the actual calibration,

The screen display of the test colour patches. The red triangle – fourth column, third row – is essentially a cursor indicating the current patch

Cyan-Magenta-Yellow
This is the subtractive colour system used by printers: cyan is white minus all the red frequencies, magenta is white minus all the green yellow is white minus all the blue

Is vision 23-bit?
It is considered that human vision can distinguish up to ten million colours – a little more than 2^{23}



The "Build Profile Setup" adjustment screen – a clear indication that printer colour management works imperfectly and still requires subjective adjustment.

you place the printed test sheet on a table, and on top of this the guide – this helps you position the Spyder sensor over each patch. You start in the top left corner, and progress along each row. A cursor in the shape of a red triangle on screen shows which patch is being measured, and once the measurement has been take – either by pressing the button on the Spyder or by hitting Enter – the software makes a sound to indicate the measurement, and then another as it automatically moves the cursor along to the next patch.

The user has to take care to move the sensor itself, and make sure it is correctly positioned over each patch. It is easy to keep to the correct patch in the sequence, but care must be taken to ensure the positioning is correct and that the sensor is flat on the paper – otherwise bad measurements will result. It took just over ten minutes to measure all 225 patches in the Fast target – it is well worth doing this slowly and very carefully, although you can go back and retake measurements, if needed. We tried this a few times, and found that measurements were always varying slightly.

The next screen (called "Build Profile Setup") gives a set of further options for adjustment before the actual profile is built. We'll come back to this. You enter a name for the file, select any adjustments as necessary, and then press "Next". The profile is built and saved to disk. You then come to a screen named "SpyderProof". This allows you to print and compare the results. You can here choose the rendering intent, print the sample, and compare with the image on screen, assuming you have a calibrated screen. It would be a much better idea for actual sample printouts to be provided by Datacolor here – these would enable a much more accurate comparison.

Getting Spyder
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WHY BOTHER WITH COLOUR MANAGEMENT?

In an ideal world, if you take a photograph of any scene (or a scan of any image), the colours you see when directly looking at the scene would be indistinguishable from those that you see when that image is displayed on your monitor or printed on your printer. This is clearly critical for high-end applications such as book and magazine publication, but can also be important for semi-professional photography or enthusiastic amateurs.

But it is a far from perfect world, and there is no such thing as a perfect camera, screen, printer, etc.

Not only do the colours not match exactly, but also the range of colours – the gamut – that any device can detect or reproduce will vary from one device to another; and all devices have gamuts that are considerably less than that perceived by human vision.

The process of making adjustments as colours are mapped from one device to another so as to bring the colours displayed or printed as close as possible to those perceived in the original scene is called colour management.

In our tests, we used a standard PDI test file, which certainly seemed to give better results when printed using the created profile than not. However, we also printed some images of artwork, and the results seemed best – most true to the original – when simply using the printer's built-in Adobe RGB profile. Clearly, this is far from an exact science.

This type of variability is obviously the reason for the existence of the "Build Profile Setup" screen that immediately precedes the creation of a profile. It obviously makes sense the first time you profile your printer to make no other manual adjustments – let the software do its job first, as objectively as possible, and then only later make further manual adjustments.

I asked the distributors of the Spyder why these extra controls are there, and they came back with a mixture of answers, some of which involved personal preferences. The other main points concerned the physical characteristics of the printer and media themselves; these were, in brief:

The presence of optical brighteners in the paper can at times fool the machine and lead to yellowish greys. Matt fine art papers require compensation for shadow detail. Some printers (especially some lasers) are weak in printing highlight details. Profiling tends to work best in printers which have extra grey inks, in other printers you might get some colour cast which can be removed manually.

Conclusions

Profiling a display with the Spyder Elite is a simple process. After some initial setup and checks, you place the Spyder against the screen, and the software runs through various colour patches, taking measurements as it goes. The profile is then created and used by the system. It is a good idea to repeat the calibration every few weeks, but that is basically it, certainly with a modern, good quality display.

Our experience certainly suggests that profiling your printer with a system such as the Datacolor Spyder is worth doing, but much more is needed in terms of user judgement and time. Straightforward objective profiling simply does not work properly. You need to become familiar with your printer, understand the types of printing that you need to do, and how the printer responds to different profile adjustments and media. It is best to treat a tool like the Spyder as an aid in understanding how to adjust your printer profile. If you think that you can run just one calibration and get excellent results, think again, unless, of course, you have stumbled upon that elusive near-perfect, printer-paper-ink combination.

mylifeisaverage.com
Life is not as legendary as you'd think! Have fun with this site. It's a place to share your everyday mediocrity and have a few laughs.

Really touchy Touchscreens

The importance of being tactile

Nimish Chandiramani
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We've loved our touchscreens for as long as we can remember. After all, what can be more gratifying than poking at a screen and making something happen? And there's also multi-touch, of course. Whether it's Jeff Han's incredible demo or the iPhone's pinch gestures, there are many oohs to be emitted.

But in all our geek-gasms, we've ignored what touchscreens have really become – distractions. If you've got a touchscreen phone, for example, you've probably forgotten about the days when you could type out a message without looking at the phone (and so what if "cool" became "book"?). It's not such a big deal with cellphones, but with touchscreens coming to cars, the implications of having to look at a screen to interact with it become much more dangerous.

And so, Chris Harrison (CH) and Scott Hudson in the Human Computer Interaction Institute at Carnegie Mellon University (CMU) came up with a design to bring the usefulness of physical buttons to the flexibility of touchscreens.

The concept is straightforward: use a latex membrane to make the touchscreen "puff up" in the shape of buttons. You get the ability to display anything on the touchscreen, but you still have big squishy buttons you can push. The idea itself doesn't beget as much awe as it does the question, "How did it take so long for someone to figure this out?"

But enough of that. We (d) spoke to Harrison recently, and so we'll let him do the talking.

d How did this project come about?

CH: The big dream in HCI [*Ed.notes: Human-computer Interaction*] is to have a tactile display. People have been looking at the problem for a very long time, and have come up with some really complicated solutions for this. There are three distinct parts to building a tactile display: being able to render content, being able to do the tactile, and being able to accept input from the user. Most people are able to do two of the three. Microsoft Surface, for example, does input really well, but doesn't do tactile. If you look at interfaces in cars, the physical ones can do the tactile and the input, but they don't have the ability to display graphics.

To do all three is a really tough problem. And so we looked at what technologies were out there, and we came to this solution, which is a bit unusual in that it requires micro-bladders of air, but we were able to take advantage of two really good technologies: rear-projection, and multi-touch with infrared. This is very similar to the setup you see on a multi-touch table like Microsoft Surface, but we've added the extra tactile layer on top of it. So we get all the same great multi-touch capabilities, and it's rear-projected so we don't get the occlusion from hands that you would get from a front-projected screen.

It's also inexpensive; we were able to do this with materials in our labs – primarily acrylics or plastic – and we were able to do sophisticated cut-outs using our laser cutter. It's somewhat specialised, but the material costs per display were no more than typical touchscreens.

d How is your solution better than existing tactile technologies?

CH: Well, unfortunately there aren't many existing tactile technologies. Among the ones that do exist, the most sophisticated tactile screens have a series of servo motors operating behind the screen, but any time you put actuators behind a screen, you run into a few problems. One is that if you're using rear projection, you're going to occlude the screen with lots of motors [*Ed. notes: which means no multi-touch*]. And if you're using an LCD screen, it's very difficult to have contiguous areas of space without breaking up the screen – having holes in the LCD where you can have motors. Also, from a scale point of view, if you have a 10x10 grid of little servo motors that cost $5 (Rs 250) apiece, you're paying for 100 servos.

The researchers' ATM interface prototype demonstrates what they can do with the display

And 10x10 is pretty coarse – if you imagine dividing your screen into a 10x10 grid, that's roughly a square inch. You're not going to have buttons [*Ed. notes:on your screen*] that size. So you're already at 100 servo motors for a not-very-high resolution. That's pretty much the state of the art in tactile displays right now. There's nothing that'll give you per-pixel resolution on a, say, 1024 x 768 resolution, where each pixel can be actuated.

There are things in the pipeline: there's a great project from Nokia [*Ed.notes: Haptikos, which first surfaced in 2007*], where you have micro-fluid chambers push up on a per-pixel level, but I haven't seen the technology public yet, and I believe it's fairly expensive at present.

Where do you see your touchscreen technology being used?

CH: Unfortunately, the big limitation is that it doesn't let you have dynamic buttons – you have to "pre-layout" the tactile buttons. So you can do maybe four or five interfaces, depending on how complicated you want to make the display. For our ATM display, we'd get about 25 different combinations. But interfaces that want to support four or five different screens – like an ATM screen, which has a number keypad and some buttons in fixed places – that's where it's going to be a big win, because you can augment the display in a very simple way. It's not going to work fantastically well on your desktop machine or your laptop, because there are so many interfaces that it needs to support. If you wanted to have every button and widget on your desktop to be tactile, you'd have to have buttons everywhere, and that's just not practical. If you wanted to augment just the start button in Windows, if it's in a fixed location, you could do that. But there's less of a win there.

A typical car [*Ed.notes: in the US*] might have GPS, radio, air conditioning, an entertainment system – there's only four or five different states that you could ever want to see. You could build a display that supports a unique tactile layout for each one of those. Those are definitely the most compelling applications.

Where they make a huge difference is driving. As you can imagine, your eyesight is consumed by trying to keep on the road. There's been a tendency in car manufacturers to move to touchscreens, because they want to support so many features. The big problem is that with touchscreen buttons with no tactile feedback, you'd have to look at the screen every single time – you can't do it by feel, like you would with a physical dashboard. And that's a big problem – I wouldn't be surprised if accident rates increased because of this technology.

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Coming back to the ATM example – what are the restrictions of today's ATM interfaces? We've always thought they were pretty effective.

CH: They are pretty effective, although... we're young – people with limited eyesight have a much tougher time. Even when I stand directly in front of ATM interfaces with touchscreens, sometimes it still doesn't recognise my input for my PIN. For us, [*Ed.notes: a tactile display*] is not such a big deal, except that we might be able to type faster with less error. But for people who are slower, or who have less motor control, this could be a big win.

Capacitive Screens
Most popular touchscreen mobiles such as the iPhone and Palm's Pre use this technology in their handsets

Nimish Mehta
Pioneered multitouch technology at the University of Toronto way back in 1982

And no matter who you are, if you're in a car, having tactile feedback on your dashboard – for changing volume or navigating the GPS – it's going to help you keep your eyes on the road.

How strong is the prototype, and how intensely did you test it?

CH: [*Ed.notes: on robustness*] We ran a user study – we put several displays in front of users – and I used several of the prototypes for testing input, testing pressure sensitivity, and so on. Overall, they got some decent wear and tear – some hundreds of hours of use. Some of the displays probably got a few hours of use, and there's no noticeable difference. And these are pretty ad-hoc prototypes we made in the lab, with glue and acrylic. So I think a specially engineered model will be pretty robust and airtight.

[*Ed.notes: on effectiveness*] We put people at a computer screen, doing something similar to driving tasks – something that really consumes their vision, and we could measure their performance in this game by how accurate they were. So every time they took their eyes off the display to do something else – like press a button – we could measure their performance deficit in that task. Next to the computer monitor, we had another display which showed them which button they needed to press next – "press the upper right button", "press the big button in the centre", and so on – and the results, unsurprisingly, were that with a touchscreen, users had to look at it almost every single time, and that degrades their performance. That's a running-over-pedestrians-type deficit. With our buttons and real buttons, they only had to look at the display 20 per cent of the time to find the right button – with touchscreens, it's 90 per cent. So, in a spectrum where touchscreens are the worst end and physical buttons are the best, we are really close to the buttons, which is a really positive result. We get all the tactile benefits of the physical buttons, and yet we can display four or five interfaces on a single surface, which is a nice benefit of touchscreens.

Is there any possibility of going beyond the limited number of interfaces?

CH: One of the techniques that we demonstrated is that instead of having just a single layer of latex on top of the display, you actually stack multiple levels of latex, each with its own particular mask – so basically, you're sandwiching latex together, and you can actuate each layer of latex in its own particular way, either one at a time, or a combination at a time. In the end, you can have a large number of different displays. Above five different patterns, this would probably get difficult, but depending on how many different buttons you wanted, you could potentially have a layer per button. The other way to do this is to divide the surface into lots of different chambers. So in the ATM example, there are three different chambers – one for the number pad, one for the buttons on the bottom, and one for the buttons on the side, and so you can individually actuate each one of those independent chambers. So if you wanted to have 100 buttons, the worst case scenario is that you have 100 chambers – probably something you're not going to want to do, but it is an option.

For simple interfaces like the ATM – five buttons on the screen plus number keypad – you could almost use individual chambers for every button and it wouldn't be terribly expensive.

But if you think about pixels on a computer monitor, they're in the millions. Think of millions of actuators; for the time being, that's not possible.

Have you tried this at the cellphone scale?

CH: No, but we have ideas on how to do it. Obviously, you can't cut holes in LCD screens on cellphones, so you won't be able to do anything with negative pressure, unless you make it a lot thicker. But we have some good ideas on doing it with some fluidic chambers, and the problem with our big setup is that it requires air pumps, and air pumps are quite sizable – about the size of a computer mouse – but the new system we're developing uses micro-pumps that are hydraulic based, and they're about the size of an American penny, and can be made even smaller. So you can fit a few of these into a mobile device and potentially push up a QWERTY keypad or number keypad right on the surface of the display, which will be really great.

Is it possible with today's technology to go down to that size?

CH: We haven't built anything yet, but I'm pretty convinced it is. Again, you wouldn't be able to do per-pixel, but if you wanted to push up 10 buttons or a number keypad, you can do that on a cellphone.

What further development are you doing on the project right now?

CH: We haven't done a tremendous amount since it was published at the Computer-Human Interface conference about three months ago, because I'm away from CMU and working for Microsoft. We are looking at miniaturising the displays for use on things like cellphones. But as of right now, we're looking for potential commercial partners to pick up the technology; there's been some interest in the automotive industry.

What problems do you need to address before this technology can make it into the wild?

CH: I think there are quite a few hurdles that still need to be overcome – the first is the robustness of the flexible membrane that's going to be on the top of the display; that's going to have some wear and tear. However, we found that the latex we were using was pretty robust.

Since we're using a rear-projected camera setup, there's a decent amount of throw distance there – so you can't have it as thin as an LCD touchscreen – you're going to need a foot or two of space to project the interface. I think that's probably going to go away, because pico-projectors are getting so small that if you combine them with the right optics, you could make that about a couple of inches [*Ed. notes: of projecting distance*], maybe less.

It also needs to be robust enough survive in a car environment, which is noisy and air-prone. And since this is air-driven, it may be worthwhile to use some type of fluid. But the problem with any kind of fluid is that leaks are possible.

The technology's pretty good, but it would take... maintenance...to keep your tactile display going. But honestly, the robustness of the prototype we have in the lab is pretty good.

As for cost, they're really very inexpensive, so that's not a hurdle at all.

It may be too early to hope for tactile touchscreens in cellphones, but if they can be cheaply manufactured, it might just mean that this one won't end up on the could-have-been-great-but... pile, and may well be worth watching for.

Step into the light

LCD monitors are the *de facto* standard these days and are becoming ever cheaper. They offer serious value for money, and performance that get close to the best CRTs around, while occupying a fraction of your desk space. We've dug up some of the best ones your money can buy in this shootout.

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Forget swine flu, we have been well and truly bitten, or smitten by the slim bug in nearly every aspect of our lives. We've taken the plunge and sweated our way to a cellulite free existence. We've thrown out our old idiot boxes and invested hard earned cash on sexy new flat panel displays. We've even fallen for Apple's new slim notebooks and have put away our clunky old laptops in anticipation of acquiring one of these beauties. Sleek cellphones... slim PMPs, what's next? Slim washing machines and refrigerators? Indeed, a few years down the line, designers may come up with something on those lines. People have also bucked the prevailing recessionary trend by splurging on the super slim LED displays that have just emerged in stores around the country. After all, it's only by spending more that the economic laws of supply and demand can do their job.

LCD monitors aren't as hot as LCD and plasma televisions since they've been in markets for much longer and most people already own one. However, prices that crashed sometime early last year have continued to fall and today one can buy a 22-inch monitor for under Rs. 10,000. One of the reasons for these falling prices is the economics related to large-scale production that all manufacturers have cashed in on. Allied technologies have also become cheaper as a result of the burgeoning demand. Larger panels are becoming more prevalent as more and more people want a better viewing experience. Size matters, as any gamer or HTPC user will tell you. Even if all you want to do is surf, there is just no substitute for a larger display area. Gone are the days when a 19-inch display was the de facto standard – these days settle for

Imaging: Chaitanya Surpur
Photograph: Manas Parekh

Seagate Technologies has announced shipping of the Cheetah® 15K.7 enterprise-class hard drives into the worldwide distribution channel

nothing less than a 22-inch monitor.

This year we considerably ramped up our test process. Firstly, we used a display calibrator, the DataColor Spyder 3 Elite and each of the monitors was carefully calibrated before testing them. We decided not to test 14, 15, and 17-inch LCDs this year since 19-inch displays have become so affordable. A trend we hope to see continue was the presence of larger panels, namely the 24- and 26-inch categories. Last year we only received one 24-inch display; this year we came across three of them. TN panels abound because of their cheaper price point but there are still a few high-end S-IPS and PVA panels floating around and although we weren't able to get our hands on all of them, we did have some participation from this category.

AOC 2434 PW

26 and 24-inch LCDs – Glory be

These two categories represent the top of the pyramid of LCD monitors available today. This size category is also where one would find the high-end PVA and IPS LCD panels, and in general, the best specifications. It's also the costliest of the categories in test, and in general a 24-inch display will cost you at least Rs. 15,000, while a high-end monitor could cost upward of Rs. 75,000. One of the most pleasing things about these two size categories is the resolution – a whopping 1920 x 1200 pixels; this is even higher than the 1080p HD resolution that equates to 1920 x 1080 pixels. The bigger viewing area is another plus. Obviously, such a resolution is just what the doctor prescribed for gamers who want all the details at higher resolutions but one also needs a super graphics card to pull off gaming at this resolution in high detail. Image editing professionals also look at higher-end panels in these size categories. Do note since both 24- and 26-inch displays pack the same number of pixels on-screen, the pixel pitch on a 26-inch display is larger and for some the 24-inch may look marginally crisper due to the pixels being grouped closer together, although our eyes could not discern significant difference.

Features

NEC's MultiSync 2690WUXi sports a smooth satin-like finish and is a relief from the other piano-glossy finished panels. It's black in colour and the build looks decidedly industry grade, with very rugged construction of the stand that incorporates a tilt, swivel and a portrait mode – top-notch build quality. For its size, the bezel is incredibly thin and the menu system and buttons very well laid out with a helpful on-screen indication of the menu buttons in case you're groping in the dark. This display has a host of options for changing colour gamut, saturation, hue and whiteness level; also on board is an option for enabling and disabling HDCP.

NEC's MultiSync 2490WUXi2 looks identical to the 26-inch version and also sports the same AS-IPS panel. Build quality is exemplary and the swivel and tilt mechanisms work very well – great quality of movable parts. The NEC AccuSync 24WMCX has a decidedly value look to it, and it's evident this one is built for relatively conservative users – we say relatively because this cheaper display still costs

BEST PERFORMER digit AUGUST 2009

NEC Multisync LCD 2690 WUXi

HOW WE TESTED

We divided the monitors received into categories on the basis of their screen size. On the features front, we logged all the physical specifications of the LCDs including details on the panel, the weight and dimensions and connectivity. We also rated the build quality, menu system and bezel thickness of each panel.

Our test system consisted of an Intel Core 2 Duo E6700 CPU (2.66 GHz), 4 GB DDR2 800 MHz RAM and a ZOTAC GeForce GTX 295 graphics card. We used the Spyder 3 Elite to calibrate each display and also give us the real contrast ratio and luminance figures. For luminance we kept the brightness at 100 per cent for all displays. For calibration and testing the contrast ratio, both the contrast and brightness level were set at 50 per cent. Post calibration we ran Display Mate to judge the contrast ratio for ourselves via the grey scale intensity test; this consists of checking visibility of grey squares of varying intensity on a black background.

Display Mate's colour test suite allowed us to check for colour gamut and shade intensity rendition for each display. In the colour spectrum test we look for the wideness of the colour gamut where the primary colours are separated by the secondary colours and the entire spectrum is presented on-screen. Colours should smoothly merge into others without vertical lines called "banding". When testing for purity of the

primary colours and individual shades we use the 16-shade ramp test and the 256-ramp test. 16 and 256 bands (respectively) are presented for each of the primary and secondary colours one colour at a time and these bands vary equally in intensity moving from highest intensities to lowest intensities. We check for uniformity of change in intensity and adequate separation between each band – this tells us that the monitor is able to display variable intensities of a particular shade well. Generally, IPS and PVA panels that are natively 8-bit are better performing than 6-bit TN panels that use dithering to make up for additional colour intensities that they cannot otherwise produce.

Our movie test consisted of a set of four HD 1080p clips encoded in WMV format. A mix of natural scenery, fast action scenes and underwater photography, these video clips allow an objective look at the colour rendition, contrast and brightness level of a display. We used F.E.A.R and Crysis for our game tests. Both these games are studies in opposites — Crysis with its realistic scenery, bright outdoors and lighting depicting an island paradise while F.E.A.R with its cramped, dimly lit corridors and slow motion action scenes. Using these two games, detail, contrast, brightness, colour rendition and viewing angles are a snap to assess.

Deck of cards
Apacer has launched its new AE700 701 Embedded Card Reader.

USB Hub
Apacer has launched the funky looking PH152 USB 2.0 hub

a whopping Rs. 36,000. It has a brilliant menu system but the lower bezel is annoyingly wide, unlike the other NEC displays.

The ASUS VK266H also looks neat, with a smooth black finish and a slim bezel, despite the two-megapixel web camera built into the top bezel. This monitor has good build quality. The menu layout is very good but the control buttons are horrible.

AOC's 2434Pw rounds off the large monitors. It's also the cheapest, at Rs. 14,500, but isn't any shabbier looking for it. AOC uses a rather unique colour scheme – silver and piano white and quite honestly it's a refreshing change from the usual black LCDs we come across. In fact, this display is well built and has a very neat tilt mechanism. The only sore point is that the barrel of the stand pokes above the top bezel, and if the display is viewed at eye level the tip of the barrel is visible – not exactly an eyesore but an aesthetic flaw to be sure. It's resolution is exactly 1920 x 1080, meaning it's designed to be used mainly for watching movies.

Performance

The ASUS VK266H did well in the reverse text tests with only white on yellow and cyan on green being hard to read. The 16-shade ramp test didn't do well with the colour red, where three blocks, the 9th, 10th, 11th block on the top row looked similar. The contrast ratio tests were also mediocre, and there was a noticeable orange tinge to things when viewed from wide horizontal angles. Vertical viewing angles are impossible due to the TN panel under the hood although we noticed this panel was worse than some of the other TN panels around and a slight change in the vertical viewing angle changes the picture characteristics significantly. The rendition of green was good, while we noticed banding when displaying reds and blues. With its good brightness and contrast this monitor is good for games, but movies will be a problem, if only due to the poor viewing angles.

AOC's 2434Pw surprised us with its performance – it did far better than we expected and belied its price. Owing to its TN panel, the colour rendition in Display Mate was really poor and the 256-shade ramp test revealed a highly deficient colour gamut. None of this was too evident in the movie test and other than a few glitches everything looked fine. It also has pretty decent viewing angles for a low-end display. NEC's AccuSync 24WMCX didn't have as wide a colour gamut as the other two NEC displays and although it did well in the Display Mate tests we weren't impressed with it because of the price tag. It's good for

AOC 2236Vw

movies and games, although the contrast ratio isn't as good as we'd like for bringing out the finer detail in F.E.A.R; but Crysis looked pretty good.

On to the other two NEC displays, both of which are based on high-end LCD panels. For some reason the MultiSync 2690WUXi seemed not to have as fast a pixel response as the MultiSync 2490WUXi2, but this is not very noticeable. We found the contrast to be slightly inadequate for some scenes in the video clips where we felt some detail was missing from the darker areas of the screen. But to be honest, it's only MVA and PVA panels that can improve on the performance of these displays, as most IPS panels do not have as good contrast ratios. Both these monitors provided an amazingly rich experience with Crysis and the highlighted detailing on the bodysuit and weapons was something we've not seen before. The vividness of colour, contrast and the level of detail provided are pretty amazing and it's hard not to smile after gaming or watching movies on these monitors. The MultiSync 2690WUXi also has the widest viewing angles and betters its excellent sibling in this regard.

Conclusion

With sterling colour performance that was accurate and very close to an ideal colour gamut, the NEC MultiSync 2690WUXi was the undisputed winner of our Best Performer award. It's equally suitable for image professionals and multimedia/gaming junkies. It's also remarkably well built. Its sibling, the MultiSync 2490WUXi2, comes very close to it but loses out because of its slightly worse viewing angles. The only pinch is the price, i.e. Rs. 90,000. A shade below is the 2490WUXi2 priced at Rs. 83,000. If you demand the best, shell out big – you'll cry but once. These NEC panels are also a must for any sort of work that demands high colour accuracy. If you need studio grade colour accuracy in your work and desire a flat panel you have no option but to shell out for an IPS or PVA panel or one of their derivatives. If you're looking for a large panel on the cheap, and colour accuracy isn't that important to you, check out the AOC 2434Pw – at Rs. 14,500 you will not find a comparable display at a better price.

22-inch monitors – Settle for no less

We received 13 monitors in this category, obviously the most populous one in this test. Although the native resolution for a 22-inch monitor is usually 1680 x 1050 pixels, some of these displays supported 1080p with a resolution of 1920 x 1080 pixels; these are obviously aimed at movie buffs wanting HD content without the ugly black bars on the top and bottom of the picture. Widescreen displays can either support an aspect ratio of 16:10 or 16:9; the former is a better all-purpose resolution while the latter is better for purely HD content. Most 22-inch displays are based on cheaper TN panels and this is why they are so affordable. We were shocked to see a couple of displays priced at well below Rs. 9,000; something we didn't think possible. The market is flooded with 22-inch monitors, and there is no dearth of choice, so if you are still holding on to a smaller monitor, whether CRT or LCD, now is the time to spend.

Features

Dell's E228WFP is an older monitor that was well ahead of its time. This display is extremely well built with a matte finished black body and sports a very good fit and finish. The stand is excellent and looks super sleek and all mechanical parts seem extremely rugged. The ultra slim bezel adds to its appeal, while the menu system is also intuitive and the buttons very usable. HP's LE2201w also sports an industrial grade finish and although it's not as sleek as the E228WFP, most will appreciate the great build quality, although we doubt it's aesthetics as it has a rather squat, unappealing look.

ASUS' VK222Hs bezel is narrow enough for it to pass as sleek and the contoured design is neat. The menu system is well laid out, unfortunately it has horrible buttons like its larger sibling. ViewSonic's VX2233 sports a piano black finish that is the norm these days and this display has a narrow bezel surrounding a high-resolution (1920 x 1080 pixels) screen. The DVI port is extremely close to the barrel of the stand and inserting a DVI cable isn't easy as the width of the connector means it foils with the stand.

Switch in time
Belkin launches its range of KVM switches in India

On top of this the port is rather recessed – another ergonomic slip up.

Intex had two monitors in this category: the IT-2003W was pretty ordinary looking with decent build quality but somewhat of a quirky stand that doesn't keep the display 100 per cent stable. Their 2202TVP sports a large, heavy, metal stand and this model comes bundled with a wireless remote control unit. At first we thought it might have television capabilities but there was no connect for a TV cable, although composite and HDMI connects have been provided. The bezel was quite wide on the sides owing to the inbuilt speaker grilles; this makes this monitor look larger than one would expect.

Samsung sent in two displays. The SyncMaster P2250 is an attractive looking monitor with touch controls that are backlit and beautifully made, with good attention to detail – each icon is well backlit and very readable both under fluorescent lighting and in darkness. The on-screen menu is also not in the centre of the monitor but to the right – a fact that we highly appreciated since when testing we need access to the menu systems and our Spyder calibration unit sits on the middle of the screen causing visibility problems – if only more manufacturers gave this option! The 2233RZ was the other Samsung monitor; this one looked really neat with its smart glossy black body and matte screen. The speciality here is this displays' refresh rate, at 120 hertz it is double that of normal displays. This monitor is intended to be used with 3D glasses and other such gear to enable a realistic 3D gaming experience, and although it's rather unfair to compare it to other displays in this comparison, we are going to do precisely that.

AOC had the strongest presence in this category with four models, some of which were rather special. The V22 was radically different from anything we've seen. Firstly it has a dark blue colour and a wide bezel. The appearance is attractive but in a garish sort of way. Secondly, it was by far the lightest monitor we've ever had the distinction of hefting, far lighter than even a 17-inch display. We discovered this was due to the fact that unlike most LCDs that are CCFL backlit, this one had a white LED (WLED) backlight, meaning the display was slimmer and hopefully a better performer. The AOC F22 embodies a novel concept with a bottom bezel that can also be used as a handle to carry the display, albeit upside down. The stand is similar to a photo frame stand and is detachable. The front is piano black while the rear is glossy white and this contrast really sets the display off. The shape of the stand is weird, something even Priapos would be proud of. The AOC 2230Fm has a neat menu system, the on-screen display is clear and well laid out and the controls are via a simple four-way joypad with a huge backlit centre button. The buttons work well and although it looks fancy, navigation is really simple. The display bezel is quite narrow, except for the top portion that widens out. A chrome trim on the lower part of the bezel adds a little flavour to what is a plain-looking display by AOCs standards, judging from others we've seen so far. And the best part – this monitor has additional USB ports and a memory card reader integrated into the back, and along with a wireless remote unit one can enjoy movies, music and photos without a PC, a unique feature and one that is sure to find many eager takers.

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AOC 2230 Fm

The last of the AOC foursome was the 2236Vw, a well built monitor with a really shaky stand, the first gripe we had with this brand. The front bezel is piano black and the rim of the bezel is wide. Due to this, some reflections of the on-screen image can be seen on the rim of the bezel and while not too distracting, it is noticeable. The last display we looked at was the NEC 2190UXp and this display is based on a high-end S-PVA panel. It sports the same industry grade build as the other NEC designs and has an identical stand mechanism. The bezel is the same size as the 24- and 26-inch panels but looks wider owing to the smaller size of the display. This panel had a 4:3 aspect ratio with a resolution of 1600 x 1200 pixels.

Performance

Dell's E228WFP that

LCD Monitor Test

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	19-inch						20-inch
Brand	**AOC**	**AOC**	**NEC**	**NEC**	**Samsung**	**ViewSonic**	**Acer**
Model	**F19**	**831S**	**MultiSync 1990FXp**	**1990SX**	**SyncMaster D190S**	**VA1928wm**	**P205H**
Plus (+)	Neat menu system	Really cheap	Superb build & performance	Superb build & performance	Novel looks	16:10 aspect ratio	Sleek performer
Minus (-)	Deficient contrast	Poor colour and contrast	Expensive	Expensive	Quirky stand	Mediocre colour rendition	None in particular
Price (Rs)	6,500	6,200	54,000	54,000	7,500	8,200	7,500
Features (Out of 35)	12.67	10.11	19.55	20.56	9.85	13.6	13.21
Performance (Out of 65)	41.41	37.62	47.42	46.87	42.32	40.14	43.01
Grand Totals (Out of 100)	54.08	47.73	66.97	67.43	52.17	53.75	56.22
Features							
Display Size (inches)	19	19	19	19	19	19	20
Pixel Pitch (mm)	0.3	0.3	0.294	0.294		0.285	0.276
Luminance (Cd/m2)	300	250	250	270		300	300
Contrast Ratio (Manufacturer claimed)	1000 : 1	10000 : 1	1500 : 1	600 : 1	1000 : 1	1000 : 1	20000 : 1
Panel Technology	TN	TN	PVA	S-IPS	TN	TN	TN
Native Resolution (H. Pixels x V. Pixels)	1366 x 768	1366 x 768	1280 x 1024	1280 x 1024	1360 x 768	1440 x 900	1600 x 900
Screen Aspect Ratio (Normal/Wide)	16 : 9	16 : 9	5 : 4	5 : 4	16 : 9	16 : 10	16 : 9
Response Time (Gray To Gray)	5	5	20	9	2	5	5
Weight (KG)	3.7	3.89	9	9		4.4	4.2
USB Hub (✔/✖) / No. Of USB Ports	✖ / NA	✖ / NA	✖ / NA	✖ / NA	✖ / NA	✖ / NA	✖ / NA
Card Reader (✔/✖) / Cards supported	✖ / NA	- / NA	- / NA	✖ / NA	- / NA	- / NA	- / NA
Swivel Base (Axis)	Vertical	Vertical	Vertical	Vertical	-	Vertical	Vertical
Height Adjustment / Portrait (✔/✖)	✖ / ✖	✖ / ✖	✔ / ✔	✔ / ✔	✖ / ✖	✖ / ✖	✖ / ✖
Power Consumption (Watts)	25	37	35	39	30	36	28
HDCP Support (✔/✖)	✔	✖		✔	✖	✔	✔
Input Interfaces	D-Sub, DVI	D-Sub	D-Sub, DVI, S-Video	D-Sub, DVI x 2, S-Video	D-Sub	D-Sub, DVI	D-Sub, DVI
Extra Features (If Any)	-	-	-	-			-
Miscellaneous (So 10)	-						
Bezel Thickness	6	6	9.5	9	6.75	7.5	6.5
Quality Of Moving Parts	8	6.5	8.75	9	7.5	7	7.25
OSD Usability & Menu buttons	7.75	8	7	8.25	7	8.25	6.5
Performance							
Spyder3 Elite Actual Contrast Ratio	560 : 1	643 : 1	840 : 1	843 : 1	631 : 1	605 : 1	584 : 1
Spyder3 Elite Measured Luminance	232.8 cd/m^2	245.2 cd/m^2	220 cd/m^2	201.5 cd/m^2	177.6 cd/m^2	262.9 cd/m^2	291.8 cd/m^2
Displaymate Video Edition (So 10)							
Moiré Tests	8.25	8	8.25	8	8.25	8	8.25
RGB Colour Purity Tests	7.25	6.25	7.75	7.75	6.25	7	7.25
16 / 256 Colour intensity Ramp Test	6.5 / 6.5	6.25 / 5.75	8.25 / 7.5	8.5 / 7.5	7.25 / 6	7 / 6.5	7 / 6
Multimedia and Game Tests (So 10)							
1080p Clip Colour Rendition / Contrast	7.25 / 7.25	6.25 / 6.5	8 / 7.5	8 / 7.5	7.5 / 6.75	7.5 / 7	7.5 / 7.25
1080p Clip Overall Viewing Experience	7.25	6.75	7	7	7	7.25	7.25
F.E.A.R							
Bullet Time, Weapon Effects	7	6.5	7.5	7.5	7	7	6.75
Shadows / Particle Effects	6.5 / 7	5.5 / 6.5	7.5 / 7.25	7.25 / 7.25	7.5 / 7.25	7.25 / 7.25	7.25 / 6.75
HDR and Contrast	6.5	6.25	7.25	7	7	7.25	7.5
Crysis							
Colours & Environment realism	7.5	6	8	7	7	7	7
Contrast & HDR	7.5	6.25	7.75	7.25	7.5	7.5	6.75
Viewing Angles (So 10)							
Text / Movies / Games	6 / 5.75 / 5.5	5.5 / 5 / 5	8 / 7.5 / 7.5	8 / 8 / 7.75	5.5 / 6 / 6	5.5 / 4.5 / 4.5	6 / 5.25 / 6
Built in Speakers Sound Quality (So 10)	-	-	-	-	4	-	6

				22-inch				
	AOC	**Dell**	**Intex**	**NEC**	**AOC**	**AOC**	**AOC**	**AOC**
	2036SA	**ST2010**	**IT-2002W**	**MultiSync 2190UXp**	**V22**	**2230Fm**	**F22**	**2236Vw**
	Really affordable	Solid build	Well priced	Super performance and build	WLED panel	Superb features, good performer	Good performer, well priced	Good performer, well priced
	Mediocre performer	Pricey	Mediocre colours	Very expensive	Slightly expensive	Pricey	Wide bezel	None in particular
	7,000	8,900	7,500	75,000	13,500	14,000	88,00	8,700
	10.45	13.03	10.26	20.3	14.82	19.3	13.04	15.39
	39.37	40.77	41.75	48.57	41.45	44.46	40.88	40.44
	49.82	53.8	52.01	68.87	56.26	63.76	53.93	55.83
	20	20	20	21.3	22	22	22	22
	0.277	0.277	0.277	0.27	0.276	0.282	0.248	0.248
	250	250	300	300	280	300	300	300
	60000 : 1	1000 : 1	1000 : 1	1000 : 1	100000 : 1	1200 : 1	1000 : 1	1000 : 1
	TN	TN	TN	S-PVA	TN	TN	TN	TN
	1600 x 900	1600 x 900	1600 x 900	1600 x 1200	1680 x 1050	1680 x 1050	1920 x 1080	1920 x 1080
	16 : 9	16 : 9	16 : 9	4 : 3	16 : 10	16 : 10	16 : 9	16 : 10
	5	5	5	8	2	2	5	5
	4.2	4.5	4.5	6.5	3.8	5.2	4.6	4.35
	✖ / NA	✖ / NA	✖ / NA	✖ / NA	✖ / NA	✔ / 2	✖ / NA	✔ / 1
	- / NA	- / NA	- / NA	- / NA	- / NA	✔ / MMC, SD, xD, MS/MS Pro	✖ / NA	- / NA
	Vertical	Vertical	Vertical	Vertical	Vertical	Vertical	Vertical	Vertical
	✖ / ✖	✖ / ✖	✖ / ✖	✔ / ✔	✖ / ✖	✖ / ✖	✖ / ✖	✖ / ✖
	25	20	25	90	28	60	36	36
	✖	✔	✖		✔	✔	✔	✔
	D-Sub	D-Sub, HDMI	D-Sub	D-Sub, DVI x 2, S-Video	D-Sub, HDMI	D-Sub, HDMI,	D-Sub, DVI	D-Sub, DVI
	-	-	-	-	Webcam (1.3 MP)	Remote	-	-
							-	
	6	7.5	7	8.5	5.75	6.25	6	6.5
	7	7	7.25	8.75	7.75	6.75	8	7.25
	8	7.5	7	8.25	7.75	7.75	7.75	8
	573 : 1	614 : 1	631 : 1	616 : 1	610 : 1	646 : 1	404 : 1	534 : 1
	209.4 cd/m^2	211.2 cd/m^2	315.2 cd/m^2	350.9 cd/m^2	225.8 cd/m^2	277.6 cd/m^2	196.2 cd/m^2	254.6 cd/m^2
	8.25	8.25	8	8	8.25	8	8.25	8
	6.75	7.25	6.5	7.75	7.25	7.25	7.25	7
	4.75 / 4.5	7 / 6.25	5.5 / 5	8 / 7.75	7 / 6	6.5 / 6.25	6.75 / 6.25	7 / 6
	6 / 7.25	7.5 / 7.25	6.75 / 7	8 / 7.5	7 / 6.75	7 / 7	7.25 / 7.25	7.5 / 7
	6.75	7.5	7	7.5	7	7.25	7.5	7.5
	6.5	7	6.5	7.5	7	7	7.25	7
	7 / 6.5	7 / 7	7 / 6.75	7.75 / 7.25	7.25 / 7	6.75 / 7.25	7.25 / 7.25	7 / 7.25
	7	7	7	7.75	7	7	7.25	7
	6.5	7.25	7.25	8.5	7.25	7.5	7.5	7.25
	6.5	7.25	7.5	8.5	7.25	7.75	7.5	7.25
	5.5 / 5.5 / 5.5	6 / 5 / 5	6 / 6 / 6	7.75 / 7.5 / 7.5	6.5 / 5.75 / 5.5	7 / 6.25 / 6.25	6 / 5.5 / 5.5	5.5 / 5 / 5
	4	-	-	-	-	4	-	-

LCD Monitor Test

Brand	ASUS	Dell	HP	Intex	Intex	Samsung
Model	**VK222H**	**E228WFP**	**LE2201w**	**2203W**	**2202TVP**	**SyncMaster 2233RZ**
Plus (+)	Good looking	Superb build quality	Built well	Affordable	Feature rich	Neat looks
Minus (-)	Poor viewing angles	Mediocre colours	Ordinary performance	Very basic performer	Poor performer	Mediocre viewing angles
Price (Rs)	13,400	14,940	12,200	9,500	14,900	9,500
Features (Out of 35)	15.37	13.32	10.27	10.89	14.95	12.76
Performance (Out of 65)	38.3	39.81	39.07	37.96	33.59	42.63
Grand Totals (Out of 100)	53.66	53.13	49.34	48.85	48.54	55.39
Features						
Display Size (inches)	22	22	22	22	22	22
Pixel Pitch (mm)	0.282	0.282	0.282	0.282	0.282	0.282
Luminance (Cd/m2)	300	300	250	300	300	300
Contrast Ratio (Manufacturer claimed)	1000 : 1	800 : 1	1000 : 1	1000 : 1	1000 : 1	1000 : 1
Panel Technology	TN	TN	TN	TN	TN	TN
Native Resolution (H. Pixels x V. Pixels)	1680 x 1050	1680 x 1050	1680 x 1050	1680 x 1050	1680 x 1050	1680 x 1050
Screen Aspect Ratio (Normal/Wide)	16 : 10	16 : 10	16 : 10	16 : 10	16 : 10	16 : 10
Response Time (Gray To Gray)	2	5	5	5	5	3
Weight (KG)	5.1	5.2	5.2	4.5	7	5.2
USB Hub (✔/✖) / No. Of USB Ports	✖ / NA	✖ / NA	✖ / NA	✖ / NA	✖ / NA	✖ / NA
Card Reader (✔/✖) / Cards supported	- / NA	- / NA	- / NA	- / NA	- / NA	- / NA
Swivel Base (Axis)	Vertical	Vertical	Vertical	Vertical	Vertical	Vertical
Height Adjustment / Portrait (✔/✖)	✖ / ✖	✖ / ✖	✖ / ✖	✖ / ✖	✖ / ✖	✖ / ✖
Power Consumption (Watts)	55	45	35	35	40	45
HDCP Support (✔/✖)	✔	✔	✖	✖	✔	✔
Input Interfaces	D-Sub, DVI, HDMI	D-Sub, DVI	D-Sub	D-Sub	D-Sub, HDMI, Composite	DVI
Extra Features (If Any)	webcam (1.3 MP)	-	-	-	Remote control	-
Miscellaneous (So 10)						**-**
Bezel Thickness	7.75	8.5	7.25	7	5.75	7
Quality Of Moving Parts	7	8.5	7.25	6.5	6.75	7.25
OSD Usability & Menu buttons	5	7.75	7	8	7.5	8
Performance						
Spyder3 Elite Actual Contrast Ratio	452 : 1	533 : 1	342 : 1	504 : 1	288 : 1	685 : 1
Spyder3 Elite Measured Luminance	222 cd/m^2	278.2 cd/m^2	165.8 cd/m^2	193.4 cd/m^2	293.2 cd/m^2	300.5 cd/m^2
Displaymate Video Edition (So 10)						
Moiré Tests	8.5	8.5	8	6	8	8.25
RGB Colour Purity Tests	7.25	6.5	6.75	6.5	6	7.5
16 / 256 Colour intensity Ramp Test	7 / 6.25	6.5 / 6	6.75 / 6	6 / 6.25	4 / 4	7 / 6.5
Multimedia and Game Tests (So 10)						
1080p Clip Colour Rendition / Contrast	6.5 / 5.5	7.25 / 6	7 / 6.25	6.25 / 5.75	5 / 5.5	7.25 / 7.25
1080p Clip Overall Viewing Experience	6.25	7	7	6.75	5	7.5
F.E.A.R						
Bullet Time, Weapon Effects	6.5	6.5	6.5	7	5.5	7.25
Shadows / Particle Effects	5.5 / 7	6 / 6.5	6.5 / 6.5	6 / 6.5	3.5 / 5.75	7 / 7.25
HDR and Contrast	6.75	6.25	6.75	6.5	5.25	7
Crysis						
Colours & Environment realism	6.75	6	6.5	7	6	7.5
Contrast & HDR	6.75	6.5	6.5	6.75	6.5	7.5
Viewing Angles (So 10)						
Text / Movies / Games	6.25 / 4.25 / 4.5	6 / 6 / 6	6.25 / 6.25 / 6	5.5 / 4.5 / 5	5.25 / 5 / 4.75	6 / 5.5 / 5.5
Built in Speakers Sound Quality (So 10)	4	-	-	4	-	-

			23-inch	24-inch			26-inch	
	Samsung	**ViewSonic**	**LG**	**AOC**	**NEC**	**NEC**	**ASUS**	**NEC**
	SyncMaster P2250	**VX2233wm**	**M237WA**	**2434Pw**	**AccuSync 24WMCX**	**MultiSync 2490WUXi2**	**VK266H**	**MultiSync 2690WUXi**
	120 Hz display	Neat looks	Novel features, neat looks	Novel looks	Good performer	Superb performer	Large display, good looks	Superlative performance
	Mediocre colour	Poor performance	Mediocre performer	None in particular	Very expensive	Very expensive	Mediocre viewing angles	Expensive
	11,500	11,000	17,990	14,500	36,000	83,000	25,250	90,000
	13.77	12.69	17.55	13.72	16.35	20.42	18.85	19.46
	39.97	34.16	39	42.36	43.14	48.99	37.69	51.24
	53.74	46.86	56.55	56.08	59.49	69.4	56.54	70.7
	22	22	23	24	24	24	26	26
	0.25	0.3	0.266	0.271 mm	0.27	0.27	0.287	0.287
	300	300	300	300	400	320	300	400
	1000 : 1	1000 : 1	1000 : 1	60000 : 1	1000 : 1	1000 : 1	20000 : 1	800 : 1
	TN	TN	TN	TN	TN	AS-IPS	TN	AS-IPS
	1680 x 1050	1920 x 1080	1920 x 1080	1920 x 1080	1920 x 1200	1920 x 1200	1920 x 1200	1920 x 1200
	16 : 10	16 : 9	16 : 9	16 : 9	16 : 10	16 : 10	16 : 10	16 : 10
	2	5	5	2	5	7	2	7
	4.4	4.2	7	6.2	6.5	11.6	7.9	12.6
	✖ / NA	✖ / NA	✖ / NA	✖ / NA	✖ / NA	✖ / NA	✖ / NA	✖ / NA
	- / NA	- / NA	- / NA	- / NA	- / NA	- / NA	- / NA	- / NA
	Vertical	Vertical	Vertical	Vertical	Vertical	Vertical	Vertical, horizontal	Vertical
	✖ / ✖	✖ / N	✖ / ✖	✖ / ✖	✖ / ✖	✔ / ✔	✖ / ✖	✔ / ✔
	40	38	50	60	90	70	60	111
	✔	✔	✔	✔	✔	✔	✔	✔
	D-Sub, DVI	D-Sub, DVI	D-Sub, DVI, Composite, Component, HDMI x2, TV antenna	D-Sub, HDMI	D-Sub, DVI, HDMI, Component	D-Sub, DVI x 2, S-Video	D-Sub, DVI, Component, HDMI	D-Sub, DVI x 2
		-	wireless Remote control	-	-	-	webcam (2 MP)	-
	6.5	6.75	6.25	6.5	7	8.75	7.5	9
	7.5	6.25	6.75	7.5	7.5	8.75	7.25	9
	7.25	5.5	7.5	7.5	9	8.25	5	8.5
	595 : 1	279 : 1	523 : 1	630 : 1	486 : 1	594 : 1	522 : 1	546 : 1
	291.2 cd/m^2	234.7 cd/m^2	259.3 cd/m^2	275.1 cd/m^2	346 cd/m^2	328.8 cd/m^2	211.4 cd/m^2	354.9 cd/m^2
	8	8.5	8.5	8.25	8	8.25	8.5	8.25
	6.75	6.75	7	7	7	7.75	7	8.25
	6.25 / 6.25	5.75 / 4.75	6 / 6	5.5 / 3	7 / 7	7.75 / 7.5	6 / 5.5	8.5 / 7.5
	6.25 / 6	6 / 5.25	6.75 / 4.75	7.25 / 7	7 / 7.25	8 / 7.5	7 / 5.5	8.5 / 7.5
	6.5	6	6.75	7.25	8	8	7.25	8.5
	6.75	6	6.75	7.25	7.25	7.5	7	7.5
	7.25 / 7.25	5 / 6.25	` / 6.75	6.25 / 7	7 / 7	7.75 / 7.5	6 / 7	8 / 7.5
	7	6.25	6.75	7	7	7.75	7	7.75
	7.25	6	6	7.25	7.75	8.75	6.5	8.75
	7.5	5.75	6	7.5	8	8.75	6.5	8.75
	5.5 / 5 / 5.25	6.25 / 4.25 / 4	6.5 / 4.5 / 4.75	6.75 / 6.5 / 6.5	6.25 / 4.25 / 5	7.75 / 7.75 / 7.75	6.5 / 3.5 / 3.5	8.75 / 8.75 / 8.5
	-	-	6.5	-	5.5	-	4	-

Dream in colour
HP's new GreenColor monitor is the latest thing for colour professionals with a 10-bit, LED-backlit display capable of displaying 1 billion colours

Lynnfeild chipset
Intel's P55 chipsets are due on the 1st of September with support for the yet unseen LGA 1156 CPUs

LG M237WA – SPLIT PERSONALITY?

The LG M237WA was unique from the start. First of all it was the only 23-inch display in test. Secondly, it's a TV and a monitor rolled into one. It's a good looking display, with a thick plastic body that does make it look unnecessarily bulky. The exteriors are well finished with piano black. The power LED is attractive – blue inside a translucent glass that gives a slightly diffused effect. This display has a nice full featured remote control and although a couple of others also had remote units, none had support for a TV cable. That's right – plug in your cable TV wire and you're good to go.

It also has two HDMI ports, composite, component, D-Sub and DVI connects, making it quite an all rounder. The resolution of 1920 x 1080 pixels is also right for an entertainment monitor – this is a cheaper alternative to LCD TVs if you have a gaming console such as the X-Box 360 or the PS3. In terms of performance, the results are mixed. The rendition of red was poor with quite a bit of banding. Green rendition is decent, although there was a lot of banding in the blues in the colour spectrum test. The viewing angles were also an issue, as was the contrast in video clips. It has marginally better horizontal viewing angles than the ASUS 26-inch, but that's not saying much. It does a fair job with games, but really, overall performance is not its forte – features and connectivity are. Priced at Rs. 17,990, the M237WA is a TN panel based LCD monitor cum TV that should find a pretty wide audience other than the most discerning fraternity, that is.

LG M237WA

impressed us two years ago no longer stands out when compared to the latest crop of displays. In our tests it didn't handle *Crysis* well and the colours look washed out with poorer HDR performance. In the Display Mate intensity tests the contrast was not good. It's good enough for movies but the reds and blues are a bit dull. On a positive note, the brightness level in movies is good, excellent for detailing, and the pixel response is good enough for a satisfactory movie experience.

Samsung's SyncMaster P2250 did well in the grey scale intensity check; in the colour spectrum test the rendition of all the primary colours was good although the ability with blue and green didn't seem as broad – this was surprising, since most monitors do well with green – the most discernable colour. In the 16-shade intensity test the two highest intensities are pretty close to blending with the others – not good. It did fairly well in the games, particularly *Crysis*, but the performance with videos was pretty mediocre.

ViewSonic's VX2233WM didn't impress us with poor performance in the shade ramp tests and very mediocre performance in the video tests and *Crysis*. In *F.E.A.R.*, the shadows were not realistic at all, and we could spot anomalies. There was also a lot of noise in the darker regions of the screen.

The ASUS VK222H did decently in the colour spectrum test with good rendition of green, but with banding in the transitions from yellow to red and dark blue to light blue. In the grey squares intensity check it didn't do as well as the bigger ASUS VK266H, a poorer measured contrast ratio being the culprit. It's viewing angles are quite poor – a pity for movie junkies. The Intex 2203W performed poorly in the *F.E.A.R* test with poor quality shadows, but it wasn't as bad as the Intex 2202TVP that had rusty brown patches in the deepest part of the shadows in *F.E.A.R* – evidently the contrast ratio is not good enough for gaming. Interestingly, this game did not display any other glaring flaws in Crysis or other parts of *F.E.A.R.*, but the colours and contrast were not as vivid as we'd like. It's a poor choice for movies as well, so give this one a wide berth.

NEC's 2190UXp does very well in Display Mate in the colour gamut test but there was banding noticeable in the blue segment, especially the transition from blue to cyan. It has an excellent contrast ratio, the benefits of which were most noticeable in movies and *Crysis*, both of which look vivid with startlingly realistic colours. Only the 2690WUXi and 2490WUXi2 did better.

AOC's 2230Fm was the best performer of the company's 22-inch offerings. We loved the way *Crysis* looked, especially for a TN panel – detailed environments and good colour and brightness levels. The sun flare and HDR effects were also excellent, with good detailing on weapons that is not always visible on the lower quality TN panels. We also used the display for playing videos and photos sans a computer – but quality is poor, and although the display itself is good the in-built engine for multimedia playback isn't and it's also picky about the formats used.

The AOC V22 was a surprising let down in Display Mate; we expected more from this WLED panel in terms of colour, but this was not to be. It's fairly good for movies, with good detailing and contrast and does well in games. The AOC F22 also did well in our game tests and outperforms the AOC 2230Fm in *F.E.A.R.* across all tests except contrast, which is important for enjoying this game. Crysis is enjoyable and the viewing angles, while not as good as non-TN panels, are fair.

The AOC 2236Vw was the last of the quartet tested and is a decent monitor with good contrast and colours. Although its performance in Display Mate left something to be desired, especially with the 256-shade ramp test, on the whole it made up for this with the gaming and movie tests.

HP's LE2201w has good viewing angles for a TN panel based display, but little else, its performance in the gaming tests was mediocre at best.

Conclusion

AOCs 2230Fm was the pick of the lot when it comes to sheer value for money. It's got a few additional features, but other than that is a superb display at a good price. Sure you can get better S-PVA panels but then you'd need to spend at least five times more. For Rs. 14,000 it's our Best Buy in the 22-inch category. If you desire pure quality and you must have a 22-inch display (no bigger), then NEC's 2190UXp will satisfy – an S-PVA panel and some excellent scores throughout the slew of tests thrown at it, but it's not cheap and will make you poorer by a good Rs. 75,000. If you desire something really cheap, look at AOC's 2236Vw, a good all-round performer at an astoundingly low price of Rs. 8,700.

BEST BUY digit AUGUST 2009

ACER P205H

3 new phones
LG launches the GB270, KP265 and GB210 cellphones for Rs. 4,599, 4,999 and 4,399 respectively

Mac Office
Microsoft has rolled out another major update to Office 2008 for Mac that it's calling Service Pack 2

20-inch monitors – between rock bottom and a larger screen

20-inch displays are the big boys of yesteryear. Before the coming of the 22-inch monitor there was a time when the 20-inch wide screen monitor ruled supreme. As kings of the LCD monitor domain these displays had a resolution of 1680 x 1050 pixels, which was way higher than widescreen 19-inch monitors that could manage only 1440 x 900 pixels. 22-inch monitors have the same resolution as the 20-inch displays but offer a bigger screen. These have found a wide fan base with gamers and movie aficionados. Most 22-inch monitors sport very cheap TN panels and these monitors have been the catalysts of the price crash, but a few of the smaller, less popular 20-inch displays are still available.

Features

Dell's ST2010 is a neat looking monitor that has a narrow piano-black finished bezel; the rear is piano white and gently rounded, giving it a very Apple-like look. Build quality is good, but the stand is very mediocre. Acer's P205H has a glossy LCD panel and is neat looking with a piano black finish and a decent looking bezel. It's also pretty slim though not anywhere as slim as a WLED display. AOC's 2036Sa is another neat looker with a reasonably slim bezel. The stand is oval shaped with a simplistic look but well finished in glossy black; its tilt mechanism is stiff. Intex' IT-2002W is a well-built LCD with a steadier stand than the 22-inch Intex 2202TVP; build quality is good, though the surface finish is a simplistic smooth black. Weirdly, all these 20-inch displays supported the ultra widescreen 16:9 viewing format and their resolution was identical at 1600 x 900 pixels apiece.

Performance

Intex' IT-2002W has good brightness levels and a decent enough contrast to make movies a fun experience, but we'd like a wider colour gamut; this is also one of the reasons why Display Mate wasn't kind to this panel, with some mediocre scores. Dell's ST2010 was the best 20-inch display when it came to gaming – good colour, a decent contrast ratio that allowed good detailing under *Crysis*. The only test where it lagged behind was the 256-shade ramp where we found the higher intensities and extreme lower intensities tended to blend noticeably. Both Acer's P205H and AOC's 2036Sa had issues in the reverse text tests, where white on a yellow background and cyan on a green background were nearly impossible to read. A couple of other colour combinations are also barely discernable. The P205H did well in the gaming tests, especially Crysis where good weapon and suit details were visible. Its viewing angles are also pretty good for a TN panel and it did well in the movie tests.

As for the 2036Sa from AOC, it wasn't too hot. Firstly, the reds seem compressed in some videos with visible noise. In the 16-shade intensity ramp the pinks, greys and greens have a problem at the highest intensities where the two highest intensity colours seem to merge – this problem is visible with all the other colours as well though it's not as severe. Colour breadth for red and blue was not as wide as we'd like. As a result, we didn't like the experience when playing *Crysis* on this display.

BEST BUY digit AUGUST 2009

AOC F19

Conclusion

Acer's P205H emerges as our Best Buy – it's a good all-round performer at a sweet price. Rs. 7,500 is a good price point and until a year ago you would only get you a 19-inch CRT monitor. In fact, with the exception of the Dell ST2010 (Rs. 8,900) all the other monitors were pretty affordable. The Dell might be worth a look if you want something for gaming, but to be honest, if you could spend a bit more and pick up a 22-inch display, you'd also have a lot more variety.

19-inch monitors – Fresh minnows

These monitors represent, for us, the minimum size bracket you should look at. Some people protest saying they only want to surf and will never need a bigger screen – a common statement and also one that is most often proven wrong. There's nothing like "enough" when it comes to screen size. Since the only way to interface with your PC is by what you see on-screen, ultimately no paltry 15-inch display will satisfy for very long. Even if you're not a gamer or a movie junkie eventually every PC user craves for more viewable real estate and today's websites are also rich enough with multimedia content to advocate a larger display.

Features

Of the six 19-inch monitors we tested three had weird resolutions of 1366 x 768 pixels – this resolution is more used on 26- and 32-inch LCD TVs. This also allows these monitors to natively support 720p (1280 x 720 pixels) content. These were two models from AOC and the Samsung SyncMaster D190. The ViewSonic VA1928wm was the only monitor to support a 16:10 aspect ratio and a resolution of 1440 x 900 pixels. The other two NEC displays had resolutions of 1280 x 1024 pixels and were clearly aimed at business, medical and industry segments with their high-end panels, superb build quality and fully functional (rotate,

Contact Sheet LCD Monitor Comparison Test

Brands	Phone No	Email	Website
AOC	91-124-280 6116 / 17	info@in.aocmonitor.com	www.aoc.com
Acer	011-26734300	varshas@perfectrelations.com	www.acer.co.in
ASUS	022 - 67668800	media_india@asus.com	www.in.asus.com
Dell	1-800-425-4026, 080-25068026	dell_enquiries@dell.com	www.dell.co.in
HP	9811626585	mansi.pal@bm.com	welcome.hp.com/country/in/en/welcome.htm
Intex	1800116789 (toll free); 011-41610224, 26	info@intextechnologies.com	www.intextechnologies.com
LG	0120-2560900/40	Sanjoy@lgindia.com	www.lgindia.com
NEC	011-30822112	info@shibacomp.com	www.shibacomp.com
Samsung	011-4151 1234	m.malhotra@samsung.com	www.samsung.com/in
ViewSonic	022 2668 1921	Umang@rooponline.com	www.in.viewsonic.com

Constellation launch
Seagate launches it's Constellation ES series of drives with capacities starting from 500 GB to 2 TB

Samsung Lavender
Samsung launches its stylish new Lavender Series of LCD Monitors available in 21.3 and 23-inch sizes

pivot, portrait mode), stands. All the high-end panel-based NEC displays have two DVI ports – one DVI-D (digital) and one DVI-I (analogue and digital). These, and the MultiSync 1990FXp were the only exceptions with a single DVI-D port. The 1990FXp has the same menu system as the 24- and 26-inch NECs but the up/down selection buttons are on the bottom bezel along with the right/left buttons.This creates confusion when using the menus, for while all the controls have legends onscreen that indicate their usage, the button layout is not intuitive, unlike the excellent menu layout on the larger NEC displays and the 1990SX. The reason for not having the up/down buttons on the vertical portion of the bezel is apparent when one considers the slimness of the bezel – the thinnest in the entire test.

The Samsung D190 has a nifty photo-frame type stand though it's not very stable. ViewSonic's VA1928wm is the simpleton amongst the 19-inch displays – it has a decent plain black finish but there's nothing really attractive about it. The AOC831s looks neat with a nice piano black design and a lower bezel that droops towards the middle.

Performance

The NEC 1990SX has very wide viewing angles owing to the S-IPS panel used. Slight backlight bleeding was noticed at all four corners although unevenly; for example, it was really noticeable at the bottom right corner while at the top left corner wass barely noticeable. This monitor has great brightness levels. It didn't do as well in the gaming tests, and *Crysis*' colours didn't look as crisp and lovely as on the other S-IPS panels. It's very good for viewing movies, but we didn't like the aspect ratio; this is the reason we deducted extra points in the movie test. The same goes for the NEC 1990FXp – a good panel with an amazing contrast ratio that brought the shadows in *F.E.A.R* to life and made playing the game a fun experience.

The AOC F19 did very well with *Crysis*, with some good environment detail and the colours looked really crisp. *F.E.A.R.* wasn't as good because of its problems with reproducing accurate shadows – it doesn't do as well with lower intensity shades. The Samsung D190 has a good contrast ratio, but the resolution of 1360 x 768 is not perfect for every type of application. The simple ViewSonic VA1928wm did quite well. Post calibration, this was one of the few displays that actually seemed to have cooler looking colours, most of the other monitors seemed to look a little warmer after calibration. It's got a decent colour gamut for a TN panel, with a good rendition of green. For movies, we were surprised that it was quite good and displayed good colour and very decent contrast. There was a problem with backlight bleeding though at the top and the right side. *F.E.A.R.* looked good and with good contrast. Crysis had good colours.

Conclusion

The ViewSonic VA1928wm impressed us till we saw the price – at Rs. 8,200 it's pretty close to many 22-inch monitors. AOC's F19 steals its thunder though; a price of just Rs. 6,500 and performance that was marginally better than the VA1928wm. The F19 wins our Best Buy and we heartily recommend this monitor for anyone looking at something for movies. If you want something to game on, then the ViewSonic VA1928WM makes more sense with its 16:10 aspect ratio. For someone looking for professional monitors where colour accuracy is of utmost importance, NEC's duo of the 1990SX and the 1990FXp fit the bill, but are pricey.

Buying Guide

You Need
A high-end panel, you're a gamer with a unlimited budget and a GeForce GTX 295

We Recommend

NEC MultiSync 2690WUXi
Rs. 90,000

You Need
A large screen for gaming, maximum budget of Rs 20000

We Recommend

AOC 2434Pw
Rs. 14,500

You Need
A 22-inch panel for gaming and movies

We Recommend

AOC 2230Fm
Rs. 14,000

AOC F22
Rs. 8,800

You Need
A really affordable LCD for multimedia

We Recommend

AOC F19
Rs. 6,500

You Need
A monitor that I can use as a TV and one that has multiple connects

We Recommend

LG M237WA
Rs. 17,990

You Need
A large monitor for a photo studio - colour accuracy is of utmost importance

We Recommend

NEC MultiSync 2690WUXi
Rs. 90,000

NEC MultiSync 2490WUXi^2
Rs. 83,000

Windows 7 on USB drives?
While there is no official word yet, there are rumours flying around that Microsoft will offer Windows 7 on USB drives, as many netbooks do not have optical drives

USB 3.0 starts shipping
LucidPort has started shipping ports for the new standard, USB 3.0, called USB300. The port offers ten times the speed of USB 2.0

Memory Madness

Flash memory is a market of plenty, and that's where the problems begin...

Agent001
agent001@thinkdigit.com

I'm usually out looking at prices for a wide range of technology products, and often come across some great deals that I inform you of in my regular column. Recently, I started getting a lot of mails asking me about buying advice for flash memory. Now this is a very, very important segment. Think about it – although we've tested everything from a Rs. 2,000 phone to a TV that costs Rs. 20 lakh – with quite a few tasty graphic cards, PMPs and speaker sets thrown in, it's categories like this that most of you will buy on a more regular basis. The real CD killer, flash memory is the reason we can all carry about GBs of data in our pockets, or in our phones. With megapixel ratings on cameras climbing constantly, even those with entry-level shooters need to have large capacity flash memory.

Size isn't everything

My apologies for the cliché, but with all types of data storage mediums, this is quite a valid statement. As you know, even entry-level phones are capable of audio and video playback, and the amount of data we want to carry with us is measured in GBs now, instead of MBs. How well your phone performs is dependent on the speed of the flash memory it's reading from and writing to. Even when it comes to the "thumb drive" segment, most of us expect to pull out our drives, plug it into a friend's box, and copy his entire music collection – quite illegal, but that didn't stop you before, did it? Like most crimes, you want this little caper to be done with quickly, and don't want to be sitting around waiting an hour for all this to copy, do you?

Of course, size isn't nothing either, because at the end of the day, we all want to carry our precious data, and are willing to compromise on speeds. So why not just buy a USB hard drive? Because not all of us want that much storage, or are willing to carry around bulky (by comparison) hard drives. Flash drives are truly portable, and memory cards just fit into devices that you're already carrying.

We've never tested memory cards before at Digit, so this was a really interesting few days for us. We also decided only to test high capacity flash drives, because the falling prices have made eight GB (and larger) drives very affordable, and rather enticing as well.

Flash drives

Setting the cutoff at 8 GB and above, I ended up with 10 high-capacity flash drives in my hands. Although there was a variety in prices of these drives (Rs. 1,100 to Rs. 15,591), I decided to stick to my original plan and categorise them according to size, and not price. This is because when it comes to portable flash memory, your storage requirements dictate what you go out and look for. You're more likely to decide that you want or need an 8 GB drive, and then look at all the options you have. Of course some will still set a budget, and then get the most storage they can, even buying unbranded Chinese drives because they're cheap. This article is not for those people however, because any self-respecting Digit reader knows the value of performance, quality and

Wackiest USB drives in the markets

warranty, and is willing to spend a little more to get some peace of mind.

I divided the flash drives into three categories: 8, 16 and 32 GB. Unfortunately, one of the drives, the 16 GB Corsair Flash Voyager GT, was obviously faulty. One would assume it would outperform its cousin, the Corsair Flash Voyager, by a mile. When testing, however, this drive gave us the lowest scores of all the drives in the test, and we just had to leave it out. We'll try and make sure to get another GT and include it in our Bazaar section in the near future.

Anyway, back to the test. Although, like a good little reviewer, I did use HD Tach to test all storage components we received, the scores are often very deceptive for flash memory. HD Tach is specially coded to bypass operating system overheads, and checks for read and write speeds from different areas of the drives. This is generally needed for drives that have spinning parts, where read and write speeds vary, based on how far the sensor is from the centre of the platter. HD Tach also works best on non-formatted drives on Windows XP, but we decided that our test rig should run Vista because of the high rate of adoption (forced, or otherwise) that Vista now has; and we couldn't delete all formatting information on the flash memory. For those of you interested in soft scores, we've retained them for the Flash drives, but not included them in the decision making process.

8 GB

Plump portables

This is probably the most popular category right now, because of the drastic fall in prices, and the numbers show. We had a drive each from Apacer, Corsair and SanDisk, and two from Kingston. Before I get into the reviews, I should point you to the tables, because that's where you will find all the numbers. The reviews below will give you the information that the numbers cannot.

SanDisk Ultra Cruzer Titanium

The 8 GB segment seems to have the most variety, in terms of looks, with quite a few eye-catchers here. By far the one that stands out the most is the SanDisk Cruzer Titanium. This slick looking, shiny silver drive actually has a titanium casing that SanDisk claims is "crush-resistant". Obviously I haven't tested this particular quality (and continue to fight my desire to run it over with a car), but it does feel really sturdy.

In terms of performance, this drive had the best assorted read speed, clocking in at an average of 24.4 Mbps – transferring 4 GB of assorted data in just 168 seconds. Now this is impressive, because all drives seem to slow down considerably in our assorted file transfers – all except this one, though. However it did get beaten in the three other tests, by Kingston's HyperX.

The only grouse I have with the build quality is the plastic slider mechanism, which although it feels as sturdy as any of the other sliders, just does not sit well with the rest of the body construction. A nice metal slider would just make this the perfectly built drive. That said, the plastic slider's quality is top-notch. My personal preference is towards non-slider flash drives, but the Ultra Cruzer has forced me to rethink that.

In terms of software support, this drive pretty much has everything you need – the U3 platform assures you of this. If you're the clumsy type, this is a must buy, because it feels like nothing but a frustrated fling at a concrete wall could scratch this beauty. It's price of Rs. 1,449 is surprising, because it looks more expensive. When you consider the performance you get for such a low price, it's the obvious pick for our Best Buy award.

BEST BUY digit AUGUST 2009

SanDisk Ultra Cruzer Titanium

Corsair Flash Voyager

I'll be honest, I was actually looking forward to reviewing this drive's bigger brother – the Voyager GT. That drive was fried, sadly, so I popped open this one's packaging. This drive is distinctive, and looks good. The black and green look suits it. As soon as I picked it up, I could tell that this drive is built solidly, with a soft rubber sheath. The rubber quality seems pretty good, and, apologies to the Corsair guys, but I just had to drop test this one. To answer the questions that some of you might have: yes, it does bounce; a little oddly, like a crazy ball; and is a real joy to play hacky-sack with. That should tell you all you need to know about its build quality. Funny how the Voyager kept functioning normally after all my abuse, and the Voyager GT didn't work out of the box!

Corsair Flash Voyager

HOW WE TESTED

Test Rig

For both tests, we used a PC running Windows Vista Ultimate, with only the essential services running, with the following configuration:

Intel Core2Duo E6700
2 GB AData DDR2 RAM
Seagate 7200.11 500GB
Gigabyte GA-965P-DQ6

Flash drives

All flash drives were connected to the test PC on the same USB port. Because you can't delete a flash drive's partition data like you can on a hard drive, you can't run HD Tach's write test, but this is really no big loss, because HD Tach proved to be a better indicator of internal hard drive speeds, and not so much for USB drives. Also, once the tests were run, it became apparent that HD Tach rarely mirrors real world results. If you look at the comparison table, you will notice that the HD Tach scores are pretty much identical across the board, with all drives offering similar results. However, the real world tests give very varied results. We've preserved this information for the curious amongst you, but have not really given any importance to anything but real world tests and build quality.

Since these are all large capacity flash drives, we formatted all of them to the NTFS file system, and used 4 GB of assorted and sequential data to test them. This was done because, when you have between 8 and 32 GB of storage space, you're going to use this for large movies or videos, and will often find yourself transferring GBs of data to and from the drive.

Memory Cards

This one's even simpler to call. All that matters here is real-world performance, and price. There are no features, build quality or anything else to speak of. We used a Kingston Media Reader to conduct the tests on all of the cards. Since the memory cards ranged from 1 GB to 32 GB, we used test files that were 512 MB in size. There were 2 basic tests that we ran – assorted and sequential – and we noted down scores for read and write for each test. We were careful to restart the test rig each time we finished one test, because we didn't want the small test files to be cached in memory.

You will experience this when transferring files to your memory card, and then copying them back to the PC – you will get transfer speeds of over 190 Mbps, because it's writing directly from memory to the PC hard drive. So don't get fooled into believing that your memory card is capable of such speeds if this happens to you.

We ran each test multiple times, and only if the results differed by less than five per cent, they were logged. This is done to ensure that operating system overheads are nullified.

Interpreting the scores is not that simple however, because of the usage scenarios of these cards. A detailed explanation is provided in a box next to each category.

	Flash Drives								
	Brand	**Corsair**	**Kingston**	**Kingston**	**Apacer**	**SanDisk**	**SanDisk**	**Transcend**	**Kingston**	**OCZ**
	Model	**Flash Voyager 8GB**	**Data Traveler HyperX 8 GB**	**Data Traveler Vault Privacy 8GB**	**AH522 8GB**	**Ultra Cruzer Titanium 8GB**	**Ultra Backup 16GB**	**JetFlash JF V30 16GB**	**Data Traveler 150 32GB**	**USB ATV 32GB**
Features	Formatted Capacity	7.53	7.46	7.46	7.46	7.48	14.93	14.96	30.05	29.7
	Software features	NA	NA	Security, Encryption (DataTraveler Vault Privacy)	NA	U3	U3 + Backup button	JetFlash Elite (Email, Favourites, AutoLogin, SecretZio, Data Backup, PC Lock)	NA	NA
	Visual indicators like LED etc.	LED (blue)	LED (blue)	LED (blue)	LED (blue)	LED blue	LED (Orange)	LED (blue)	LED (blue)	LED (Orange)
	Other accessories provided	USB Extension, Strap	Lanyard	Lanyard	NA	Tiny key ring	NA	NA	Lanyard	OCZ Key chain
Build Quality	**Sturdiness (So10)**	8.75	8	7	6	8.25	5.25	4.25	6.75	9.25
Performance	**HD-Tach 3.04 (Synthetic test)**									
	Random Access Time (ms)	0.4	0.8	0.8	0.7	0.5	0.7	4	1.9	1.9
	Average read speed (MBps)	32.8	34.5	30.5	31	31.9	25	19.2	32.8	30.7
	Read Burst Speed	35	35.1	32.8	31.9	32.9	26.3	23.8	35	31.8
	CPU Utilization (per cent)	12	14	10	10	10	8	6	17	5
	File Transfer Tests - 4 GB (NTFS)									
	Sequential Write (s)	836	183.7	325.7	383	260	331	424.4	231.2	597
	Sequential Write Speed (MBps)	4.90	22.30	12.58	10.69	15.75	12.37	9.65	17.72	6.86
	Sequential Read (s)	134	126	135	140	134.8	167	290.5	131	144.1
	Sequential Read Speed (MBps)	30.57	32.51	30.34	29.26	30.39	24.53	14.10	31.27	28.42
	Assorted Write (s)	1044	296.5	541	590.7	502.4	1127.3	581.4	442	1377
	Assorted Write Speed (MBps)	3.92	13.81	7.57	6.93	8.15	3.63	7.05	9.27	2.97
	Assorted Read (s)	363.5	196.8	201	165.7	168	245	322.6	176	800.7
	Assorted Read Speed (MBps)	11.27	20.81	20.38	24.72	24.38	16.72	12.70	23.27	5.12
	Price (Rs.)	**1,100**	**3,633**	**15,591**	**1,299**	**1,449**	**2,499**	**2,500**	**5,499**	**3,900**

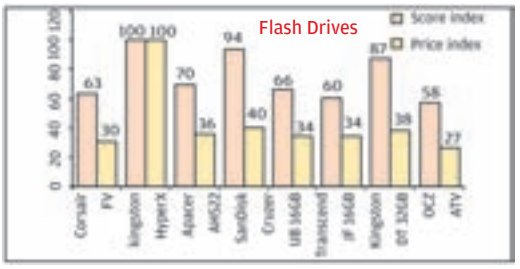
This drive gives you the most formatted capacity, and even though it's a mere 50 to 70 MB more space compared to the others, that's still commendable. Unfortunately, that's where all the praise for this drive stops. Yes, it is the cheapest drive in the test at a mere Rs. 1,100, but do you really want to be sitting around for over 17 minutes waiting for 4 GB of assorted data to copy?

I should tell you that I did a lot more drop testing with this drive after being bored to death waiting for the tests to finish. Those of you who really don't care about transfer speeds, and are more interested in a drive that you can be careless with, this might make a decent buy. It's not an expensive investment, thankfully, and market prices should be even cheaper!

Kingston Data Traveler HyperX

Kingston's HyperX nomenclature is usually associated with system memory, and we've used our fair share while testing other products. Anyone who's followed Kingston products knows that anything HyperX is usually its fastest product in that segment. As soon as I saw the box, I knew this had to be one of the drives I tested last. The reason for that is because if I tested the fastest drives first, I'd fall asleep waiting for the more run-of-the-mill ones to complete tests. So, was this drive the fastest in the test?

Kingston Data Traveler HyperX



For all flash drives, I ran all tests thrice, to omit any OS overheads that might affect the scores. For the HyperX, I ran the tests five times, just to be sure, and didn't mind at all, because it just breezed through everything I threw at it – most noticeably taking a mere 296.5 seconds (under 5 minutes) to complete the assorted write test. In fact, I even found myself looking at the test files again to check whether they were actually 4 GB in size.

The drive is made up of a metal/rubber mix, which feels pretty sturdy. The drive connector is the sliding type, and the slider mechanism seems top notch. The blue HyperX look is cool for uber geeks who want to show off to their buddies. With the fastest scores in all but the assorted read test, you can be sure of showing off its performance even more than the branding.

So is there anything bad at all about this drive? As usual, price plays spoilsport. At Rs. 3,633, this is the most expensive normal use drive (read the next review to understand this) in the 8 GB category. You do get what you

Calvin Klein USB Shades

The old routine of putting on your shades if they are off and pulling them off if they are on just got another step thrown in. Take off an arm, and slip it into the computer, transfer some data, and then continue with the routine.

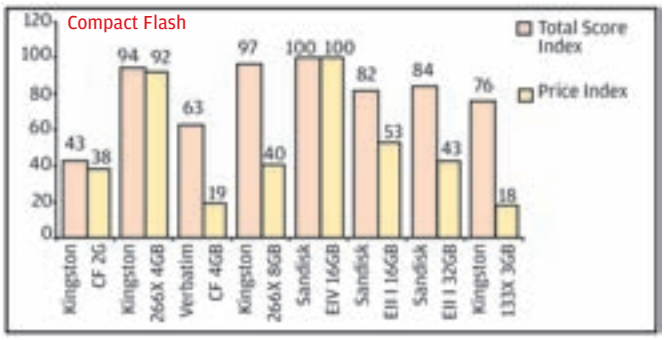
pay for though, and this drive is our Best Performance winner, across categories, by miles. If you're impatient like I am, don't even think of buying another drive.

Kingston Data Traveler Vault Privacy

Kingston Data Traveler Vault Privacy

To explain the comment in the previous review, this drive is most certainly not for "normal use". Corporate employees, those handling sensitive data and conspiracy theorists rejoice. This is a drive that's made for one purpose only, to keep your data secure. Probably aimed at government and department of defence personnel, this drive features 256-bit AES hardware encryption; to put that in perspective, most banks feel 128-bit is good enough for financial data transactions.

With features such as automatic drive formatting after 10 intrusion attempts, enforced complex password protection, an aluminium casing and the ability to stay safe up to four feet underwater, you know Kingston means business with this product.



So how does it perform? Surprisingly, in spite of all the encryption and security features, this drive is no slacker. It's actually faster than the Apacer and Corsair Voyager, which is commendable.

At a price of Rs. 15,591, this drive can hardly be considered affordable. It's not meant for the everyday user at all, but if you're used to carrying a lot of confidential data, this is one of the very few options you have. Hopefully, market prices are lower, and falling prices of flash memory might make this drive more affordable in the future.

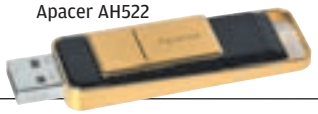
Apacer AH522

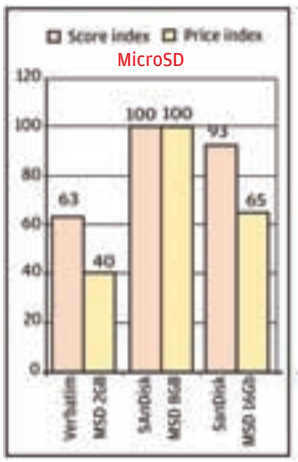
Apacer is targeting the executive class with this drive. The golden sheen is derived from a "zinc alloy and electro-polished components", or so says their site – I'm no metallurgist.

The metallic body gives this drive a sturdy feel, and the capless design means that the USB head is hidden beneath the gold exterior. However, the slider mechanism doesn't feel as sturdy as, say, the SanDisk Cruser Titanium, or the Kingston HyperX. In all fairness, though, at a price of Rs. 1,299, I really shouldn't expect any better.

In terms of performance, this drive seems to have a split personality. It's better than the Voyager on almost all counts, and I don't think it's fair to expect to compete with the other three. This drive is the better of the two budget drives, and is actually the fastest drive across all categories in the assorted read test. I tested and re-tested to ensure this wasn't a freak occurrence, and those of you who read a lot of small files from your flash drive might want to consider this as an option. For those on a budget, this drive will give you better performance results than the Voyager, and for just a few hundred more – maybe even less if you consider market prices.

Apacer AH522





16 GB
Fat flash

Falling prices have made this a very affordable category, while rising data usage has made this category pretty popular. Perhaps as little as 6 months or a year down the line, I expect these to be the hot favourites.

SanDisk Ultra Backup 16 GB

SanDisk Ultra Backup 16 GB

SanDisk targets the Ultra Backup at those of us who have important data to backup. Available in 16, 32 and 64 GB versions, this drive features a dedicated backup button that's meant to make life easier. This is another capless (slider) design, and has a plastic body that seems rugged enough to withstand the occasional fall. It's not rugged enough to handle much more than that though.

The advantage of the plastic is that this drive is extremely light, and my dislike of moving parts on flash drives seems justified here, because the slider mechanism feels like cheap plastic.

Off topic for a bit, the reason I hate slider designs is because invariably, I have seen them go kaput. There's nothing more irritating than struggling to reach behind a cabinet to find USB ports, whilst holding down the broken slider mechanism of your flash drive so that you can connect it without pushing the USB head back into the body. The lack of moving parts makes flash drives what they are.

Coming back to the drive, it's U3 capable, and also features optional 128-bit hardware encryption. Hardware encryption ensures that there's minimal loss of speed in the name of security. The software bundle includes a backup software that can do one touch backups, live backups and even backup versions of the selected files.

In terms of performance, the drive does pretty decently with sequential data, but coughs and splutters with assorted data. Considering that most people who would want to use a backup drive would write assorted data to it, the fact that it was the second slowest in the assorted write test is a dampener.

Weirdly enough, in a category where we never thought it possible, it's the good software that makes us want to recommend this drive. Priced at Rs. 2,499, this drive is a cheap buy, especially when you consider that it can do one-touch backup.

Transcend JetFlash 16 GB

This has got to be the plainest looking drive in the test. Like a blast from the past, this flash drive's design is simple, but also comes with the drawbacks that other manufacturers have been trying to rectify. For starters, the plastic body is just too flimsy to be considered sturdy enough to handle a fall. In fact, the plastic feels like it might crack under the slightest pressure from your thumb. The cap mechanism is also ancient, and those who buy this drive are surely going to lose / misplace their caps at some point in time.

This vanilla drive is actually Re. 1 more expensive than the SanDisk Ultra Backup, and I cannot, for the life of me, figure out why. It's slower than the SanDisk UB16 in every test, save the assorted write speed test. That's more to do with the faults of the SanDisk

Transcend JetFlash JF V30 16 GB

SuperTalent Picox
Buffalo, one of the leading memory solution companies, has released 5 mm long USB drives, which still manage to pack in 16GB of memory – housed in the plug itself

IronKey Protection
IronKey offers military grade protection on its USB drives to consumers. It has released a new series of USB drives, in the $200 range, which use a technology known as cryptochip to secure the data

UB16 than with the Transcend.

Continuing the trend, this drive is also rescued by its software. The JetFlash Elite software can take care of backups, email, favourites, 128-bit encryption, and PC locks. The Transcend is available for an MRP of Rs. 2,500, though market prices should be a lot cheaper – half that at least. Based on the MRPs, it would be ridiculous to choose this drive over the SanDisk Ultra Backup; however, you're going to have to consider the market prices.

32 GB

Obese options

This segment is targeted at all those of you who just have to have tonnes of space, or carry a lot of data around with you. With 64 GB drives coming out, expect prices here to fall steadily.

OCZ ATV 32GB

This segment interests me the most, because I use a lot of portable applications, and just have to carry my email and work around with me. The OCZ ATV demands attention, with a black and blue rubber body. The rubber is hard and feels durable, and acts like a shock resistor. The rubber is also specially designed to make this drive waterproof – something I tested by holding it under a running tap. The rubber is like a duck's back, with no water clinging to it, and a quick wipe on my jeans almost completely dries it. Although I did want to chuck it into a bucketful of water for about an hour, I resisted, mainly because I still had to test it.

OCZ ATV 32GB

I'm assuming that ATV stands for all-terrain vehicle, and this drive certainly is one. Like the 8 GB Corsair Voyager, I played hacky-sack with this one too (after testing it), and although it doesn't bounce as much, or as weirdly, as the Voyager, the ATV still stands tough. It's by far the best built drive of this test.

In terms of performance, however, this is more a Hummer than a Ferrari. The assorted tests especially kill this drive – like a Hummer it probably needs a lot of refuelling pit stops between file transfers. This drive was the slowest across all categories for the assorted read and write tests. The sequential tests didn't reveal much better results, with the drive yielding the second slowest write time and third slowest read time.

What this drive does offer, however, is the lowest cost per GB of storage. At Rs. 3,900, you're going to be hard pressed to find a drive of this capacity for any cheaper. So if you want something that will last a lifetime, really cheap, and don't mind spending half that lifetime waiting for transfers to finish, this drive is worth a look at.

Kingston Data Traveler 150 32 GB

This is a weird looking drive, with a very odd colour. It's got a tiny honeycomb pattern that's somewhere between red and orange. Depending on the lighting conditions, this drive looks either orange or peach – not my favourite fruit colours. The body is hard plastic, and seems to be durable, though I bet I could crush the plastic by pressing really hard. The drive has a cap holder design on the back, and a key ring, which seems only limited in its usefulness. Overall, it's one of the better built plastic drives, but I'm still personally biased towards rubber or metal.

All this negativity stopped when I connected the drive up and started the tests. It's not the fastest in any of the tests, but it's a very consistent performer. Across the capacities, it's beaten only by the Kingston HyperX in the sequential tests and the assorted write, and comes in third in the assorted read tests, behind the Apacer AH522 and the SanDisk Cruzer, respectively.

Kingston Data Traveler 150 32 GB

Although not as cheap, in terms of price per GB as the OCZ, it's still pretty good value for money, especially when you consider its performance. It marginally lost out to the SanDisk Cruzer as the value for money pick, because of the lack of a software bundle and capabilities. It's a good standalone drive though, and wins the Editor's Pick award, because this editor feels that a 32 GB pen drive is a must have.

Memory cards

Almost every device, these days, use memory cards to enhance their data storage capacity. From mobile phones to digital cameras, and some PMPs to hand-held console devices, everything needs memory cards these days.

For this test, we received memory cards in four categories: Compact Flash, Micro SD, SD and Memory Stick Pro Duo. These four categories pretty much cover every type of memory that you might need for a modern gadget.

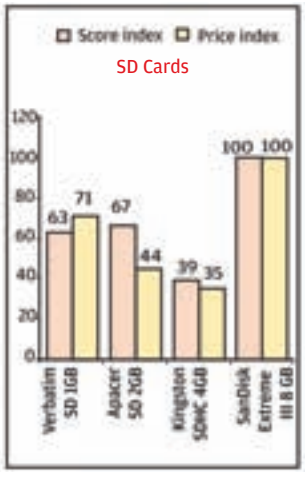
Compact Flash

Mostly used in digital cameras, Compact Flash (CF) seems to offer the best performance of the memory cards. We received 8 memory cards for this test: four from Kingston, three from SanDisk and one from Verbatim.

I'm only tested one parameter, and that's real-world performance. The CF cards Digit received ranged from 2 GB to 32 GB, and my tests showed that although read speeds are quite comparable, write speeds can throw a spanner into the works. Interestingly, since the most common uses for these cards are in copmact digital cameras and dSLRs, write speeds become more important as the megapixel count goes up. With 10 mega pixels almost the norm these days, at least the sequential write speed for the card becomes very important. I ensured that I scored the cards accordingly, giving more importance to sequential speeds than assorted speeds.

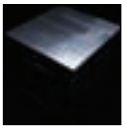
The fastest card overall was the SanDisk Extreme IV CF 16 GB. The two Kingston brothers, the Ultimate 266X 4 GB and 8 GB were a very close second and third. The SanDisk Extreme IV gets the Best Performance award in the CF category.

If you look at the comparison graph, you'll notice that the Extreme IV is only marginally better than the two Kingstons. The Ultimate 266X 8 GB, however, has the bigger difference in performance and price between the two, and you'd expect it to get our Best Buy award. That's not to be though, because the Kingston



COMPACT FLASH CARDS

Compact flash cards are pretty much always going to be used in digital cameras. This means that assorted reads and writes are of less importance, because you're mostly interested in sequential writes, as your camera tries to write the image it's just clicked to the card. Even when reading (previewing images), the camera is going to try and read a large image to display on the screen – sequential again. We gave more importance to sequential reads and writes for this category.



SolidAlliance Mnemosyne

The SolidAlliance Mnemosyne is a $10,000 USB drive that is yet to be released. Despite the price, there is no plug and play feature; you have to solve an aluminium puzzle cube before access is allowed.

Memory Type		Compact Flash							
Brand		Kingston	Kingston	Verbatim	Kingston	SanDisk	SanDisk	SanDisk	Kingston
Model		CF 2GB FE	Ultimate 266X 4GB	CF 4GB	Ultimate 266X 8GB	Extreme IV Compact Flash 16GB	Extreme III Compact Flash 16GB	Extreme III Compact Flash 32GB	Elite Pro 133X 32GB
									
Formatted Capacity (MB)		1,925	3,789	3,830	7,752	15,617	15,564	31,256	30,720
Performance	File Transfer Test (512 MB)								
	Sequential Write Time (s)	85.5	24.6	64.1	24.9	22.9	30.9	27.6	35.9
	Sequential Write Speed (MBps)	5.99	20.81	7.99	20.56	22.36	16.57	18.55	14.26
	Sequential Read Time (s)	40.7	21	21.6	20.8	20.2	23.6	23.3	21.1
	Sequential Read Speed (MBps)	12.58	24.38	23.7	24.62	25.35	21.69	21.97	24.27
	Assorted Write Time (s)	177.6	33.7	116.1	36.5	38.8	47.9	52.3	87.1
	Assorted Write Speed (MBps)	2.88	15.19	4.41	14.03	13.2	10.69	9.79	5.88
	Assorted Read Time (s)	43.3	30.4	33.6	28.4	33.3	35.8	42.8	36.8
	Assorted Read Speed (MBps)	11.82	16.84	15.24	18.03	15.38	14.3	11.96	13.91
Price (Rs.)		810	3,921	800	3,435	16,999	8,999	14,499	5,999

Elite Pro 133X 32 GB has a price per GB that's just unmatched. A quick glance at the graph and you can see that although it only offers 75 per cent of the performance score (compared to the best performer), it is only about 18 per cent of the price. The Elite Pro 133X 32 GB is our Best Buy in the CF category.

I will say, however, if you're looking for something smaller than 32 GB, the Kingston Ultimate 266X 8 GB is the card you should buy – 40 per cent the price for 98 per cent the performance.

MicroSD

Used mostly in mobile phones, these tiny cards are the hottest selling right now. We received three cards in this category – one from Verbatim and two

Memory Type		Micro SD		
Brand		Verbatim	SanDisk	SanDisk
Model		Micro SD 2GB	Micro SDHC 8GB	Micro SDHC 16GB
				
Formatted Capacity (MB)		1,935	7,782	15,155
Performance	File Transfer Test (512 MB)			
	Sequential Write Time (s)	66	41.3	42
	Sequential Write Speed (MBps)	7.76	12.4	12.19
	Sequential Read Time (s)	38.6	29	29.2
	Sequential Read Speed (MBps)	13.26	17.66	17.53
	Assorted Write Time (s)	244.7	55.9	62.7
	Assorted Write Speed (MBps)	2.09	9.16	8.17
	Assorted Read Time (s)	60.8	40.1	42
	Assorted Read Speed (MBps)	8.42	12.77	12.19
Price (Rs.)		500	4,999	6,500

MICROSD

This category is mainly consumed by mobile phone users. Apart from having to read a large number of assorted files – most of our phones these days store phonebook entries, SMSes, camera images, applications, web pages, and more. However, writing to the flash drive is a rarer occurrence than reading from it. Your special ringtone, or display picture for your significant other, reading SMSes, etc., is how most people use their mobiles.

However, we cannot ignore the fact that most mobile phones these days are being used, in part, as digital cameras, and thus sequential write speeds are also important. To complicate matters further, we also use our mobiles as PMPs, and view videos on them. It's obvious that memory cards for mobiles these days are used a great deal. We consider this order of importance: assorted reads, sequential reads and sequential writes, assorted writes.

Linux to first support USB 3.0

The Linux 2.6.31 kernel, scheduled to release this August, will be the first operating system kernel to support USB 3.0. The first computers with the port are only going to be out by the end of the year though

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Contact Sheet — **Memory Comparison Test**

Brand	Company Name	Email Address	Phone Number	Web site
Verbatim	Verbatim Marketing India Pvt. Ltd.	ramesh.tuli@verbatim.co.in	91-11-46525661 / 62	www.verbatim.com
OCZ and Corsair	Tirupati Enterprises	mail@tirupati.net	91-33-22251192 / 93	www.tirupati.net
Transcend	Mediaman Infotech Pvt Ltd	sales@mediamangroup.com	91-22-43441122	www.mediamangroup.com
SanDisk	SanDisk Corporation	manisha.sood@sandisk.com	91-124-4354243	www.sandisk.in
Kingston	Kingston Technology Company Inc.	vishal.parekh@kingston.com	1800-425-4515	www.kingston.com/india

from SanDisk. This turned out to be a completely one-sided affair. The SanDisk 8 GB card out-performed everything, but the SanDisk 16 GB card offers insane value for money. The 16 GB offers 96 per cent of the performance at 65 per cent of the cost per GB. There's just no beating that kind of value for money, and the trend of larger cards upstaging the rest because of a better cost per GB continues. The SanDisk 16 GB wins our Best Buy award in the MicroSD category.

Secure Digital

The SD category had more players, with one card each from Verbatim, Apacer, Kingston and SanDisk. As you can see from the score sheet, the SanDisk Extreme III SD card just blew away the competition. However, that sort of performance comes at a premium, and although the Extreme III is our Best Performance award winner, most of you would not want to spend that kind of cash for an SD card.

The second best performer was the Apacer SD 2 GB card. This card also happens to be really cheap, and thus wins our Best Buy award. However, if you feel that a 2 GB card just will not meet your needs, the Kingston 4GB card is also a good buy. The Verbatim 1 GB card performs a lot better than the Kingston, but loses out terribly on its price per GB.

SD

These are the true multi-purpose cards. Used in everything from phones, digital cameras, PMPs, camcorders, and various gadgets and gizmos, scoring this one was a little easier, with equal importance given to assorted and sequential reads and writes.

Memory Stick Pro Duo

Made specifically for Sony devices, these are rarer cards. We received two cards from SanDisk in this category: an older 8 GB and a new 16 GB version. The difference between old and new is obvious. Although the 8 GB is slightly cheaper per GB, it performs pathetically in comparison to the 16 GB. Anyone who has to buy an MS Pro card should only consider the 16 GB variant, because, let's face it, it's future proof and faster.

MS PRO DUO

Memory Stick cards are used only in Sony devices. However, since Sony makes digital cameras, phones, and various gadgets like the PSP and PS2, this category is also scored like the SD category.

Conclusion

Remember, when you're buying memory for a device, try and gauge how that card is most likely to be used, and then make your own calculations based on the scores we provide you, so that you get the best value for your money.

Memory Type		SD			
Brand		Verbatim	Apacer	Kingston	SanDisk
Model		SD 1GB	SD 2GB	SDHC 4GB	Extreme III 8GB
					
Formatted Capacity (MB)		971		3,830	7,762
Performance	File Transfer Test (512 MB)				
	Sequential Write Time (s)	70.7	102.8	119	36.7
	Sequential Write Speed (MBps)	7.24	4.98	4.3	13.95
	Sequential Read Time (s)	37.4	38.1	56.3	29.8
	Sequential Read Speed (MBps)	13.69	13.44	9.09	17.18
	Assorted Write Time (s)	248.1	175.1	246	60
	Assorted Write Speed (MBps)	2.06	2.92	2.08	8.53
	Assorted Read Time (s)	55.1	41.6	139	46.3
	Assorted Read Speed (MBps)	9.29	12.31	3.68	11.06
Price (Rs.)		400	499	779	4,499

Memory Type		Memory Stick Pro Duo	
Brand		SanDisk	SanDisk
Model		8GB Memory Stick Pro Duo	16GB Memory Stick Pro Duo
			
Formatted Capacity (MB)		7,618	15,248
Performance	File Transfer Test (512 MB)		
	Sequential Write Time (s)	186.7	91.5
	Sequential Write Speed (MBps)	2.74	5.6
	Sequential Read Time (s)	83.3	36.1
	Sequential Read Speed (MBps)	6.15	14.18
	Assorted Write Time (s)	245	118.7
	Assorted Write Speed (MBps)	2.09	4.31
	Assorted Read Time (s)	116.5	41.4
	Assorted Read Speed (MBps)	4.39	12.37
Price (Rs.)		2,499	5,599

Subsurface scattering
The way a game engine simulates light passing through semi-transparent objects, such as crystals or ice, is known as subsurface scattering

Motion blur
Games simulate the effect of a slow shutter capturing a moving object, thus creating a visual effect of the object being blurred

Good graphics... ...better prices

For those who do not need the highest performing graphics system, but who use perhaps, semi-professional graphics, casual gaming or need an HTPC setup, we test lower cost range of graphics cards and explain how to find one that fits your needs

Kumar Jhuremalani
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It's been over six months since we last tested graphic cards and this time around we have a treat for you. This graphic card comparison test is specific to those who are on a budget of up to Rs. 7,000. However, these cards are not only for low-end applications – some of these entry level cards have been specifically created for HTPCs with a low profile PCB and passive cooling.

Also gamers need not worry as last year's high-end cards, from certain vendors, have dropped in price and NVIDIA and AMD chipsets such as the 9800GT and GTS250, andHD 4850, now fall into the price bracket of up to Rs. 7,000.

We've divided the cards into two categories based on price. The first being cards up to Rs. 5,000 and the other, Rs. 5,000 and above. Based on these categories we saw some really interesting results in the performance scores and also cooling performance from each group.

We were quite disappointed by one fact though, not a single one of the graphic cards we tested this time came bundled with a game. Surprisingly, a few of them came bundled with 3D Mark Vantage instead, giving a call to benchmarkers in the low-end segment.

There are a total of 31 cards in the first category, while the second category has a total of 15 cards.

We received a good number of cards from most vendors, and we have selected the most important or representative of these to test.

HTPC/Low end cards (Up to Rs. 5,000)

With large screen LCD TV prices dropping, we're sure many of you have, at some point or the other, planned to build an HTPC which you could use for playing HD and Blu Ray content with ease, and at the same time play games. Normally, people purchase mini-ITX form factor motherboards or micro-ATX form factor motherboards. There are specific cabinets that take the mini-ITX motherboards and these don't have enough space for full height graphic cards. For this reason, cards such as the NVIDIA 8400GS and AMD's HD4350 have been created with half-height or low

Light beams and shafts

Light beams or sun shafts are the rays of sun light that are seen around an object such as a tree. Games such as *Crysis* and *S.T.A.L.K.E.R* Clear Sky use this technique to great effect in their game scenes

High dynamic range lighting

Also known as HDR lighting, is a technique implemented in games, derived from photography, which allows a wider range between the lightest and darkest areas of a particular scene. In other words, scenes with excess brightness and contrast are rendered to look more realistic

profile PCBs. For such cards, a half height metal bracket is essential, so that it can fit into HTPC cabinets. Some of these cards have scored higher in the features section.

You will also see full height PCBs in this category, ranging from the 9500GTs to even some HD4650s from ATi, which do show a range of performance results. The main reason we have kept a wide first category is because we are targeting those users who want HTPCs and at the same time need a graphics card on a budget.

The chipsets that we tested in this category include NVIDIA's G98 (8400GS), G96 (9400GT and 9500GT), G84 (8600GT) and G92 (9600GSO), while AMD's contribution in this category includes the RV710 (HD 4350) and RV730 (HD 4650).

From the table, you will see a big performance difference between the lower-end 8400GS, 4350 and the 9600GT and HD4670, which clearly shows what you will get by increasing your budget by Rs. 1,000 or Rs. 1,500.

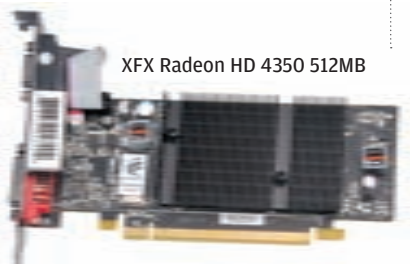
MSI N9400GT 512MB

Features

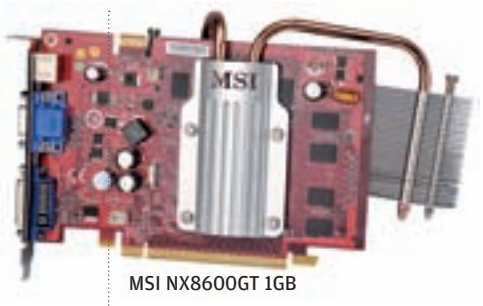
The factors that are important for graphic cards for HTPC are size, connectivity, noise and temperature. While noise and temperature is something that is important for both categories, it is more important here for the simple reason that these cards will have to survive the gruelling temperature levels within a smaller HTPC cabinet. You also don't want the machine playing your videos to drown out the soundtrack.

DVI, D-Sub and S-Video are the standard connects located on most graphic cards, but important in this category is the inclusion of an HDMI port – which is needed for connectivity to large screen displays that don't come with DVI ports for digital connectivity. The cards in this category that did come with an integrated HDMI port are the Palit GeForce 9400GT 1GB, the ASUS EN9400GT, the MSI GeForce 9500GT 512MB, ASUS EAH4550 and the ASUS EAH4650.

The ZOTAC 9400GT Zone and the 9500GT Zone were almost identical in terms of



XFX Radeon HD 4350 512MB



MSI NX8600GT 1GB

design and were both passively cooled with the heatsink stretching over the height of the PCB. The ASUS EN8400GS is also passively cooled, but unlike it's 8400GS low profile competitors, this one was full height. Not only that, but the heatsink extended lengthwise more than the PCB. The XFX Radeon HD 4350 is a low profile card and is passively cooled with slim heatsinks on both sides of the PCB.

We received two 8600GTs from MSI, one of which wasn't working. The one that did work, the NX8600GT, is also passively cooled with a very interesting design. The

HOW WE TESTED

The test rig used was:
Motherboard: ASUS P5Q3 Deluxe; based on Intels P45 chipset this is one of the best performing P45 motherboards available.
CPU: Intel Core 2 Quad QX9650 (3.0 GHz)
RAM: 2 x 2 GB DDR3 Corsair XMS3 (1333 MHz @ 8-8-8-20)
Hard drive: 500 GB Seagate Barracuda 7200.11
Operating System: Windows Vista SP1 32-bit

Benchmarks
3D Mark 06: A theoretical test for DX9 performance.
3D Mark Vantage: FurtureMarks DX 10 benchmark
Unreal Tournament III: Unreal Tournament III has been built on the Third Generation Unreal Engine and has been designed for DX9 and DX10 based systems. This game supports HDR (High Dynamic Range), dynamic shadows and per-pixel lighting which makes it a good test for graphic cards. We tested this game at 1280 x 1024 and 1600 x 1200 with Hardware Physx and Motion Blur enabled.
Prey: Prey is one of the few OpenGL based games based on the Doom 3 engine still doing rounds. This engine scales very well and makes a good benchmark particularly for lower-end cards. The resolutions we tested at were: 1024 x 768 and 1280 x 1024 with high settings.
Tom Clancy's H.A.W.X: This game is a great air-combat, dog fight based game of which the game engine has been developed in house by Ubisoft. We tested H.A.W.X in DX10 mode and this is one of those games that are great for multi-core CPUs. H.A.W.X. was tested with 2x AA and High settings at 1024 x 768 and 1280 x 768
Company of Heroes: Tales of Valor: The latest in the Company of Heroes series and is based on Relic's Essence Engine which features HDR, dynamic shadows and advanced shader effects, and makes for a very good test of graphic cards through all categories. We ran the game at 1024 x 768, with High setting, but shader quality was set at Medium. At 1280 x 1024, the high settings were maintained, but we increased the shader quality to Ultra.
Crysis: Crysis is a famous First Person Shooter developed on the CryEngine 2 by Crytek and stresses the GPU to the max. Lower end cards had a real rough time through this benchmark. The CryEngine2 supports Real Time Lighting and Dynamic Soft Shadows, Volumetric, Layer and View Distance Fogging, Subsurface scattering, HDR Lighting, Light shafts, Depth of Field and a whole lot more. Crysis was tested at 1024 x 768 with low settings and no AA and also at 1280 x 1024 with the same settings.
Crysis Warhead: The second installment in the Crysis series has also been developed by the same CryEngine 2, but as the FPS results show, do stress the graphic cards even further. Crysis Warhead was also benchmarked with the same resolution and settings as Crysis.
S.T.A.L.K.E.R. Clear Sky: The prequel to S.T.A.L.K.E.R. Shadow of Chernobyl and uses the X-Ray 1.5 game engine with features such as volumetric lighting, smoke and fire, soft water, dynamic wet surfaces, depth of field, blur and enhanced weather effects. The resolutions selected for this game were 1024 x 768 with Enhanced Full Dynamic Lighting, DX10 with High settings. We also tested this game at 1280 x 1024 resolution with the same lighting, but at low settings.
Temperature: We measured the temperature of each graphic card under idle and 100 per cent load by using Speedfan and Riva Tuner. We had to use two different programs to record the temperature because Speedfan could not record the AMD GPU temperatures while Riva Tuner couldn't record NVIDIA GPUs. To get the cards to their maximum load, we ran the S.T.A.L.K.E.R. Clear Sky benchmark in a five time loop and recorded the maximum temperature.

Graphic Card Test

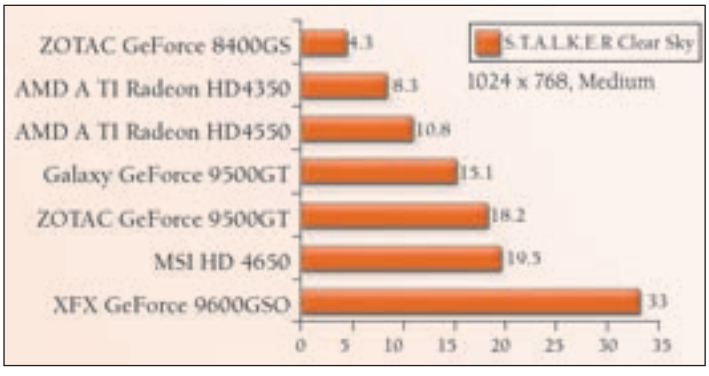
	Upto Rs. 5,000							
Brand	**GALAXY**	**ZOTAC**	**ASUS**	**XFX**	**AMD**	**XFX**	**MSI**	**ZOTAC**
Model	**GeForce 8400GS**	**GeForce 8400GS**	**EN8400GS SILENT**	**GeForce 8400GS**	**ATi Radeon HD 4350**	**HD 4350**	**N9400GT**	**GeForce 9400GT Zone Edition**
								
Price	1,600	1,700	1,875	1,900	2,125	2,200	2,300	2,500
Grand Total (Out of 100)	28.54	27.91	27.98	26.29	31.39	35.06	40.34	40.73
Features	36.8	40.2	31.2	31.2	27.2	36.8	30.2	46.2
Performance	26.47	24.83	27.18	25.06	32.43	34.63	42.87	39.36
Features								
Chipset	G98	G98	G98	G98	RV710	RV710	G96	G96
No. of Stream Processors	16	16	16	16	80	80	16	32
Core Clock (MHz)	450	450	567	450	600	600	550	550
Type of memory	DDR2	GDDR2	GDDR2	GDDR2	DDR2	DDR2	DDR2	GDDR3
Memory Clock (MHz)	800	667	800	667	1000	1000	800	800
Memory size (MB)	512	512	512	512	256	512	512	512
Memory Interface	64-bit	64-bit	64-bit	64-bit	64-bit	64-bit	128-bit	128-bit
SLI or CrossFire support (✔/✖)	✖	✖	✖	✖	✖	✖	✖	✖
Connects on card	D-Sub, DVI, s-Vid	D-Sub, DVI, s-Vid	D-Sub, DVI, s-Vid	D-Sub, DVI, s-Vid	DVI, D-Sub, S-Vid	DVI, D-Sub, S-Vid	DVI, D-Sub, HDMI	D-Sub, DVI, s-Vid
In the Box (except drivers and manuals)								
Bundled Connects and Cables	S-Vid to S-Vid		S-Vid to Component			S-Vid to S-Vid		S-Vid to Component, DVI to HDMI connector, SPDIF
Software and Accessories	1 x half height backplate	2 x half height bracket				1 x half height backplate		
Warranty	3	5	3	3	3	3	3	5
Performance								
Temperature (Idle/Load)	42 / 56	41 / 53	40 / 48	40 / 50	44 / 68	39 / 61	37 / 44	41 / 51
Synthetic Benchmarks								
3D Mark 06 (Overall)	1692	1424	1697	1481	2842	2908	3344	3284
3D Mark Vantage (Overall/GPU)	468 / 354	NA	NA	NA	NA	NA	1020 / 778	998 / 761
Game Benchmarks								
Unreal Tournament III (1280 x 1024 / 1600 x 1200)	13 / 9	11 / 8	13 / 9	11 / 8	21 / 14	22 / 15	28 / 20	27 / 19
Crysis (1024 x 768, low / 1280 x 1024, med)	26 / 7	23 / 6	26 / 7	22 / 6	49 / 15	49 / 15	49 / 36	49 / 14
Crysis Warhead (1024 x 768, low / 1280 x 1024, med)	18 / 4	15 / 4	18 / 4	15 / 3	40 / 8	40 / 8	40 / 9	39 / 9
Tom Clancy's H.A.W.X (2x AA, High - 1024 x 768/1280 x 1024)	18 / 12	14 / 9	18 / 12	16 / 11	25 / 17	26 / 18	36 / 24	34 / 24
S.T.A.L.K.E.R. Clear Sky (1024 x 768, High/1280 x 1024, Low)	4.9 / 5.7	4.3 / 4.8	4.9 / 5.6	4.3 / 4.8	8.3 / 8.7	8.3 / 9.3	9 / 10.4	8.9 / 10.2
Company of Heroes: Tales of Valour (1024 x 768-High, Shaders:Med/ 1280 x 1024-High, Shaders:Ultra)	19.6 / 7.5	18.5 / 6.9	19.4 / 7.3	16.2 / 6	35.7 / 19.1	35.8 / 19.6	38 / 13.9	37.8 / 13.5
Prey (High - 1024 x 768/1280 x 1024)	26.2 / 16.9	23.8 / 15.5	26.1 / 16.9	21.4 / 13.8	40.6 / 27.2	41.2 / 27.5	50.6 / 33.3	49.3 / 32.4

heatsink extends to the back, where many metal sheets are present; connected through two copper heatpipes. This entire setup is mounted at an angle making it rather odd, and at the same time it occupies two slots.

The ASUS EN9400GT is a low profile card and looks very similar to the ASUS EAH9550 in terms of cooling solution, though the latter has a better overall temperature.

Graphics cards from XFX usually came with X-shaped packaging, but this time we received only one card from XFX with that type of packaging – the GeForce 9500GT. The best thing about this card is that it is a low profile card with brackets provided to fit into a half height HTPC cabinet.

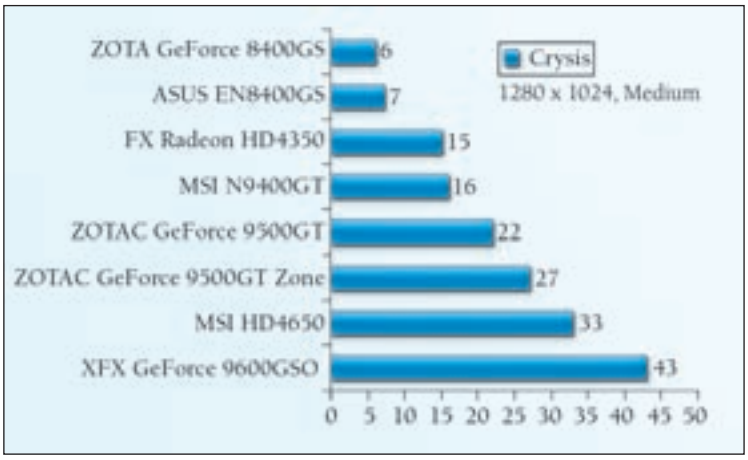
Along with the 9500GT from XFX, the HD 4350, HD 4650 and the 9600GSO come with a Door Tag that

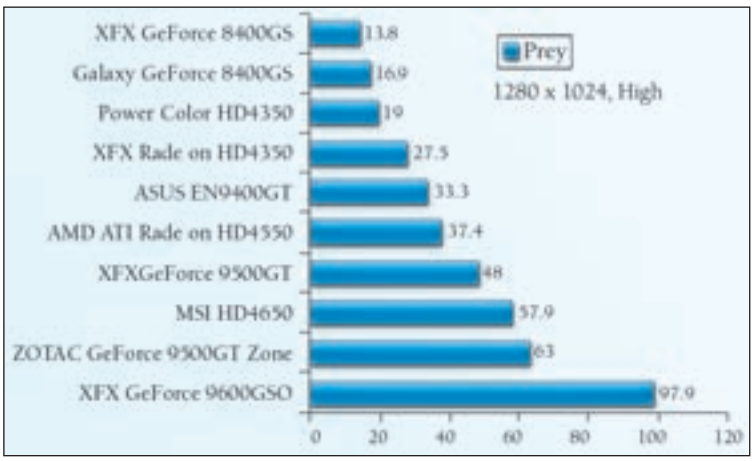


	GALAXY	Palit	ZOTAC	ASUS	Sparkle	GALAXY	AMD	PowerColor	Palit	GALAXY
	GeForce 9400GT	**GeForce 9400GT Super+1GB**	**GeForce 9400GT**	**EN9400GT**	**GeForce 8400GS**	**GeForce 9500GT**	**ATi Radeon HD 4550**	**HD 4350**	**Geforce 9500GT Super**	**GeForce 9500GT**
										
	2,500	2,650	2,700	2,720	2,790	2,900	2,990	3,100	3,250	3,500
	37.77	37.24	38.66	39.28	27.25	47.39	39.19	31.61	48.43	57.99
	32.2	31.2	37.2	44.6	30.2	34.4	27.2	27.2	34.2	45.4
	39.16	38.76	39.03	37.96	26.52	50.64	42.18	32.71	51.99	61.13
	G96	G96	G96	G96	G98	G96	RV710	RV710	G96	G96
	16	16	16	16	16	32	80	80	32	32
	550	550	550	550	567	550	600	600	550	550
	DDR2	DDR2	GDDR2	DDR2	DDR2	DDR2	DDR3	DDR2	DDR2	DDR3
	800	700	800	800	800	800	800	1000	800	800
	1024	1024	1024 MB	512	512 MB	512	512	1024	512	512
	128-bit	128-bit	128	128-bit	64-bit	128-bit	64-bit	64-bit	128-bit	128-bit
	✖	✖	✖	✖	✖	✖	✖	✖	✔	✔
	D-Sub, DVI, s-Vid	DVI, D-Sub, HDMI	D-Sub, DVI, s-Vid	DVI, D-Sub, HDMI	D-Sub, DVI, s-Vid	Two Dual link DVI, S-Vid	DVI, HDMI, Display Port	DVI, D-Sub, S-Vid	DVI, D-Sub, S-Vid	Two Dual link DVI, S-Vid
	S-Vid to S-Vid	SPDIF cable	S-Vid to Component	DVI to D-Sub, SPDIF	S-Vid to Composite	S-Vid to S-Vid, DVI to D-Sub connector		S-Vid to Composite		S-Vid to S-Vid, DVI to D-Sub connector, S-Vid to Component connector
	BadaBoom Trial			1 x half height backplate						
	3	3	5	3	3	3	3	2	3	3
	42 / 55	43 / 53	46 / 60	47 / 57	38 / 47	42 / 56	37 / 53	38 / 45	35 / 51	37 / 47
	3379	3213	3329	3303	1417	4500	3822	2109	4508	6051
	1050 / 801	982 / 748	1028 / 784	987 / 753	NA	1564 / 1199	1186 / 911	NA	1551 / 1188	2185 / 1686
	28 / 20	27 / 19	27 / 19	28 / 20	11 / 8	40 / 28	27 / 19	16 / 11	40 / 28	52 / 37
	49 / 14	48 / 14	48 / 14	49 / 14	23 / 6	61 / 22	61 / 18	37 / 14	59 / 22	67 / 26
	39 / 10	39 / 9	39 / 9	39 / 9	16 / 4	51 / 15	50 / 10	30 / 6	50 / 15	57 / 18
	36 / 24	34 / 23	36 / 24	35 / 25	15 / 10	47 / 31	31 / 22	20 / 14	45 / 30	61 / 43
	9.2 / 10.4	8.9 / 10.2	9 / 10.3	8.9 / 10.1	4.4 / 4.9	15.1 / 16.6	10.8 / 12.7	6.3 / 6.5	15 / 16.8	18.2 / 20.8
	38.3 / 14	40 / 13.8	37.3 / 31	38.1 / 14.3	18.4 / 6.7	61.6 / 22.1	41.1 / 21.2	31.6 / 16.6	57.3 / 22	66.5 / 24.7
	50.1 / 33.5	49.7 / 32.7	49.5 / 32.6	51 / 33.3	23.8 / 15.5	73.1 / 50	55.9 / 37.4	29.2 / 19	74.1 / 49.6	91.8 / 62.7

Depth of field

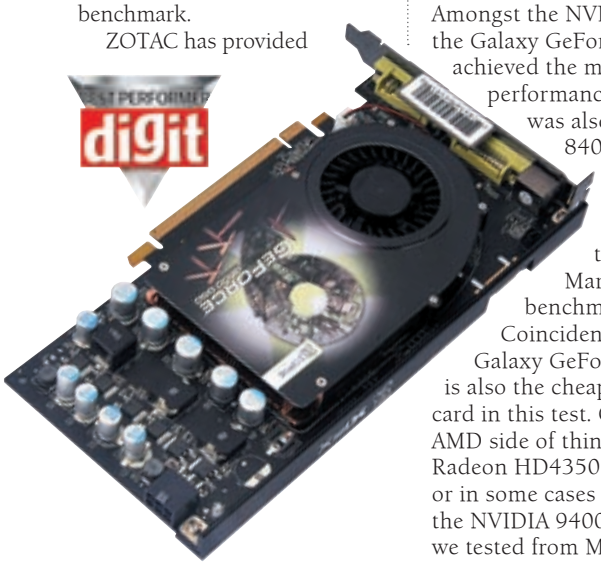
When a particular object within a scene needs to be in focus, that area is kept sharp while the surroundings retain a slight blur so that the eye will fall on that object first. This feature in games is called Depth of Field





reads either 'I'm gaming do not disturb' or 'Do not disturb I'm gaming' with images of the XFX Alpha Dog or of some weapons. The XFX GeForce 9600GSO also comes with a 3D Mark Vantage Advanced Key, you'll still need to download the benchmark.

ZOTAC has provided a 10 per cent discount coupon with the GeForce 9500GT 1GB that can either be used to purchase any five games from the NVIDIA store, or five Physx applications.



Performance

Amongst the NVIDIA 8400GS, the Galaxy GeForce 8400GS achieved the maximum performance score. This was also the only 8400GS that was able to successfully complete the 3D Mark Vantage benchmark. Coincidentally, the Galaxy GeForce 8400GS is also the cheapest graphic card in this test. On the AMD side of things, the XFX Radeon HD4350 is equal to or in some cases better than the NVIDIA 9400GTs that we tested from MSI, ZOTAC, Galaxy, Palit and ASUS. The temperature of this passively cooled card at idle was recorded at 39 degrees Celsius, but under load it went up to 61 degrees, which might cause a problem if you intend to stress out the card almost all the time.

The best performer award under this category goes to the XFX GeForce 9600GSO. The 9600GSOs come with the G92 GPU (the same used on 9800GTs) and has 96 stream processors – 16 stream processors less than a 9800GT. The GeForce 9600 GSO 512 is slightly different than this particular 9600 GSO, as it differs in the number of stream processors (48), and uses 512 MB DDR3 memory instead of the DDR2 that comes with the standard 9600 GSO. Also, unlike the 9800GT, this graphic card comes with DDR2 memory instead of DDR3. With XFX's slim cooling solution, the card kept cool at 54 degrees Celsius under load and 38 degrees Celsius at idle. There were a few problems we encountered with this particular piece though – it caused the test PC to crash a couple of times when we were trying to run the Tom Clancy's H.A.W.X benchmark at 1280 x 1024 resolution, and the next problem that we faced was the excessive noise from the fan. This could have been a problem with only this particular card and not the whole line.

The next best performers were the ZOTAC GeForce 9500GT Zone Edition and very close to that was the MSI HD4650.

The XFX GeForce 9500GT, with 512MB DDR2 memory, being a low profile card, performed on a par with other 9500GTs with similar configurations. The only doubt we have with this particular card is the cooling solution as the temperature under idle was 43 degrees, but under load went up to 69 degrees Celsius, but the outer body of the cooling provided was cool to the touch.

The ASUS EAH4550 was another low profile card which performed on a par with the AMD 4550, but at the same time it did better than the 9400GTs, but could not match up with the 9500GTs.

Mid-range graphic cards priced at Rs. 5,000 and above

Now for those of you who thought they had to spend a bit more on a graphics card., the NVIDIAs s, 9800GTs GTS250, and ATi's HD 4850 can now be purchased within this price bracket albeit

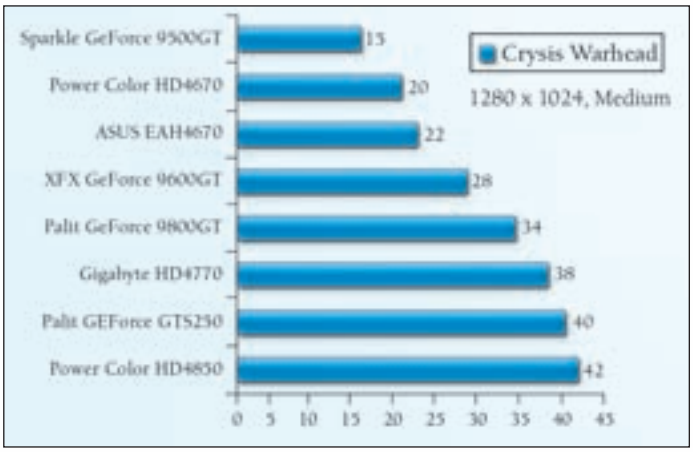
HTPC LIMITATIONS

The main limitation when setting up an HTPC is the lack of expansion slots on the motherboard, since the motherboard is most likely going to be of the mini-ITX form factor. Some motherboards come with PCIe x16 slots – in that case you need not worry about what type of card to purchase. But there are some motherboards which come with either a PCI slot or a PCIe x1 slot as the only option for expansion. No need to get too worried, as even in such cases there are graphic cards that can come to your aid as you have a few cards based on PCI and PCIe x1 slots.

We received two such cards from TAG (Technology and Gadgets) based on the 8400GS, and though the benchmark results are mentioned in the table, we haven't included them in our comparison for the simple reason that they are on a different interface, which will be affecting the scores. The TAG 8400GS PCI card is priced at Rs. 3,500, whereas the TAG 8400GS PCIe card is priced at Rs. 5,000 –this is a premium for something that you could get for less than half the price, but since these are not the regular cards, the cost goes up.

Dynamic shadows

In older games such as Quake 3, shadows used to be preset for each character and map, but with dynamic shadows, the shadow created by any object or character in a game gives a more natural look and changes according to changes in the environment



from vendors like Palit and PowerColor and ZOTAC. The 9600GTs, 9800GTs and even a GTS250, can now be purchased within this price bracket. The 9600GTs are based on the G94 GPU, whereas the 9800GTs and the GTS250s GPU codename is the G92.

From AMD, in this category, we have HD4670s based on the RV730 GPU, a single HD4850 and an HD4840 with the RV770 GPU, and HD4770s with the RV740 GPU. ATi's HD4770 is the world's first graphics card based on a 40nm GPU (RV740).

Features

Since these cards aren't really meant to fit into HTPC cabinets they tend to have larger form factors. Power connects are an important factor here. There were some 9600GTs and 9800GTs that require 6-pin PCIe power connects, while others such as the ZOTAC 9600GT ECO 1GB and the ZOTAC 9800GT ECO 512 MB, XFX GeForce 9600GT 512 MB didn't need an external power connect.

Palit GeForce GTS 250

Since this category is meant to attract gamers, another feature that's important is support for SLI for NVIDIA cards and CrossFire for AMD cards. The only card that did not support CrossFire in this category was the Power Color HD4670 1GB.

A game bundled with these cards would have been a good offer, but unfortunately it's not the case, as mentioned earlier none of the cards we received came bundled with any games.

Cooling solutions play another important role here as you will be stressing the GPU when playing games, so keeping it cool is a high priority. In this category, passively cooled cards are not really that good an option. XFX has used a cooling solution on the Radeon HD4830, which looks similar to the NVIDIA GTX series of cards, and does quite well.

Connects on the card are something that you would need to watch out for, especially if you plan to use this rig as an HTPC and don't really care about keeping it in a tiny cabinet. For that reason, an HDMI port would be an added bonus. The XFX GeForce 9600GT, Palit

PowerColor HD 4850 512MB

GeForce 9600GT, Galaxy GeForce 9800GT 512MB, Palit GeForce 9800GT 512MB, ASUS EAH4670 1GB, Palit GTS250 and Power Color HD4850 are the graphic cards in this category that come with HDMI ports.

The ZOTAC GeForce 9600GT Eco 512MB comes with a CD of 3D Mark Vantage, whereas the XFX GeForce 9600GT 512MB came with a Key for the same software. The XFX cards in this category also come with the gamers door tag; the same as mentioned in the previous category.

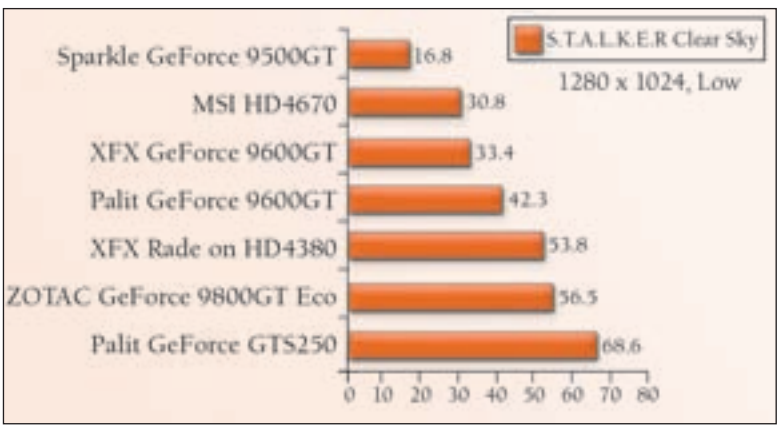
Performance

Out of all these cards, the MSI HD4670 reached the highest temperature, touching 71 degrees Celsius under load, while the coolest here was

Graphic Card Test

Brand	ZOTAC	XFX	ZOTAC	MSI	MSI	GIGABYTE	XFX
Model	**GeForce 9500GT Zone Edition**	**GeForce 9500GT**	**GeForce 9500GT**	**N9500GT**	**HD 4650**	**HD 4650**	**Radeon HD 4650**
							
Price	3,500	3,500	3,600	3,800	3,800	3,900	3,900
Grand Total (Out of 100)	58.88	45.16	51.44	49.72	56.35	52.57	50.34
Features	56.4	31.2	50	30.2	21.2	36.6	31.2
Performance	59.51	48.65	51.8	54.6	65.14	56.56	55.13
Features							
Chipset	G96	G96	G96	G96	RV730	RV730	RV730
No. of Stream Processors	32	32	32	32	320	320	320
Core Clock (MHz)	550	550	650	650	750	750	600
Type of memory	GDDR3	DDR2	DDR2	DDR2	DDR2	DDR2	DDR2
Memory Clock (MHz)	1600	800	1800	800	1000	1000	800
Memory size (MB)	512	512	1024	512	1024	1024	512
Memory Interface	128-bit	128-bit	128-bit	128-bit	128-bit	128-bit	128-bit
SLI or CrossFire support (✔/✖)	✔	✖	✔	✖	✖	✖	✖
Connects on card	Two Dual link DVI, S-Vid	DVI, D-Sub, S-Vid	Two Dual link DVI, S-Vid	DVI, D-Sub, HDMI	DVI, D-Sub	DVI, D-Sub, HDMI	DVI, D-Sub, S-Vid
In the Box (except drivers and manuals)							
Bundled Connects and Cables	S-Vid to Component, DVI to D-Sub connector, DVI to HDMI connector, SPDIF cable	S-Vid to S-Vid	S-Vid to Component, DVI to HDMI connector	DVI, D-Sub, HDMI	DVI, D-Sub	DVI, D-Sub, HDMI	S-Vid to S-Vid
Software and Accessories			10% discount on 5 NVIDIA games				
Warranty	5	3	5	3	3	3	3
Performance							
Temperature (Idle/Load)	41 / 55	43 / 69	39 / 52	35 / 48	30 / 40	35 / 49	36 / 50
Synthetic Benchmarks							
3D Mark 06 (Overall)	6143	4496	4629	4740	5518	4731	4659
3D Mark Vantage (Overall/GPU)	2273 / 1755	1573 / 1205	1608 / 1233	1677 / 1286	2353 / 1852	2056 / 1608	1987 / 1535
Game Benchmarks							
Unreal Tournament III (1280 x 1024 / 1600 x 1200)	53 / 38	40 / 28	41 / 28	42 / 29	47 / 32	40 / 27	39 / 26
Crysis (1024 x 768, low / 1280 x 1024, med)	67 / 27	59 / 22	60 / 22	62 / 23	91 / 33	81 / 29	81 / 28
Crysis Warhead (1024 x 768, low / 1280 x 1024, med)	57 / 18	51 / 15	51 / 15	52 / 16	78 / 14	67 / 13	63 / 12
Tom Clancy's H.A.W.X (2x AA, High - 1024 x 768/1280 x 1024)	61 / 44	46 / 30	47 / 31	46 / 31	53 / 38	48 / 34	46 / 32
S.T.A.L.K.E.R. Clear Sky (1024 x 768, High/1280 x 1024, Low)	18.2 / 20.7	15.1 / 16.6	15.5 / 17.1	16.1 / 18	19.5 / 19.6	16.7 / 16.1	15.8 / 16
Company of Heroes: Tales of Valour (1024 x 768-High, Shaders:Med/ 1280 x 1024-High, Shaders:Ultra)	67 / 25.8	61 / 22.7	57.5 / 22.3	64.2 / 23.6	61.7 / 37.4	60.5 / 35.3	60.2 / 32.7
Prey (High - 1024 x 768/1280 x 1024)	91.6 / 63	72.8 / 48	74.3 / 50.7	76.5 / 50.3	83.4 / 57.9	70 / 47.4	69.4 / 47.5

ZOTAC 9600GT Eco 512MB



							Rs. 5,000 to Rs. 7,000			
	MSI	**PowerColor**	**ASUS**	**XFX**	**Sparkle**	**ASUS**	**MSI**	**Sparkle**	**XFX**	**PowerColor**
	NX8600GT	**HD 4650**	**EAH4550**	**GeForce 9600GSO**	**GeForce 9400GT**	**EAH4650**	**HD 4670**	**Geforce 9500GT**	**GeForce 9600GT**	**HD 4670**
										
	4,000	4,100	4,125	4,200	4,380	4,460	5,000	5,080	5,200	5,200
	46.17	51.8	40.47	73.7	37.75	46.64	49.21	37.66	53.02	50.93
	48.6	30.4	37.2	51.1	30.2	30.2	36.4	27.2	45.7	27.4
	45.56	57.16	41.28	79.35	39.64	50.75	51.47	39.5	54.31	55.08
	G84	RV730	RV710	G92	G96	RV730	RV730	G96	G94	RV730
	32	320	80	96	16	320	320	32	48	320
	540	600	600	580	550	600	750	550	600	750
	DDR2	DDR2	DDR3	DDR2	DDR2	DDR2	DDR3	DDR2	DDR3	DDR3
	800	800	1450	1000	800	800	1746	800	1400	1746
	1024	1024	512	768	1024	512	1024	512	512	1024
	128-bit	128-bit	64-bit	192-bit	128-bit	128-bit	128-bit	128-bit	256-bit	128-bit
	✔	✖	✖	✔	✖	✖	✔	✖	✔	✖
	DVI, D-Sub, S-Vid	Two Dual link DVI, S-Vid	DVI, D-Sub, HDMI	Two Dual link DVI, S-Vid	DVI, D-Sub, S-Vid	DVI, D-Sub, HDMI	Two Dual link DVI	DVI, D-Sub, S-Vid	DVI, HDMI	Two Dual link DVI, S-Vid
	S-vid to S-Vid, S-Vid to Component, DVI to D-Sub connector	DVI to D-Sub connector, S-Vid to Composite		Two DVI to D-Sub connector, S-Vid to S-Vid cable, S-Vid to Component, 6-pin PCIe power connect	S-VID to Composite		DVI to D-Sub	S-Vid to Composite	DVI to D-Sub connector, SPDIF cable	DVI to D-Sub connector, S-Vid to Composite
			1 x half height backplate					A pen	3D Mark Vantage Key	
	3	2	3	3	3	3	3	3	3	2
	43 / 58	33 / 48	38 / 52	38 / 54	42 / 53	43 / 70	40 / 71	33 / 46	42 / 56	33 / 51
	4333	4695	3603	8331	3414	4654	8202	4604	9137	8243
	1545 / 1184	1993 / 1557	1069 / 819	3422 / 2650	1051 / 802	1976 / 1542	3687 / 2985	1605 / 1230	3741 / 2923	3565 / 2879
	36 / 26	39 / 27	26 / 18	78 / 55	28 / 20	39 / 26	73 / 51	41 / 28	84 / 61	73 / 51
	55 / 19	83 / 28	59 / 17	75 / 43	50 / 14	82 / 28	123 / 46	61 / 22	78 / 40	118 / 47
	44 / 10	68 / 12	48 / 10	64 / 25	40 / 10	62 / 12	99 / 24	51 / 15	66 / 28	94 / 20
	43 / 29	46 / 34	30 / 20	78 / 57	36 / 24	47 / 33	76 / 55	47 / 31	91 / 69	76 / 55
	13.9 / 15.9	16.5 / 16.1	10.1 / 11.9	33 / 35.4	9.2 / 10.3	15.4 / 15.9	29.6 / 30.8	15.3 / 16.8	29 / 33.4	29.9 / 31
	49.8 / 19.1	60.5 / 31.8	38.8 / 20.5	84.1 / 42.7	38.7 / 14.2	60.2 / 32.4	72.2 / 44.7	59.9 / 22	80.4 / 36.8	72.5 / 44.8
	69.8 / 47.5	71.3 / 47.5	53 / 35.8	142.4 / 97.9	51.3 / 33.7	69.7 / 47.5	134 / 92.4	75.5 / 50.5	148.4 / 102.5	138 / 94.3

BEST BUY digit AUGUST 2009

Galaxy Gforce8400GS 512MB

the Sparkle GeForce 9500GT at 46 degrees Celsius under load.

The Best Performer award in this category goes to the Power Color HD 4850 as it had the best overall scores. It did the best in Crysis and it overtook the second best performer – Palit's GeForce GTS250, due to it's cooling solution. This particular GTS 250 went up to 65 degrees Celcius.

Another interesting thing here is that the Gigabyte HD4770 and the AMD Radeon HD4770 were also able to slightly outperform the Palit GeForce GTS250 in Crysis, whereas in Crysis Warhead, the GTS250 was ahead, but ultimately did not perform better than the Power Color HD4850.

The 9800GTs did perform well and were equal in performance to the XFX Radeon HD4830. The HD4670s, on the other hand, were no match for the 9600GTs.

It's decision time

The best performer from the first category of cards, already mentioned above, is the XFX GeForce 9600GSO. The Best Buy award from this category goes to the Galaxy GeForce 8400GS, mainly due to it's low price. But, if you were

BEST BUY digit AUGUST 2009

Graphic Card Test

Brand	ZOTAC	Palit	ZOTAC	GALAXY	Palit	GIGABYTE	ASUS	Palit
Model	**GeForce 9600GT ECO**	**GeForce 9600GT**	**GeForce 9800GT ECO**	**GeForce 9800GT**	**GeForce 9800GT**	**HD4770**	**EAH4670**	**GTS 250**
								
Price	5,300	5,500	6,000	6,000	6,350	6,500	6,640	6,990
Grand Total (Out of 100)	60.13	61.2	64.27	63.77	66.25	69.02	52.23	72.79
Features	49.4	47.2	49.4	42.2	49.2	34	42.2	50.2
Performance	62.02	63.67	66.89	67.58	69.26	75.19	54	76.78
Features								
Chipset	G94	G94	G92	G92	G92	RV740	RV730	G92
No. of Stream Processors	64	64	112	112	112	640	320	128
Core Clock (MHz)	600	600	550	550	600	750	750	745
Type of memory	GDDR3	DDR3	GDDR3	DDR3	DDR3	GDDR5	DDR3	DDR3
Memory Clock (MHz)	1800	1800	1800	1800	1800	3200	1600	2200
Memory size (MB)	512	512	512	512	512	512	1024	512
Memory Interface	256-bit	256-bit	256-bit	256-bit	256-bit	128-bit	128-bit	256-bit
SLI or CrossFire support (✔/✖)	✔	✔	✔	✔	✔	✔	✔	✔
Connects on card	Two Dual link DVI, S-Vid	DVI, D-Sub, HDMI	Two Dual link DVI, S-Vid	DVI, D-Sub, HDMI	DVI, D-Sub, HDMI	Two Dual link DVI, S-Vid	DVI, D-Sub, HDMI	DVI, D-Sub, HDMI
In the Box								
Bundled Connects and Cables	DVI to D-Sub Connector		DVI to D-Sub Connector		6-pin PCIe power connector, SPDIF cable	S-Vid to Component, DVI to D-Sub, DVI to HDMI, 6-pin PCIe power cable		DVI to HDMI Connect, 6-pin PCIe power connector
Software and	3D Mark Vantage		A pen, 3D Mark Vantage					
Warranty	5	3	5	3	3	3	3	3
Performance								
Temperature (Idle/Load)	36 / 57	37 / 52	39 / 64	41 / 59	44 / 55	37 / 54	32 / 52	47 / 65
Synthetic Benchmarks								
3D Mark 06 (Overall)	10910	11005	12296	12383	12928	12297	7835	14803
3D Mark Vantage (Overall/GPU)	4998 / 3933	5108 / 4024	6143 / 4853	6223 / 4924	6589 / 5209	7624 / 6743	3500 / 2822	7710 / 6097
Game Benchmarks								
Unreal Tournament III (1280 x 1024 / 1600 x 1200)	105 / 77	105 / 78	121 / 92	121 / 92	127 / 99	127 / 98	69 / 48	148 / 119
Crysis (1024 x 768, low / 1280 x 1024, med)	83 / 46	81 / 47	84 / 50	81 / 51	81 / 51	124 / 70	119 / 44	90 / 56
Crysis Warhead (1024 x 768, low / 1280 x 1024, med)	71 / 35	70 / 36	71 / 32	71 / 32	69 / 34	94 / 38	94 / 22	76 / 40
Tom Clancy's H.A.W.X (2x AA, High - 1024 x 768/1280 x 1024)	102 / 79	105 / 82	109 / 89	112 / 91	114 / 91	104 / 89	74 / 54	128 / 104
S.T.A.L.K.E.R. Clear Sky (1024 x 768, High/1280 x 1024, Low)	37.1 / 42.1	37.3 / 42.3	49.3 / 56.5	48.8 / 56.7	52.2 / 59.6	51.3 / 58.7	28.3 / 28.9	60.2 / 68.6
Company of Heroes: Tales of Valour (1024 x 768-High, Shaders:Med/ 1280 x 1024-High, Shaders:Ultra)	83.9 / 42.4	83.5 / 42.4	84.6 / 52	84.6 / 52	84.5 / 54	74.4 / 58.1	72.3 / 43.7	84.6 / 58.7
Prey (High - 1024 x 768/1280 x 1024)	186.4 / 128.3	188.1 / 129.3	204.6 / 144.9	203.7 / 145.3	215.7 / 156.1	214.8 / 166.9	128.4 / 87.5	243.1 / 189.4

Contact Sheet — Graphic Card Comparison Test

Brand	Company Name	Email Address	Phone Number	Web site
ASUS	Rashi Peripherals Pvt. Ltd.	reponse@rptechindia.com	022-67090828	www.rptechindia.com
AMD	Aditya Infotech Ltd	sales@adityagroup.com	011-46665666	www.adityagroup.com
Galaxy	TECHNOLOGY AND GADGETS (TAG)	vikas@technologyandgadgets.com	91 -22-2382331/2	www.technologyandgadgets.com
GIGABYTE	Gigabyte Technology Co. Ltd.	Amanda.lu@gigabyte.com.tw	+886 2 89124000 ext.1571	www.giga-byte.com
MSI (for AMD cards)	Acro Engineers	saini@amigointernational.biz	09871949399	www.amigointernational.biz
MSI	Top Notch Infotronix India Pvt Ltd (Zebronics)	enquiry@zebronics.info	044-4393-6000 to 6099	www.zebronics.net
Palit	TIRUPATI ENTERPRISES	mail@tirupATi.net	09339207519	www.tirupati.net
Power Color	TIRUPATI ENTERPRISES	mail@tirupati.net	09339207519	www.tirupati.net
Sparkle	Abacus Peripherals Pvt. Ltd	sajid@abacusperipherals.com	91 22 40914603 / 40914600	www.abacusperipherals.com
TAG	TECHNOLOGY AND GADGETS (TAG)	vikas@technologyandgadgets.com	91 -22-2382331/2	www.technologyandgadgets.com
XFX	Rashi Peripherals Pvt. Ltd.	reponse@rptechindia.com	022-67090828	www.rptechindia.com
ZOTAC	Aditya Infotech Ltd	sales@adityagroup.com	011-46665666	www.zotac.com

	PowerColor	AMD	XFX	TAG	ZOTAC
	HD 4850	HD4770	Radeon HD 4830	GeForece 8400GS (x1)	GeForce GTX295
					
	6,990	6,990	7,000	5,000	Reference
	72.84	67.82	67.99	-	-
	37.2	34	50.4	-	-
	79.13	73.79	71.1	-	-
	RV770	RV740	RV770	G98	GT200
	800	640	800	16	480
	625	750	575	450	576
	GDDR3	GDDR5	DDR3	DDR2	GDDR3
	1986	3200	1800	667	1998
	512	512	512	512	1792
	256-bit	128-bit	256-bit	64-bit	896-bit
	✔	✔	✔	✖	✔
	DVI, D-Sub, HDMI	Two Dual link DVI, S-Vid	Two Dual link DVI, S-Vid	DVI, D-Sub, S-Vid	Two Dual link DVI, HDMI
			S-Vid to Component, DVI to D-Sub connector, 6-pin PCIe power connector		HDMI cable, 2 x 6-pin PCIe power connector, SPDIF cable
				2 x half height back plate	
	2	3	3	3	5
	31 / 47	39 / 56	38 / 53	40 / 50	46 / 64
	13987	12231	12574	1171	17114
	7785 / 6901	7545 / 6665	6649 / 5742	NA	20352 / 17531
	135 / 107	127 / 98	123 / 95	10 / 7	170 / 163
	125 / 69	130 / 67	122 / 63	18 / 5	122 / 69
	93 / 42	92 / 39	92 / 37	12 / 4	93 / 60
	101 / 84	105 / 87	93 / 75	11 / 7	123 / 122
	51.1 / 58.8	48.2 / 58.2	45.3 / 53.8	3.9 / 4.3	75.5 / 71.3
	74.3 / 57.5	74.2 / 57.9	74.3 / 56.7	16.6 / 6	84.6 / 59.6
	224.6 / 178.3	213 / 156.7	207.7 / 159.5	21 / 13.9	308.8 / 303

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looking for something that gives you about 40 per cent more performance at a cost of only Rs. 700 more, then the MSI N9400GT is the perfect card – it was also the next best card in terms of price and performance. This clearly shows that if you just spend a bit more, you will in practice be getting a significant boost in performance.

The best buy award from the second category of graphics cards, between Rs. 5,000 and Rs. 7,000, goes to the ZOTAC GeForce 9600GT Eco. Priced at Rs. 5,300, it packs quite a punch without the need of a 6-pin power connect, and the added bundle makes for an ideal solution for a mid-ranged graphics card.

Buying Guide

You Need

The cheapest card for your HTPC and don't really care about game performance as you will be watching movies connected to a TV through a DVI cable.

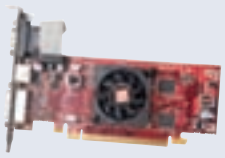
We Recommend

Galaxy GeForce 8400GS
Rs. 1,600

You Need

The most performance from a low profile card within a budget of Rs. 3,000

We Recommend



AMD ATI Radeon HD4550
Rs. 2,990

You Need

A full profile card, but at the same time don't want to spend more than Rs. 2,500

We Recommend

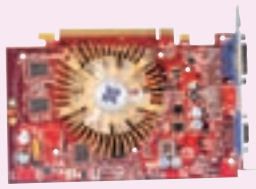
MSI N9400GT 512MB
Rs. 2,300

ZOTAC GeForce 9400GT Zone Edition 512 MB
Rs. 2,500

You Need

The best performing AMD card within Rs. 4,000

We Recommend



MSI HD4650 1GB
Rs. 3,800

You Need

The best NVIDIA graphics solution that's quiet and doesn't need a 6-pin power connect and shouldn't cost more than Rs. 5,500

We Recommend

ZOTAC GeForce 9600GT 512MB Zone Edition
Rs. 5,300

Palit GeForce 9600GT 512MB
Rs. 5,500

You Need

The best performance from any (NVIDIA or AMD) that also gives me HDMI and it shouldn't go over Rs. 7,000. Also, size and power requirements are of no concern

We Recommend

Power Color HD 4850
Rs. 6,990

Palit GeForce GTS250
Rs. 6,990

ASUS launches the X58 powered P6X58 that comes with USB 3.0 ports

Belkin launches KVM switches in India

Nokia N97

Floundering flagship?

The N97 has been a while coming. It has a dream set of specifications – a large touchscreen, impressive five megapixel camera, 32 GB of inbuilt storage with expansion, and a full QWERTY keypad. The phone itself is not too wide and will fit most palms fine. It's long, owing to the large 3.5-inch touchscreen. It's well built for the most part, the only let down being the plastic and tacky feeling battery cover. The front bezel has a finish akin to polished black granite and there are just three keys on the facia – two soft keys for accepting/rejecting calls and one button for the main menu, finished in the same burnished chrome as the outer bezel. Overall, the phone looks slick. The QWERTY slides out from the left side; upon activating the slide mechanism the screen slides upwards with a slight angle maintaining visibility even if the keypad is flat on a table; the slider looks delicate but after three weeks we couldn't detect any flaws in the slick action.

There is only so much a resistive touch can achieve, and accuracy while scrolling or even when selecting highlighted menus is not possible until you get used to the device. In short, the touch interface on the N97 is much less responsive, accurate and usable as the Apple iPhone's interface. However, Nokia has time to iron out such bugs with future N-series devices. There are a lot of applications and games bundled with the N97, including the PC game *Spore*. A nifty SMS reader reads out SMSs to you in a rather monotonous male tone. Another application, Qik, allows streaming of videos as your camera captures them – live. Unfortunately Qik needs the internet (GPRS) and does not use Wi-Fi.

The camera quality is good, slightly better than the Nokia N96 – good detail and colour and the flash is effective up to four feet. Music quality is good via the bundled headphones, but the loudspeaker is lacking. In comparison to the N95 8 GB the loudspeaker sounds slightly tinny and the richness of vocals is lost; there is also a lack of bass that makes music less enjoyable. Audio is a couple of volume notches lower than the N95. The slider tray mechanism for the SIM card is neat.

The QWERTY keypad is a mixed bundle. While key spacing is good, the keys themselves are tiny and don't give adequate feedback. Although the small spacebar placed to the extreme right may be viewed as quirky by some, we got used to this pretty soon – the key feedback and tiny size takes longer. The four-way navigation button and centre button placed to the left of the keypad is a blessing. The onscreen keyboard is well laid out and large spacing helps. The font is highly legible, though boring looking. sWith the onscreen keyboard, multiple fast key presses with predictive text disabled is tough. We preferred the keypad to the Xperia X1, though.

Call quality is impressive. At Rs. 36,166, the N97 commands a flagship price and for that price we have to say you get quite a lot of phone in terms of hardware. But it seems like the interface hasn't matured enough to keep pace with the brilliance under its hood, and using the phone leaves one with the opinion that things could be and should have been much better. Firmware updates will resolve some quirks (we hope), but Nokia needs to spend more time with the Symbian touch-based platform and move to a capacitive touch based interface.

Contact

Nokia India Pvt. Ltd.
Phone: +91-124-419 9000
Email: communications.india@nokia.com
Web site: www.nokia.com
Price: Rs. 36,166

Specifications

Symbian S60 v9.4, 3.5-inch, 360 x 640 resistive touch screen, 32 GB inbuilt storage, microSD expandable, 5-megapixel camera

RATINGS

Features	9
Performance	8
Build Quality	7.5
Value for money	7
Overall	8

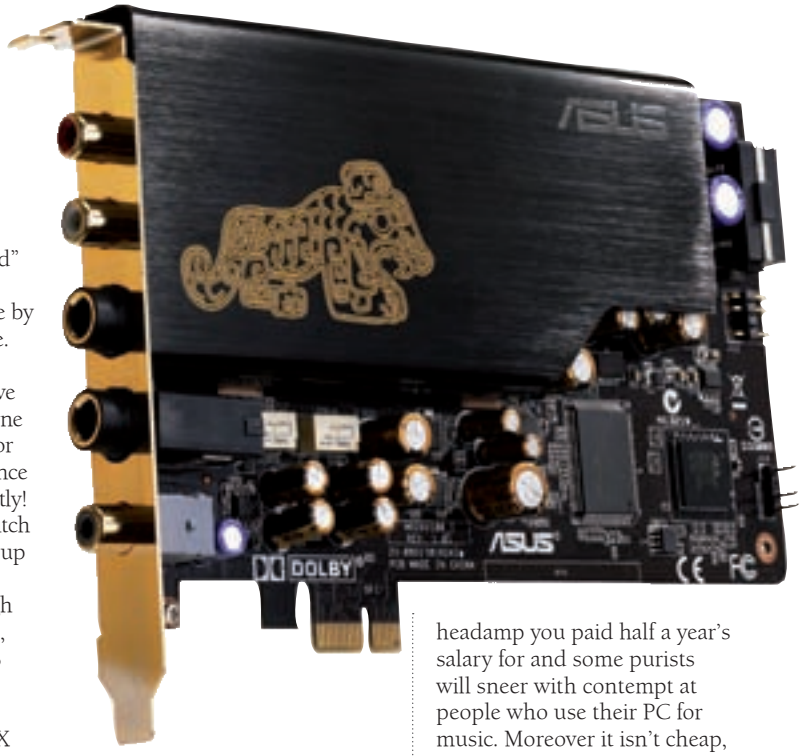
MD's new southbridge SB800 supports SATA 6 Gbps ◆ MSI's superoverclocked Cyclone Radeon 4890 card touches 1GHz ◆ CPU-Z is being developed further to

Kingston launches a 256GB pen drive in Europe

Hotmail and other Live services to have 500 GB of space

ASUS Xonar

Elixir of audiophilia?



If there's one part of the computing experience we've missed it's something really high-end for audiophiles. And we're not talking about the dime-a-dozen 7.1-channel cards. Just looking at the STX you just get the feeling of *quality*. And it's hard not to get impressed looking at its spec-sheet. The 124 dB SNR aside, the functional parts (opamps, DAC chip etc) are covered with an EMI shield. The Essence STX is built on a rather unusual four-layer PCB, ensuring excellent filtration of noise while the analogue output signal paths are also EMI shielded, ensuring that squeaky-clean signals are passed on. Additional power is required via a four-pin molex connector. This one is built on a PCIe x1 interface and ASUS has recently come out with a PCI version.

The DAC is a Burr-Brown (now Texas Instruments) PCM 1792A, considered an audiophile-grade component. beneath the EMI shield the opamps are mounted on sockets as opposed to being soldiered to the PCB. This allows swapping of opamps to alter the sound signature according to taste. Note that the Essence STX is a stereo soundcard only, therefore it's special to see not one but three stereo opamps on the card. Two opamps are the JRC 2114, considered good for audio applications. These serve as the current to voltage converters and are placed just after the DAC chip. They utilise the output of this chip and convert it, passing it on to the third opamp, the LM4562 which acts as the final buffer. Made by National Semiconductor, this opamp is quite famous and widely used by DIY audiophiles. Its claim to fame is excellent THD (Total Harmonic Distortion), quick slew rate and high bandwidth – all of these elements make for a superb choice for any discerning audience. Nichicon "fine gold" caps are used for all critical regions – a costly indulgence by ASUS and we highly approve.

Now for the fun part – this soundcard is the first one we've seen with an in-built headphone amplifier. This is good news for high-end headphone users, since headphone amps are very costly! The bundled software can switch between normal impedance, (up to 64 ohms), high impedance (60–300 ohms) and extra-high impedance (300 – 600 ohms), adding 0 db, 12 dB and 18 dB (respectively) to the gain to match headphones of varying impedances. The Essence STX has a pair of RCA outs for stereo, one 6.3 mm headphone jack, one 6.3 mm analogue input jack and a digital-out supporting both coaxial and optical connectivity on a single jack.

We tested the Essence STX with some stereo speakers first – our Genelec 6010A active loudspeakers with the 5040A active subwoofer and some SACD .FLAC rips. The imaging (soundstaging) is spot on. The bass, while ample, is not excessive and won't intrude on the mid-range. But it goes low down and does so cleanly and with nary a hint of loss of control. The mid-range is liquid and wide with lots of detail to be plucked from between notes. Male and female vocals alike sound rich and lush without being overly warm. The highs are incredibly detailed and transparent. We felt the highs were slightly overemphasised, but not inordinately so. Quite the contrary, this is just the tool for discerning listening sessions; particularly pieces with instruments have great rendition. Next we plugged in some quality cans and we're pleased to report the STX handles itself admirably – the sound is clean, without any sort of noise and very musical – the word balanced came to mind as the incredibly detailed Grado SR225 seemed to get a bit of needed bottom end grunt from the headphone amp unit. What is equally hard to miss is the immediacy of the detail, there is no unnecessary delay to notes, attacks, decay, instrument reverb – everything is spot on and tonally accurate. The Essence STX will also drive something as beefy as the Sennheiser HD 650 quite well, but not to the same level of analytical detail as a high-powered headphone amp.

We also tried the STX with games and movies, although not its forte, it handles games quite well and with very accurate imaging – something necessary for a proper gaming experience. Movies are fun too, with action scenes getting their just rewards – the Essence STX never loses control and detail and its surround imaging is superb, despite the lack of additional channels.

So ASUS finally delivered something "stereophiles" (including some of us) around the world have waited for. So what's the trade off? Well, it won't replace that Zana Deux headamp you paid half a year's salary for and some purists will sneer with contempt at people who use their PC for music. Moreover it isn't cheap, at Rs. 10,900, but then quite frankly neither is a ticket to a Pink Floyd concert. We feel it is well worth the price with its premium quality innards and audio performance. It serves a niche segment and does so exceedingly well, therefore those on the lookout for something similar won't flinch one bit.

Contact

Rashi Peripherals Pvt. Ltd.
Phone: +91-22-6709 0828
Email: response@rptechindia.com
Web site: www.rptechindia.com
Price: Rs. 10,900

Specifications

PCIe x1 interface, 2-channel, SNR = 124 dB, headphone amplifier = Texas Instruments TI6120A2, DAC = Texas Instruments PCM1792A

RATINGS

Features	8.5
Performance	9
Build Quality	9
Value for money	7.5
Overall	8.5

integrated a graphics section ◆ Microsoft starts terminating Windows 7 beta installations; Release candidate builds will continue to run into 2010 ◆ Firefox 3.7 plans

Zenimax Media takes over id software

Seagate releases 15,000RPM Cheetah 15K.7 line of drive

Razer Mamba

Ravaging rodent

Contact

Netplace Technologies Pvt. Ltd.
Phone: +91-22-4221 3901
Email: enquiry@netplacetechnologies.com
Web site: www.razerzone.com
Price: Rs. 12,000

Specifications

5,600 dpi 3.5G laser sensor, 1,000 Hz polling rate.
Dimensions: 128 x 70 x 42.5 mm

The Mamba is the fastest rodent to be made by Razer. We were dumbfounded by the 4,000 dpi resolution sensor of the Lachesis and Razer's now pushed the barrier even further. The Mamba is a 5,600 dpi mouse and it offers something that very few mice offer – wired and wireless connectivity.

The Mamba has an attractive design – it now has a battery charging indicator for the sensor sensitivity setting. Most of the mouse is covered with antibacterial coating, except for strips on the sides that grip to your palm. With the batteries, the mouse only feels a little heavier than the Logitech MX518.

A slider disconnects the USB cable while using the mouse wirelessly. When disconnected, the cable connects to the base antenna which doubles as a charging dock for the mouse. This is a very well thought out design, and is very practical.

The performance of the mouse is flawless on all surfaces – on Razer's hard eXactMat surface as well as the soft pads from Steelseries. There were no tracking issues whatsoever. At 5,600 dpi, the sensitivity is too high to be used by most gamers unless the sensitivity for Windows or in-game is turned down. Refresh rates can be tightened as well.

The wireless performance of the mouse is also impressive – it works flawlessly from a distance of well over 10 feet. There is a slight drop in performance wirelessly, though. Gamers using it with the settings turned up and sitting at a distance might notice this. .

The wireless connectivity is really useful, and nice to have in a gaming mouse but the huge dpi sensitivity increase will only by useful for a few. For most gamers, mice with sensitivities between 1,600 and 3,200 dpi is much more than enough. Despite all the great things, the Mamba's price of Rs. 12,000 is excessive in our opinion.

RATINGS

Features	9
Performance	8
Build Quality	7
Value for money	4
Overall	7

Sony Ericsson C510

Just smile

Contact

Sony Ericsson, Phone: 1-800-11-18-00 (MTNL/BSNL); 3901 1111 (others)
Web site: www.sonyericsson.com, **Price:** Rs. 12,195

Specifications

Display resolution: 320x240 pixels
Memory: Phone memory 100MB, Memory Stick Micro (M2) support (up to 8 GB)
Networks: GSM/GPRS/EDGE 900/1800/1900, UMTS/HSPA 2100
Dimensions: 107.0 x 47.0 x 12.5 mm
Weight: 92.0 g

The C510 has a candy bar form factor and comes in two colours – Future Black and Radiant Silver. We received the Future Black colour, but overall it had a blue tone to it. M2 or Memory Stick Micro cards are only supported on the C510. You would have to transfer data if you are switching from a phone that used other cards such as SD or microSD.

The loudspeaker is located at the back of the phone, towards the bottom. The back cover has a nice rubber coating which works well as a grip. The sliding camera lens cover is not very smooth and you will need to apply a little pressure at the top where there is a slight tilt and then sliding is possible.

When you slide the camera cover open, the camera is activated regardless of the keypad being locked. When in camera mode, certain keys are highlighted in blue, instead of the standard white, which are camera specific functions keys.

The camera comes with auto-focus, face detection as well as smile shutter, which is seen on most of the Sony Cybershot digital cameras. We tried out the face detection and the smile shutter. The C510 was even able to detect the smile on a picture of the Mona Lisa. The quality of the photos was good, but only considering the fact that this had a 3.2-MP camera.

The call quality of the phone was good, we did not hear any distortion on either end of the call, but when the speaker phone was used, some random distortion was heard.

With the Mega Bass Equalizer settings, music is better than you would hear on other phones.

The Sony Ericsson C510 is feature rich and could be considered a mid-range entry, but a price of Rs. 12,195 is a little difficult to justify. If this was priced around Rs. 9,000, it would be a good deal.

RATINGS

Features	8
Performance	7.5
Build Quality	8
Value for money	6.5
Overall	7.5

are already underway; plans of making it 64-bit as well ◆ Intel to launch next generation solid state drives this month ◆ Toshiba to start manufacturing Blu-ray drives

Ubisoft to develop games for Facebook

MSI to add an feature to boards that allow it automatically overclock on a press of a button

MSI GX400

Give me red

The MSI GX400 is a notebook from MSI, and this 14-inch notebook falls under its gaming series and is the smallest in that series.

The body of the GX400 is made of plastic, with the lid bright red in colour. This is the only colour variation MSI has adopted with the GX400; the rest of this notebook is black. The keyboard is squished up towards the right, with smaller uncomfortable arrow keys. Another problem is that the Fn key is the last key on the left, which is more useful for office users rather than gamers. The feedback of the keys isn't the best ever, there is no spacing between the keys either, but overall this keyboard will suffice.

The Turbo key is something you will see on MSI's notebook gaming series and is used to overclock the CPU by about 15 per cent, just by the click of a button. The Eco button has multiple presets for longer battery, office use, etc.

MSI has also thrown in an HDMI and an e-SATA port which is really helpful for those who want to connect their laptops to their LCD TVs through HDMI cables, or for those who want to have eSATA based external hard drives.

The NVIDIA 9600M graphics solution in terms of performance is similar to a desktop NVIDIA 9400GT and even some 9500GTs, which will give you good playability at lower resolutions.

The MSI GX400 at Rs. 65,000, it's pretty decent. The Dell Studio XPS 13 with a somewhat similar configuration would cost you the same, though the Dell comes with a faster processor (2.4 GHz versus 2.0 GHz). If not, then a desktop would be a better option with a better configuration and will ultimately give you better performance.

Benchmarks	Performance
PC Mark 05 (Overall/CPU/Memory/Graphics/Hard Drive)	3834 / 4120 / 3929 / 4659 / 4148
3D Mark 06 (Overall/CPU)	4306 / 1017
DivX 100 MB File Conversion (sec	120.4
Doom 3 FPS (640x480, med/1024x768, med)	91.9 / 87.4
FarCry FPS (640x460, min/1024x768, max)	158.9 / 81.3

Contact

MSI
Phone: +91-11-4175 8808
Email: marketing@msi-in.com
Web site: http://in.msi.com
Price: Rs. 65,000

Specifications

Chipset: Intel PM45 ICH9M, Intel Core 2 Duo P7350, 14.1-inch display, 4 GB DDR2
Dimensions: 332 x 243 x 33.5 mm
Weight: 2.2 kg

RATINGS

Features 7
Performance 7.5
Build Quality 7
Value for money.....7
Overall 7

Mybox HD NV-300

Almost everything you need from an HTPC!

Contact

GoDB Tech Pvt Ltd.
Phone: +91-44-4399 7700
Email: sales@myboxhd.com
Web site: www.myboxhd.com
Price: Rs. 9,990 (NV300)
Rs. 10,990 (NV300T)

Specifications

Video input: S-video, HDMI 1.1 interface (upto 720p supported), 200 MIPS C2 processor, 512 MB ROM, 128 MB RAM, 2 USB ports, 1 eSATA port, 100Mbps Ethernet port
Dimensions: 140 x 40 x 210 mm

RATINGS

Features 8.5
Performance 6
Build Quality 7
Value for money.....8
Overall 7.5

The Mybox NV300 is one of the latest devices to land on Indian shores.

The Mybox is a lot larger than the WD HD player and has no built-in hard drive as the Iomega Screenplay. It's attractive for sure, and comes with a huge fancy remote control. Two USB storage devices can be connected to it and even an eSATA drive! What's more there is a network connectivity option which lets you access network devices and computers.

The remote doesn't work very well and the interface is a little slow. There are many submenus for various kinds of content, including games and internet material.

The device only plays back up to 720p media, which makes it a little handicapped. Where the Mybox HD loses out, it makes up in features. It can record videos using the S-Video input and it can also access content on the network. The Mybox HD can play Youtube videos, online radio, access Flickr photos and even has Bittorrent support! It has a very basic web browser which is very slow and isn't exactly feature-rich.

This player is for those who want a device that can do almost everything an HTPC can, but with a much simpler and cheaper setup. At Rs. 9,900, it's an excellent price as an HTPC setup can typically cost more.

soon ◆ Call of Duty: Modern Warfare 2 to be sold with night-vision goggles; to be out later this year ◆ Samsung to launch Ion based netbooks ◆ Intel to retire the

ASUS confirms the Eee PC T101H - a touchscreen Atom based netbook with built-in GPS

BOINC, the computing network does three times more work than the world's fastest supercomputer

Sony MDR NC7/WM

Unnecessary shushing

Contact

Sony India
Phone: 1-800-11-11-88
Email: sonyindia.care@ap.sony.com
Web site: www.sony.co.in
Price: Rs. 4,490

Specifications

Supraaural, foldable headband, single AAA powered active noise cancellation.

RATINGS

Features	7.5
Performance	6
Build Quality	5.5
Value for money	7
Overall	6.5

The MDR NC7/WM has an unnecessarily long name and is an active noise cancelling headphone – the noise cancellation circuitry is battery powered by a single AAA cell. The headband armature gives the impression of being a bit flimsy, but this is no doubt the result of its folding nature.

The earcups are slightly smaller than full-size circumaurals but a bit larger than some supraaural designs like Grados headphones. However, since they don't encompass the ear entirely and the foam padding sits atop the outer ear we're classifying them as supraaural. Mind you, because they're plastic and light they won't fall off because of the loose headband.

One of the oddities we noticed is that enabling and disabling noise cancellation causes a lot of variation in the sound signature and quite frankly this should not be. In fact, when using NC, the volume level also goes up. That being said the enabling NC does drown out some small external sounds although even without this feature turned on the headphones isolate pretty well. With NC turned off we found the bass to be lacking and it's not just a lack of punch but feels anaemic overall. The highs also sound thin and shrill, and the soundstage narrows by around 30 per cent. Turning NC on brings a certain amount of warmth to the vocals while the bass, although still weak, is a bit more noticeable. The highs lose their shrill nature. Any comparisons with other noise cancelling sets are pointless since the Sennheiser PXC 450 we tested is very expensive in comparison.

But this one is not for discerning listeners, particularly since we couldn't figure out why enabling a feature meant to isolate external noise should change the way this headphone sounds. At Rs. 4,490 the MDR NC7 is priced reasonably well for a NC set, but you could buy a pair of quality in-ear monitors for the same price that would provide better sound quality.

Photographs: Manas Parekh, Jiten Gandhi

Razer Carcharias

Where's the comfort?

Contact

Netplace Technologies Pvt. Ltd.
Phone: +91-22-2422 13901
Email: enquiry@netplacetechnologies.com
Web site: www.razerzone.com
Price: Rs. 5,999

Specifications

Headphones:
Frequency Response:
20 - 20,000 Hz
Impedance: 32 Ohms, 40 mm neodymium drivers
Microphone :
Frequency Response:
50 - 16,000 Hz, 3 meters cable

RATINGS

Features	7
Performance	6.5
Build Quality	7
Value for money	4
Overall	6

The Razer Carcharias head phone has a circumaural closed-can design, with an integrated microphone. They're pretty light, and the foam cushion on the head strap rests nicely on the contours of your head. The height adjusters are smoother than most headphones we've seen. After testing the microphone we agree with its forte as a communications package – the microphone quality is quite good and it does manage to pick up, primarily your voice, without much background noise. The mic is also positioned in such a way that there is no disturbance caused by breathing or puffs of breath. There is a mic on/off switch on the cable, which comes in handy.

The pads are soft, but the pressure exerted by the device is a tad too much, especially when using it for long. On using the device for more than 20 hours, at least four hours at a time, it still didn't feel comfortable. Perhaps the headphone needs a bit more breaking in until they ease up the pressure at the base of the ear.

As far as audio quality goes the whole audio spectrum seemed narrowed. They function without any distortion even at high volume. The sound is not too bassy and we can go on about the mids and highs being repressed, but hey, lets not forget this is a gaming device. They will perform decently enough for listening to tunes, but its core function is gaming. Bottom line is that this is definitely not a device for audio appreciation. What it is however, is a thorough bred and quite expensive gaming device.

QX9775 Skulltrail processors in the third quarter of the year ◆ Flash 10 to support all mobile platforms other than the Apple iPhone ◆ PocketSurfer 3, the latest model

A disc ISO of Google's operating system Android is available for download

DiRt 2 for the PC delayed, expected to be a DirectX 11 game

Epson Stylus Photo TX700W

Just click and print

The Epson Stylus Photo TX700W is an all-in-one photo printer. The TX700W has good looks with its all black finish and stylish silver line running horizontally through the middle. The TX700W has support for memory cards, PictBridge and pen drives. Connectivity is also possible through WiFi and an Ethernet port.

The paper tray has a flap for 4R and envelope sized paper which is a tad bit inconvenient when loading paper into the normal tray. You can also print on to a CD or DVD face and the tray for this is located just above the paper tray.

Our first test image showed an overall darker tone but good detail. There are different segments within our test image, one of them being a scene with a small pond where the ripples and reflections in the water were reproduced nicely. The Combi document , consisting of text and images, showed the text to be clear but on the rougher side, and at the same time the images in the document were dull. The Epson Stylus Photo TX700W took 88.2 seconds to print our test image at the maximum quality, and 16.7 seconds in economy mode with a huge difference in print quality.

Scanning at 300 dpi took 24.6 seconds with a not so great quality result, but at 600 dpi the quality was much better and it took 48 seconds. The Epson Stylus TX700W is an overall good performer with decent print speeds as well as quality. For a printer, it doesn't beat our photo printer winner – the HP Photosmart D4568, but it was pretty close to it.

The price of Rs. 13,999 is decent for a colour all-in-one printer and this Stylus Photo TX700W does show good results, doing justice to it's price tag.

Contact

Epson India
Phone: +91-80-3051 5000
Email: think@eid.epson.co.in
Web site: www.epson.co.in
Price: Rs. 13,999

Specifications

Print Resolution: 5760 x 1440 dpi
Scanner Resolution: 2400 x 4800 dpi
Input capacity: 120 A4 sheets (Plain paper)
Built-in card slot: CF Type II, Memory Stick, SD/MMC, xD-Picture card
Dimensions: 446 x 385 x 150 mm
Weight: 9 kg

RATINGS

Features	8.5
Performance	8
Build Quality	7.5
Value for money	7.5
Overall	8

Apacer AB611

Great presentation tool

The Apacer AB611 is a wireless pointing remote, meant to be used as a presentation tool. With a tool like this, there isn't a need for a separate individual to operate the slides for you.

The design is very basic and the material used is plastic. It could have been sturdier device, though. The receiver for this wireless remote is a USB dongle, which is also a flash drive.

There is a set of six buttons in all. Four keys are used for the Page up and down function. There are keys for the left and right click but they're too tiny in comparison. It doesn't take too long to get used to this.

The performance of the device isn't extraordinary as far as smoothness of the pointer goes. We were able to control it well over 12 ft without any problems. The device has a built-in laser that can be used to point out things.

We tested the flash drive and were disappointed with the speeds. Data write speeds were around 4.3 MB/s and read speeds hovered around 13 MB/s. There was a noticeable amount of stuttering visible on the mouse pointer while using the remote with the transfers running in the background.

The device is a good utility for anyone who gives presentations on a large screen. The bundled flash drive means that you can carry you presentations and other content that you need on it wherever you go.

Contact

Epson India
Apacer Technologies Pvt. Ltd.
Phone: +91-80-4152 9061
Email: shiva_neelangi@apacer.com
Web site: www.apacer.com
Price: Rs. 2,499

Specifications

2.4 GHz transmission, powered by 2 AAA batteries, 4 GB flash drive capacity, Dimensions: 123 x 39 x 26 mm

RATINGS

Features	7
Performance	6.5
Build Quality	6
Value for money	7
Overall	6.5

Windows 7 pricing made public - $319.99 for Windows 7 Ultimate, 299.9 for Professional and 199.99 for Home Premium

AMD's 785G chipset uses the DirectX 10.1 supported Radeon 4200 GPU

WD My Book Studio Edition II 4TB

It's HUGE!

In April this year, we tested a large number of hard drives. In the category of external desktop drives, the 2 TB WD My Book Studio Edition II was pretty good. We now have with us the WD My Book Studio Edition II External 4TB Hard Drive.

This is a huge drive mind you – it weighs around 2.63 kg, so it's not ideal to carry very often. Four connectivity options are available – Firewire 800, Firewire 400, USB and eSATA.

The speciality of this drive is that it supports RAID-0 & RAID-1. RAID-0 makes the entire 4 TB usable. We haven't seen too many drives that require drivers, but this one does for the RAID function. When you first connect it, you need to install the driver and then set the RAID configuration.

There was nothing spectacular with the test results. The read burst speed was higher with the RAID-1 configuration with both connection interfaces – USB and Firewire. With our file transfer tests, we found the average read and write speeds to be similar with both RAID configurations. The 1 GB Photoshop scratch test showed a big difference in file transfer. With RAID-0, the speed was twice as good as RAID-1, as you would expect.With Firewire, the performance was around 10% better than with USB.

The 4 TB WD My Book Studio Edition II only works with Windows Vista due to capacity restrictions of previous Windows operating systems. Using RAID-0 is recommended, but if your data is very important, RAID-1 is the way to go.

Contact

Contact: Amarjeet Singh
Phone: +91-93210 29204
Email: Amarjeet.singh@wdc.com
Web site: www.wdc.com
Price: Rs. 39,000

Specifications

Capacity: 4 TB
Interface: Firewire 800
Firewire 400, USB 2.0 and eSATA
Dimensions: 166 x 98 x 154mm
Weight: 2.63 kg

RATINGS

Features 8
Performance 7
Build Quality 6
Value for money.....5
Overall 6.5

HP Photosmart C8188

Print and scribe

The HP Photosmart C8188 has memory card slots and a lightscribe CD/DVD drive. Not only does this printer read from CDs, but it can also print labels directly onto the face of the CD or DVD. There is a 3.5 inch touch screen with an easy interface, that somewhat resembles a Windows XP theme. Like the Epson Photo Stylus TX700W, this too has Ethernet, WiFi, and also comes with Bluetooth, so almost any phone or laptop can shoot out prints without the hassles of wired connectivity.

Some detail on our first test image was lacking and also the overall colour tone of the print was on the warmer side. The second test image was more balanced, but again, a few details with regard to the textures were missing here and there. The Combi document, consisting of text and images, showed smooth and readable text and well distinguished colours in the images.

The HP Photosmart C8188 costs Rs. 24,615, which may seem pricey, but if you do need a feature rich photo printer with all connectivity options including an optical drive that can read your digital media, then this is something you should buy.

Contact

Hewlett-Packard India Pvt. Ltd.
Phone: 30304499
Email: bharat.kharbanda@hp.com
Web site: www.hp.com/in
Price: Rs. 24,615

Specifications

Input capacity: Upto 100 sheets (A4)
Print quality: 4800 x 1200 dpi
Scan quality: 9600 x 9600 dpi
Dimensions: 448 x 392 x 216 mm
Weight: 11.4 kg

RATINGS

Features 8.5
Performance 7.5
Build Quality 8
Value for money.....7
Overall 8

keys LG has announced three new cell phones to be launched in India and these will fall in the low-end segment - GB210, GB270 and KP265 Windows 7 Release to

Assassins rejoice
Sony is said to launch limited edition white PSPs that will feature the upcoming Assassin's Creed Bloodlines game

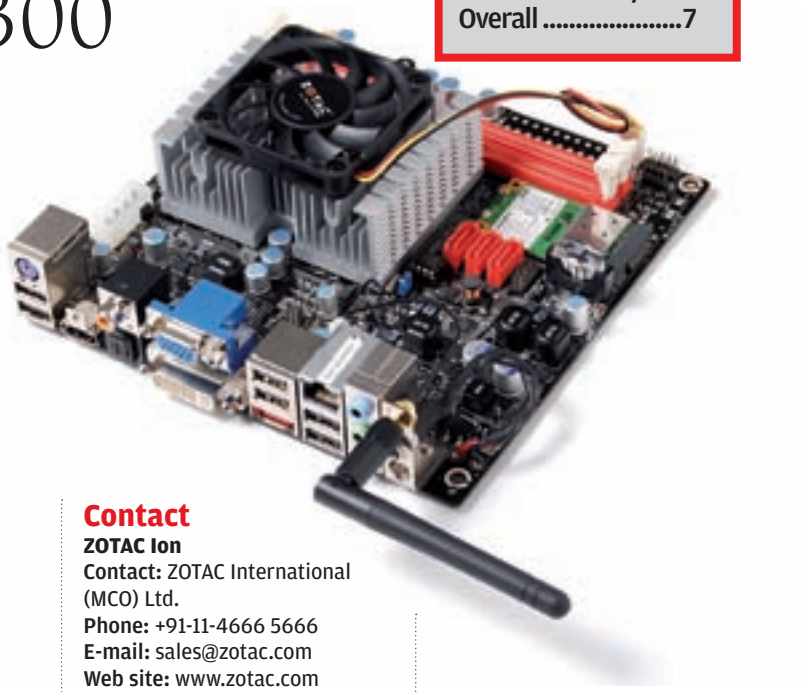
Work on Honey
Honeywell has introduced the new Dolphin 6100 mobile computer, which is an addition to their existing line of Dolphin mobile computers

ZOTAC Ion ITX A Series and Panache T3300

Tiny size and tiny power consumption

RATINGS

Features	8
Performance	6
Build Quality	7
Value for money	6
Overall	7



In the last few years, manufacturers have focused on bringing out low power, compact computing solutions. The Atom processor is ideal for this kind of task, except the subsystem around it wasn't geared for high-definition content processing.

The Ion platform from NVIDIA is built for that purpose. We received the ZOTAC Ion platform which comes with a built-in Atom N330 dual core processor. What makes it different is that it's powered by a GeForce 9 series graphics solution. The mini-ITX form board is just 17 x 17 cm in size. An equally compact case from Panache was sent to us.

The board, although tiny, isn't handicapped in any way. To give you an idea, it comes with a built-in 802.11n WiFi module, a gigabit Ethernet controller, 3 SATA ports, HDMI out and digital audio outputs. The only thing missing on these boards are the PCI and PCI-E expansion slots.

The ZOTAC board has no 20-pin power connector and it connects directly to the DC power connector. There's also a 4-pin male molex connector to connect your hard disk drives, and other optical drives.

The case is equally tiny and just about fits everything in. A fan on the side channels out the hot air but fortunately, the Atom and Ion solution doesn't generate too much of it. There are a few issues with the case though. There's no space to install an optical drive or an internal hard drive, so you are forced to use USB or eSATA devices.

We tested the board with 4 GB of DDR2 memory and a 500 GB Seagate Barracuda 7200.11 hard drive. The graphics performance was considerably better than the Intel 945's graphic solution that are used on low power desktops and netbooks. Even PCMark05 churned out better overall scores. Memory scores stayed more or less the same. We also ran a couple of game benchmarks. Doom 3 for example, showed average frame rates between 25 and 28 fps with low and ultra quality settings. The processor is clearly the bottleneck here.

But the Ion was made for a completely different purpose – low power HD playback. WMV HD content works rather well without any glitches. We then tried H264 content with the default settings on both Media Player Classic and VLC. At 720p, we noticed some slowdown and heavy stuttering with 1080p H264 videos. The performance wasn't what we expected. It was only after some fooling around, that we realized that you need to set your media player to use the graphics card to process HD content. We did this with Media Player Classic with DXVA enabled. The CPU utilization dropped from 80-90 per cent right down to 10-15 per cent, which is something we've never previously seen an Atom do. It's a pretty impressive sight!

This undoubtedly makes a good low power media centre solution. It also makes good sense as a download rig. You might need to setup your media players once to use the Ion's power properly though. The only bad news is the price – Rs. 12,800. Even though it's a feature rich board, that's quite a lot of money, especially when you remind yourself that the Atom N330 with the Ion although good for HD playback doesn't come close to other dual core processors in performance on other kinds of applications. The Rs. 3,000 Panache case is a decent price for a case of this size – these are very difficult to find.

Contact
ZOTAC Ion
Contact: ZOTAC International (MCO) Ltd.
Phone: +91-11-4666 5666
E-mail: sales@zotac.com
Web site: www.zotac.com
Price: Rs. 12,800

Specifications
NVIDIA Ion chipset, Intel Atom N330 dual core processor (integrated), integrated 802.11n WiFi, 3 SATA ports, 6 USB ports, 1 HDMI out, 2 DIMMs (upto 4GB RAM)

Contact
Panache T3300
Contact: Panache Infotech
Phone: +91-93200 22012
Email: info@panache.co.in
Web site: www.panache.co.in
Price: Rs. 3,000

Manufacturing build is going to be out in August | Stellar Information Systems released an updated version of its Mac data recovery software priced at Rs. 4,800.

Gnumeric

Gnumeric is a spreadsheet programme that was initially developed as an alternative to Microsoft Excel and other commercial spreadsheet applications. It was then incorporated into the Gnome desktop, as part of the Gnome office suite. Those used to advanced functions in Excel will not find the same number of features in Gnumeric, or the same behaviour in many cases. For example, selecting a column and running a find and replace operation will replace all the instances of that word or figure in the spreadsheet in Gnumeric rather than just the column selected in Excel. There is no support for Pivot tables either. Apart from these few differences, Gnumeric is functional, and we like the way it handles charts. It is a well designed spreadsheet application, and is also available for Windows. It's a lot smoother than IBM's Lotus Symphony, or OpenOffice.org's Calc. Here are some tricks to help you on your way, if you are willing to experiment with an open source alternative to Excel.

Understanding spreadsheet terminology

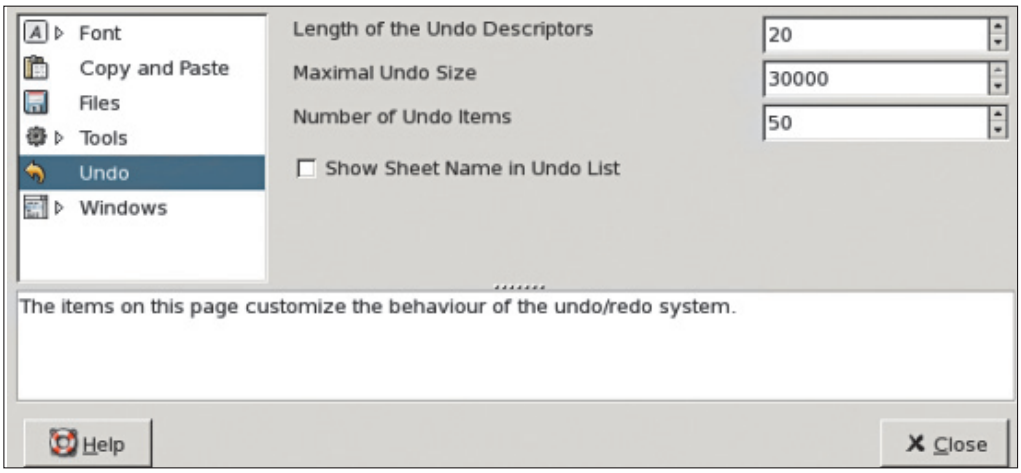
A programme that works with rows and columns of data, is known as a "spreadsheet". A new document, by default, has three worksheets, which are effectively three "pages". The collection of all horizontal fields in the same line are called "rows", and vertical fields up and down in the same line are called "columns". Each field, or intersection of a column and a row is known as a "cell". A "command" is an operation on a cell, or a collection of cells.

Increase the number of Undo operations

Gnumeric allows a default of 50 undo operations. If you are an advanced user, working on a machine with limited resources, this can reduce the amount of resources available for other applications, and for Gnumeric itself, particularly if you are going to be working with a lot of charts. Fifty undo operations is far more than is necessary for run of the mill work, and if you are going that far back into history, chances are that you are doing something terribly wrong to begin with. Reducing the number of undo operations to about 20, or even 15, significantly improves the smoothness of your work, and does not take up unnecessary memory.

Understanding scientific number notations

One of the nifty features of Gnumeric is that the size of a cell expands to allow for up to 21 numerals. If the length of a number string exceeds 21 numerals, then the number is displayed in scientific notation. This is a convenient format to handle and make sense of really long numbers! If the calculation draws up a figure that looks something similar to "1.243E+16", it simply means that the number is 1.243x10^16. By default, Gnumeric spreads the width of the cell to support an accuracy of fifteen decimal spaces, which is sufficient even for rocket science. Manually dragging and reducing the width of the cell, reduces the number of decimal places displayed. Increasing the width of the cell, does not however, increase the number of decimal places displayed beyond the maximum of 15.



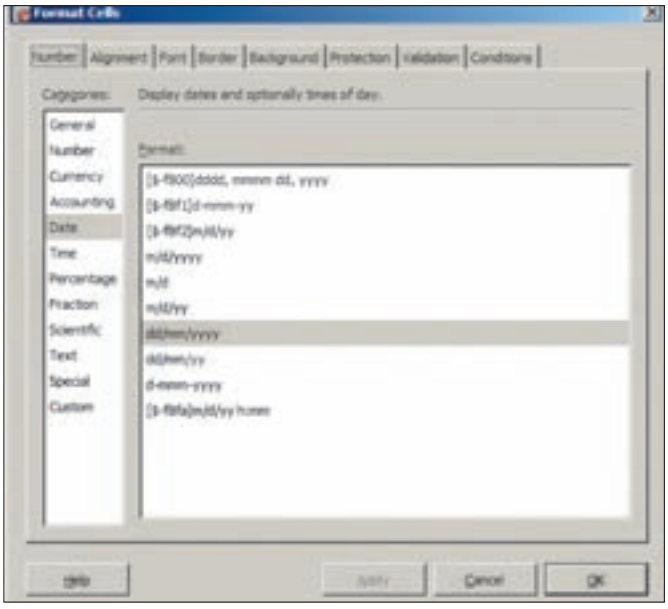
Changing the number of default undo operations.

Make numbers behave like data

Gnumeric, like most spreadsheet applications, makes numbers behave in a certain way, and text strings behave in a certain way. Text strings are aligned to the left of the cell, and numeric strings are aligned to the right of the cell, which is just one superficial difference in the way Gnumeric displays data. Sometimes, it is necessary for users to make numeric strings behave like text strings. To do this, append (') before the number. For example, entering ('43) in a field will align the number to the left, whereas (43) will align it to the right. Once the numeral is entered with the (') before it, and the cursor is moved to another field, the (') won't show up before the number in the spreadsheet. Note that mathematical operations on such numbers will still work.

Changing the date format

By default, Gnumeric follows the American convention of displaying dates. This follows the mm/dd/yy format, instead of the dd/mm/yy format which is more common here and makes more mathematical sense. The can be problematic in the way Gnumeric handles data. To fix this, select the Date column by clicking on the column header (or the row header if you work that way). The Row and Column headers are the identifying blocks along the sides of the sheet, with the column headers being capital letters, and the row headers being numbers. Once a header is clicked, the entire column



Changing the date format convention in Dnumeric

or row should be highlighted. Right-click on any cell and select format cells. Navigate to `Number>Date`, and select the dd/mm/yy convention. Now whatever date you enter in the row or column will be treated in this format. Note that this setting is applied to the selected cells only, and is not a global change.

Autosaving documents

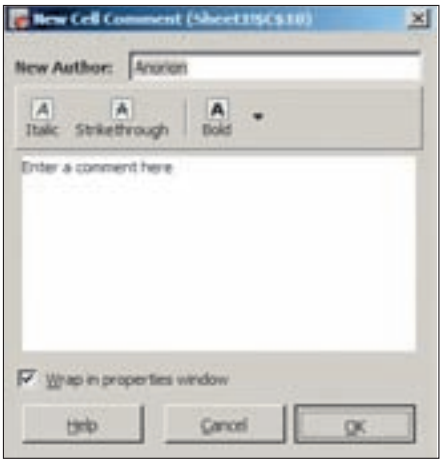
Gnumeric has an autosave feature. However, this feature is not enabled by default. To change this setting, go to `Tools > Auto Save`. Check the "Automatically save every" checkbox. Enter the interval in minutes. Leave the "Prompt before saving" box unchecked if you don't want to be disturbed in the workflow for a save prompt every few minutes.

Using the clear command

The clear command is a great way to get rid of certain kinds of information from a cell, without changing others. For example, if a cell is formatted according to a particular date, then it is possible to retain the date formatting, while deleting the contents of the cell. To do this, select the cells, the row, or the column and go to `Edit > Clear > Formats`. Alternatively, you can clear the formatting of the cell, while retaining its contents. Go to `Edit > Clear > Contents` to do this. You can also use the `Edit > Clear > Comments` to clear all the comments in a selection, or the entire sheet.

Adding a comment to a cell

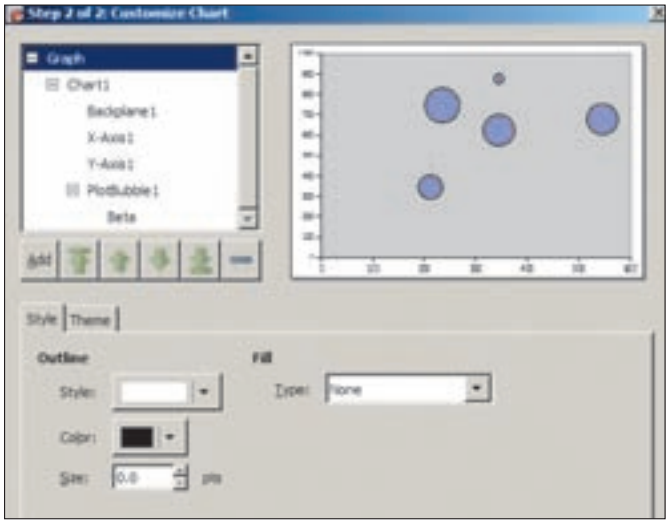
To add a comment to a cell, right-click on a cell and select Edit Comments. Then type in a comment and hit `[Enter]`. Comments are indicated by a small red triangle in the top-right corner of a cell. To view a comment, hover the mouse pointer over this small red triangle, and a small text box should appear with the comment. Right-click on a cell with a comment, and click on Edit Comments to change the comment for that cell. Right-click on the cell and click on "Clear Comments" to delete a comment.



Adding a comment to a cell

Using the Gnumeric format, when Gnumeric is not available

In a pinch, if you have work stored in the Gnumeric format, and want to use the contained data, but Gnumeric is not installed on the system you are working on, there is an easy way to extract the data. Gnumeric uses the .gnm extension to store files. Just change the extension to .gzip, which is a common zipping package in Linux. If you are working on a Linux system, you can do this using pre-installed tools. If, however, you are working on a Windows machine, you will need an unpacker that supports the .gzip format (peazip is a popular one). The data is extracted as an .xml file, which is compatible with many programs, and can even be opened in a text editor.



Creating a chart in Gnumeric

Inserting charts in a worksheet

Creating a chart in gnumeric is a simple process. After entering the data, select the range of data that you want to be represented in the chart. Go to `Insert > Charts`, and a chart wizard should appear. The Chart wizard in Gnumeric is known as the Chart Guru. There are sixteen kinds of charts available by default – others are available using plug-ins. Select on of the chart types, and select the variables in the wizard. Once you are done configuring the Chart Guru, the chart does not immediately appear on the sheet. You have to manually click and drag the chart across the sheet, which is a welcome deviation from the norm in spreadsheet applications. This allows you to position and set the size of the chart without having to manipulate it later on. The chart is linked to the selected contents, so every time you change the data in the cells you selected to make the chart, these changes are reflected in the chart in real time.

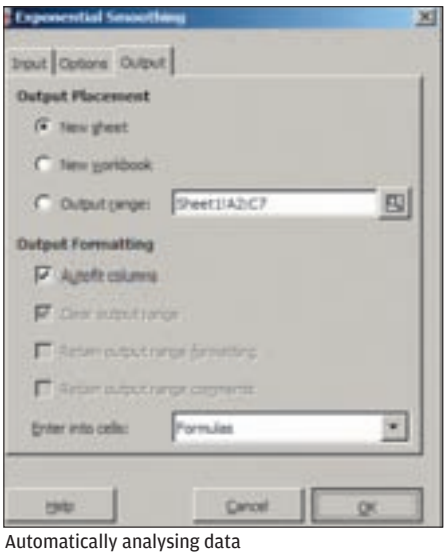
Deleting worksheets

Sometimes it is necessary to delete worksheets. Most of the time, people use only one worksheet. However, some operations create and enter data into a new worksheet. When such operations are automated, the data is not entered into an existing blank worksheet, but instead in a new worksheet. This can clutter the work area with too many worksheets. To remove

a worksheet, right-click on the worksheet, and select Remove. Although the help manual says that this operation cannot be undone, it can, so don't worry about loss of data when you are doing this. It is also a good idea to allocate custom names to worksheets, to manage a large number of worksheets, or to avoid confusion. Double-click on a worksheet, and enter text to rename it.

Statistical analysis

Some advanced functionality is included by default in Gnumeric, through the menu, which would involve entering complex formulae in other worksheets. This feature of Gnumeric makes it popular in the scientific community, and is particularly useful to mathematicians, scientists and statisticians. The Tools>Statistical Analysis has a range of options to choose from. We will show an example of the Forecast function. Go to `Tools>Statistical Analysis>Forecast>Exponential Smoothing`. There are five smoothing approaches available, and configured by default. Select one of these, and remember to toggle between the column and row radio button, depending on how your worksheet is laid out. You can tweak the input in the Input tab. The Options tab has error correction and factor options with reference to the operation. Check the Include Chart checkbox in this tab if you also want the operation to be charted. The Output tab lets you choose the output location. The safest location is a new worksheet, which is the one selected by default. Click on OK. A new worksheet should be created, with a neat table, headers and a chart if you have chosen to include one.



Automatically analysing data

Freeze panes

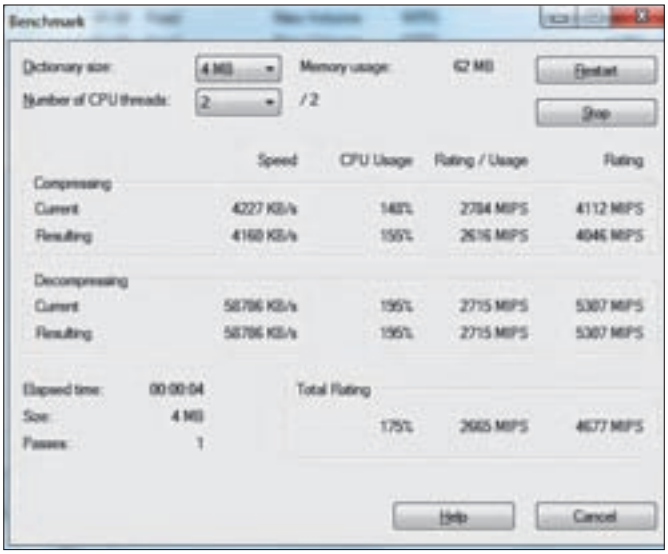
When working with a large amount of data, it is convenient to have the header rows always displayed, irrespective of how far into the worksheet you have scrolled. This avoids the need to scroll back to the top of a worksheet to find out which header a particular data entry comes under. To do this, select the header row by clicking on the appropriate section head number, or simply select the cells that you want to freeze. Then go to `View > Freeze` Panes. You can do this for rows as well as columns, and at the same time. Select the row or the column, and go to `View > Unfreeze Panes` to remove the freezing. Doing this without selecting any row or column will unfreeze all the Panes in the worksheet.

7zip

7zip is an open source compression tool developed for the Windows operating system. The utility supports decompression of almost every compression format available and it can also compress to 7z, Zip, and some others. It's a good free alternative to commercial packages such as WinZip and WinRAR.

Quickly accessing folders

For folders that you need to access quickly, 7zip has a favourites option where you can bookmark up to ten separate folders. Adding folders is done by first accessing the folder in 7zip, then clicking on the `Favorites > Add folder` to Favorites as, and then selecting a slot. Accessing the folders is done similarly using the same menu. Keyboard shortcuts such as `Alt` + (Number) can also be used to open the folder.



7zip's benchmark feature in action

Using the flat view

The flat view is a way of viewing files in 7zip where all the contents of the subfolders are displayed within the root folder. This way, you don't have to go looking through all the subfolders looking for a specific file. The flat view can be toggled by clicking on `View > Flat View`.

Benchmarking your PC

Compressing files is a highly CPU intensive task that also requires a lot of memory. Really high compression levels can stress components, so it makes a good benchmark. You can use it to compare the performance of different computers and it is used by some test labs. The benchmark utility can be run using the Tools menu. The dictionary size option will affect the memory consumption of 7zip.

Selecting files by format

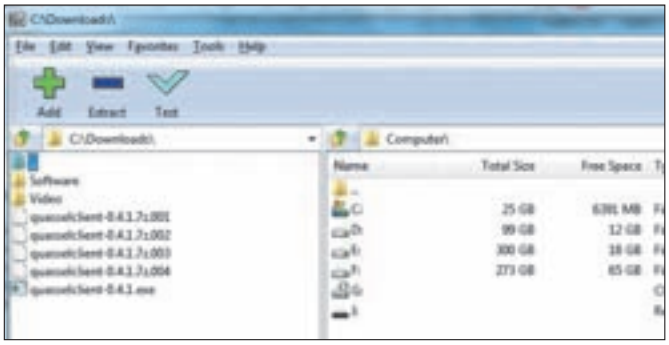
Selecting files in an organized folder can be difficult. If you need to compress files of a particular format, then you have to select them separately. 7zip has a unique feature that automatically lets you select all file formats of a kind. Click on a file of a particular format, then click on Select by Type. Similarly, you can select all the files and then deselect certain formats by clicking on `Edit > Deselect by Type.`

7zip as a file manager

7zip can be used with a 2-pane configuration which offers better flexibility. Files can be dragged and dropped between two separate folders. 7zip has many more features that make it a very good file manager alternative to Windows Explorer. Files can be copied and moved using the function key shortcuts `[F5]` and `[F6]`. There's even a feature to add comments for files which can be handy if you have too many similarly named files.

Compress using a single core

When 7zip compresses files, it uses all the available cores. This may affect the performance of other applications running at the same time. To reduce the load, you can allot the number of processors that 7zip is allowed to use. The window that is used to create an archive has an option Number of CPU threads. For example, if you

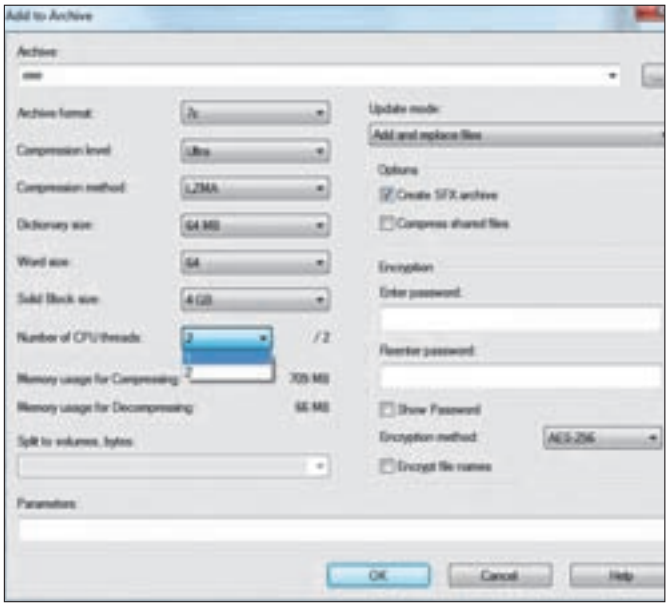


The two panel view makes working with multiple folders easy

have a four core processor, you can force 7zip to use three of those threads. The last one can be used to run your browser or your instant messenger without any loss in performance.

Quickly splitting files

Many a times, we have to deal files that are larger than a flash drive, or of a CD or DVD. Splitting files is one of 7zip's features. To split a file, right-click on a large file in 7zip and click on Split Files. Choose one of the presets available or type in the size of the pieces in bytes. To add the files back together, select the first file of the sequence and click on `File > Combine files`.



The load on the system can be drastically reduced by limiting the number of CPU threads

Creating executable archive

If you have to compress a file using a compression tool and send it to someone, the PC on the other end also requires a utility like 7zip. Asking the person to download, install and learn how to use the tool might not always be practical. The SFX archive feature allows 7zip to create an executable archive where the user simply needs to double click on the archive to uncompress it. To create an SFX archive, click the Create SFX archive checkbox in the Add to Archive window.

Making password protected archives

7zip can password protect files so your data doesn't fall into the wrong hands. The way this is done is by adding a password to the archive. During the archive creation, enter a password and reconfirm it. The password can also be encrypted using the AES-256 standard. This can also be done for SFX archives. During extraction, the programme will prompt the user to enter the correct password.

Moving back the folder structure

7zip's toolbar is really basic and has no folder navigation buttons on it. The way to move back is to press the backspace key. To move to the root of all the drives, press \. If you prefer to move back up the folder structure using a shortcut link, it can be enabled by clicking on `Tools > Options` and then on the Settings tab. Enable the Show ".." items checkbox to get a link for the previous folder.

PDF Creator

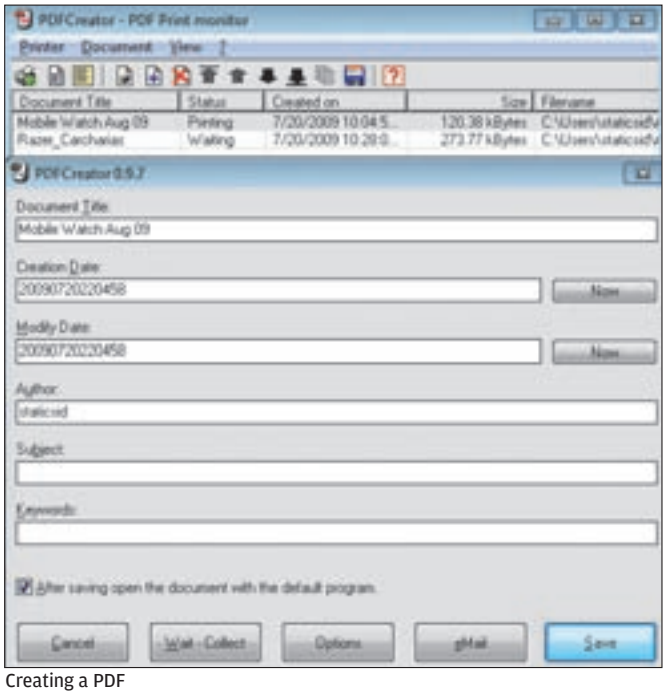
PDF Creator is a sourceforge open source project. It's a powerful PDF creation tool that installs itself as a virtual printer in all Windows-based programmes that have the ability to print documents such as Word, Excel and Powerpoint. So, with it you can save almost any file or document into the pdf format. The application also integrates itself into the Windows Explorer context menu, allowing you quick access to convert any file to PDF by simply right-clicking on it. It can be downloaded from **www.pdfforge.org/products/pdfcreator/download**

Creating PDFs

There are multiple ways of creating PDFs using PDF Creator. The first one is through the regular file menu or print process of the default programme that handles a particular document type. Simply click on the print option and select PDF Creator as the printer. Shoot the print order and the application will open a dialogue box where you can choose the file name and other details of the resulting file. Click Save to create the PDF. The alternate way is by right clicking on a file in Windows Explorer and clicking on "Create PDF and Bitmap files with PDF creator". The third route is from within the application itself. Click on `Document > Add` and select file. Alternatively, press `[Ctrl] + [Insert]`. The application even has support for drag and drop.

Sending generated files via email

The programme has the ability to attach created files directly



Creating a PDF

to emails. Follow the creation process as you normally would. When the save window appears, asking you to enter certain details about the file, click on the eMail button. You will be prompted to save the file, and you will have to specify a location. This is necessary for the programme to be able to attach the file. Once this is done, your default email programme will be launched, and the file will be already attached.

Creating other formats

The application has support to create other formats such as PNG, JPG, TIFF, BMP, PCX, PS and EPS. To have a look at settings for each of these formats, go to `Printer > Options` and click the collapsible link for formats. Here resolutions, compatibility, etc. can be set for each of the format types. To actually convert to the desired format when the save window appears, choose format from the drop-down list for "Save Type As"

Queuing files

PDF Creator has the ability to queue files. Simply add files to convert to PDF in the regular fashion by clicking on the + button or `[Ctrl] + [Insert]`. Then in the save dialogue box click the Wait + Collect button. The file will be added to the queue. You can then give a print order.

Autosave

Auto-Save Mode allows the user to automatically create PDFs with predefined settings and save them to a predefined location. When Auto-Save Mode is enabled PDFCreator does not ask for a filename and a location. To configure autosave, click `Printer > Autosave`. In the options, click on the Autosave button and check the box for Use Autosave. Specify the file type you want to save as. PDF Creator allows you to save not only PDF, but various other formats. Then specify how you would like to name the file. You can add tokens to the name such as author

Autosave options

name, computer name and file count, from the drop-down list. Specify the destination folder and click Save.

Merge files

To merge multiple files into one, open a file from PDF Creator by clicking on the + button or `[Ctrl] + [Insert]`. Remember, the default file format will be PS, change it to All Files. Then, in the save dialogue box click Wait + Collect button. Then add the other files that you want to merge. Once you've queued them, click the combine all button in the tool bar. Name the new file and click save.

Create PDFs via network

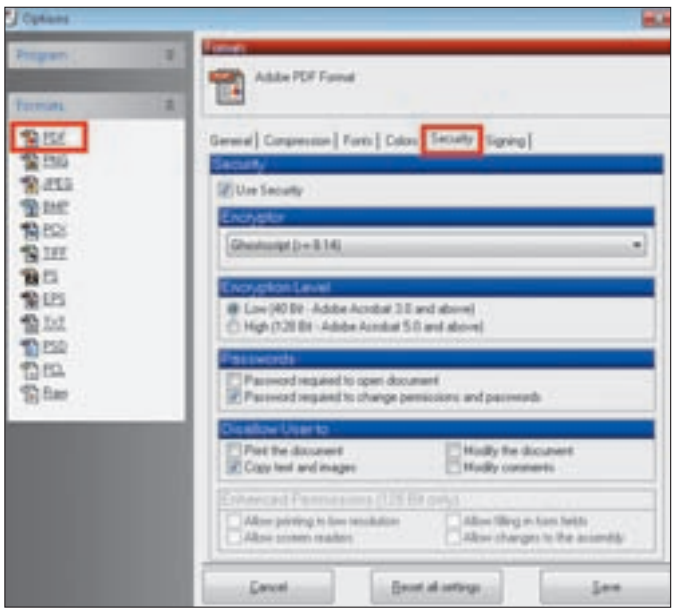
To access this feature you will have to choose the server installation instead of the standard installation, during the installation process. Choose additional drivers for all operating systems such as Windows 98/NT that will access this virtual printer on the network. With a server installation, you can use Auto-Save Mode to automatically save documents to a specified directory with pathnames and / or filename tokens. Make sure the users have rights to save in that folder or path. Make sure to create a share for the printer with user access rights belonging to yourself. This is done from the control panel by right-clicking on the printer and going to printer properties. In the sharing tab, check the box for share printer. Now configure a path in the autosave options and you can start dumping created PDFs remotely to a specified location.

Encrypt PDFs

With PDF creator you can also Encrypt PDFs and protect them from being opened with up to 128-bit encryption. To do this, click on `Printer > Options` and go to the formats drop down button and click on PDF format. In the security tab, check the Use security box. Choose the encryption method and encryption level - you have a choice of 40-bit (low) and 128-bit (high). After this, you can set various permissions such as disallowing only printing, modification, copying, or all of them. Check the 'Password to open document box'. Click save when done.

Twitter

Twitter is the latest micro blogging/social networking tool to take the web 2.0 world by storm. People seem to be quite divided about what they feel about it. Some hate the concept, while others can't stop using it. Nevertheless, the service allows you to send small messages called tweets into the twittersphere (an imaginary



Encryption settings

world in cyberspace that is inhibited by people who tweet). But there is a lot more to twitter than just sending out such 140 character long messages. Through twitter's powerful API, people have been able to do some quite amazing things with the little birdie. Here we'll take you through some of the basics as well as tricky tips that you can use to get the most out of twitter.

Understanding symbols

Anyone new to Twitter will see a lot of "@" and "#" being used. The former is a way to address your post as a reply to another user. So if you want to reply to a user by the name of "xxx", you will type "@xxx" followed by your message to the user. The latter is a hashtag. Hashtags are a way of grouping or segregating topics on twitter. Its a concept borrowed from IRC. You will have to follow "hashtags" for your hashtags to get indexed. Head over to hashtags.org to see how they manage these tags.

Expanding your twitter bubble

The trick to expanding your twitter followers is by following more people. Follow to be followed is the *mantra*. But you can't just go about following people randomly. One of the best tools to help you get started is Twubble. It simply finds other people who you're connected to and picks out people who you may like to follow (**http://crazybob.org/twubble/**).

Put feeds into twitter

RSS feeds can be automatically posted through your twitter account. Twitter's API allows for this though third-party sites such as **yotwits.com** and **twitterfeed.com**. All you have to do is get the RSS feed URL and enter it into these services along with your twitter account details. There are also certain predefined news feeds available that the web site will suggest. These will be divided according to category, such as, say Tech news. If you put this feed into your twitter stream, it will automatically tweet the latest tech news from your account at predefined intervals. One of the best uses of this is to put your last.fm tracks feed into your twitter account. So any new track you play is automatically twitted. Yotwits does not need registration while twitterfeed does.

Using twubble to increase followers

Twitter trends

Do you know what #Twanuvaad is? Neither did we, but suddenly everyone on twitter was talking about it for some time. You can head over to **whatthetrend.com** to find out about the latest topics that are trending on twitter. The web site also gives you a short summary of why the particular topic is trending. Twanuvaad, by the way, is the literal translation of Hindi movie dialogues to English posted on twitter.

Monitor specific topics

By using **search.twitter.com** you can search for and monitor specific topics that people are talking about. Once you give a search term, you can even set up a feed for it. This feed will let you know every moment when someone talks about your keyword. This is also very useful for companies.

Go beyond 140 characters

Some people find that 140 characters is too little space to get by. Twitzer is a Firefox extension which lets you post text longer than 140 characters (**http://shorttext.com/twitzer.aspx**). Once you install the extension, simply ignore the negative counter, right click anywhere on the page and click "Twitzer Text". Your text is shortened and an extension link is created. If the one viewing the post also has the extension, the user simply has to right-click and say "De-Twitzer text" to view in the same place. Be careful with this one though; people don't like to read long boring lectures via twitter.

Tweet your photos

To tweet pictures from your flickr account you can use **http://flicktotwit.com**. It's a nice service that allows integration between your twitter and flickr accounts. You can upload pictures to your flickr account from here, and give some text to go along. The text will automatically become a twitter update with a link to your photo. While you are linking the two accounts, be sure to complete the authorisation process carefully. Yahoo! will require you to authorise Flicktotwitt to access your flickr account. The other option for Firefox users is to use the flickr2twitter add-on. This one too is similar in terms of functions.

Use clients

Twitter applications such as Tweetdeck and seesmic are much better than using the twitter web page. Applications such as these allow for much greater functionality. For instance, Tweetdeck (which seems to be the favourite lately) gives you a subject and

See what people are currently talking about Digit on search.twitter.com

Flicktotwitt upload interface

keyword filter, thus separating information of interest. The AdobeAIR application has support for integrating your Facebook account as well. It has in-built features like TwitPic (a way of sharing pictures on twitter), url shortening and translation tools. You can of course also send out updates from here as well.

Tweetdeck

More and more people are getting hooked on to Twitter. The number of followers keeps increasing and there's just too much information there. Tweetdeck has loads of features any Twitter fan will love. Tweetdeck isn't only a Windows application. It runs on a software environment called Adobe Air. It's available for Windows, Linux and Mac OS X. Download it from **http://www.adobe.com/products/air/**. Once you've done this, download Tweetdeck from **www.tweetdeck.com**. The installer should start automatically.

Searching for topics or keywords

There's a lot of activity on Twitter and people want to know what's going on in the world. You can keep a constant watch on Tweeter for all kinds of topic. Click on the Twitter Search icon in the toolbar. Type the keywords including operators such as AND and OR. For example, you can look for people posting things about rains in Mumbai. In this case, we use Mumbai AND Rain.

Creating user groups

When you have too many friends on your Twitter list, you need to sort and put them into groups. Click on the group icon on the toolbar. Enter a name for your group – office, school, internet friends, etc. Now, check the boxes next to all the friends you want in that group. Click Save group. You can also filter friends by typing their name in the text field. A new pane will be created in Tweetdeck. Tweetdeck adds new panes when you create new groups or use any of the features.

Adding Facebook to Tweetdeck

Tweetdeck doesn't only work with Twitter; it can also be used for Facebook status messages. All you need to do is add the account to Tweetdeck by clicking on the distinctive Facebook icon on the toolbar. Enter your user ID and password and a new panel should appear with updates from your friends.

You can also post status messages to Facebook or to multiple accounts using Tweetdeck. Click on Tweet, then select the accounts to which you want to post the messages. You can also attach images at the same time.

Viewing Tweetdeck's recommendations

Tweetdeck also recommends a number of users and groups for you to follow. To view this list, click on the Tweetdeck recommends tool. A list of popular keywords will appear with popularity denoted by the size of the font. This information is gathered by the online service, TwitScoop **(www.twitscoop.com)**

Short URL and photo uploading services

Twitter uses separate services that let you upload photos to


Tweetdeck interface

Adding multiple Twitter IDs and Facebook account to Tweetdeck

Selecting which online services to use for uploading images

the internet. People also post links, but the link address can be a little too long for Twitter. There is a number of services which can shorten URLs. You can choose which service you want to use by default. Click on `Settings > Services`, then select the services you want to use at the bottom of the screen. Click Save.

Finding popular tweets

Almost all of the features in Tweetdeck open up as separate panels. Each of panels contain tweets. To see which tweets are more popular, click on the "Show what is popular in this column" button at the bottom of that panel.

twitter.com/digitindia

Follow @ DigitIndia on Twitter to receive up-to-date news on technology and on what goes on at Digit everyday. View photos and updates of products being tested in the test lab and wise cracks from Agent001!

Opening photo links in a separate window

When image links are opened in Tweetdeck, they appear as a popup. There is no way to save these images. It also covers up Tweetdeck and is resource intensive. As with other users who use feed readers, opening up links and images in browsers is preferable. There's an option to force Tweetdeck to open images in your default browser. Click on Settings, then on the checkbox for Open photo links in web pages.

Optimising viewing area

While Tweetdeck might have a very attractive looking interface, it does use up a big part of the desktop workspace. Tweetdeck does not let the user change the width of each column. There is a way to do this though. Click on Settings and check the Narrow columns checkbox under the General tab.

Setting up refreshing rates

There are a lot of tweets being made every single minute, but Tweetdeck doesn't refresh that often. By default, Tweetdeck refreshes content every few minutes. If you want updates in real time, you can turn the refresh rate down to somewhere around 25 seconds. This option is available in the Twitter API section of the Settings window. Move the slider controls for all the events to 100 per cent.

Customising the Tweetdeck interface

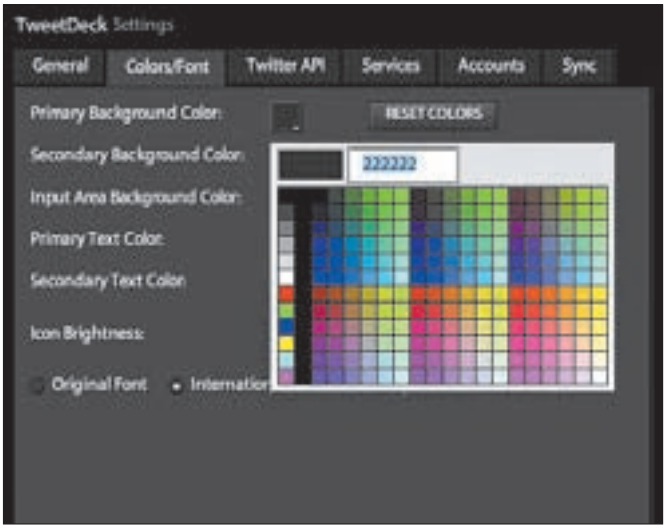
Tweetdeck allows its colour scheme to be altered easily. Click on Settings, then on the Colours/Font option. Click on the colour you want to change, then select the new colour from the palette displayed. You can also set a different font.

The toolbar icons have some illumination set by default and there's a slider which lets you change the brightness. There's even a Tweet Colors button which sends out a Tweet with the setting. Other users who use Tweetdeck might find these settings worth trying.

Showing preview of short URLs

Almost every URL that is posted on Twitter uses a short version using some online service or the other. There are also spammers on Twitter who advertise links. It's only after you click and open the link in a browser that you know what content the page holds. Tweetdeck has a feature which generates a preview of the page for you. Enable it by checking the Show preview information for short URLs option. The next time you open a link, a short 2-3 line brief of the link will be displayed and also the complete link. The number of clicks that the link has received is also shown.

Changing refresh intervals for Tweetdeck



Customising colours and fonts for Tweetdeck

Your questions, our answers

All your computer niggles and nags are dealt with here!

Can't open files

I have an Intel Core 2 Duo powered PC with 1 GB of memory and 160-GB hard drive running on Windows XP. The hard drive has four partitions – three of them are 40 GB each and the last one is 29 GB. There is a folder containing about 30 GB of data in the E drive. All files in this folder are shown properly and even Windows XP recognises them. The folder has AVI, MKV and MP3 files. When I double-click on any of these files, they don't open. I tried using VLC, but it wouldn't open them either. Sometimes, I get a message saying Access is denied. I don't want to lose the data so I don't want to format the partition.

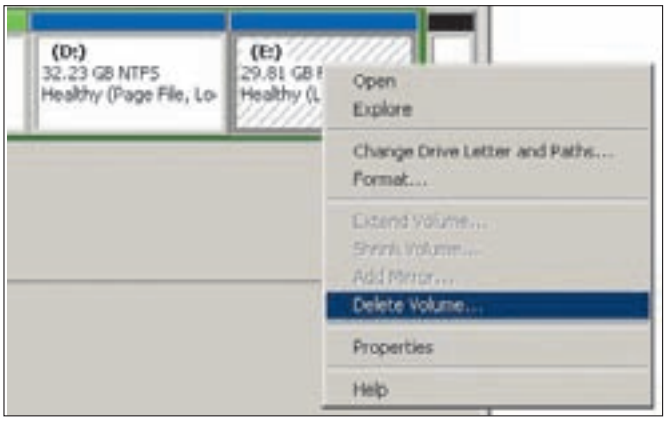
Animish Vaidya

The problem you are facing could be due to permissions for that drive or partition. If you were previously running a different operating system, the rights and permissions for a partition might still be present. You need to authenticate using the same user name and password to access the folder. Create a new user through the Control Panel with the previously used credentials and try accessing the drive. You can also change the permissions by right-clicking on a particular drive or folder and clicking on the Security tab.

Flash drive woes

I have a 2 GB Transcend pen drive. I locked it using a data locking program and gave it to one of my friends. He formatted it and now, it only shows 1 GB as usable. The pen drive shows up as empty but it contains 1 GB of data. I also tried formatting but it hasn't helped. Give me a solution for the problem.

Sourav Paramanik



Deleting the partition from a drive

If there isn't any important data on the drive, the simplest fix is to delete all the partitions on it. To do this, click on `Start > Control Panel > Administrative Tools > Computer Management`. Click on Disk Management. Right-click on the partition on the flash drive and click Delete Volume. Use similar steps to recreate a partition in the free space.

How to burn?

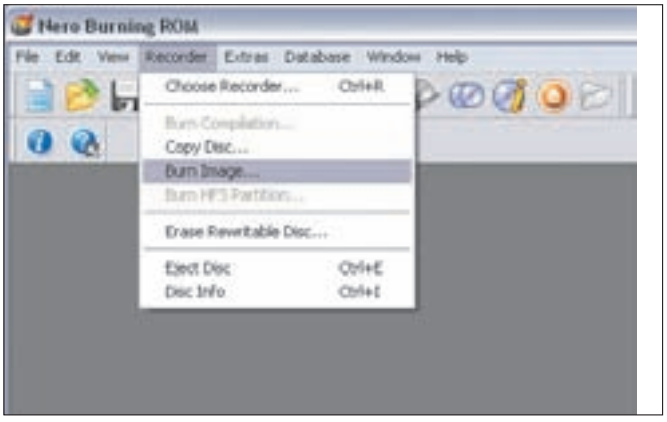
I have a lot of movies on my hard disk and I want to burn them on DVDs. Suggest me an easy-to-use burning program that can convert every video format to the VOB format so I can play them on my DVD player.

I have images of a few operating systems. I don't know how to create a bootable disk. Kindly help me with the complete process of how to create a bootable CD/DVD so that I can install them on my system.

P. Parikshit

It's difficult to find a single program that can convert every format to VOB. You might have to use a combination of programs. Check out Media Coder **(http://mediacoder.sourceforge.net)**. Convert the videos you want to AVIs using the Xvid codec. Use Nero after that or any other popular DVD burning program to write the AVI as a video DVD.

Disk images of operating systems such as Linux distributions are bootable images. You can simply burn them to the disk. Don't burn them as a file on the disk, but as a disk image. For example, in Nero Burning ROM, click on `Recorder > Burn Image`. Choose the image file, set a speed for writing and burn the disk. To be able to boot from the CD or DVD, you'll have to set your optical drive as the primary boot drive from the BIOS.



Burning a disk image using Nero

Logon problem

I have an Intel Pentium 4 system running Windows XP SP2 with a 3-GHz processor and 1 GB of memory. I have a problem with the logon screen. When I turn on my PC, I can't find the Welcome screen. With fast user switching turned on, it automatically opens to Windows.

Bishwas Gurung

Setting a password to your current account might help. If your Windows XP runs on a single user without a set password, it might automatically boot into the desktop. Go to the Control Panel and set a password to the account. If you are using some customised version of Windows, then the autologin might be a feature of that program.

Get Help Now!

E-mail us your computing problems along with your contact details and complete system configuration to sos@thinkdigit.com, and we might answer them here! Since we get many more mails per day than we can handle, it may take some time for your query to be answered. Rest assured, we are listening!

FreeDOS turned 15 this June

Terre Star launches the first satellite Windows Mobile phone

MS Word errors

I transferred a few Office 2007 Word files from my laptop to a CD and then deleted them from my laptop. However, while trying to open these files from the CD, with Office compatibility pack installed, the result was pages filled with tiny square symbols. Similarly, on some instances, a message showed up "Select the encoding that makes your document readable: 1. Windows (Default); 2. MS-DOS; 3. Other encoding". The preview page offered the options filled with tiny square character symbols with the text "Page Break" and "Column Break". None of the options worked. Why is Windows behaving like this and what is the solution?

Pulin C Barthakur

If it's behaving in the same manner on every computer, then it most likely is a problem with the file. The data might not have been burnt properly and the file might be corrupted. Try copying the file to your drive and open it with a different word processor or even on online office suites such as Google Docs. If you still have problems, then the file is definitely corrupted.

Splitting DVD files

Can we split the contents of a DVD into two or more CDs so that Windows automatically asks for the second CD after installing the first one?

Vivek Agarwal

Splitting data on multiple DVDs or CDs is simple if you use WinRAR. While creating an archive, use the Split to volumes feature to split the archive into separate files. Executable archives can also be made using WinRAR. Here, the application will ask you to enter the location of the next file. You can switch the CD then and continue the extraction.

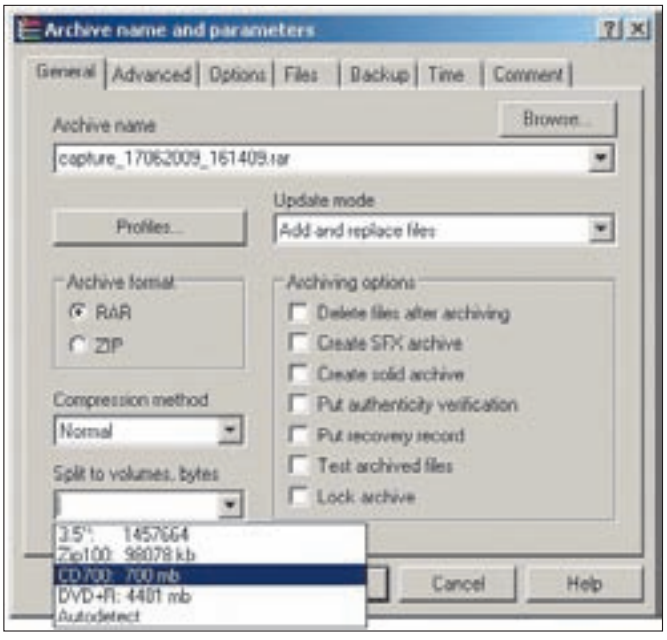
Notebook vs laptop

Can you explain the difference between a laptop and a notebook? I also want to know the difference between DVD-R and DVD+R. When I purchase blank DVDs, the shopkeeper gives me DVD-R and sometimes DVD +R.

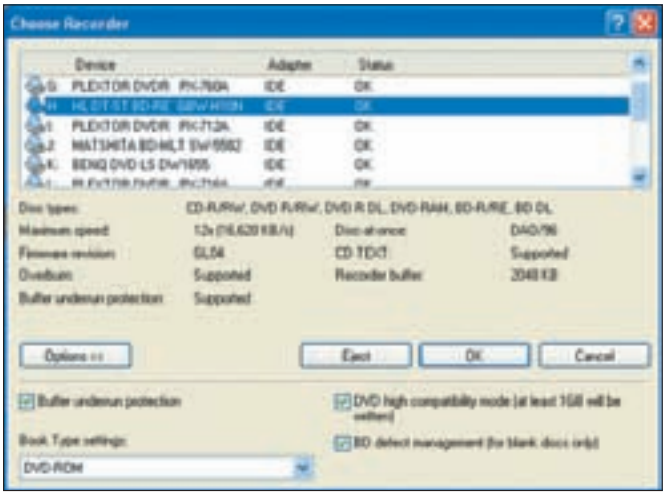
Rajesh Kumar

There is no difference between a notebook and a laptop. Notebook is just one of the newer terms used to describe laptops.

For all practical purposes, DVD-R and DVD+R aren't any different from each other. They are both writeable DVD disks.



Using WinRAR to compress to fit multiple disks



The book type setting can be changed in Nero Burning ROM

The most prominent feature with DVD+R is that it allows changing of a feature called bit-setting which offers better compatibility with other drives.

Flash drive problem

I am a reader of your magazine and have been reading it since last year. I like it very much. I have a Kingston pen drive and it was working properly until a few days back, when a folder named NEW FOLDER has been created in it. I am unable to remove it. I have even formatted my pen drive but it just won't go. My antivirus doesn't remove it either. What should I do about it ?

Shubham

The New Folder in your flash drive is created by a virus. Install a different antivirus and scan the drive to remove the virus. The DVD bundled with the July issue of Digit had trial versions of many antivirus solutions. Install one of the suites and update them to scan the flash drive. If your PC is also infected, then the flash drive might be getting infected every time you connect it to the PC.

New Recycle Bin

I want to rename the Recycle Bin to a name of my choice. I tried renaming it using the registry editor but I couldn't. I am using Windows XP.

Bishal Chhetri

If you look for the Recycle Bin in the registry, you will find an entry for it. One of the simpler ways to rename the icon is to use a free program called Desktop Renamer (**http://iconico.com/desktopRenamer/**).

Empty desktop

I have installed Windows XP SP2 on my computer. Whenever I start my computer, it shows my desktop without any icons and then, the computer shuts down automatically. I tried to format my C drive, but the virus comes back again.

Nilesh Chauhan

The problems you are facing are due to a virus. If your PC is connected to an ISP

Desktop Renamer allows renaming of icons on Windows

network, those viruses might be infecting your PC. Disconnect any cables during and after Windows installation, upgrade your Windows to SP3 and install an antivirus. Avoid using any flash drives or executing any files on any other partitions as they might be infected.

System instability

My PC has a 2.8 GHz dual-core processor, 2 GB DDR2 RAM, NVIDIA 9400 graphics card. It hangs on regular intervals of a few seconds. I use a home licensed Avast antivirus. It says that there is a virus. I regular update it . Also, when I start my PC, it automatically opens the My Documents folder. A Window script menu is also displayed. Hope you can help me fix these problems.

Vikram

The scripting errors that you see when your PC boots up is because of a worm or virus. If your PC locks up every now and then, that too could be because of the worm. One of the ways to fix it is to try a different antivirus or security suite.

Explorer crashes

Whenever I open My Computer and close it, an error message shows up "Windows Explorer encountered a problem and needs to close. We are sorry for the inconvenience" Why is this so?

Achuth Krishnan

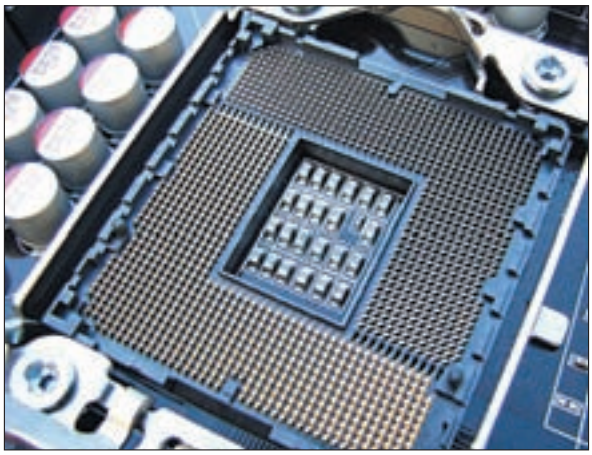
Explorer might crashing due to a number of reasons. A virus, faulty memory or even a corrupted file could be causing it. First, run a thorough virus scan of the entire system, then run Memtest86+ (**www.memtest.org**) to check for any problems with the memory. If nothing works, try running a repair operation for Windows using the bootable disk.

Upgrading to i7?

I have purchased ASUS Striker 2 NSE motherboard. Does it support Core i7 processors? If not, which processor should I buy?

Aslam Qureshi

The ASUS Striker 2 NSE board is based on the NVIDIA 790 SLI chipset. It doesn't support Core i7 processors. You need an LGA1366 socket motherboard for an i7 processor. If you need a fast processor for gaming, an Intel Core 2 Duo E8500 or E8600 will do. For more intensive media content editing and creation, a Q9550 would be better suited.


Intel's Core i7 line of processors uses the new LGA1366 socket

PC beeps and blanks

I have an HP computer that is powered by a 230-W PSU. I bought a Leadtek PX9600GT graphics card. I used an LCD monitor that was later damaged. I started using my old 14-inch CRT. When it boots, a long beep can be heard from my cabinet, the screen goes black and the orange indicator turns on.

Saif

To begin with, a 230W PSU is not really sufficient for running a GeForce 9600GT graphics card. The beep you are hearing is an alarm. Get a power supply with a higher rating such as 450W or higher.

Booting problem!

I recently had to change both my PSU (Corsair TX 650) and my HDD (Seagate 500GB 7200.11 ST3500820AS) which had become faulty. The reason for the fault is still unknown and my assembler has no idea either. The earthing at my place is fine. However, since the time my new PSU was installed (last two days), the PC has a strange booting problem. The power LED (blue) stays on, but the hard disk LED remains off. I get a total blank screen. There are no error beeps. I have tried fitting the RAM in alternate slots, but the problem still persists. Sometimes, when I restart the machine it boots fine and at other times, the usual problem. I have Windows XP and Vista Ultimate setup in a dual boot configuration. My system specifications: C2D E7300, ASUS P5Q-E Mobo, Palit Radeon HD4870 1GB DDR5 GPU, 4 GB Corsair 800MHz memory, CM690 cabinet, Dell 19-inch LCD, Emerson Liebert 600 VA UPS. Suggest a viable solution. I'm getting really frustrated.

Amitava

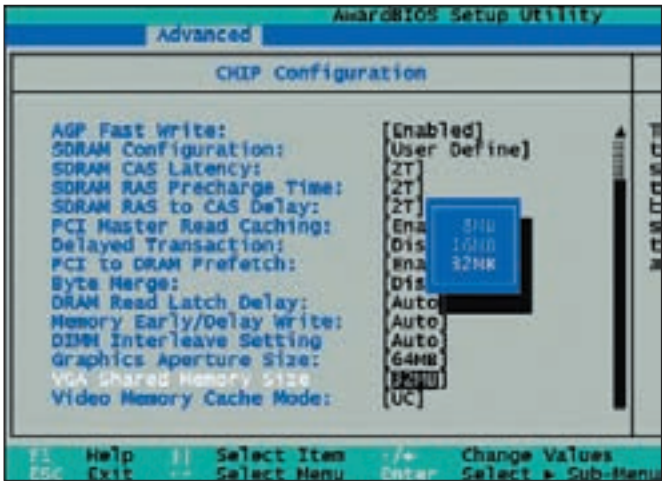
You mentioned that your power supply and drive got spoilt. Some of the components might have also been damaged due to the same problem. Try powering up the PC while connected to the power point bypassing the UPS. See if it boots. Also, check for loose connections. Check the power connectors going to the motherboard and the graphic card.

Memory loss

I have a PC running a Gigabyte motherboard and a Pentium III processor (735 MHz). I have installed a 256MB SD RAM module, but the computer only shows 128 MB. The other 128MB is not put to use. I'm really puzzled. What might be the cause for this problem and what is the solution?

Karthik Janarthanan

The graphics solution on the motherboard might be using system memory. Boot into the BIOS and check for the allocated memory.



Memory allocated for the onboard graphics can be set in the BIOS

Agent goes on a cooling spree and hunts down elusive aftermarket CPU and GPU cooling solutions

The real chill factor

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If you're one of those people who've been following technology for the last six years or so the term room heater would mean more than just the electrical device we use to lessen the severity of winter indoors. Critics used to refer to Intel's Pentium 4 processors by this nickname owing to the extraordinary temperatures they would reach. Another infamous component was NVIDIAs GeForce 5800 Ultra, fondly called the dust buster because of the whirring sound its fan produced when spinning at full tilt.

While stock cooling does a fair job of keeping entry-level and mid-range components cool, even these components benefit from after-market cooling solutions with lower temperatures, longer working life spans and less noise. Remember, heat is the universal enemy of all integrated circuitry and an increase in temperature of 10 degrees Celsius can bring about a 25 per cent decrease in the total life of the product, and this applies to CPUs, graphics cards, RAM, HDDs and just about any IC.

In India, an additional enemy is dust. Dust reduces working efficiency of heatsinks, fans and just about any cooling solution. Even a liquid cooling solution experiences a decrease in working efficiency due to dust build up on the radiator block and fan over time. Fan bearings gradually wear down because of dust and their rpm slowly decreases – and this happens irrespective of how good the fan. I've actually experimented with measuring the rpm of a new fan and again measuring it after six months sans maintenance and was surprised to see its speed reduced by 15 per cent, and I'm talking about a good fan I bought for 500 bucks – the average 100 rupee fan will likely conk off in under a year. Obviously, the more powerful the system you build the more cooling and ventilation it requires. Cooling is also dependent on cabinet ventilation; after all fans need to suck air from the environment and blow it on to hot components.

small fan to cool these chips. Nearly all high-performance, low latency RAM also comes with aluminium heatspreaders to dissipate heat produced in the memory chips. However the heat produced in CPUs and graphics cards is much more than the heat produced in memory and motherboards. Especially if you opt for a high-end configuration, stock cooling may not cut it.

Since the processor and graphics solutions are by far the biggest culprits when it comes to producing heat, I'm going to cover solutions available for cooling them down. You might ask yourself – why should I spend 2000 bucks on an aftermarket cooler when I already have a cooler with my CPU / attached to my graphics card? Quite simply, these coolers are designed to be just about adequate. Moreover, the geographical regions where companies like Intel, AMD and NVIDIA test the efficiency of such coolers are generally much cooler than India and such solutions are rarely adjusted for the tropics. In cases where your CPU or GPU is producing more heat than the thermal solution can dissipate, an aftermarket solution will control temperatures. Previously, aftermarket coolers were a rarity in India but this has changed for CPU coolers at least.

The concept of using heatpipes to whisk away heat is also common, and many aftermarket solutions utilise heatpipes embedded amid the fins. Remember from your physics that the larger the surface area of metal in contact with air the better the cooling; therefore the larger the heatsink and the more fins the better cooling it will provide, although a lot also

Shrikrishna Patkar

The latest Radeon HD 4890 and GeForce GTX 285 GPUs are cooler than their predecessors and don't require additional cooling

Copper makes for the ideal component when designing heatsinks. Unfortunately it's prone to corrosion especially in contact with moisture

depends on the assembly of the unit. Most CPU heatsinks are built to accommodate either 120 mm or 92 mm fans. Obviously, the smaller the fan the smaller the heatsink will be. These heatsinks are also called tower heatsinks owing to their height, which is much more than normal stock heatsink solutions.

When shopping for a CPU cooler one also needs to take into consideration the depth of the cabinet. Since these coolers are high, some of them might interfere with the side panel fitting – please make a note of this when shopping for one. Also most of these coolers use copper for the base, (the part that contacts the heat spreader on the CPU). This is because copper is a superior conductor of heat compared to aluminium or steel. In case you are living in a coastal region, ensure that the cooler you choose has some sort of plating (usually nickel) on the heatpipes and fins since copper corrodes with moisture. Most after-market CPU coolers come with a fan, although a few heatsinks are bundled without fans. Enthusiasts prefer these since the choice of fan is flexible while for most users the fan is another expense. Remember that the larger the fan the better because larger fans have a higher cfm rating i.e. they move more air at the same rpm, therefore cool more efficiently and with less noise.

When looking at a heatpipe-based cooler, remember to check and see how the heatpipes are attached to the base and the fins. If things are glued together it's not a good product, since any sort of glue or resin is not a good conductor of heat and will impede cooling. Ideally, the heatpipes should be soldered. Liquid coolers are also available although these are generally a bit more complicated to install, costlier and require more space inside the cabinet. I feel liquid coolers are unnecessary for most users except the hardcore overclocker who wants to benchmark components at much-higher-than-default clock speeds.

CoolerMaster is one of the brands offering a wide range of CPU coolers. Some are basic models with slightly better specifications than the stock coolers, while others are full blown coolers with large fans, heatpipes and such. Thermalright is another brand that caters to the high-end user with some high performance CPU coolers. The default LGA Intel 775 CPU cooler will set you back by around Rs. 500, while the AMD Socket AM2+ cooler retails for around Rs. 400 – there is another one for Rs. 600, this one has two embedded heatpipes. CoolerMaster's Hyper TX 2 Super is the first step-up from the regular heatsinks and comes with a 92 mm fan and three copper heatpipes. It's ordinary looking, but built well and ships with brackets and adapters for both Intel LGA 775 and AMD sockets. Priced at Rs. 1,600, this cooler is effective, certainly better than the stock coolers, but it won't be very effective at cooling overclocked quad cores. CoolerMasters Hyper 212 Super is the next option.

Heat, dust and humidity are together your PC's worst enemies

Priced at Rs. 2,500 this cooler comes with one 120 mm fan but can use another in a push-pull configuration. It has four heatpipes and this coupled with the larger surface area of the fins brings about greater efficiency in dissipating heat, especially when using two fans.

There are two other newer entrants from CoolerMaster, the Hyper N520 and the Hyper N620. The former is priced at Rs. 2,850 and features two 92mm fans in a push-pull setup. The latter uses a beefier heatsink and has two 120mm fans. Obviously the bigger the better, but for some people fitting such a large cooler may be a problem, and in such cases I highly recommend the Hyper N520 – I've tested this and found it to be very efficient, cooling even a QX9650 overclocked to 4 GHz to just 50 degrees on load. The Hyper N620 should be more efficient and is priced at Rs. 3,260, but weighs a hefty 847 grams, enough to damage your motherboard if you lug your cabinet around with the cooler attached. The Hyper N520 is also heavy at 688 grams, certainly heavier than most 92mm fan-based coolers.

Thermalrights Ultima 90i is the one I use on my Q9650, and this cooler is priced at Rs. 2,400. It's superbly built with six heatpipes and everything is nickel plated to avoid corrosion. Unfortunately, this excellent heatsink doesn't come with a fan – a minor irritation compared to its superb cooling. A good 92mm fan from the likes of NMB will cost you Rs. 600. For Rs. 3,000 you will have a cooler that cools a Q9650 running at 4.2 GHz to 53 degrees, and at stock speeds, (3.0 GHz), my CPU never crosses 48 degrees.

The Ultra 120 Extreme is a heatsink based around a 120mm fan and is the pinnacle of the Thermalright range at Rs. 3,400 and represents one of the best attempts at a top performing air-based CPU cooler, I've tested it, and can safely say that it's the choice if you want the best overall performer. Unfortunately, a good 120mm fan will often cost up to Rs. 850, meaning you'll spend a little over Rs. 4,000 for this solution, placing it embarrassingly close to a few of the liquid cooling solutions around. CoolerMasters Aquagate S1 is the only liquid cooler I could find readily in stock with Lamington Road dealers; CM is the only brand with liquid coolers available all over India. The Aquagate S1 has a 120 mm fan and adapters for AMD and Intel CPUs. The block is pure copper and the S1 makes sense for crazy overclockers. There are also a few vendors who import liquid cooling kits to order. In fact, one could order a discrete pump, tubes, fan, radiator and coolant from the likes of Swiftech, which is one of the better known builders of liquid cooling equipment. However, such kits will cost at least Rs. 8,000, meaning they're for hardcore enthusiasts with cash to burn.

If you purchase enthusiast-grade memory, chances are the memory sticks will come with heatsinks. I don't advocate slapping heatspreaders (available with many local vendors) on just about any memory. Value memory doesn't require any heatsink to dissipate heat and any heatspreader will likely trap what little heat is generated and cause more problems. OCZ has a memory cooler called the Memory Cooler XTC available for Rs. 1,200; it's got two blue-LED fans and will cool all four DIMM slots. It sits atop the RAM modules blowing air on to them. Other than this cooler there are no other active (fan based) memory coolers available, save the Corsair Dominator cooler that ships with Corsair's Dominator memory range.

GPU coolers are slightly more exotic since PCBs and GPUs themselves within a particular generation have no specified size or interface. Therefore a GPU cooler built for, say, an 8800 GT won't work on an 8800 GTX, simply because the layout of the cards differ greatly. Another point worth noting is that not all GPUs need cooling, for example the GeForce 8800 GTX GPU used to generate a lot of heat, but the much faster GTX 285 is relatively cool thanks to improvements in manufacturing technology and chip fabrication. Sadly the only decent brand available in Lamington Road was Thermalright; its HR-03 and HR-03 Plus are available for Rs. 2,300 and 2,650, respectively. Unfortunately both these solutions are pretty outdated and intended for GPUs that are largely obsolete today. I couldn't find any liquid cooling kits for GPUs. There are a few solutions available in the form of simple heatsinks and small fans that local assemblers will only be too glad to mod for your specific graphics card, but I think it's fair to say such solutions are okay if you are flogging a five year old graphics card with a dead cooler. I think it's also fair to say that today's generation of graphics cards are cool enough not to require additional cooling. Possibly the next generation of DX 11 cards will raise temperatures to an extent where manufacturers may start designing chip-specific solutions.

Proper airflow is important, just randomly placing more fans inside a cabinet can actually raise temperatures

Lapping is a technique used primarily for making any surface completely flat and allows for a better seal between that surface and the heatsink

Q My brother wants to buy a multimedia cell phone, with decent music playback and good camera for taking video and still images. His budget is Rs. 5,000-6,000.

Vicky Duggong

A Check out the Sony Ericsson K660; it's a good all-rounder and well built. It should be priced at around Rs. 6,000 on street.

Q I have Compaq sr5060il PC with 1.25 GB of RAM. Can I upgrade my system to 2x2 GB RAM? What will it cost me?

Gaurav Kesharwani

A The PC you mention has support for 4 GB of RAM, therefore upgrading it will be possible. If you are within the warranty period, ask a genuine HP dealer to do the upgrade, or you will lose your warranty; otherwise, else you can do it yourself. 2 x 2 GB sticks can be used but check the frequency of the RAM used in your PC by using software like CPU-Z, available for download from **http://www.cpuid.com/**

Q I needed help in buying a graphics card. I am something of a gaming freak and wanted one with at least 512 MB of video RAM that could play Halo 3 and Far Cry 2. Could you please suggest me a good one. My PC configuration is 2 GB RAM, 2.8GHz C2D CPU, ASUS P5KPL motherboard. My budget is around Rs. 4-5k.

A NVIDIAs GeForce 9600GT is a superb card priced at Rs. 6,000 and would really fit the bill. Check out the prices of brands like ZOTAC and Palit; their prices will impress and may be lower than I have mentioned. Otherwise, you can look at ATi's Radeon HD4650 which should be priced at around the Rs. 4,500 mark.

Q I have been reading Digit for quite a time. I have decided to buy a pc after extensive research. Here are the specs: ASUS P5Q-PRO motherboard, Intel Quad Core Q8200, 2GB Kingston value Ram, ZOTAC GeForce 250 GTS GPU, Acer AL 1916 LCD monitor, Seagate 160 GB SATA 2 HDD, Samsung SH-S203 DVD writer. Please suggest a suitable PSU for it. My budget is Rs. 35,000 (can extend up to a maximum of Rs. 40,000). Can I opt for an MSI P45 motherboard within this budget?

Sougata Nair

A Firstly, you haven't mentioned what you want to use this PC for. If you want a regular multimedia PC you could do with a cheaper dual core CPU and a GeForce 9600 GT graphics card. If you specifically want a gaming rig, please go for a Core 2 Duo E8400 and buy a faster GPU such as the GeForce GTX 260 or Radeon HD4870 1 GB, both of which will be priced around the Rs. 15,500 mark. Also, if you are into multitasking opt for a cheaper GPU and buy a better CPU such as a Core 2 Quad Q9550. If an MSI P45 board is cheaper, save a bit and go for it. Otherwise the P5Q-Pro is a super board. For a power supply, if you are going for the faster CPU and GPU I'd recommend CoolerMasters Real Power 500W, a modular PSU priced at Rs. 6,250. Corsair's TX650 is also available for Rs. 6,500. If you are going with a dual core CPU and a 9600 GT you won't need as much juice – in such case I recommend Corsair's VX450 for Rs. 4,500.

Q I recently upgraded my motherboard to an NVIDIA GeForce 7025/nforce 630a with 2GB Hynix RAM. Most of the games like FEAR, NFS: MW are running fine but some games like Resident Evil 4 and Doom 3 are running poorly, even at low graphic settings. Earlier I had a Gainward GeForce FX 5900 XT 128 MB, and these games were running fine. Is it because of the integrated graphic card? Please help and kindly suggest a good DVD writer under Rs. 1,200.

Bimit Verma

A Yes, this is a result of migrating to an integrated graphics platform. The onboard GPU is nowhere near as powerful as the GeForce FX 5900XT card. I suggest investing in a new graphics card. Even a GeForce 9400GT will give you a nice boost in performance over anything you have experienced. This will cost Rs. 3,500 approx. If you want something more powerful, look for cards based on the GeForce 9600GT GPU.

Q I have a budget of Rs. 9,000 to Rs. 10,000. I prefer to buy a Symbian phone, preferably a Nokia handset but please advice me for all known companies in India. And, should I wait for a week or two and will the rates fall? Symbian, memory and music are my main priorities respectively. I can spend up to Rs. 10,500/-.
Please help

Aman Arya

A For Rs. 10,500 you may be able to buy a Nokia N73, although the official price is higher, the street prices are lower. If you can get this phone, it's a sweet device with great music quality and expandable memory. It's Symbian based and has a very good camera.

Q I'm considering a PC on a budget of Rs. 75,000 for high-res gaming. I've considered the following components: CPU - Intel Core i7 920 / Core 2 quad 9550, please give me prices for both.
Monitor - Mercury 1990 TWA / View Sonic Va1918 (or any better if u can suggest under 6.5k), RAM - Corsair 2x2 GB DDR2 / Corsair 2x2 GB DDR3
HDD - Seagate Barracuda 1TB
Keyboard + Mouse - Logitech Multimedia Combo
Cabinet - Cooler Master CM 690
SMPS - Zebronics PRO 600w
GPU - Palit GTX 260 (216sp) sonic ed.
Motherboard - MSI x58 M / Asus P5N D
UPS - any of your choice under 2,000

Sushant Salil

A Hi, firstly, I suggest buying a Core 2 quad over the Core i7 as that platform is costlier. The Q9550 is a good choice at Rs. 15,500. Invest in 2x2 GB of DDR2 RAM from Corsair, OCZ or Kingston. For a monitor I suggest at least a 22-inch, there's no point in buying a high-end card and gaming on a lower resolution, low quality display. Any 22-inch display should be priced at Rs. 12,000 or so, look for our LCD monitor test for a good choice. I recommend spending a bit more on a ZOTAC GeForce GTX 260 216 – these cards have better build quality. For a motherboard, look at ASUS' P5Q-Pro priced at Rs. 10,500. The Zebronics PRO 600W is a decent choice, but you could get the Corsair TX650 which is much better, for a high-end config. For a UPS I personally recommend Numerics 800VA offering priced at Rs. 3,500. Hardly any Rs. 2000 UPS' will provide you the backup you need with a PC so powerful. Also opt for the WD 1 TB Black Edition over the Seagate 1 TB hard drive – the WD model is a bit faster and notably more reliable. Expect to pay Rs. 600 extra for this hard drive.

KILLER RIGS

everything you will ever need to build your own PC. whatever your budget.

- **Basic rig = Rs. 21,350**
- **Multimedia cum gaming rig = Rs. 81,100**
- **Ultra high-end PC / Gaming rig = Rs. 1,51,700**

MONITOR
- ViewSonic VA1928wm / Rs. 8,200
- AOC 2230fm / Rs. 14,000
- Dell S2409W / Rs. 15,000

HARD DISK
- Seagate 250 GB 7200.11 / Rs. 1,900
- Seagate 1 TB 7200.11 / Rs. 5,500
- Western Digital Velociraptor 150 GB / Rs. 9,900 or Western Digital 1 TB Black Edition / Rs. 7,400

CABINET
- Zebronics Antibiotic / Rs. 2,100
- CoolerMaster 690 / Rs. 4,400
- CoolerMaster Sniper / Rs. 11,500

POWER
- VIP 350 Watts / Rs. 850
- Corsair TX 650 / Rs. 6,500
- CoolerMaster RealPower Pro 850W / Rs. 11,200

GRAPHICS CARD
- None
- Palit Radeon HD 4870 1 GB SONIC / Rs. 18,100
- ZOTAC GeForce GTX 295 / Rs. 29,000

MOTHERBOARD
- ASUS NVIDIA 7025 M2N68-AM / Rs. 2,250
- Abit IP35-E Rs. 5,300
- ASUS P5Q Deluxe / Rs. 14,000

SPEAKER
- None
- Altec Lansing MX 5021 / Rs. 6,500
- Logitech Z5500 / Rs. 14,000

MOUSE
- Logitech 3 button scroll / Rs. 300
- Logitech MX518 / Rs. 1,300
- Razer DeathAdder / Rs. 2,500

KEYBOARD
- Logitech Multimedia / Rs. 400
- Logitech G15 / Rs. 4,500
- Logitech G15 / Rs. 4,500

SOUND CARD
- None / NA
- ASUS Xonar DX / Rs. 3,700
- ASUS Xonar DX / Rs. 3,700

CPU
- AMD Athlon XP 6000+ / RS. 2,850
- Intel Core 2 Duo E8400 / RS. 8,200
- Intel Core 2 Quad Q9650 / RS. 23,000

RAM
- 2 x 2 GB DDR2 800 MHz (Kingston Value) / Rs. 1,350
- 2 x 2 GB x 2 DDR2 800 MHz (Corsair XMS2) / Rs. 3,600
- 2 x 2 GB DDR2 OCZ Platinum 1066 MHz / Rs. 6,500

Monitors

Model	Market Price	Tested in	Size	Resolution	Contrast Ratio	Response time
Acer AL2216	Rs. 9,800		22-inch	1680 x 1050	700 : 1	5 ms
ASUS VM193D	Rs. 6,850		19-inch	1440 x 900	800 : 1	5 ms
BenQ T2200HD	Rs. 9,975		21.5-inch	1920 x 1080	1000 : 1	5 ms
Dell 1909W	Rs. 7,205		19-inch	1440 x 900	1000 : 1	5 ms
Dell S1709W	Rs. 7,200		17-inch	1440 x 900	600 : 1	8 ms
Dell S2409W	Rs. 18,200		24-inch	1920 x 1080	1000 : 1	5 ms
LG 177WSB	Rs. 6,400	May 2008	17-inch	1440 x 900	700 : 1	8 ms
LG W1942S	Rs. 6,900		19-inch	1440 x 900	700 : 1	5 ms
Samsung 2033SW	Rs. 7,500		20-inch	1600 x 900	1000 : 1	5 ms
Samsung 733NX	Rs. 6,650		17-inch	1440 x 900	1000 : 1	8 ms
Samsung 943NWX	Rs. 7,500		19-inch	1280 x 1024	1000 : 1	5 ms
ViewSonic VA1918WM	Rs. 6,600		19-inch	1440 x 900	1000 : 1	5 ms
ViewSonic VX2255WMB	Rs. 12,500	May 2008	22-inch	1680 x 1050	1000 : 1	5 ms
ViewSonic VX2240	Rs. 9,900		22-inch	1680 x 1050	1000 : 1	2 ms

CPU Coolers

Model	Market Price	No. and Size of Fans	Dimensions	Weight (grams)
Cooler Master Hyper TX2	Rs. 1,800	1 x 120 mm	108.3 x 123.7 x 136.5 mm	482
Cooler Master Hyper N520	Rs. 2,700	2 x 92 mm	122.35 x 102.5 x 141 mm	688
Thermalright Ultima 90 - 775	Rs. 1,480	0	115 x 55 x 139 mm	460
Thermalright Ultima 120 Extreme	Rs. 2,870	0	132 x 63.44 x 160.5 mm	790
Sunbeam Core Contact Freezer	Rs. 2,150	1 x 92 mm	95 x 80 x 155 mm	272
Glacialtech Igloo 5750	Rs. 1,795	2 x 92 mm	96 x 120 x 121 mm	507
OCZ Vendetta 2	Rs. 2,550	1 x 120 mm	120 x 50 x 159 mm	746

Portable Music Players

[illegible]	Market Price	Audio/Video Support	Dimensions (W x H x D) in mm	Weight (grams)
Apple Ipod Shuffle	Rs. 4,500	AAC, MP3, Apple Lossless, WAV, AIFF	45.2 x 17.5 x 7.8	10.7
Creative Zen Micro	Rs. 14,350	MP3, WMA	83.82 x 50.8 x 17.78	110
Creative Zen Stone	Rs. 2,235	MP3, WMA	53.6 x 35.4 x 12.8	450
Sony Walkman NWZ-E435F/B	Rs. 5,165	AVC, MPEG-4, WMV, MP3, WMA, AAC, L-PCM, JPEG	44.0 x 83.9 x 8.5	50
Transcend T.Sonic 630	Rs. 2,275	MP3, WMA	73 x 33 x 12.5	30
Transcend T.Sonic 850	Rs. 2,475	MP3, WMA, WAV, MTV	81.5 x 41.4 x 12.7	50

Graphic Cards

Model	Market Price	Tested in	Core Speed	Type of memory	Memory
EVGA 9600GT Knock-out	Rs. 7,000	November 2008	700 MHz	GDDR3	512 MB
PowerColor HD 4850	Rs. 6,590	August 2009	625 MHz	GDDR3	512 MB
PowerColor HD 4670	Rs. 4,650	August 2009	750 MHz	DDR3	1024 MB
Palit GeForce 9400 GT Super	Rs. 2,525	August 2009	550 MHz	GDDR2	1024 MB
Palit Radeon HD 4870 SONIC	Rs. 13,500	October 2008	750 MHz	GDDR5	512 MB
Palit GeForce GTX 250	Rs. 10,990		650 MHz	GDDR3	896 MB
XFX GeForce 8600 GT	Rs. 3,150		540 MHz	GDDR2	256 MB
ZOTAC GeForce GTS 250	Rs. 9,250		738 MHz	GDDR3	1024 MB
ZOTAC GeForce GTX 285	Rs. 24,900	February 2009	648 MHz	GDDR3	1024 MB

Hard Drives

Model	Market Price	Tested in	Speed	Cache	Interface
Seagate 1.5TB	Rs. 7,050	March 2009	7200 RPM	32	SATA 2
Seagate 1TB	Rs. 4,475	April 2009	7200 RPM	32	SATA 2
Seagate 7200.12 500 GB	Rs. 2,750	April 2009	7200 RPM	32	SATA 2
Seagate 750GB	Rs. 4,225	April 2009	7200 RPM	32	SATA 2
Western Digital Caviar Blue 640GB	Rs. 3,350		7200 RPM	16	SATA 2
Western Digital Caviar Black 1TB	Rs. 6,655	April 2009	7200 RPM	32	SATA 2
Western Digital Veloci Raptor 150GB	Rs. 8,470	April 2009	1000 RPM	32	SATA 2

Digital Cameras

Model	Market Price	Tested in	Sensor	OPtical Zoom	LCD Screen Size
Canon Powershot A480	Rs. 8,199		7.1 MP	3.4x	2.5-inches
Canon SX10Is	Rs. 23,995	June 2009	10 MP	20x	2.5-inches
FujiFilm FinePix A100	Rs. 5,995		10 MP	3x	2.7-inches
Kodak C140	Rs. 5,499		8 MP	3x	2.4-inches
Nikon Coolpix L19	Rs. 6,995		8 MP	3.6x	4.7-inches
Nikon S220	Rs. 8,995		10 MP	3x	2.5-inches
Olympus FE25	Rs. 5,995		10 MP	3x	2.4-inches
Panasonic LZ10	Rs. 8,499		10 MP	5x	2.5-inches
Sony S930	Rs. 7,800		10 MP	3x	2.4-inches
Sony H20	Rs. 17,800		10 MP	10x	3.0-inches

Flash Drives

Model	Market Price	Capacity
Corsair Flash Voyager	Rs. 575	4 GB
iBall USB Drive	Rs. 1,250	8 GB
OCZ Pen Drive	Rs. 575	4 GB
Kingston Data Traveler Pen Drive	Rs. 450	4 GB
Kinsgton Mini Slim Pen Drive	Rs. 675	4 GB
Kingston Data Traveler 100	Rs. 925	8 GB
SanDisk Cruzer Micro Skin	Rs. 485	2 GB
SanDisk Cruzer Micro Skin	Rs. 789	8 GB
Sony USB Pen Drive	Rs. 1,299	8 GB
Toshiba USB Pen Drive	Rs. 589	4 GB
Transcend JetFlash	Rs. 350	2 GB
Transcend JetFlash	Rs. 475	4 GB

External HDDs

Model	Market Price	Capacity	Interface	Warranty (Years)
Seagate Freeagent GO	Rs. 5,700	500 GB	USB	5
Seagate FreeAgent GO	Rs. 3,375	250 GB	USB	5
Seagate Freeagent GO Mac Edition	Rs. 9,850	320 GB	USB, FireWire	5
Transcend StoreJet	Rs. 2,750	160 GB	USB	2
Western Digital MyPassport Essential	Rs. 4,100	640 GB	USB	3
Western Digital MyPassport Studio Edition	Rs. 7,800	1 TB	USB, FireWire, eSATA	3
Western Digital MyPassport	Rs. 2,825	160 GB	USB	3

Siddharth Parwatay
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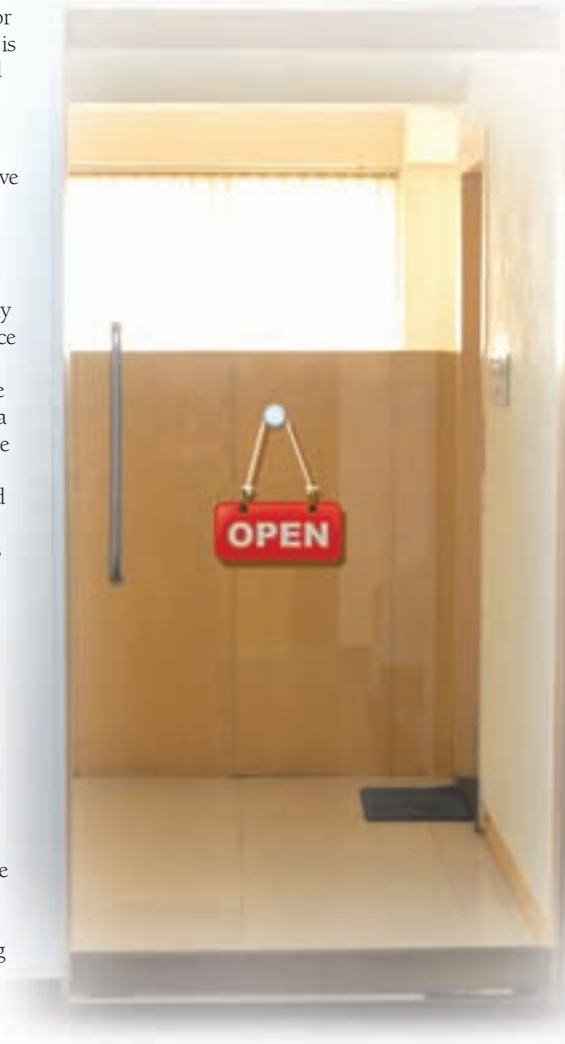
WE'RE OPEN FOR BUSINESS

Open source is all about freedom, so where's the money? Here's a look at various strategies for businesses, entrepreneurs and developers in the open source world



Introduction

Open source has come to be synonymous with the word free. Yet there are several businesses that are adopting the open source model as a strategy to stay afloat in today's times. If open source is free, then where is the money, especially if you decide to release your software into the open source world? The first thing we need to understand is that free relates to the word freedom. The famous quote goes, "To understand the concept, you should think of free as in free speech, not as in free beer". Therefore, thinking of open source as free and hence "no revenue" is a misnomer. If you are an independent developer, or are considering some sort of open source strategy or are just curious how an OS strategy might work; these are some of things you should consider.

Why open source?

It is important to understand that open source is not a supernatural cure-all and neither should it be shunned from the point of view of business and revenue. The basic premise we will go from is that a company or developer engaged in the software business is in it to provide value to the customer or end user. In such a case, open source will help a product maker potentially to provide better value to customers, by leveraging the ability for your customers or third parties to improve the product through bug fixes and product enhancements. The key is also to provide better value to customers than competitors, and then ultimately turn that value into a revenue stream. Fortunately or unfortunately – which ever way you look at it – open source ensures the survival of the fittest.

The open source model differs from the traditional model in the sense that you as a software developer, will most likely provide only part of the support to end users. The large base of your support will be provided by a community of developers engaged in furthering your product. These developers are attracted to your product as opposed to your competitors'. In such a way your resources are greatly augmented. What motivates these independent developers? That is a huge subject altogether, but some of the motives are - the satisfaction of working on a product that addresses a critical functional area in their lives or other people's lives; the fact that developers look forward to the possibility of providing allied services and creating related products, thereby gaining a revenue stream; they might also view working on your product as a learning opportunity; and finally there is the ego kick of building a reputation amongst peers. All this free resource augmentation brings down your cost of operation. It also facilitates in greater product development. As Venkatesh Hariharan, Corporate Affairs Director at Red Hat puts it, "In the next few years, we may see the pace of innovation in open source outstrip anything that proprietary vendors and their closed group of paid programmers can produce."

The make-or-break then lies with retaining these developers who contribute to the product and the community at large, ostensibly without any tangible return. Developers will not contribute if they don't remain interested. So a lot of what you do as a company to support these developers will determine if they take an active interest or not. Treating developers and the community fairly to a great extent is also a function of what kind of licences you release your product under.

Licencing for the open business

Licencing is perhaps the most important component of the open source model. There are several licences plus their variants in this domain, but all of them share some common principles, such as free distribution (no royalty), scope for derived works (modification), etc. The complete list of principles is available at www.opensource.org. In effect, licences go beyond just access to the code. Here are some of the main licences that are applicable.

No licence (Public Domain)

In open source software, the originator of the code, although while not charging anything for distribution, still has the copyright to the original code. In this type of licence, the copyright is waived. This is a no-holds-barred form of usage; users are free to do whatever they want with software that is released in this manner. This includes using it as a base for proprietary software.

BSD Style licence

BSD stands for Berkeley Software Distribution, and this type of licence is most famously used for the operating system Open BSD, and the Apache web server. This licence was originally designed to release software which resulted as a by product of academic research. It gives importance to attribution and proper mentioning of credit. Commercial proprietary products are possible under this licence.

GNU GPL

This licence was created by the legendary Richard Stallman, father of the Free Software Foundation. So naturally, it lies on the complete opposite side of BSD style licences, that leave scope for commercial exploitation of code. Thus the General Public licence and its variants deter developers from modifying code and not re-distributing it back into the community.

Mozilla Public licence

This licence is quite suited to commercial purposes as the provisions allow for augmenting the original code with proprietary code and then releasing a larger work that can be commercially licenced. Such proprietary code need not be made publicly available. The proprietary code must be distinctly separate from the original MPL code. It must interact with the original code through predefined APIs. While at the same time all modifications to the original code covered under MPL must be made publicly available.

Read
Chapter 1.2 of this month's Fast Track to open source software for operating licences

Business models

Once you start developing with open source it allows for deep market penetration. It is generally believed that customers start paying at the point of value. A famous example is of Facebook. Facebook started with MySQL as it did not have investment to buy a paid data base subscription. The venture used open source tools such as MySQL to give motion to an idea but when patching servers and security bug fixes became unmanageable, Facebook bought a MySQL subscription and paid them to solve the problems. At that point Facebook had a lot of users and angel funding, so Facebook paid for the service at a point where they saw value in it. This in effect is a business model.

When you develop open source applications you allow people to use them, they become part of your business logic, when they start making money, then you start making money. "The logic is - when you empower customers to be able to make money, you start a revenue stream for yourself. For instance many software related enterprises run Firefox across many of their terminals. It's a critical part of their business process, so they invest a lot of their own developers' time, as well as money into the Mozilla Foundation." said Abhishek Kumar who is an open source evangelist and works for with Solaris Outbound Product Marketing to promote developers in the country to work on the OpenSolaris platform.

Business models for open source are many. In fact open source businesses are free to come up with their own business model or make hybrid combinations as follows.

Support sellers

In this type of model the company backing the product distributes the software for free but makes money off things like media distribution, branding, support and training, and even customisation. This is perhaps the most common type of business model. Companies strive to make their installation process simpler by giving customer friendly media, etc. Red Hat is one of the companies that follows this model.

Accessorising

Simply put, this means selling associated paraphernalia to generate revenue. Associated products like books, training manuals and specifically compatible hardware are the more substantial options, but this also includes products like T-shirts, coffee mugs and action figures with product branding.

Dual Licencing

In this type of model software vendors offer the same product under different licences. One is an open source licence and the other is a proprietary licence which the vendor usually offers to enterprise clients. The product released under the open source licence is free to distribute or modify. Some of the most notable examples are of Firefox, MySQL and OpenOffice. It is believed that the open source version serves to popularise the commercial one. Developments of the open source version are offered as add-ons.

The return on investment

The open source developer community is comprised of a large number of students. In many different ways people, specifically students and entrepreneurs, can take advantage of open source. A student's involvement in open source and the learning derived in the process enhances his or her resume and improves employability. Contributions to open source are subjected to extensive peer review and testing, both by developer and user communities, and so for a student contributor, their contribution is testimony to their technical excellence. So, such students attract higher compensation in the industry. "This is particularly relevant in our country where thousands of students graduate every year with a technical degree and contributions to open source projects can be a big differentiator." says Abhishek, whom Digit spoke to in a freewheeling conversation on open source.

Abhishek Kumar, (SunSolaris Outbound Product Marketing)

Consider this scenario – say a life sciences business is running a sales force automation system developed totally in-house, exclusively on PHP and MySQL, as opposed to a commercial product. As a result of costs being brought down, they are in a position to hire a developer who handles the maintenance. If he/she finds a problem he/she emails the PHP or MySQL community and gets the application running again with their support. If you are a developer, then such companies going the open source way will be looking for you.

"When you've worked in open source for a certain amount of time you have a brand value to yourself. Eventually you gain a contributor status in the community and people understand that value. What you did in your free time actually gives you a day job."

Those who take the entrepreneurial route can monetise their contribution in multiple ways, such as providing professional services on open source products and solutions and charge for customising and extending current open source products to suit the needs of large enterprises. All this involves working with open source communities and contributing to open source projects. If you have a good understanding of how communities work, you can harness the power of community. With the multitude of communication and distribution channels available today, getting your product out in the market becomes simpler. If your product is good, your customers will find a point at which they find value in your product.

Alternatively, entrepreneurs can make a very viable business only by investing their idea and time with open source. The open source world offers almost all the development tools, such as operating systems, programming languages, databases, IDE's and even source code management systems, free of cost, and so anyone with a product idea can use open source to develop it without making any significant capital investments. "For instance if you start a business creating and managing websites, you can use technologies like Java EE, MySQL, and Netbeans to develop a product and deploy it on OpenSolaris, which is a free platform" says Abhishek. In this scenario, when the business turns profitable or demands increase beyond what can be handled, there is always the option of going to professional support for each of the concerned technologies.

In conclusion, open source creates an ecosystem for businesses and entrepreneurs to grow, where they need to invest only at the point where they see value. This way the entry barrier for anyone who wants to break into the business is at an all time low. And this holds good for everyone who uses technology in any form in their business, which is practically everyone in today's world. Thus, harnessing open source technologies, the process of open source development, and engagement with open source communities would prove to be a great advantage for developers and bring both direct and indirect revenues to both small as well as large entrepreneurs.

Knowing about programming design patterns such as MVC and IoC is also important for any developer, as any major software project involving multiple developers will probably use one

If you are very interested in developing user interfaces and designing the way people interact with software, then Interaction Design or IxD is an entire field just for you!

Imaging: Chaitanya Surpur
Photography: Jiten Gandhi

Developing... your career

Proud of being an uber geek? Make it a career...

Kshitij Sobti
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Developing... an option

The open source community has changed the very way we look at software. The very non-commercial nature of it makes you wonder whether there is any future in software development.

When you see so many people developing software for free, you are sure to get the impression that it isn't a very lucrative career.

However software development is far from a profit-less venture. There are still a large number of companies which develop applications, and provide software services. There is no lack of programming related jobs out there, it is just that the bar has gone up.

Even if you don't intend to take up programming as a career, learning programming languages can be a lot of fun. It is like learning how to speak in another language, it gives you access to another programming culture and community.

Developing... desktop applications

Here, by desktop applications we mean to encompass all conventional computer platforms, x86, x86_64. For the most part this means programming for Linux, Windows, or Mac OSX.

While most programming languages are capable of targeting any of these platforms, there are some languages which are more platform biased. The core of Linux programming and its kernel itself is written in C and Apple platforms favour Objective-C.

When you see so many people developing software for free, you are sure to get the impression that it isn't a very lucrative career

The number of desktop programming languages is so diverse that it is impossible to learn them all. Yet there are a few that we might constantly run into in our programming endeavours, and a minimal knowledge of them is highly recommended.

All said and done, these are the programming languages that every developer should know:

Java

Java is the most popular programming language, thanks to its wide scope of use. It espouses the principle of "Write Once, Run Anywhere," meaning that as long as a runtime environment is available for an operating system, the Java application you write will run on it (and the Java Runtime Environment is available for nearly every platform). Java is very popular for enterprise applications and as such is a very good programming language to learn for furthering you career. Java is also used in web programming and programming applications for mobiles, thus making your experience even more portable. Java should not be confused with JavaScript, which is the scripting language of the web, they have very little in common besides their names.

C and C++

The syntactical similarities between C and C++ mean that by learning one, you essentially learn the other. C code will require very little adaptation to compile with a C++ compiler, however the languages differ in paradigms. A large amount of code is still written in the C programming language, and as such you are bound to run into it sooner or later once you start programming – learning C is thus a worthy investment for any programmer.

Visit thinkdigit.com/d/81714 for an article on where you can get certifications for some of the programming languages listed here, and some institutes which offer courses

Most programming languages today are object-oriented. Learning the concept of OOP is very important when you make real world applications that need to be scalable

Windows is undoubtedly the most popular operating system you will find on personal computers, and as such, Microsoft Visual Studio remains a popular choice as a programming environment. The Microsoft .NET SDK is used to build applications in the recent Visual Studio products:

.NET

.NET isn't a programming language, instead there are multiple programming languages which can be used to build .NET applications. Much like Java, .NET applications are compiled to bytecode which Microsoft calls the Common Intermediate Language (CIL) which is then run by the .NET Common Language Runtime (CLR). Many of Microsoft's technologies can use .NET as their programming system, so learning a .NET language means that you can write for any platform which is .NET capable . Microsoft Silverlight and ASP.NET are examples for web technologies which utilise .NET. While this is a Windows technology, the open source community is hard at work on the Mono framework, which will enable .NET applications to be written for Linux-like operating systems.

Computers have become much more powerful now than we could have imagined a few years ago, and this has also led to a change in how people develop applications. We are not talking about applications becoming larger, or having more visual effects, but about the way application are run or compiled. The abundance of computing power has led to the rise of interpreted languages such as Ruby, Python, Perl, and the overhead they consume is no longer that significant. Python and Perl are both very popular for writing scripts for the *NIX environment.

It is impossible to list all the languages you can use to write desktop applications or even those which you might need to develop in. On one hand, you can learn popular languages to make you suitable for a large number of jobs, and on the other hand, by learning some of the less popular languages, you gain an edge over the mainstream developers. For example, by learning some of the older languages such as FORTRAN and COBOL you can be of immense use to organisations which need to deal with applications written in such code in the past.

ACHIEVING UBIQUITY

The reason most people cite for avoiding operating systems such as Linux is the lack of their favourite applications outside of Windows.

There is a vicious loop we see, where software companies avoid creating software for Linux due to the increased cost in supporting an additional platform, while people avoid the platform due to the lack of software on it!

There are many projects now that aim to break this cycle, by improving cross platform compatibility of applications.

Linux users will be familiar with WINE (WINE is not an emulator) which allows you to run Windows applications on Linux. Thanks to WINE, some of the people who have been held back due to their dependence on Windows-only software can now switch to Linux.

Nokia's Qt toolkit (formerly owned by Trolltech) is another solution that works the other way around. The Qt toolkit allows developers to write software once which can then be compiled for Windows, Linux or MacOS, and even manages to ensure that each user gets their native UI experience.

If you intend to develop applications that need to run on all platforms, you can benefit greatly from learning about such solutions. Even if you do not intend to use Qt for developing your application, it is wise to at least ensure that your application runs properly on Linux using Wine.

Such solutions can greatly ease a developers task. In fact, the Linux version of Google's popular image management software Picasa, has been created using WINE, thereby nearly eliminating the effort of porting the application.

Developing... web applications

When it comes to web development, there are no choices more obvious than HTML and JavaScript. Surely you can start off there, but gone are the days of web pages with static content. To unleash the full power of the internet you need to make websites dynamic

The number of desktop programming languages is so diverse that it is impossible to learn them all

in body, mind and spirit.

To call yourself a web developer you need to not only know HTML and JavaScript but also at least one server-side programming language, extra cookies for those who know more.

For web development, you need to know the languages of the web:

HTML

The web is HTML. Whatever goes on in the back-end is irrelevant to the user, as all they will see is what the final HTML code renders. You have to start web development by learning HTML, and no, knowing how to use a WYSIWYG editor like Dreamweaver won't do.

CSS

CSS, HTML's sister language is about as important for a web developer today. While HTML gives you the raw data and layout of the web-page, it is CSS which gives it style, and grace.

JavaScript

The magic potion which makes a website come alive. To engage the user in a true interaction with the website, you need to use JavaScript, without it you; web page is exactly dead.

A static website is a stagnant website. Unless all you need to do is showcase pictures of your cats, you need to know at least one server-side language to make your website worthwhile. Some of the most important tools are:

Recession ending
With the global recession categorised as 'ending' by the Federal reserve and the World Bank, recruitments are expected to increase in the months to come

PHP
For a better understanding of PHP, read January 2009 issue of Fast Track

WEB TECHNOLOGIES YOU NEED TO BE AWARE OF

It is unlikely that you haven't heard of Flash and Silverlight by now. They are plug-ins for web browsers which allow rich media content in webpages. If properly used they can add a greater level of interactivity to your website and give people a richer experience of the web. If done wrong, they can as easily spell disaster (who hasn't found Flash intro-pages annoying!)

Flash might perhaps be most popular as method of embedding video content in webpages, while Silverlight's mightiest claim to fame is that it is a Microsoft technology.

Flash is a powerful tool for creating rich multimedia content. Adobe's Flex SDK however also turns it into an immensely powerful tool for creating RIAs (Rich Internet Applications). Even better the Flex SDK is free and open source! Although Adobe's Flex Builder IDE for creating Flex applications is not free, there are many free tools which can use the SDK to create content. Using Adobe AIR SDK, you can also take your Flash applications to the desktop, and enable users to install them on their computers like regular software applications.

Silverlight is Microsoft's answer to Flash, however till v3 it had remained a weak answer indeed. As of version 3, Silverlight is capable of creating content equivalent to Flash. Microsoft provides the Silverlight SDK for free, and combined with free Eclipse tools you can get started with Silverlight too, at zero cost. For a professional environment you can use Microsoft Expression Blend which is part of the Expression Studio suite. Silverlight v2 onwards uses .NET languages for programming, which is another useful skill set applicable to multiple domains.

PHP
Possibly *the* most popular server-side scripting language for the web, and free and open source. If you have decided to get into web development, it is a good idea to know this even if you choose another language to develop in.

SQL
SQL (Structured Query Language) is not a programming language, but rather a language for describing how to access data from a database. Since any dynamic website you make will in most likelihood require a database back-end, it is necessary that you learn how to query the data and manipulate it using SQL.

ASP.NET
A successor to Microsoft's older Active Server Pages, ASP.NET is another popular server-side scripting language. It allows you to use any .NET language to code your web applications. If you're already planning to develop on .NET, this will be just an HTML throw away.

JSP
JavaServer Pages use Java as the server-side scripting language to make websites dynamic. If you already know or plan to learn Java, then you should add on this one for good measure.

Coldfusion
While Coldfusion is not nearly as popular as some of the other options listed here, it is still is very much in use in intranets of some enterprises. It has a rather expensive server, however it has enough free learning resources to get you started, and a free developer version of Coldfusion is available for testing your applications.

Perl
The Perl language has some of the most powerful features for manipulating text strings, making it a powerful language for the internet, which is essentially described in HTML text. Most paid hosting providers nowadays support Perl as a server side language. The popular Movable Type Blogging platform / CMS is in fact written in Perl.

Python
Python is becoming increasingly popular as a server-side language for websites. It is in fact the language of choice if you wish to build applications which will run on the "Google App Engine" cloud computing service.

Programming is something that gazillions of open source developers find rewarding enough to do for free!

Developing... mobile applications
By developing applications for mobiles, you have the capability to reach into millions of pockets. Mobiles reach a different audience than personal computers as they may be used even by people who are not computer savvy, or in fact those who don't use computers at all. While this is not much of a consideration while choosing what programming language to develop on, it does mean you need to take a different approach.

Unlike PCs, where you can write software using the same programming language for any OS, mobiles tend to be a little more picky. If you want to write native applications for mobiles, almost every OS will require you to learn a new language!

Java
Even some of the lower end mobile phone out there today support Java applications, ensuring that any Java application you write will reach the maximum audience.

Applications for Android are also written in Java; however the dialect is a little different. Java's presence in almost any computing field means that it is indeed an essential skill set if you intend to become a developer.

Objective-C
Being the language of the iPhone SDK, it is important to learn if you need to build applications for the iPhone. While you can build applications for the iPhone in C++ it is a rather more complicated process than using Objective-C.

Your skillset in Objective-C will not go to waste, since it can also be used for developing applications for Mac OSX and even PCs. However Apple has very vague policies regarding which applications will be accepted in the Apple store, so it is important you keep their terms in consideration.

C++ for S60
The language of choice for Symbian, Nokia's preferred platform. The dialect of C++ used by Symbian differs from the standard, and is supposed to be tougher. While Symbian usage in mobile phones is decreasing, it is still the operating system on many mobile phones out there and will continue to be the OS for Nokia devices for the foreseeable future. Nokia will also make Symbian open source soon, which might affect its popularity for the better.

Developing... my career?
It is very possible to make a career out of programming, but if you intend to, it is important that you get into it as soon as possible. Leave nothing unexplored, and go where your curiosity takes you. Experiment. It is the best way to explore any programming language, and is more important than reading any book or taking up any course.

Any certification that you intend to get for proving your programming skill is not as important as the unique perspective you bring to programming. There is no dearth of code monkeys swinging on the branches of multiple certifications.

If you are indeed passionate about programming, you will find that there are plenty of opportunities. Think about it, programming is something that gazillions of open source developers find rewarding enough to do for free!

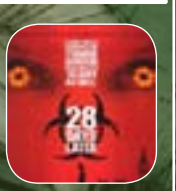
Here's to a brilliant career in development ahead of you, and hoping we'll get free licences to any software you write!

Geek culture : *Zombies*

Zombies are re-animated dead bodies, either controlled en masse, or with a rabid mind of their own. One of the most drastic models for an apocalyptic ending to human civilisation, is being overrun by a hoard of zombies. As killing dead things is not an option, the best you can do is decapacitate them. Watch the movies listed below for education, play the games for practice and buy the gear to prepare yourself. Not convinced of the possibility of a Zombie apocalypse? Hunt around the net for a certain "Clairvius Narcisse".

Movies

28 Days Later (2002)



This Zombie movie uses the "virus outbreak" approach for creating an apocalyptic onset of Zombies. Directed by Danny Boyle, the has a sequel and another one being planned.

Dawn of the Dead (2004)

A modern remake of a 1987 classic, Dawn of the Dead has a small bunch of people locked in a mall, while hoards of zombies gather outside.

Planet Terror (2007)

Part of the "Grindhouse" double feature, this Zombie movie is a salute to a all the cheesy zombie movies from the pulp sci-fi era. Directed by Robert Rodriguez.

Games

Doom

The game that defined the FPS genre, and gave early gamers the most thrilling expirience of dealing with minions of demonic undead apparations, on an alien surface. There have been many revivals since the original release in 1993.

Left 4 Dead

Left 4 Dead features a whole host of superpowered zombies, including exploding stinkballs, and zombies with insanely long tongues. This is one of the most engaging multiplayer zombie games around.

Resident Evil series

A series of zombie killing games from Japan that really brought out the gore involved when fighting the undead. The series of games spawned a successful bunch of movies and comic adaptations as well.

Gear

Zombie survival guide

A well researched and detailed history and survival guide written by Zombie expert Max Brooks, this is the reference work for those who wish to survive the eventuality of a Zombie Apocalypse.

Zack Ax

The Zack Ax is a hand-held, close combat weapon for when the Zombies get uncomfortably close. This is just one of the many anti-zombie blades available at http://zombietools.net, we also recommend the Urban Bone Machete II.

Zombie survival kit

Pack your tools, a first aid box, some canned food, your blades, the book into this neat little Zombie survival kit from www.cafepress.com and you can expect to live just a little longer.

Digit Diary

Kumar got in one of those Annoy - A - Trons sold at ThinkGeek.com. These are very simple gadgets, where a beeper is added to a circuit board, along with a battery and a magnet. Every 2 to 8 minutes, at random intervals, a high frequency buzzing sound or a beep is emitted. Just hunt around for the testimonials of this thing on the web, and you should get an idea of how irritating this is. Michael and Rossi were immune to it, probably too many beeps in the test centre for them to pay attention to. Siddharth however, was affected, and could not find the source of the sound, which irritated him. Raaabo was however, affected by it the most. He knew what it was the second he heard it, and threatened to find the Annoy - A - Tron and throw it out of the nearest window. These are not easy to come by, so Kumar promptly switched it off.

Movies
Riding Solo to the Top of the World, and *One Crazy Ride*, two Indian biking movies by dirt-trackproductions.com.

Music
We used the video *Juggalo Homies* by Insane Clown Posse to test how long laptops lasted.

Game
Tap tap revenge 2 is an addictive game for the iPhone. Tap and get pointsbased on visualisation over music.

NSD Powerball

The NSD Powerball is a toy and a machine that combines fun with a serious arm workout. It claims to be the most powerful gyroscope in the world, so we called in a couple of them for testing, and the team was absolutely addicted to them. What got us interested was that it was a good relief to those suffering from, or on the verge of carpal tunnel syndrome. The Powerball is a plastic sphere, with a rotor inside, that spins faster depending on how fast you can rotate it. When the forces builds up, it becomes really hard to hold on to the powerball, and this gives the muscles in your arms a great workout.

We spent the first few hours getting the wrist movement right, which involved rotating the wrist in a circular motion over and over. Eventually, we ended up doing what the web site (www.powerballs.co.in) promised we would, and began competing for the high scores on the digital counter. High scores from around the world are recorded, the current ones being somewhere in the range of 16700 RPMs.

tech art: interactive art

Image Credit: www.nawlz.com

Online interactive comic books are not a new idea, and have been around for some time. However, no one has taken this concept as far as Stu Campbell and his collaborators. The comic is hosted at **www.nawlz.com**, and is regularly updated in an episodic format. Each episode has a mixture of visauls, animation, sound and some interactivity thrown in. The premise is a surreal cyberpunk adventure in a large, futuristic city, following a typical high-tech protagonist, Harley Chambers. There is some interactivity thrown in, about how the story is told, but it is essentially the same story no matter what you do. We suggest that you start soon, as there is a lot to catch up on. Also, follow the associated blog on **http://nawlz.com/blog**.

Drakensang: The Dark Eye

RATINGS

Platforms	PC (Microsoft Windows)
Publisher	DTP Entertainment
Developer	Radon Labs
Price	$ 29.99 (Steam)
Score	7/10

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Drakensang is a pen-and-paper style game, based on a German role-playing game that enjoys immense popularity in its home country. The world of Drakensang will immediately feel familiar to those who have played D&D games, read Tolkien's work or seen film adaptations of his work with the *Lord of the Rings* trilogy. On a broad level, the races in this game are humans, elves and dwarves – the staple of any fantasy game. Taking inspiration from the real-world, ancient and modern day cultures, humans have sub-races. Similarly, elves and dwarves have sub-races too. During character creation at the start of the game, the choice available for your characters' playing class depends on the race (or sub-race) and sometimes gender too.

The game does not offer a great deal of choice in character customisation during creation – which is rather disappointing. Since this is a pen and paper style game, at its core are dice-rolls and it requires a lot of information crunching to truly understand the system. It took me an almost entire play through to get a grasp of the basic rules and then I played (and finished) the game a second time through with far greater understanding.

The combat is in real-time with a classic four-member party. However, as one would expect, there is an option to pause the game and queue up commands to your party members – a tactic that is highly recommended. To use crafting skills like alchemy, bowyer and weapons forging, the game requires you to have raw materials. These can either be purchased from merchants in the game or can be acquired by foraging plant life and gutting felled enemy creatures. The later method requires you to learn certain skills from trainers in the game (if your character class does not already give you access to those) and subsequently invest experience points in those skills. Although these form an important part of game play, the process is uninspiring and often tedious.

Many of the quests in Drakensang are set in and around the city of Ferdok. There is a good deal of variety in the environments, featuring the staple fare of any respectable RPG – sewers, old-ruins, underground dungeons, cemeteries, swamps and so on. These levels are well crafted, with good attention to detail and impressive sense of scale and grandeur.

The game has fairly short load-times. With the graphical effects cranked up to the maximum, there was never any instance of jittering or frame loss, even in the heat of battle with spells flying in from all directions. In spite of having an expansive and detailed environment, traversing in the game world quickly becomes tedious and tiring, simply because the running speed of the playing characters is just too slow compared to the scale of the maps.

So, Drakensang has a robust party system, looks good, and has decent combat with some well crafted environments. Sadly though, the game fails in an important cornerstone of any good RPG – it does not tell a compelling story. The story starts off with a letter and a plea for help from a friend, who lives in the city of Ferdock. After some travelling and sub-quests later, the main plot of the game has you pursuing the Dragon Quest. This uninspiring story is delivered by a less than intuitive conversation screen that will have you reading reams of text with a few bits of very dull voice acting. If you can get past the weak plotline and still enjoy the combat, the game has lots of it to offer.

Despite its flaws, Drakensang seems promising and with a lot of potential. Let's hope they get the story telling right with the reportedly next installment in the series, titled The River of Time, due to release in early 2010.

Artistically refreshing

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One of the most interesting and artistically refreshing games of the year 2009 is a little known title called Zeno Clash. Developed by a group of Chilean developers who call themselves the ACE Team, the game uses Valve's Source Engine to bring to life the often disturbing world of Zenozoik. The protagonist of the game is Ghat who is one of the many children of a hermaphrodite creature, aptly called Mother-Father. Curiously, the game starts off with Ghat regaining consciousness after a heated battle in which he kills Mother-Father. Subsequently having being chased out of the city of Halstedom by the other off-spring of Mother- Father (your brothers and sisters that is), you are accompanied on your exodus by a female companion called Deadra.

The game plays out in the first person perspective; however, the emphasis is on melee combat, rather than ranged. It heavily draws influence from fighting games and old-school side scrolling beat-em ups. As you'd expect from most melee fighting systems, there are combos and block-parry-counter systems. If you've not played games like Breakdown and Dark Messiah, it may take you some time to get used to melee fighting in the first-person perspective. Although most of the game is fought unarmed, the game features a few melee weapons that are available only during certain encounters and for a short period. It's not all hand-to-hand combat though, and the game features some twisted versions of standard shooter arsenal like the crossbow and hand grenades.

The developers using the Source engine have done an admirable job at creating the world of Zenozoik with contemporary production value. The game takes you from the city Halstedom, through desert, forest and ultimately to the proverbial end of the world. In Zeno Clash, you'll perhaps find some of the most shockingly creative landscapes and creatures that you have seen in a long time in a game. The games' anarchist world is inhabited by some very interesting characters such as the insane Corwid of the Free and the game's antagonist, Mother-Father. There is a pretty deep storyline for an action game which is effectively narrated through alternate reality and flashbacks. The game is pretty short though, and we would be heading into spoiler territory if we wrote much more about the game details.

Initially, I found the game pretty challenging and at one point even considered taking the game difficulty down a notch. In spite of this, I would peg the games' length between five to six hours; which is if you only consider the single–player campaign. Finishing the game unlocks the Challenge Mode towers – something that should keep you busy for another few hours. This mode also has an online leader-board, in case you want to show your friend who is the better man. At $14.99 (roughly Rs. 750) I would recommend this game to all who have access to games on Steam – if only for the game's compelling art style and character design.

RATINGS

Genre	Action/Adventure
Platforms	PC (Microsoft Windows)
Publisher	Valve Corporation
Developer	ACE Team
Price	$ 14.99 (Steam) Rs. 725
Score	8.5/10

Toy Story
Toy Story was the first completely computer generated animation, and came from Pixar in 1995

Avitel Post Studioz

We have a look around in one of the country's leading animation and post production houses, bringing you the dirt on how they work, and juicy details on the equipment they use.

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The Animation Technology team


Concept designing


The Pre-Production unit

Avitel is a post production, visual effects and animation company that has an illustrious history of thirty-five years. The office and animation wing is located at Mahim, Mumbai, and the studio wing, which houses the post production facility, is located at Juhu, Mumbai. Avitel offers a wide range of services to its clients, and works on the aspects of cinema that are not in public view.

Dr. Pradeep Jain founded Avitel in 1972, and at that time it was the first private post production studio. Till then, post-production work was done by Doordarshan itself. *Yeh Jo Hai Zindagi* and *Mukkad* were among the first of many television serials that were post-produced by Avitel. Television advertisements came along with the onset of television, and there were a lot of special effects work involved for these commercials, a market which Avitel dominated. Avitel steadily grew in the field of post-production, with a history of many firsts. These included conversion to Telecine, reverse Telecine, and introduced digital post-production to India in 1992. Avitel was also the first to start mastering VCDs and DVDs in India, with record numbers of films mastered (1,200 for VCDs and 6,000 for DVDs). Recently, the Content Architecture and Design (CAD) wing of the company has been established for making animated full-length feature films.

The CAD department takes care of the entire animation process, which includes both pre-production and production.

The pre-production aspect of animation requires a lot of brain storming and ideation. The concept designer comes up with a story idea, or a skeleton for a film. The script writer develops and writes the story, which is then converted to a script. The director is consulted at this point, and the script is given a cinematic treatment – which involves the technical details and storyboarding. The script doctor consults with the technical team, and a final script, which is the foundation for the animation, is prepared. Based on the script, the characters are designed and developed. This stage also includes the modelling and the rigging of the characters. A character is made to look and move in a certain way in this process. The production of the animation starts only after this.

Indian animation studios had a lot of production work previously, but were not involved in pre-production. Avitel has successfully conceptualised and sold four films to a UK-based company, Purple Passion Productions. The films will be sold as a one time sale. The studio is geared entirely towards the international market, as the quality of their content is not justified by the current revenue stream of Indian animations. This is because of a lack of an audience; an overseas animated feature makes much more than an Indian animation film.

Avitel currently has a team of 80 animators, who work at the Mahim office. They are looking to expand to a facility that allows for 500 animators, and they plan to hire 300 animators over the course of the next three years, which is the development schedule for the movies that they have sold to their overseas clients. The studio works mostly on Dell machines, which are upgraded according to the requirements of the engineers in the organisation. Everyone in the organisation are technocrats, and intimately involved in the technologies that the studio uses. The CAD division recruits freshers from animation schools, and then trains them for the organisation itself. As advice to budding animators, Dr. Pradeep Jain encourages going through an animation school, and then specialising in one aspect of animation.

Animation grabs a fair share of the limelight, and quite a few people are aware of modelling and basic animation, which can be done on household computers as well. Post-production, on the other hand, requires expensive equipment, and the intricacies of the operation are beyond common public knowledge. The post production wing of Avitel is at Juhu, and occupies two floors of a well decorated office. There are cartoons all over the walls of the studio, and the best equipment in the world is used.

There are two departments in the post-production studio, the digital intermediate department, and the commercial or broadcast department. The digital intermediate department converts data from one format to another, while the broadcast department handles all the colour-correction, editing, transitions and the like. Most of the work comes into the studio in film reels,

which are called cans. Each reel is about twenty minutes long, and is first run through the Spirit 4K. The Spirit 4K converts the raw video to one of the highest formats in the industry, which is the 4K format. The Spirit is made by a German company called Digital Film Technology (DFT). If a commercial is brought in, it is processed immediately on the DaVinci 2K controller, which is housed in the same room as the Spirit 4K. The DaVinci 2K is a colour correction tool, and the work for broadcast is done on this machine.

If the client has come in with a feature length film, the reels are run through the Spirit 4K, saved on the servers (more on that later), and colour corrected on one of the two Lustres. The studio has a Lustre 2006 and a Lustre 2010. This is the standard equipment used worldwide, and even Hollywood studios have the same machines. Even highly specialised hardware such as the Lustre machines have beta versions, which were tested out by Peter Jackson while he was working on the Lord of the Rings trilogy. The colour correction artist sits on an elevated stage, with his hands on the Luster, and a Barco projector near his feet projects the video on a screen opposite the artist. All the colour-correction work is done in real time, and in full resolution. This allows a client to sit beside the artist, and not have to worry about render time, which was a common delay to projects till recently.

The video itself is colour-corrected shot by shot, twenty minutes at a time. Either the whole frame is worked on, or a part of the frame. Applying colour-correction to a part of a frame is known as masking, and is useful when there are multiple sources of light, such as a number of windows in an indoor scene. The Lustre allows for as many masks as necessary.

There are three Smoke machines, which are typically used for special effects, transitions and basic animations. The software used is known as Discreet Smoke, and the latest version runs on Linux. The Smoke machines are used for packaging or stylizing the video, including adding text and backgrounds. Both the Lustre and the Smoke machines are from Autodesk, which is based in the United States. The new Smoke machines can directly work on the raw Red format. Red cameras are one of the leading cameras in the industry for digital video, and the raw format consumes a lot of space, so this is no mean feat.

There is one Avid machine, which is mostly used for commercials and music videos. The shots are sequenced on the Avid machine, and then saved to be processed by the Lustre or the Smoke machine. Sometimes, the output from the Avid is used directly. Typically, an hour or so of raw video footage (called "rushes") is cut down to about five minutes of edited sequence.

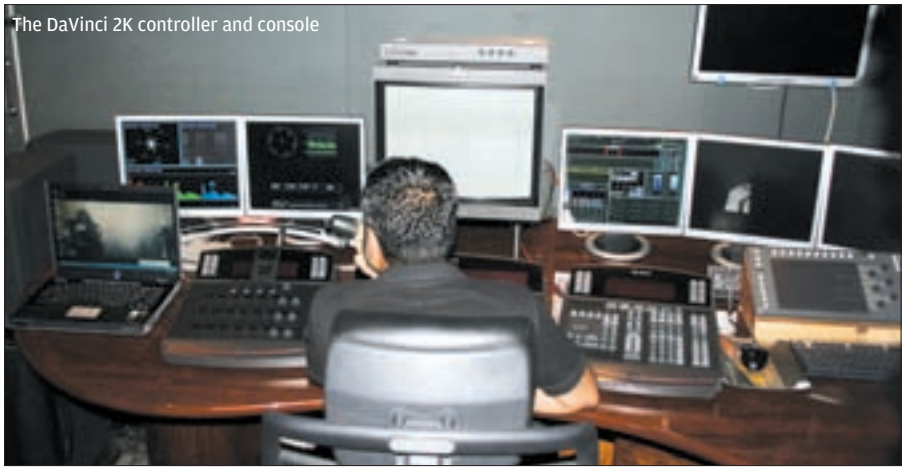
The Ari, another German made machine, is used for the final output. The client may want the output in a number of formats, or in a particular format, which this machine produces. From the film, or open format, the video is downsized to HD format, 35mm, 70mm or broadcast tapes known as digi-betas. It can also print every frame in a video frame by frame, which would give stacks of paper for every reel.

The Ari Machine, and the three smoke machines, as well as the servers are housed in the same room, which is connected by fibre cables to all the other machines in the studio. The storage capacity of the server is 100 terabytes, but all the data is configured on a RAID5 system, which automatically creates a backup of all the data. Essentially, the storage capacity of the server is 50 terabytes, which is sufficient for the studio to work on seven 2K films at the same time. 4K is one of the highest formats in the industry, but is not used regularly as it is not required, and is more time consuming. The servers are designed in a way that there is no need to move or copy and paste data, significantly reducing the time necessary to work for any client. Moving a 300 GB file takes up 4 to 5 hours, which is a considerable amount of time. The servers can handle four streams of real time 2K, which means that both the Lustres can work on the same project, while the Spirit scans data and dumps it on the servers. The throughput of the server is 8 GBps, and 16 GB of RAM is used on all the systems, which is the maximum that is currently possible.

Avitel Post Studioz has worked on many advertisements, films and music videos that you have seen on television. A version of its show reel is on this month's DVD, which shows some of the work that they do. This involves special effects, green screening and animation. The official web site is at **www.avitelpoststudioz.com**.

DR. PRADEEP JAIN ON "THE FINAL GOAL"

"When television came in, it was supposed to be a source of education, but it became an idiot box. When animation came in, it was also supposed to be for education. One of the films we are making, "The Final Goal" is about football. It is more than just an entertainer. One of the interesting things we are doing is that we actually, very subtly, teach the techniques of playing football through animation. When you watch football on television, it is very difficult to see what the players are doing. Through animation, we can show these moves, from whatever angle we want. "



The DaVinci 2K controller and console

The Spirit, used for scanning films

The Lustre 2010, used for grading and colour correction

Xxx
Join us on Orkut – go to http://www.thinkdigit.com/d/91630/

Find out about the latest happening at Digit. Follow the Digit India Twitter page at www.twitter.com/DigitIndiaDigitIndia

Liquid Nitrogen Expriment

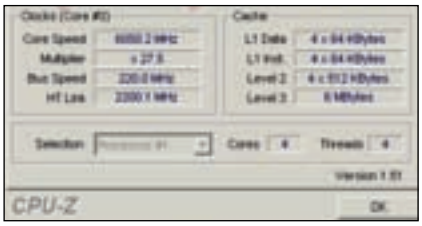
Here at Digit, we get excited everytime we hear the words liquid nitrogen. Darklord, from our forum, managed to get his hands on some and we're glad he used it for the right things – overclocking!

darklord

Join Date: Oct 2003
Location: Pune,India
Posts: 1,396

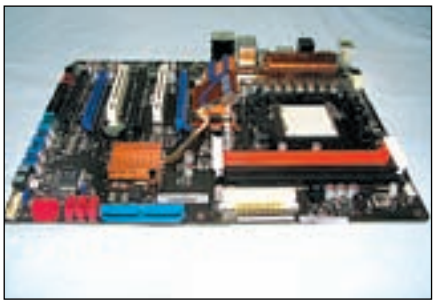
Hi,
Finally found a local source for LN2 so decided to put my new Phenom 955 to the test this weekend.

Test setup:
AMD Phenom II X4 955BE O913APBW
Asus M4A79T Deluxe Bios Ver.1303
Crucial Value DDR3 1333 2 x 1GB @ 1600 7-7-7-24
Corsair HX1000W PSU
Seagate 7200.12 500GB
Gigabyte 7200GS 256MB



This is how far darklord took the 3.2 GHz AMD Phenom II 955 X4 BE to – 6GHz.

These are the ingredients they used



thinkdigit.com For more pictures and details, visit the thread on the ThinkDigit forum - http://thinkdigit.com/d/78447/

thinkdigit

Come meet us on Digit's chat server

If you have questions to ask or you just want to hang around with us or other Digit readers, you can do so on our internet chat server. Joining the channel is really simple.

Step 1. Download and install an IRC client – HydraIRC (www.hydrairc.com), Xchat (**www.silverex.org/download/**) or Chatzilla – a Firefox addon (**https://addons.mozilla.org/en-US/firefox/addon/16**)

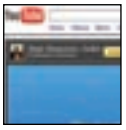
Step 2. Add a server to the list with the address irc.thinkdigit.com

Step 3. Connect to this server and enter the channel name to connect as #digit

If you already have an IRC client installed, click on `Start > Run`. Type irc://irc.thinkdigit.com/digit to connect. If you Opera or Chatzilla, type the URL as irc://irc.thinkdigit.com/digit

For a more detailed procedure, visit the forum thread **http://www.thinkdigit.com/d/73915/**

Be a part of the Digit Community on Facebook. Go to www.facebook.com/DigitIndia



Watch the latest unboxing videos of the latest gadgets on the Digit Youtube page - http://www.youtube.com/digitindia

This is the list of winners for the "Get Smarter" Contest. Winners will be contacted by Team Digit.

Name	City	Waiver
Arindam Mondal	Kolkata	100%
Sanjeev Chharia	Kolkata	100%
Sunil Kumar Gupta	Mysore	100%
Anuj	bangalore	50%
Anurag	Kolkata	50%
Sandip Mane	Mumbai	50%
Shivaraj	Mysore	50%
vaibhav tyagi	Delhi	50%
Ashish BAnsal	Hyderabad	25%
Balaji Cuttackam	Hyderabad	25%
Dhaval Gandhi	Ahmedabad	25%
Imtiyaz Jariwala	Bangalore	25%
Manjunath	Bangalore	25%
Pankaj	Delhi	25%
Punit Shah	Mumbai	25%
S. Vishnu	Hyderabad	25%
Samrat Chakraborty	Kolkata	25%
Ganesh Prabhakar Badhe	Nagpur	25%

Arindam Mondal

Sanjeev Chharia

Sunil Kumar Gupta

Re: The Photography Thread

pimpom
Alpha Geek
Join Date: Jul 2004
Posts: 994

Ever since I made one of my occasional visits to NASA's eclipse site last year, I've been eagerly looking forward to this day. The eclipse was to be only slightly over 90% of total in my area and I knew a photo of it would be nowhere nearly as spectacular as in the totality zone. But it's the first major solar eclipse I'd have a chance to photograph.

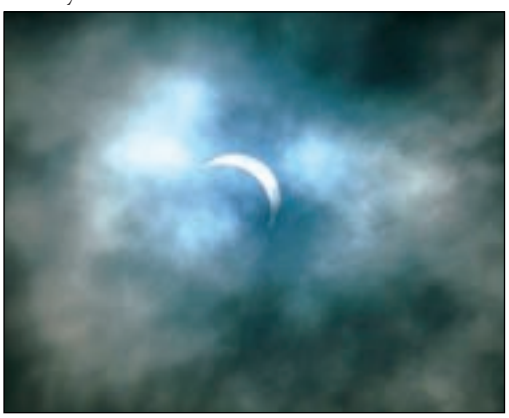
I decided to stay up all night rather than catch a couple of hours' sleep and force myself to get up all woozy headed. With some friends whom I've been informally guiding in photography, I went to the house of another friend who's in a good location facing the eastern sky.

Dawn came but alas, the morning sky was heavily overcast, with thick fog rolling in too. There wasn't even a faintly luminous spot to indicate where the sun was. We watched TV, the clock and the darkening sky as the moment of maximum eclipse came and went. Some time later, the weather relented a bit and we began to catch glimpses of the receding eclipse. We started shooting and I took some 60 shots. The clouds were moving so fast that the brightness level changed literally from second to second.

I saw no point in trying to check my exposures in between shots as the next one would need a different level anyway. I went entirely by guesstimate and kept turning the shutter and aperture dials, using exposure values from f/11 at 1/2000 sec with a filter to f/4 at 1/20 sec without a filter.

I was pleasantly surprised when I later found that more than half of the shots had acceptable exposure, at least acceptable to me, given the circumstances.

Here's the very first shot, taken about 10 minutes after the moment of maximum eclipse:



At last, a data-centric OS?

Edward Henning, Editor-in-Chief

The recent announcement by Google of the forthcoming Chrome OS immediately reminded me of a prediction I had heard in the mid-90s, and suggested that Google might actually be heading in the right direction.

In February 1995, I was invited to visit IBM's T. J. Watson Research Centre, just outside of New York. I had shared some obscure research data which happened to be of importance to IBM, and so this was a courtesy visit – and not a PR or marketing man in sight. One exercise the researchers do each year is to make predictions for the computer of ten years time. They also check each year to see what predictions they had made ten years before, and how accurate they were. (They proved very accurate at the time I was there, apart from the 40 MB floppy drive!)

I wrote at the time: "Almost sheepishly, they told me of one of their current predictions, which they seemed to feel confident about, but a little hesitant to express, apparently because it seemed so radical: that the user interface of the future would be Mosaic – or whatever was the successful browser at the time." NCSA Mosaic was the first successful web browser, before it was eclipsed by Netscape.

"... they considered that the future importance of the web and the logic of having the same kind of interface to access local data and web-based data would force a demand for a browser style in the operating system interface"

Those researchers considered that the future importance of the web and the logic of having the same kind of interface to access local data and web-based data would force a demand for a browser style in the operating system interface.

For most of the time that we have had PCs, the interface has been program-centric. With command lines, such as DOS, you might enter:

edit column.txt

The text file to be edited is a parameter for the command. You might also simply start the editor and then proceed to open various documents. Everything is done from the program. With a graphical interface like Windows, you also normally start a program first and from there open data files.

In a data-centric approach, typically, you might click on the icon of a text file and the OS will know which program should open the file - there are problems with this approach - click on a video clip, and do you want to view it, edit it or resample it?

There are other ways also in which the program-centric approach has advantages. Take my own work; I spend most of my time on my PCs working with text: writing, reading or editing. I have three text editors that I use for this purpose, and having three icons on my desktop does not take up too much space. However, as I write, my main directory tree for documents contains over 5,000 text files - many very old ones are zipped up and not included in this count. Imagine that lot dropped on the desktop as icons.

However, the main attraction of developing a data-centric approach to the user interface lies in the fact that users think in a data-centric manner. I don't turn on my PC in the morning and think "Now I want to work with my word-processor." Rather: "I need to get back to that document I was working on last night."

So, how to develop a data-centric user interface? The idea has been around for a long time. Bill Gates told me around 1989 of his vision that he called "information at your fingertips". He described this as an approach to all data for which the only analogy he could give at the time was hypertext (known at that time in program help systems). He had been very impressed with the work that had gone on at Xerox PARC, admitting in private that this was the inspiration for Windows, and that group was one of those working on hypertext. Perhaps some of you also remember the discussions in the 90s about the Program Manager for Windows and OS/2 - how to do this for data?

Gates was nearly right with the hypertext suggestion, but Microsoft seems never to have been able to embrace this fully. Clearly, a data-centric approach favours a GUI and browser-style interface. If anything has shown us how we can manage data on a large scale and find our way around it, it is the experience with web browsing. This is what the IBM researchers figured out nearly 15 years ago.

And this seems to be how the Google developers are thinking. Don't be fooled that this is only for netbooks - if they get it right, it will be made available for desktops. The irony is that just as Google is describing a browser-style interface for an operating system, Microsoft moves the other way and tells us that Internet Explorer is not an integral part of Windows and can be removed. That must be music to Google's ears...

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