

January 2007

www.thinkdigit.com

# digit

YOUR TECHNOLOGY NAVIGATOR

## HIGHER DEFINITIONS

HDTV: An Eye-Opener



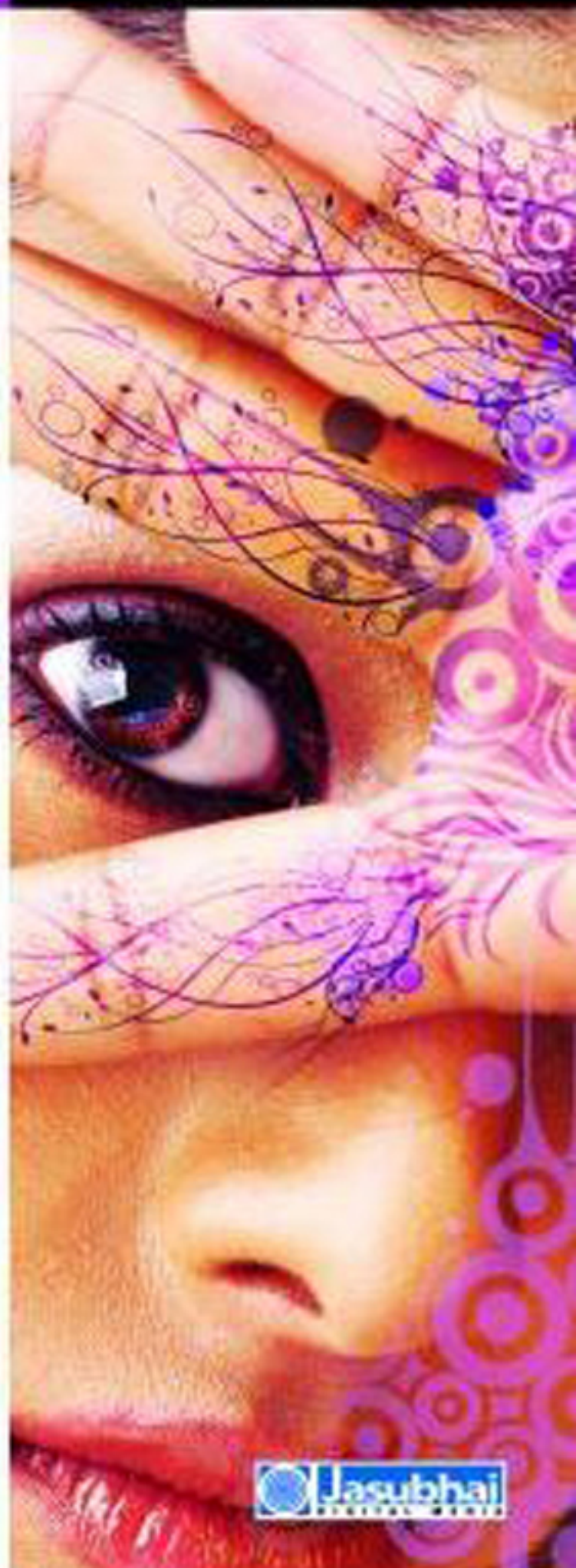
Keeping It Cool: Plan The Airflow  
In Your Cabinet

More Monitors, More Utility,  
More Fun!

Wi-Fi Devices—What Do You Need?

46 USB Flash Drives Tussle  
For Your Pocket

A Dozen E-Mail Clients  
To Choose From



## Please Sign In. Or Else.

**T** HIS CHRISTMAS WAS the first time I did all my shopping online. Giving the finishing touches to this issue and many trips out of town meant little or no time for the luxury of doing the mall rounds. Add to it the sheer convenience of online... I was through with my purchases in all of 30 minutes. And this included Googling for the best shopping sites, the best deals on offer, choosing the gifts, and the credit card bit.

I happened to have been signed into Google—what they call the “Personalized Home.” It hadn’t occurred to me, though, in those 30 minutes I’d left digital footprints all across the Web—right from my gift preferences to my choice of Web sites to even the amount of time it took me to nail down the gifts. Now e-payments are more or less secure these days and robust systems have lent a great deal of credibility to payments online, but what I’m concerned about is that somewhere on Google’s servers are locked away little titbits about me. Very personal things. Well, they do call it “Personalized.”

The sheer dominance of a handful of search engines is my concern here. Especially Google. It is not me who determines whether I get to search all existing sites; it depends on whether Google has decided to index the site. In a very real way, Google controls my Web experience and my online exposure.

Now what if Google were to make it mandatory to sign in before you could use its search services? They’re well within their rights to do it!

Every day we send millions of search queries to Google and give away a daily log of our online preferences. Imagine if Personalized were mandatory. What might they do with all that data? Will they use it to enhance our search experience, or will they limit our search to the sites that pay them?

And then, one day, say Google decides to link search with its other services such as Gmail, Orkut, and Google Earth... they’ll end up knowing our friends, our social interactions, our location. And there’s more—wait till we get habituated to using Google Docs and Spreadsheets! You, just a few gigabytes of data on Google’s servers, locked for posterity!

The scary thing here is that, like I said, there’s nothing to stop them from making Personalized mandatory. We’re so dependant on search, even if



**Deepak Ajwani** Executive Editor

**“In a very real way, Google controls my Web experience”**

they did, we’d all take it in our stride—and sign in every time. Google is also offering an online payment service (in the US right now), so, happily, they’ll also have your credit card details. And possibly your mother’s maiden name. And God knows what else.

In a way, it might seem justified: you’re getting so much information without clicking a single ad, so you’ve got to give something in return—right? No, there’s something wrong here.

I do *not* want Them to know I spent six and a half minutes choosing a yellow soft toy for my daughter on the 22<sup>nd</sup> of December 2006. It might seem insignificant, but I’m just not comfortable.

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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

## Products Reviewed This Month

### HARDWARE

#### Flash Drives ..... 176

A-DATA Oriental 512 MB  
Corsair Flash Readout 1 GB  
Corsair Flash Voyager 2 GB  
Corsair Flash Voyager 1 GB  
Gigabyte Flash Disk 1 GB  
iball 1 GB  
iball 2 GB  
iball 512 MB  
Intex 512 MB  
Kingston Data Traveler 4 GB  
Kingston DataTraveler mini Fun 512 MB  
Lexar JumpDrive FireFly 1 GB  
Lexar JumpDrive FireFly 2 GB  
Odyssey 1 GB  
Odyssey 512 MB  
PQI Cool drive U339 1 GB  
PQI Cool drive U3395 1 GB  
PQI Intelligent Stick 1 GB

PQI Travelling Disk U230  
PQI Travelling Disk U260 1 GB  
SanDisk Cruzer CrossFire 1 GB  
SanDisk Cruzer CrossFire 2 GB  
SanDisk Cruzer Micro 1 GB  
SanDisk Cruzer Micro 2 GB  
SanDisk Cruzer Micro 4 GB  
SanDisk Cruzer Micro 512 MB  
SanDisk Cruzer Mini 4 GB  
SanDisk Cruzer Profile 512 MB  
SanDisk Cruzer Titanium 1 GB  
SanDisk Cruzer Titanium 2 GB  
TECH-COM 1 GB  
TECH-COM 512 MB  
TECH-COM 2 GB  
TECH-COM 4 GB  
Transcend JetFlash 130 1 GB  
Transcend JetFlash 150 1 GB  
Transcend JetFlash V30 512 MB  
Transcend JetFlash V30 1 GB  
Transcend JetFlash V30 2 GB

Transcend JetFlash V30 4 GB  
Transcend JetFlash V30 8 GB  
UMAX APUS 210 1 GB  
UMAX APUS ELITE 1 GB  
UMAX APUS PRO 1 GB  
Zion 1 GB  
Zion 2 GB  
Zion 512 MB

#### Wi-Fi Routers ..... 80

ASUS WL-320G  
ASUS WL-530G  
ASUS WL-600G  
Buffalo WHR-HP-AG108  
Compex NetPassage 27G  
Compex NetPassage 28G  
Compex WP54G 1a  
D-Link DWL-2100 AP  
Level One WAP-0010  
Linksys WAP54G  
Linksys WRT300N

Linksys WRT54G  
Netgear DG834G  
Senao ECB 3220

#### Bazaar ..... 80

**Hardware**  
Canon LBP-3500  
ECS PX1 Extreme  
Fujitsu LifeBook P7120  
iPod White 80 GB  
Nokia E50  
NVIDIA Nforce 680i  
Samsung NV10  
Seagate Pushbutton Backup 750 GB  
Zebtronics ZEB-9000 HMV  
**Software ..... 84**  
McAfee Internet Security Suite 2007  
Altiris SVS  
Xara 3D

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## Enter



**16** Former Miss India Tanushree Dutta and her travails with tech

**16** Europe wants Linux, but they miss MS Office

**18** e-Donkey—and others of its ilk—are dead, thanks to the prize Ass'es

**22** An open-source gaming device?

## Digital Passion

### Cover Story

#### **35** The High-Definition Itch

The marketing seems to have worked—HD this, HD that, go HD or die alone—but what is HD and how do you not get cheated by all this nonsense?



### Take a Crack

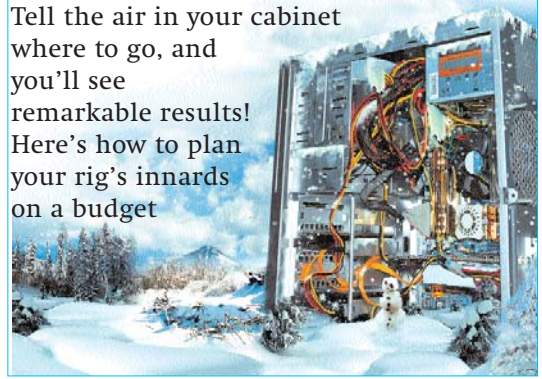
#### **50** Add “Restart In Safe Mode” To Your Start Menu

You *know* you want to say goodbye to all those “Whoops I forgot to hit F8” days!

### Lead Feature

#### **27** Going With The Flow

Tell the air in your cabinet where to go, and you'll see remarkable results! Here's how to plan your rig's innards on a budget



### Tomorrow

#### **42** Battle For Tomorrow

A look at the changing face of warfare. The future of information exchange promises more precise and deadly battles



# Contents Magazine

## Digital Tools

### Main Story

#### **51** The More The Merrier

There are other reasons for you to have two GPUs—like hooking up a bunch of extra monitors to clear all that desktop clutter



### Agent 001

#### **90** Agent 001 Wants It On Paper

Which is the best inkjet printer of them all? The Agent wants a copy of his memories, and getting some work done wouldn't hurt either



### Test Centre

#### **72** Dinky Data Vaults

CD? DVD? Bah! The best way to carry data is the USB Flash drive, and now you can use our opinions on 46 of them—ranging from a slim 512 MB to a ridiculous 8 GB!



### Test Centre

#### **94** Popping The Cork

With so many free e-mail providers giving you POP3 access, isn't it wise to use a mail client to store and browse them on your PC? Here are the ones you should try out

## Digital Business

Test Centre

### 106 Clutterless Connectivity!

Nobody likes being tied down by a bunch of network cables, especially laptop-toting businessmen. We've tested a bunch of Wi-Fi devices to keep you from tripping over all that wired nonsense



Smart Soho

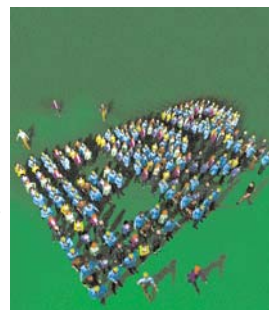
### 117 To Simpler Times

Fear not Excel's PivotTable, for it is your friend. Really. Say goodbye to complex code; making simple, professional reports will never be the same again!

Tech Careers

### 103 Enterprise in ERP

If terms like "efficient resource management" get your bonnet buzzing, read on!



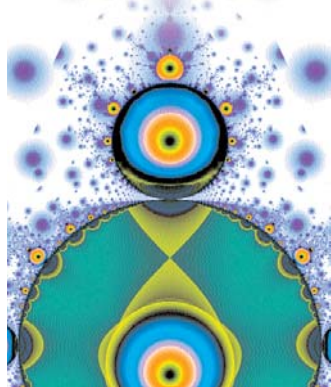
# January 2007

## Digital Leisure

Main Story

### 123 Art For The Asking

What are these mesmerizing things called fractals? Presenting a look at mathematics gone trippy



### 148 Tabloid Tech

We promised not to mention her again, but She Who Must Not Be Named has topped another of Yahoo!'s lists. Somehow people can't get enough!

### 128 Game On Epic Adventures

*Neverwinter Nights 2* has finally released, and it was worth the wait! Also featuring *IL-2 Sturmovik 1946*—easily the best flight simulator you can buy today



### Escape



**133** Where would we be without James T. Russell and his CD-ROM?

**134** We Indians suffer from a rare disease: it's called Mouse Rage Syndrome. A little fat in our pipes wouldn't hurt

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DIGITAL PASSION

Heroes of Annihilated Empires



This time it's not about units, it's about armies with thousands of soldiers that entrust their fate in your hands. It's about responsibility taken by great leaders and future of entire races. Survival or extinction? It's all up to you to decide

Microsoft Expression Web Beta 1



It gives you all the tools you'll need to produce high-quality, standards-based Web sites the way you want them

VMware Workstation 5.5

This powerful desktop virtualization software for software developers /testers and enterprise IT professionals that runs multiple operating systems simultaneously on a single PC



LINUX

- Adobe Reader 7.0.8
- Scribus
- Gnumeric



- Mp3Tools 1.5
- Open Movie Editor 0.0.20061130
- Quick Image Viewer 2.0
- Squid version 2.6
- Zimbra Collaboration Suite Open Source Edition

DEV TOOLS

- FileMaker Server 8
- HomeSite 5.5
- JDK 5.0 Update 10 with NetBeans 5.5
- Matrix Server Setup
- Mobile Application Development Toolkit
- Automated Build Studio v. 2.25
- TestComplete v.4.28
- UltraEdit v12.20a



GAMES

- NTE: Strike and Retrieve
- Medieval II Total War

DIGITAL TOOLS

Corel Painter IX.5

This software features a new set of advanced tools and features to help you create your digital masterpieces



Trend Micro Internet Security 2007



This internet security tool comprehensively safeguards your computers, your home networks and your personal identity

Canvas X

The single most cost-effective, integrated solution for the creation, enhancement, presentation, and sharing of technical illustrations and graphics

MULTIMEDIA

- Photoshop Album Starter Edition 3.0
- Snagit
- ACDSee 9
- FotoSlate 4



- AV Voice Changer Software Diamond Edition 4.0
- AVS Video Tools ver. 5.4
- DVD MovieFactory 5 Plus

INTERNET

- SurfControl E-mail Filter
- DC++
- FileZilla 2.2.2.9
- Hylapex 2.0.9.1
- Messenger Archive Viewer 3.9
- Pando
- Peer2Mail 1.61 build 6



- ISA Server 2006 Enterprise Edition

SYSTEM

- CDBurnerXP Pro 3.0.116
- Partition Magic 8.0



- IObit SmartDefrag
- Update Rollup 2 for Windows XP Media Center Edition 2005 RU2
- Driver Genius Professional Edition
- DriveWasher
- PC Backup 7.3.1.3
- Registry Repair
- Spyware X-terminator 5.0.3.3

DIGITAL BUSINESS

Contribute 4

Adobe® Contribute™ 4

Contribute 4 enables anyone to quickly, easily, and safely update existing websites and blogs

Fishbowl Inventory 4.5.1



Businesses need advanced inventory control capabilities beyond ordinary inventory software currently provides and Fishbowl Inventory caters to those needs

AnyTime Organizer Deluxe 10.0



This adds organization and enjoyment to your daily life. Day Planner & Calendar: Schedule all your appointments, events, calls, and meetings and organize your busy schedule

TurboCASH Accounting v3751



TurboCASH .7 is an open source accounting package for small business

XAMPP Windows 1.5.5

XAMPP is an integrated server package of Apache, MySQL, PHP and Perl that all run from a removable drive



PRODUCTIVITY TOOLS

- Achievo
- Aethera
- GanttPV v0.6.1
- Grisbi 0.5.8
- Nomad PIM

MOBILE APPS

- iPod AudioBook
- FMA 2.1 Beta 3
- Mobile GMaps v1.27.00
- JabLite v1.17



- TaskSpy v0.96
- BlueEyes 1.21
- JADMaker 1.15

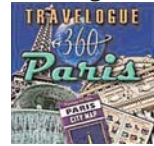
DIGITAL LEISURE

Battles of Britain



This is a flight simulation game that recreates the historical Battle of Britain in World War II. Fly as the Germans or British in historically accurate planes

Travelogue 360: Paris



Locate items hidden in 3-Dimensional views of the Eiffel Tower, down the Champs Elysees, under the Arc d'Triomphe, and others of Paris' most beloved landmarks

Crazy Nut Free Full Game



Ridiculous and funny game about fascinating travel of a nut! Jump higher and higher

Laxius Power II



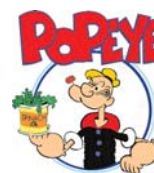
A great sequel to one of the best freeware console-style RPGs, Laxius Power II is even larger and more polished than Laxius Power

SMALL GAMES

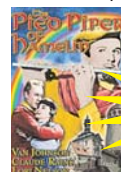
- Babo Violent 2 v2.02
- Mystery Case Files: Prime Suspects
- Dominions 3

MOVIES

- Toonerville Trolley - Trolley Ahoy
- Popeye - A Haul in One



- The Pied Piper of Hamelin



MOVIE of the MONTH



## DIGITAL PASSION

### Flash Lite 2.1

Flash Lite is the Flash technology specifically developed for mobile phones and consumer electronics devices. It dramatically accelerates the delivery of rich content and browsing, and customized user interfaces



### XML Notepad 2007

#### Microsoft

It provides a simple intuitive user interface for browsing and editing XML documents

### Xtreme Toolkit Professional Edition 10.3.1

Xtreme ToolkitPro for Visual C++ MFC provides Windows developers with a sophisticated set of components to give applications a professional, modern appearance



### AXIGEN Mail Server Business Edition



It is a fast, reliable and secure mail server on Linux, with an open architecture. Providing ESMT, IMAP, POP3, WEBMail services and an integrated List server

### DEVELOPER TOOLS

- Devel Package 1.5.5 - XAMPP
- Microsoft Threat Analysis & Modeling
- NeoPhoto
- Syn Text Editor 2.1.0.46
- BlueTools
- EditPro 1.57
- TextPad 4.7.3

### LINUX

- Bluefish 1.0.6.



- Zope
- PageStream 5.0.3.4 beta
- Bochs 2.3
- GNU Parted 1.8.1
- GPhoto2 2.3.0
- GQview 2.1.5
- UPX 2.03
- Webmin 1.310
- BRU Desktop 1.70



## DIGITAL TOOLS

### McAfee Internet Security Suite 2007

New Internet Security Suite automatically cleans viruses, repels hackers with a secure firewall, blocks spyware when it tries to load, detects spam and credit-card phishing scams, warns of dangerous Web sites



### Rohos Welcome

This program adds the convenience and additional security level to the standard Windows logon procedure



### MULTIMEDIA

- Alcohol 120% 1.9.5.3823
- The Blaze Media Pro
- ThumbsPlus version 7 SP1
- iClick DVD to Divx xVid Avi
- AVI TO MPEG Scout
- AVS TV Box 1.3.5.52 beta
- Fractal Forge v.2.8.2
- FractalVision
- Fractint version 20.0
- Movies Extractor Scout Lite 2.31
- TieraZon2
- WinFract 18.21
- Fractal eXtreme
- PhotoAcute Studio
- Ulead GIF Animator
- Ultra Fractal 4.03
- HyperSnap-DX



### INTERNET

- Gigaget 1.0.0.21
- hMailServer 4.2 Build 195
- Traces Viewer 1.20
- Voice E-Mail Pilot
- BlackWidow 5.21
- WS-FTP Pro 2007
- Ez4file Personal Edition
- SecurWall 0.98

### SYSTEM



- Registry Mechanic 6.0
- Advanced WindowsCare Personal
- FileBox eXtender
- Mz Ultimate Tweaker 3.2
- Smart Data Recovery
- Advanced Archive Password Recovery



- Aurora Password Manager 1.6.10
- Super Utilities 6.6
- AutoPlay Express 4.2
- Virtual CD v8

### ESSENTIALS

- Avast Home Edition 4.7
- Foxit Reader 2.0 Build 0930
- Irfan View 3.99
- K-Lite Mega Codec Pack 1.61
- Spybot Search and Destroy 1.4
- Opera 9.02
- VLC Media Player 0.8.5
- Winamp 5.32
- WinRAR 3.62



## DIGITAL BUSINESS

### ConceptDraw MINDMAP Professional



This is a mind-mapping and team brainstorming tool with extended drawing capabilities

### PiggyBob Premium 3

This powerful, Windows-based application will help you keep track of daily, weekly and monthly events - with an alarm clock and alert system included



### copy2calendar



With a single keystroke you create calendar entries in Microsoft Outlook, Lotus Notes or Palm Desktop

### Mind Pad



Mind or concept mapping is an excellent method to represent your opinion, ideas and projects

### PRODUCTIVITY TOOLS

- WinGate Proxy Server 6.2.0
- HindiWriter 1.4a
- ABC Amber iCalendar Converter 1.03
- Cover Commander
- FindGraph 1.72
- Home Bookkeeping
- VIP Task Manager (Client/Server) 1.01



### MOBILE APPS

- ClamWin Portable



- PhotoAcute Mobile



- Yahoo Go Mobile v1.0
- 7-Zip Portable
- Guardian 2.1
- MMS Home Studio Version 1.1.283
- Mobile Phone Monitor
- SymTorrent v1.12
- Theme Creator Pro Version 3.1
- VLC Media Player Portable
- Pstart Version 2.09



## DIGITAL LEISURE

### Believe In Santa



Just before Christmas, Sandy visits her granny and learns that granny's bank loan on her gift shop is due in 10 days! How is she going to make \$10,000 in such a short time?

### Mystery Case Files: Huntsville



Crime spree baffles Huntsville police! Do you have a keen eye for details? See if you can locate enough hidden clues to solve the crimes and become a Master Detective!

### Sudoku Portable



Sudoku Portable is the entertaining and addictive Sudoku puzzle game packaged as a portable app, so you can play on the go

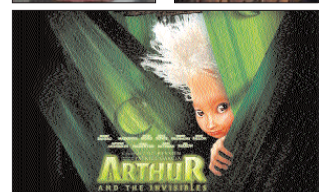
### SMALL GAMES

- Halloween 2006 Free Full Game



- Tobo On The Run 1.4
- Railroad Tycoon Deluxe
- Sheepish
- Park a Lot 2

### VIDEOS





### By Demand

You get to choose what goes on Digit Interactive. This month, you chose:

### Update Rollup 2 for Windows XP Media Center Edition 2005 RU2 Free

Size: 29 MB

### ACDSee 9 Trial

Size: 23 MB



### Subscribe

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### Digit Reader Poll

#### This Month's Question

#### What Optical Drive Do You Own?

- CD Writer or below
- DVD-ROM Drive
- DVD Combo Drive
- DVD Writer

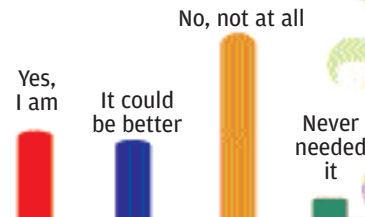


To vote Log on to [www.thinkdigit.com](http://www.thinkdigit.com)

#### Last Month's Question

Total: 4317

#### Are you satisfied with support for your technology-related purchases—services, software or hardware?



taste technology at [www.thinkdigit.com](http://www.thinkdigit.com)

### MADNESS ON THE FORUM ([www.thinkdigit.com/forum](http://www.thinkdigit.com/forum))

We've dealt with some crazy stuff on the forum, but just watch how this thread starts out and goes completely nuts.

Click here to go back to [thinkdigit.com](http://www.thinkdigit.com)

For the rest, go to <http://www.thinkdigit.com/forum/showthread.php?t=44144>

**As the title says it all. Many companies send their products for reviewing (both hardware and software) .. what do Digit guys do after reviewing them**  
Do they return them to companies or use them at center or sold in sale..  
I have an idea, give them in patron points or post them in bazaar section.  
I want to purchase games that Digit reviews at half the rates. Is that possible??

**Akhil Jain**  
Broken In

In the new digit patron programme Xbox 360 will be available for 80 points and PS3 for 100 points

**vimal\_mehrotra**  
Broken In

And for 60 points get Raaabo free....

**blackpearl**  
In The Zone

**What does DIGIT do after testing the products in their lab?**

Buy the Digit company for 120 points

**Tech Geek**  
Alpha Geek

for 140 get Manmohan Singh (shipped in four weeks)

**vimal\_mehrotra**  
Broken In



## Into Cyberspace And Back

IBM will work with Circuit City to explore retail business models in 3D virtual worlds. The companies hope to discover how such environments can be utilised to improve customer experiences with brands, and have built a digital store on an IBM's island in *Second Life*.



## The Last Windows?

Research firm Gartner has predicted that Vista will be the last major Windows release. "The era of monolithic deployments of software releases is nearing an end," Gartner has said. The prediction went on, "Microsoft will participate in the trend toward more flexible updates."



# Enter

**Tanushree Dutta**  
Model and Actress

The now-well-known actress got her first glimpse of fame with the Ponds Femina Miss India Universe 2004 award.

She is best known for her performances in *Aashiq Banaya Aapne* and *Chocolate*.



### Technology...

Helps one in day-to-day life. People's entire life revolves around technology, and has now become an integral part of our lives.

### What gadgets do you use?

I use a laptop, and of course, a mobile—a Nokia N72 to be precise. I also have a handycam and an iPod.

### What would be your dream gadget be?

Something that would read people's minds...

### What do you mostly do online?

I chat with my friends, e-mail, and I go online if I need to watch movie trailers. I also listen to music online and download MP3s. I don't watch movies online, and would prefer to go to a theatre—or watch them on my DVD player.

### An instance where technology has really helped you?

Technology has always helped me. One instance I can recall is when I was in college: my vehicle broke down at night on a lonely road, and it was quite a distance to walk. Thanks to my mobile, I was able to call my friends for help.

## LINUX EVERYWHERE

# Europe Wants It, Won't Do It

Like many Asian countries, European governments want to shift to Linux—in some cases entirely—in a bid to save money and break free of the MS hegemony. But not just for these reasons.

There are several interesting perspectives on why it is that Europe wants to take the lead in moving to the OSS business model, much more so than the United States does, for example.

Xavier Cazin, a Chief Editor at O'Reilly Editions France, has an interesting take: as computers become a daily necessity, the French philosophical perspective has led people to revolt. "The more the role of something is essential, the less it should cost. People hate paying for something that is unavoidable. That's why French people didn't feel guilty in pirating Microsoft software for years."

But unfortunately, most of the current talk is rhetoric in nature, and it's a case of I-can't-get-myself-to-do-it. Or something like "the spirit is willing but the flesh is weak," in dramatic terms.

One official put it thus: "If the technicians say 'no', it's not going to happen." And why, indeed, are the technicians saying "no"? For all the basic reasons: compatibility issues, conflicts with MS Exchange Servers, and the problem of educating governmental IT departments about Linux, OpenOffice and more.

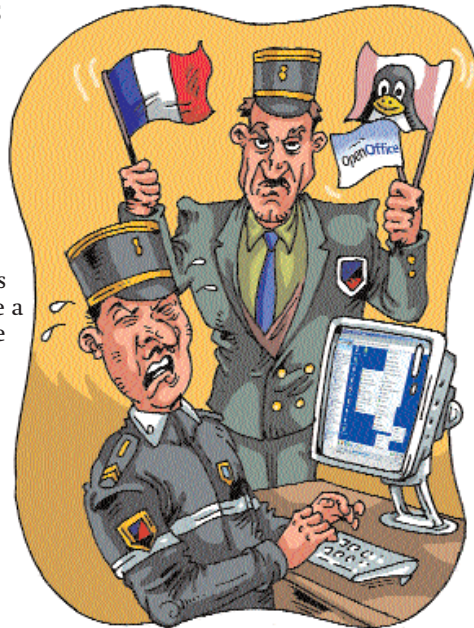


Illustration Harsho Mohan Chatteraj

The suspects and the figures: elected officials have, for some time now, been making a fuss about migrating to open source on major scales. Migrations of governmental computers in France, Germany, Norway, and Spain have been planned at some point or the other, but few departments have actually

done the migrating. According to research firm IDC, more than 95 per cent of all PCs used by government workers in Europe still run on Windows.

The most ambitious open source initiative in Europe thus far was a project by the local government in Spain's Extremadura region, which has managed to migrate some 75,000 PCs to Linux. Tellingly, some of the computers in the project's administrative office still run Windows, an employee told Wired News. Under condition of anonymity, of course.

The drive continues. France, in particular, is trying to hasten the crossover, as we indicated above. Over the next few months, lawmakers in France's National Assembly will start using Linux, OpenOffice, and Firefox on PCs. The official reason stated goes thus: the French government's push away from Microsoft platforms is driven in large part concerns about security and industrial espionage in the economic war between Europe and the US.

In the case of the French Gendarmes—the police department—the PCs used by the 1,00,000-member police force run almost entirely on Windows. The unit plans to make 5,000 of its PCs run under Linux this

### IM With Caution

#### The Problem

A vulnerability has been reported in Yahoo! Messenger. This can potentially be exploited to compromise a user's system. The vulnerability is reported in versions obtained prior to 2 Nov 2006. It is caused due to an error in an ActiveX control, and can be exploited to cause a buffer overflow.

#### The Solution

Upgrade to the latest version, available at <http://messenger.yahoo.com>.

### Firefox Vulnerable

#### The Problem

Security firm Secunia has given its "highly critical" rating to multiple vulnerabilities that have been reported in Mozilla Firefox. These can be exploited to gain knowledge of certain information and potentially compromise a user's system. The vulnerabilities are reported in all Firefox 1.x versions, as well as in Firefox 2.

#### The Solution

Mozilla released Firefox version 2.0.0.1 pretty soon after the vulnerabilities were reported. Just "check for updates" from the Help menu in Firefox—it's a small download. If that doesn't work—if it says "update failed"—then head to [www.getfirefox.com](http://www.getfirefox.com) and download the latest version.

If for some arcane reason you don't like Firefox 2, you should upgrade your other version to 1.5.0.9.

year under a pilot project, and the plan is to migrate fully by 2010. Where Linux goes, OpenOffice can't be far behind: the police unit has also shifted its users to OpenOffice and Firefox.

The bottomline? A Gendarme, speaking on condition of anonymity, said that while he was optimistic about Linux, he was not too happy with OpenOffice. He said he "missed" MS Office. "OpenOffice is complicated. It is atrocious," he said. (Something must have been lost in translation, we're sure. Unless he was speaking less-than-perfect English.) "We save money but the advantages of its use are not terribly clear." A mixed statement if ever there was one, but we get the general idea.

#### LANDMARK ACHIEVEMENT

## Fujitsu Joins The Race

Seagate won the race with **S**perpendicular recording of hard disks, of which you've doubtless heard. They produced the first 750 GB disk using that technology. Now, we mentioned in our December 2006 issue that they're already talking about HAMR to increase areal densities. Fujitsu recently achieved a landmark in this field of research.

HAMR (Heat-Assisted Magnetic Recording), as it is called by Seagate, or TAR

(Thermally Assisted Recording), as it is called by Hitachi GST and others, uses a two-fold principle to record at higher densities. The first idea is that bits cannot be packed closer together because when this is done, they tend to lose their proper magnetic orientation. If the material used were of higher coercivity—meaning that it is harder to demagnetise—then the bits can be cramped together more closely without fear of them changing magnetisation.


The second idea is that if a material has higher coercivity, it's also harder to write on to, and that's where the heat comes in—when the spot of data to be recorded on is heated by a laser, it becomes easier to record on.

Now for recording onto heated spots, areal densities (how closely-cramped the bits can be) would be high enough only if the spot were small enough. As you can see, making a smaller spot is plainly key to the process.

Now Fujitsu has demonstrated what it claims is the world's first optical element capable of producing a beam less than 100 nm across. The company says TAR will be key to the next generation of hard disks in terms of capacity.

The company says the optical element will be able to achieve a spot size of 88 nm by 60 nm, eventually enabling recording at a density of 1 terabit per square inch or higher. This is more than double the current record—421 gigabits

**HOT** **HAMR**  
Heat-Assisted Magnetic Recording, or TAR (Thermally Assisted Recording). The hottest thing happening in storage research labs. IBM has a working prototype. Expect all disk storage news in 2007 to be about HAMR!



**NOT** **Perpendicular Recording**  
Sorry, but we measure time in weeks and days, not years. We don't expect anything groundbreaking to happen on this front—just produce more disks and get it done with, don't talk about the technology any more!



per square inch—set by Seagate earlier this year.

Other companies such as Hitachi GST (Global Storage Technologies) are also working on TAR (or HAMR). They say they can get the grain, or spot, size down to 2 nm, where conventional recording could only manage 8.

The bottomline: Fujitsu has said that in conjunction with perpendicular recording, HAMR (or TAR) will enable drives with capacities ten times higher than what is possible now.

As for "when," the timeline for TAR is about 2010. Another race, one we're keenly looking forward to—and one that's spoken about much less than the gigahertz races or the core wars. For some

### One Silly Question

### "How Big Is The Internet?"



"As endless as the universe!"  
Amit Babar



"Bigger than the ocean."  
Mayur Gangar



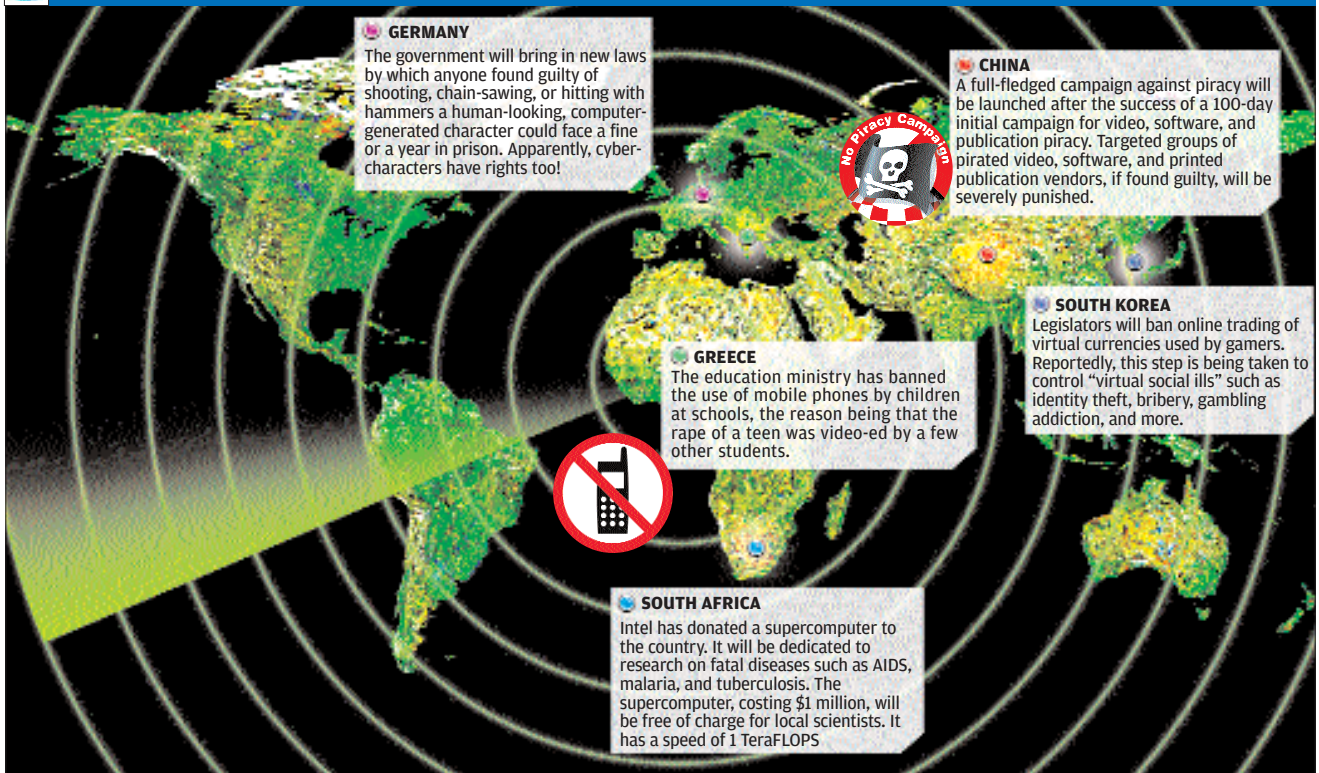
"It's like the sky."  
Pradnya Gurav



"As big as my brain..."  
Prashant Sonpal



"It stretches from the north to the south pole!"  
Sudipta Satpathy



**GERMANY**  
The government will bring in new laws by which anyone found guilty of shooting, chain-sawing, or hitting with hammers a human-looking, computer-generated character could face a fine or a year in prison. Apparently, cyber-characters have rights too!

**CHINA**  
A full-fledged campaign against piracy will be launched after the success of a 100-day initial campaign for video, software, and publication piracy. Targeted groups of pirated video, software, and printed publication vendors, if found guilty, will be severely punished.

**GREECE**  
The education ministry has banned the use of mobile phones by children at schools, the reason being that the rape of a teen was video-ed by a few other students.

**SOUTH KOREA**  
Legislators will ban online trading of virtual currencies used by gamers. Reportedly, this step is being taken to control "virtual social ills" such as identity theft, bribery, gambling addiction, and more.

**SOUTH AFRICA**  
Intel has donated a supercomputer to the country. It will be dedicated to research on fatal diseases such as AIDS, malaria, and tuberculosis. The supercomputer, costing \$1 million, will be free of charge for local scientists. It has a speed of 1 TeraFLOPS

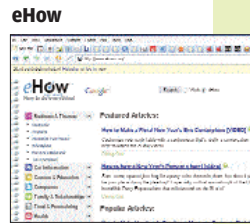
reason, silicon valley has hogged the limelight for good, and "iron oxide valley"—possibly the more important one—will always remain in the shadow.

**THEY'VE MADE A DENT  
Of Asses And Donkeys**

The M. P. Ass. of A. and the R. I. Ass. of A. aren't doing the silly thing anymore—going behind 12-year-old schoolboys and 89-year-old grannies demanding money for filched songs. They're hitting P2P where it hurts. eDonkey is dead: a New York court ruled that the P2P site did enable users to illegally share copyrighted material. The owners have another P2P network—Overnet—which, too, the court has declared illegal. The ruling is a major victory for the record labels. Their RIAA has, by now, managed to dent all the major file-sharing networks with the exceptions of

LimeWire and The Pirate Bay. The developers behind LimeWire will soon be hauled to court, too: in November, the RIAA filed suit against LimeWire, and RIAA CEO Mitch Bainwol has gone on to pronounce: "Our settlement with eDonkey will make operations such as LimeWire that continue to break the law... all the more conspicuous." As precedents go, it's a bleak outlook for LimeWire. In very related news, the MPAA has declared it will launch a legal attack on BitTorrent server operators. This could ultimately prove to be the sock in the b\*\*\*s for the BitTorrent community, at least the 99 per cent or so of it that comprises illegal-file sharers. eDonkey.com and Overnet.com now bring up ominous-looking messages: "The eDonkey2000 Network is no longer available. If you steal music or movies, you are breaking the law. Your IP address is xxx.xxx.xxx.xxx and is being

**Three Incredibly Useful Sites**  
A source for facts, a conversion tool, and a how-to



**www.refdesk.com**  
"The Single Best Source For Facts," this is one site where much of the information clutter on the Internet is organised in an easily-accessible manner. Browse through dictionaries and encyclopaedias. Conduct Business Searches, People Searches and Fact Searches. Check weather forecasts. Keep in touch with the latest news. Read about the significance of this day in history. Just head to the site!

**www.zamzar.com**  
Zamzar lets you convert image, document, music, and video files up to 100 MB in size to different formats. Image files can be converted between BMP, GIF, etc., document files to CSV, DOC, HTML, etc. music files between AAC, AC3, OGG, etc., video files to and from 3GP, AVI, MPEG, OGG... there's a caveat, though: read the terms of service, but beware of spam.

**www.ehow.com**  
How do you tie a tie? How do you install a GPS receiver or strip the paint from your car? How do you open a stuck jar lid? eHow has answers to all the above: 20,000 articles! From the everyday to the exotic, from the simple to the complex—find out how to do it all right here.



Photograph Gaurav Gogia

Each month *Digit* will carry a caption for a photo. Come up with something funnier, and beat the *Digit* team at their own game! Entries accepted by the 20<sup>th</sup> of this month.

# Beat That!

## Digit Caption

“Umm... it does have Notepad, though”

## Last Month's Winner!

D Sunil Kumar

Dabolim, Goa

“Mobile Shop = Mobile Phone!”



E-mail your caption with the subject “Beat That”, and your postal address, to [beatthat@thinkdigit.com](mailto:beatthat@thinkdigit.com) and win

## CCNA INTRO

by TODD IAMMLE

Published by

WILEY-INDIA



logged.” ThePirateBay.org, however, looks fresh as ever.

People will doubtless continue to share music and movies, regardless of what happens to the P2P operators. There are simply too many people who will lend their servers to the “Darknet” for the whole thing to be wiped out.

But what’s happening here is that it’s not going to be for Joe Average any more—it’s going to become more of a geek thing. Like it once was a geek thing to connect to another computer using a modem. This, if the Ass.es have their way—and they just might.

### BEYOND ILLEGAL P2P

## BitTorrent To Deliver Movies?

BitTorrent CEO Bram Cohen now seems all set to pitch P2P as the most efficient way of delivering HD content. It’s

timed just right: cable companies are just about beginning to strain under increased costs of HD delivery, as more and more people get the idea that HD is the way video was meant to be. And with demand naturally poised to increase over the next couple of years, will P2P come to the rescue?

BitTorrent’s pitch could have something to it, though there are detractors aplenty. The technology could need some work, but it does seem to hold promise. It’s all about bandwidth efficiency—and one only needs to put out the mindset that one is “sharing” something while watching a movie downloaded via P2P, or that one is somehow doing something shady. Such misconceptions were once prevalent: Cohen, in an interview, said there were instances of “companies having a policy of not using any P2P technology at all, but some sysadmin would surreptitiously use BitTorrent for internal

distribution when it was warranted.”

After BitTorrent’s acquisition of  $\mu$ Torrent, Cohen and  $\mu$ Torrent creator Ludvig Strigeus said in a joint statement, “Bringing together  $\mu$ Torrent’s efficient implementation with BitTorrent’s expertise in networking protocols will significantly benefit the community.” And: “We will continue to develop  $\mu$ Torrent, and will be using the code base in other applications, such as embedded systems on TVs, cell phones...” Meaning, effectively, that P2P is the way to go.

It’s been a while since Cohen’s company signed deals with major Hollywood studios including 20th Century Fox and MTV Networks. BitTorrent is forming distribution partnerships with film and TV studios including 20th Century Fox, MTV Networks, and Paramount Pictures. One of the goals, of course, is to be able to deliver—via P2P—content directly to users’ set-top boxes. And,

“We’re working on making BitTorrent come preinstalled on many embedded devices, as one of the basic services they support—in the same class as Web browsers,” Cohen said in a recent interview.

Asked by Wired News about where he sees file-sharing going, Cohen had just this to say: “We’re going to see everything... become more Web-based, and the special status of high-quality video files... as somehow different will go away. The current limitations on distributing them will cease to exist.”

On the other side of the story, HDNet (an HDTV cable network in the US) chairman Mark Cuban, billionaire investor and dot-com veteran, has dismissed the notion of P2P as a content delivery platform as, well, nonsense: “I think P2P is great for corporate and controlled apps, but not for open distribution. P2P has content-distribution capabilities, but mass distribution of content isn’t one of them.”

## GENDER

Ali Vs. Asmita

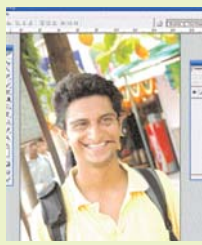


## BENDERS

## Use Photoshop filters to give an image a funny look



"Ali started off well—he seemed to know his Photoshop. He was directly on to the filters and rapidly went through them, choosing, applying, and then undoing effects. In a few minutes he had changed some colours, blurred the image, and crystallised it quite a number of times. He obviously didn't know which filter would do what. We gave him a pointer: that the "Liquefy" filter might be useful. Ali was quickly on to it, and using the "forward warp," he



managed to pull the cheeks and the ears out. After looking at his work for a couple of minutes, he decided he had done enough.

She took a cursory look at the filters, but Asmita seemed to like the colours better. She spent quite a bit of time painting the image red and sometimes brown, toggling between the two. Her favourite colours perhaps. She



wasn't, however, doing what she was supposed to—try to change the image. Once she'd been reminded, she had a good look at the filters again and decided to use the "Liquefy > Bloat" tool to give the image a bulged-eye look. The hair underwent some changes. Asmita just wouldn't give up on the colours—there had to be the red on the lips before she stopped!



Cuban had said in September, "Only a moron would buy YouTube." So what does that tell us? We aren't clear either.

## COP-OUT

## Time Goes Ga-Ga About Web 2.0

They probably expected such sneers, and they probably didn't care. *Time Magazine* has gone on to name participants in the inexplicable experiment

called Web 2.0—including "you"—as the People of the Year. This is a cop-out of a major order.

Lev Grossman of *Time* waxes eloquent: "It's a story about community and collaboration on a scale never seen before. It's about the cosmic compendium of knowledge Wikipedia and the million-channel people's network YouTube and the online metropolis MySpace." Wikipedia is an event of the year? Seriously, we're all avid users of Wikipedia, but when it comes to naming something of global importance we must point out, we've had

Encyclopaedia Britannica for centuries. As for YouTube, you can comment on it being a groundbreaking event as easily as we can.

MySpace users, incidentally, are 55 per cent American. "You can learn more about how Americans live just by looking at the backgrounds of YouTube videos than you could from 1,000 hours of network television." Mr Grossman, we beg to remind you that the world is *not* American.

Are blogs revolutionising the world? Some people seem to think they're doing something revolutionary when they're creating something the world can see, but the problem is, it's a cacophony of voices (in which each possibly has merit). Whichever way, what does Web 2.0 have to do with it?

The whole thing smacks of wasted eloquence: "We also worked like crazy. We reviewed books at Amazon and recorded podcasts. We blogged about our candidates losing and wrote songs about getting dumped. We camcordered bombing runs and built open-source software." In much of the above, what's to do with Web 2.0? And in any case, would *you* read a blog about someone getting dumped—something that, in Grossman's opinion, is revolutionising things? Is it "changing the way the world changes"? Are the book reviews at Amazon.com more credible than those you can read in *The New York Times*? Seriously, again, does Web 2.0 have the will to change the world, is our question.

Grossman excuses himself with "Web 2.0 harnesses the stupidity of crowds as well as its wisdom," going on to say, "That's what makes all this interesting." We are therefore to gather that something interesting—rather than something or somebody edifying—is to hold our collective attention.

But yes, Web 2.0 is interesting. However, that's where it should end. At least when you're talking on a global scale.

## SOCIALISM, ANYONE?

## First Splogs, Now Phony Stories

Marketers are in line to boost their companies' profiles at the expense of Digg. This rather interesting news story doesn't, at first look, seem to hold much: it starts off, "Digg continues to crack down on users who plant phony stories on behalf of marketers." The story goes like this: Digg recently deleted a user who posted a story about a company that offered to pay him. Karim Yergaliyev is one of Digg's top-rated users. Yergaliyev was booted for violating the company's terms of service, but was reinstated after he acknowledged the infraction, apologised nicely, and promised never to do it again.

"I receive two or three offers from marketers a week to promote some product or service,"

## AMD Quad FX

The hottest tech talk on the Internet now is, of course, about cores. AMD has officially announced its Quad FX Platform, in which a pair of AMD Athlon 64 FX series dual-core processors can be used together on a supporting motherboard. This dual-socket platform enables use of four cores for megatasking—use of multiple displays or running multithreaded applications such as games, while running other processes like disc burning and so on.

Power consumption is much higher than an equivalent Intel system, though. Some forums are talking about an upgrade possibility—using eight cores on the platform after the release of AMD's quad-core chips. Some experts believe there isn't any potential in hooking up more than two cores, and that there will not be any performance boosts with new titles. In any case, the battle of the multiple cores continues...

Buzzword  
of the MONTH



## GP2X

### What is it?

The GP2X is a video game console and media player. It is hand-held and Linux-based. Using the GP2X, you can view photos, read e-books, watch videos, listen to music, play games, import games from other systems, and use games developed on your own. It runs on two 200 MHz CPUs, 64 MB of RAM, and 64 MB of Flash memory. It has a 320 x 240 backlit LCD with custom graphics hardware and a TV-out.

### When was it released?

The initial release was the GP32, in 2001. Later—in 2005 to be precise—it was reincarnated as the GP2X.

### Who will use it?

Game lovers—both gamers as well as developers—are the target users.

### Why is it special?

The GP2X can connect to a TV, enabling games to be played on a big screen. The scaling chip allows movies to be resized and played without re-encoding. Being Linux-driven, there are a lot of software (games, emulators, PDA applications, multimedia players) and tools freely available, which enable the development of new games and applications. The emulators allow one to run a host of software from other systems. And, it just needs two AA-sized batteries.

### How easy is it to develop games for GP2X?

The SDK is included with the system. The GP2X source is available for Windows and Linux developers at the GP2X site. More libraries with their source are provided at the GP2X developer's forum and elsewhere on the Net.

### Where is it being sold?

30,000 units have been sold worldwide. Right now it seems to be very popular in the UK and Europe. The UK price is £124.99 (Rs 11,000)!

Yergaliyev, 19, said in an interview with CNET News.com. "I never do it, but (this time)..."

So what's of interest here? Note that Yergaliyev is one of Digg's top-rated users, and you'll get a hint. We're referring to *Time's* Lev Grossman talking about this year going down in history as the time when "the many wresting power from the few."

Sounds rosily socialistic—socialistic in a positive sense, as in actually working—but it seems to us far from the truth.

Technorati.com has a drop-down menu that lets you search for blogs "by authority." So where's the many who are wresting power from the few who have the "authority" on Technorati? Would you read something by Robert Scoble of Scobleizer fame, or something by someone with a name like geeky\_butterfly? And why do we need the Web to teach us this—ever heard of a "journalist of repute"?

Similarly, Amazon.com has a rating system for its reviewers. Naturally, and correctly, you'll read the reviews of a high-rated reviewer with more credulousness. The many are down there; the few are right up there in the rankings.

This isn't a space for a political discussion; our point is that there will always be the few and the many, and the latter will never "wrest power." Web 2.0 creates its structures and hierarchies very well indeed—it's as good a watchdog as any of the old-world status quo.

## A FRESH ATTEMPT

# Will EVD Make It?

Yet another format, but one we've spoken about earlier. EVD—Enhanced Versatile Disc, or Enhanced Video Disc,

depending on whom you ask—is like a Phoenix rising from the ashes! It will revolutionise HD delivery! That's what China would have you believe!

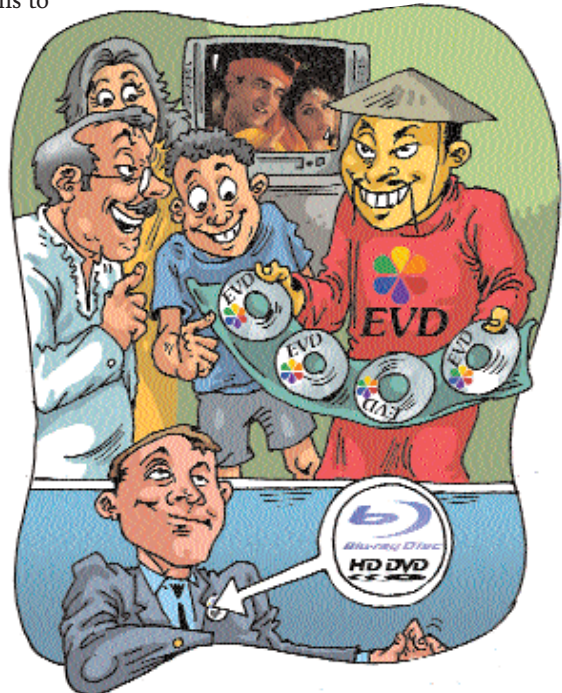
Exclamation marks aside, Chinese manufacturers are sick of paying intellectual property royalties for most of the DVD players they manufacture, which is a lot—80 per cent of the world's total. Now EVD—China's home-grown format—was being pushed before as an alternative to HD-DVD and Blu-ray, and interest somehow fizzled out; it's back now, not with a bang but with what sounds to us like a whine. ("Please buy our dirt-cheap discs and players!")

Technically, EVD is not a blue-laser technology like HD-DVD or Blu-ray; it's red-laser, like DVD, and is touted to be its successor. China plans to

though, say more than two layers will be difficult.

This whole thing holds some import for us for three reasons. First, it's already out: 6 December, several of the players were on display at a Beijing art gallery. (Several titles have been released too, most of them Chinese.) Second, the players are cheap—lower than the \$100 price point. And third, they will in all probability be targeted at Indian audiences—and which Indian doesn't like the ring of the word "cheap"?

Now China has attempted peddling its stuff to the world before. Cases in point are S-VCD, its telecommunications standard TD-SCDMA, and WAPI (WLAN Authentication and Privacy Infrastructure), a Chinese national standard for Wireless LAN. None of these made it big worldwide, and



phase out DVD altogether by 2008. EVD is essentially DVD that uses a more efficient compression system. But EVD's developers have said in the past they would try and merge the format with London-based New Medium Enterprises' VMD (Versatile Multi-Layer Disc), a red-laser system offering 50 GB on ten 5 GB data layers. Analysts,

didn't make too much of a dent even in Chinese markets.

Of course, we shouldn't be extrapolating, and this time round, EVD might just cut it. But most analysts are saying "no," and state media have reported that the EVD players have fared poorly in tests. Hedge your bets now! ■



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# Digital Passion

Technology For Personal And SoHo Productivity

Lead Feature

## Keeping It Cool

**PC cabinets are just boxes that hold our components, and keeping it cool is only a matter of adding fans, right? Wrong!**

**Robert Sovereign-Smith and  
Nimish Chandiramani**

**I**t all started when a colleague wanted to show off his latest geek-venture. Working for *Digit*, it's tradition to show off the latest gizmos and gadgets. This particular colleague hadn't bought anything new—he'd just added a lot of fans to his cabinet, and was now claiming to have the coolest cabinet in town. We counted

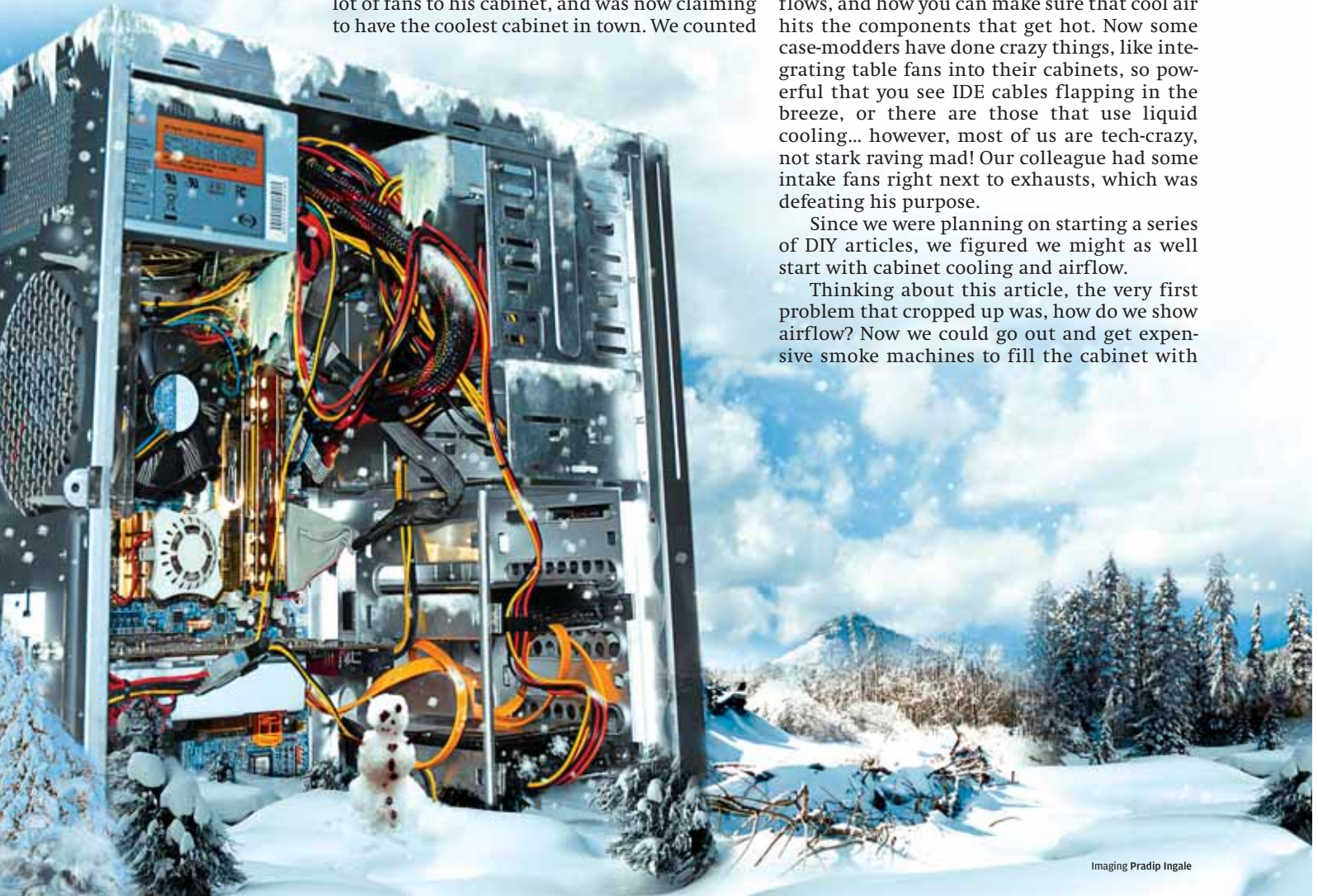
12 fans in all—overkill for sure! However, what he didn't know was that his 12 fans were not helping much...

### All About Airflow

Keeping a cabinet cool isn't as simple as just adding an obscene number of fans on the top, back, front and side. What you need to focus on, when improving cooling is how the air flows, and how you can make sure that cool air hits the components that get hot. Now some case-modders have done crazy things, like integrating table fans into their cabinets, so powerful that you see IDE cables flapping in the breeze, or there are those that use liquid cooling... however, most of us are tech-crazy, not stark raving mad! Our colleague had some intake fans right next to exhausts, which was defeating his purpose.

Since we were planning on starting a series of DIY articles, we figured we might as well start with cabinet cooling and airflow.

Thinking about this article, the very first problem that cropped up was, how do we show airflow? Now we could go out and get expensive smoke machines to fill the cabinet with



smoke and see where the air went, but how would that help you? A DIY needs to be simple, and needs to lend itself to easily replication at the average home.

Also, we often get carried away and tend to use the best hardware for everything, but in order to stay in touch with real-world scenarios, we were forced to curb our enthusiasms, and work with an everyday, run-of-the-mill PC setup.

Another restriction we set upon ourselves was the money we were allowed to spend on this little project. A budget of Rs 1,000 was allocated, because we figured there's no way the average *Digit* reader would be willing to spend more than that on just cooling his or her regular cabinet.

With these things in mind, we set off to our neck of the computer component woods called Lamington Road. We bought three cabinet fans, Rs 50 each; a hard disk cooler, Rs 350; one round IDE cable for a slightly steep Rs 400 (thankfully, they come bundled with most new

motherboards), and then overshot our budget even more, splurging on a little tube of Arctic Silver thermal paste, Rs 400! The Arctic Silver is completely unnecessary for most of you, especially if you're not overclocking your CPUs or GPUs, so forgive us our little indulgence. We also bought a little hand blower for Rs 15 to get rid of accumulated dust.

### Smoke Screens

The 12-fan-colleague, mentioned earlier, was shown the folly of his ways using cigarette smoke; however, it's not like *Digit* wants to encourage its readers to take up a bad habit like smoking just to solve airflow problems—we get enough mails from angry parents as it is! So we decided to use incense, the type that most of India uses in prayers and rituals. It's called *dhoop* here, but anything that gives off a lot of smoke will do. Just make sure it doesn't give off too much heat, or you'll end up scorching your eyebrows, or worse still, your cabinet or SATA/IDE cables!

## Temperature Readings

Here's what we noticed in terms of cabinet ambient temperatures while doing this workshop

Configuration	Temperatures (degrees C) - Maximum		
	Idling at Bios	Idling At Windows	Running 3D Mark 05
Stock without cleaning	33.8	34.2	37.9
Stock	32.1	32.5	36.2
Stock + Acrylic sheet	31.8	32.1	35.7
Reversing the rear fan	33.1	33.4	36
Adding the front fan	29.1	29.3	33.3
With front fan without GPU	28.3	28	32.2
Hard disk cooler + front fan	28	27.8	32

We think this paints a pretty descriptive picture about the cooling components we added, and will help you decide on how to go about optimising your airflow





It isn't as descriptive as it seeing it live, but the smoke from the incense sticks is fairly indicative as to how air flows in the top section of the cabinet. What you can't see here is the smoke being blown out the sides of the processor heatsink and then sucked and expunged by the power supply

*Note: You should know that we did leave black charred marks in our white cabinet, and at least one person burnt his fingers, so be careful.*

## The PC

We used a regular-looking cabinet, and tried to recreate an average PC configuration to generate the type of heat that most of you should have within your cabinet.

### The configuration was:

- AMD Athlon 64 3200+
- 2 x 512 MB Transcend DDR 400 RAM (without heatsinks)
- 80 GB Seagate hard drive (SATA)
- 120 GB Maxtor hard drive (SATA)
- MSI RS 480 motherboard
- ATI Radeon X1300 graphics card
- 380 W PowerSafe SMPS
- 1 stock rear cabinet fan
- Plextor DVD-Writer (for the IDE cable)

This configuration generated 34 degrees Celsius of ambient cabinet temperature, which we measured using a temperature sensor that we got from a Zebronics cabinet we had. This temperature was measured at the Windows desktop, after leaving the PC on, idling, for about half an hour.

In order to be able to show you the smoke / airflow, we also went out and bought a clear acrylic sheet for Rs 80. You can do this yourself as well, to keep the innards of your cabinet visible at all times.

## Getting Ready

First things first—we decided to get rid of all the dust in the cabinet. Using our little orange hand blower, we realized that keeping the insides of the cabinet clean was quite a task. We took apart the whole system, and coughed and sneezed our way through blowing away all the dust. Even in our temperature-controlled office with sealed windows, we found quite a lot of it, so if you haven't opened your cabinet for over a year, wear a surgeon's mask!

The only thing we didn't open in search for dust was the SMPS, which was still within the warranty period. You should also avoid breaking any seals that can void your warranty. If all warranties have expired, don't be afraid to open out the SMPS cover as well (after disconnecting it from the mains, obviously) to get at that cake of dust that forms within all power supplies.

Now that we had a nice, gleaming PC, we went a little off track and Arctic Silver-ed the CPU, after

## Tip

### Round IDE Cable

A round IDE cable will help you push it to one side, and not obstruct airflow the way the flat cables do. If you have mainly IDE drives, make sure you get yourself a few round IDE cables to help air flow inside your cabinet. Unless they came bundled with your motherboard, the costs can be a little daunting, at around Rs 400. You could, however, gingerly pry out individual wires, or even pairs, from your flat IDE cable and bunch the lot together to make your own round IDE cable, as we have done here. Note that we take no responsibility if you botch up.



cleaning the old thermal paste away, and cleaning the heatsink using a cloth and some brushes between the fins. We then proceeded to connect everything back, and used the round IDE cable instead of the flat one we had earlier. We also connected the RAM strips in the slots furthest away from the CPU—you may not be allowed to do this on all motherboards—and made sure there was enough space above and below each hard drive.

We now measured the temperature again, and found that it hovered between 31 and 32 degrees celsius. That's 2 or 3 degrees cooler just because of a sound cleaning! We also found that the CPU idling temperature from the BIOS screen had dipped from 42 degrees to 38 degrees Celsius—vive le Arctic Silver!

Now our cabinet also came with a side panel with a conical appendage on the inside that's meant to help bring cool air directly to the CPU heatsink. We wanted to check whether this helped the CPU cool any better than when we attached the simple acrylic sheet. It did, but very marginally; with the stock cabinet side panel, with the conical appendage, we found that CPU temperatures stayed at 37 or 38 degrees; however, we suspect that airflow was obstructed by this cone, because cabinet temperatures were raised a degree.

For those of you wondering why a degree matters, you should remember that these are just idling temperatures, and also during the winter, in an air-conditioned office. At home, with cramped spaces within your computer table, or under a desk, while running a game or video-rendering software or something equally taxing, the temperatures of your CPU and cabinet will soar—even more so in our Indian summers, for those without air conditioning!

We decided to discard the stock side panel and stick to the acrylic sheet. Not only did it seem cooler inside the cabinet, we also needed to conduct our airflow experiments now, and needed the transparency of the acrylic.

### Coughing Fits

Now it was time for the smoke. We made the mistake of trying to conduct the experiment in a closed room—bad idea. Five minutes into the whole thing, we all ran out coughing up something terrible, and found that everything, including water, seemed to taste of incense. We strongly advise that if you do this, do it in a very well-ventilated area.

Red-eyed and with weakened lungs, we bravely ventured back into the room and opened the windows, and brought along a couple of fans.

We then proceeded to fill our cabinet with smoke, and try and see how the smoke flowed. We put a few burning incense sticks (safely contained inside a ceramic plate, after one of us burnt his fingers!) into the cabinet, put the acrylic sheet on, and then waited awhile for the cabinet to fill up with smoke. We then turned the PC on and watched where the smoke went. The hardest part was trying to get



The hard disk cooler sucks in air from below and is supposed to blow it out both open sides, but for some reason, it would do so out of only one side. Go figure.



This X1300 graphics card blew air into the most inconvenient place possible—when buying, please make sure that your card's heatsink blows *out* of your cabinet!

still photographs to tell the story, but to the naked eye, the way the air flowed was obvious.

Now the fan-happy colleague we mentioned earlier had inadvertently reversed his cabinet's rear fan, causing it to draw air *in* instead of throwing it out! We did the same to our test cabinet, and noticed that this was bad for airflow, because everything was being forced out from the power supply exhaust. This left smoke in the lower regions of the cabinet for a few seconds longer. It was also opposing the way the CPU fan was trying to blow air out, causing our smoke to be dispersed wildly, instead of forming a nice neat channel of airflow. All of you should make sure that your cabinet's rear fan does indeed blow air out, because if it's acting as an input instead of an output, it could cause your cabinet to be hotter than it should be. The smoke also cleared a few other things up:



The entire setup. Don't get awed by the low temperature, though—this shot was taken without the acrylic sheet

We found that the ATI Radeon X1300XL graphics card we used had active cooling, but due to its design, sent its exhaust (hot air) towards the centre of the cabinet. When we compared it to the newer design of the X1900XT, which occupies two slots but sends its exhaust directly out the back of the cabinet, we found that older graphics cards really leave a lot to be desired in terms of airflow!

We also noticed that there was hardly any air flowing over or under the hard drives or the DVD-Writer. Now a DVD-Writer may not need cooling, but hard drives certainly do!

### Fanning The Front

We found that most cabinets have a space to attach a front cabinet fan. However, the front is blocked by the Power and Restart buttons, along with the hard drive and power LEDs. Front USB ports also block the front of most cabinets.

There are big gaps in the front and along the sides of cabinets, which were made obvious by the smoke billowing out of these gaps when the PC was switched off. We decided that adding a front fan was the next step, and these gaps should allow the fan to draw enough air in. The first hurdle was the fact that the location of the front fan was obstructing the hard drive placement. We couldn't push the hard drives all the way in, and settled for them sticking out a little towards the motherboard in favour of the additional fan.

It worked! Soon after the cabinet was filled with smoke, we found that switching it on made the smoke accumulated around the hard drive disappear almost instantly and flow towards the rear cabinet fan. If anything, the flow of air from the X1300XL was the only obstruction to smooth airflow. When we removed the X1300XL and used the onboard graphics, we found that air flowed much better! We also saw that smoke from outside the front of the cabinet was being drawn in through the gaps in the front, so despite being covered, the front fan was working well.

### Cooler Disks

The next step was to cool the hard drives. We attached the hard drive coolers we'd bought, and immediately found that they refused to sit comfortably in their bays. The problem was that even if we managed to muscle them in, because of the extra height the hard drives

#### Tip

##### Buying A Cabinet

When buying a cabinet, try not to choose a small form factor cabinet, especially if you want powerful hardware. The space savings are not worth running your components hot. Also, a lot of cabinets come with top fans already attached. Some even come with front fans. If you don't want to have to fiddle about inside the cabinet, make sure you get yourself a cabinet with at least one top and one front fan, in addition to a large rear fan.

## Tip

### Cable Organising

Inside your cabinet, or outside, organising your cables properly is essential. You can use plastic wire binders, or even rubber-bands, but make sure your cables are all arranged along the sides and the bottom. This prevents them from getting in the way of the airflow, and thus helps keep your cabinet cooler.

gained due to the cooler, we couldn't screw the drives in because the holes on the disks refused to line up with the holes on the cabinets. Our solution, although requiring considerable finger-acrobatics, was to screw the hard drives into their bays, sans coolers, and then attach the cooler from below. Basically, we attached the coolers from under the notches that the hard drives rest on! The pain was worth it, because we'd rather not risk our data on a hard drive that's clattering about inside a cabinet.

Placing the hard drive above or in front of the cabinet's front intake fan seemed to help. When we filled our cabinet with smoke again, we saw that the smoke around the disks disappeared even faster than before, and was all thrown out from the rear intake fan. We also noticed that after running a few games, the hard drives seemed a lot cooler than before, especially the Maxtor, which used to get so hot that you couldn't touch it without discomfort. After the hard drive cooler was added, though, it always seemed to stay cool!

Cabinet temperatures were not affected at all, though, by adding the hard drive fan. However, if you use your computer in a way that has a lot of hard drive usage, such as rendering, or even leaving it on all night downloading from P2P networks, a hard disk cooler is probably a good investment, and should help prolong the drive's life.

## For The Adventurous

If you're not satisfied with just adding on another fan and a hard disk cooler, you can go out and get yourself some cutting equipment, and cut a hole into the top of your cabinet as well. We suggest that you do it above the RAM strips, or basically towards the end of your motherboard.

Make sure the fan is placed as an exhaust, and make sure that there is at least 6 inches of space between the top of the cabinet and your desk. This will help hot air that accumulates around the power supply—and the top of the cabinet in general—flow out easily. Besides, hot air rises, so the exhaust on top will make sure it rises out of the cabinet!

If you're one of the crazy people who want to attach a rather huge fan to the side of your cabinet, make sure all other fans are set as exhausts, including the front fan. This is because the smaller front fan will be no match for a huge fan, so it might as well help it send air out instead of opposing it by trying to send air in.

## Do It Yourself

All this said, it's not enough for you to just read this article and nod in agreement with what we're saying (or in disagreement either). We'd



If you disconnect all the other fans and stick the incense close to the processor, you can watch the airflow around the area better—including how that air is sucked up by the power supply as well



It's advisable not to forget your smouldering incense in the cabinet while you go stuff your face

rather you discover the joys of tinkering with your PC. Remember, when playing with fire (or smoke), play it safe. And let us know if you come up with some ingenious ideas for improving the airflow / cooling of your PC.

Remember, we've shown you how to improve airflow using standard components. However, if you have powerful heat-generating components, like an overclocked CPU, a powerful graphics card, and a 500+ W power supply, the heat generated increases dramatically, and you will see greater differences after optimising airflow.

Also, watch this space for more such articles, and we promise you, they're about to get geekier! ☒

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# The High-Definition Itch

**You might not be able to afford one. There is nothing to watch on one. But you still want one. We help you scratch that HDTV itch**

Ahmed Shaikh

There is no clear path to HD land. The idea of high-definition television is a beehive of activity with new tech replacing the old, faster than a speeding bullet. With no clear winner, choices are numerous, with many pros and cons to weigh. Things are not very clear on the content either: HD content producers are ambiguous on their DRM (Digital Rights Management) policies—will they, won't they, and when (because they will)? What resolution will be widely adopted, to what extent will DRM shackle our media? To make matters worse, the content sources are anaemic in India (neither over-the-air nor broadcast HD channels available); the only HD content currently on offer being games. Nor is there any clarity on the next-generation of HD media—will Blu-Ray best HD-DVD or vice-versa?

But walk into an electronics shop and your jaw drops—pretty HDTVs all in a row and none of the above matters, lust overtakes logic; and while some practical corner of your brain pleads to

look before you leap into the HD stream, you can't help but scratch that big-screen itch.

So, hearts filled with joyful consumerism, let's take a walk through the HD swamp—learn a bit about what makes an HDTV, and take a look at some of the numerous technologies available, with a strong emphasis on the pros and cons of each. Which technology to pick? There is no clear answer. Consider this an interesting journey without a destination.

## What Makes An HDTV?

All televisions display images as a grid of coloured dots or pixels. The more the dots a TV can display, the higher its resolution. The TV sets that most of us currently use is called SDTV; it has the lowest resolution possible. An enhanced version of this type of TV—called EDTV—is also available, but even that type does not differ much over the SD variety. The drawback of a low resolution is that as the screen size of a television set increases, the TV has to fit the same number of pixels to a larger screen area. This results in poor image quality; it's similar to watching a video recorded by a cell phone on a PC in full-screen mode. Larger displays offer a more cinematic experience. This is where HDTV steps in.

TVs generally come in two screen ratios—a 4:3 screen and a 16:9 screen; some sets also sport



a 16:10 screen. The number denotes the ratio of the horizontal size of a TV screen to its vertical size. Thus a 4:3 PAL SDTV (the most common variety) uses a fixed pixel grid of  $768 \times 576$  or  $720 \times 540$ . Most movies, however, are shot in 16:9 format, also known as widescreen (as seen in movie theatres); some SDTV sets and almost all HDTV sets come in a 16:9 widescreen format. A small thing to note: if you are in the market for a new PC monitor, you'd do well to pick up a widescreen variety, as most forms of entertainment now come in 16:9.

Now what happens if your TV is not 16:9? The 16:9 format movie on a 4:3 TV set will be scaled down to fit the lesser width. This leads to empty areas at the top and the bottom of the TV screen, which are filled with black bars. This is known as letterboxing. Some sets might attempt to stretch and scale the image and make it fit the 4:3 area, leading to a distorted video. Others might zoom into the video instead; this hides a portion of the video content. A 4:3 format video on a 16:9 display will fill the screen from top to bottom but not from the sides, and so you will see borders on either side of the screen.

As a general rule of thumb, all HDTV sets are likely to be widescreen, but all widescreen TV sets need not be HDTV. Thus what essentially distinguishes an HDTV from an SDTV is its screen resolution. An SDTV is 480i, an EDTV is 480p, and HDTV can be either of three resolutions: 720p, 1080i, 1080p. What do these specifications mean? The number denotes the number of horizontal lines of dots that are present in the TV. Thus a 480i has 480 lines forming its screen. An HDTV resolution is 720 and above—720p, 1080i, and 1080p—since an HDTV is widescreen and 16:9, these numbers correspond to  $1280 \times 720$  and  $1920 \times 1080$  pixels. The “i” stands for “Interlaced,” the “p” for “Progressive.” This is a way to denote how a picture is painted on a TV screen.

Interlaced TV sets, which most of our TV sets are, divide a video image into odd and even lines of dots. Each divided image forms a field, and when the odd field and the even field are combined, they form a complete frame. An interlaced TV draws each field every 1/60 of a second to form an illusion of running 30 frames every second. The illusion, however, isn't perfect, and



HDTV: Looks good, feels great

almost everyone can perceive flicker on our standard TV sets. A progressive scan TV set takes both the fields and combines them before displaying on screen. It thus displays a complete frame every 1/60 of a second—painting a complete picture at once, to eliminate the flicker. Progressive is almost always superior to interlaced.

Beware: some TV sets offer SDTV/EDTV resolutions along with 1080i—these are not HD sets; make sure your HDTV offers at least a 720p resolution.

Almost all HD sets available in the market today are 720p/1080i; 1080p sets are a newer breed and are much costlier than a 720p set. Generally, a 720p set can also do (or is advertised) as 1080i as well.

So which one should you buy? For all practical purposes, a 720p set is good enough. All HD content—movies, over-the-air TV content, or games—is enjoyable on a 720p set. More is, of course, better, but a 1080p set is not only significantly costlier, there is little HD content available in 1080p to best utilise the set. Subjectively, for lower screen sizes or larger sitting distances from the TV screen, it becomes very difficult to qualitatively differentiate content on a 720p set from that on a 1080p. Unless you are buying a set larger than 50 inches, you need not concern yourself with the lack of 1080p resolution.

### HDMI Demystified

Our usual cables need not apply to the new HD era: S-video, SCART and composite cables are not suited for HDTV viewing. They simply do not have the required bandwidth, nor do they offer the required digital fidelity. When you move on to HDTV, you will have to deal with component, DVI and HDMI cables. The latter two are digital in nature and are the ideal course to take. A component cable will carry unprotected HD content. Most of the high-definition content will be protected, and to view this as intended, you will need HDMI ports on both the source of content (unless it's over-the-air) and on the TV set. HDMI (High-Definition Multimedia Interface) is a pure digital cable that carries audio and video and is backward-compatible with DVI-D—a DVI-D source can drive an HDMI unit through a converter, but the audio will not be available. As for the content protection: HDCP (High-Bandwidth Digital Content Protection) is a form of DRM (digital rights management) that

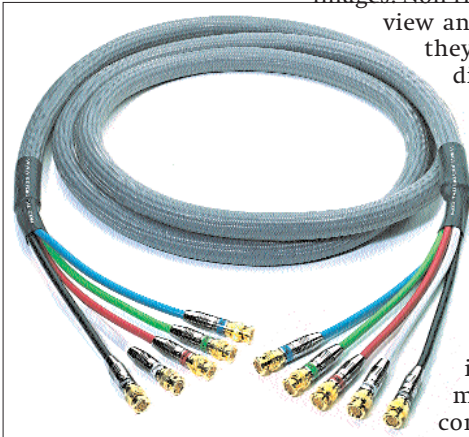
controls content travelling along DVI-D and HDMI. High-definition video content is downgraded to DVD quality on non-HDCP compliant TV sets, when requested by the source. DVD-Audio content is restricted to DAT quality on non-HDCP digital audio outputs (analogue audio outputs have no quality limits). Thus you will need an HDTV with an HDMI port, a video source with HDMI output, and an HDMI cable to experience real HD content.

HD-DVD and Blu-ray Disc players allow movie studios to set an Image Constraint Token (ICT) flag that will only output full-resolution HD content through HDCP. If such a player is connected to a non-HDCP-enabled HDTV, and the content is flagged, the player will output a 480p signal. The good news is that most of the movies studios seem to have informally agreed to not use this flag for the near future; additionally, none of the HD games currently have any restrictions—they can be enjoyed over both component and HDMI without niggles.

Now that we're clear on the basics of TV and HDTV, let's move on to the specifics of what makes a High-Definition television.

### One Big Family

The majority of HDTV sets, be they LCD, plasma, rear-projection microdisplays, DLP, or LCoS technology, are so-called fixed-pixel displays. Such a display uses pixels to form



HDMI to DVI-D adapter

images. Non-fixed-pixel displays are direct-view and rear-projection CRTs, and they don't use discrete pixels to display images. Fixed-pixel HD displays operate at a "native" resolution, say 720p. They are also all inherently progressive-scan—even a 1080i "interlaced" HDTV set runs at a 720p "progressive" resolution. Since an HDTV only talks in native resolution, there is some scaling involved with content: no matter what the source of the content, a fixed-pixel HDTV will always scale it to fit to its native resolution.

If the incoming signal has more pixels than the TV can handle, you will lose some detail and sharpness. If in turn the signal has fewer pixels, the TV will scale it to fit its screen but you won't get any extra detail and sharpness (this is called upscaling or upconverting). How well the TV does at scaling is a critical point to consider while purchasing an HDTV.

Before making a purchase, we recommend that you play various content on your desired set—TV, DVD, HD video games, and if available, HD movies.

### What Flavour HDTV?

Wouldn't it be great if you could just walk into a store and pick up an HDTV, any HDTV, without worrying about black levels, contrast ratio, refresh rates, viewing angles, colour saturation, colour accuracy and so on... of course it would, but if you're in the market for an HDTV, you need to understand the pros and cons of each HDTV technology.

Broadly speaking, there are two major categories of HDTV—you have your Flat Panel TV sets, which are your thin plasmas and LCD panels. Then you have your rear-projection sets which can be LCD, DLP (Digital light Processing), CRT, or LCoS (Liquid crystal on silicon). Apart from these, you can also purchase an HD-resolution projector, or an old-fashioned CRT TV set. Let us run through the major technologies first, and then take a look at the table *Which HDTV Should I Buy?*

### Flat Panel Displays

There is little to differentiate between a plasma and an LCD display today—each one's pro is generally replicated well by the other. A plasma screen is no longer as liable to suffer from burn-in as it used to, while an LCD TV's viewing angle is much improved today than it was a year ago. And so on. Generally speaking, a plasma television is still a better choice if you are looking to set up a home-theatre: these are large screens with great image quality, high brightness, and good contrast ratio. The only negative is screen brightness: a plasma TV will gradually dim over its life. Present plasmas are typically 60,000 hrs of half-life—long enough to last five to six years, but something to keep in mind while picking one up. For gaming, both technologies have their cons: an LCD screen is liable to "ghost" or blur when the action gets fast (due to slower response time); a game's HUD (Head-up Display) is liable to

Which HDTV Should I Buy?			
HDTV technology	What's great about it	What sucks	
Tube televisions (non-fixed-pixel displays)	Inexpensive, wide viewing angle, great picture quality (especially black levels)	Huge, extremely heavy, limited screen size, lower resolution	
Flat Panel TV	Plasma television	Slight potential for burn-in, more expensive than LCD, display gradually dims over time (loses brightness)	
	LCD television	Image quality generally not as good as plasma (poor blacks); relatively narrow viewing angle, might show ghosting while displaying fast-moving images like in games	
Rear Projection TV	CRT	Need professional calibration for ideal setup, deep cabinets, not suited for bright rooms	
	Microdisplays	DLP (Digital Light Processing)	Rainbow effect might be visible in some sets, low-level noise, wobulated resolution on some TVs
		LCD	1080p currently unavailable, black level lacking, uniformity issues, not as bright as DLP, currently no 1080p chips, poor contrast ratios, weak and stuck pixels are common
LCoS	No rainbow effect, true 1080p resolution (not wobulated), excellent black levels, great interpixel fill	Some uniformity issues	
Projectors (Front Projection)	DLP	Rainbow effect, more expensive than LCD	
	LCD	Not as bright as DLP, might show screen-door effect	

be burned-in to a plasma screen. Both these display types are widely available in the market, and unless you are a videophile, picking up either of these technologies is a safe choice.

### Rear-Projection TV

Microdisplays make up most rear-projection units. A microdisplay is driven by one or more microchips, which contain millions of pixels. Based on the nature of the chip, a microdisplay can be further classified as DLP, LCD, and LCoS. Each such unit displays by either bouncing light on to and off these chips (DLP and LCoS) or streaming light through them (LCD). The light source, being a lamp, must be replaced every 5,000 to 10,000 hours depending upon the technology and model (ask your local dealer for details); the lamps might also require a few seconds to warm up and cool down. Due to the nature of the technology, all such TVs are excellent for viewing in bright rooms. Let's quickly run through two of the most promising microdisplay technologies:

**DLP:** The microchip is actually an array of mirrors sitting on silicon, the number of mirrors correspond to the resolution of the set. These mirrors are rapidly repositioned to give various shades of grey by varying the intensity of light through a lens; black and white levels are achieved by switching the mirror off and on respectively. Colours are added by use of either a colour wheel, or by employing Red, Green, and Blue LEDs. A common complaint about DLP sets is that of the "rainbow effect"—this artefact is generally visible as a multi-colour shimmer when changing focus from one part of the projector screen to another, generally at a viewer's periphery when shifting focus from a high contrast area or bright object. The rainbow effect is mostly seen in single-chip DLP projectors. Make sure you check for this before buying a DLP set—people are not equally sensitive to the effect.

Some DLP sets use a technique called "wobulation" to double the actual resolution of a TV—a 1080p chip might have 960x1080 physical pixels. A mirror or lens is then made to move rapidly to form a complete picture, from the two halves of 960 pixels to give the 1920 x 1080 (1080p) finished picture. A wobulated image might appear soft; results vary from set to set.

**LCoS:** This is a technology similar to DLP, but uses liquid crystals instead of mirrors to reflect light. LCoS is the technology to watch—it has the potential to realise big-screen HDTVs with very high picture quality and at a low cost compared

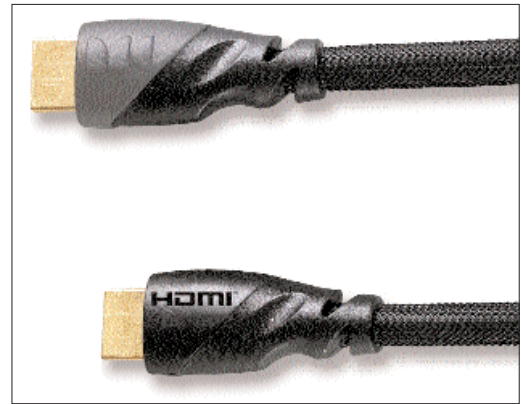
#### Ideal Viewing Distance From An HDTV set

Screen size (inches)	Viewing distance (feet)
30	3.75 to 6.25
34	4.25 to 7
42	5.25 to 8.75
50	6.25 to 10.5
56	7 to 11.75
62	7.75 to 13
70	8.75 to 14.75

#### What Is An "HDTV-Ready" TV?

Some HDTVs might not have an inbuilt tuner to view over-the-air or broadcast HD content; these are generally labelled as "HDTV-ready TV" and must be connected to a separate HDTV set-top box to view them. Note that they will have the usual PAL/NTSC SDTV tuners.

to the others. Pixels on LCOS panels can be made smaller than is possible with other microdisplay technologies, without compromising on picture quality or manufacturability. LCoS displays can be scaled to 1080p resolution and beyond, without increasing the size and cost of the panel and other optical components in the light engine. Commercially, Sony's SXR D is the most visible and viable implementation of this technology in the market.



HDMI Cables

### Summing It Up

For most of us, the fog of uncertainty surrounding HDTV lifts when we consider price as a factor. These big screens, sexy as they may be, are priced beyond EMIs for the rest of us. And when you look at HDTV through this lens of practicality, the choice becomes clear—whatever is the most affordable amongst this array of tech, and the most ubiquitous. Right now, that choice is a toss between Plasma and LCD sets. Too many companies have invested too much money for LCD to not have a slightly upper hand. LCD tech has overcome most of its inherent disabilities, and TV sets based on them are the cheapest money can buy today. Plasmas do not fall far outside an LCD's price bracket, and generally do make for a better home-theatre experience. But as far as the market is concerned, LCD is ascendant—you are bound to find a wide variety of prices and offers when shopping for an LCD-based HDTV.

Moreover, while some of the newer tech might or might not last tomorrow's dawn, LCD displays are here to stay. We'd recommend you wait a while before picking up an HD set—prices are bound to fall further, and 1080p displays should soon become more practical. By some major miracle, we might even see some HD content in India. But if you intend to walk that HD path this year, let LCD be your guiding light. ■

readersletters@jasubhai.com



# Battle For Tomorrow

**Technology is enabling the movement of warfare from a blood-drenched killing affair to something more precisely-targeted and yet more powerful**

**Vishal Kansagra**

War is a sad reality: has been the same in the past and will continue to remain so in future. It is anybody's conjecture what war will be like, say, five decades from now. It will not involve the loss of lives in direct combat: we would have passed well beyond that stage. But what can it be about? Will it be about the destruction of physical targets via what the Internet will be at that time? Or will it be entirely cyber-warfare... attacks solely on information systems?

Whatever the case, the fact is that technology has decisively entered the battlefield, just as it has entered the sports arena. It makes it less fun and more serious business, but war is fun only when you're watching a movie!

Here, then, are some things that have happened in recent years, which point to the inexorable rush of technology into combat of all sorts. We focus on the communications and networking aspect, because that's where it's happening most. We have good reason to believe that what's happening today is indicative of what will be tomorrow.

## **The Networked Soldier**

In the US Army's vision called the Future Combat System, networks will acquire the capability of being set up on the fly to adapt to the progress of a battle.

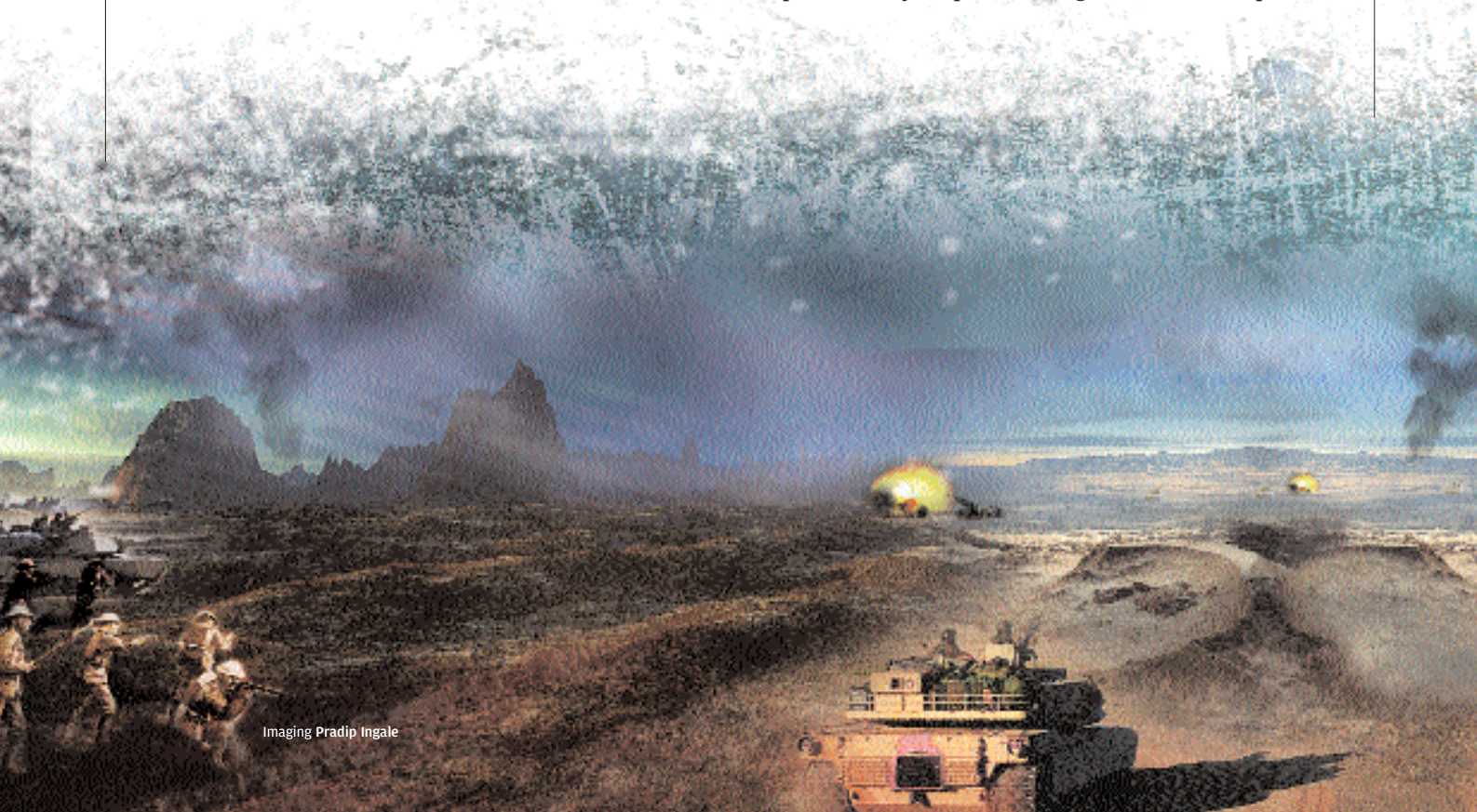
Peter Marcotullio, director of development

at SRI International, the research centre working with the DoD (the US Department of Defense) on ad hoc network development, says, "Each person is a network with routing capability to everyone else. Think of cascading networks, all IP-based, that are dynamic and self-configured as the troops advance."

Sensors, commanders and soldiers will all be linked to a dynamic network that will adapt to the situation and satisfy the information demands of the battlefield. This vision is not far from being realised. By the end of this decade, major armed forces across the globe will have sensors and communication gear that will make such connectivity possible.

In addition to conventional weapons, the soldier of the future will have the necessary equipment to make him a network-enabled "smart warrior." Using his helmet-mounted drop-down eyepiece, he will see a virtual, GPS-linked display showing his current location and that of friendly and hostile units in the area. He will be able to switch the display to watch live video feeds from UAVs (Unmanned Aerial Vehicles) coming via a secure data link. His rifle-mounted TWS (Thermal Weapon Sight) will not only help him identify enemy positions in the dark, but also pass on the same information to allied units on the network.

A soldier is just a part of a platoon or company of similarly-equipped soldiers. The soldier utilises data fed in by sensors like UAVs, aircraft, satellites, and other sensors to identify important targets and detect potential



traps or hostile units. He won't fire unless absolutely necessary, rather relying on combat robots or UCAVs (Unmanned Combat Aerial Vehicles) to do the job. Once the target has been identified, the soldier will deploy robots or UCAVs to destroy it.

The individual soldier thus becomes a powerful component of a huge grid, much more powerful than the soldier of today, but also with his safety ensured.

### Network-Centric Warfare

August 17, 2016: A pilot flying a fighter jet on a routine patrol spots a group of intruders trying to sneak in through the border. He immediately updates their coordinates on a digital map on his aircraft computer. That done, the information is updated in real-time to army units in the vicinity.

Moving in to intercept the intruders, they get a constant video feed from the aircraft, so they have all they need to know—how many of them there are, what are they currently doing, which way they're going. Using this information, the unit chooses the best spot to ambush the trouble-makers. Ambush and capture them they do, without a single casualty.

The scenario above is a classic one, where the ability to conduct Network-Centric Warfare (NCW) not only increases the efficiency of a unit, it also minimises the loss of men and materiel (equipment).

The term "Network-Centric Warfare" is the latest buzzword in military circles; it is the transition of military forces from the industrial age—where better equipment was the key to success—to the information age, where having the latest information is the key. The idea is to provide real-time, accurate information available to all friendly forces so as to make fast, effective, better-informed decisions.

### The All-Important Network

We live in a networked world, be it the cell phone network or the Internet. It was only a matter of time before the network entered the battlefield.

Visualise a huge network of computers with three key components:

**Sensors:** These include objects that generate useful information (such as pictures or radar images). The objects can include satellites that provide images of a particular area, Unmanned Aerial Vehicles (UAVs) that generate real-time images of an area, and so forth.

**Commanders:** Military commanders get a broad view of what's going on by collating the information sent by the sensors. They make decisions depending on the situation.

**Shooters:** Troops on the battlefield that do the actual shooting. It could be a squad of soldiers, robots, tanks, aircraft, or even a single ship. These are guided by the commanders to perform set actions.

These components are analogous to hubs on the network, and the computers are like the nodes. All the computers can access the information flowing around the network. This network relies on a high-bandwidth link using optical fibre or satellite links.

Such networks have to be much more secure than your regular SSL-encrypted connections, due to the highly sensitive nature of the information being transmitted. As a standard procedure, the networks have multiple redundant links, so in the eventuality of war, even if one link is damaged, the network can rely on the others without affecting operations.

### In Conventional Warfare

In a more conventional setup, communication happens via radio. Radio communication can not only be intercepted by the enemy, it is also

**Network-Centric Warfare not only increases the efficiency of a unit, it also minimises the loss of men and equipment**





**In the Future Combat System, each person is a network with routing capability to everyone else”**

**Peter Marcotullio**  
Director of Development  
SRI International

dependant on ambient geography. Moreover, a commander receiving information from various sources has to collate that information and make a mental picture of the situation. There may sometimes be conflicting information. Many a time, it so happens that a commander doesn't have the precise location of friendly or enemy troops. Ambiguous states such as these can hamper decision-making. In such situations, a commander has to rely on experience and gut-feeling. It's sometimes a bit like gambling. With lives.

Taking an example of air combat, radars are a must for any fighter aircraft. But there are drawbacks associated with the use of radar. First, fighter aircrafts have a very small radar range compared to ground-based radars. Second, switching on your radar gives away your position to the enemy. So during most air combat scenarios, fighters keep their radars off, being guided by ground-based radars or AWACS (Airborne Warning and Control Systems): these are aircraft with huge radars of extremely long ranges mounted on them. In addition to pilots, AWACS have controllers who have the details about all aircraft within their radar cover. These controllers can inform friendly pilots about enemy movement and help them plan their tactics.

Now, in this conventional scenario, a radar operator or an AWACS controller uses radio to communicate with the pilots. The pilots have to create a mental picture of their position relative to the enemy aircraft and plan their approach. Air combat is highly dynamic due to the high speeds involved, and it takes time for a pilot to create a mental picture. If, during this time, the enemy aircraft make a sudden change in their path, the radar operator will need to update the pilots about it. The pilot will need to scrap his earlier idea and start from scratch.

In NCW, secure data links on the aircraft and ground station would be installed, and they would be linked via satellite. In this case, the radar operator can share visuals in real-time. Instead of creating a mental picture, pilots will have an exact idea of enemy locations, and can plan their approach quicker to gain the upper hand.

### Iridium

Remember Iridium? The satellite phone service? It boasted of global coverage provided by a “constellation” of 77 satellites, with only 66 having been commissioned. During the recent Iraq conflict, US and UK forces made good use

of Iridium not only to increase combat efficiency but also to boost morale. The US forces transmitted voice and data for tactical purposes using the service, while the British military let soldiers talk to their families. Both militaries also used commercial GSM networks during the conflict—and are still using it. They use the Sectera Secure Wireless Phone, which includes a clip-in security module that uses cryptographic algorithms to ensure secure communication.

These are just two instances of commercial setups being used in warfare—and we're likely to see more of this. Like the use of RFID tags to track men and materials. Like the use of smart cards, using which a soldier would have access to his assigned weapons, and by which an injured soldier's medical records would be instantly accessible.

### Talking To Each Other

Operation Red Dawn to capture Saddam Hussein saw an integration of lots of new technologies. Thanks to the integrated system, intelligence reports were analysed and forces

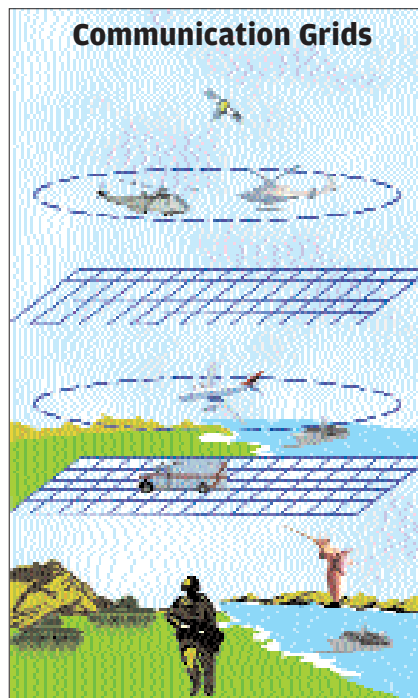
prepared within a few hours. Looking at how tense and time-bound this decision was, an extremely short time from tip-off to capture was no small matter.

Each component involved in this integrated system was not exemplary on its own, and had existed for quite some time. US forces have been using UAVs and satellites to gather information for quite some time now. But this time, all the data was communicated in real time. It was sent to the US, front line units, and to the commanders who made the decisions.

Says John Hillen, senior Vice President and Director of the defense and intelligence group at American Management Systems (AMS), an IT

consultancy in Virginia, “There were a lot of new technologies out there, but none of them was particularly dramatic. It was the stitching together of all of these things in real-time and their integration into the operation.”

As recently as in the first Gulf War, air commanders had to print hundreds of pages of “air tasking orders” to be sent out to various air units. These printouts would then be sent to airbases or aircraft carriers, where they were further sorted out to be given to pilots to inform them about their tasks. In the second Gulf war, IT had already “invaded” the battlefield. A single Humvee became a mobile data centre. Intelligence updates provided by various sensors were fed into a Unix-based work-



station at the back of the Humvee. As many as 20 different interfaces were made available to enter data generated by various sensors and systems, like radar from JSTARS (Joint Surveillance Target Attack Radar System) reconnaissance aircraft and video from UAVs.

The system automatically collated all the data on a single electronic map to give commanders a bigger, more accurate and near-real-time picture of the entire battlefield. In its latest avatar, this system uses a Web service architecture to provide near-real information on demand to decision makers in the US, Europe, and the Middle East. This service uses the US military's restricted network called SIPRNET (Secret Internet Protocol Router Network).

A communications system that speaks for the power of "simple" commercial technology is a wearable computer/radio called the TM-7.

It uses an 800 MHz Transmeta Crusoe processor and 256 MB of RAM. Weighing just 5 kg, the device provides mapping, GPS, and communications. With the help of a USB joystick and a helmet-mounted VGA display, soldiers can use TM-7s to control robots—sending them into buildings and caves, avoiding risk to human lives.

### Bots And Nanobots

Talking about robots in combat, such a bot—the PackBot—was actually deployed in Iraq and Afghanistan. It entered caves, scouting around and reporting to human operators using wearable computers. In the future, its role could accommodate combat duties: such robots could be loaded with explosives to blow up locations not accessible to soldiers.

Thanks to its 802.11b connection, the PackBot can also be operated over the Internet, allowing for remote operations.

Another DARPA (Defense Advanced Research Projects Agency) funded project, dubbed the High Mobility Tactical Microrobot (HMTM), is in the works. Weighing just 5 pounds, it is being designed for surveillance and reconnaissance. The HMTM has a camera on top of a periscope to look around corners, in addition to an inbuilt homing device that will work even if its 802.11b connection breaks.

We've spoken of Smart Dust earlier in this space; how can it help reduce casualties, which was a primary goal during the Iraq war? The central idea, of course, was to replace people with machines that could gather intelligence. In Iraq, the US military used smart robots and small UAVs to reduce danger to personnel. Another DARPA-supported technology, called Smart Dust, could possibly reduce casualties and gather information even more effectively.

Smart Dust is an "autonomous sensing and communications device in a cubic millimetre" package. A millimetre has not yet been achieved, but the goal is to package a light sensor, power supply and circuitry, a communication device, and a programmable processor into a small space.

Assuming we have it, imagine a plane "spraying" Smart Dust over a conflict area. The specks would be light enough to stay afloat and

monitor the movement of enemy troops, or perhaps the presence of biological or chemical weapons. It's not all that futuristic: in a recent test, a Smart Dust researcher controlled a drone about 8 inches long. It flew at 100 kmph for 18 minutes, carrying a camera that sent live feeds back to headquarters!

### In Conclusion

Advanced though the above scenarios and technologies may sound, we think they're baby steps into the future of something that will not be called warfare any more. "Warfare" assumes that one is not omniscient; that, like in a game of chess, one needs to outwit the opponent. What happens when sensors and tracking capabilities and number crunching becomes so advanced that everything is *known*? Surrender and victory would both be immediate—removed only a short span of time from the declaration of the conflict. All the activity happens in preparation.

It's analogous to a grandmaster resigning twenty moves into the game once he knows he's made a wrong move—while amateur chess players, like the forces of today, knowing little about the broad picture, take the game into the hundredth move and more. It's about getting smarter—and technology is enabling that. As it is everything else. ■

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December 2006

# Mitashi MPL 1003

Michael Browne

Now I'm a bloke who loves his music. Admittedly, I haven't been a big fan of portable music, simply because I don't think any player can substitute for the aural experience a set of Sennheisers will provide. Well, my editor decided to cure me of my scepticism, getting me into what he calls the "portable entertainment" experience. Needless to say, it was up to the MPL 1003 to mend my ways...

## Day 1

The MPL 1003 is compact, with a surprising amount of functionality accessible through just the six buttons adorning it. One observation—except for the menu button, the others are super-hard to press.

## Day 2

I notice what seems to be a dead pixel on the left corner of the screen. Funny—a few hours later it wasn't there. Though the LCD is small, it's surprisingly crisp. It did take some time to copy a few MP3s and photos to the player—20 to 30 per cent slower than a Flash drive the same size. The fact that the player stores all files, movies, still, or music in the same root folder is convenient, though browsing through the folder can be a pain.

## Day 3

Mitashi states in the manual that the player can only browse JPEG files. This statement had me stumped—because the player not only displays BMP images as well, the treatment of both (JPEG and non-JPEG) images is the same. I took the time to read through the entire user manual at last. Lots of ambiguity, and certain parts were really hard to follow.

## Day 8

Copied some more MP3s to the MPL 1003 and actually played them this time! Sound quality is decent, but the player seems to have some inherent background noise that's noticeable if you listen carefully, particularly at the higher

volumes. Incidentally, dB levels are more than satisfactory with the bundled headphones. I viewed a couple of dozen photos—respectable, but this is no photo iPod!

## Day 15

Finally got down to using the inbuilt voice recorder. It works well, and the 1 GB of inbuilt memory provides ample recording space. Playback quality of the recorded content is good, but once again, it's not to be compared with a dedicated recorder.

## Day 21

Upgraded the firmware. It's easily accomplished, really. The interface is very easy to work with, unlike so many other multimedia players around. This is an important and oft-missed feature. Battery life isn't too good... around five hours under regular use. The bundled 2-pin power adapter to USB accessory is useful if you need to charge the player without a USB port handy.

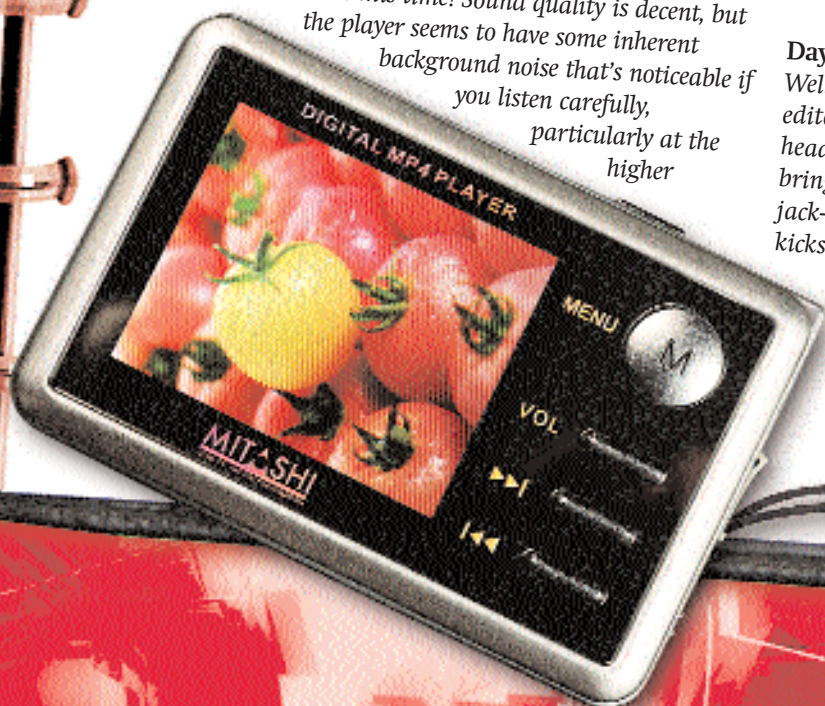
## Day 25

A few friends come over. The ladies went "oh...how cute, it's so small," the guys went "YOU went in for a portable player? What's up with that?" They played around with the device. Reactions ranged from "video quality isn't good" and "MP3s are decent," to "look, it's got FM and a voice recorder too" and "slim... looks hot actually!"

## Day 30

Well that was that. I dutifully returned the player to my editor. He threw an enquiring look at me. I shook my head. A decent product simply for the great value it brings via the features integrated, but ultimately, it's a jack-of-all-trades thing. I'll look elsewhere for my acoustic kicks, thank you very much!

michael\_browne@thinkdigit.com



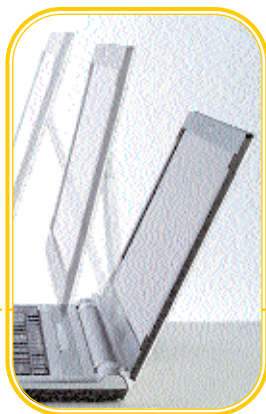
❖❖❖ **Becker Traffic Assist Pro Ferrari**



**T**his GPS receiver is not from the Ferrari stables, but Ferrari does endorse it. To give you that Ferrari feel, the pop-up that's displayed at startup is an exact reproduction of a Ferrari F430's tachometer. The device, which doubles up as an MP3/WMA player, has a 4-inch touch-screen with anti glare coating. Powered by a fast 400 MHz processor, it supports 2 GB of memory on an SD card. There's a USB port for PC connectivity. The menu features spoken instructions, and it can even be operated by voice!



# Drool Maal

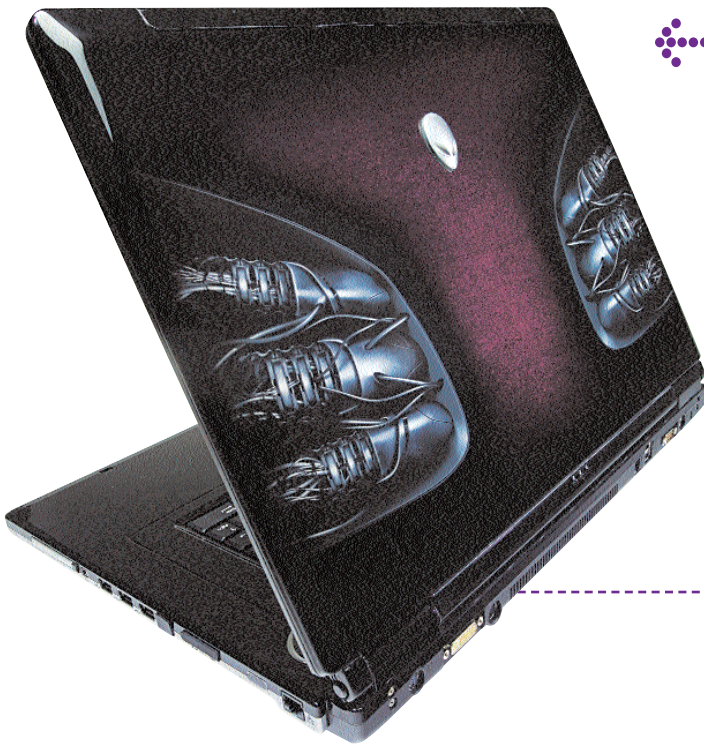


**Flybook VM** ❖❖❖

**T**he innovative design of the Flybook VM is a far cry from the monotony of "regular" ones. It has a tilting screen you can pull towards you while working, and push away to enjoy a movie. Because the screen can lift up, you won't need to strain your neck when working with the laptop at a table—you can adopt a more natural posture.

The screen is a wide 12.1-inch, and the device sports a reasonably good configuration for its size: powered by Intel's energy-efficient Core Duo processor, it allows up to 2 GB of RAM. Price? A little more than Rs 2 lakh. It's all about design and ergonomics!

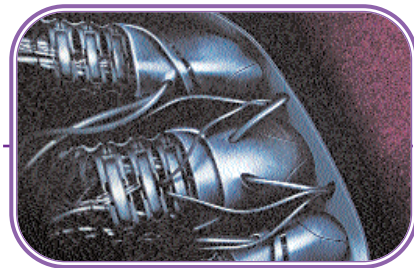




## Alienware Aurora mALX

**T**his beast packs in everything a gamer can hope for—for now. It bequeaths upon you immense bragging rights over lesser mortals. Just going through the specs is enough to make most hardware freaks bow in reverence.

Powered by nothing less than an AMD Turion 64 @ 2.4 GHz, this monster is loaded with 2 GB of RAM and 400 GB of storage space. For a totally immersive experience, you get HD, surround audio. The coolest thing here is two GeForce Go 7900 GTX with 512 MB RAM each in SLI for that top-of-the-world gaming experience on a 19-inch screen. Rs 5 lakh - too much? You decide...



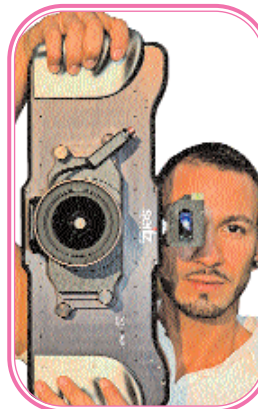
## Hela Glider Mouse

**T**he Hela Glider Mouse looks and works like an air hockey board. As you can see from the picture alongside, the Glider Mouse sits between you and the keyboard, and the actual mouse is at the centre, giving you good control. And how much comfort can you *not* expect from an extended gel-filled wrist-pad? With shiny things you see are customisable buttons. Pair those with the scroll wheel, and you have the ultimate in navigation comfort—without having to take your hands off the keyboard and reach out every time you need to use the mouse.



## Seitz 6x17

**S**eitz has outdone everything in its class with its mind-numbing 160-megapixel 6x17 digital camera. (Sorry, we got that wrong: there's nothing else in its class!) You got that right—one hundred and sixty MP. Couple that with 48-bit colour depth, and you get images of definitions we can't speak about. At the maximum resolution, an image is 900 MB, and you can't use Flash to store several such—so the 6x17 uses a Mac Mini as its storage device. You can control the camera remotely using a PDA. Go ahead, prove you're a *real* photography enthusiast: sell your house and buy the 6x17 for Rs 27 lakh!



How would you reboot your computer into Safe Mode from the Start Menu?

Send in your solution with the subject "Take a Crack", and your postal address, to [takeacrack@thinkdigit.com](mailto:takeacrack@thinkdigit.com)

## THIS MONTH'S CHALLENGE

# Add "Reboot Into Safe Mode" To Your Start Menu



## LAST MONTH'S CHALLENGE



Take a Crack and win

Google Analytics

by Mary E. Tyler and Jerri L. Ledford

Published by



## LAST MONTH'S WINNER

**Santhosh S**  
Nagasandra Post  
Bangalore

### Rules and Regulations

Readers are requested to send in their answers by the 15<sup>th</sup> of the month of publication.

Employees of Jasubhai Digital Media and their relatives are not permitted to participate in this contest.

Readers are encouraged to send their replies by e-mail. Jasubhai Digital Media will not entertain any unsolicited communication.

Jasubhai Digital Media is not responsible for any damage to your system that may be caused while you are trying to solve the problem.

## Create an XP CD that requires no driver installation!

### Last month's solution

Our challenge last month was to create a Windows XP installation CD that requires no driver installation.

1. Download and install Windows Unattended CD Creator from [www.windows-unattended.de](http://www.windows-unattended.de), or install it from the *Digit* December 2006 Utilities CD.
2. Launch the program and insert your Windows XP CD into the drive.
3. Copy all the contents of the CD. Eject the CD after copying the files.
4. In the program's first tab—"Source CD"—click Select, and select the folder to which you copied the CD's contents.



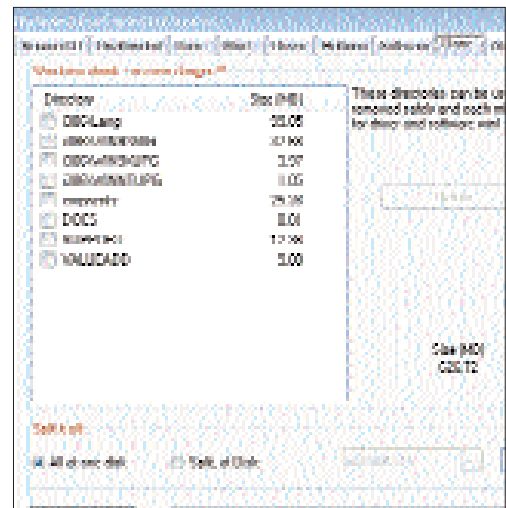
The source CD tab in Windows Unattended CD Creator

5. Select "Work in source directory" under the "Target directory for new CD" column.
6. Bypass all other options and head to the Driver tab.
7. Insert the driver CD that came with your motherboard.
8. Give a name to the driver group in the General Drivers text box, for example, "Gigabyte". Click Add.



Select the drivers you want

9. Wait until all the drivers get copied. It should look something like the screenshot below. (The name you gave will appear along with its attributes).



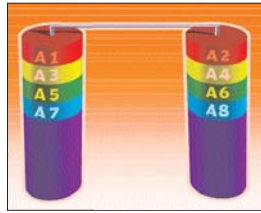
Finalise the CD compilation

10. Head straight to the Done tab, making no changes.
11. Click Save and then on "Create ISO-image". Enter the path of where the image should be written to.
12. After completion, burn the ISO image to a CD using a disc burning tool such as Nero. You're done! ■





**72** Dinky Data Vaults



**85** RAID



**94** Popping The Cork

# Digital Tools

Technology For Personal And SoHo Productivity

## Lead Feature

# The More The Merrier

Why waste your time minimizing windows and searching through all those apps on your taskbar?

**Robert Sovereign Smith**

Remember the days when using a computer meant just having one browser window, one mail client and maybe an office application? I know a lot of us found just those three windows intimidating at times. Today, however, whether it's at work or at home, we've got so many things happening at once that it's hard to keep track of everything that's open on your Desktop. No, don't worry, we're not going to be preaching about silly taskbar applications or telling you how to [Alt] + [Tab] better... instead, we wonder why the majority of the computer users in the world stick to just one screen!

### Why?

In the heyday of the good old CRT, where the average monitor was a 15-inch monstrosity that

weighed as much as you and occupied most of your desk space, this question would seem stupid. However, the LCDs rule the roost today, and with the amount of multi-tasking expected from all of us, the whole "lack of desk space" argument falls flat—pardon the pun! Televisions aren't cool unless they're LCD/Plasma gizmos, and a computer monitor also just *has* to be an LCD today. So why buy one when you can get two? Sure... that is, if your daddy has a multi-crore business and loves splurging on your whims! For the rest of us unfortunate souls, when we think two monitors, it's usually our spanking new LCD and the antique CRT that's now collecting dust. Regardless, if you have more than one monitor, you should be using them all!

There are quite a few ways in which you can put multiple (two or more) monitors to good use, but before we get to where this can be useful, let's look at...



### How?

Laptops! Everyone seems to be buying one, or being given one by the company. Well, most newer models have support for an external monitor as well as its own LCD screen. Just look for a VGA-out on your laptop. If it's got one, you can just hook up another monitor (CRT or otherwise) and start using multiple desktops. This is usually provided for people who need to give presentations, so that they can hook up to a projector, and is a standard feature on any business laptop.

What if you are a desktop user? Well, a few of us have dual graphics cards, for gaming. Most of them will either be NVIDIA or ATI solutions, and these will allow you to hook up at least a monitor to each card. Those with just one graphics card will need to look for two DVI or VGA outputs on the card to know whether the card supports two monitors.

If your card has only one monitor output, but your motherboard has onboard graphics, you may still be able to use two monitors. The rule is generally that the onboard and GPU chipset manufacturer should be the same. So an onboard ATI solution will work with an ATI graphics card; ditto for NVIDIA.

For those whose hardware does not meet the above hardware criteria, the only option is to use one of the many hardware or software solutions we have listed a little later.

Apart from this, you obviously need two or more monitors. Though the ideal setup is to have two identical monitors—so that you never have to deal with colour or brightness changes when looking from one to the other—any two monitors can be used.

A good way to find out whether your display adapter supports more than one monitor is to go to the Display Properties (right-click on the Desktop and select Properties). Here, under the Settings tab, if you see icons for two monitors, or can see more than one monitor in the Display dropdown, you already have a dual-monitor capable display adapter. Just plug both monitors in and the display adapter should recognize them both. You can also connect your TV up to your computer if the adapter has an RF output. Though standard TVs are terrible for displaying things such as office applications, Web pages, or basically anything involving text, they're perfectly capable of displaying video.

Whatever the case, just make sure you select the "Extend my Windows desktop onto this monitor" checkbox so that you can use both monitors together.

### What Good Is This?

Whether you're using two monitors or one TV and one monitor, chances are you can relate to one of the usage scenarios below:

- For those who need to work with MS Excel, and have to keep referring back and forth between two or more spreadsheets.
- When using Explorer to search through drives and find and move files from one drive to another.
- Using any two related applications, such as an HTML editor and a browser, to make changes and check the changes you've made.

- Viewing video while working on an application—when a single computer has to cater to multiple users, one can watch a movie while the other works.

The last one is especially useful when the kids want to watch that cartoon *Digit* provided in the DVD, while you need to work on that project that the boss wants first thing in the morning!

### Other Options

For those of you who wouldn't mind spending a little money to get the most out of your multi-monitor setup, there are quite a few hardware and software options that can enrich your multi-monitor experience. Let's take a look at a few examples:

#### Ultramon ([www.realtimesoft.com/ultramon](http://www.realtimesoft.com/ultramon))

This is a utility that will help you use your multi-monitor setup better. It features support for more than 10 monitors, adds a "move to desktop" icon to all windows, extends the Taskbar to all monitors, so that only the applications displayed on a particular monitor show up in the Taskbar of that monitor... etc. It will even break your windows wallpaper over the displays, allows you to mirror the display instead of extending the desktop (ideal for presentations), and even run different screensavers on each monitor. At \$39.95 (Rs 1,800), it's not very expensive for professionals or serious home users.

#### MaxiVista ([www.maxivista.com](http://www.maxivista.com))

This is a software solution that is best suited for those with a desktop and a laptop. It adds a virtual display adapter that sends display information over the LAN to another computer to display the first's desktop. Basically, you can display your desktop's display on the laptop over the LAN, or even extend the desktop so that only certain windows get displayed on the laptop. Whether it's wireless or wired LAN, you won't notice the difference because MaxiVista monitors the LAN speeds and adjusts the optimal colour depth of the second desktop.

#### MouseJail ([www.dr-hoiby.com/MouseJail](http://www.dr-hoiby.com/MouseJail))

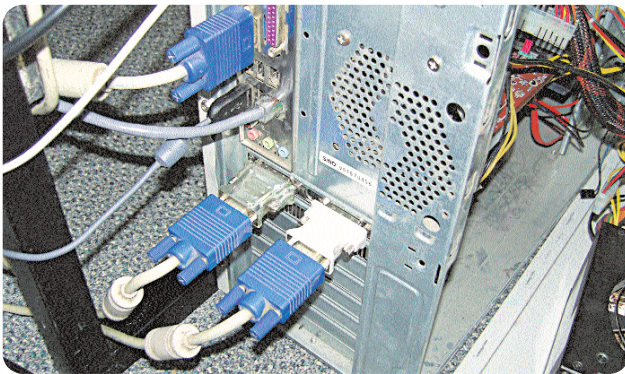
When you have a multi-monitor setup, the most common problem happens when gaming. Some games just don't lock the mouse to the screen that the game is displayed on. So what happens is that you move your mouse during the game and it ends up on your extended desktop, pausing or exiting the game. You can start games that have this problem using MouseJail—your mouse will be locked to the screen that contains the game. It's freeware, so enjoy!

### Monitors

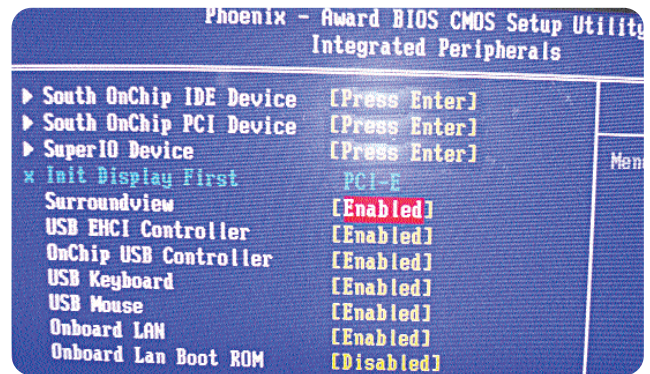
For those of us with a bank balance, settling for old monitors might not be the perfect answer to our troubles. There are quite a few display solutions available out there, and we'll list out a few to help you get started finding the perfect one.

**9X Media ([www.9xmedia.com](http://www.9xmedia.com)):** Take a look at their X-Top series with anywhere from two to 30 LCDs placed together.

## WORKSHOP



First, connect the monitors to the VGA/DVI outputs. In our case we had an ATI onboard working with a ATI Radeon 1900XT



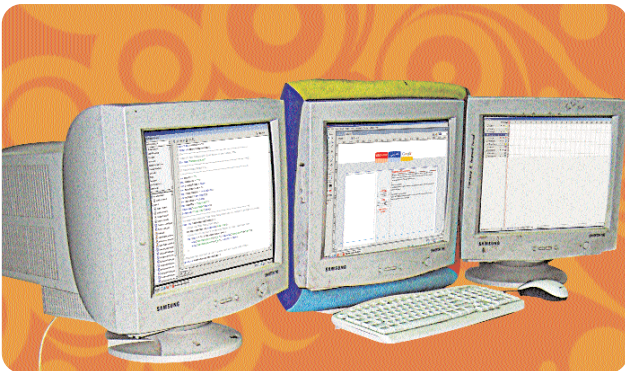
For ATI graphics, you need to enable their SurroundView option from the BIOS. The procedure is similar for NVIDIA solutions



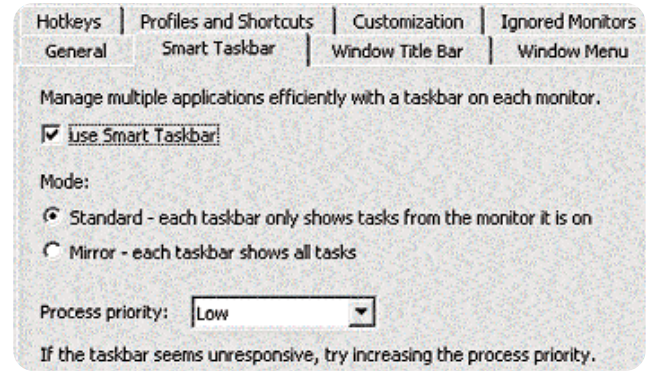
The BIOS and Startup screens are displayed on the two monitors connected to the GPU. The onboard is enabled after Windows starts



Here's how you will be able to work on Adobe Photoshop on one screen, have the toolbars on another and leave the third for other activities



Flash designers will find this setup a gift from god! You can move the timeline to one monitor, design in one and code in another



For better control, you can use Ultramon. This will give you their Smart Taskbar, which gives you better control over your monitors

**Digital Tigers ([www.digitaltigers.com](http://www.digitaltigers.com)):** These guys boast of clients such as NASA, Microsoft, and Dell, and offer “affordable prices” for their screens. A triple display 21-inch will set you back by a mere \$2499 (Rs 1,13,000)!

**Custom Trading Computers ([www.customtradingcomputers.com](http://www.customtradingcomputers.com)):** Their ClearView series are designed for stock traders, so that they can view multiple feeds at once.

As you've seen in the workshop above, setting it all up is really easy. Now you can sit back and enjoy the extra desktop space, but a word of cau-

tion: we learnt the hard way that it's very hard to get back to using just a single monitor... this writer found himself looking to the right (where the extended desktop was) into a blank space, and moving the mouse pointlessly to the right every time he sat on another computer! It's addictive, and once you get the hang of using multiple monitors (which is about an hour at most), you will find your productivity soar.

So if you're used to working on several applications simultaneously, you just *have* to give this a try! Let us know how it goes! ■

*robert\_smith@thinkdigit.com*



# Bazaar

We test the latest hardware and software products available in the market

## NVIDIA nForce 680i The Hyper-Performance Platform!

NVIDIA's holiday-season gift to Intel's latest breed of processors, the 680i sports small (meaning better) chipset-cooling heatsinks which share a single heatpipe. The inclusion of a hex POST debugger is appreciated, as is the huge gap between the two x16 PCI-Express slots (no more issues with dual-slot coolers).

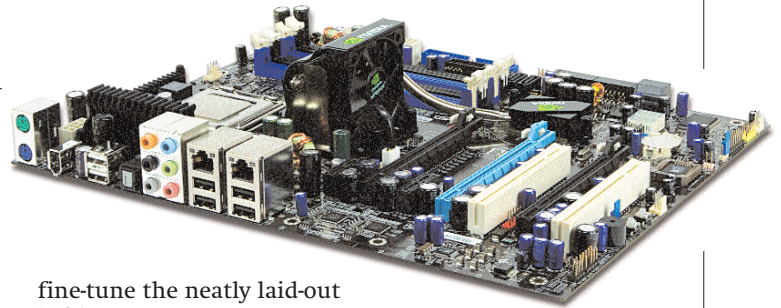
The 680i sports a new BIOS aimed at the hardcore enthusiast. Voltages from CPU to memory to even the Northbridge and Southbridge can be tweaked, ensuring minimal

bottlenecks while overclocking.

LinkBoost—an NVIDIA trademark—automatically overclocks the individual PCI-Express lanes when you SLI with any of the 8 series cards or 7900GTX cards.

There's a couple of Gigabit LAN ports sporting something called DualNet technology. These ports can actually be clubbed together for twice the theoretical throughput, while the TCP/IP acceleration engine aboard each LAN controller reduces CPU utilisation.

nTune has also been reworked, and now allows changing most BIOS options from Windows itself. This can be a huge advantage for overclockers who are in an all-fired hurry, though the hardcore will still want to



fine-tune the neatly laid-out BIOS.

We managed to get our QX 6700 (Core 2 Quad, 2.66 GHz default) to 3.45 GHz at a multiplier of 13 (default 10), without any tweaking... simply awesome! Super Pi 1M calculations took 14 seconds at this speed, and 18 seconds at stock.

For the enthusiast who wants performance at stock and stability under overclocking, the 680i makes for a very a potent package. It's future-proof, and a rock-solid overclocker as well. If you want the best platform for your new Core 2 Duo or

Core 2 Quad processor, you can't go wrong here.

### Specifications

Intel Socket 775; 1333 MHz FSB; 2x16 SLI; third PCIe Graphics Expansion Slot; supports DDR2 800 MHz (SLI-Ready memory with EPP: 1200 MHz); 46 PCIe lanes and 9 links; 6xSATA II; 2xPATA; RAID: 0,1,0+1,5; Dual Gigabit Ethernet; 10xUSB 2.0; 5xPCI; HAD (Azalia) audio

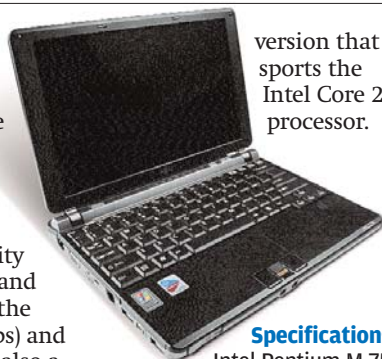
Contact: NVIDIA Corporation  
Web site: [www.nvidia.com](http://www.nvidia.com)

RATINGS	
Performance	★★★★☆
Features	★★★★☆
Build Quality	★★★★☆
Overall	★★★★☆

## Fujitsu LifeBook P7120 A True Ultra-Portable

Weighing just 1.3 kg and with its small dimensions, this notebook puts the "ultra" in "portable"! The performance may not be jaw-dropping, but good enough for most users. Connectivity options include Wi-Fi and Bluetooth apart from the usual LAN (10/100 Mbps) and modem ports. There's also a fingerprint identification sensor. The battery will last a cool seven hours under normal use.

At the price, however, we'd suggest you wait for a



version that sports the Intel Core 2 processor.

### Specifications

Intel Pentium M 753 (1.2 GHz); 915 GMS with 128 MB shared onboard; 10.6-inch widescreen; 512 MB; 60 GB (4200 rpm); DVD flir/RW; Wi-Fi; Bluetooth v1.2; 3 USB ports; FireWire; SPDIF, VGA, TV-out; RJ-45 and RJ-11

Contact: Fujitsu India Ltd  
Phone: 011-65475887  
E-mail: [rakshit.thussu@fujitsu-india.com](mailto:rakshit.thussu@fujitsu-india.com)  
Web site: [www.fujitsu.com](http://www.fujitsu.com)  
Price: Rs 1,16,000 + taxes

RATINGS	
Performance	★★★★☆
Features	★★★★☆
Build quality	★★★★☆
Value for money	★★★★☆
Overall	★★★★☆

## Canon LBP-3500 A Reliable Workhorse

The Canon LBP-3500 laser printer is meant for medium- to large-sized workgroups. It supports a range of paper sizes—A3, Legal, A4, and more. It connects via USB, and there's also an Ethernet port to connect to a network. The maximum resolution is 1200 x 600 dpi, it can hold 350 sheets of paper, and build quality is rugged.

The warm-up times of laser printers are progressively decreasing, but the LBP-3500's warm-up time of just 10 seconds is



quite commendable. A text document at the Draft setting was printed in 2.8 seconds. The print quality is good even at the Draft setting. Overall a very good printer suited for really heavy printing, but the price tag of Rs 64,000 seems a bit too steep.

### Specifications

Paper support up to A3 size, network support, 1200 x 600 dpi maximum resolution

Contact: Canon India Ltd  
Phone: 0124-4160000  
E-mail: [info@canon.co.in](mailto:info@canon.co.in)  
Web site: [www.canon.co.in](http://www.canon.co.in)  
Price: Rs 64,995

RATINGS	
Performance	★★★★☆
Features	★★★★☆
Build quality	★★★★☆
Value for money	★★★★☆
Overall	★★★★☆



## Nokia E50

“Sleek, elegant, and “Sexecutive” is what comes to mind when one first looks at the new Nokia E50. The phone has a nice, sturdy feel to it. The display is stunningly clear. The keypad has slightly bevelled keys, but feel cramped. The joystick provides good feedback.

Oriented towards business users, the E50 comes with



support for most mail protocols, and setting up an account is simple. PIM functions are also available, and synchronise with MS Outlook. There’s a 1.3 MP camera, a decent MP3 player, and 70 MB of onboard memory, with support for a microSD memory card (not included).

At a street price of Rs 13,000, the E50 is a great buy if you are looking for an elegant, executive-class phone.

### Specifications

Weight: 104 gm; screen: 262K colour, 320 x 240 TFT

Contact: Nokia  
Phone: 0124-5199000  
Web site: [www.nokia.com](http://www.nokia.com)  
Price: Rs 15,539

#### RATINGS

Performance	★★★★☆
Features	★★★★★
Build Quality	★★★★★
Value for money	★★★★★
Overall	★★★★★

## Seagate Pushbutton Backup 750 GB The Backup Behemoth

The newest Seagate Pushbutton Backup class of drives boasts a gigantic 750 GB capacity. Construction is rugged, and it comes with a stand to keep it in the upright position. When stacked horizontally one above the other, each drive locks with the one above and below it. In addition to the USB 2.0 port, the drive has two FireWire ports, so you can connect multiple drives in a daisy-chain.

The drive disappoints somewhat on the performance front: read speed is as expected, but the write speed was a bit slow. The bundled software

includes data backup software, in conjunction with which the drive’s push-button conveniently backs up data. The bundled DiscWizard adequately performs drive maintenance functions.

The drive is priced too steep right now—if you need an external backup solution, you’d be well-advised to wait a couple of months.

### Specifications

750 GB; 7200 rpm; 16 MB buffer; dimensions: 180 x 165 x 58 mm; weight: 1.27 kg; USB 2.0, FireWire400

Contact: Seagate Technologies  
Phone: 044-42243353



E-mail: [ramprasad.md@redington.co.in](mailto:ramprasad.md@redington.co.in)  
Web site: [www.seagate.com](http://www.seagate.com)  
Price: Rs 25,500

#### RATINGS

Performance	★★★★☆
Features	★★★★★
Build Quality	★★★★★
Value for money	★★★★★
Overall	★★★★★

## Zebronics ZEB-9000 HMV Vibrating cans!

The 900 HMV are full ear-cup USB-based headphones that use the C-Media CMI108 chipset. Yes, that’s right—you don’t need a sound card or even onboard sound to use these headphones! And best of all, they’re plug-n-play, though you’ll need drivers to configure the inbuilt 5.1 surround sound capabilities.

Though these cans look heavy, they’re pretty light without sacrificing on build quality.

It was a pleasant surprise to note that sound quality is really good: well-produced, deep bass, and the vocals crisp and distinguished—just the way we like our music! The extreme highs are slightly weak, but you will rarely feel the loss under most usage scenarios.

Sadly, the headphones are rather uncomfortable for long music sessions, and after around three



hours of use, we found our ears complaining. Though the vibration feature is little more than a gimmick—enabling it gives an impression of bass boost via vibrations—it isn’t uncomfortable to have a ear massage while listening to music, but this does get irritating after a

#### RATINGS

Performance	★★★★★
Features	★★★★★
Ease of use	★★★★★
Value for money	★★★★★
Overall	★★★★★

while. The only scenario where the vibration could add to the immersive experience is while gaming. The Xear3D surround engine has been incorporated for this very purpose.

Volume levels are really high, and you’ll rarely need to go anywhere

beyond 50 per cent of what these cans are capable of belting out.

Just as well, since you’ll encounter distortion beyond

85 per cent of the max volume level—this is rather normal for most headphones.

### Specifications

USB Interface, integrated C-Media CMI108 chipset, 5.1 Xear3D surround sound, vibration mode.

Contact: Top Notch Infotronics (I) Pvt Ltd  
Phone: 044-26616202  
E-mail: [zebronic@zebronic.com](mailto:zebronic@zebronic.com)  
Web site: [www.zebronic.com](http://www.zebronic.com)  
Price: Rs 1,800

## iPod 80 GB We're Seeing Bigger Apples!

The new iPod throws in an ultra-roomy 80 GB hard disk. Apple hasn't changed the look of the new model, but the display is slightly brighter, making it more legible outdoors. The bundle includes a USB connector-and-charger, a slick suede protective case, and tiny, comfortable ear-bud type phones.

Sound quality is good, but the bundled ear-buds lack punch—other headphones gave better results. The new iPod also makes for a great photo viewer, but the lack of zoom, pan, and rotate abilities is sorely missed. Video playback is quite smooth, and movies look great as always.



Battery life is excellent—we got 18 hours of MP3 playback on a full charge. Video playback drains the juice quicker, and you'll be cut down in a little less than six hours.

**Specifications**  
Fifth-generation; 80 GB; 2.5 inch display (320 x 240); multiple audio and picture format

Contact: Apple Computer International  
Phone: 09886039424  
E-mail: avinash\_ramchandra@asia.apple.com  
Web site: www.asia.apple.com  
Price: Rs 23,900

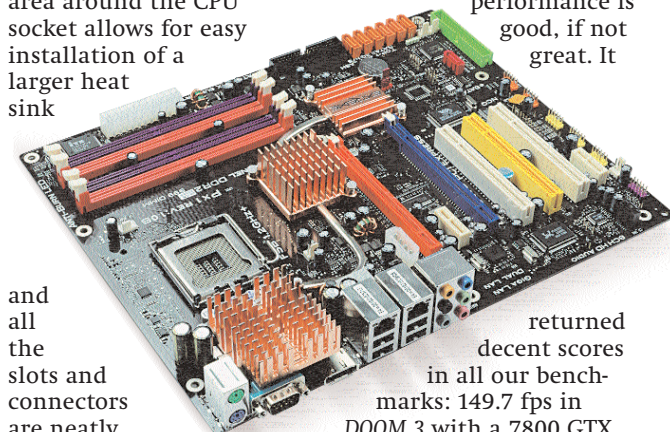
RATINGS	
Performance	★★★★☆
Features	★★★★☆
Build Quality	★★★★☆
Value for money	★★★★☆
Overall	★★★★☆

## ECS PX1 Extreme Not Really Extreme...

The ECS PX1 Extreme is one of the earlier Intel P965 chipset based motherboards that support ATI's CrossFire by means of two PCI-E x16 slots. The board has a spacious layout: the area around the CPU socket allows for easy installation of a larger heat sink

Up to 8 GB of DDR2 RAM @ 800 MHz is supported. Its ICH8DH Southbridge is compatible with Intel Viiv, and there's 8-channel HD audio.

This board's performance is good, if not great. It



and all the slots and connectors are neatly laid-out.

returned decent scores in all our benchmarks: 149.7 fps in DOOM 3 with a 7800 GTX, and it encoded a 100 MB

## Samsung NV10 Brilliant!

The NV10 defines Samsung's grand re-entry into the digital camera business with class. Gone are the old plastic body, dash of chrome, and the cheap-camera feel; the NV10 exudes reverberating style.

Ergonomics are near-perfect—the placement of the buttons, mode dial, and lens is spot on. The shallow grip means a perfect and secure fit in one's palm. The large 2.5-inch LCD adorns the back, with a host of touch-sensitive buttons lined on the sides. The screen is large enough to be used in direct sunlight. With the NV10 comes a completely different menu interface that's superb and intuitive once you get the hang of it. The interface is driven by the touch sensitive buttons.

The NV10 cramps a 10-megapixel sensor into that sleek black body. The lens is a standard 3X optical assortment from Schneider-Kreuznach. The flash is neatly tucked away, and pops up automatically when required. In our tests, the NV10 delivered good photographs; outdoor performance using the Auto setting is brilliant. However, the colour rendition is overwhelming—there's too much saturation, though this can be fixed in Photoshop. Apart from Auto, there are a lot of



modes to choose from; one such is ASR for image stabilisation. There's also a manual mode, of course.

At Rs 24,990, the NV10 is priced on the higher side. But price aside, we really appreciate the new user interface, and the only problem we have is the over-saturation. Considering that the NV10 is the third camera in the series, we expect to see even better models.

**Specifications**  
10 megapixel; 3X optical zoom; 19 MB internal memory; SD/MMC card; Image stabilisation mode; 2.5-inch screen; six White Balance presets; 11 Scene Modes; three Metering Modes; rechargeable battery

RATINGS	
Performance	★★★★☆
Features	★★★★☆
Ease of use	★★★★☆
Value for money	★★★★☆
Overall	★★★★☆

Contact: Samsung Electronics India Ltd  
Phone: 011-4151 1234  
E-mail: rajiv.k@samsung.com  
Price: Rs 24,990

VOB file in 76 seconds with a Core 2 Duo X6800. The motherboard is certainly good for those who want to build an entertainment PC, but not for hard-core gamers or enthusiasts.

**Specifications**  
Intel P965 chipset; support for a Core 2 Duo CPU; dual-Gigabit LAN; E-SATA port; 8-channel audio; upto 10 USB 2.0 and 2 IEEE 1394a; 7 SATA; ICH8DH Southbridge; 2 PCI-E x16 slots

RATINGS	
Performance	★★★★☆
Features	★★★★☆
Ease of use	★★★★☆
Value for money	★★★★☆
Overall	★★★★☆

Contact: Mediatech India Distribution Pvt Ltd  
Phone: 022-2636111  
E-mail: ghanshyam@mediatechindia.com  
Web site: www.ecs.com.tw  
Price: Rs 7,935

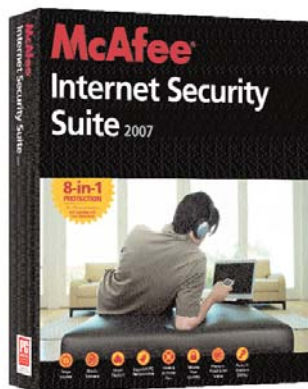
## McAfee Internet Security Suite 2007 A complete security solution

McAfee Internet Security Suite 2007 bundles SpamKiller, VirusScan, Privacy Service, and Personal Firewall Plus. You initially set up a password to access the Security Center.

The main screen shows bar charts of various data in the form of indices—such as Security, AntiVirus, AntiHacker, AntiAbuse, and AntiSpam. The status of various services such as Personal Firewall Plus, SpamKiller, and others, are also visible here.

WormStopper and ScriptStopper block suspicious behaviour in e-mail and scripts respectively. The SpamKiller module filters any POP3 account. The new gaming-suspend mode suspends confirmation pop-ups during full-screen gaming sessions. There is a File Shredder utility, as well as a rescue disk option—which allows you to create an emergency disk that can be used when your computer can't boot as a result of an infection.

McAfee Internet Security Suite 2007 is quite



taxing on system resources, and the average scan time is slow. Nevertheless, you get a complete security solution, and if you have a good configuration, you should give it a try—a trial version is included on this month's CD.

Contact: McAfee Inc  
Ph: 9820154506  
E-mail: [terrence.gomes@mcafee.com](mailto:terrence.gomes@mcafee.com)  
Web site: [www.mcafee.com](http://www.mcafee.com)  
Price: \$79 (Rs 3,500)

RATINGS	
Performance	★★★★☆
Features	★★★★☆
Ease of use	★★★★☆
Value for money	★★★★☆
Overall	★★★★☆

## Altiris Software Virtualization Solution 2 SP1

### In A Shell Of Your Own

Altiris Software Virtualization Solution (SVS) lets you place applications and data into managed units known as Virtual Software Packages. Small modules known as Virtual Software Packages (VSPs) are created for each software, which can contain the installations, and which remain essentially disconnected from the OS. This only means that no Registry modifications are made to Windows and your system stays clean, while transparency means you won't be able to tell this is a layered module. In case an application malfunctions, the problem is limited and isolated to its particular module, and your OS remains unaffected.

SVS monitors software installations, and grabs Registry changes—in addition to the addition and deletion of files—and transfers these to a layer. Any file and Registry call is thereafter forwarded to this layer rather than to Windows.

The application is great if you wish to try out certain applications without the



risk of problems for your OS. It also supports transferring installations to other computers with SVS installed. Best of all, it is completely free for personal use on up to 10 computers—worth a try!

Contact: Altiris  
E-mail: [www.support@altiris.com](mailto:www.support@altiris.com)  
Web site: [www.altiris.com](http://www.altiris.com)  
Price: Free

RATINGS	
Performance	★★★★☆
Features	★★★★☆
Ease of use	★★★★☆
Value for money	★★★★☆
Overall	★★★★☆

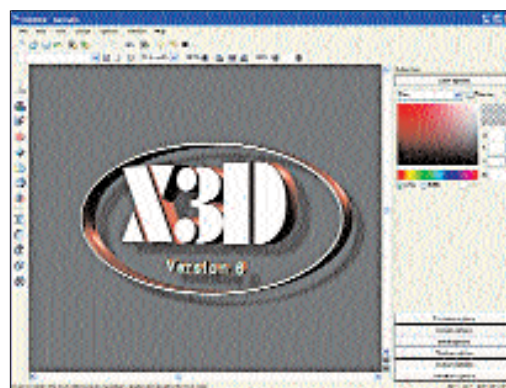
## Xara3D 6.0 A Dash Of Style

With Xara3D 6.0, you can add that extra zing to your Web pages with animated 3D headings, logos, and buttons. It lets you create stunningly beautiful 3D graphics from TrueType fonts as well as imported 2D shapes.

This new version has a better interface than the previous one. Similarly, there are newer styles such as new Bevel types, boards, boards with holes, and borders. You can change

the lighting, texture, colour, depth, font size, etc., but the controls are not very easy to use, especially for a novice. But once you get used to the interface, things get going pretty well.

Creating a variety of animations such as multi-



page sequences and even animated 3D screensavers is very easy. The anti-aliased graphics provide you the best possible visual quality, and it can

also be optimised for use in Web pages. Xara3D can import from WMF/EMF, CorelXARA, and Webster, and can export to a variety of formats such as GIF, Flash, JPEG, PNG, AVI, and BMP. You can get yourself a 15-day trial at [www.xara.com](http://www.xara.com).

RATINGS	
Performance	★★★★☆
Features	★★★★☆
Ease of Use	★★★★☆
Value for money	★★★★☆
Overall	★★★★☆

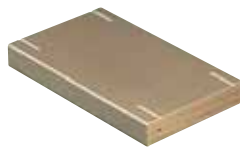
Contact: Xara  
Web site: [www.xara.com](http://www.xara.com)  
Price: \$44.99 (Rs 2,250)

**External Portable Hard Drives**

**Lacie Design by F.A. Porsche 40 GB**

- ⊞ Inexpensive, good performance
- ⊞ Looks bland

Contact Neoteric Infomatique Pvt Ltd  
 Phone 022-39828600  
 E-mail sales@neoteric.co.in  
 Price Rs 5,250



**Internal PATA Hard Drive Hitachi Deskstar HDS725050KLAT80**

- ⊞ Speedy performance
- ⊞ Expensive

Contact Cyberstar Infocom Ltd  
 Phone 9341057327  
 E-mail lalit.sudrik@cyberstarindia.com  
 Price Rs 4,950

**Linux SuSE Linux Enterprise Desktop 10.1**

- ⊞ Good software bundle
- ⊞ A little resource-heavy

Contact Novell India  
 Phone 022-28342244  
 E-mail apanjwani@novell.com  
 Price Rs 2,650

**Internal DVD-Writers Sony DRU-830A**

- ⊞ Good performance
- ⊞ None in particular

Contact Rashi Peripherals Pvt Ltd  
 Phone 022-67090909  
 E-mail navinderc@rptechindia.com  
 Price Rs 2,300



**Digital Cameras (High-End)**

**Sony Cybershot W50**

- ⊞ Excellent image quality, vibrant colours
  - ⊞ Trouble focusing in low light
- Contact Macro Photo  
 Phone 022-22618639  
 E-mail macro.photo@gmail.com  
 Price Rs 15,000



**Digital Cameras (Mid-range)**

**Sony Cybershot DSC L1**

- ⊞ Great image quality
- ⊞ Only 4 MP CCD

Contact Macro Photo  
 Phone 022-22618639  
 E-mail macro.photo@gmail.com  
 Price Rs 9,000

**Graphics Cards (High-End)**

**NVIDIA GeForce 8800 GTX**

- ⊞ Blistering-fast
  - ⊞ Runs slightly hot
- Contact Rashi Peripherals Pvt Ltd  
 Phone 022-67090810  
 E-mail navinderc@rptechindia.com  
 Price Rs 41,000 + taxes



**Graphics Cards (Mid-Range)**

**FXF PV-T73G-UDL7 (NVIDIA 7600GT)**

- ⊞ Great bundle and performance
- ⊞ None in particular

Contact Rashi Peripherals Pvt Ltd  
 Phone 022-67090810  
 E-mail navinderc@rptechindia.com  
 Price Rs 10,500



**The A-List**



The best products tested so far in different hardware and software categories

**Internal SATA Hard Drive Seagate ST3750840AS**

- ⊞ Huge 750 GB storage capacity
- ⊞ Expensive

Contact eSys Distribution Pvt Ltd  
 Phone 011-41811694  
 E-mail msinghal@esysmail.com  
 Price Rs 23,500

**2.1 Speakers**

**Altec Lansing MX-5021**

- ⊞ Great sound and build quality
- ⊞ Slightly expensive

Contact Rashi Peripherals  
 Phone 022- 55090909  
 E-mail divya@rptechindia.com  
 Price Rs 7,900



**Hard drive-based MP3 Players**

**Apple iPod 80 GB**

- ⊞ Large capacity; great fidelity
- ⊞ Expensive



Contact Apple Computer International Pvt Ltd  
 Phone 09886039424  
 E-mail avinash\_ramchandra@asia.apple.com  
 Price Rs 23,900

**LCD Monitors (17-inch) Samsung SyncMaster 740N**

- ⊞ Crisp images and vibrant colours
- ⊞ None in particular

Contact Samsung India Electronics Ltd  
 Phone 011-41511234  
 E-mail subrotah.b@samsung.com  
 Price Rs 11,500

**Processors**

**Intel QX6700 Core 2 Extreme**

- ⊞ Extreme performance
- ⊞ Expensive

Contact Intel Corporation  
 Phone 080-25075000  
 E-mail saranya.rustagi@intel.com  
 Price Rs 52,000

**Projectors**

**Sharp XR-10S**

- ⊞ Brilliant quality and performance
- ⊞ Bulky

Contact Sharp Business Systems Ltd  
 Phone 011-26431313  
 E-mail anilsodhani@sharp-oa.com  
 Price Rs 71,000



**Wi-Fi Access Points**

**Linksys WAP54G**

- ⊞ Great performance
- ⊞ None in particular

Contact Ingram Micro India Pvt Ltd  
 Phone 9323112279  
 E-mail sunil.z@ingrammicro.co.in  
 Price Rs 3,816



**Wi-Fi Routers**

**ASUS WL-530G**

- ⊞ Very fast; well-priced
- ⊞ None

Contact ASUSTeK Computer Inc  
 Phone 022-40058923  
 E-mail mamta\_bhatia@asus.com  
 Price Rs 4,400



**Motherboards**

**AMD AM2 Motherboards  
ASUS Crosshair AM2**

- ⊞ Great bundle and performance, accessories for the enthusiast
- ⊞ None

Contact ASUSTeK Computer Inc  
Phone 022-40058888  
E-mail media\_india@asus.com  
Price Rs 15,400



**Intel High-end Motherboards  
Foxconn 975X7AB-8EKRS2H**

- ⊞ Inexpensive, good performer
- ⊞ None in particular

Contact Mediatech India  
Distribution Pvt Ltd  
Phone 022-26361111  
E-mail info@mediatechindia.com  
Price Rs 10,750



**AMD 939 Motherboards  
ASUS A8R MVP**

- ⊞ Good performance
- ⊞ Skimpy bundle

Contact ASUSTeK Computer Inc  
Phone 022-40058888  
E-mail media\_india@asus.com  
Price Rs 8,700

**Intel Mid-range Motherboards  
Gigabyte GA-965P-DQ6**

- ⊞ Good build quality and performance
- ⊞ Expensive

Contact GIGABYTE Technology  
India Ltd  
Phone 022-26526696  
E-mail sales@gigabyte.in  
Price Rs 16,000

**Home Inkjet MFDs**

**HP Officejet 4355 All-in-One**

- ⊞ Fax with handset, compact
- ⊞ Only sheetfed scanner

Contact HP India Sales Pvt Ltd  
Phone 0124-2566111  
E-mail ashwini-k.aggarwal@hp.com  
Price Rs 6,499

**Office Inkjet MFDs**

**HP Officejet 5610 All-in-One**

- ⊞ Good performance
- ⊞ Expensive, No memory card support

Contact HP India Sales Pvt Ltd  
Phone 0124-2566111  
E-mail ashwini-k.aggarwal@hp.com  
Price Rs 9,999



**Keyboard-Mouse Combos**

**Logitech MX-3200 Laser**

- ⊞ Extremely feature-rich
- ⊞ Slightly expensive

Contact Logitech Electronics  
India Pvt Ltd  
Phone 022-26571160  
E-mail response@logitech.com  
Price Rs 6,995



**Mono Laser Printers**

**Brother HL-5170DN**

- ⊞ Good build quality, network support
- ⊞ Expensive

Contact Lipi Data Systems Ltd  
Phone 022-22882960  
E-mail sharatk@lipidata.com  
Price Rs 21,900

**Feature-rich Cell Phones**

**Nokia N80**

- ⊞ Brilliant screen; extremely feature-rich
- ⊞ Slightly bulky

Contact Nokia  
Phone 0124-5199000  
Website www.nokia.com  
Price Rs 21,000



**Flash Drives**

**Transcend JetFlash 150 1 GB**

- ⊞ Fast
- ⊞ Poor package bundle

Contact Mediaman Infotech Pvt Ltd.  
Phone 022-23828100  
E-mail santosh@mediamangroup.com  
Price Rs 1,500

**Mice**

**Logitech MX Revolution**

- ⊞ Has a flywheel
- ⊞ Expensive

Contact Logitech Electronic  
India Pvt Ltd  
Phone 022-26571160  
E-mail response@logitech.com  
Price Rs 8,000



**Mono Laser MFDs**

**Samsung SCX-4521F**

- ⊞ Good performance and quality
- ⊞ Low input tray capacity

Contact Samsung India  
Electronics Pvt Ltd  
Phone 011-26431313  
E-mail vikram.negi@samsung.com  
Price Rs 21,990



**Thin And Light Laptops**

**Dell Inspiron 6400**

- ⊞ Amazing performance
- ⊞ Looks gaudy

Contact Dell India Pvt. Ltd.  
Phone 080-25068026  
E-mail belgundi\_indrajit@dell.com  
Price Rs 64,000

**Performance Laptops**

**Sony VAIO AR18GP**

- ⊞ Mind boggling performance
- ⊞ Very expensive

Contact Sony India  
Phone 022-28231558  
E-mail sonyindia.care@ap.sony.com  
Price Rs 1,99,900



**Budget Cell Phones**

**Nokia 6070**

- ⊞ Great value for money
- ⊞ Poor-quality camera

Contact Nokia  
Phone 0124-5199000  
Website www.nokia.com  
Price Rs 5,500

**PC Webcams**

**Tech-Com SSD-641-MP**

- ⊞ Good image quality, inexpensive
- ⊞ No software bundle, bad build quality

Contact Shree Sagarmatha Dist  
India Pvt Ltd  
Phone 011-26428541  
E-mail contact@techcomin-india.com  
Price Rs 549

# www.devX.com And www.EchoEcho.com

Developers in the making can't afford to miss these two happy helpers!

Prakash Ballakoor

## devX.com

This Web site is heaven for professional programmers and development teams. It's bound to go over the heads of beginners, though—and that's a word of warning! The site deals for the most part with application development—programming languages such as .NET, Java, and C++, as well as domains such as Web development, architecture, databases, security, and many more are discussed and dissected.

The site provides “just in time” e-learning to help development teams move ahead with project bottlenecks. The site aims to broaden the knowledge and hone the skills of developers through Webcasts, tutorials, and tools under partnership with IBM, Microsoft, and more. The Webcasts are dedicated to streaming online IT education and business events, though the content sites might need free or paid registration.

Sub-sections under “Zones” are based on language and domain, and the topics covered in these sections are based on real-world experiences.



The DevX main page

For example, if you're a team leader and need to choose an AJAX library type—server-based or pure JavaScript—you'll find something at this site to help you out.

The home page features general programming articles as well as some on implementations of new technologies. Programming and enterprise trends are also talked about in these articles. Then there's the incredibly useful “Tip Bank,” which contains more than 10,000



The 10-minute solutions section gets you your answers in, well, 10 minutes!

tips: workarounds and pieces of code that are oh-so-just-what-you-were-looking-for. For example, how do you create a favicon? How do you call a Java method from XQuery or animate form icons? Then, “Sourcebank” gives links to source code and scripts posted from around the world.

“10-Minute solutions” is a library of questions and answers and how-to articles that can be accomplished under 10 minutes: how do you encrypt sensitive configuration data with Java? How do you programmatically apply XSLT in a dynamic Java application? (See—we told you the site isn't for beginners.)

“APIFinder” redirects you to a sister site. Here, again, are articles, news, and so on, and most importantly, “the majority of APIs (here) are Web Services—a.k.a. Web 2.0—APIs, but the site is designed to include APIs of absolutely any type.”

We suppose you've gotten the idea by now. Newbies, stay out; intermediates and experts, explore, contribute, learn, use, code!

## EchoEcho.com

If you're a beginner to intermediate-level Web programmer, you'll probably find EchoEcho.com indispensable. The site is categorised into eight broad categories.

At the first category, User Forums, you'll find opinions about various Web sites and how they could have been done better. A forum on Page Development has

discussions on scripting languages and Web site user interfaces; discussions on server-side coding and operating systems can also be found here.

D-Zine, another category, talks about design aspects beyond HTML and JavaScript. You'll see important topics like site colours, graphic standards, and design perception that determines the pulling power of a Web site. Search engine types as well as off-beat ways of pushing your page up the search rankings are also explained. Then there are the techniques for fast loading of pages using CCS and JavaScript. Tables and XHTML are explained in detail.

The Tutorials section is subdivided into Page Building, Component Building, and Server Programming. Though only HTML, JavaScript, Flash and Java applets are explained in detail, there are links to various external sites.

“Online tools” has some cool pre-coding to enhance Web site presentation. One just needs to enter the type of look and the links required, and the online tools return code that can be pasted to your site!



EchoEcho's Online Tools section shouldn't be missed

In the Free Resources section, you can find links to host your site for free, and also graphics like backgrounds, buttons, and bullets. Programs such as image editors, GIF animators, and HTML editors can be downloaded from here—as well as applets like a weather updater, fading text, image peeling, and pop-up menus.

There's one anomaly, though: we're wondering why EchoEcho hasn't implemented some of the “best practices” it preaches! ■

prakash\_ballakoor@thinkdigit.com

# Tips & Tricks

SECRETS THAT KEEP YOU AHEAD IN THE RACE

## TIPS

Windows XP  
Windows Games  
Internet Explorer  
Firefox 2

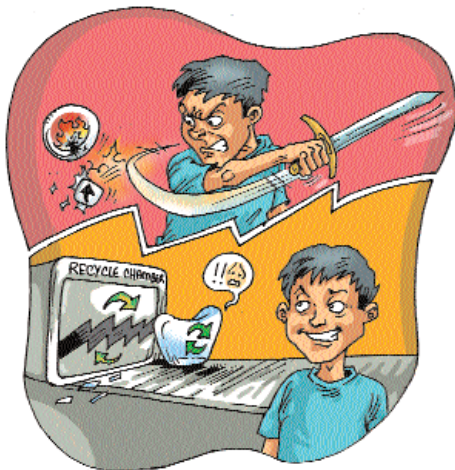
63  
65  
69  
70

## 30 MINUTES EXPERT

Play Anything

66

## WINDOWS



Illustrations Harsho Mohan Chatteraj

Wherever the Registry Editor is mentioned in the following, you will need to go to **Start > Run**, type in “regedit” and press [Enter]. You also need to remember that editing the Windows Registry can be dangerous, and if not done right, might require you to format and re-install Windows to get your system working again. Ideally, you should back up your Registry before making any changes to it.

### Open Without?

When you right-click on a file, one of the options you see is “Open With”. These usually contain what Windows thinks are valid programs to open particular file types. Now, sometimes, when you have bad installers or

uninstallers, some programs leave their mark on this context menu. Basically, if you want to clean out this long list of junk that accumulates here, you have to edit the Registry.

Open the Registry Editor and navigate to `HKEY_CURRENT_USER\Software\Microsoft\Windows\CurrentVersion\Explorer\FileExts`

Now, for example, if you have to remove programs from the Open With menu for AVI files, find the extension on the left that corresponds to AVI files and click on the “+” sign to expand it and find the “OpenWithList” key. In the right pane you should see a list of programs, such as “wmplayer.exe”, “notepad.exe”, “mpaint.exe”, etc. Select the ones you don’t want and delete them.

Next, navigate to `HKEY_CLASSES_ROOT` and find the same extension. Again, navigate to “OpenWithList” and delete the unwanted programs. This key is where Windows reads from when using the All Users profile. Now you will only see the programs that you want in the Open With list... well, most of the time; the problem is that Windows also reads the Open With list from another registry key: `HKEY_CLASSES_ROOT\SystemFileAssociations\`

Here’s where it reads the default Open With list from, but we strongly advise you against changing it because it might affect multiple file types.

### Show Desktop Not Showing

Sometimes, we accidentally delete the Show Desktop icon in the Quick Launch menu. You can manually

recreate it by creating a file called “Show Desktop.scf”. Open Notepad, and type in the following:

```
[Shell]
Command=2
IconFile=explorer.exe,3
[Taskbar]
Command=ToggleDesktop
```

Save this file as “Show Desktop.scf” by selecting the “Save as” type as All Files—to prevent the file being saved as “Show Desktop.scf.txt”.

Now all you have to do is drag this file to the Quick Launch toolbar and your Show Desktop icon is restored.

Another way is to use the Regsvr32 command. Go to **Start > Run** and type in “regsvr32 /n /i:U shell32.dll”. This should restore the Show Desktop icon.

### Save Disk Space

Windows XP, after Service Pack 1, keeps uninstall information for all updates in the `C:\Windows` folder. These appear as \$NTUninstall...

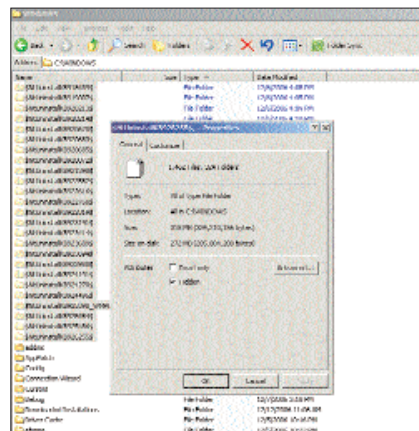
Depending on how many updates you’ve installed, you might have anywhere from a couple to a couple of dozen of these folders. In order to save some disk space, you can delete these folders. Doing this does not uninstall the updates, but will make sure that you cannot uninstall them later—though why someone would want to uninstall security fixes is something we can’t understand at all anyway.

In case you do want to know exactly what uninstaller you’re deleting, you can go to <http://support.microsoft.com/?kbid=<###>>, where <###> is the number listed in the name of the folder you are deleting—remember, don’t add the text “\$NTUninstallKB”, just the number after the prefix.

Once you’re satisfied, just select the folder(s) and press [Shift] + [Delete].

Now, there are two ways in which to remove their references from the Add/Remove Programs list.

Open the Registry Editor and



Here’s the perfect example of wasted space: 272 MB of update uninstallers!

navigate to HKEY\_LOCAL\_MACHINE\Software\Microsoft\Windows\CurrentVersion\Uninstall

Now, select the key that corresponds to the Update uninstall information that you want to delete, and delete it.

Another way to do this would be to select the update in the Add/Remove Programs list and clicking Remove.

Since you have already deleted the Uninstall information, it's obvious that you will get an error message that tells you that the update cannot be uninstalled, and you'll get the option to remove the entry from the Add/Remove Programs list. Just click OK and the entry will be removed.

Remember to check the Show updates box so you can see the installed updates in Add/Remove Programs.

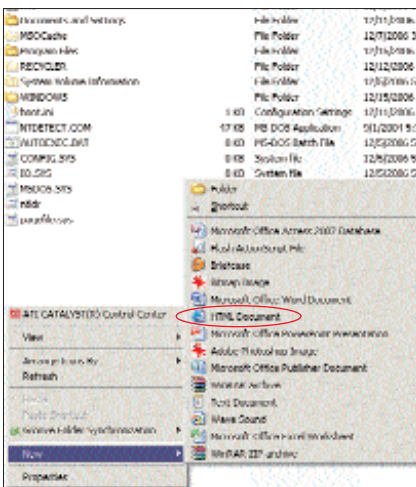
### New "File > New"

In Explorer, when using the File > New option, or when right-clicking and selecting New, you get a list of files that you can create, including text documents, folders, images, sounds, Excel spreadsheets, etc. If you want to be able to make new items, such as HTML files or RTF documents, you will have to edit the Registry.

Open the Registry Editor and navigate to HKEY\_CLASSES\_ROOT. Here, find the extension of the file type you want to be able to create, such as .htm or .rtf, and then find the key called ShellNew. If the file type does not have a ShellNew key, create one.

Now, in the right-pane of the Registry Editor, create a new String value called NullFile. Now you need to close the Registry Editor and restart Windows.

The next time you right-click, you will be able to create a new file (.htm in our example) by selecting File > New. A zero byte file will be created, which you can then edit.



You can add various file types to the context menu in Explorer

### Get Rid Of The Arrow

Shortcuts have an arrow, and it's irritating to a few people. If you want to remove the arrows, open the Registry Editor, navigate to HKEY\_LOCAL\_MACHINE\SOFTWARE\Microsoft\Windows\CurrentVersion\Explorer\Shell Icons. If this key does not exist, create it.

Now, create a new String value inside this key and name it "29". Set the value of this String value to "C:\Windows\System32\shell32.dll,52", which is basically an empty icon. Now close the Registry Editor and restart your computer to see the arrows disappear.

If you're doing something important, and don't want to restart just yet, you can force Windows to redraw all the icons by doing the following:

Right-click on the Desktop, select Properties. Now click on the Appearance tab and click Advanced.



Desktop icons: before, on the left, and after removing the arrows, on the right

From the drop-down list, choose icon, and change the value (the default is 32). Click OK and then Apply. Now go back and restore the value to 32 and click OK, Apply, and then OK. This will bring you back to your desktop, and you will find all those pesky arrows gone.

You can also replace the arrows with something else. Just change the path provided in the Registry hack mentioned earlier ("C:\Windows\System32\shell32.dll,50") to the path of the icon you want to use.

### Prioritise

Have you ever been busy burning a dual-layer DVD master and had something stupid like a scheduled anti-virus scan create a very expensive coaster? No? Well, it's happened to us quite often, and it's probably happened to others who burn a lot of CDs or DVDs.

Of course, this isn't the only problem that occurs when Windows gets its priorities all wrong, but it is the most common.

Basically, every process (task) has its priority, according to which Windows chooses which process requires maximum love from the CPU. In order to make sure that some task that you feel is critical, which Windows may consider a low level task, gets the ideal CPU usage time, you will have to manually give it some importance.

Press [Ctrl] + [Shift] + [Esc] to open the Windows Task Manager. Now click on Processes to see the list of running processes. In order to change the priority of a running process, just right-click on the process, go to Set Priority, and select a level. The choices you have are Realtime, High, AboveNormal, Normal, BelowNormal and Low. These are pretty self-explanatory.

If you have a CD/DVD burning software that you want to give the highest importance to, set the burning software's process to have a High or Realtime priority. Now, hopefully, you should see your burner stop producing coasters.

### Recycle The Recycle Bin

Some people are paranoid about how clean their desktops look, and would rather not have icons like My Computer, My Documents, etc. on it. Now removing these is easy—just right-click on the Desktop, select Properties > Desktop > Customize Desktop, and then uncheck all the boxes corresponding to the icons you don't want. But what about the Recycle Bin? This one's a tougher nut to crack.

Go to the Registry Editor, navigate to HKEY\_LOCAL\_MACHINE\SOFTWARE\Microsoft\Windows\CurrentVersion\Explorer\Desktop\NameSpace. Look for the key {645FF040-5081-101B-9F08-00AA002F954E} and delete it.

Of course, you may want to just rename the Recycle Bin instead of



deleting it altogether. In this case, you should navigate to HKEY\_CURRENT\_USER\Software\Microsoft\ShellNoRoam\MUICache and change the value of @C:\WINDOWS\system32\shell32.dll,-8964 to whatever you want.

Look ma, No Recycle Bin!

## WINDOWS GAMES



A lot of us are addicted to games, especially the simple ones that Windows bundles. Here's a look at some tips, tricks, and cheats for *Spider Solitaire* and *Minesweeper*—two of the most difficult Windows games to master.

### MINESWEEPER

Most people just play *Minesweeper* by guessing and randomly clicking, hoping to open out the empty squares. Most people also end up never finishing even the Beginner level of *Minesweeper*! The tips provided here guarantee to shave at least 30 per cent off your best time in all levels—unless you're already an expert!

Before we start, you should:

Turn off Marks (?). Go to **Game > Marks(?)**. This will get rid of the "?" mark that appears when you mark and then try to unmark a mine. Often we mark mines incorrectly by mistake, and then waste precious seconds right-clicking twice to get rid of that pesky "?".

Position yourself in such a way that your left index finger is resting on the [F2] button. This will help you quickly start a new game when you click on a mine and die.

If you're using a ball mouse, clean the ball. Position your mouse in such a way that you can be comfortable using it for hours.

Go to **Start > Run** and type in "control mouse". Click on the Pointer Options tab and reduce the pointer speed. How slow depends on the quality of the mouse and the precision you require. Only playing *Minesweeper* regularly and experimenting with these settings can help you find that perfect pointer speed where you have precision control.

### Basics

When you click on a square and see a number, the number signifies how many of the eight squares that touch the open square are mines—so a "3" means that three of the eight surrounding squares are mines. Using logic and arithmetic, you have to try and identify which squares are mines, and which are safe to be opened.

### Openings

Left-click randomly, and fast, in a circular motion trying to get a nice, big opening so that you can start sweeping with some options. This will beat getting a small opening and then trying to figure your way out of a corner. Also, the techniques of the best sweepers in the world suggest that starting at the corners, and making a circular sweeping motion towards the centre for an opening works best. There's no hard and fast rule, but it is a lot easier if you start off with a nice big opening.

### Use Both Clicks

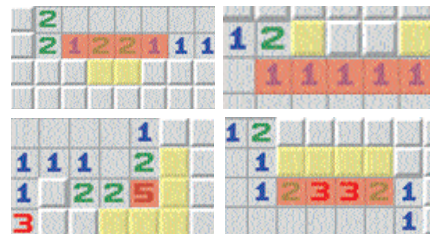
If you spend all your time left-clicking to open and right-clicking to mark mines, you will never get anywhere in terms of breaking time records. And yes, *Minesweeper* is all about timing. Let's say you have a "1" on the grid, and you've already marked the one bomb that touches that square. Now, that same "1" has four more squares touching it that are yet to be opened. If you left-click to open each of the four squares, you waste time. Instead, hover the mouse over the square with the "1" in it and press the left and right mouse buttons together. All the touching squares will be opened. Remember, this is not magic, so if you marked the wrong square, you will explode a mine by opening all touching squares using the left-right click. Also, when stuck in a corner, and not all mines touching a square have been marked, you can use the left-right click to see which squares are unmarked and touching the number you're hovering over. This is great to visually finding out common squares between adjacent numbers—like a visual aid for your thinking. Just get an opening, don't mark any mines, and left-right click on numbers to better understand what this tip is trying to teach you.

### Pattern Recognition

If you waste time solving the position of every mine, you're never going to get past your own record. Instead, use pattern recognition to quickly calculate which squares are mines and which aren't. The most common examples are shown below. These mostly involve what are called wall patterns. (A wall pattern is shown in the screenshot, to help illustrate



Look for patterns in the clues. Red highlights are the patterns and yellow highlights are where the mines will always be



what we mean.) Once you learn these patterns, you will no longer need to think about solving them, and will be able to blindly mark them, solve them and move on to more complex problems.

### Don't Mark Them All

You don't have to mark every mine in the field. The objective of the game is to uncover every empty square, and once you've done that, the game automatically stops the clock and marks all the mines you didn't bother marking. So when you get an opening, and off to one side are squares that are obviously all mines, ignore them—get on to solving and opening all squares that aren't mines instead. This can shave as much as 10 seconds off your time in the Intermediate and Expert levels.

### Don't Hesitate To Guess

No, we don't mean to tell you to guess your way through this game, because you will never succeed. Sometimes, you're just left stuck with a position where either of two squares is a mine, and it has to be a complete fluke to mark the right one. In such cases, delaying the inevitable is pointless—just make a guess and get it over with. There's nothing more frustrating than finding yourself way below your best time and only one mine to sweep, only to make the wrong guess.



# Play Anything!

Lessons to familiarise yourselves with the most versatile media player

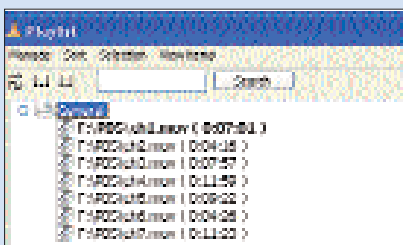
Jayesh Limaye

The VideoLAN or VLC media player is one of the most versatile players in the world, able to play virtually every major (and minor) format of audio and video. You don't need to install any codecs to be able to play a certain file format—VLC emulates them to play the files. The name isn't a misnomer either—you can even use it stream multimedia content over a LAN! VLC is highly portable and can be carried anywhere even on your thumb drive. You can find this open source media player on every *Digit* CD, and you'll find some handy VLC tips in *Digit*, December 2006.

*Note:* To execute any of the command-line commands here, go to **Start > Run > "cmd"** and navigate to your VLC installation directory at the command prompt.

## Basic Stuff: Managing Playlists

Any media player needs a playlist to manage the order of media items to play. The VLC playlist can be accessed from **View > Playlist** or by pressing [Ctrl]+[P]. You can also bring up the



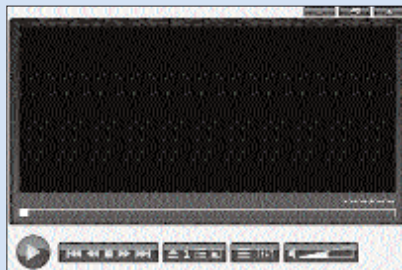
Using VLC's Playlist feature

playlist by simply clicking on the Playlist icon (the icon to the left of the Volume Control). Click on Manage to add files, directories or even URLs to the Playlist. You can also sort the Playlist by Title, Artist, or Album. Items can also be dragged-and-dropped to the Playlist, and you can drag an item in the Playlist to decide its order of playback. Common functions such as Shuffle, Repeat, and Search are also supported.

## More Basic Stuff: Skins

VLC comes with a default simple look or "skin", but like most other media

players, VLC, too, supports skinning. Go to **Settings > Switch interface >**

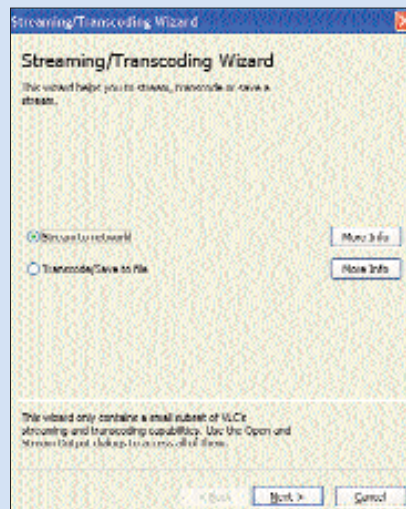


Skining VLC!

**Skins 2** to view the alternative skinned VLC. You can also download and use one of the many skins from [www.videolan.org/vlc/skins.php](http://www.videolan.org/vlc/skins.php). Just place the skin in the Skins subfolder of the VLC installation (C:\Program Files\VideoLAN\VLC\Skins in most cases) and VLC will automatically detect the skin. Launch VLC and use the above method to load the skin. A little-known fact is that VLC also recognises and can use all the skins meant for Winamp2 and XMMS (.wsz files)

## The Streaming And Transcoding Wizard

While you can stream media over a LAN using the command-line interface, the easiest way to go about is by using the included Streaming and Transcoding Wizard. This Wizard is a step-by-step guide to streaming your media on a network or saving a



The Streaming/Transcoding Wizard

stream to your hard drive. To launch this wizard, go to **File > Wizard** or simply press [Ctrl] + [W]. Choose "Stream to network" if you wish to stream media on a network, or choose "Transcode/Save to file" if you wish to change a file's audio codec and/or video codec, its bitrate, and/or encapsulation method.

Now choose an input by selecting "Select a stream" (a stream can be a file, a network stream, a capture device or a hard drive), and clicking on Choose, or select an existing item in the playlist by choosing "Existing playlist item".

If you chose "Stream to network", you can specify a streaming method. The available methods include UDP Unicast, where you can stream to a single computer whose IP you need to specify. UDP Multicast allows you to stream to multiple computers by specifying multiple IP addresses, and HTTP lets you use the HTTP protocol to stream media. Check the box next to "SAP Announce" and enter the name for your stream if you wish to advertise it on the network using the UDP method. This option is unavailable if you chose the HTTP streaming method.

## Setting Up A Video Streaming Server

A video file or a video capture device is all you need to start broadcasting videos over a network.

- 1 Start the Streaming and Transcoding wizard, and with the "Stream to Network" radio button checked, click Next.
- 2 You will now be prompted to choose an existing stream or choose a new one. Click on "Choose" to create a new stream.
- 3 Select a video file of your choice in the Open dialog box and click OK, then click Next.
- 4 Select the HTTP radio button, leave the Destination dialog box blank, and click Next.
- 5 Leave the Encapsulation format at the default (ASF) and click Next.
- 6 Enter "1" in the TTL dialog box and click Finish.
- 7 The Windows XP firewall will warn you about VLC—just choose Unblock in the dialog box.

Your video server is now up and streaming across the network. Now to

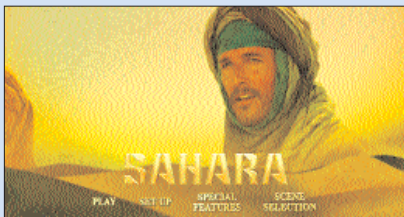
check whether your video is really streaming, open another instance of VLC. Click on the File menu, select “Open Network Stream”, select the “HTTP/HTTPS/..” radio button on the Network tab, and enter “localhost:8080” in the URL dialog box. Click OK.

If all is well, you should now be able to see the video you’re broadcasting, in this new instance of VLC. If you pause the video in the server, the video will pause playing in the second VLC instance. To access the video on another computer in the network, just replace “localhost” with the IP address of the server PC.

You can even adapt this to stream live video such as from a TV-Tuner or a webcam across the network. To do this, open the Wizard, and with the “Stream to Network” radio button checked, click Next. Then click Choose. Click on the DirectShow tab and choose the device to use for video and audio capture using the “Video device name” and “Audio device name” selectors. Click on the Configure button to access the settings of your selected device.

### Playing A DVD

VLC is fully capable of playing DVDs as well; it even lets you easily navigate a DVD using its menu structure. Go to File > Open Disc or press [Ctrl]+[D]. In the window that opens, select the

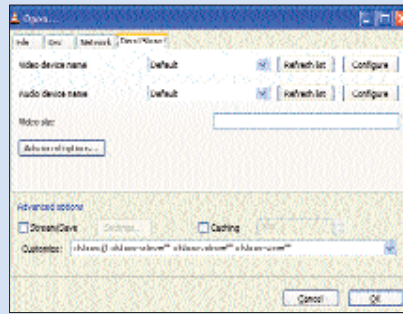


You can play DVDs using VLC

DVD (menus) radio button and enter the DVD drive letter followed by a colon, such as “I:” as the Device Name. Alternatively, you can enter the MRL (Media Resource Locator) as “dvd://E:” in the Customize dialog box (assuming E is your DVD drive letter). Click OK. You can choose the Audio format, Subtitle, Language, etc. by clicking on the appropriate menus.

### Working With Capture Devices

You can even play and stream the content from a capture device, be it a webcam, video capture card, or a TV-Tuner, using VLC. The only prerequisite is that you need to install the WDM drivers for the capture device. Click on File > Open Capture Device or simply press [Ctrl] + [A]. Choose the device to

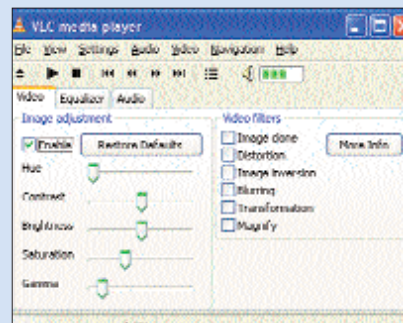


Displaying video from capture devices

use for video and audio capture using the “Video device name” and “Audio device name” selectors. You can access the settings of your selected device through the Configure button.

### The Extended GUI

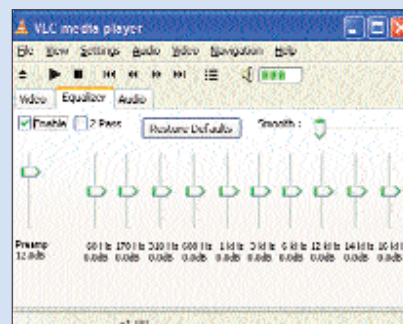
Go to Settings > Extended GUI for the Extended GUI, which gives you access to a load of settings that let you tweak your video. Under the Video tab, check the box next to Enable, and you will be able to adjust the Hue, Contrast, Brightness, Saturation, and Gamma to suit your viewing needs. VLC also features additional video effects such as



Adjusting image quality

Image Clone, Distortion, Image inversion and Blurring, Transformation, and Magnify.

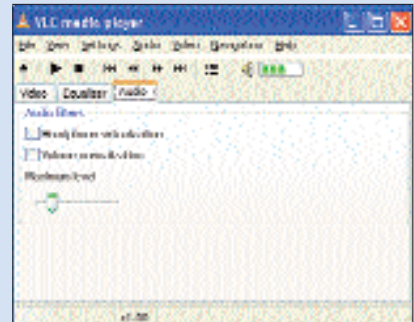
Like any other media player, VLC, too, has a 10-band graphic equaliser. Click on the Equalizer tab to access it. Check the box next to “2 Pass” to apply the equaliser twice for sharper



The 10-band graphic equaliser

effects. Moving the Smooth slider to the right will control the blending of the equalizer bands. The more towards the right it is, the more correlated the movements of adjoining equalisers will be. The equaliser has preset modes as well, but to access them, you need to enter the Preferences section in VLC.

VLC features two audio filters—a volume normaliser and Headphone

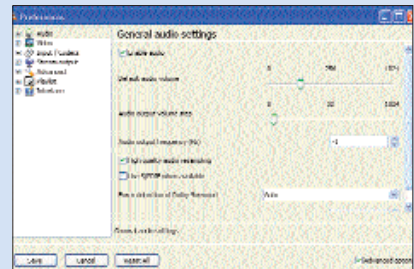


More audio tuning

virtualisation. The Volume Normaliser is nothing but a limiter that caps the maximum volume of the player. Headphone virtualisation is a filter that provides sound spatialisation when using headphones. Spatialisation of sound is an enhanced reproduction of sound that mimics multiple speakers even when only two speakers (in this case, headphones) are being used, thereby adding the immersive touch.

### Additional Preferences

You can further tweak the various settings of VLC by entering the Preferences. Go to Settings > Preferences; here, you can adjust var-



Adjusting the Preferences

ious audio settings such as Filters, Output modules, and even Visualisations.

There’s a whole lot more to explore, and you should now be in a position to experiment with the player on your own. VLC media player is certainly the jack of all codecs and the master of most! ■

*jayesh\_limaye@thinkdigit.com*

Cut your losses and get on to the next game.

### Cheats

In older versions of *Minesweeper* (before Windows XP), you could stop the clock by keeping the left and right mouse buttons pressed and pressing [Esc]. This doesn't work with Windows XP's version of *Minesweeper*, but you can always download the Windows 98 version and overwrite winmine.exe in the C:\Windows\System32\ folder.

Another interesting cheat is to start *Minesweeper*, then type [X] + [Y] + [Z] + [Z] + [Y] + [Shift] + [Enter] + [Enter] (that's xyzzzy + Shift + Enter twice) on your keyboard. This will display a single pixel on the top left of your desktop that glows white when you hover an empty space and black when you hover over a mine—this obviously only works to your advantage when you have a black desktop background, so that you can see the pixel glow white when you are over a square that doesn't contain a mine. It also will not help your time much, especially if you depend on this pixel to solve your game. However, this can help a lot when you're stuck with an unsolvable pattern (where guesswork is needed).

### Alternatives

There are many clones for *Minesweeper*, including those that use hexagons instead of squares, making the sweeping more complicated. There is also the official *Minesweeper Clone*, which has an inbuilt recording facility and is cheat-proof. If you find yourself getting good enough to challenge the masters of *Minesweeper*, you will need *Minesweeper Clone*. Records are only acknowledged if you send in a recording of it, and *Minesweeper Clone* will let you play back the records of the masters, in case you want to see how they play. Just visit [www.planet-minesweeper.com](http://www.planet-minesweeper.com) to delve into the wonderful world of minesweeping.

We should mention that, currently, the world records for the three levels are:

Beginner	:	1 second
Intermediate	:	10 seconds
Expert	:	38 Seconds

You can only get into the hall of fame if your combined time (Beginner + Intermediate + Expert) is 99 seconds or less! Happy sweeping!

## SPIDER SOLITAIRE

The aim of this game is to empty out 10 stacks of cards by building each suit from King to Ace. It involves two decks of cards, and you can choose between just a single suit (easy) to all four suits (highest difficulty).

### It's All In The Suit

If you want to have any kind of success in *Spider Solitaire*, always try to build according to suit. This is the most basic point of the game, because only when you have King through Ace of the same suit (all 13 cards) does it get taken off the playing board. Also, if you have, say, Jack of Clubs through Six of Clubs, you can move that whole build of cards to another slot, together. So building in-suit allows you to reveal more of the covered cards.

### Exposé

This holds true for any form of *Solitaire*: try your best to expose the covered cards. The only way you can win at this game is if you focus more on opening all the covered cards rather than building a single sequence and losing focus on the rest. Besides, covered cards are of no use to anyone, so the faster you uncover them the better your chances of building multiple sequences.

### Kings High

Kings are your friends, unless there are no Queens to be found, that is. Focus on building on top of higher-ranked cards. An Ace on a covered pile is just useless unless there's a two around; a Jack, on the other hand, is a nice option for a Ten of any suit. So make sure to try and keep all playable cards as high as possible.

### Don't Mix

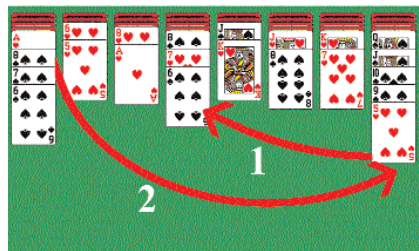
Although in *Spider Solitaire* you are allowed to place, say, a Six of any suit on a Seven of any other suit. This is just going to get you stuck. Obviously, sometimes you might want to mix and match to try and open out more covered cards in the hope that you get the cards that you're looking for; but as far as possible, don't ruin a built sequence by adding a card of another suit. Whenever possible, always mix suits in sequences that already have mixed cards. Later you can always un-mix them when you have a few free spaces on the board.

### Dealing Is Death

Don't just deal the next hand in the hope that you will get some good cards. It's better to try and keep playing without dealing. The longer you play and the more options you try, the better your chances of opening out covered cards. Dealing the next hand is like the "Get out of jail free" card in *Monopoly*—only to be used in emergencies, or when there's no other choice.

### Mixed Suits

Often, you find yourself with, say, King through Nine of Hearts, then Eight of Spades, and then Seven through Ace



1: If you have to mix suits, add to an already mixed pile. 2: This helps you build better

of Hearts again. In such a case, keep an eye out for the first opportunity where an Eight of Hearts is available, and any other Nine is free. Let's say you have the Eight of hearts open, quickly move the Seven through Ace of Hearts on to the Eight of Hearts, then the Eight of spades on to any available Nine, and then move the Eight through Ace of hearts back on to the original pile to complete the sequence. This holds true when any sequence is broken up by one card from a different suit.

### Don't Touch The King

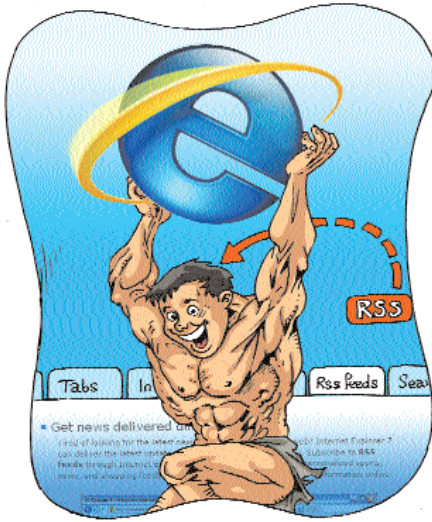
A very common mistake all novice *Spider Solitaire* players make is to move a King to the first available empty space. Unless you can get that whole sequence (King to Ace) in three moves or less, you're asking for trouble. Empty spaces on the board (created after all the covered cards in that pile have been opened and moved) are what will help you win the game. Any card from Queen through Ace, when put in an empty space, can be moved out again, but a King in an empty space can only be moved off the board—when the entire sequence of King to Ace of that suit is completed. So next time a King is on top of a pile and a space opens out, don't just pop it into the empty slot hoping to be able to build from there.

### Think Ahead

*Spider Solitaire*, like any thinking game, requires some planning. You should always be thinking at least three moves ahead for even a single suit (easy) game. Good players think as much as 10 moves ahead when playing with all four suits (highest difficulty). You will have to learn to visualise your moves before you make them. So when you're thinking of moving a card, look at the board in your mind and see what that move will mean for the rest of the game—will you be able to continue? Will moving this card really help? Also, it's most important to see all your available moves before making any move, even the very first one. Sometimes games are lost just because the first move was wrong. Also never be shy to use the [Ctrl] + [Z] (undo) option that's available, but remember that it is only available till the last hand was dealt.



# INTERNET EXPLORER 7



IE7, at first look, is decent. You'd expect it to be perfect, what with its having been released so late (two years late, in our opinion). And it's not. The zoom feature has some problems—certain zoom and/or text size levels make some text disappear altogether; favicons (the icons associated with Web pages, which appear next to the site name) sometimes don't load, and so on. But on the whole, it's decent: there's tabbed browsing (finally), an easy way to add feeds and organise Favorites, a Quick Tab feature that shows you thumbnails of open tabs in the full window so you can switch to one or close some, and more.

### Why's The File Menu There?

You might want to bring the File and other menus back where they "belong," that is, at the top. (That's one funny decision on the developers' part). It's a Registry edit. First back up the Registry, then navigate to HKEY\_CURRENT\_USER\Software\Microsoft\Internet Explorer\Toolbar\WebBrowser. Right-click in an empty area of the right pane, then select **New > DWORD**. Give it the name "ITBar7Position" (without the quotes). Double-click the newly-created value to give it a value of 1. Re-opening IE7 should make the change visible.

### Setting A Wallpaper

One issue with IE7 is that in some cases, you might be trying to set an image as a wallpaper, and the option "Set as Background" might be greyed out. If that's the case, you'll need to do a Registry edit. First back up the Registry, then navigate to HKEY\_CURRENT\_USER\Software\Microsoft\Windows\CurrentVersion\Policies

\ActiveDesktop  
Locate the entry called NoChangingWallpaper, and change that DWORD value to 0.

### Multiple Homepages

Instead of just one homepage, you can have multiple homepages in IE7. When you're at a page that you want to add to your homepage list, click the down arrow next to the homepage icon. You'll be asked whether you want to set the page as your only homepage or add it to your "list of homepages" (still sounds funny to us). It so happens that you can also manage this from Internet Options.

### Adding Feeds And Engines

Adding a feed or search engine couldn't be easier. When IE7 detects that a page has a feed on it, the feed button will light up (get coloured). Just click the down arrow next to it and it's clear from there on what to do. Now, press the Favorites button at any time to see a list of Favorites and Feeds as well as History. Right-click a feed and select Properties: you'll be able to select how often to update it, and other things.

To add a search engine, click the down arrow next to the search field. You'll get a Microsoft page that gives you directions on what to do to add an engine!

### A list of common tasks and how to get them done quickly

- ❑ To disable all add-ons, Run "iexplore.exe -extoff".
- ❑ To turn on AutoComplete so that site addresses will be automatically filled in when you begin to type them, go to **Tools > Internet Options > Advanced > Use inline AutoComplete**.
- ❑ To change how tabs work, go to **Tools > Internet Options > General tab**. Under Tabs, click Settings.
- ❑ To display the Menu Bar permanently at the top of the screen, go to **Tools > Menu Bar**.
- ❑ To delete cookies, passwords, form data, history, and temporary Internet files, go to **Tools > Delete Browsing History**.
- ❑ To find and install add-ons, go to **Tools > Manage Add-ons > Find More Add-ons**.
- ❑ To print only part of a page, select the part, press [Ctrl] + [P], click Selection, then click Print.

## Internet Explorer 7 Keyboard Shortcuts

Open a link in a new tab in the background	[Ctrl] + Click (or just middle-click)
Open a link in a new tab in the foreground	[Ctrl] + [Shift] + Click
Open a new tab in the foreground	[Ctrl] + [T]
Switch between tabs	[Ctrl] + [Tab] (forward) OR [Ctrl] + [Shift] + [Tab] (backward)
Close current tab (closes current window when there are no open tabs)	[Ctrl] + [W] OR [Ctrl] + [F4]
Open a new tab in the foreground from the address bar	[Alt] + [Enter]
Switch to the n <sup>th</sup> tab (n can be 1 to 8)	[Ctrl] + [n]
Switch to the last tab	[Ctrl] + [9]
Close all other tabs	[Ctrl] + [Alt] + [F4]
Open quick tab view	[Ctrl] + [Q]
View list of open tabs	[Ctrl] + [Shift] + [Q]
Increase zoom (+10%)	[Ctrl] + [+]
Decrease zoom (-10%)	[Ctrl] + [-]
Original zoom	[Ctrl] + [0] OR [Ctrl] + [*]
Go to the Toolbar search box	[Ctrl] + [E]
Bring down the search provider menu	[Ctrl] + [Down Arrow]
Go to home page	[Alt] + [Home]
Go backward a page	[Alt] + [Left Arrow]
Go forward a page	[Alt] + [Right Arrow]
Refresh the page and the cache	[Ctrl] + [F5]
Stop loading page	[Esc]
Open Favorites	[Ctrl] + [I]
Open Favorites in pinned mode	[Ctrl] + [Shift] + [I]
Organise Favorites	[Ctrl] + [B]
Add current page to Favorites	[Ctrl] + [D]
Open Feeds	[Ctrl] + [J]
Open Feeds in pinned mode	[Ctrl] + [Shift] + [J]
Open History	[Ctrl] + [H]
Open History in pinned mode	[Ctrl] + [Shift] + [H]
Select the Address Bar	[Alt] + [D]
View list of previously-typed addresses	[F4]
View list of search providers	[Ctrl] + [Down Arrow]

## FIREFOX 2

Firefox 2 has been eagerly awaited by many, and it was released in December. It's got some nice improvements over earlier versions, and there's no reason you won't want to install the latest version.

Attention has been paid to the smallest of details: where in the old versions you had "Open in Tabs" under a bookmark with multiple tabs, you now have "Open All in Tabs"! You'll be pleased to know that people are coming up with updated extensions rapidly, so you won't be deprived of yours very long—and many already work.

### Tab Close Buttons

Probably the first thing you'll notice when you open a new tab in Firefox 2 is that each tab has a tab-close button! This is nice, really, but you might just be used to the old version's behaviour.

It turns out there are more than two options. Open the `about:config` page, go to `browser.tabs.closeButtons`. Set it to one of the following.

0 shows a close button only on the active tab.

1 makes close buttons visible on all tabs—Firefox 2's default behaviour.  
2 makes it no close buttons at all! You'll have to use the right-click to close a tab.

3 is the old default—a close button at the end of the strip of tabs.

### The Go Button Annoyance

The "Go" button is now (irritatingly) merged with the location bar. What does it do, anyway? All you need to do to make it go away is to set `browser.urlbar.hideGoButton` to True.

### Tab Sizes

One irritant can be the vanishing size of tabs when there are too many open. Isn't there a way to make them a



With one setting, make all tabs the same width

set size, and then have a tab scroll button, you ask? There is, in Firefox 2. (We're not sure about earlier versions). To specify the minimum size for a tab modify `browser.tabs.tabMinWidth`. For some reason, if you want to, you can also specify the maximum size of a tab: modify `browser.tabs.tabClipWidth`.

### A Helpful Warning?

Firefox 2 warns you when opening more than 15 tabs at a time. This typically happens when you click



Firefox 2 gives you a warning when you try to open many tabs at once. You don't need it!

on "Open All in Tabs" in a bookmarks folder. It says something about Firefox slowing down. You can modify this at `browser.tabs.maxOpenBeforeWarn`.

Just set it to the number of tabs at which you'd "like" the warning, or just type in "999" or something to save yourselves a few picoseconds of thought.

### Closing A Tab

OK. This is a tiny niggler, but when you have a fresh new browser, you want everything just perfect, don't you? Consider this: when you close a tab, Firefox 2 takes you back to the tab "that opened it" (meaning the tab you were in when you opened the new tab) if you haven't changed to another tab in the meantime. (Open and close a few tabs to get what we're saying.) In Firefox 1.5, you were always taken to the immediately previous tab. To restore that behaviour, set `browser.tabs.selectOwnerOnClose` to False.

### SSL Support

Support for SSL version 2 is deactivated by default in Firefox 2. Only SSL 3 is supported. If you happen to encounter an old Web site that requires SSL 2, you'll need to enable it. This is pretty rare, but here's the `about:config` key anyway—set `security.enable_ssl2` to True.

### Search Results

To make Firefox display search

results in a new tab, set `browser.search.openintab` to True. The key might not be present, in which case you'll have to add it yourself.

### The Spell Checker

Spell checking is disabled by default in single line text boxes. To make it do the spell check (if you're that conscious about your spelling!), set `layout.spellcheckDefault` to 2.

### The Search Button

If you want to remove the Search button, you'll need to edit the `userChrome.css` file. Add the following lines:

```
.search-go-button-stack {display: none !important; }
#searchbar { margin-right: 1em !important; }
```

To find the `userChrome.css` file, navigate to

```
{Drive}:\Documents and Settings\your_user_name\Application Data\Mozilla\Firefox\Profiles\random_name.default\chrome
```

Here you'll find "userChrome-example.css". Rename it to `userChrome.css` when you're done with your changes.

### Adding Feed Readers

Firefox 2 by default supports only three Web feed readers: Bloglines, Yahoo! and Google Reader. You can, however, add as many providers as you like, and use any of them as your subscription manager. For this, you'll need to do a couple of `about:config` tweaks, and add some preferences.

- 1 Under `about:config`, create a new preference by right-clicking on any preference and selecting **New > String**.
- 2 Enter "browser.contentHandlers.types.6.title" for the preference name. Then enter the URL of whichever service you want to use—Newsgator, for example ([www.newsgator.com](http://www.newsgator.com)) for the value.
- 3 As you add more Web feed readers, you will need to change the "6" to the next number. 6 happens to be the first available.
- 4 Create a new preference and enter "browser.contentHandlers.types.6.type" for the preference name. Enter "application/vnd.mozilla.maybefeed" for the value.
- 5 Create yet another preference name and enter "browser.contentHandlers.types.6.uri" for the preference name, and "http://www.newsgator.com/subscribe.php?url=%s" for the preference value.
- 6 You're done—just restart Firefox.

# Dinky Data

**Flash drives, uncommon just a year ago, now find a place in any worker's pocket. If you're in the market for one, here's what you should be buying**

**Vishal Kansagra**

They're called "pen drives," "thumb drives," "data vaults," and "Flash drives"—of which the last is the technically correct name. Small and more rugged than any other popular media, they're particularly useful for people who keep transferring data between different machines. You can even carry your office with you thanks to the newer U3 drives, which allow you to use any application without installing it on a computer. What's more, you can install a Linux distro onto your Flash drive and use it off the drive itself.

Most Flash drives offer password protection, and for the paranoid, some even have biometric scanners. You can also use one as a key to lock or unlock your computer.

We classified the Flash drives based on their capacity—512 MB, 1 GB, 2 GB, and 4 GB. While there are drives ranging from 256 MB to 16 GB available in the market, the price difference between 256 MB and 512 MB is negligible, so look for nothing less than 512 MB.

## **512 MB Drives**

We received ten 512 MB drives—two from SanDisk and one each from A-DATA, iball, intex, Kingston, Odyssey, TECH-COM, Transcend and Zion. They don't have particularly fancy features, but are useful for those who want to carry documents and pictures around with them.



## Features

Though at the bottom of the drive pyramid, some of these drives came with decent features—the SanDisk Cruiser Micro 512 MB, for example, was the only drive in this category to support U3. Its cousin, the Cruiser Profile 512 MB, comes with a biometric scanner so your critical data is protected. While most drives come with a software CD that allows you to set a password or set partition sizes using a rudimentary interface, the Transcend drive comes with a good software package and decent interface that includes features like secure zip, PC lock, data backup, auto login, and e-mail sync. The SanDisk Cruiser Mini comes with the U3 versions of Avast!, Skype (with one month of free voice mail), SignupShield Passwords, and its own PC synchronisation software—standard features on all their drives. The Intex 512 MB also doubles up as an SD card.

## Build Quality And Bundle

With its chewing-gum-like looks, Kingston's DataTraveler Mini MB was the cutest of the lot. A-DATA's Oriental Elite has a beautiful design and allows you to change faceplates (two are provided with the drive). It also includes a USB extension cable. The SanDisk Cruiser Profile 512 MB has rugged build quality and small rubber strips at the bottom to protect it from scratches. The Cruiser Micro's retracting USB connector is good for people who tend to lose their drive's cap, but is also a veritable dust-trap.

## Performance

Since these drives will mostly be used to carry documents and presentations, data transfer speed is critical. The A-DATA Oriental Elite 512 MB was the fastest of the lot and took little more than 11 seconds to transfer 50 MB of files, which included documents, spreadsheets, pictures, MP3s, and



**BEST BUY**  
**digit**  
JANUARY 2007

**A-DATA Oriental Elite**  
Blazing fast and looks good too!

executables. The TECH-COM 512 MB took a decent 27.6 seconds. Though it took just 30 seconds for the A-DATA Oriental Elite to transfer a sequential file to its full capacity. The Zion followed closely with a time of 50.3 seconds. The SanDisk Cruiser Micro took a somewhat sluggish 76 seconds.

## In Sum

The A-DATA Oriental Elite takes Gold not only for its speed, but also thanks to a decent package bundle. Both the Cruiser Micro and the Profile from SanDisk put up a decent performance and have a good bundle. The Silver-winning Cruiser Profile, with its biometric scanner, is highly recommended for those who deal with sensitive data. Special mention goes to the Zion drive—though it lost out on features, it's quite fast and costs around 30 per cent less than most other Flash drives in this category.

## 1 GB DRIVES

This category witnessed a total of 22 drives fighting for top spot—five from PQI, three each from SanDisk, Transcend and UMAX, two from Corsair, and one each from Gigabyte, iball, Lexar, Odyssey, Transcend and Zion. These drives let you do more than just carry your documents around—you can even pack a DivX movie along with your other data. They tend to be slower than their 512 MB counterparts, however, as there is a trade-off between speed and capacity.

## How We Tested

Our test bed used an Intel Core 2 Duo Extreme E6800 on an ECS PX1 Extreme Motherboard with 1 GB of Kingston HyperX DDR2 RAM. The hard drive was clean-formatted before loading Windows XP, and all the latest drivers for the motherboard and USB ports were loaded. To maintain a standard environment, we installed only the required benchmarking utilities and the files we used in our tests.

### Test Methodology

All the storage devices we tested were evaluated on the basis of their scores in three primary areas, namely Features, Performance, and Price. To help in our calculations, we assigned a relevant weightage (refer table for the breakup) to these parameters.

The parameters included are:

#### Features

We looked at the various inbuilt characteristics such as U3 or password protection. We also observed the build quality, with primary importance given to the sturdiness of the product. We gave extra points for any security features such as biometric protection, and also for any useful software in the package.

#### Performance

To gauge performance, we conducted two types of tests—synthetic and real-world. For the synthetic tests, we used the HD Tach 3 benchmarking suite to assess theoretical read and write speeds, as well as the average access time. Due to the varying storage capacities of the models, we also carried out an additional test, where the thumb drive was filled to capacity with both sequential (a single large file) as well as assorted data. We observed the time taken for each transfer, and then calculated the actual data transfer rate in terms of megabytes transferred per second.

**BEST BUY**  
**digit**  
JANUARY 2007



**SanDisk Cruiser Profile 512 MB**  
As secure as it gets



**Transcend JetFlash 150 1 GB**  
Fast and fully-loaded

**Features**

The Corsair Readout 1 GB has an external display that shows you the drive label and the free space available—no more plugging it in to check! The display does not require any external power, and stays on for a good one year.

The PQI CoolDrive U339S, SanDisk Cruzer Micro and Cruzer Titanium are U3 drives (see box U3). While all of them have PC synchronisation features, PQI's software lets you select the sync direction—from PC to drive or from drive to PC. The Lexar JumpDrive FireFly comes loaded with Google software for Windows—including Google Toolbar for Internet Explorer, Google Desktop, and Picasa.

**Build Quality And Bundle**

The Corsair Flash Voyager, with its rubber and water-resistant exterior, was the toughest of



**Corsair Flash Voyager 1 GB**  
Built like a mini-truck!

the lot—it bounced back safely every time we tossed it around. The PQI CoolDrives—true to their names—look cool and have decent build quality. The SanDisk Cruzer Titanium has very good build quality, and retains the retracting USB connector found on the SanDisk Cruzer Mini. Most drives came with a lanyard cord and some with a USB extension cable—real handy when your PC is placed under the table—but the Transcend JetFlash 130 was different, with two different coloured caps.

**Performance**

Since these drives have larger capacities, they can easily accommodate a single DivX movie (roughly 700 MB). The Transcend JetFlash 150 took just a minute to transfer a 700 MB video file. The Zion was at its heels, and took 64.8 seconds for the same task. These drives took less than a third of the category average of 192 seconds. The full-capacity assorted file test took 82.9 seconds to complete on the Transcend JetFlash 150m and a close 91.7 on the Zion. The Corsair Flash Voyager took a little more than two minutes to complete the task. Considering the average time of 274 seconds, these scores are really impressive. If you are looking for sheer performance, the Transcend JetFlash 150 and the Zion are the drives for you.

**In Sum**

The Transcend JetFlash 150 gets Gold for its blazing speed and feature-rich bundle. The Corsair Flash Voyager claims the Silver for decent performance, rugged build quality, and a good software bundle. Once again, Zion just misses the Silver for lack of accessories and software.

**2 GB DRIVES**

Nine drives turned up in this category: SanDisk sent in three, and Corsair, iball, Lexar, TECH-COM, Transcend, and Zion sent in one each. This category is for those who use pen drives to transfer large amounts of data such as MP3s, movie clips, and games. Speeds fall again because of increased storage space.

**Features**

There's nothing different about the drives' bundled software—it was similar to what came with the 1 GB drives. Since these drives are a bit expensive, some more value-added software wouldn't have disappointed.

**Build Quality And Bundle**

The Corsair Flash Voyager comes up tops again with its superior build quality. The SanDisk Cruzer Titan is built well, is quite sturdy, but its metallic lustre may fall prey to dust and rough use. Its retracting USB connector can act as a dust trap in dusty environments.

**Performance**

The Zion led the way, taking 89.7 seconds to transfer a 700 MB video file. This is a little more than the fastest 1 GB drive. The SanDisk Cruzer

**U3**

U3 is a new standard formed by leading Flash drive manufacturers to provide customers with the ability to carry their favourite software and applications along on their drives. If you need to use a particular software on a PC where you don't have Administrator rights, this feature can come in quite handy. The U3 interface lets you manage your data, install and uninstall software, and search for new U3 software over the internet.

Though U3 has its uses, it can be irritating for some: the U3 menu pops up every time you plug in the drive. As of now, the feature only works with Windows XP, so people using other operating systems won't be able to take advantage of it.



**Corsair Flash Voyager 2 GB**

Tough, and comes with a good software bundle

follows at 91.5 seconds. The Transcend JetFlash V30 took a never-ending 529 seconds to transfer the same amount of data!

The Zion handled the full-capacity assorted file transfer in just four minutes. The closest competitor was the Corsair Flash Voyager at 266.7 seconds. Lexar posted the lowest score of 764.7 seconds—almost 13 minutes—to transfer 2 GB of data.

**In Sum**

Our Gold winner, the Corsair Flash Voyager, is fast, has sturdy build quality, and offers a good software bundle. To top it off, Corsair offers a 10-year warranty and over-the-counter replacement, no questions asked. Our Silver winner is the Cruzer Titanium; the Zion lost



**SanDisk Cruzer Titanium 2 GB**

Excellent build

**ReadyBoost**

If a computer is too sluggish, you can increase the amount of RAM on it to improve the performance. Increased system memory means that applications need not access the hard drive too often. But RAM is expensive, and your computer won't support RAM beyond a point.

To take care of such a situation, Windows Vista will introduce a new feature called ReadyBoost that will allow you to use a Flash drive as swap drive. Vista uses the Flash drive as a cache while transferring the data from a hard drive to the CPU in case the RAM is found insufficient. It uses an optimised algorithm that reduces the number of read/write cycles, so your drive won't wear out easily. Windows Vista RC2 does show a marked performance increase, and we expect this to get better by the time the final version is released.

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**Scoreboard** **Flash Drives (512 MB)**

BRAND	A-DATA	iball	Intex	Kingston	Odyssey	SanDisk
<b>MODEL</b>	<b>Oriental 512 MB</b>	<b>512 MB</b>	<b>512 MB</b>	<b>DataTraveler mini Fun</b>	<b>512 MB</b>	<b>Cruzer Micro 512 MB</b>
<b>Features</b>						
Storage Capacity (Stated)	512 MB	512 MB	512 MB	512 MB	512 MB	512 MB
Storage Capacity (Actual)	499 MB	480 MB	476 MB	476 MB	505 MB	483 MB
Security	Password protection	Password protection	✗	Password protection	Password protection	Password protection
Software features	✗	Partition software	✗	✗	✗	U3
Visual indicators such as an LED etc.	✓	✓	✗	✓	✓	✓
Other accessories provided	Face plate, Lanyard, USB cable	Lanyard, protective case	Protective case	✗	Lanyard	Lanyard
<b>Build quality (Scale of 10)</b>						
Sturdiness of the overall package	6	6	4	6	6	7
Cap locking mechanism	7	5	4	9	7	8
<b>Performance</b>						
<b>HD-Tach 3</b>						
Random Access Time	38.6	40.7	1.1	9.6	8.1	1
Average read speed	23.8	18.5	20	13.1	7.5	12.8
Average write speed	16.8	5	3.2	4.1	6.1	6.6
Read burst Speed	25	25	20.6	13.5	11.2	13.1
CPU utilisation	1	7	10	7	3	1
<b>File Transfer Test (seconds)</b>						
Write (Sequential)*	3.4	11.2	22.3	13	10	9.2
Read (Sequential)*	1.2	1.3	2	1.3	1.3	1.5
Write (Assorted)*	11.6	44.9	209	28.5	51.7	31.5
Read (Assorted)*	1.7	2	2.3	2	1.8	1.7
Write—max capacity (Sequential)	30	102.7	146	122	90	76
Read—max capacity (Sequential)	8.3	22.7	9.8	16	8.9	9
Write—max capacity (Assorted)	112	425.5	279.3	277	472	301
Read—max capacity (Assorted)	19.3	38.6	38	19.3	25	23.7
<b>Final Scores</b>						
Features <sup>1</sup>	16.45	14.70	2.10	13.65	15.05	21.00
Performance (out of 50)	34.46	17.36	16.51	16.73	16.04	20.00
Price <sup>2</sup>	7.58	12.71	5.00	11.72	11.11	6.85
Grand Total (out of 100)	58.49	44.77	23.61	42.10	42.20	47.85
Price (Rs)	990	590	1500	640	675	1095
Warranty (years)	3	2	1	5	2	2

\* For 512 MB drives - 50 MB  
1 GB drives - 700 MB

<sup>1</sup> 512 MB drives - out of 15  
1 GB drives - out of 10

<sup>2</sup> 512 MB drives - out of 35  
1 GB drives - out of 40



+ Very fast  
- None in particular



+ Cheap  
- Poor build quality



+ Small  
- Expensive



+ Fast; refreshing design  
- Too small



+ Reasonable price  
- Slow



+ U3 software  
- Poor package bundle

Flash Drives (1 GB)

SanDisk	TECH-COM	Transcend	Zion	Corsair	Corsair	Gigabyte	iball
Cruzer Profile 512 MB	512 MB	JetFlash V30 512 MB	512 MB	Flash Voyager 1 GB	Flash Readout 1 GB	Flash Disk 1 GB	1 GB
512 MB	512 MB	512 MB	512 MB	1 GB	1 GB	1 GB	1 GB
483 MB	460 MB	491 MB	495 MB	977 MB	997 MB	961 MB	983 MB
Biometric scanner	Password protection	Password protection	✗	Password protection	Password protection	Password protection	Password protection
Syncing software	✗	PC lock, secure zip	✗	Corsair sync utility	PC Lock, secure zip		Partition software
✓	✓	✓	✓	✓	✓	✓	✓
Lanyard	Lanyard, USB cable	Lanyard	Lanyard, USB cable, retention cap	Lanyard, USB cable	Lanyard, USB cable	Lanyard	Lanyard, protective case
8	6	6	8	8	6	6	6
9	7	5	6	7	6	6	5
0.6	1.6	5.7	38.6	30.3	53.9	1.7	8.6
18.2	10.7	15.5	23.8	18.6	22.8	11.4	14.9
5.8	3.2	4.2	16.8	9.3	10.4	5.4	4.6
21.9	10.8	16.4	25	20.2	25	12.1	17.5
1	2	8	8	1	11	1	5
9.6	17	16.8	5.8	96	84.6	131.2	186.1
1.4	1.4	1.5	1.1	21.3	11.5	62.6	29
61	27.6	206	28.9	100	135.7	131.3	220
1.7	1.8	1.9	1.5	28	20.2	63.5	43.9
83	147	134	50.3	130.9	107.1	166.1	241
7.9	10.9	8.7	8.7	40.4	34.7	79.6	60.9
613	240	720	256.2	134	149.6	168.7	274.2
18.2	26.6	31	10.2	18.6	32	80.7	56.8
23.45	15.75	19.60	9.80	26.80	25.60	24.80	23.20
22.66	16.08	15.48	30.33	18.57	17.77	11.44	10.69
5.58	13.64	8.33	10.00	4.67	3.89	4.38	9.33
51.69	45.47	43.41	50.13	50.03	47.26	40.62	43.22
1345	550	900	750	1500	1800	1600	750
2	3	Lifetime	3	10	10	1	2



- + Biometric scanner
- Heavy



- + Cheap
- Slow



- + Good software bundle
- Slow



- + Fast
- Poor package bundle



- + Rubber body
- None in particular



- + External display
- Looks gaudy



- + Looks different
- Slow



- + Inexpensive
- Poor build quality



Scoreboard

Flash Drives (1 GB)

BRAND	Lexar	Odyssey	PQI	PQI	PQI	PQI
MODEL	JumpDrive FireFly 1 GB	1 GB	Cool drive U339 1 GB	Cool drive U339S 1 GB	Travelling Disk U260 1	Travelling Disk U230
<b>Features</b>					<b>GB</b>	
Storage Capacity (Stated)	1 GB	1 GB	1 GB	1 GB	1 GB	1 GB
Storage Capacity (Actual)	965 MB	1000 MB	999 MB	953 MB	983 MB	995 MB
Security	Password protection	Password protection	Password protection	Password protection	Password protection	Password protection
Software features	Google software		PC Lock, secure zip	U3	PC Lock, secure zip	PC Lock, secure zip
Visual indicators such as an LED etc.	✓	✓	✓	✓	✓	✓
Other accessories provided	✗	Lanyard	Lanyard, USB cable	Lanyard, USB cable	Lanyard	Lanyard
<b>Build quality (Scale of 10)</b>						
Sturdiness of the overall package	6	7	6	6	6	6
Cap locking mechanism	6	7	6	7	7	6
<b>Performance</b>						
<b>HD-Tach 3</b>						
Random Access Time	1.7	111.3	68	0.5	4.7	0.8
Average read speed	9.8	7.4	10.8	11.5	12.8	11.1
Average write speed	2.6	5.3	7.5	6.2	2.3	2.1
Read burst speed	9.9	10.9	11	11.7	13.1	11.2
CPU utilisation	2	1	6	4	1	4
<b>File Transfer Test (seconds)</b>						
Write-700 MB (Sequential)	363.5	151.9	106	124	335	424.3
Read-700 MB (Sequential)	13.1	68.3	67	33.3	21.3	61.8
Write-700 MB (Assorted)	376.6	246.4	109	131	351	441.8
Read-700 MB (Assorted)	64.9	52.4	42.5	40.3	20.8	38.9
Write-max capacity (Sequential)	466.5	267.9	136	162	440	565
Read-max capacity (Sequential)	96.5	53.4	54	84	74.4	64
Write-max capacity (Assorted)	482.9	302.2	142	165	468	576.7
Read-max capacity (Assorted)	97.1	68.7	62	60	23.3	63
<b>Final Scores</b>						
Features (out of 40)	22.40	25.60	25.60	26.00	25.20	24.80
Performance (out of 50)	7.34	9.23	11.10	11.71	10.93	7.85
Price (out of 10)	3.68	7.18	5.60	5.19	7.57	7.57
Grand Total (out of 100)	33.43	42.01	42.30	42.90	43.69	40.22
Price (Rs)	1900	975	1250	1350	925	925
Warranty (years)	5	2	Lifetime	Lifetime	Lifetime	Lifetime



+ Good software bundle  
- Slow



+ Reasonable price  
- Slow



+ Package bundle  
- None in particular



+ U3 Software  
- Slow



+ Reasonable price  
- Slow



+ Reasonable price  
- Slow



Flash Drives (1 GB)

PQI	SanDisk	SanDisk	SanDisk	TECH-COM	Transcend	Transcend	Transcend
Intelligent Stick 1 GB	Cruzer Micro 1 GB	Cruzer CrossFire 1 GB	Cruzer Titanium 1 GB	1 GB	JetFlash 150 1 GB	JetFlash V30 1 GB	JetFlash 130 1 GB
1 GB	1 GB	1 GB	1 GB	1 GB	1 GB	1 GB	1 GB
983 MB	971 MB	976 MB	976 MB	939 MB	979 MB	967 MB	997 MB
Password protection	Password protection	Password protection	Password protection	Password protection	Password protection	Password protection	Password protection
	U3	CS13 demo	U3	×	PC lock, secure zip	PC lock, secure zip	PC lock, secure zip
✓	✓	✓	✓	✓	✓	✓	✓
Casing, stick slot	Lanyard	Lanyard	Lanyard	Lanyard, USB cable	Lanyard	Lanyard	Lanyard, two extra caps
6	6	6	8	6	6	6	6
5	8	7	6	6	6	6	6
102.8	0.9	0.7	0.9	6.3	0.6	0.6	59.6
0.8	13.7	16.2	13.3	9.9	14.5	11.9	0.8
5.1	5.3	5.4	8.7	2.9	13.6	3.5	9.9
12.1	18.8	20.2	18.8	10.4	15.7	12.7	11
1	5	5	1	1	1	6	1
284.4	152.1	145.5	96.7	249.1	60	371.4	87.2
12.71	12.6	21.3	12.28	31.9	13.1	12.8	29.85
312.5	167	155.1	105.6	251.4	62	397	100.8
53.5	22.6	38.3	34.3	72.1	22.9	27.4	71
368.1	203.2	193.2	153.2	321.6	79.5	430.2	129.6
83.4	41.3	50.7	69	94	64	54.1	90.2
400.6	215.5	201.7	167.4	322.8	82.9	507	136.4
20.2	36.9	49.65	67.3	92.9	22.5	48.2	95.6
15.60	25.60	25.20	25.60	25.60	24.80	24.80	25.60
9.83	12.80	13.25	14.75	8.43	20.85	9.44	10.95
5.60	5.20	5.20	4.13	9.33	4.67	5.83	4.67
31.03	43.60	43.65	44.47	43.37	50.32	40.07	41.21
1250	1345	1345	1695	750	1500	1200	1500
Lifetime	2	2	5	3	Lifetime	Lifetime	Lifetime

<ul style="list-style-type: none"> <li>+ Small form factor</li> <li>- Fragile</li> </ul>	<ul style="list-style-type: none"> <li>+ U3 software</li> <li>- Slow</li> </ul>	<ul style="list-style-type: none"> <li>+ Looks Different</li> <li>- Poor package bundle</li> </ul>	<ul style="list-style-type: none"> <li>+ Rugged build</li> <li>- Poor package bundle</li> </ul>	<ul style="list-style-type: none"> <li>+ Cheap</li> <li>- Slow</li> </ul>	<ul style="list-style-type: none"> <li>+ Fast</li> <li>- Poor package bundle</li> </ul>	<ul style="list-style-type: none"> <li>+ Good package bundle</li> <li>- Slow</li> </ul>	<ul style="list-style-type: none"> <li>+ Good package bundle</li> <li>- None in particular</li> </ul>

Scoreboard		Flash Drives (1 GB)					
BRAND	UMAX	UMAX	UMAX	Zion	Corsair	iball	
MODEL	APUS PRO 1 GB	APUS ELITE 1 GB	APUS 210 1 GB	1 GB	Flash Voyager 2 GB	2 GB	
<b>Features</b>							
Storage Capacity (Stated)	1 GB	1 GB	1 GB	1 GB	2 GB	2 GB	
Storage Capacity (Actual)	979 MB	983 MB	960 MB	991 MB	1.9 GB	1.91 GB	
Security	Password	✗	✗	✗	Password protection	Password protection	
Software features	Secure zip, bootable	✗	✗	✗	PC lock, bootable	Partition	
Visual indicators such as an LED etc.	✓	✓	✓	✓	✓	✓	
Other accessories provided	Lanyard, USB cable	✗	✗	Lanyard, USB cable, retention cap	Lanyard, USB cable	Lanyard, protective case	
<b>Build quality (Scale of 10)</b>							
Sturdiness of the overall package	6	6	6	8	6	6	
Cap locking mechanism	6	6	5	6	8	5	
<b>Performance</b>							
<b>HD-Tach 3</b>							
Random access time	5.6	7.1	53.2	0.7	29.8	8.6	
Average read speed	10.8	10.1	21.3	9.5	17.9	23.3	
Average write speed	3.1	2.6	4.4	13.1	10.5	5.7	
Read burst Speed	10.9	10.1	27.6	14.6	20.2	30.9	
CPU utilisation	4	1	5	2	1	3	
<b>File Transfer Test (seconds)</b>							
Write - 700 MB (Sequential)	235.4	340.1	134.5	64.8	91.6	95.1	
Read-700 MB (Sequential)	42	44.7	38.53	11.9	11.7	25.7	
Write-700 MB (Assorted)	236.8	345.9	160.4	69.5	97.5	142.5	
Read-700 MB (Assorted)	69	80.3	59.8	38.7	34.7	24.2	
Write-max capacity (Sequential)	299	438.7	287.6	84	231.1	298.4	
Read-max capacity (Sequential)	90.7	92.2	84.3	68.6	105.4	63.9	
Write-max capacity (Assorted)	309.4	439.8	292.3	91.7	266.7	353.8	
Read-max capacity (Assorted)	89.5	96.3	86	75.6	100.7	83	
<b>Final Scores</b>							
Features <sup>1</sup>	25.60	6.40	6.00	11.20	27.45	26.10	
Performance (out of 50)	7.72	7.90	12.91	16.29	34.30	29.97	
Price <sup>2</sup>	4.83	5.60	5.38	6.51	1.67	4.04	
Grand Total (out of 100)	38.15	19.90	24.30	34.00	63.41	60.11	
Price (Rs)	1450	1250	1300	1075	3300	1360	
Warranty (Years)	Lifetime	2	Lifetime	3	10	2	

<sup>1</sup> 1 GB drives 40  
2 GB drives 45

<sup>2</sup> 1 GB drives 10  
2 GB drives 5

+ Package bundle - Slow	+ None - Slow	+ Transparent casing - Slow	+ Fast - Poor Package bundle	+ Rubber body - Expensive	+ Cheap and fast - Poor build quality



Flash Drives (2 GB)

Lexar	SanDisk	SanDisk	SanDisk	TECH-COM	Transcend	Zion
JumpDrive FireFly 2 GB	Cruzer Titanium 2 GB	Cruzer Micro 2 GB	Cruzer CrossFire 2 GB	2 GB	JetFlash V30 2 GB	2 GB
2 GB	2 GB	2 GB	2 GB	2 GB	2 GB	2 GB
1.88 GB	1.86 GB	1.86 GB	1.9 GB	1.9 GB	1.88 GB	1.92 GB
Password protection	Password protection	Password protection	Password protection	Password protection	Password protection	×
Google software	U3	U3	CS13 demo	×	PC look, bootable	×
✓	✓	✓	✓	✓	✓	✓
×	Lanyard	Lanyard	Lanyard	Lanyard, USB cable	Lanyard	Lanyard, USB cable, retention cap
6	8	6	6	6	6	8
6	6	6	7	6	6	6
1.7	0.9	0.9	0.6	8.7	0.6	8
9.8	13.3	13.2	14.7	9.4	12.2	11.3
2.7	8.7	8.5	8.8	3	3.1	8.5
9.9	18.8	18.8	19.4	10.4	12.5	11.7
2	1	1	1	1	3	4
358.9	96.7	91.5	100.3	192.6	529	89.7
14.3	12.28	12.4	13.3	21	18.1	14.1
377.9	105.6	98.6	98.3	260	460	94.3
62.3	34.3	36.9	36.4	54	61	64.8
738.3	262	264.5	244.4	653.1	653.1	238.6
103.9	87.5	80.6	115.9	184.3	184.3	171.3
764.7	274.3	292.3	264.1	708.5	708.5	240.8
108.2	89.6	109	109.6	196.7	196.7	171.7
22.95	26.55	25.65	26.10	26.55	25.65	12.60
18.75	33.17	32.60	32.55	17.02	17.15	26.10
1.58	1.38	2.04	2.04	4.23	2.75	3.14
43.29	61.10	60.29	60.69	47.80	45.55	41.84
3475	3995	2695	2695	1300	2000	1750
5	5	2	2	3	Lifetime	3



+ Good software bundle  
- Slow



+ Fast  
- Poor Package bundle



+ Fast  
- Poor package bundle



+ Looks Different  
- Poor package bundle



+ Cheap  
- Slow



+ Good package bundle  
- Slow



+ Fast  
- Poor package bundle



**Scoreboard** Flash Drives (4 GB)

BRAND	Kingston	SanDisk	SanDisk	TECH-COM	Transcend
MODEL	Data Traveler 4 GB	Cruzer Micro 4 GB	Cruzer Mini 4 GB	4 GB	JetFlash V30 4 GB
<b>Features</b>					
Storage Capacity (Stated)	4 GB	4 GB	4 GB	4 GB	4 GB
Storage Capacity (Actual)	3.75 GB	3.8 GB	3.8 GB	3.75 GB	3.77 GB
Security	Password protection	Password protection	✗	Password protection	Password protection
Software features	PC lock, bootable	U3	✗	✗	PC lock, bootable
Visual indicators such as an LED etc.	✓	✓	✓	✓	✓
Other accessories provided	✗	Lanyard	Lanyard, two extra caps	Lanyard, USB cable	Lanyard
<b>Build quality (Scale of 10)</b>					
Sturdiness of the overall package	8	6	6	6	6
Cap locking mechanism	6	6	6	6	
<b>Performance</b>					
<b>HD-Tach 3</b>					
Random Access Time	0.5	0.9	0.6	9	15
Average read speed	14.1	13	14	9.6	5.8
Average write speed	13.7	8.5	8.7	2.7	15
Read burst speed	26.3	18.8	18.7	10.4	1
CPU utilisation	4	4	1	1	
<b>File Transfer Test (seconds)</b>					
Write-700 MB (Sequential)	58.9	91.6	84.3	180.3	180.3
Read-700 MB (Sequential)	12.1	12.5	11.8	12.7	12.7
Write-700 MB (Assorted)	56.8	102.2	98.2	192.5	192.5
Read-700 MB (Assorted)	21.3	36.1	34.5	43.5	43.5
Write-max capacity (Sequential)	279.2	232.7	451.4	869.5	918.7
Read-max capacity (Sequential)	161.7	109.3	211	272	272
Write-max capacity (Assorted)	282	272.4	631.2	912.8	1013.6
Read-max capacity (Assorted)	164.1	110.8	225.3	259.3	259.3
<b>Final Scores</b>					
Features (out of 45)	23.85	25.65	10.80	26.55	25.65
Performance (out of 50)	36.15	30.98	26.96	17.27	20.99
Price (out of 5)	2.98	2.93	2.94	4.90	3.13
Grand Total (out of 100)	62.98	59.56	40.70	48.72	49.77
Price (Rs)	4200	4265	4256	2550	4000
Warranty (years)	5	2	2	3	Lifetime

				
<p>+ Rugged build quality - None in particular</p>	<p>+ U3 software - Poor Package bundle</p>	<p>+ Fast - Expensive</p>	<p>+ Inexpensive - Lack of software features</p>	<p>+ Good software bundle - Slow</p>



### A Decision Maker

You need it for...	We recommend
Occasional data transfer	A-DATA Oriental 512 MB, Zion 512 MB
Transferring photos and movie clips	Corsair Flash Voyager, Transcend JetFlash 150 1 GB
Data backup and as a bootable drive	SanDisk Cruzer Micro 2 GB, Kingston Data Traveler 4 GB

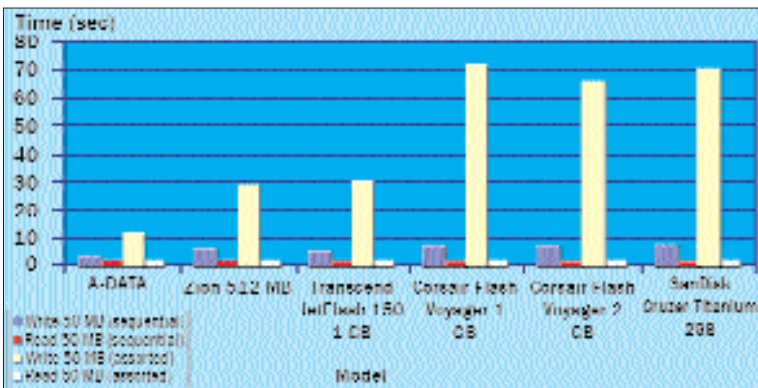
out because of its lacklustre bundle, but we still recommend it to those who want a decent, fast drive with a good storage capacity.

### 4 GB DRIVES

We received five drives under this category—two from SanDisk and one each from Kingston, TECH-COM, and Transcend. This category is for those who want to carry a Flash drive instead of a DVD. With its storage capacity coming quite close to that of a DVD, these drives can very well carry your HD movies. This category is not for those on a budget though—if you don't mind the slower speeds and larger size, you're much better off with a portable hard drive; you'll get much more storage at a lower price.



**Kingston DataTraveler Secure 4 GB**  
Superior performance



Contact Sheet		Flash Drives	
Brand	Company	Phone	Web Site
A-DATA	KMI Business India Ltd	022-30224715	www.adata.com.tw
Corsair	Tirupati Enterprises	033-22251192/93	www.tirupati.net
Gigabyte	Gigabyte Technology India Ltd	022-30616666	www.gigabyte.in
iball	Best IT World (India) P Ltd	022-30815032	www.iball.co.in
Intex	Intex Technologies (I) Ltd	1800-116789	www.intextechnologies.com
Kingston	Kingston Technology Company, Inc.	1800-4254515	www.kingston.com/india
Lexar	Neoteric infomatique P Ltd	022-39828600	www.neoteric.co.in
Odyssey	Compuage Infocom Ltd	022-2384220	www.compuageindia.com
PQI	Mediatech India Distribution P Ltd	022-26361111	www.mediatechindia.com
SanDisk	Rashi Peripherals P Ltd	022- 67090909	www.rptechindia.com
TECH-COM	TECHCOM INDIA	011-26428541/42	www.techcomindia.com
Transcend	Mediaman Infotech P Ltd	022-23828100	www.mediamangroup.com
UMAX	Neoteric infomatique P Ltd	022-39828600	www.neoteric.co.in
Zion	Abacus Peripherals P Ltd	022-40914609	www.abacusperipherals.com



### Transcend JetFlash 8 GB

With a whopping 8 GB of storage space, the Transcend JetFlash 8 GB sounds really good. The drive is quite fast: it took just 56.4 seconds to transfer a 700 MB video file. The drive is a good bit bigger than the other drives (it was the biggest we tested), but the build quality is strictly average. When you look at the price tag, though, you might start looking elsewhere—it costs an atrocious Rs 9,500. For that kind of money, you could invest in an 80 GB external drive, or if you don't mind carrying some extra weight and cables, use a regular 400 GB SATA drive with an external casing to build your own backup behemoth!



### Features

Due to their lower market share and a very niche user segment, the feature set of this category is mediocre. The SanDisk Cruzer Micro was the only U3 drive, and came with the earlier-mentioned software bundle.

### Build Quality And Bundle

The Kingston is the best-looking drive in this category, with a nice matte finish that will make scratches less visible. Most of us tend to misplace Flash drive caps, and SanDisk has provided two extra caps with the drive.

### Performance

Typically, higher capacity drives don't offer much speed, but the Kingston took less than a minute to transfer the 700 MB video—faster than even the fastest 1 GB drive. The SanDisk Cruzer Mini lagged a bit, taking 84.3 seconds. The slowest of the lot were the TECH-COM and Transcend JetFlash V30, taking almost three minutes. The full-capacity assorted file saw the SanDisk Cruzer Micro



**SanDisk Cruzer Micro 4 GB**  
Fast, with a good software bundle

taking just 272.4 seconds, with Kingston following at 282 seconds. Transcend sat the race out at a leisurely 17 minutes!

### In Sum

Kingston takes Gold for its vastly superior performance and build quality. The SanDisk Cruzer Micro wins the Silver for the balance it strikes between speed and software bundle. We must note that there is not much difference in the prices of these drives, but when it comes to performance, things are different. ■

vishal\_kansagra@thinkdigit.com

# RAID

More than one hard disk need not just mean more partitions

Arvind Subramanian

**R**AID is the abbreviation for “Redundant Array Of Independent Disks.” It refers to the technology of storing data with a higher degree of protection and/or performance than regular storage.

There are many different “levels” of RAID, and typical examples are RAID 0, RAID 1, RAID 1+0, RAID 0+1, RAID 3+0, and many more. At each level, RAID takes a different approach to the storage of data.

RAID works on the concepts of Data Mirroring, Data Striping, and Parity Checks. That’s where the levels come in: RAID 0 uses only striping, RAID 1 uses only mirroring, and further levels include parity checks and/or a combination of these. You get many permutations as a result, but RAID always uses at least two hard disks that work as a single unit.

## The Basic Concepts

### Data Mirroring

Simply put, mirroring means making simultaneous writes of the same block of data on multiple disks. That’s where the “Redundant” in “RAID” comes from. It is expensive but far from redundant in transaction- and data-intensive applications such as accounts, finance, and banking. In the case of a hard disk crash, data can be restored from a “mirrored” disk.

### Data Striping

Here, a stream of data is divided into blocks, and each block is written to a different disk in the array. The writing of the blocks takes place concurrently after the division, thus increasing the speed of the write operation. Concurrent reads, too, are faster: if you need 10 KB of data, 5 KB can come from each disk at the same time, so *theoretically*, you get double the data rate. This, however, is a broad generalisation.

### Parity Checks

A “parity check code” is generated during the write of every block of

data. This code helps the RAID system recognise the data. During a read of the same block, the parity check code is again generated, and this is matched with the parity check code generated during the write. Now, the parity code generated during the write is stored on one of the disks in the array, and this increases the reliability of the data—and thus that of the entire database in use.

## What RAID Can Do

RAID levels 1, 0+1, 1+0, 5, 6, 5+0, and 5+1 allow a single hard disk to fail while keeping the data on the system accessible to users. Users in general would not realise that a disk has failed, and would continue to work normally. The use of RAID allows the disk in question to be changed, and the data restored and updated, without hampering work. Data from the working disk can then be mirrored back on to a new disk. Backups taken on tape or on a separate hard drive are not “online” or in real-time; there will necessarily be a delay before the system can be restored.

In RAID levels that use striping, at the byte (RAID 3) level, each byte of the stream is stored on a different disk; at the bit (RAID 2) level, data is broken down into *bits* and then stored on different disks. This is very useful in applications that deal with large image files, as well as video editing applications, which demand a good amount of speed.

## What RAID Cannot Do

RAID can help in the recovery and restoration of data, but it cannot protect it. It cannot, for example, stop viruses or malicious code from attacking data. Any such attack will cause simultaneous and equal harm to all the disks in the system.

RAID does not simplify *disaster recovery*. Restoration from tape backups is still much simpler than recovery from a disk attached to the array in question.

RAID also cannot provide a performance boost to all running applications. Increasing the data transfer rate does little to help

desktop users, since most files that are accessed are typically very small. Disk striping using RAID 0 increases the performance of a sequential read/write operation—such as one for a single, large video file—but does hardly anything for a random seek. For users with high performance as a goal, it is better to buy a faster and bigger single disk with a higher rpm and buffer than to run two smaller drives under RAID 0.

## Problem Areas

RAID systems are not easily interchangeable, unlike the case with single disks. The RAID BIOS, which controls the reads and writes of the data to the disks in the array, must be made available to the operating system. Moreover, RAID controllers make use of different formats depending on the level used. Even moving the controllers to a new system might see a degradation in performance.

## Proprietary RAID

Different vendors have their own adoptions of RAID:

### DVRAID by ATTO technology:

This was developed for digital audio and video applications, which typically require a lot of speed. RAID 0 provides speed but not fault tolerance. ATTO used the striped parity concept, where a parity check code is generated, and the code itself is striped and stored across disks.

### RAID 5 or Parity RAID by EMC Corporation:

A single disk is used to store the parity check code, the difference being that it is distributed across different volumes.

### MATRIX RAID—Intel ICH6R RAID BIOS:

Nothing new, except for the fact that *each* disk in the array acts as RAID 0 as well as RAID 1. ■

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Imaging Pradip Ingale

# Q&A

Your Questions, Our Answers

## Networking 101

**Q** I have two PCs—one a 2.4 GHz Intel and the other a 2.8 GHz. I need to connect them to be able to transfer data between them. How do I do this?

Ashish Singh

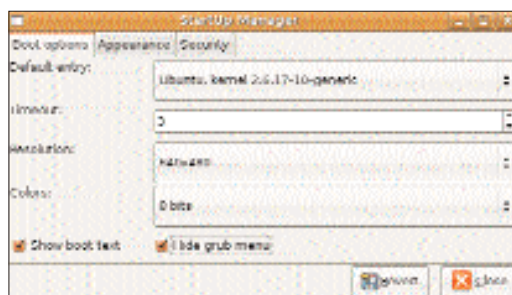
**A** If you wish to connect two PCs to each other, they both need to have network cards installed. You'll also need what is called a crossover cable. Now, first make sure File and Printer Sharing is enabled: open Network Connections in the Control Panel, right-click on Local Area Connection, and select Properties. In the General tab, look for "File and Printer Sharing for Microsoft Networks" and make sure the checkbox next to it is selected. (If it isn't in the list, go to **Install > Services > Add** and choose this service to add it.) Now return to the General tab, select "Internet Protocol (TCP/IP)" and click on Properties. Enter an IP address such as "192.168.1.10" and a Subnet Mask of 255.255.255.0 for one computer, and the IP address "192.168.1.11" and the same Subnet Mask for the other. Now, for a particular folder that is to be shared, right-click on it and click on "Sharing and Security". Enter the share name of the folder and click OK. Connect the two computers using the crossover cable. You should now be able to access the contents of the shared folders on one computer from the other.

## First Things First

**Q** Ubuntu Linux dual-boots with XP on my computer. By default, the computer boots into Ubuntu. What do I need to do so that it boots into XP by default?

Mohnish Negi

**A** Ubuntu uses the Grub bootloader to manage the boot sequence. This can be configured from within Ubuntu. Boot into Ubuntu; you'll



Select Windows in the Boot Options

need to install a tool known as Startup Manager. First install imagemagick:

```
sudo apt-get install imagemagick
```

Download the Startup Manager (SUM.tar.gz) from [www.ubuntuforums.org/showthread.php?t=295524](http://www.ubuntuforums.org/showthread.php?t=295524). Extract the file using

```
sudo tar xzvf SUM.tar.gz
```

You'll now have a directory called SUM. Use

```
cd SUM
./install.sh
```

Once the installation is done, go to **System > Administration > Start-Up Manager**. This will open the window that can be used to select various boot options such as default boot entry, time-out, resolution, and more. Select "Windows" from here and click Close.

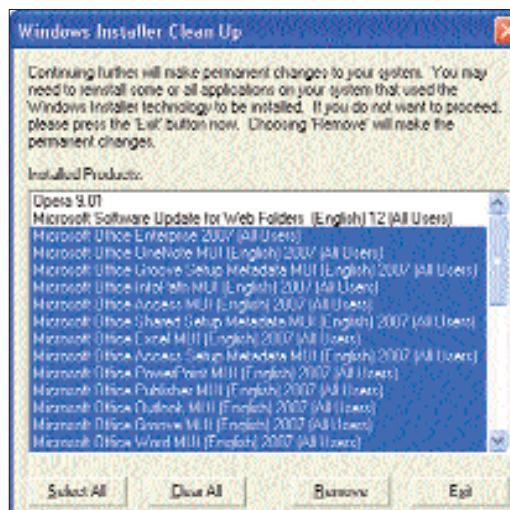
## Here To Stay?

**Q** I installed Microsoft Office 2007 Professional Pre-release Beta 2, which was distributed on your DVD. I've had enough of it and wish to revert to Office 2003, which was installed earlier. But I can neither uninstall nor reinstall Office 2007. If I select "Change", I get the message:

"This product installation has been corrupted. Run setup again from CD, DVD, or other original source."

On choosing Remove, the setup screen shows up for a second and then disappears without a message. Please help.

Zahid Irani



Remove registry entries using Windows Installer Clean Up

**A** This is a known issue with the installation of MS Office 2007 Pro Pre-release Beta 2—a bug with the installer which cannot correctly read the Microsoft Windows Installer information from an earlier Office installation in the Registry. To fix the issue, download and install Windows Installer Cleanup utility, msicuu2.exe, from <http://tinyurl.com/42u19> (<http://download.microsoft.com/download/e/9/d/e9d80355-7ab4->



45b8-80e8-983a48d5e1bd/msicuu2.exe). This is a 350 KB file. Now go to **Start > Programs > Windows Install Clean Up**. Select Microsoft Office 2007 Professional Beta 2 from the list and click the Remove button. Click OK and then Exit. The program deletes only the Office-related Registry entries. The Office 2007 files will remain on the hard disk, so you will have to manually delete them. You will now be able to install any version of Office.

### Scan, Select, Save

**Q** I inadvertently deleted an extended partition on my Seagate 40 GB PATA drive. Can I recover the lost data?

Arvind Kumar Sharma



PC Inspector File Recovery

**A** As long as your hard drive is recognised by the BIOS, and as long as it has not suffered mechanical damage, you can attempt to recover data from it using software such as the free PC Inspector File Recovery. Download this 6 MB file from [www.pcinspector.de/file\\_recovery/UK/welcome.htm](http://www.pcinspector.de/file_recovery/UK/welcome.htm). Install and launch the program. Click on Lost Drive on the left and wait for PC Inspector to scan your hard drives and determine the available partitions. Select your drive in the Logical Drives tab and click on Preview to verify the drive's contents. Click on the tick-mark to start the scan. After the scan is complete, you will be able to view the recoverable contents of the drive. You can select all or any of the files to recover. Right-click on them and select "Save to". Choose a drive or folder to save the recovered files to.

### Mode Madness

**Q** My computer has become very slow, and copying files from one drive to another has become a frustrating affair. I checked the DMA settings in the device manager and found that my hard drive is operating in PIO mode, even though the "DMA if available" option is selected.

Nav S

**A** Every time Windows boots, it checks each storage device to determine the highest performance that it will offer. If it encounters any problems, such as a faulty cable, it falls back to the next lower speed available, which is from DMA to PIO mode in your case. Replace your hard

drive's data cable. Open the Device Manager and under "IDE ATA/ATAPI Controllers", delete your hard drive controller. Restart Windows; your hard drive should start functioning in DMA mode.

### One K = One Thousand?

**Q** My 80 GB hard disk shows up as 76 GB in Windows Explorer. Where is the remaining 4 GB of space? Have I been cheated? I'd also like to ask you: while capturing from my Sony handycam (mini DV) to the PC using the bundled Picture package software, it captures in parts; these segments are of 10 minutes length. So when I capture a 60-minute video, I get six segments.

Shashishil Kshatriya

**A** Drive manufacturers specify drive capacities in "Giga Bytes." (A Giga Byte is equal to 1024 "Kilo Bytes" and a Kilo Byte is equal to 1024 Bytes.) But they measure the capacity using 1000 as the multiplier. Specifying the capacity in this way is a marketing gimmick—it shows a larger number. So an "80 GB" hard disk has a capacity if  $80 \times 1000 \times 1000 \div 1024 \div 1024$ , which is equal to 76.29 GB. This is the capacity you see in Windows Explorer.

Most software capture the digital video content from a DV camera by default in multiple segments. This is known as Scene Detection, where the software tries to recognise major changes in scene. When it encounters such a change, it stops capturing to the current file and continues into the next file. This is to facilitate creating chapters on DVD. It increases file manageability. You will need to explore the options in your capture software to be able to disable this option and capture the video as a single file.

### Amnesia

**Q** Is it possible to recover Excel passwords?

Prabhu Karthikeyan

**A** There are many tools available to recover passwords for Excel files. Some of these are AOPR 3.11 from [www.elcomsoft.com/aopr.html](http://www.elcomsoft.com/aopr.html) (-49—Rs 3,000—for the Home Edition), Excel Key from [www.lostpassword.com/excel.htm](http://www.lostpassword.com/excel.htm) (\$45; Rs 2,000), and Excel Password from <http://lastbit.com/excel/> (\$39; Rs 1,750).

### Fantelligence!

**Q** I have an Intel Pentium 4 2.6 GHz on an Intel 915GAV motherboard. Whenever I run two or three applications or when I run a game, the CPU fan runs very fast and makes a lot of noise.

Sagar Ranjankar

**A** This is normal. Your BIOS supports variable fan-speed control. The fan spins slow when the CPU is idle or under little load. It spins the fastest when the CPU is stressed, such as when running a game, editing video, or anything else that is CPU-intensive. Automatic fan control ensures better balance between cooling and the noise generated by the fan.

# Host A Web Server On Your Home PC

Share your treasures with the world, its easy!

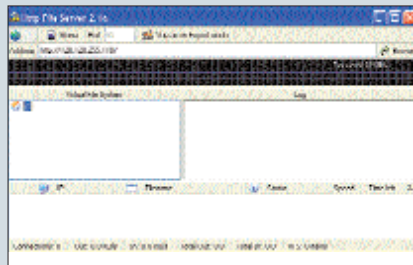
Jayesh Limaye

Many of us have at some point toyed with the idea of hosting a Web site. But be it the prohibitive Web hosting costs of days long gone by, or how complex we've imagined it to be, or just plain laziness, few of us have actually gotten down to doing it! The fact is, it can be done for free, and it's just about as difficult as maintaining a blog. Here's a workshop on how to go about it.

## 1 STEP Download And Run The Software

Head to [www.rejetto.com/hfs/](http://www.rejetto.com/hfs/) and download Http File Server (HFS). It is free and open source, and is a standalone executable that requires no installation.

On XP with SP2, when you run HFS,



Http File Server

you will be asked about whether or not to allow hfs.exe to connect to the Internet. Unblock HFS. Likewise, if you have a third-party firewall installed, configure it appropriately.

## 2 STEP Configure The Port

By default, HFS uses port 80. If your firewall is blocking port 80, set HFS to use some other port (such as 8080 or 8245 and so on). To change the port number, turn HFS off by clicking on the green "On" button at the upper left corner. Change the port and turn HFS back on.

Also, if you are behind a router or firewall, you may, in some rare cases, need to set up port forwarding. The best way to go about this is to go to [www.portforward.com](http://www.portforward.com). There, choose your router type, then choose the program you want to set up port forwarding for, which in our case is HFS. In such a scenario, you cannot proceed unless you know which router you are using.

## 3 STEP Test HFS

To test whether your settings work, click the Menu in HFS and choose "Self Test". If the test completes successfully, your settings are correct. You should now be able to point your Web browser to your IP address and see HFS' default Web page.

## 4 STEP Register A Domain

For setting up a Web site, you need to first assign it a domain name. For this, you need a DNS service running on your computer. You need to get one from a site that offers such a service. There are quite a few sites that offer such services, and we've chosen No-IP. This site offers a variety of free sub-domain names that you can register for your Web site.

Go to [www.no-ip.com/newUser.php](http://www.no-ip.com/newUser.php) to create a No-IP account. Log on to the site with the account you created, and click on the Services button. Click on "Hosts / Redirects" on the left and then on Add. In the page that opens, enter a hostname of your choice and select from amongst the free domains available. Then choose the host type; "DNS Host" (Option A) is usually the best option.

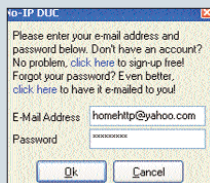
Your ISP might be blocking inbound port 80; to get around this, choose "Port 80 Redirect". When you use this and run your Web server on an alternative port, users will not need to type a port number in the URL.

Click on "Create Host". Your domain will be available within five minutes of registration. You can use and give out this domain name instead of your IP address.

If you would like to use a domain name of your own, No-IP offers a custom DNS service for a yearly fee.

## 5 STEP Install the Dynamic DNS Update Client

Skip this step if you have a static IP. If you don't, you will need a client software to take care of your changing IP address. Go to [www.no-ip.com/downloads.php?page=win](http://www.no-ip.com/downloads.php?page=win) to download the No-IP.com Dynamic DNS Update client software. Install it and provide your login details. This program will sit in the system

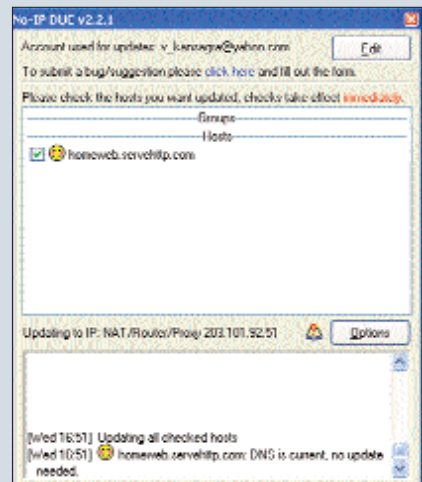


Log in to No-IP

tray and automatically update your No-IP account when your external IP address changes.

## 6 STEP Launch Your Web Site

You can now decide what page will appear when someone types in the name of your Web site. To change the default page, open HFS and click on "You are in Easy mode" to turn on Expert mode. Right-click on the little "house" icon in the Virtual File



No-IP Dynamic DNS Update Client

System (VFS) and click on "Bind root to real-folder". When prompted, point to the folder that contains the file you wish to display by default on your site. Click on "Default file mask..." and type in the name of the file you've chosen for this file, such as "index.html". Press [Ctrl] + [S] to save the VFS to any location on your hard disk.

If it is only files you wish to share with friends, you can just host the files on the site—an index.html is not necessary. Just drag and drop files into the VFS window and save the VFS. These files will be available for download from the opening page.

To make HFS start with Windows, choose Start/Exit > Run HFS when Windows starts. Also make sure to checkmark "Reload on startup VFS file previously open". You're done!

The method of Web hosting we've described is good enough if you wish to share files with friends or to create content for a few people to view. It is not recommended for high-traffic situations, though. ■

[jayesh\\_limaye@thinkdigit.com](mailto:jayesh_limaye@thinkdigit.com)



## The Need For Speed

**Q** I use Windows Server 2003. My printer prints very slowly—at a speed much lower than advertised. What could be the problem?

**Ritesh Patil**

**A** Printers always print at speeds lower than what the manufacturers advertise. However, there are many factors that affect the speed of a printer. Go to **Start > Settings > Printers** and right-click the default printer. Choose **Properties > Advanced** tab, and select the option “Print directly to the printer” rather than “Spool print documents so program finishes printing faster”. You can also check the printer spool settings to see if that is the cause of your problem: go to **Start > Settings > Printers**, right-click on your printer, then choose **Properties > Details > Spool Settings**. Change the spool data format from RAW to EMF, or vice-versa. (The location of this option, too, depends on the type of printer.) The other

most obvious determinant of print speed is the printer settings. Choosing a lower print resolution, for instance, or printing in black and white rather than in colour, can increase the speeds.

You could also try opting for the printer’s “high-speed” or “fast” printing mode. Almost all printer drivers have such a mode, optimised for day-to-day printing needs. If you need more speed, consider setting the printer to print multiple smaller pages per single sheet of paper. Consult the printer user’s manual for detailed instructions about how to activate the fast printing mode and adjust the pages-per-sheet setting.

Another important factor in determining print speeds is the health of the system. A system with lots of system memory, a neatly-organised hard drive with at least 100 MB of free space, and a powerful processor will be much more efficient in feeding data to the printer than a system that is lacking in these key areas. Install enough memory on your computer to take care of your needs. Run Disk Defragmenter periodically.

## Dusty, Dirty, Defunct

**Q** My LG USB drive was working fine for the past one year. Now, when I connect it to my computer, it does show up as a removable disk in Windows Explorer, but the computer hangs when I click on the icon. Another problem is, when I use the “Safely Remove Hardware” from the System Tray, the notification message “Your USB storage device can now be safely removed” message pops up, but after a few seconds, the “Safely Remove Hardware” icon disappears.

This only happens on my home PC—the drive works fine on my office computer.

**Kaushik Dey**

**A** This problem usually occurs if your USB port has become dirty due to accumulation of dust, or if it has become loose because of wear and tear caused by plugging and unplugging of the drive. Clean it using a paintbrush and try to see if the problem goes away. Try using a different free USB port, or adding a port if you don’t have one. As far as your second query is concerned, it is normal for the “Your USB storage device can now be safely removed” message to go away after a few seconds.

## DirectZip?

**Q** I have an Intel Pentium 4, 2.66 GHz, 256 MB RAM, and a 64 MB graphics card. *Dungeon Siege 2 Demo* didn’t run on my PC—I got the message “D3D initialization Failed.” I thought it was because I didn’t have DirectX 9.0c, but when I try installing it, setup runs and completes in just one second. Why?

**Sahil Sharma**

**A** You haven’t mentioned your graphics card chipset, and your issue is linked to dated graphics card drivers. Please update to the latest drivers from your graphics chipset’s manufacturer’s Web site—[www.nvidia.com](http://www.nvidia.com) or [www.ati.com](http://www.ati.com), as the case may be. Also, run

DXDIAG and see if DirectDraw and Direct3D acceleration is enabled. If it isn’t, enable it.

DirectX 9.0c setup completes very quickly because you already have that version installed.

## Forget It!

**Q** Any information entered in a Microsoft Word 2003 Wizard (such as the Resume Wizard) gets stored in the Registry, so when you call up the Wizard again, you can view the old information. We have many users working at the same computer, and the nature of our work is such that we do not want such information to persist after a session is done. What can I do?

**Rohit Bhatt**

**A** The data is stored in `HKEY_CURRENT_USER\Software\Microsoft\Office\11.0\Word\Wizards`. You can clear all the Wizard information each time the computer starts. Open Notepad and type in these two lines:

```
REGEDIT4
[-HKEY_CURRENT_USER\Software\Microsoft\Office\11.0\Word\Wizards]
```

Save this file with the name “wizfix.reg”. Include the quotes to ensure that Notepad doesn’t save the file as a TXT file rather than as a REG file.

Now click on **Start > All Programs**, and find the Startup menu in the list. Right-click on it and choose **Open All Users**. Windows Explorer will open, displaying the shortcuts that define the menu items under the Startup folder. Right-click in an empty area and choose **New > Shortcut**. Enter “`REGEDIT -S C:\Path\wizfix.reg`” in the “Type the location of the item” dialog box, and click **Next** (assuming you saved the file to `C:\Path`). Give the item a name of your choice, such as “Delete Wizard data” and click **Finish**. The registry entries will be removed every time you start up. ■

## Get Help Now!

E-mail us your computing problems along with your contact details and complete system configuration to [sos@jasubhai.com](mailto:sos@jasubhai.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!

# Agent 001 Wants It On Paper

**There's nothing more challenging than choosing a printer today. With a variety of models, brands and technologies, you're going to need the help of our resident super sleuth to figure this one out!**

This is the first time I'm mentioning this, but reading happens to be my favourite hobby. I've collected more than 600 books thus far! Nowadays, however, I'm most often reading PDFs and e-books, and this was one of the reasons I bought a Nokia N80.

However, I find reading on such devices is a pain, especially for extended periods. How about printing them out? My older HP DeskJet 640C has been in operation for the last seven years, and has now lost its ability to deliver crisp print-outs. I just had to buy a new printer, and since we haven't done a good printer comparison for almost a year now, the setting seemed perfect for me to go about my business.

In the good old days, selecting a printer was a no-brainer: there were only a few models to choose from, and each had a distinct advantage over the other. But now? Too many models, extremely focused categorisation, and the significant onslaught of MFDs. Further, "should I opt for an inkjet or a laser printer" is the question one has to answer before buying.

Instead of narrating how I went about buying a printer for myself, I've decided to touch upon these issues.

Nearly everyone who buys a PC ends up buying a printer, and this very demand has ensured easy availability of printers, which earlier were quite expensive; in addition, very few dealers were selling them. When it comes to printers, India has been a very pro-HP country, pretty much like it is pro-NVIDIA in the graphics card category. But you also get good printers from Canon, Lexmark, Epson, Xerox, Samsung, and Brother.

A home user can buy an inkjet for as little as Rs 2,250; the Epson C45, to be precise. In the same league, you get HP's 2360, which costs about Rs 2,400, as well as the Canon IP 1000, for the same price. The Lexmark Z645 also falls into this category. Before you invest in one of these entry-level printers, make sure to ask about cartridge prices; most often, it would work out to be the same or a little less than what you paid for the printer. These printers are for those who print like ten pages a week.

Moving up the ladder, HP has the DeskJet D4168 that retails at Rs 3,750, and Canon has its Pixma iP3300 retailing at Rs 5,500. Epson has its Stylus C58, C79, and C87 in this range, retailing at Rs 3,250, Rs 4,150 and Rs 5,000 respectively. Printers in this range are for people who print around a hundred pages a week—typical office desktop usage.

Moving on, the price of the "average" laser printer has fallen to an affordable Rs 6,000. Almost every vendor has a laser printer for mass consumption. HP, Canon, Samsung, and Xerox are the major players in the mass-market category. HP's LaserJet 1020 and LaserJet 1022 are mono lasers available at attractive prices of Rs 6,900 and Rs 9,700 respectively. Samsung, has their ML-1610 at a low Rs 5,000. Samsung also has the ML-2010 and ML-2570, which are higher-spec laser printers, featuring faster printing speeds. Similar to entry-level inkjet printers, these entry-level laser printers require cartridges (laser cartridges) that often cost around Rs 3,000, and can print around 2,500 pages. These lasers are good for typical office desktop usage, but not for a large team.

When colour laser printers were introduced, they cost too much; however, in recent months, they have seen a drastic price drop. The HP Colour LaserJet 1600 can be had for Rs 15,000, and the souped-up LaserJet 2600n that used to cost Rs 40,000 can be bought for Rs 19,000. Samsung recently introduced the CLP-300, an entry-level colour laser. It retails at Rs 14,500.

While talking to a HP dealer, I came across the new HP Officejet K550 Pro. This is a business-class inkjet, and is supposed to deliver better performance than a laser, or at least on par. The demo the dealer gave me proved its capability—good speeds, high-capacity cartridges, and superb print quality. The attractive pricing of just Rs 8,999 sold me, and I coughed it up immediately—but why not a laser? Well, with an inkjet I can print *good* quality colour prints not possible even on a colour laser. Bet you didn't know that! ■

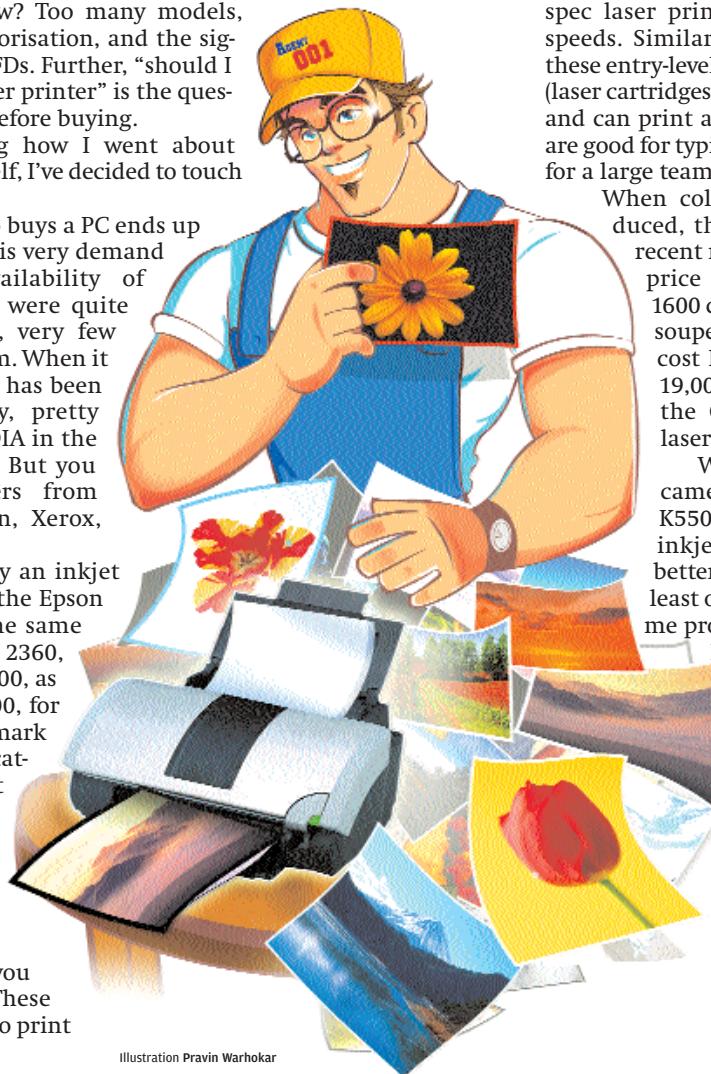



Illustration Pravin Warhokar

Want more of Agent 001? Turn over to read his answers to your buying questions

## The Heart Of The Matter

**Q** I want to build a machine for casual gaming. Please recommend a good AMD processor (Socket AM2), a motherboard with decent onboard graphics, and memory up to 512 MB DDR2. I have a budget of around Rs 12,000.

**Bipin Thite**


 For onboard graphics at a reasonable price, an AMD platform based on NVIDIA's 6150 chipset works out great. You can go with an AMD Athlon64 X2 3600+ or 3800+ AM2 processor. You will find these retailing at around the Rs 7,000 mark. For the motherboard, opt for an ASUS M2NPV-MX or MSI K9NGM2; they both retail at around Rs 4,500. For RAM, I'd suggest 512 MB of Transcend, Corsair value, or Kingston.

If you can stretch your budget to around Rs 15,000, opt for an Intel Core 2 Duo E6300 processor (Rs 9,000), an ASRock 945G DVI, and the memory I mentioned earlier. The latter configuration will offer much better performance. For any sort of serious gaming, upgrade to a decent graphics card at a later stage.

## Supply And Demand

**Q** I own an Intel Pentium 4 2.66 GHz processor, ASUS P5N32-SLI Leadtek 6800 GS cards, a Creative SoundBlaster Audigy 4 sound card, and a Zebronics 500 Watts platinum SMPS. If I upgrade to an Intel Core 2 Duo E6600 processor and 8800 GTX card, which I will do soon, will the SMPS be able to handle the load?

**Jassim**


 In the most probable case, yes, a 500-watt SMPS is more than sufficient. We haven't tested the Zebronics Platinum, so I can't comment on its efficiency level. For the moment, forget about the wattage—what's important is the efficiency level rated at some temperature.

If your SMPS fails to cope with the load, you can opt for Antec or Corsair power supplies. Contact Tirupati enterprises at 033-22251192/93 for Corsair and CyberSpace Abacus at 044-24362681 for Antec.

## First Steps

**Q** I have taken to computer gaming and like games such as *Half Life 2*, *F.E.A.R.*, and *NFS Carbon*. I want to buy a graphics card. My upper limit for this purchase is Rs 7,000.

**Soumitra Panda**


 You haven't mentioned your configuration, so I'll assume you have a PCI-Express compatible motherboard. For Rs 7,000, you can expect a decent enough graphics card. Get a card based on the NVIDIA 7600 chipset—you will be able to get a 7600 GS at your budget. Try for a 7600 GT, though; if you're lucky, you might be able to get yourself a deal.

## How Good Is A Cam-Phone?

**Q** I am a hobby photographer and am looking to buy a new digital camera. Should I buy a good

3MP camera phone or a better standalone camera? My budget is Rs 22,000.

**Aditya Narayan Ray**


 It depends on what you mean by "hobby photographer." How often do you click snaps, what's your typical shooting environment, and what do you expect from a photograph? Today's camera phones have evolved to a level where they can provide good photographs, but quality takes a significant hit under poor lighting conditions. Moreover, additional but useful features such as image stabilisation, faster response times, and better flash performance haven't yet made their way to camera phones.

A standalone camera is a much better tool if you plan to adopt photography as a serious hobby or career. If you want to be a casual shutterbug, a convergent device such as a camera phone will do. For a 3MP camera phone, you can opt for the Nokia N73 or the Sony Ericsson K790i. As for standalone cameras, for Rs 22,000, you will get an excellent one. Look for the Canon PowerShotA700, Sony Cybershot W70, or in the pseudo-SLR range, the Panasonic FZ30.

## Defying Dust

**Q** I am planning to buy a laptop, possibly based on the Celeron M platform. I have allocated a budget of about Rs 32,000. I have a problem though—I travel a lot, and the local environment is dusty. Please recommend a laptop that can take a punishing environment.


**Ranen Biswas**

 Don't bother too much about the dust—unlike PCs, laptops don't have open crevices from where dust can enter and accumulate. The best way to keep dust at bay is to get the notebook serviced at regular intervals—get the ventilation ports cleaned. You can choose from HP, IBM, Gigabyte, or Zenith notebooks. I'd recommend the R40 series from IBM; if they are still available, they should fit into your budget.

## Tuning In

**Q** I have a Toshiba A105 series laptop and want to purchase a compatible TV-Tuner card for it. Which one should I buy?

**Suresh Desai**

 You have two options—USB TV-Tuners and the Card Bus type. The former plug into a USB 2.0 port and can be connected to regular PCs as well as laptops. The Card Bus type of TV-Tuners go into the PCMCIA slot and are specifically designed for laptops. Card bus tuners are available from Pinnacle, Compro, and AVER. There are different variants available—some have an FM tuner and/or PVR functionalities, and the price will depend on these features. USB TV-Tuners are relatively bulky, and carrying them around might be inconvenient. ■

### Ask Away!

Want a tech product, but don't know how to go about buying it? E-mail [agent001@thinkdigit.com](mailto:agent001@thinkdigit.com) with your complete contact details, and he might answer them here! Please note that Agent001 only answers purchase-related questions in this space.

# Finding Maps

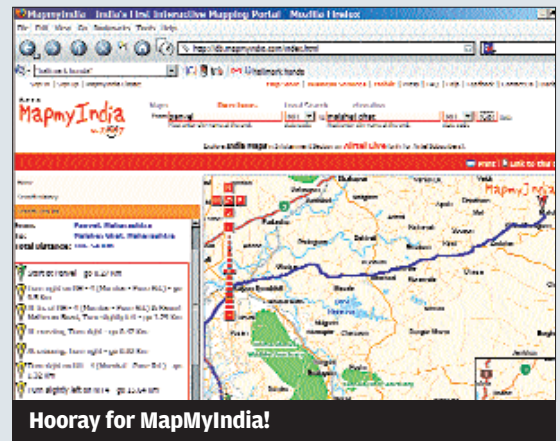
You usually ask friends who've been there for directions to someplace interesting—right? And different friends give you slightly different versions...

For our company trip, we decided to DIY: look in the maps and figure how to get there. We had a map of Maharashtra, and we also decided to give MapMyIndia.com a shot. We just looked at the regular section, not the “business services.”

**Ram Mohan Rao** (*ram\_mohan@thinkdigit.com*)



**Tracking down a vacation spot on the map**



**Hooray for MapMyIndia!**

**1**

Malshej Ghat is a hill station close to Mumbai, one of the lesser-known ones. (More and more people are finding out, and it's getting overpopulated by junk tourists, though.) At first, we didn't notice it on the map at all.

We were highly sceptical about the site. India actually having been mapped? We expected it to be one of those crappy sites with tons of pop-ups and nowhere to look. But... a pleasant surprise!

**2**

Naturally, the problem is, it's not a town—it's a *ghat*; an area. But there it was—in tiny print—the entire green stretch. We still had no clue where the nearest town was, though.

“Malshej Ghat” actually showed up, even though it's not a town. A simple “directions” search from Panvel to there brought up a detailed directions list—along with the nearest town to the place, called Walhivale. We'd never have known this from the paper map.

**3**

The map showed us the roadway as well as the railways—so we could choose. Not much of a value-add—the railways—because we'd decided to go by road anyway.

The directions were a little confusing though: “At Kalyan-Dombivli, turn right—go 1.34 km.” The next one, perplexingly: “At Kalyan-Dombivli, continue...”. “Turn right” and “continue” to do so?

**4**

Figuring out the exact distance is impossible—we just used a ruler for the distance as the crow flies, then compensated for the turns.

We'd gotten the general drift, though—and we had the exact distance, too. Zoom into the map as much as you want to, and find tiny towns and villages... a great help when you're driving.

**5**

Looking at the map is all well and good, but where exactly do we turn? It was all we could do to note down the towns along the way, and we'll have to ask for directions at each.

We'll have to ask for directions anyway, but we knew each place along the way, so no getting lost beyond a few kilometres!

Fun: **4.5/10 (What did you expect?)**



Fun: **7/10 (A novel experience!)**



**AND  
THE  
WINNER  
IS...**

**M**apMyIndia.com is terrific. It shows up specific addresses too, in many parts of the country. The detail in the maps is incredible.

However, we won't say the tech way is the “winner,” because you just can't be sure. The difference between this and using a paper map is essentially that you get more town names along the way, as well as an idea about distance.

India simply cannot be mapped the way developed countries are, and MapMyIndia.com will unfortunately

never be what Yahoo! Maps is to the US.

A search for “Belapur”—right next-door to our office— took us to the interiors of Maharashtra. Our roads aren't known for being neatly organised into streets and avenues... your mileage, therefore, *will* vary. Can't blame the site in the least. And then there's all the thing about no-one knowing what a road is called... is Brigade Road in Bengaluru still Brigade Road, by the way?

# POPPing The Cork

**E-mail clients aren't all Outlook! There's a whole bunch of them out there—and it's time we did a round-up of the lot**

**Jayesh Limaye**

**D**espite Instant Messaging, SMS, and other new forms of communication, the *de facto* way of keeping in touch is still e-mail. It was the killer app of the Internet, and its importance has not diminished one bit. In fact, it's the lifeline of many businesses.

The simplest way of checking and sending mail from anywhere is by using Web-based e-mail. In this case, you need to be online and log on to the Web site of your e-mail provider—such as Gmail, Rediffmail, and so on. However, there are times when you can connect to the Internet only once in a while; in such situations, Web-based e-mail solutions cannot be relied upon. Another scenario: you have a company e-mail account, and you're connected to the Internet all the time. Why should you log on to a Web site each time you want to check your mail? It's preferable to just let the mail come into your Inbox as and when it is received. Here is where e-mail clients come in.

When you send an e-mail, it goes to the e-mail server and is stored there. An e-mail client retrieves the mail from the server to the

computer. Not only does an e-mail client let you view your e-mails when you're offline, it also lets you compose mails without having to be connected. Mails composed offline can be sent across once you connect to the internet. This way, if you're on dial-up, or on any other access scheme that makes you pay by the minute, you're better off using an e-mail client than Web mail.

Still, Web mail services offer the convenience of letting you check your mail from anywhere. Many e-mail service providers have revamped their interfaces to mimic that of e-mail clients.

Some of us use both—an e-mail client at work for our office e-mails, if, for example, we aren't allowed to check personal e-mail during work hours—and Web-based mail at home. Ultimately, each method has its pros and cons, and this test is for those who do use an e-mail client—which will be Outlook or Outlook Express in most cases! We wish to remind you that there are alternatives.

We will take a look at twelve of the most popular e-mail clients. These are RimArts Inc.'s Becky! Internet Mail, Qualcomm's Eudora, IncrediMail Xe, MemeCode's i.Scribe, Mulberry, Opera Mail Client, Microsoft Outlook 2003, Microsoft Outlook Express 6.0, Pegasus, Sylpheed, RITLABS S.R.L.'s The Bat! Home Edition, and Mozilla Thunderbird.



## The Postmen



### Becky! Internet Mail

Becky! Internet Mail 2.29 is a mere 2.3 MB download, and starts up very quickly, probably due to its no-frills interface.

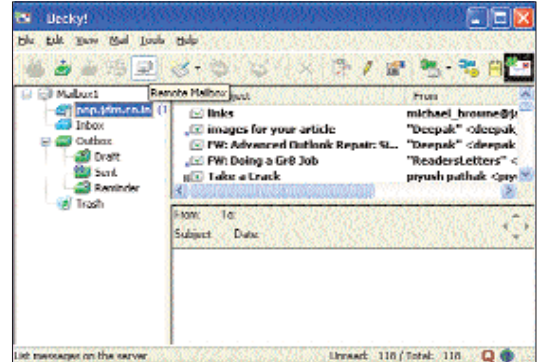
Becky! Internet Mail does not have a polished interface; attention seems to have been paid only to functionality. There are no Wizards or guides, and a newbie will feel lost. However, the simple menus do everything one would expect of an e-mail client.

While it supports HTML e-mail composing to some extent, it can hook up to an external editor such as Word to enhance your composition. This is a configurable option. If you attempt to enter ActiveX content into the mail, Becky! will warn you about its potential dangers. You can even directly edit mail in the viewer window, and this can even be the HTML message you created earlier using the external application.

The search as well as the mail rules are a pain to understand, and not very customisable. Becky! has a unique Reminder capability, using which

you can send yourself an e-mail and specify the date when you wish to receive it. The Mailing Lists Manager helps you maintain multiple mailing list subscriptions. Becky! also comes with a PGP (Pretty Good Privacy) plug-in preinstalled, which lets you encrypt messages before sending them.

Becky! has a feature called the Remote Mailbox, which lets you decide whether to delete or download a certain mail or mails while they're still on the server. All basic mail functions such as copy, paste, delete, forward, reply and drag-and-drop are supported when using the Remote Mailbox feature. Becky! is, however, priced at \$40 (Rs 1,800), which seems too much for just an e-mail client.



Becky's Remote Mailbox lets you preview your mails

## What We Looked For

### Protocol support

**POP3:** Post Office Protocol version 3 is an application-layer Internet standard protocol that lets you retrieve e-mail from a remote mail server over the Internet. Many e-mail service providers provide a free POP3 service, while some such as Yahoo! provide it for a fee.

**IMAP:** This was earlier known variously as Internet Mail Access Protocol, Interactive Mail Access Protocol, and Interim Mail Access Protocol. This is an application-layer Internet protocol that allows a local client to access e-mail on a remote server. It is also known as IMAP4. Almost all modern e-mail clients and servers support it.

**NNTP:** Network News Transfer Protocol is an Internet application protocol primarily used for reading and posting Usenet articles, as well as to transfer news among news servers.

**News Feeds:** This is a family of Web feed formats used to publish frequently-updated digital content such as blogs, news feeds, and podcasts. It is again divided into formats such as ATOM and RSS (Rich Site Summary); the latter again has versions 0.91, 1.0, and 2.0.

### Security features

**SSL encryption:** Secure Sockets Layer is a cryptographic protocol that provides secure communications on the Internet for things such as e-mail, Web browsing, Internet faxing, and other data communications and transfers.

**Preview before download:** Some e-mail clients support reading mail off the POP3 server directly without downloading it to the PC. This provides you with security against malicious e-mail. The image-blocking feature also has the same advantages.

**Junk filtering:** Spam can be irritating and also means a waste of time. Inbuilt Junk/Spam filters are therefore a big plus.

### Appearance

**Formatted mails:** HTML-formatted messages have much better visual appeal than plain-text messages.

**Customisable Interface And Keybindings:** The interface and keybindings (combinations of keystrokes) should be customisable to suit individual needs.

**Mail Notification:** Mail notifiers alert you when you receive a new mail so you don't need to keep checking for new mails.

**Ease Of Use:** We looked at the ease with which a new mail account could be created, whether the interface is user-friendly, and so on, and collectively rated this on a scale of five.

### PIM features

Personal Information Manager features such as Calendar, Notes, Tasks, Scheduler, Memo, etc. were noted. Though these aren't that important for the home user, they don't hurt!

### Other features

**Split large attachments:** Most e-mail service providers specify a certain size limit for the attachments you can send. Anything above this size is rejected. The option we're talking about lets you split attachments to a size below the specified threshold.

**Import/Export Of Mail And Address Book:** This is an important feature—very useful when you're migrating from one e-mail client to another. An e-mail client should support importing from as many popular clients as possible.

**Multiple Profile Support:** For more than one user to access a mail client installation, the client should be able to handle a profile unique to each user.

**Changeable Mail Store Location:** It is a good idea to change the location of the e-mails stored locally on the hard drive to a safer-than-default location (such as a drive other than the one where the OS resides).

**Plug-in Support:** Plug-ins have the power to completely revamp an e-mail client, so this is a very welcome feature.

**Additional features:** We looked for any additional features to the above that the e-mail client offered.





## Eudora 7.1

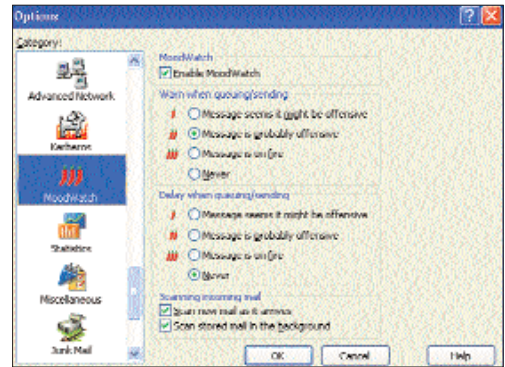
Along with support for POP3 and IMAP, Eudora has a special feature called ESP (Eudora Sharing Protocol) that allows you to create a group of users who can synchronise and share a set of files via e-mail.

The e-mail composer supports plain-text as well as richly-formatted text, and you can even send emoticons if you use the paid version. Then there is MoodWatch—an offensive-vocabulary alert that warns you about profanity if you accidentally type in some. Eudora has extensive search options, and it also supports indexed search for faster performance.

It's SpamWatch Bayesian spam filter is quite effective. Also featured is ScamWatch, which warns you about deceptive URLs in phishing e-mails, but you need to be a paid user to use these.

Eudora's PureVoice plug-in lets you send a voice message as an attachment, and this can be opened by the receiver using the PureVoice plug-in. It also gives you the option to redirect your e-mail to a different address.

This program is available in three versions: Paid, Sponsored, and Lite. The paid and the sponsored versions have the same features, except that the sponsored version is adware. The Lite version has fewer features. At the end of the day, Eudora is a good e-mail client, but will be somewhat tough to get used to. Eudora is set to go open source in the first half of 2007.



MoodWatch guards against profanity



## Incredimail Xe

This is one of the best looking e-mail clients we have seen, and it seems to be aimed at the young. The download is just 450 KB, but this is a deceiver—it is a Web installer, and over 10 MB is downloaded.

Incredimail has support for POP3 as well as IMAP, but support for news feeds has been left out.

The interface is similar to that of Outlook Express (OE), only more colourful thanks to Flash, which is what most likely contributes to its slow load times.

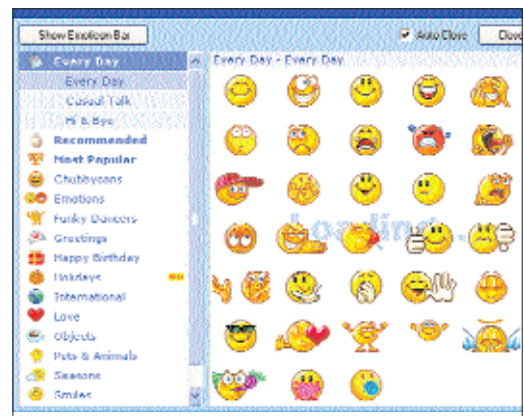
When you open the e-mail composer, along with it opens a Style Box that lets you choose from loads of colourful backgrounds—including some animated ones. You can even choose to add 3D effects and also emoticons. You can send audio mail, where you record a message and mail it with the text.

Incredimail sits quietly in the System Tray, and when new mail arrives, the Notifiers let you

know. These Notifiers are animated characters—something similar to the search assistants in XP.

Incredimail's spam blocker automatically determines ad-based messages. The safety concerns are the same as those in OE—maybe even more, considering the presence of Flash content. Incredimail, too, has the ability to read POP mail without downloading it. This way, you can delete unwanted mail directly from the POP3 server.

With so much colour and animations, we revise our earlier view: this isn't really for teens, but rather for kids being introduced to the world of e-mail!



Convey your emotions using the Emoticons

## Windows Mail

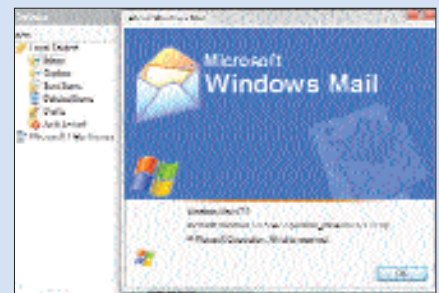
“Finally, Microsoft is taking steps to do away with the buggy-yet-popular version of their e-mail client—Outlook Express. Windows Vista will feature a new e-mail client—Windows Mail.” This rumour has been around on the Internet for the past few months. But the excitement is not warranted: Microsoft has not built this e-mail client from scratch—rather, this is Outlook Express's new avatar.

Let us first look at what new features are offered in Windows Mail. An integrated spell-checker is provided, so you don't need to install MS Office for this feature. It also includes a new storage engine that is more reliable and performs better than OE.

Windows Mail makes use of Internet Explorer 7's Phishing Filter, and also has a Junk Mail filter—similar to Outlook. Other than this, Windows Mail offers only a few cosmetic enhancements over OE.

While it gains some features, it loses quite a few. You can no longer access Web mail accounts like Hotmail (and the soon-to-be Windows Live Mail)—only POP3 and IMAP mail accounts are supported. It also does away with the Identities feature of OE, but this is a feature that was often left unused and hence won't be missed much.

Vista comes with Windows Calendar and Windows Contacts, and integrating Windows Mail with these two would have



Old wine, new bottle

given it good PIM functionality, but it is speculated that Microsoft didn't do so to protect Outlook from being threatened.



## i.Scribe 1.88

An open source cross-platform e-mail client, more popular with OSes other than Windows, i.Scribe is just 790 KB! It requires no installation, and can be carried around on a thumb drive. You can even take it to a Linux computer and continue checking your mail. It supports the POP3, IMAP, and LDAP protocols.

i.Scribe has a simple three-pane interface, with the mail folders at the left, mails at the top right, and message content at the bottom right. You are guided by a wizard to create your account on your first run. This version being free, you are limited to creating only one account, and once we did create one, we had a hard time trying to delete it.

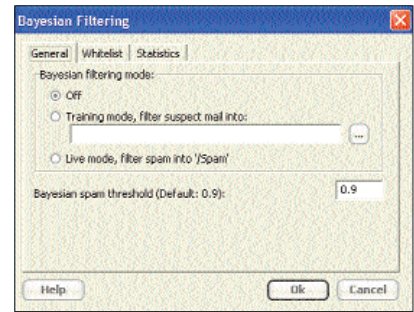
You can only compose messages in plain-text, but you can view HTML messages. i.Scribe uses its secure internal engine to render HTML, but can

also use Internet Explorer's HTML rendering engine.

i.Scribe does not provide a sufficient number of options in its mail search—you can only provide one search term, and search in only one field, such as To, From, Subject, etc. Message rules are also inflexible, and it takes a while to understand how to set up a certain rule.

The powerful Bayesian spam filter can effectively discard spam and allow only good e-mail to end up in your Inbox and the duplicate message filter looks for and deletes duplicate messages.

Small doesn't mean less, because i.Scribe even has PIM features such as a Calendar, which lets you share your appointments with others. You can also expand i.Scribe's functionality using the large number of community-created plugins.



i.Scribe's Bayesian Filter keeps spam at bay



## Mulberry 4.0.6

Here's a powerful mail client that supports almost every platform. It supports all the protocols expected of an e-mail client, but Mulberry fails miserably when it comes to simplicity of interface and ease of use. It took us a considerable amount of time to figure how to even configure a new mail account.

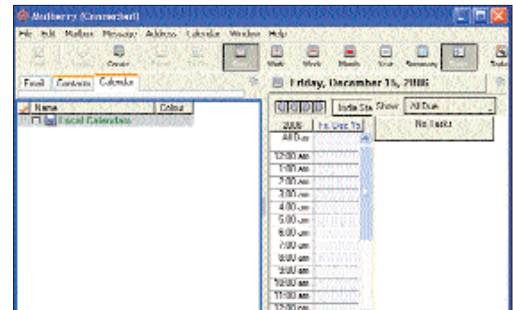
The e-mail composer supports messages with plain-text, rich text, and HTML formatting. The text macros let you specify commonly-used text, so that you can quickly insert such text into your messages using hotkeys. The Speak mail feature uses the

installed text-to-speech engine in the OS to read your e-mail to you.

The search engine is simple yet powerful, and you can also save search criteria for future use.

Mulberry has taken care of security and privacy. It supports OpenPGP and S/MIME message encryption in addition to TSL/SSL.

From this version on, Mulberry also comes with calendaring support. It's free software—so you can always give it a try!



Mulberry even comes with PIM features



## Opera Mail Client

Opera Mail Client was the only e-mail client we tested that was integrated with a browser rather than being a separate piece of software. While all the received e-mails are stored in the Received folder, mails with attachments are also categorised according to the attachment type—such as Documents, Images, Music, Videos, and Archives, for faster retrieval.

Integration within Opera does have its advantages. It can accept all kinds of RSS as well as Atom feeds, and these are well-sorted into folders—one per feed. This is the only e-mail client that supports all the required protocols—POP3, IMAP, NNTP, and even Chat (IRC).

The Opera mail composer is still primitive, and does not support HTML. The lack of HTML and JavaScript support however means that this mail client is well-protected from viruses. Integration with the Opera browser also allows you to create a new mail from just about anywhere within a window in the browser—

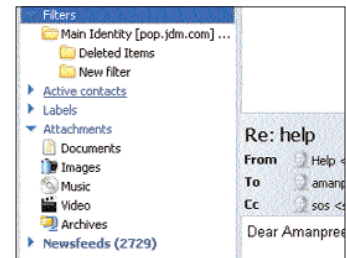
just select text, right-click, and click on "Send by mail."

The search option lets you specify very basic search criteria. Ditto for the message rules. Opera creates folders when you create a filter, and filtered messages are copied to this folder. You can create filters within filters to refine the categorisation of your mail. The spam filter is Bayesian, meaning it keeps learning.

The wizards let you import mail easily. E-mails can be imported from Eudora, Opera, OE, Netscape, and Thunderbird. Unlike previous versions, versions post-9.02 don't crash while importing Thunderbird mail.

You can take notes and send them as e-mails if required. This is the only PIM feature to be seen here. The e-mail storage location cannot be easily changed, and you need to go into the advanced configuration options to do that.

Opera Mail Client is a good client overall, but you may probably use it only if you use the Opera browser.



Mails are sorted according to filters and attachment types



## Microsoft Outlook 2003

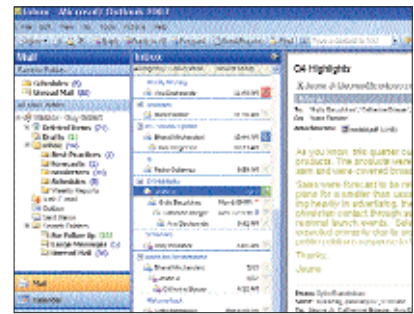
Microsoft Outlook 2003 comes bundled with Microsoft Office 2003, but is also available as a standalone product. The interface consists of a shortcuts panel where the different features can be quickly accessed; the Folder List and a third pane is where you can view the features activated from the shortcuts panel. It can be a bit confusing in the beginning, but a closer look reveals that everything is in a proper, logical order. Keep in mind that this is primarily a PIM client, and the e-mail client is only a part of it.

Outlook supports the POP3 and IMAP protocols, and you can also connect to HTTP e-mail servers such as Hotmail. The real power of Outlook is realised only after it connects to the MS Exchange Server, but you won't see this as a home user.

You can compose great-looking HTML mails thanks to its integration with Word as an e-mail

editor. The spell-checker is the same that comes with MS Office, so you can expect it to work very well. You can add ActiveX content to the mail using Word. This opens the door of vulnerability to viruses and worms, but thankfully, Microsoft periodically issues security updates to patch holes in Outlook—just remember to update!

Outlook 2003 comes with a good spam filter that efficiently weeds out most spam. You can even set the level of filtering. By default, messages are sorted by date, and are arranged into groups. You can also set messages to display as threaded chains. Since this is a product aimed primarily at the corporate user, it comes with PIM features such as Calendar, Notes, and Tasks. It costs \$109 (Rs 4,900)—too steep a price for a home user!



The three-pane interface of Outlook 2003



## Outlook Express 6.0

Outlook Express 6.0 (OE) is part of Windows XP and has a very simple and easy-to-use interface. It is well integrated with the OS and also with Internet Explorer. An e-mail setup wizard launches on your first run, and guides you to set up your account with no hassles. Due to its integration with Windows, it performs with ease and speed.

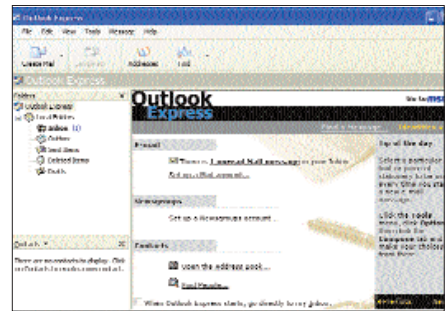
Along with the usual POP3 and IMAP, you can also set up newsgroup accounts, or even LDAP for that matter.

Though you can create HTML messages in OE, there are certain limitations. While replying with HTML formatting, you cannot insert lines below the quoted message or within it because of the irritating vertical line that appears to the left

of the quoted text. Plus, you can only add simple backgrounds to your e-mails.

It is easy to arrange mail in different virtual folders, and you can easily create rules that automatically transport e-mails to the required folders.

Integration with MSN Messenger lets you synchronise contacts between the two. You get all this at a price: Outlook Express is one of the least secure e-mail clients, and is rather vulnerable to attacks by worms and viruses. But then, do you find computers around that are not protected by an anti-virus these days?



Outlook Express—it's right there



## Pegasus 4.4

Pegasus is one of the oldest e-mail clients around, having first been launched in 1990. The interface is far from polished—the functionality is there, but is in scattered form, and takes time to get comfortable with. Thankfully, it comes with an exhaustive help system.

All messages you send are stored in a folder named "Copies to self"—realise that that's the correct way of addressing sent mail! The Main Folder contains all the mails it receives, but there is a New mail folder that contains unread mails, so you don't have to search for an old mail you forgot to read.

You can sort messages by thread, sender, date, and more criteria. Public folders allow multiple users to share access to the same messages in Pegasus Mail.

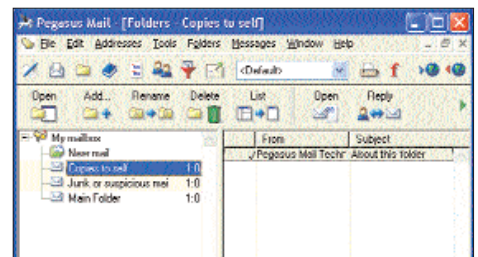
Pegasus supports POP3 and SMTP, and can also manage multiple accounts of each type.

Unfortunately, it does not support Atom or RSS feeds.

HTML-formatted mails can be composed in Pegasus. The Glossary lets you store a list of abbreviations and their long forms, so that you can use and expand them in mails at the click of a button.

While Pegasus has an extensive e-mail filtering system and is highly configurable, it is likely that the general user would be left confused because of the lack of Wizards for this purpose. The Bayesian filter takes care of spam, while the integrated phishing protection alerts you about malicious Web sites.

You can review your mail on the POP3 server and choose to directly delete it if you so wish. Along with TSL / SSL, Pegasus can also work with third-party e-mail encryption solutions.



The Sent Items folder is called *Copies to self!*



## Sylpheed 2.2.10

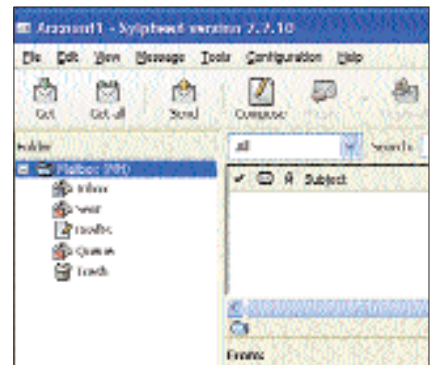
Sylpheed is an open source, cross-platform e-mail client that works with Windows as well as Linux. It not only supports all major protocols including RSS feeds, but also supports IPv6—the next-generation Internet Protocol.

The user interface is somewhat similar to that of Outlook Express, and is quite comfortable to work with. The usual Inbox, Sent, Draft, etc. folder structure is strikingly similar.

The mail composer lets you create new templates according to your needs. Messages can be composed only as text, but you can view HTML messages. You can either use the inbuilt editor or

bind and use an external editor for this purpose. Sylpheed's message editor cannot reflow text: it can only wrap it. Sylpheed takes care of your privacy issues by means of GnuPG keys for encrypted communication, in addition to TSL/SSL support.

The search feature is quite powerful, and allows you to save the results as a search folder. Spam is taken care of by means of bogofilter and bsfilter, which feature a learning function that improves their performance with use.



Sylpheed comes with a simple interface



## The Bat! Home Edition

The Bat! Home Edition 3.85.03 was the one e-mail client that had a markedly different menu system. Unlike the usual File, Edit, etc. menus, here we have Messages, Specials, Accounts, etc.—much more relevant for an e-mail client. This may confuse the user at first, but it actually makes navigation much easier and faster.

Like most mail clients, The Bat! has support for POP3 and IMAP protocols. It can even connect to an MS Exchange Server using the MAPI protocol. The Message Dispatcher tool shows you the most important message headers, and lets you delete messages directly from the server. In some cases, the sender and subject might not be enough for you to decide whether you want to keep the message, so The Bat! can automatically download a few body lines together with the headers.

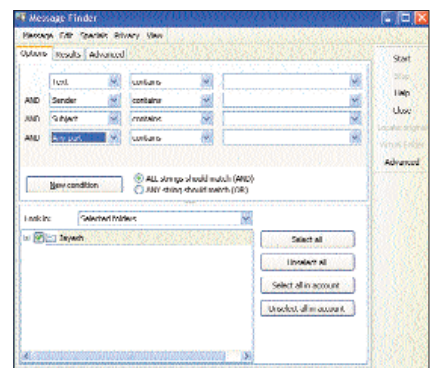
This version, unlike the previous versions, is capable of sending as well as receiving messages in the HTML format. The e-mail composer is also feature-rich; in fact, it is the only e-mail client we have seen that supports aligning even in plain-text mode. The spell-checker can even correct words based on phonetics!

You can set rules and search with seemingly endless options that yield highly refined results. A point to note is that though we have a large number of options, they are neatly named and thus not confusing. This multithreaded e-mail client can send as well as receive at the same time!

Mail Chat lets you chat with other The Bat! users by means of e-mail, so you remain protected from the potential threats posed by IMs. A flashing icon informs you about Mail Chat replies.

The Bat! is very secure against viruses and worms. It supports various PGP standards such as OpenPGP to encrypt your messages. You can also password-protect individual mailboxes if you wish.

With features such as Scheduler and Memo, The Bat! competes head-to-head with Outlook, and is good even for corporates and can also work as a server on your home network. Synchronisation and backups are also easily achievable. It costs \$24.50 (Rs 1,100), which is just right.



Extensive search options let you pinpoint your mail



## Mozilla Thunderbird 1.5

Thunderbird is an open source, free e-mail client from the Mozilla Foundation. The interface is pretty simple and straightforward, and allows you to arrange mails into different virtual folders. E-mails can be sorted according to importance, time of reception, and even according to attachment. It has a themes-based interface, which means that the looks can be changed by applying themes.

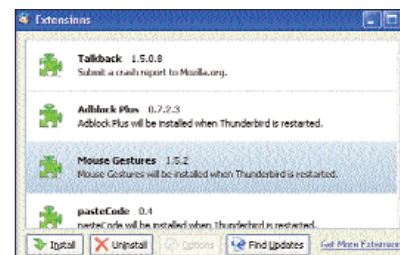
POP3 and IMAP are the supported mail protocols. In addition, it also supports NNTP, which lets you subscribe to Newsgroups. Like Firefox, it supports feeds from RSS 0.91 and Atom to keep you updated, and can be viewed as regular e-mails.

The search feature does not have too many parameters, but they seem to be adequate for a

home user. Message filters (rules) also do not have too many options, but a home user may be better off with the limited set of options.

This is a basic e-mail client like OE, while being less vulnerable to viruses because of the lack of ActiveX support. Pair this with the included Bayesian spam filter, and you have a very safe e-mail client.

We must also mention that Thunderbird supports a variety of plug-ins or extensions developed by the open source community. These extensions bring in new functionality and can enhance the client. Some extensions like the Adblock Plus filter block ads and increase system security, while others such as United States English Dictionary, add to the vocabulary of the e-mail composer.



Extensions are the meat of Thunderbird



# Scoreboard

# Email Client

Email Client	Becky! Internet Mail	Eudora	i.Scribe	Incredimail Xe	Mulberry
<b>Mail Protocol Support</b>					
POP3 Support (✓/✗)	✓	✓	✓	✓	✓
IMAP Support (✓/✗)	✓	✓	✓	✓	✓
NNTP (Newsgroup Support) (✓/✗)	✗	✗	✗	✗	✓
LDAP (✓/✗)	✓	✓	✓	✗	✓
Feeds (RSS 0.91/1.0/2.0/ ATOM)	✗	✗	✗	✗	✗
<b>Security features</b>					
SSL Encryption (✓/✗)	✓	✓	✓	✓	✓
Preview Before Download (✓/✗)	✓	✗	✓	✓	✗
Image Blocking (✓/✗)	✓	✓	✓	✓	✓
Junk Filtering (✓/✗)	✗	✓	✓	✓	✗
<b>Other Features</b>					
Message Grouping in Virtual Folders (✓/✗)	✓	✓	✗	✓	✓
Create Virtual Folders (✓/✗)	✓	✓	✗	✓	✓
Search Options (Scale of 5)	3	4	2.5	3.5	4
Message Rules (Scale of 5)	2.5	4	3.5	3.5	4
Read Confirmation (✓/✗)	✓	✓	✗	✓	✓
Can Split Large Attachments? (✓/✗)	✗	✗	✗	✓	✗
Spellcheck (✓/✗/External)	✓	✓	Plug-in	✓	✓
Import and Export Address Books (✓/✗)	✓	✓	✓	✓	✓
Import and Export of Mails (✓/✗)	✓	✓	✓	✓	✓
Importable Email Clients	NA (mbox files)	Outlook, OE, Netscape	Eudora, Outlook, OE, Netscape, Thunderbird	Outlook, OE, Eudora, Exchange	Eudora, Netscape, OE, Pine, Quickmail
Multiple Profile Support (✓/✗)	✓	✓	✗	✓	✓
Supports Synchronization (✓/✗)	✓	✗	✗	✗	✗
Mail Store Location Can be Modified? (✓/✗)	✓	✗	✓	✓	✗
Backup (✓/✗)	✗	✗	✗	✗	✗
Plug-in Support (✓/✗)	✓	✓	✓	✗	✓
<b>Appearance</b>					
Send Formatted Messages (✓/✗)	✓	✓	✗	✓	✓
View Formatted Messages (✓/✗)	✓	✓	✓	✓	✓
Customizable Interface	✓	✓	✓	✓	✓
Customizable Keybindings	✓	✗	✗	✓	✗
Mail Notification (✓/✗)	✗	✗	✗	✗	✗
Skinnable Interface (✓/✗)	✗	✗	✗	✓	✗
Ease of Use of Interface (Scale of 5)	3	3	2.5	4	2.5
<b>PIM Features (Calendar, Notes, etc)</b>	Reminder	✗	Calendar	✗	Calendar
<b>Additional Features</b>	PGP	Emoticons, Voice Messaging	Has option to remove duplicate mails	Emoticons, Colourful backgrounds	Speak Message
<b>Price</b>	\$40 (Rs 1800)	\$19.95 (Rs 900)	Free	Free	Free
<b>Website</b>	<a href="http://www.rimarts.co.jp">www.rimarts.co.jp</a>	<a href="http://www.eudora.com">www.eudora.com</a>	<a href="http://www.memecode.com">www.memecode.com</a>	<a href="http://www.incredimail.com">www.incredimail.com</a>	<a href="http://www.mulberrymail.com">www.mulberrymail.com</a>
	+ POP3 mail preview - Expensive	+ Good Bayesian spam filters - Difficult interface	+ Small and portable, Windows-Linux operability - Single account can be created	+ Lively, easy interface - Vulnerable	+ Good search and message filters - Hard-to-learn interface

Opera Mail Client	MS Outlook 2003	MS Outlook Express 6.0	Thunderbird	Pegasus	Sylpheed	The Bat! Home Edition
✓	✓	✓	✓	✓	✓	✓
✓	✓	✓	✓	✓	✓	✓
✓	✗	✓	✓	✗	✓	✓
✗	✓	✓	✓	✓	✓	✓
✓	✗	✗	RSS 0.91, ATOM	✗	Via Plug-in	Via Plug-in
✓	✓	✓	✓	✓	✓	✓
✗	✗	✗	✗	✓	✗	✓
✓	✓	✓	✓	✓	✓	✓
✓	✓	✗	✓	✓	✓	✓
✓	✓	✓	✓	✓	✗	✓
✓	✓	✓	✓	✓	✗	✓
3.5	4.5	4	3.5	3.5	4	4.5
3	4.5	4	4	3	4	4.5
✗	✓	✓	✓	✓	✓	✓
✗	✓	✓	✗	✗	✗	✓
Plug-in	✓	✗	✓	✓	✓	✓
✓	✓	✓	✓	✗	✓	✓
✓	✓	✓	✓	✗	✓	✓
Eudora, Opera, OE, Netscape, Thunderbird	Eudora, Netscape, MS Internet Mail, Outlook Express	Eudora, Outlook, Exchange, MS Internet Mail, Netscape	Eudora, Outlook, OE, Netscape	✗	NA (mbox files)	Eudora, Pegasus, Netscape, Outlook, OE
✓	✓	✓	✓	✓	✓	✓
✗	✓	✓	✗	✗	✗	✓
✓	✓	✓	✓	✓	✗	✓
✗	✓	✗	✗	✓	✗	✓
✓	✓	✓	✓	✗	✓	✓
✗	✓	✓	✓	✓	✗	✓
✓	✓	✓	✓	✓	✓	✓
✓	✓	✓	✓	✓	✓	✓
✓	✓	✗	✓	✓	✓	✓
✗	✗	✗	✗	✗	✓	✓
✗	✓	✗	✗	✗	✗	✓
✓	✗	✗	✓	✗	✗	✗
3.5	4	4	4	3	4	4
✗	Calender, Tasks, Notes	✗	✗	✗	✗	Scheduler, Memo
✗	Connects to MS Exchange Server	✗	✗	Public folders	GnuPG	Mail Chat, OpenPGP. Connects to MS Exchange Server
Free	\$109 (Rs 4,900)	Free	Free	Free	Free	\$24.5 (Rs 1,100)
<a href="http://www.opera.com">www.opera.com</a>	<a href="http://www.microsoft.com">www.microsoft.com</a>	<a href="http://www.microsoft.com">www.microsoft.com</a>	<a href="http://www.mozilla.com">www.mozilla.com</a>	<a href="http://www.pmail.com">www.pmail.com</a>	<a href="http://sylpheed.sraoss.jp/en">sylpheed.sraoss.jp/en</a>	<a href="http://www.ritlabs.com">www.ritlabs.com</a>
+ Supports all protocols - Primitive mail composer	+ Ultimate in seamless integration and features - Very Expensive	+ Simple to use, bundles with XP - Vulnerable to threats	+ Unlimited plug-ins - Search could have been better	+ POP3 mail preview - Confusing interface	+ Simple interface, cross-platform operability - Bad mail composer	+ Almost every feature you'll ever need - None in particular

## POP3 vs. IMAP

POP3 and IMAP are the predominant protocols of e-mail services. They are popular and hence are supported by most clients. But there are certain advantages and disadvantages with both of them, and here we try to make a general differentiation between the two.

POP3	IMAP
<i>You may encounter the following problems with POP3 access since e-mail needs to be downloaded onto the PC before being displayed: You are required to download all e-mail again when using another PC to check your email. If you need to check e-mail at office as well as home in this way, it can lead to confusion. Depending on the settings of your e-mail client, the downloaded e-mail may be deleted from the server.</i>	Since the email is kept on the server, it has the following benefits: There is no need to download all e-mail when using other PC to check your mail. Unread mail can be easily identified.
During the "Check new mail" process, all messages as well as their attachments will be downloaded to your computer.	A complete message will be downloaded if and only if it is opened for display to access its contents.
While multiple mailboxes can be created on the PC to download the mail, there is only one mailbox on the server that stores all the mail.	IMAP has the provision of letting you create multiple mailboxes on the home PC as well as on the mail server.
Incoming and outgoing messages are filtered and transferred only to local mailboxes.	Incoming and outgoing messages are filtered and transferred to other mailboxes no matter where the mailboxes are located (on the server or on the PC).
Outgoing mail is temporarily stored locally.	Outgoing mail is stored on a mailbox on the mail server and can be accessed from another computer.
While you can delete the messages on the home PC very easily, cleaning up messages from the server requires you to download all messages with the mail client configured to delete mail after downloading.	You can delete messages directly on the server, thus making it more convenient to clean up your mailbox on the server.
If your hard drive crashes, you lose all your e-mails.	Since the mail is stored on the server, you won't lose your mail if your hard drive crashes.
The client connects to the e-mail server for a short period of time, only as long as it takes to download any new messages.	When using IMAP4, the client stays connected to the server as long as the user interface is active and downloads message content on demand. In case of many or large messages, this can result in much faster response times.

### Who Delivers?

Of the twelve e-mail clients we tested, we found that many of them are good when catering to a particular segment of users. We therefore break away from the tradition of crowning a Gold and Silver winner. Instead, we will mention the noteworthy ones here—the ones we think are worth a try.

Windows comes with Outlook Express 6.0 as the default e-mail client, and though it is buggy and prone to worms and viruses, applying frequent bug-fixes and patches from the Microsoft Web site and using a good anti-virus will minimise the risks. Outlook Express is very simple to use—no wonder there was a hue and cry following rumours in August 2003 that Microsoft had decided to stop further development of Outlook Express: within a week, Microsoft pledged allegiance to its free e-mail client.

If you are always on the move, need to check your e-mails and also carry them around, i.Scribe is the e-mail client for you. Not only does it allow you to password-protect your e-mail folders on a portable drive, it also has advanced features that let you preview your e-mails on the POP3 server without downloading them. This is useful in a scenario where you've run out of free space on your drive, but still want to check new mails

without downloading them. In addition to this, it runs on both Windows and Linux.

If you are a novice or if you are, well, young, IncrediMail Xe with its colourful interface and animated emoticons will surely appeal.

If you are willing to pay for better features, The Bat! should be your choice because it has all the features one might ask of an e-mail client. Corporate users, too, will not be disappointed, because it can connect seamlessly to Microsoft Exchange Server. It even packs in PIM features such as Scheduler and Memo, and at \$25.50 (Rs 1100), the price is not too high.

We have to mention that when it comes to pure performance and compatibility, nothing comes even close to Outlook 2003. This PIM-plus-e-mail client rips the competition apart because of its excellent integration with Windows. It has excellent drag-and-drop support, and integration with components of MS Office. When coupled with MS Exchange Server, Outlook 2003 takes on a whole new avatar as a collaboration tool, complete with the ability to assign tasks to subordinates and delegating correspondence while you take vacations. Corporate users who have the money should definitely opt for it—nothing works better with MS Exchange Server than Outlook 2003. ■

*jayesh\_limaye@thinkdigit.com*



**106** Clutterless Connectivity!



**117** To Simpler Times



**122** Thin Clients Experiences

# Digital Business

How Technology Can Help Your Organisation

Tech Careers

## Enterprise in ERP

**ERP systems are expanding in just about any industry. Are you ready to position yourself as one of the leaders in the multi-faceted expansion of business models?**

**Samir Makwana**

An ERP software package helps organisations in effective and efficient management of available resources such as machines, material, manpower, inventory, etc. A unified database serves the needs and requirements of various departments, leading to optimised functioning. The aim of a business in using an ERP (Enterprise Resource Planning) system is to bring all its departments to a common platform, such that the departments can easily share information and communicate with each other.

To elaborate, in ERP, a single software package has modules customised to the needs of different departments—financial accounting, production, distribution, marketing, inventory control, data warehousing, etc. ERP is, in sum, an application for effective and efficient management of the resources of an organisation.

Let's say the human resources department keeps a record of the attendance, performance on the job, contribution,

and such for every employee. A software module will keep these records and save it in a unified database. When the employees are to be remunerated, the finance department uses the same database for calculating the employee's salary after the necessary costs, rates, and taxes have been applied.

ERP systems have been used for ages, and software packages provided by the vendors have undergone several changes. Today, ERP is used by large corporations as well as small-and-medium businesses; almost every sector has some form of ERP implemented.

### The Opportunities

Earlier, ERP was confined to the manufacturing sectors. Its success led to a further demand for it in industries such as automobiles, media, pharmaceuticals, textiles, telecom, heavy machines, and many more.

"The growth of ERP as a business solution has fuelled the adoption of upcoming technologies and implementation of ERP packages in several



Illustration Pradip Ingale





ERP consulting and solutions are people's business, where interpersonal and intrapersonal skills are equally important—besides basic qualifications and certifications”

Satish Joshi  
Chief Technology Officer  
Patni Computer Systems Ltd

also spawned the growth of IT consultant firms that specialise in helping organisations both in India and abroad in implementing ERP solutions. It also requires organisations where ERP has been adopted to develop teams for ongoing maintenance of the applications and providing support to clients,” says Jason Gonsalves, Vice President, IT and Corporate Planning, Kansai Nerolac Paints, a leading paint manufacturing company.

The implementation of ERP passes through a number of stages—analysis of the business process, the drawing up of plans for the ERP, installing and configuring the ERP package, and, finally, support and management.

Thus, the demand for ERP professionals is, naturally, in companies who have adopted or are planning to adopt ERP applications. There are several options for those who have specialised knowledge in this field—through either education or work experience. The increase in adoption of ERP by various industry verticals has led to an increase in demand for trained, skilled, and experienced ERP professionals.

### The Basic Requirements

Anyone aspiring to pursue a career in ERP systems should have at least a Bachelor's degree from either functional or technical academics. The qualifications required vary according to the role to be played. The roles in this field are broadly divided into Functional and Technical, so the basic requirements are as follows.

**Functional:** The qualification required is a Bachelors or Masters degree, which is to be pursued depending upon the function to specialise in. Someone willing to specialise in finance must have an academic background in finance: MBA (Finance), Chartered Accountant, Cost Accounting, Financial Analyst, etc.

Freshers are not likely to be selected directly from campuses. It is advisable to pursue further formal education in the respective functional area (finance, materials management, production management, etc.) and acquiring experience of working in the domain of their interest. After gaining sound knowledge of that particular function, they can pursue training by the ERP software vendors, who have specific course modules for professionals in a specific domain.

**Technical:** This deals purely with the development of software. For that, a minimum of a Bachelors or Masters degree from an engineering

background, specialising in computer science or software engineering, is preferred. Students pursuing degrees in computer applications and IT are also eligible. Candidates should possess strong programming skills with a constant urge for learning, as they may have to work on multiple applications.

Courses in specific domains are offered by ERP vendors such as Oracle and SAP. Education and training can be acquired from ERP vendors' authorised centres and authorised training partners: the certifications they provide are accepted by various industry verticals. These courses are usually short-term, and a bit expensive.

The industry prefers to recruit professionals who carry a vendor-specific degree. A number of private training institutes have cropped up, and impart training on ERP products. However, “Unless authorised by the ERP product vendors, it is not a wise to opt for an unauthorised institute. There are many institutes that are not authorised and use pirated software for training,” says Nilanjan Chaudhuri, Vice President, Marketing, PSI Data Systems, a software development, solutions, and consulting service provider.

### Skill Sets

Hands-on skills are looked upon as the basic benchmark for the assessment of a suitable candidate. An ERP consultant should be dynamic and able to adapt to constant change. One must possess good soft skills, too.

**Functional:** In a company such as one that provides consulting and solution services in ERP, consultants have to interact with clients from various industries. Understanding the client's needs, drawing up plans, and communicating these to the implementation team are typical duties. Soft skills such as being a patient and attentive listener, good communication skills, presentation skills, team-leading ability, and the ability to persuade clients are important. Good logical thinking is a must.

**Technical:** Those on the technical side are into programming and application development, so hard skills are valued: problem solving skills, good logical thinking and analysis, communication skills, and being a good team player.

### The Importance Of Training

Every organisation has training programmes of their own for fresh recruits, irrespective of work experience and educational qualifications.

“Training programmes are important, as a shortage of trained and experienced professionals is always faced. Training helps professionals gain hands-on experience and more understanding, which will help them in the execution of their job. Though training freshly recruited staff is cost intensive, it is looked upon as a long-term investment in them,” says Chetan Pathak, Vice President, Enterprise Solutions, Ramco Systems (India) Ltd, a company that provides enterprise IT solutions and services.

“At Wipro, we have an internal Talent Transformation Cell, where we train people recruited to work with ERP systems on platforms of vendors such as Oracle, SAP, MS Dynamics, etc. After the training, they get certified on their

### The Growth Path

#### FUNCTIONAL

- Trainee Consultant
- Assistant Consultant
- Associate Consultant
- Consultant
- Senior Consultant
- Lead Consultant
- Managing Consultant/Project Manager
- Principal Consultant
- VP, Consulting and Business Solutions
- Senior VP, Consulting and Business Solutions

#### TECHNICAL

- Trainee Software Engineer
- Software Engineer
- Senior Software Engineer
- Associate Software Consultant
- Software Consultant
- Senior Software Consultant
- Lead Software Consultant / Product Manager
- Technical Advisor
- Senior Technical Advisor
- Chief Technical Advisor / Officer

Note: The designations above are indicative

respective modules and are exposed to hands-on projects—to learn the functional aspects of business design and adopt best practices in the ERP package,” says Krishna Kumar Tirumalai S, Head, SAP Delivery, Wipro Infotech Ltd.

For in-depth and hands on expertise, companies also conduct training programs addressing specific roles in ERP. “We have a career development framework, through which specific training is delivered to the candidate depending on the job experience the candidate has acquired over the years and on his or her aspiration and capability,” says Suman K Mazumder, Director, Application Services Global Delivery, IBM India.

This training period varies depending upon the role of the individual and the organisation. On-the-job training is also common in many organisations, and some are flexible enough to allow and encourage employees to pursue education related to their job function.

“ERP consultants need to keep themselves updated with new applications and evolving technologies. Quitting their official obligations and pursuing full-time study is not a wise choice. The concept of part-time module courses has therefore evolved—to help them keep pace with changing trends,” says Anand Ekambaram, Director, Education Services, SAP India Ltd.

## The Options

Careers for ERP professionals lie in product development, implementation, maintenance, and consulting. Within these, there are multiple options available. Industry verticals often refer an ERP professional as a consultant based on his or her role and area of expertise in that organisation. The ERP employment scenario offers career options that can be classified primarily into Functional, Technical, and Training.

**The Functional Area:** Career options here need in-depth understanding along with experience of physical implementation in various functions of the business process. “By relevant experience and sound knowledge of functions like finance, human resources, materials management, quality control, production planning, manufacturing processes, etc., a person can excel in an ERP career. Also, the full life-cycle experience of the implementation of the ERP package in one or more functional modules is necessary,” says B Chandrashekhar, Vice President and Delivery Head (SAP, Oracle and Siebel), Datamatics Limited, a company that provides offshore outsourcing software services.

The ERP functional consultant interacts with the client organisation—he understands their business processes, requirements, and problems. He then analyses and builds the process flow of the functions, and recommends a cost-effective implementation of an ERP solution package.

**The Technical Area:** In ERP software companies, the individual can be involved in development of various applications on different platforms—an ERP package or specific modules within a package. They work on ERP applications like mySAP, Oracle 11i, PeopleSoft, and J D Edwards, to name a few. These professionals—often referred to as consultants—code the requirements of the business and integrate them to form

a plan for implementation of ERP in the clients’ business process models. In organisations that provide consulting services, the technical professionals are also required for the implementation team and maintenance.

**The Training Area:** After relevant industry experience and pursuing training through vendor-specific courses, training can be a good career option. Organisations looking to train their freshly-recruited ERP staff always need training professionals. Experience of working on different platforms and knowledge of many domains are important for a trainer.

**Freelancing:** Many ERP professionals provide freelance consulting to client organisations. It is mostly small or medium businesses who hire freelance consultants for implementation or maintenance for their ERP requirements. As a freelancer, one can perform any role from the bottom to the top level, depending, of course, upon the years of experience and specialisation.

## The Growth Path

Since ERP systems are implemented across different industry verticals, different designations are awarded to individuals in the ERP stream. See box *The Growth Path*.

One cannot become, say, a principal consultant in a short time-span. It takes years of experience in domains such as telecom, automotives, textiles, chemicals, etc. We can roughly say that the average time taken to climb each step of the designation ladder from the bottom is at least two years. To climb up to the position of Principal Consultant takes at least eight to 12 years with industry experience in particular domain.

It is difficult to determine the approximate salary range. The remuneration structure differs widely amongst companies, based on their size and policies. However, one can expect Rs 30,000 per month to Rs 45,000 and higher at the lower levels, that is, when advancing from Trainee Consultant / Trainee Software Engineer to Assistant Consultant / Software Engineer.

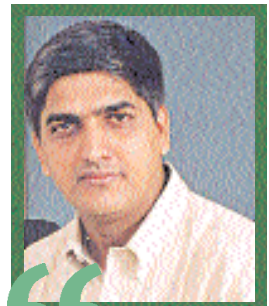
From Associate Consultant/Senior Software Engineer to Senior Consultant / Senior Software Consultant, one expect between Rs 45,000 and 65,000. From Lead Consultant / Lead Software Consultant to Principal Consultant / Senior Technical Advisor, between Rs 65,000 and 80,000 can be expected. As for the top-most designations in both the functional and technical areas, Rs 85,000 per month and above is a norm. However, these figures are indicative.

## Concluding Remarks

A lot of Indian companies have come out with highly customisable ERP package suites specifically for small and medium enterprises in various domains. These have a product life-cycle, and need to be constantly upgraded to keep pace with the technology and business requirements. Opportunities in such organisations are very healthy, both in India and abroad.

A self-assessment of one’s strengths and areas of interest must be clearly conducted before opting for this field as a career. Once that’s done, the world awaits you! ■

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“Since ERP solves a business problem with technology, it is important to have a good understanding of either technology or domain, along with an appreciation of the other”

Murali Subramanian  
Vice President -  
Applications  
Development,  
Oracle India Pvt. Ltd

Michael Browne

**H**ouseholds and offices in the US and Europe crested the wireless wave a couple of years ago. The wave has struck our shores more recently. While we cannot deny the fact that cables are still very much the preferred means for data communications today, Wi-Fi, both as a technology and as a means to communicate has made strong inroads in our comparatively emerging market.

To the home user, Wi-Fi a.k.a.

Wireless Fidelity represents convenience in its simplest sense. Freedom from sitting in front of your PC and surfing, when you could be in bed, chatting with your significant other and your friends online simultaneously! The biggest advantage of Wi-Fi is, of course, freedom from ugly, restricting wires. Your kids could be surfing the Net for school projects while you browse on your laptop, lounging in your lawn chair.

The first challenge you'll face before going cable-free will be to decide what sort of wireless device to buy. Wi-Fi ADSL Routers offer all the functional-

connectivity. An Access Point is quite simply meant to provide a wireless network without routing functions. What type of Wi-Fi device you require depends on your need as always. Do you just want to enable Net browsing on your laptop or Wi-Fi enabled PDA? Do you need to transfer data from laptop to desktop without cable hassles? You may need an Access Point (AP) in such cases. Do you plan to setup a small SoHo network, combining two or three PCs with a couple of laptops wirelessly? In such a case, you should invest in a Wi-Fi router.

Whatever your need, there's

# C LUTTERLESS CONNECTIVITY!

**Going cable-free is the in thing. We've tested 14 devices designed to de-wire your life!**

ity of a regular wireless router in addition to having ADSL modems inbuilt. Regular Wi-Fi Routers offer multiple connectors, and some even offer USB

always a solution to it. This is where we come in! Just so that you can make an informed decision, we've torture-tested 14 Wi-Fi devices.



Imaging Pradip Ingale  
Photograph Amrut Patki

## WI-FI ADSL ROUTERS

Amongst the wireless routers we received, just two were ADSL-ready: the Netgear DG834G and the ASUS WL-600G were the only two routers with ADSL modems inbuilt. Such routers are your first choice if your Internet Service Provider (ISP) provides you with a telephone line based broadband connection. Most telecom-based companies such as MTNL and Airtel will provide you with ADSL connectivity (RJ11-based). When getting such a connection, you are generally given the option of either purchasing your own modem or buying one from the ISP.

Now if you have a laptop or any wireless devices that you might want to share this Internet connection with, it's probably your best bet to invest in a Wi-Fi ADSL router. As you'll see from our tests, Wi-Fi ADSL routers offer extra features without compromising on performance. To top it off, they're not as expensive as you'd perceived them to be!

### ASUS WL-600G

**Features, performance, and looks collide...**

The stunning WL-600G would grace any workspace it occupies, meriting at least a second glance! Build quality's excellent, and this was the only router with a convenient power on/off switch.

The WL-600G is a feature-rich offering, with two USB ports, and the ability to set up a print server. Its firmware interface has a few more settings available for tweaking, as compared to the other ASUS devices we tested.

The scores this one brought up weren't the



highest we got, but what blew us away were the signal strength figures, especially in Zones 2 and 3.

At 54 per cent in Zone 2, it's a whopping 8 per cent stronger than its closest rival, the Senao ECB3220.

Even in Zone 3, the WL-600G hammers everything around with a signal strength of 49 per cent!

This one has a lot of features, but the high price tag of Rs 8,500 will not please everyone.

### Netgear DG834G

**Sleek and fast**

The pearl-white coloured Netgear DG834G is a sleek beauty. The activity indicators are also well-done, and clearly legible even under well-lit conditions.

We set this one up in a jiffy, thanks to the great firmware interface. Netgear also helpfully provides very detailed help for each option, and each item is very well explained. In fact, the help is so detailed, you could use it as a ready reference for what each option means.

The DG834G breezed through most of our



tests, clocking the fastest time in our Zone 2 multiple file transfer, averaging a blazing 1.09 MBps. This router will be very suitable for a SoHo user who wants to transfer a lot of data wirelessly. It's equally at ease browsing bandwidth-hogging Web pages.

At Rs 4,230, the DG834G keeps your wallet happy... very happy, considering the features and the fact that it's blazingly fast.

## WI-FI ROUTERS

We received seven such devices. The difference between these and their ADSL counterparts is they don't have ADSL modems inbuilt. They cannot therefore utilise an RJ11 WAN connection. Most routers will have an RJ45 interface for WAN connections.

### ASUS WL-530G

**Tiny but mighty!**

The "small wonder" in this test, it's small enough to be stuffed inside your cargo trouser pockets, yet powerful enough to ensure a near-seamless unwired experience.

The activity LEDs are, surprisingly, mounted behind the device and on top. We'd have preferred them in front, or at least where they can be viewed easily even if the device is kept above the user's line of sight.

ASUS' software definitely isn't the best laid-out



that we tested, and neither is the main menu very intuitive.

Due to its tiny footprint, we'd recommend it to the hotspot browser on the move. Its speed of 1.29 MBps was unmatched in the Zone 1 test. This makes it suitable for setting up a home or SoHo wireless office where its potent data throughput capabilities will be put to good use. It excelled in the video streaming test as well, meaning you needn't sit in front of your PC's monitor if you own one of these.

At Rs 4,400, the WL-530G offers excellent value for money. If you're looking for the fastest Wi-Fi router out there, grab the WL-530G—it's our Best Buy Gold winner!

### Buffalo WHR-HP-AG108 “Air Station”

Great show with the go!

The AG108 exemplifies build quality. It’s a great looker, and that grey-and-silver body will look smart on your desk, and equally so atop your bedroom armoire! It sported the biggest (physically) antenna we’ve seen on a Wi-Fi router. It was also the only router we received with 802.11a compliance. This means the AG108 can simultaneously create a 5 GHz (802.11a) and a 2.4 GHz network (802.11b/g). It even utilises a technique Buffalo calls “Channel Bonding” to increase throughput by clubbing the available bandwidth (of both the 5 and 2.4 GHz networks) together.

The device sports an AOSS button (Air station



One-touch Secure System). Very simply, this button automatically assigns WPA keys to all clients on the wireless network, once you’ve installed the software on each of them. You’ll also have to click the Profiles tab. Incidentally, the AG108 has a good firmware interface, and is easy to navigate even for first time users.

The AG108 performed decently in all the tests, save one—our video streaming test—where, for some reason, we got some framing.

The Air Station AG108 is a good product with a lot of add-on features, but there other products available that outperform it on all fronts.

### Compex NetPassage 27G

Ultraconnectivity!

With four RJ45 (LAN) ports in addition to two USB ports, connectivity is never going to be a bottleneck with the NP-27G. It has an inbuilt print server, making it ideal for the SoHo segment.

The NP27G incorporates the Atheros XR (eXtended Range) technology, which improves coverage area of a Wi-Fi network, eliminating dead spots. Atheros XR also supports a stronger signal than what 802.11 specifications imply, and supports additional data transfer rates.

The software interface on the NP27G firmware was the best we’ve seen this time round. It’s very



intuitive, and each option is properly placed under a relevant sub-category.

Configuring the NP27G was very easy via the interface, and even a newbie shouldn’t have too many problems during the setup.

Though the NP27G’s transfer rates weren’t the slowest in our tests, it was very close to the bottom. Surprisingly, it fared decently in the movie streaming test: although the video was jerky at times, it wasn’t as bad as we’d expected. The NP27G loses out on performance but scores on features. It is reasonably priced at Rs 5,500.

### Compex NetPassage 28G

Feature-laden—but light on performance!

With three LAN ports and four USB ports, the NP 28G is primarily aimed at the SoHo segment. Home users will also benefit, especially if you want to hook up a printer or even a Web camera (courtesy the extra USB ports). Atheros’ XR makes another appearance here. The firmware is identical to that of the excellent NP-27G.

The NP 28G is slightly slower than the NP27G, but only by a hairsbreadth! They perform similarly when the AP is in the client’s vicinity. Once the

distance increases—and signal attenuation occurs—we see the NP 27G creeping ahead.

This shows that the NP 28G is less suitable for heavy bandwidth inter-room usage. The streaming test also did not complete to our satisfaction, and there was noticeable framing.

Overall, a good feature set at an outrageous price—Rs 8,500—especially considering its less-than-ideal performance.



### Level One WAP-0010

A decent performer

The WAP 0010 is a funky looker with a sober grey body, getting a slash of silver in the form of its logo embossed topside. With three antennas and MIMO support, we had high hopes for this product in our test.

Coming to the firmware, there’s no username field; you need to type in a password in the field titled “login”. We found all the settings under appropriate heads, and most of the deeper settings were transparent, allowing us to tweak them to our

heart’s content.

Unfortunately, no amount of tweaking helped it perform well! To compare it to the proverbial tortoise would be unfair, as there were slower competitors in the test. Needless to say, if you’re looking at bandwidth-hungry data transfers and movie streaming, give the WAP-0010 a wide berth.



## Linksys WRT300N

### Feature-rich, future-proof

The WRT300N is a stylish, futuristic-looking router that supports the yet-to-be-announced 802.11n standard (Pre-n as of now). Its dark grey, black and smoky blue body will turn eyes, as will the radar-looking antenna booster.

The WRT300N brims over with features that can be accessed from its intuitive firmware menu. The WRT300N also supports MIMO, which helps maximise signal coverage while reducing occurrences of dead spots within its effective range.

We expected a lot from this model, it being the only Pre-n device that made it to this test. As you'll see in our table, it brought up some solid scores, but nothing worth cheering about. It was well and truly beaten by some of the other routers—in particular the ASUS WL-530G and the Netgear DG834G.

The WRT300N remains a good choice for the home segment because of its plethora of features and the fact that it's future-proof.



## Linksys WRT54G

### Performance you don't pay a wad for!

The WRT54G is a simple, no-nonsense looking router that sports twin antennas. The firmware is as intuitive as that on the WRT300N. The minus point is immediately evident—there's no logout button; you simply have to close your browser window after saving settings (in case you've changed any). We weren't able to check from the interface whether our two laptops were connected. For that, we had to filter the MAC address list to show the clients connected. A couple of things missing in the interface; not of great

use to home users, but a SoHo would miss them. Incidentally, the WRT54G loses out on Wireless Bridging as a feature.

While it outpaces the WRT300N in the Zone 1 tests, it lags behind in Zone 2. This shows its signal quality is slightly inferior, because signal strength of the models in Zone 2 was identical. Where this one scores is in pricing; it costs just Rs 3,634, and you'll get why the Digit Best Buy Silver award goes to the WRT54G.



## How We Tested

Testing Wireless devices involves gauging performance on mainly two fronts—transfer rates (speed) and effective range.

Our Wi-Fi test was done simulating all possible real-world conditions, for which we created the test “zones” we've described below. Please note that distances aren't important for benchmarking any sort of Wi-Fi network; it's the obstructions between the Access Point (AP) and the signal recipient that ultimately matters. Metallic objects, wooden cabinets, concrete walls, and general furniture all cause what is called attenuation of wireless signals. The signal strength is reduced, which causes loss of data integrity and therefore slows down data throughput. With this in mind, we designed each of these zones to actually take each of these wireless devices to their performance limits.

**Zone 1:** The laptop was placed within 15 feet of the AP. There was a wooden partition between the AP and the client, though they were essentially in the same room. Signal attenuation was at a minimum.

**Zone 2:** We placed the laptop within 25 feet of the router. This time we ensured there were a good deal of signal-obstructing objects. There was a concrete wall (with inbuilt cupboards) in between the Wi-Fi devices to further scramble reception. This was in addition to a couple of wooden partitions.

**Zone 3:** Our test laptop was placed approximately 30 feet away from the router. Here we actually moved the laptop to a higher floor. We also ensured the laptop wasn't exactly above the router placed a level below (this would be too easy). This was the most strenuous test for the routers, as multiple obstructions create ample cause for attenuation and hence signal loss.

We created test files to be copied from the PC to the laptop wirelessly. In each Zone we used two different files. One was a

single RAR archive, while the other was a set of small files of various types to simulate every possible data transfer scenario. The file sizes were kept the same in the same Zone, but sizes across Zones varied—100 MB for Zone 1, 50 MB for Zone 2, and 25 MB for Zone 3. The speeds were recorded in Megabytes per second (MBps). Please note that most manufacturers quote figures in Megabits per second (Mbps). Keep in mind that 1 byte equals 8 bits.

Next we streamed an HD video file encoded at 1280 x 720 (720p). This clip was on our test PC's hard disk, and was streamed to first one, and then two, laptops. We awarded points based on the entire viewing experience. In case any jerking of frames was really noticeable, points were deducted accordingly. A score in excess of

### Test Rig Specifications

	PC	Laptop 1	Laptop 2
Processor	AMD x2 4800+	Pentium M 1.73 GHz	Pentium M 1.2 GHz
Motherboard	AMD x2 4800+	Intel 915GMS	Intel 915GMS
Memory	512 MB x 2 Corsair XMS DDR 400	512 MB DDR2 533	512 MB DDR2 533
Graphics card	XFX Geforce 7900GTX	Intel Integrated 915GM	Intel Integrated 915GM
HDD	Hitachi T7K 250 SATA 2.0	Toshiba 80 GB 4200 rpm	Fujitsu 60 GB 4200 rpm
Wi-Fi Solution	NA	Intel Integrated	Intel Integrated

7.5/10 means the device is capable of providing a good movie-watching experience.

Finally, we used Wireless Mon version 2.0 as a benchmarking tool to measure signal strength in each of the Zones.

In our signal strength at 20 metres test, we ensured there were two concrete walls between the AP and the test laptop. Wireless Mon was our benchmark of choice here as well.

Scoreboard	ADSL Routers		Routers			
BRAND	ASUS	Netgear	ASUS	Buffalo	Compex	Compex
MODEL	WL-600G	DG834G	WL-530G	WHR-HP-AG108	NetPassage 27G	NetPassage 28G
<b>Features</b>						
Type Of Device (AP/Router/ADSL Router)	ADSL Router	ADSL Router	Router	Router	Router	Router
Protocols Supported (802.11 a/b/g/Pre n)	b/g	b/g	b/g	a/b/g	b/g/Super g	b/g/Super g
ADSL Modem Inbuilt (Y/N)	✓	✓	✗	✗	✗	✗
Type Of WAN Port (Ethernet/ADSL/USB)	✗/✓/✓	✗/✓/✗	✓/✗/✗	✓/✗/✗	✓/✗/✓	✓/✗/✓
Number Of Antenna(s)	1	1	1	1	1	2
Wireless Bridging (Y/N)	✓	✓	✓	✓	✓	✓
Number Of RJ45 (LAN) Ports	4	4	4	4	4	4
Number Of USB Ports	2	0	0	0	2	4
<b>Device Features</b>						
Power Indicator (Y/N)	✓	✓	✓	✓	✓	✓
Internet Connectivity LED (Y/N)	✓	✓	✓	✗	✓	✓
Individual LAN Port LED (Y/N)	✓	✓	✓	✓	✓	✓
Activity Indication (Blinking) (Y/N)	✓	✓	✓	✓	✓	✓
Factory-Defaults Reset Button	✓	✓	✓	✓	✓	✓
Wall-Mountable (Y/N)	✗	✗	✗	✗	✓ (Kit provided)	✗
Power Over Ethernet (Y/N)	✗	✗	✗	✗	✗	✗
<b>Security</b>						
Firewall (Types Supported)	NAT & SPI	NAT & SPI	NAT & SPI	NAT & SPI	NAT & SPI	NAT & SPI
LAN I/P Based Site Blocking (Y/N)	✓	✓	✓	✓	✓	✓
Encryption (Y/N)	✓	✓	✓	✓	✓	✓
Wireless Isolation (Y/N)	✓	✓	✓	✓	✓	✓
Port Mapping (Forwarding)	✓	✓	✓	✓	✓	✓
Deep Packet Inspection	✓	✓	✓	✓	✓	✓
<b>Firmware Interface Features</b>						
Basic Setup Wizard (CD/Browser)	✓/✓	✓/✗	✓/✓	✓/✓	✗/✓	✗/✓
Online/Offline Firmware Upgrade (Y/N)	✓/✓	✗/✓	✓/✓	✗/✓	✗/✓	✗/✓
Settings Backup To HDD	✓	✓	✓	✓	✓	✓
Load From HDD	✓	✓	✓	✓	✓	✓
<b>Ease of Installation / Use</b>						
Bundle (So10)	8.0	7.0	7.5	6.5	6.5	6.5
Software Interface (So10)	6.0	8.0	6.0	8.0	8.5	8.5
Device Settings (So10)	7.5	7.5	7.5	8.0	7.5	7.5
<b>Performance</b>						
<b>Zone 1 (100 MB File)</b>						
Signal Strength in Zone 1*	63.00	64.00	66.00	54.00	63.00	61.00
Single File (MBps)	0.83	0.58	1.29	0.49	0.36	0.37
Multiple Files (MBps)	0.66	0.53	1.07	0.40	0.31	0.31
<b>Zone 2 (50 MB File)</b>						
Signal Strength in Zone 2*	54.00	44.00	42.00	42.00	41.00	42.00
Single File (MBps)	0.88	1.21	1.22	0.47	0.13	0.11
Multiple Files (MBps)	0.63	1.09	0.87	0.39	0.11	0.10
<b>Zone 3 (25 MB File)</b>						
Signal Strength in Zone 3*	49.00	31.00	30.00	31.00	33.00	31.00
Single File (MBps)	0.45	0.65	0.60	0.37	0.19	0.17
Multiple Files (MBps)	0.39	0.54	0.50	0.34	0.16	0.15
Signal Strength at 20 metres (%)*	35.00	25.00	30.00	24.00	26.00	24.00
Video Streaming HD 720p WMV (Out of 10)	8.50	8.50	8.00	6.50	7.50	7.00
<b>Final Scores</b>						
Features (Out of 30)	25.97	23.66	23.99	22.47	23.84	23.78
Performance (Out of 55)	37.92	39.85	43.58	27.25	22.70	21.51
Price Index (Out of 15)	6.18	12.41	11.93	7.00	9.55	6.18
Grand Total (Out of 100)	70.06	75.92	79.50	56.72	56.08	51.46
<b>Price (Rs)</b>	<b>8,500</b>	<b>4,230</b>	<b>4,400</b>	<b>7,500</b>	<b>5,500</b>	<b>8,500</b>
Warranty (years)	2	2	2	2	3	3

\*From Wireless Mon 2.0



+ Fast and feature-rich  
- Expensive



+ Excellent value for money  
- None in particular



+ Very fast, well-priced  
- None in particular



+ Lots of features  
- Lacking in performance



+ Good signal strength  
- Low on performance



+ Good bundle and features  
- Low on performance, high on price

**Access Points**

Level One WAP-0010	Linksys WRT300N	Linksys WRT54G	ASUS WL-320G	Compex WP54G 1a	D-Link DWL-2100 AP	Linksys WAT54G	Senao ECB 3220
Router	Router	Router	AP	AP	AP	AP	AP
b/g	b/g/Pre n	b/g	b/g	b/g	b/g	b/g	b/g
X	X	X	X	X	X	X	X
X/X/X	✓/X/X	✓/X/X	✓/X/X	✓/X/X	✓/X/X	X/X/X	✓/X/X
3	2	2	1	1	1	2	1
✓	✓	X	✓	✓	✓	✓	✓
4	4	4	1	2	2	1	1
0	0	0	0	0	0	0	0
✓	✓	✓	✓	✓	✓	✓	✓
✓	✓	✓	✓	✓	X	✓	✓
✓	✓	✓	✓	✓	✓	✓	✓
✓	✓	✓	✓	✓	✓	✓	✓
✓	✓	✓	✓	✓	✓	✓	✓
X	X	✓	✓	X	✓ (Kit provided)	✓ (Kit provided)	X
X	X	X	X	✓	X	X	✓
NAT & SPI	NAT & SPI	NAT & SPI	NAT & SPI	NAT & SPI	NAT & SPI	NAT & SPI	NAT & SPI
✓	✓	✓	✓	✓	✓	✓	✓
✓	✓	✓	✓	✓	✓	✓	✓
✓	✓	✓	✓	✓	✓	✓	✓
✓	✓	✓	✓	✓	✓	✓	✓
X/✓	✓/✓	✓/✓	✓/✓	X/✓	✓/✓	✓/✓	✓/✓
X/✓	X/✓	X/✓	✓/✓	X/✓	X/✓	X/✓	X/✓
✓	✓	✓	✓	✓	✓	✓	✓
✓	✓	✓	✓	✓	✓	✓	✓
7.5	7.5	7.5	6.0	6.5	7.5	7.0	7.5
7.0	8.5	8.5	6.0	8.0	7.0	8.0	6.0
7.0	8.0	8.0	6.0	7.0	6.5	7.0	7.0
61.00	54.00	53.00	58.00	62.00	59.00	54.00	64.00
0.51	0.47	0.55	0.41	0.34	0.39	0.66	0.74
0.45	0.42	0.47	0.25	0.28	0.27	0.53	0.63
54.00	42.00	42.00	38.00	44.00	42.00	40.00	46.00
0.52	0.61	0.45	0.12	0.15	0.16	0.67	0.72
0.43	0.44	0.36	0.10	0.10	0.12	0.56	0.53
25.00	32.00	31.00	31.00	29.00	30.00	38.00	34.00
0.25	0.28	0.28	0.12	0.10	0.12	0.31	0.35
0.18	0.22	0.24	0.11	0.08	0.11	0.26	0.30
21	34.00	31.00	31.00	26.00	26.00	23.00	30.00
7.50	8.00	7.50	6.50	6.00	6.50	8.00	7.50
22.08	24.00	24.30	23.06	22.74	21.98	22.88	21.74
26.08	28.85	27.62	21.22	19.87	20.79	29.68	32.77
9.18	5.25	14.45	5.06	7.56	11.28	11.79	5.43
57.34	58.10	66.36	49.33	50.18	54.05	64.35	59.94
4,900	9,995	3,634	8,900	5,950	3,990	3,816	8,280
5	3	3	2	3	1	3	2



+ Decent performance, good warranty  
- Low on features



+ Very feature-rich, Pre n support  
- Expensive



+ Fast transfer speeds  
- None in particular



+ Decent features  
- Very poor performance



+ PoE support  
- Very poor performance



+ Good bundle  
- Low on performance



+ Great performance  
- None in particular



+ Great signal coverage and performance  
- Quite expensive



## ACCESS POINTS

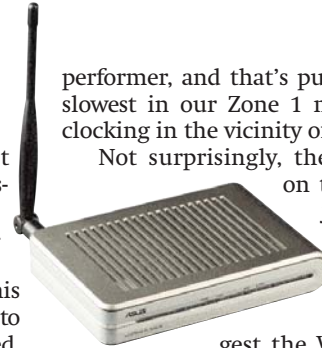
Five Access Points (APs) competed in our test. An AP is the simplest way to set up a Wi-Fi network at home. It's convenient to connect a single laptop to a PC. SoHos should look elsewhere, because APs typically have just a single RJ45 connect.

### ASUS WL-320G

#### Cool looker, light performer

The ASUS WL-320G is wall-mountable; since it doesn't have rubber foot pegs it will move easily if kept on a surface. It's well built, though, and the activity LEDs are well-placed and clearly legible.

ASUS has incorporated a high-speed mode on this model—Afterburner. The client device also needs to support it, in which case performance is boosted. Fancy titles aside, the WL-320G was a very mediocre



performer, and that's putting it mildly. It was the slowest in our Zone 1 multiple file transfer test, clocking in the vicinity of 400 seconds.

Not surprisingly, the lower data throughput on the WL-320G led to some jerks during our movie streaming test. Although it wasn't downright unwatchable, we wouldn't suggest the WL-320G for this specific purpose, especially at the steep price of Rs 8,900.

### Compex WP54G

#### An AP not worth accessing!

The third in the Compex trio to be received was a simple AP—no routing capabilities here.

The WP54G supports PoE (Power over Ethernet). Although PoE implementations differ greatly between manufacturers, the basic principle remains the same (see box *Wi-Fi Demystified*).

The WP54G lagged behind in quite a few tests, especially in Zone 3, where it was thrashed by the competition. In fact, data transfer was interrupted



once, due to a loss in signal integrity.

Video streaming, as we'd expected, was abysmal—jerking, and lots of interruptions. We don't recommend the WP54G as an AP, despite the inclusion of PoE—simply because of its inadequate performance. Its price tag of Rs 5,950 won't garner any accolades either.

## Wi-Fi Demystified

**Wi-Fi:** An acronym for Wireless Fidelity, Wi-Fi quite simply denotes “Wireless Networks” that conform to IEEE (International Electrical and Electronics Engineers) standards. The Wireless standard accepted by the IEEE is 802.11. The most common Wi-Fi standards within 802.11 are 802.11a, 802.11b, 802.11g, 802.11 Super g, and 802.11 Pre n.

**Gateway:** A gateway is responsible for proper data flow and distribution within a network and externally to other networks. The gateway machine is also called the host computer or network router.

**SSID:** Service Set Identifier or simply “Network Name” is the name (typically alphanumeric) by which a Wireless Local Area Network (WLAN) identifies itself. To communicate with any devices on a wireless network, all wireless devices must use the same SSID. The SSID can be kept private, in which case a user who doesn't know the SSID cannot gain access to that network.

**WEP:** Acronym for Wired Equivalent Privacy. This was the earliest security

method adopted by the 802.11 standard, providing 64- and 128-bit keys (hexadecimal coded) to protect wireless devices from unwanted intrusion.

**WPA/WPA2:** An acronym for Wireless Protected Access, which is a more secure method of protecting data transmission than WEP. WPA 2 is a newer protocol. It's also known as 802.11i.

**DHCP:** Acronym for Dynamic Host Configuration Protocol. It's a communications protocol that automatically assigns IP addresses to clients logging on to a TCP/IP network.

**MAC Address:** An acronym for Media Access Control Address. It's a unique identifier for an individual node on a Wi-Fi network. It is represented as a string of six pairs of hex characters, for example, FF.EE.FF.FF.00.FF

**NAT:** An acronym for Network Address Translation, it's basically a firewall feature. NAT is available on most routers today, both wired and otherwise. NAT enables individual IPs of clients on a network LAN to remain

invisible beyond the LAN, and any external communication occurs through the gateway machine. Packets of data received by the gateway machine are then routed to the clients that requested them. In case the packet received doesn't correspond with a request sent by a machine on a network, it is rejected.

**Port Mapping:** Port Mapping or Port Address Translation is the process of translating and routing packets arriving at a particular IP address or port to another IP address. Port Mapping bypasses NAT.

**Deep Packet Inspection:** Deep Packet Inspection (DPI) is a form of packet filtering that inspects the data portion of data packets as opposed to just checking the header portion. DPI is basically an evolved form of SPI (Stateful Packet Inspection).

**PoE (Power over Ethernet):** This describes the ability to transmit power as well as data to devices over an Ethernet cable. PoE is extremely useful in cases where the AP is placed in an area with no power point.

### D-Link DWL-2100AP

#### Slowcoach to Wi-Fi town...

The DWL-2100AP is well-built, sturdy, but light. It's also wall-mountable; a complete kit is provided. D-Link's firmware interface is good, but not as well laid-out as on the Compex products. The manual that accompanies this device is more informative than that that came with the other brands.

We were disappointed to see the scores on the DWL-2100AP. At 0.12 MBps it's a whopping 500 per cent slower than the ASUS WL-530G when it comes to transferring files across relatively larger distances!



Although it was faster than the Compex trio while transferring single large files, it lagged behind while transferring a bunch of smaller files. The movie streaming test also saw this AP trail behind what is acceptable for watching seamless video.

It's not suitable for file transfers or movie streaming if you intend to set up your server and client on different floors, or if the distance between AP and client is anything over 15 feet. At a price of Rs 3,990, you'd be better off buying the blazingly fast WL-530G, which throws in routing capabilities as well.

### Linksys WAT54G

#### The best access point out there!

The WAT54G is the AP equivalent of the WRT54G. Instead of just dropping out a few features (which it does), the WAT54G adds one: bridging capabilities. Besides the lack of the four RJ45 connects at the rear, the two devices look identical!

The firmware interface is identical to that of the WRT54G, aside from the lack of routing functions.

The WAT54G smoked the competition in our data transfer tests—its 0.66 and 0.53 MBps in Zone 1 (single and multiple file respectively) are faster than those of either of its brethren. Curiously, the WAT54G was actually faster in Zone 2—0.67 and

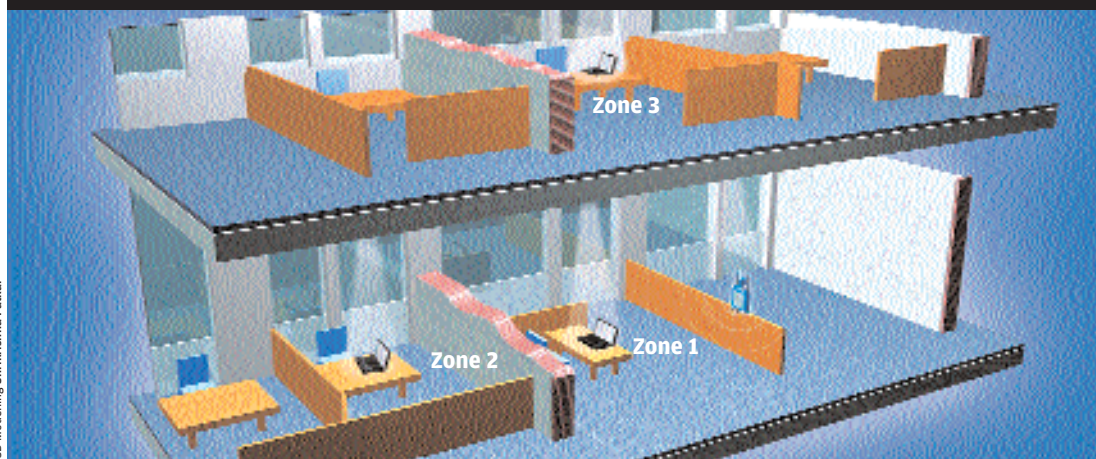


0.56 MBps, as compared to Zone 1. We ran our tests again just to be sure; while the results weren't identical (wireless transfers rarely are), they were consistent.

The WAT54G is a great access point, very deserving of accolades.

We recognize this and reward Linksys on a great product with our Digit Best Buy Gold award.

### Our Test Zones 1, 2 and 3 Demystified



3D Modelling Shrikrishna Patkar

### A Decision Maker

You Want	You Need	We Recommend
Wireless connectivity to your laptop from your desktop PC	An Access Point (AP)	Linksys WAT54G
To set up a small home network, between two PCs and your laptop or Wi-Fi enabled PDA	A Wireless Router	ASUS WL-530G, Linksys WRT54G
To stream movies from your PC's hard drive to your laptop(s) wirelessly	A Wireless Router/ AP	ASUS WL-530G, Senao ECB-3220
To set up a small office network wirelessly, complete with a network printer	A Wireless Router	ASUS WL-600G, Compex NP27G
An ADSL modem and a wireless router for a broadband connection, preferably wireless-enabled	A Wireless ADSL Router	Netgear DG834G, ASUS WL-600G

**Tips For A Better Signal**

**1. Interference**

2.4 GHz is the frequency used by most Wi-Fi devices. Unfortunately, this frequency is rather common: it's used by a few household devices, namely cordless phones and microwaves. Any Bluetooth device will also interfere with Wi-Fi signals, as will a cordless mouse.

**2. Attenuation**

Here are some common signal-scramblers. Every household will have most of these.

- Plasterboard wall: 3dB
- Glass wall with metal frame: 6dB
- Wooden partition: 4dB
- Office window: 3dB
- Metal door: 6dB

Metal door in brick wall: 12.4dB  
Now you know what happened to that signal! We're assuming average thickness here. The thicker you go, the lower your signal strength becomes. You cannot avoid attenuation from most of these materials, but knowing what material absorbs what may help you better position the router/AP.

**3. Up, up and away**

Heights are good, especially for wireless devices. Your router could even be mounted on top of a cupboard (just ensure it's away from walls if possible). Creating a little cradle mount dangling from your ceiling would be better. For a PCI wireless card, the metal cabinet and components will cause attenuation. No way to avoid this, but keeping your cabinet on a table (as opposed to on the floor) will help reception. PCMCIA cards in laptops will have the most problems with signals, and it's better to use the integrated Wi-Fi solution, as the antenna will probably extend into the screen area.

**4. Higher gain does not necessarily mean a better signal**

Higher gain means the signal is concentrated more in a particular direction. Note that the power supplied remains unchanged, just that the same amount of energy (beam) is focused in a much tighter area. Higher gain antennas therefore provide more

focused signal beams. They're better for large open areas, and may be less effective in case the site has a lot of attenuation-creating walls, furniture, etc.

**5. Other attenuating culprits**

Tinted windows will absorb a lot of your wireless signal. Note that regular glass windows will not. Even wire meshes and metal grilles will absorb signals like crazy. The degree of attenuation may be as much as what a solid metal object causes.

**6. Polarity**

By polarisation here, we mean the relation between the physical orientation of each antenna and the electric field that is parallel to the antenna. Omni-directional antennas have vertical polarisations due to the fact that they're meant to stand vertically. This is why most PCMCIA cards don't perform well in tandem with them (remember they slot into your laptop horizontally).

**Senao ECB 3220**

**A Bridge for all occasions**

Senao's ECB 3220 is positioned as a wireless bridge while also functioning as an AP. In fact, in keeping with its primary function (bridge), the ECB 3220 had the best signal in Zone 2, and just missed top spot in Zone 3. It's wall mountable.

Although Senao's firmware is reasonably laid out, it lacks detailed help on some settings. The basics are covered well though, but we had a few problems setting it up.

The ECB 3220s a steady performer. It didn't lose reception at all throughout the tests, even while moving between Zones—except while moving up the staircase to Zone 3.

You should know that all the devices in this test, with the exception of the ASUS WI-600G, lost reception while the laptop was being moved between zones. This tells us that the ECB 3220 has a very strong signal.

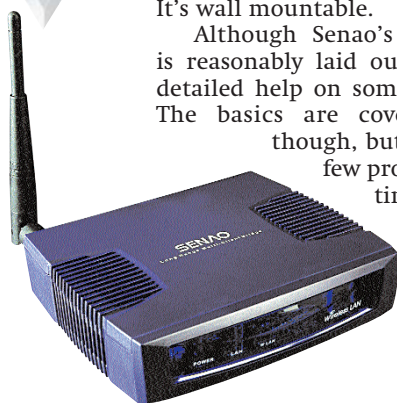
Carrying a price tag of Rs 8,280, the ECB 3220 is as expensive as an AP. However, because of its powerful signal, office users will find it useful as a bridge between two wireless networks. We're awarding it our Best Buy Silver award.

**New Horizons**

Throughout these tests, we hope one thing's become crystal clear... wireless devices, though offering freedom from wires, cannot sustain anywhere near the high data transmission rates that good old Ethernet can. However, Wi-Fi as a technology has matured sufficiently to allow us to surf the Net and stream audio and video sans the discomfort. And we're talking discomfort from iffy connections, sporadic transmission problems, loss of signal, etc. 54 Mbps may seem light years away from the actual transfer rates these devices offer when really stressed.

The silver lining on the wireless cloud promises to be the 802.11n standard. As of now, details about the exact specifications are sketchy (there's no formal draft as of today). What we do know is the intensity of signal will be much stronger than the current "g" standard. Also promised is nearly ten times the bandwidth—both the maximum theoretical and the typical (see table *Wi-Fi Standards*). If 802.11n realises this, we fully expect to see Wi-Fi penetration soar in our country as more and more people take the wireless plunge. ■

michael\_browne@thinkdigit.com



Contact Sheet		Wireless Devices	
Brand	Company	Phone	E-mail
ASUS	ASUSTek Comp Inc.	022-40058923	mamta_bhatia@asus.com
Buffalo	Advent Infotech Pvt. Ltd	011-41436751	buffalo@adventelectronics.com
Compex	Rashi Peripherals India Pvt Ltd	022-67090909	navinderc@rptechindia.com
D-Link	D-Link India Ltd	022-26526696	sales@dlink.co.in
Level One	Minds India Pvt Ltd	011-26312095	foziayasin@gmail.com
Linksys	Ingram Micro India pvt. Ltd	9323112279	sunil.z@ingrammicro.co.in
Netgear	Rashi Peripherals India Pvt Ltd	022-67090909	navinderc@rptechindia.com
Senao	Rashi Peripherals India Pvt Ltd	022-67090909	navinderc@rptechindia.com

# To Simpler Times

Cut through all the madness to generate reports quick and easy with Excel's PivotTables

Nimish Chandiramani

If you've ever heard of PivotTables, you either swear by them or they've successfully baffled you into not going near them. For a feature that does what it does, the PivotTable is probably Excel's best-kept secret—this despite the fact that it's the easiest way to generate reports of your data without knowing even a line of VB code. You don't even need to know what VB stands for to create one! (*Visual Basic, incidentally*)

We'll be using Office 2007 for this article—most of the features carry over from Office 2003, but the new ribbon on Office 2007 exposes a lot more features that you can use with PivotTables, so you might find something new even if you've been using them for a while.

## Life Before The Pivot

Imagine this rather innocuous table that looks at the sales of five products in three cities, by three salesmen. We'll be using this as a reference, but the principles will apply to any data that fits the "pivot-able" bill (we'll come to that in a bit).

Gauging a salesperson's performance in Mumbai, for example, is quite simple. You first need to apply a data filter and select Mumbai under City, then select each salesperson one by one from the respective column. Select the Units Sold column, and Excel gives you a total at the bottom right of your screen. Repeat for each salesperson, then repeat for each city. Ten rows of data, no code, fifty-odd mouse-clicks. In the real world, people need to deal with hundreds, even thousands of rows of data, perhaps fifty cities, a hundred salespeople and a whole lot more than just five columns. They also need to print out summary reports—something you can't achieve by the method above. Will they really resort to such ridiculousness?

Of course not. They will use code to generate their summaries—through judicious use of the SUMIF() and COUNTIF() functions and through macros meticulously crafted in long hours of overtime, impressing all and sundry and generally feeling good about their expertise. And then there are those who will use PivotTables—no code, no million mouse-clicks, same result.

## Gearing Up

Before we get down to creating and using PivotTables, you need to know whether you're going to benefit from it in the first place. There are just two basic requirements that your table needs to meet—at least one of your columns should have lots of repeated values (like City or Salespeople in our sample case) and numerical data. The latter is the more important of the two, which is why PivotTables find themselves used more for such things as sales and financial reports.

Next, you need to ensure that the table is formatted properly:

1. Each column should have a heading
2. There shouldn't be any blank rows between

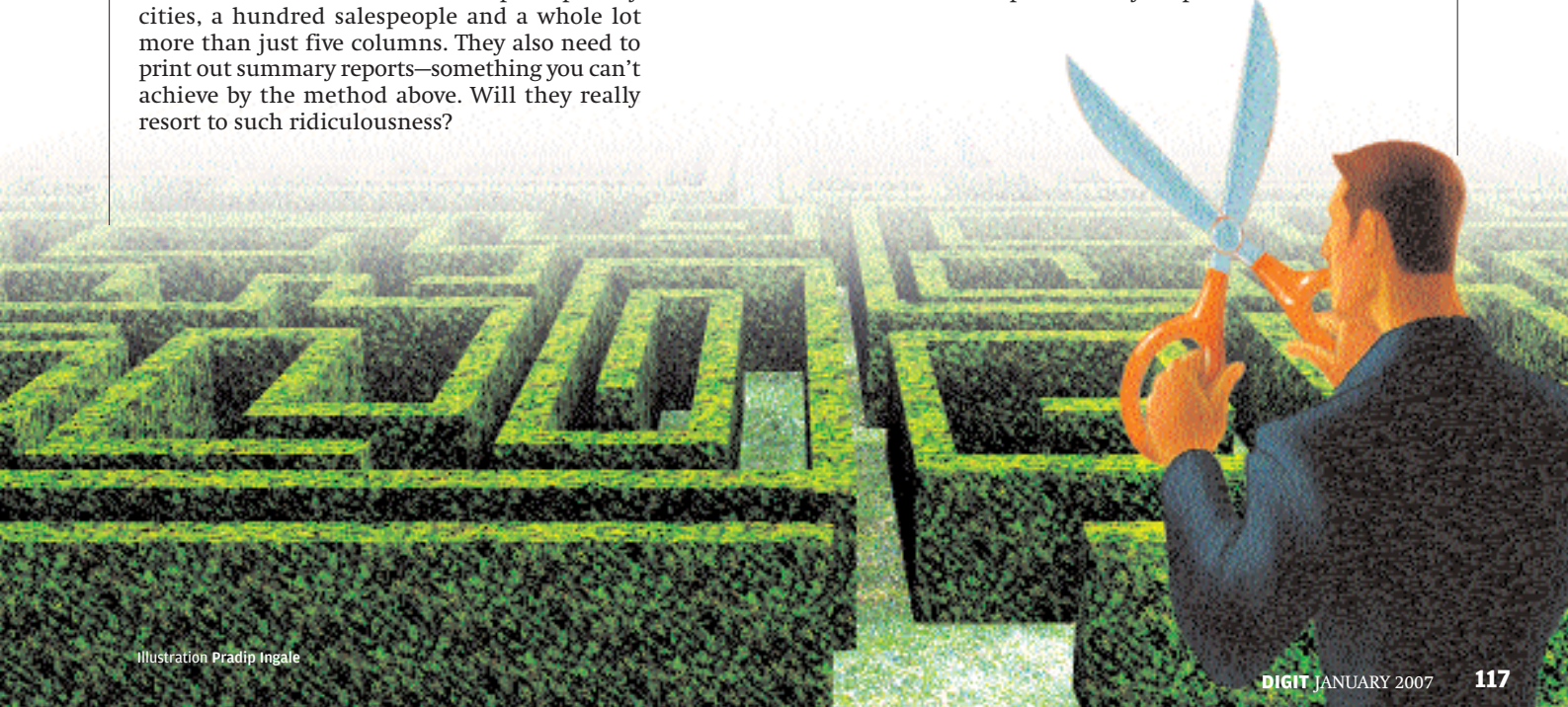
the headings and the data

3. There shouldn't be any blank rows or columns within the data; if possible, try to avoid blank cells as well

Once you've made sure of all this, your table is now pivot-worthy, or pivot-able.

	A	B	C	D	E
1	Order ID	City	Product	Units Sold	Sale
2	1	Mumbai	One	12	A
3	2	Delhi	One	22	A
4	3	Bangalore	Five	44	B
5	4	Mumbai	Seven	40	C
6	5	Bangalore	Two	23	A
7	6	Mumbai	Three	31	A
8	7	Delhi	Five	21	A
9	8	Mumbai	Seven	17	B
10	9	Bangalore	Three	60	C
11	10	Delhi	Two	31	C

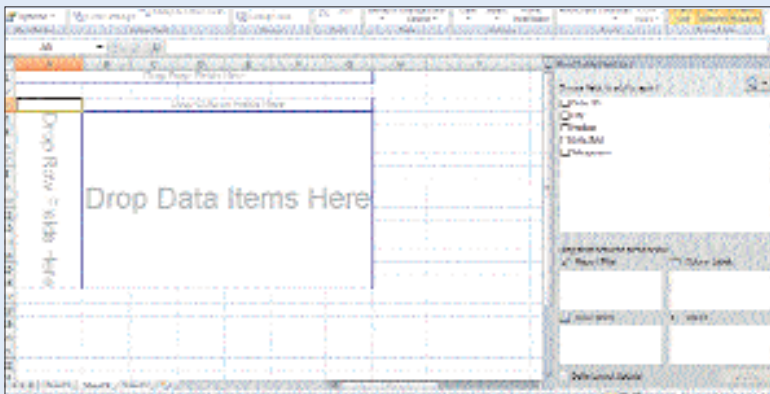
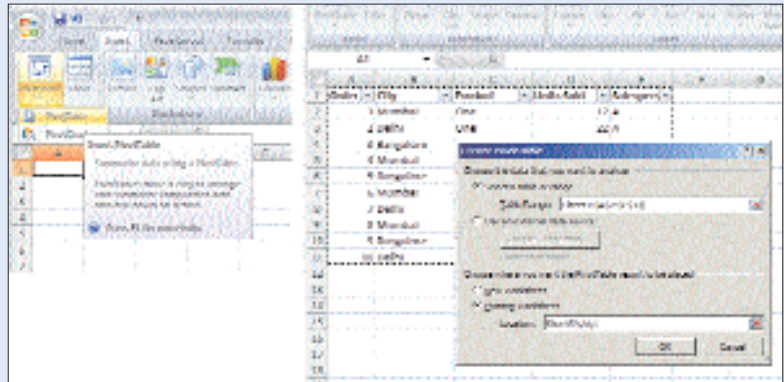
Your basic sales chart



WORKSHOP

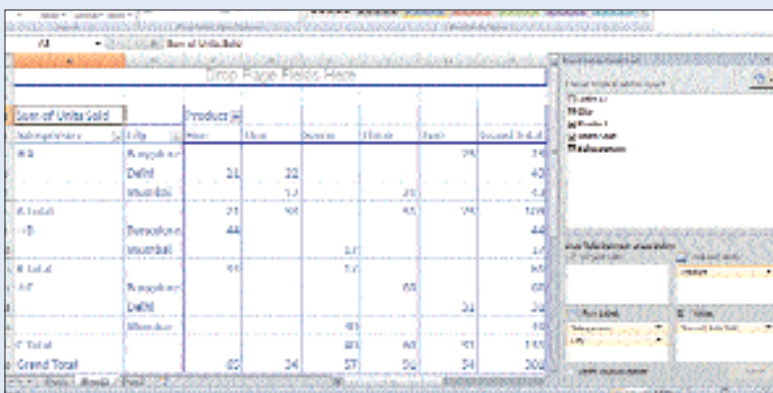
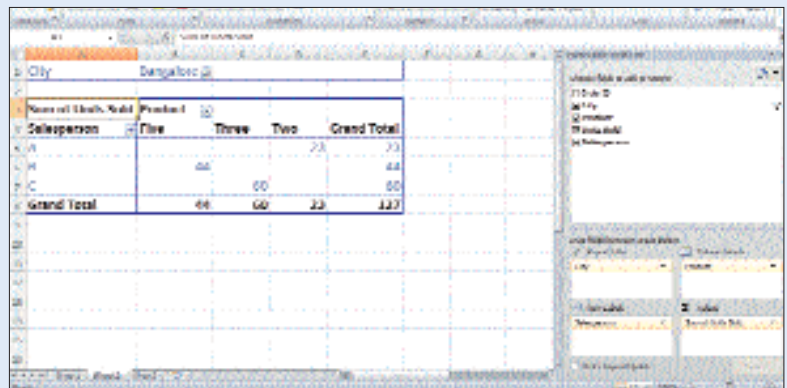
# Your First PivotTable

**1 STEP** The PivotTable button is the first under the Insert tab; click on it and select PivotTable (we'll come to PivotCharts later). Select your data table and click OK. You can create the PivotTable in a different worksheet to avoid clutter. You'll notice the option for External Data Sources—you can bring your data from another Excel sheet, an Access Database, or even an Oracle or MS SQL Server Database, if you prefer.



**2 STEP** This is what a blank PivotTable looks like. All your columns are now called *fields* and are displayed on the right in the Field List. Row and Column fields (Row and Column Labels in the Field List) are the ones you're going to establish relationships between (Salespeople and Products, for example) and Data fields (Values in the Field List) are the numbers that you're going to compare—in this case, Units Sold. Page fields (Report Filters in the Field List) are used to filter reports for a particular value in that column—City, for example.

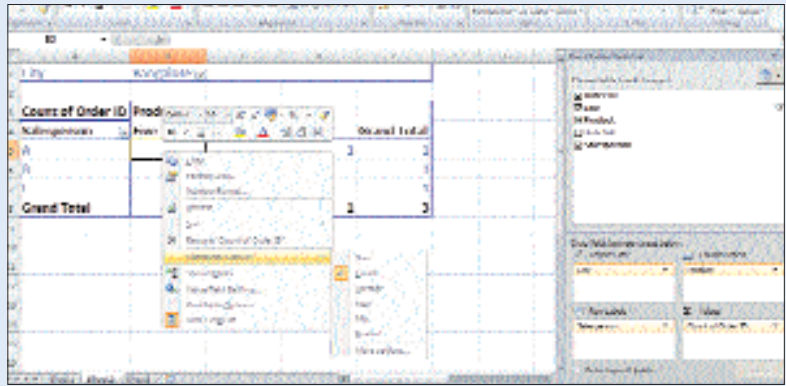
**3 STEP** You can drag and drop fields either within the blue boundaries you see in the PivotTables, or to the different areas in the Field List. This is an example of one in each—Salesperson under Row Label, Product under Column, Units Sold under Values and City under Report Filter. This gives us the number of units sold by each salesperson broken up product-wise, the total number of units sold for each product, and the total sales for each salesperson in the Grand Total row and column respectively. You can now select a city from top row to get the same report for each city.



Adding more fields to the Row Labels will group data in the order that it appears—in the above case, putting in Salesperson and City in that order gives us a city-wise break-up of their sales for each product. Change the order, and you have a salesperson-wise break-up of units sold in each city. You can even take City to Columns (this is called *pivoting*, and hence the name PivotTable) for a different view.

**4 STEP** When you drag a numerical field to the Values area, you'll notice that it gives you the sum of the values in that field by default. Suppose you wanted to see the number of orders for each salesperson. If you drag Order ID to Values, you get the sum of the IDs, which you clearly don't want. This is where "Summarize Data By" comes to the rescue. Right-click anywhere in the Data area and select **Summarize By > Count**.

You'll notice that you can also summarise data by average, maximum, minimum and so on. Incidentally, if you're using non-numeric data, Excel automatically summarises it by count.



Salesperson	City	One	Seven	Three	Two	Grand Total
A	Bangalore					23
	Delhi	21	22			43
	Mumbai		12	31		43
<b>A Total</b>		21	34	31	23	109
B	Bangalore	44				44
	Mumbai		17			17
<b>B Total</b>		44	17			61
C	Bangalore			60		60
	Delhi				31	31
	Mumbai			40		40
<b>C Total</b>				40	60	100
<b>Grand Total</b>		65	51	97	94	307

**5 STEP** Use the Styles under the Design tab to select a style for your PivotTable. Many have separate shades for subtotal rows—an added help when visualising your report. You can also use this tab to tweak display settings like whether or not to show subtotals and grand totals.

**6 STEP** For even more visual aid, you can use Conditional Formatting in your table even better in Excel 2007. For example, we used the Data Bar formatting for one of the cells; click on the icon that appears next to the cell, and you can apply that formatting to all data that links Salesperson and Products.

Salesperson	City	Five	One	Seven	Three	Two	Grand Total
A	Bangalore						23
	Delhi	21	22				43
	Mumbai		12	31			43
<b>A Total</b>		21	34	31	23		109
B	Bangalore	44					44
	Mumbai			17			17
<b>B Total</b>		44		17			61
C	Bangalore			60			60
	Delhi				31		31
	Mumbai			40			40
<b>C Total</b>				40	60	31	131
<b>Grand Total</b>		65	51	97	94	61	308

Salesperson	City	Five	One	Seven	Three	Two	Grand Total
A	Bangalore						23
	Delhi	21	22				43
	Mumbai		12	31			43
<b>A Total</b>		21	34	31	23		109
B	Bangalore	44					44
	Mumbai			17			17
<b>B Total</b>		44		17			61
C	Bangalore			60			60
	Delhi				31		31
	Mumbai			40			40
<b>C Total</b>				40	60	31	131
<b>Grand Total</b>		65	51	97	94	61	308

The result is that no matter how much you rearrange fields (we switched Salesperson and City here), the conditional formatting rule still applies, so you can go about tweaking your table without a care in the world.

### Even More Visual

For a graphical representation of your PivotTable, you can use PivotCharts—you can either create both the PivotTable and PivotChart from the Insert tab > PivotTable button, or you can generate a PivotChart from an existing PivotTable in the Options tab under the PivotTable Tools.

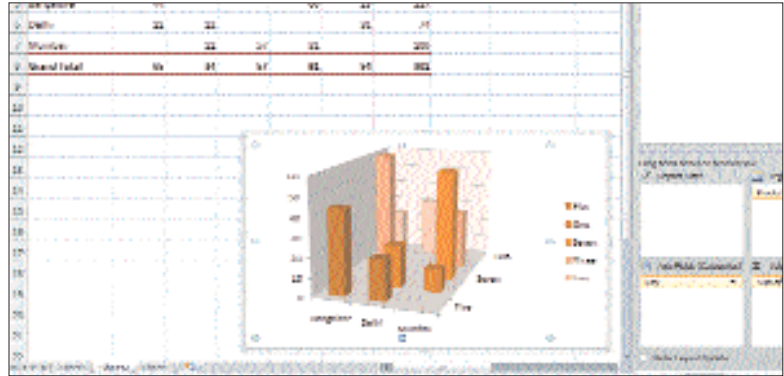
More often than not, you'll find the 3D charts more useful to represent data. Column fields are now Legend fields (they'll be represented in different colours), Row fields are now Axis fields (they'll be represented as the X and Y axis), and Value fields remain the same (they'll be represented along the Z axis). Moving these fields around will also cause your PivotTable to rearrange itself. Getting PivotCharts to work right can be tricky business, especially if you have too many axis fields.

### Little Things

When you start dragging fields to create the PivotTable, Excel updates your view in real time. If you're working with copious amounts of data, this can become a real burden on your system, especially if you're experimenting with different layouts. The best way to avoid this is to use the little "Defer Layout Update" checkbox at the bottom of the Field List, and click the Update button only when you're ready to see how your new layout looks.

When you update any data in the source table, you need to manually refresh the PivotTable for the change to get reflected, so it's

better if you generate the PivotTable after you're done making changes to the source table—forgetting to refresh the PivotTable can lead to erroneous reports. The best way to avoid this is to write a macro that refreshes the PivotTable every time the source table is updated



The PivotChart is a graphical version of your PivotTable

### Endnote

The only trouble with PivotTables is that you never really know whether it applies to your data, which is probably why most people avoid it.

As you've seen, though, they're very simple to understand, and the best way to find out if it applies to you is to try it—you might have your answer in as little as half an hour! ■

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**I am my own network manager**

Technology is not your profession. Yet, as a small business owner you have to deal with it everyday. From your workstations, printers and all those pieces of hardware to managing your intranet, the accounting software and keeping those viruses away, your business depends on technology.

What you need is a trusted navigator who helps you understand, choose, buy and most importantly, use technology.

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**digit**

## Thin Clients For Small And Medium Businesses

Is it a feasible option—and for whom does it work best?

### The data is centralised, so management has become easier

*Narang Medical Limited is a leading manufacturer and exporter of medical supplies, surgical instruments, hospital equipment, laboratory products, and diagnostics. Located in New Delhi, the firm's office has about 25 thin clients.*

“We have been using thin clients for the past one year and I must say I am happy with the way things have turned out. My employees, too, seem quite satisfied because as far as they are concerned, nothing has really changed except for the better. They still use all the applications they used to, and it's faster, too. For the kind of applications we use—Tally, MS Office, IE, and IIS, I think thin clients



**Parveen Narang**  
Director  
Narang Medical Ltd

“There has been a great investment utilisation. Expensive peripherals like printers and scanners have also been centralised, cutting down on costs”

are most appropriate. There have been no complaints of different performance on different systems—all the clients run at the same high speed. We have a server with two dual-core processors, 4 GB of RAM, and RAID 0+1 protection.

“Look at what we have gained. The data is centralised, so management has become easier. Software updates take place only on the server. The administrative staff no longer run about fixing a system or an application every now and then. Virus protection has also gotten a lot better. Moreover, we now have only the server to back up. Due to better organisation, maintenance costs have been brought down, and is under better control.

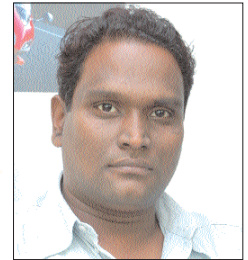
“The workstations themselves are scaled down, and so are far cheaper. No hard disk, no CD, no DVD on the clients. Expensive peripherals like printers and scanners have also been centralised, cutting down on costs. We now have a UPS connected only to the server. I do not need to buy expensive workstations for each additional staff—I can use old, outdated systems as thin clients. The old 10 Mbps hub is usable again. There has been a great investment utilisation.

“Things have been pretty stable, except during the installation and testing. It's been smooth since. A setup without thin clients is simply unthinkable for us. For similar setups, I believe thin clients are the way to go.”

### It's not for applications that deal with a huge database

*Hallmark Honda is a Honda dealer located in Navi Mumbai. They have a setup of about 50 computers.*

“We use Windows NT on the server and XP Professional on the clients. We have an in-house development team. Our primary application is the Dealer Management System. We use Access, VB, and SQL Server. Response time is very important, as we are directly dealing with customers all the time. I am not convinced that thin clients would give me the same response time as my current setup. That's the whole idea of client/server technology—distribute computing to enhance speed.



**A B Bhupesh**  
Manager-IT  
Hallmark Honda

“I would like the server to remain what its name suggests—a file server, and leave the actual computing to the clients”

“Our DMS system incorporates a lot of features like generation of ad-hoc reports by the users themselves. This can be practically possible only with a fat client with enough computing power of its own, else you would simply end up taxing the server, resulting in a breakdown. I would like the server to remain what its name suggests—a file server, and leave the actual computing to the clients.

“A lot of our code has been specially written to work on the client. Some of the code is even stored and can be executed by only specific clients. Some of our workstations are dedicated to users of huge Excel sheets throughout the day. We have quite a few users who have their own Excel sheets at their workstations, which are updated to the server only at the end of the day. I shudder to think of the state of the server with such user demands. I guess we would be constantly reconfiguring and upgrading our server—probably every three months—with thin client technology. It's not for applications that deal with a huge database.

“We would definitely not be using thin clients—on the contrary, we are constantly looking to free our server of as much work as possible.”

*As told to Arvind Subramanian  
(arvind\_subramanian@thinkdigit.com)*





**128** Epic Adventures



**133** James T Russell



**148** Here We Go Again...

# Digital Leisure

Technology Beyond Work

## Lead Feature

# Art For The Asking

Fractals, demonstrating infinite complexity from infinite simplicity, showcase nature itself

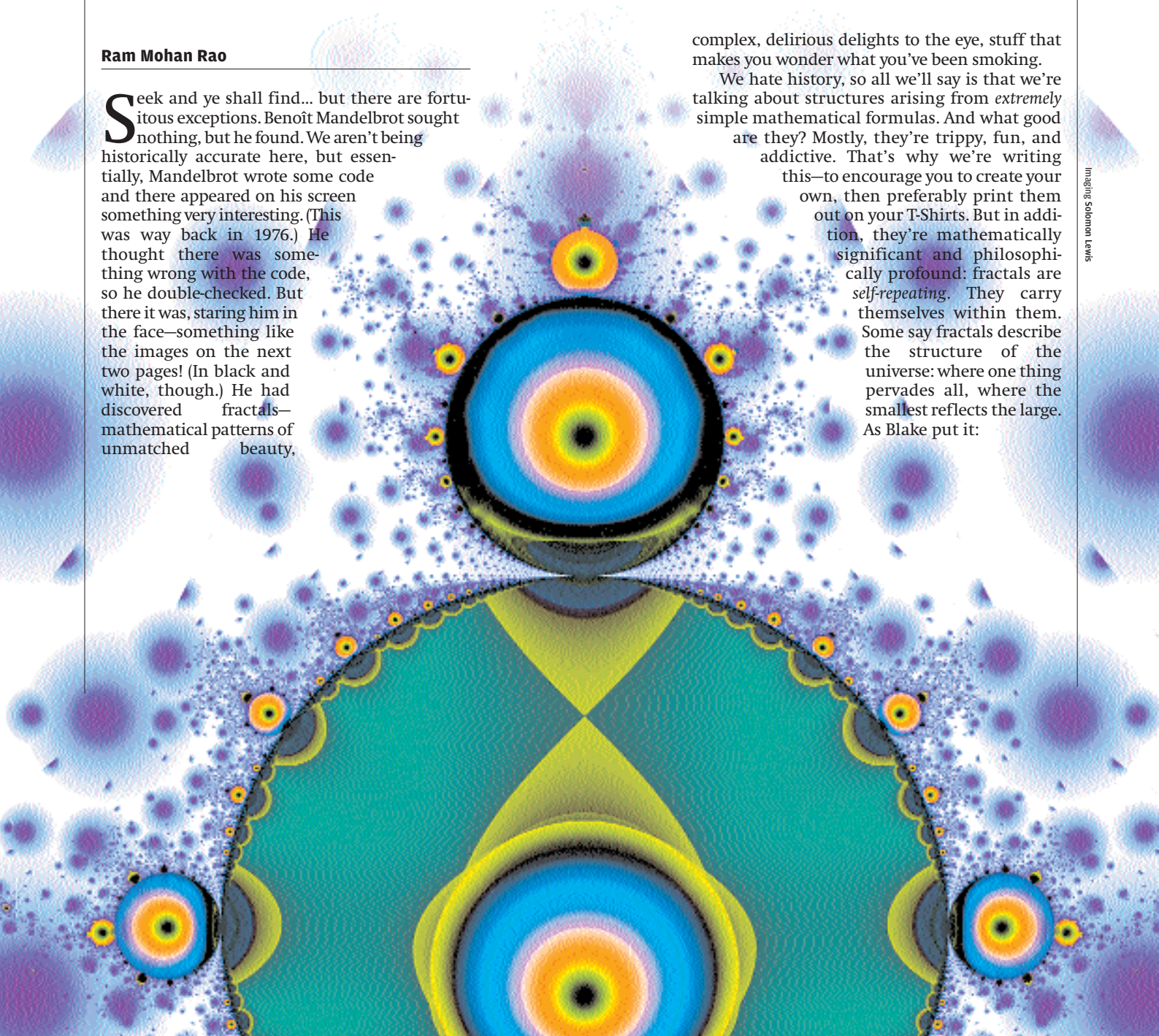
Ram Mohan Rao

Seek and ye shall find... but there are fortuitous exceptions. Benoit Mandelbrot sought nothing, but he found. We aren't being historically accurate here, but essentially, Mandelbrot wrote some code and there appeared on his screen something very interesting. (This was way back in 1976.) He thought there was something wrong with the code, so he double-checked. But there it was, staring him in the face—something like the images on the next two pages! (In black and white, though.) He had discovered fractals—mathematical patterns of unmatched beauty,

complex, delirious delights to the eye, stuff that makes you wonder what you've been smoking.

We hate history, so all we'll say is that we're talking about structures arising from *extremely* simple mathematical formulas. And what good are they? Mostly, they're trippy, fun, and addictive. That's why we're writing this—to encourage you to create your own, then preferably print them out on your T-Shirts. But in addition, they're mathematically significant and philosophically profound: fractals are *self-repeating*. They carry themselves within them. Some say fractals describe the structure of the universe: where one thing pervades all, where the smallest reflects the large. As Blake put it:

Imaging Solutions Labs



...Infinity in a grain of sand,  
And eternity in a flower.

Now you're probably wondering what *this* writer's been smoking, so without much ado, look on this month's CD to find fractal programs such as Fractal Forge (FF) and Fractint. Neither of these require installation. FF, as well as the DOS version of Fractint, feature colour cycling—very, very trippy—while the Windows version of Fractint doesn't support it in most cases. Fractint is the older, most well-known fractal-generating program; FF is newer, and the UI is more user-friendly with more obvious options.

### Creativity 101

Fractals are, generally speaking, so intricately beautiful that it's easy to think you're being creative when you generate a sufficiently complex one!

The fact is, it's nature doing it for you—it's numbers working their magic. Now what's hard is coming across something unique—like a fractal island or river in uncharted territory—which comes only with patience, hard work, and all the other virtues.

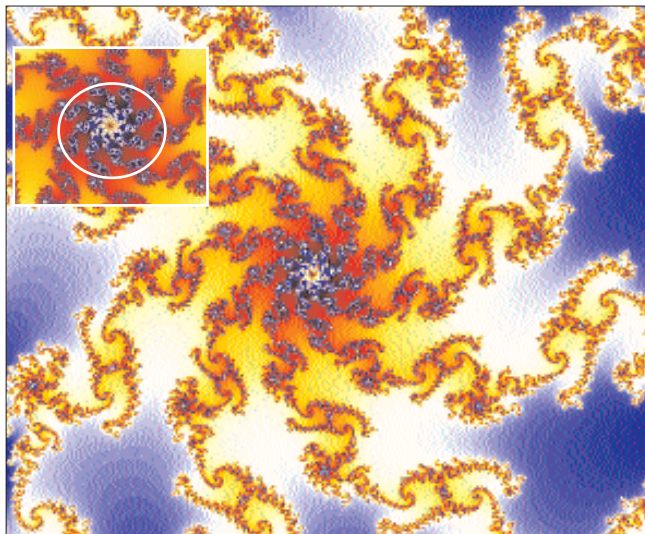


Figure 1: An incredibly elaborate spiral (top left), when zoomed into (the white circle), gives more of the same... there's no getting to the centre!

Right. So when you fire up, say, Fractal Forge, you get an interesting-looking structure. This is called the *Mandelbrot Set*. It's a fractal. Zoom in, and the plot thickens. The pattern gets increasingly complex. Zoom in even more, and you'll notice that "deep inside" is the same shape you saw in the beginning—in fact, lots and lots of them! Tiny little buggers, representative of the whole. Swirling round them are rings, rivers, beaches, islands—all swathed in passionate, psychedelic colour.

### Taking Control

We're not going into the mathematics here, but there are a few things you need to know. First read box *How It Happens*, then come back. Good. Now, the basic Mandelbrot set is generated without any special functions; it's just



Figure 2: Hills, islands, rivers, and oceans—the Phoenix set

squaring and adding. Twists happen when you add functions such as the sine and the cosine to the equation.

However, if you follow the rule of continually squaring and adding, you're still in the Mandelbrot "family" of fractals. There are many more—explore the other sets in, for example, Fractint, which are generated using different formulas. Remember that the key attribute of a fractal is that it is self-repeating.

### Happening Places

Now that you're hooked, you need to go out and look for where the interesting patterns are. Let's use the standard Mandelbrot set.

Generally, you need to look at two kinds of things, which are usually at the intersection of two major dark areas:

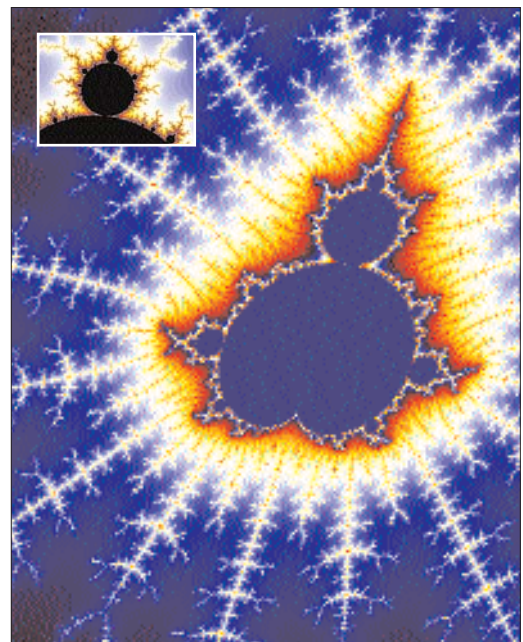


Figure 3: The typical Mandelbrot Shooting Star (upper left), which can be seen in many forms in the Mandelbrot set, shoots into baby Mandelbrots like this one. Note that this is typical of an "explosive" landscape

- Places where the energy seems to shoot forth, and
  - At where the force field seems to dissipate.
- If you've been observing your fractal patterns carefully, then (and only then!) will the above make sense!

When we talk about energy shooting forth, it's in areas like the top left in Figure 3, and when we talk of the field dissipating, it's the circled part in Figure 4. Figure out for yourself where more such areas lie.

The thing is *infinitely* zoomable, only limited by computing horsepower! So when we say "find out such areas," *don't* limit yourself to the main fractal—zoom in to totally random areas, zoom in even more, find more and more balls and spirals and such, and try to find the "energy" and the "dissipation"!

Note, though, that you'll have to set high values for the number of iterations as you zoom in further, or you won't get the real picture.

An aside: talking about computing horsepower, back in 1995, on our 386 machines, the screens that now get generated for you in a few seconds would take hours, if not days!

### Natural Fractals

We did say that fractals showcase nature. How...? The fact is, nature abounds in fractal formations. Take the Java applet at <http://snipurl.com/fract1> (<http://math.rice.edu/~lanius/frac/koch/koch.html>). There, the second iteration onwards, you'll see what looks like a snowflake. As you keep iterating, you'll find it getting more and more complex... and it becomes self-similar. That is, everywhere along the edges, it looks like the main shape itself. There are only so many iterations you can do with

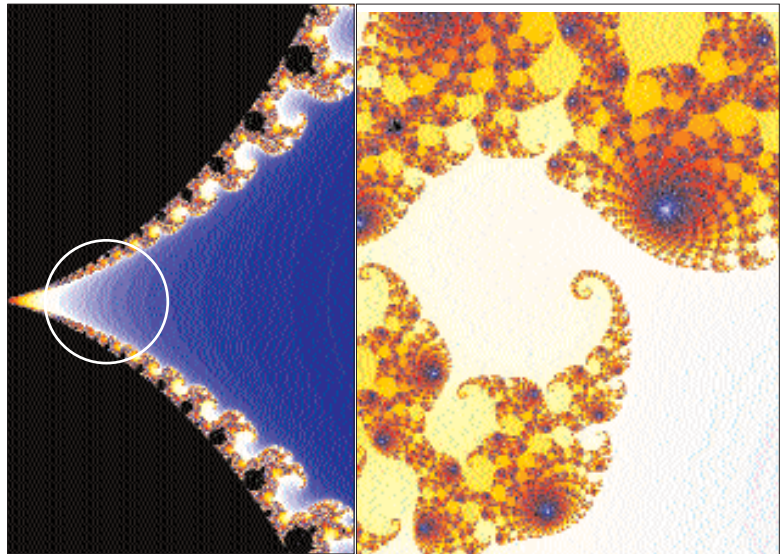


Figure 4: If you zoom into the areas of what looks like an unmentionable body part, you'll find the landscape is vastly different. Softer, gentler curves. No shooting stars

### How It Happens

Someone once said the sales of a book would drop by a factor of two for each equation inserted. In that vein, we'll explain how fractals work without using a single equation! However, you'll *need* to know about imaginary numbers, otherwise you might as well skip this. OK, to ease up a bit, think of the square root of -1. It cannot *have* a real square root, of course, because no real number, when squared, will give a *negative* number! The square root of -1 is therefore called "i", standing for "imaginary"; it's a number that's not on the line of real numbers.

Now, think of a number *plane*. "2 + 3i" represents the point which is 2 units from the origin on the X axis, and 3 units from the origin on the Y axis. See how the concept of an imaginary number leads to a number plane instead of just a number line?

And now, take that number and square it. You get (-5 + 12i), because  $i^2$  is -1. Square it again. You get (-119 - 120i)... and so on. If the number runs away to infinity, it's not "part of the fractal set," and is painted white. If the number does *not* go to infinity, and stays within limits, it's part of the set, and is painted black. Take (0,0): it's obviously part of the set, because no matter how much squaring you do, it'll remain 0.

So how do you get colours? A point is marked with a certain colour depending on how *long* it takes to move to infinity. Light colours are for those that become huge fairly quickly; dark colours are for the ones that take longer to become large. But how many times does one keep squaring? Obviously, one sets a stop point: "we'll iterate 200 times," for example. After the 200 iterations are done, a colour is assigned, based on how far it has moved to infinity (or how close it has stayed to zero).

You'll often see the word "Julia" in fractals. This is the "complement" of the main set: there is a Julia set for each point in the plane. A point *within* the main set will generate a Julia set with only one shape; one *outside* the set will result in two shapes close to each other.

that particular applet, but you'll get the idea.

Coastlines, too, are something like this. If you were to measure a coastline with a mile-long ruler, you'd get a certain length.

Make it a foot-long ruler, and you'll see that it's longer than you thought. And so on. Ultimately, you'll find you just can't measure a coastline—it's infinitely long!

That's where the fractal part comes in—coastlines are *infinitely* detailed.

Mountains, snowflakes, leaves... are all fractals. Look at a leaf: it's got a main line with "branches." These branches have similar branches, and so on—and ultimately, if you examined it under a microscope, you'd probably find the same pattern repeated infinitely.

The above is just a rough introduction, and fractals in nature is an immensely interesting subject.

Visit <http://snipurl.com/fract2> (<http://kluge.in-chemnitz.de/documents/fractal/node2.html>), and <http://snipurl.com/fract3> ([www.miqel.com/fractals\\_math\\_patterns/visual-math-natural-fractals.html](http://www.miqel.com/fractals_math_patterns/visual-math-natural-fractals.html)).

### Getting Down To It

Now, it's rather pointless telling you what parameters to change and why and how. FF features a comprehensive tutorial. We'll tell you this, though—that seemingly unrelated parameters, when changed at the same time, can lead to a drastically different picture.

Also, just try changing the real and imaginary parts of the "perturbations" in FF a wee bit and be amazed! In other words, just keep playing around...

It's a matter of discovery, and we can't teach you fractal art. Just explore *as many regions of the initial fractal* as you can.

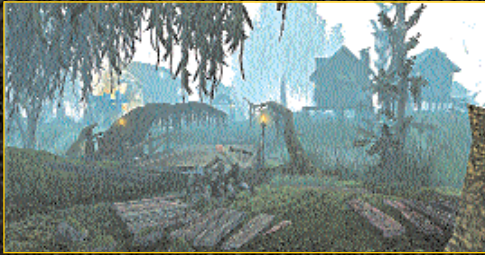
If you come across something truly unique—such as interesting symmetries—do remember to save them and send them in to us.

Welcome to psychedelia—the natural way! ■

[ram\\_mohan@thinkdigit.com](mailto:ram_mohan@thinkdigit.com)

# Neverwinter Nights 2

## Epic Adventures



The follow-up to NWN—the much-revered “RPG Game of the Year 2002”—Neverwinter Nights 2 (NWN 2) is finally here. NWN went down in the annals of gaming history as the first RPG ever to combine the hardcore D&D rule set into such an involving game. NWN 2 follows suit, with a brand-new graphics engine, an even more epic storyline, and subtle elements interwoven into the gameplay that add to the overall experience.

Like the new playable classes. Besides adding a race to the mix of elves, dwarves, and barbarians, you now have a bunch of new prestige classes, and a new base class *The Warlock*. Character customisation is much more involving than in NWN, and fans will spend a lot of time building characters and customising them.

Without any spoilers, the story plays you as a nondescript resident of a tiny village, West Harbor. You're tasked by your rather stern stepfather with retrieving a magical shard from nearby. Upon successful return you discover the town's been attacked—naturally, the attackers wanted the shard you just acquired. You are

then packed off by “dad” to the city of Neverwinter. Needless to say, adventures abound *en route* and later.

What's really wonderful is the way the story involves you, with storyline missions, sideline missions, and some mini-game-like elements, like playing Lord of your very own keep! That's all the tantalising storyline titbits you'll get from me...

NWN 2 earns a must-play tag even before you consider its excellent visuals. Although not the most splendid-looking RPG title, the graphics are very much up there. Spell and weapon effects are excellent, and so are character model animations. The Aurora 2 engine really delivers!

NWN 2 isn't really taxing graphically, except at maximum detail and high resolutions, at which even the 512 MB on my x1900xt didn't help much. There were just a couple of instances of framing, though, during the countless late-night sessions spent smiting evil and great cleaving! A must-try for any gamer worth his sand.

*michael\_browne@thinkdigit.com*



Rating:  
9/10  
Developer:  
Atari  
Publisher:  
Obsidian

System Requirements:  
Pentium IV 1.8 GHz or equivalent,  
512 MB RAM, Direct X 9 compliant 128  
MB graphics card,  
Direct X 9 compliant sound card

# Suit up, Pilot!

The best way to elicit tortured groans from any game reviewer is to throw a World War II game at him. The theme has spawned some of the most ridiculous games we've played, but thankfully, *IL-2 Sturmovik 1946* isn't a product of that heartless factory.

The *IL-2* flight simulator series has been around for five years now, and this edition is effectively a round-up of the game and its expansion packs through the years, plus three new ones—*PE-2*, *Sturmoviks over Manchuria* and *46*. The missions and campaigns give some long-overdue attention to the Axis side of WWII as well, even letting you bomb Pearl Harbour! All this adds up to a total of more than 300 different aircraft (and you can fly around 200 of these), so expect to be kept busy for a long time.

Like all worthy flight sims, you can't just jump into the game without familiarising yourself with the long list of flight controls and training missions. Gameplay is as beginner-friendly as these games can get—you can tweak the level of realism you get, though it's fairly tough even at the easiest level. At its most realistic, *IL-2* is pure torture, and will only appeal to hardcore fans of the genre. One nifty feature you'll need when you're starting out is the time-stretching feature, which lets you slow down the game to a quarter of its normal speed—excellent when you're learning combat. Low-altitude dog-fights are extremely challenging, and can be a thrill as you battle it out while trying to keep your wings from hitting treetops. The variety of aircraft at your disposal is mind-boggling, and each has its own perfectly-crafted eccentricities.

The game's graphics look dated—they haven't been updated much since 2001—but the developers' attention to detail is marvellous. Textures degenerate according to the punishment they take (including getting blackened by engine exhaust!), and each plane's cockpit is a near-perfect replica of the real thing, as explained in the 450-page aircraft guide that comes with the game.

*IL-2 Sturmovik 1946* is an important milestone in the series, and because it comes loaded with the entire set, you don't need to buy any of the previous lot. Invest in this game if you want something that lets you start out with flight simulators at a comparatively easy level, and adds realism to the gameplay as you get better. If you're a hardcore flight-sim fan, it's a crime to miss this one.

[nimish\\_chandiramani@thinkdigit.com](mailto:nimish_chandiramani@thinkdigit.com)

Rating: 8/10

Developer: Maddox Games, Publisher: Ubisoft

Distributor: E-Xpress Interactive

Contact: [sales@e-xpressindia.com](mailto:sales@e-xpressindia.com)

Price: To Be Announced

Minimum System Requirements: Pentium III 1 GHz, 512 MB RAM, 64MB Graphics Card





# SID MEIER'S RAILROADS!

**S**id Meier's *Railroads!* is a revival of the old *Railroad Tycoon* series that we've all known and loved for so long. The objective remains the same—build your own railroad empire, connect a nation, buy out your competition, and become the king of the railways. You can make your money by connecting cities so they can exchange goods and passengers, buying businesses in those cities, and dabbling a bit in the stock market.

We've reached a point where any game with the Sid Meier name comes with high expectations attached, and *Railroads!* is no doubt one of the most enjoyable games this reviewer has come across in ages. Most importantly, the game's structure has been vastly overhauled. There is just enough micromanagement—both in your finances and in

the actual building of the railroads—to make you feel like you're totally in control, but this never feels tedious.

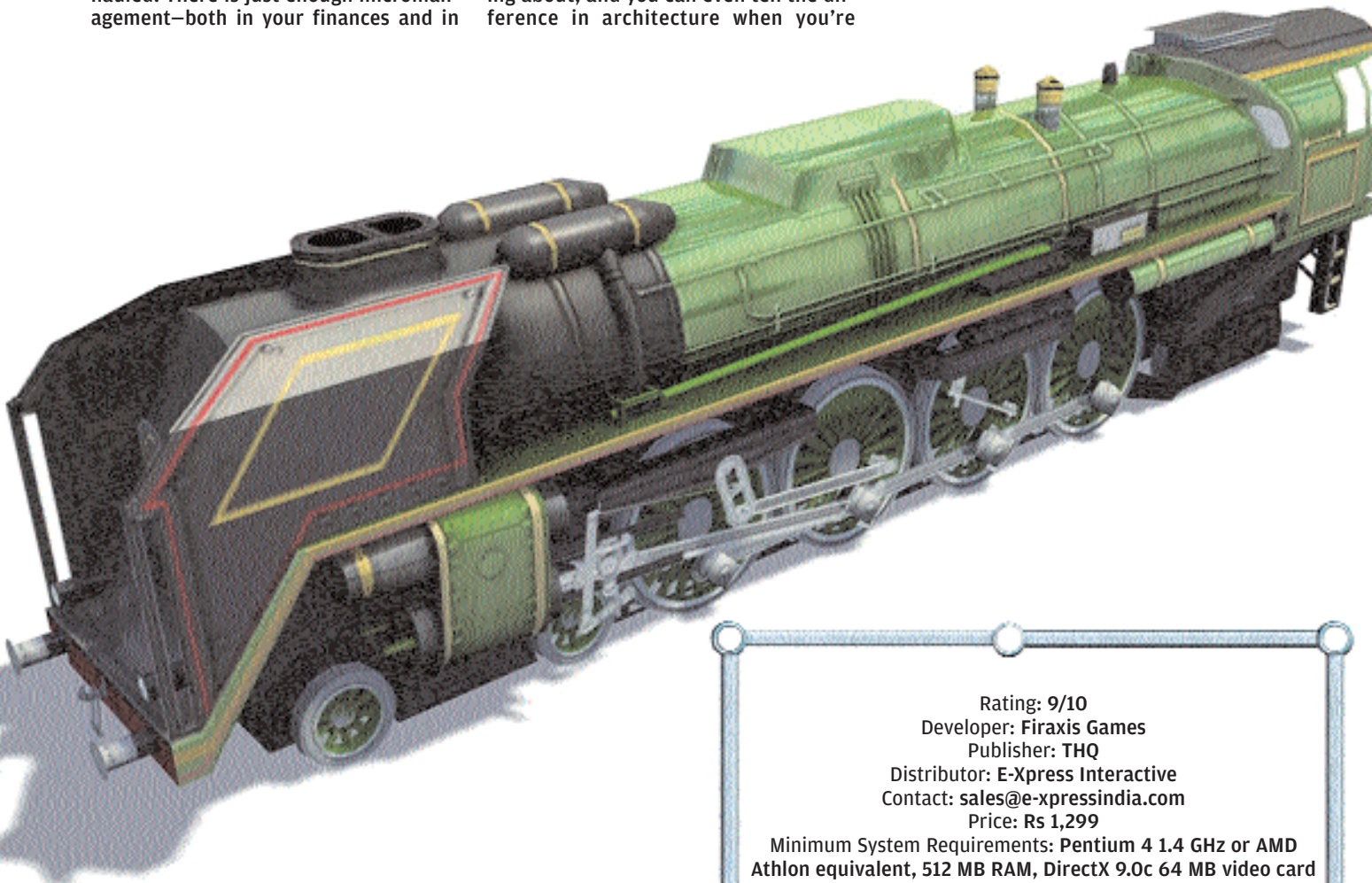
For a strategy/simulation game, I found this surprisingly fast-paced. Your opponents—the AI equivalents of greats like J.P. Morgan and the Baron Rothschild—work fast, and you're going to have to make some really quick decisions—some of which might bite you later—as you compete against them. At no point did I feel deprived of entertainment through my hours of play. Online or LAN play is even more entertaining, and the game comes with some very interesting and challenging maps to compete on.

Visually, graphics are meticulously detailed—train models are like the real things, stations have little people walking about, and you can even tell the difference in architecture when you're

building your railroad in Eastern Europe or America. All these treats come at a price, though—it's not as gentle on your graphics card as you'd expect. There are also a few aberrations here and there—trains wantonly going through houses and the like—but they're all forgiven when you look at the big picture.

That big picture is that *Railroads!* has tremendous appeal for people of all ages, shapes and sizes, and that appeal isn't going to go away soon. It's one of those few games that force you to use your brains, so grab yourselves a copy before your grey cells rot.

*nimish\_chandiramani@thinkdigit.com*



Rating: 9/10  
 Developer: Firaxis Games  
 Publisher: THQ  
 Distributor: E-Xpress Interactive  
 Contact: [sales@e-xpressindia.com](mailto:sales@e-xpressindia.com)  
 Price: Rs 1,299

Minimum System Requirements: Pentium 4 1.4 GHz or AMD Athlon equivalent, 512 MB RAM, DirectX 9.0c 64 MB video card

## Eternal Vacation

Someone out there recently got an automated response after reporting a phishing attempt to HSBC. It contained the line "I will be out of the office starting 05/10/2006 and will not return until 17/07/2050." A 44-year vacation? No wonder bank jobs are so much in demand!



## They Prefer Their Apples Green...

Five months ago, Greenpeace said Apple was the least "green" of the major tech companies, grading their use of toxic chemicals in products. They're now *again* giving Apple the bad report card! Talk about reminders—and about cutting some slack!



# Escape

## MAN-HACKS?

## Virtual Newsroom Attacked By Flying Penises

Daniel Sadville, a CNET reporter who is famous for hyping *Second Life*, the online virtual world that's the rage now, was recently trying to interview one of the virtual millionaires when they were attacked by giant flying penises! All this happened in the virtual world of *Second Life*, of course, which explains how it was possible for them to be attacked by the animated appendages.

The interview was being conducted in CNET's office within the popular virtual world, and Sadville was trying to get virtual millionaire Ailin Graef to share her secrets of setting up and successfully running businesses in *Second Life*. Then the attack happened—animated flying penises flew at the virtual CNET building for about 15 minutes. Obviously, the interview was halted immediately, and

Graef refused to continue. She then agreed to do so, providing the location was shifted to her own private space. Didn't help though, because as soon as the interview was restarted, the obscene appendages returned. In fact the hacker seemed to have been following Graef, because he then managed to crash the server on which Graef's space was hosted.

Perseverance paid off though, and after restarting the server, the interview continued normally without further incident. Looks like it's not just real-life anchors and news reporters who suffer from bloopers or intrusions! If people continue to take *Second Life* as seriously as they are right now, we're going to need a lot more security online—as much as we have offline, it seems.

However, what we must

wonder about is, how some people can take a world like *Second Life* more seriously than their real lives? When was the last time you saw members of a terrorist organisation attack with... well... their... err... members? Whatever the case, watch this space for more unbelievable nonsense from the world of *Second Life*. We shudder to think, "What next?"

## CHRISTMAS CHAOS

## Seller Beware?

December seemed to be the month of e-commerce boo-boos for UK-based retailers. First it was retail outlet Woolworths' online store that was offering *all* sizes of LCD TVs for just £150 (about

## Whatever Happened To...

## Horizontal PC Cabinets?

Surely you remember the time when the average PC consisted of a monitor perched atop the cabinet. The design had been around for ages, and nobody messed with it—not until the coming of the Tower, anyway. Since then, the picture of the PC itself changed, and the monitor-tower-everything else setup has become staple, but what of our horizontal friends?

A horizontal cabinet occupies a little more space than your monitor, so it's not a space hog if you use it with the monitor on top. Any airflow considerations you'd have to make would apply no matter which way your cabinet is oriented, so that couldn't have been a factor in its fadeout. We aren't saying they're *totally* history—you'll find them being peddled as cabinets for Home Theatre PCs, small form-factor PCs, and other applications where compactness and prettiness matter more than core functionality. But towers have their advantages—they occupy the same area irrespective of height, so you can stack them with more hardware.

The horizontal cabinet's fall from top spot *could* have something to do with the fact that monitors became bigger before cabinets could get stronger. Or that they raise the monitor to a height that qualifies as an ergonomic no-no. Maybe they just weren't cool enough. Got any theories? Write to us and put in your own two cents (91 paise)!

## Win! My Desktop

Last month's winner is **Vaibhav Sharma**, Gorakhpur (UP)

We're invariably content with still desktops, but Vaibhav Sharma's Flash escapades have made us think different. Sadly, we can't show you how it animates. He used:

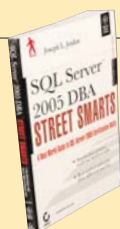
1. Macromedia Flash 8 to design the background and publish to HTML. There are navigation buttons to view the next or previous wallpaper
  2. ObjectDock, 3. CrystalXP
- Congratulations!

Participate in this contest and win next month

### Street Smart

by Joseph L Jorden  
Published by

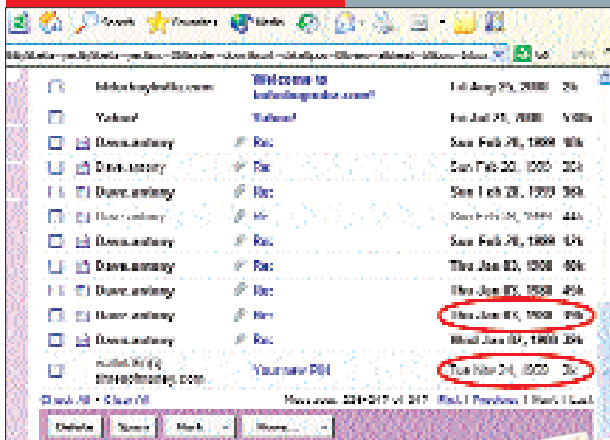
WILEY-INDIA



Send in your Desktop with a description of how you made it to [mydesktop@thinkdigit.com](mailto:mydesktop@thinkdigit.com) with the subject "My Desktop", and tell us your postal address, too.

# DigiPick of the month

“Spam Is Old  
News”



Last month's  
winner is

**Ketan Gandhi**  
Alibag  
Maharashtra

Participate and win next  
month

**Pro C# 2005 and the .NET  
2.0 Platform**

by Andrew Troelsen  
Distributed by  
Dreamtech Press



## WIN!

Send in your entry and you could win an exciting gift just by sharing an amusing picture with a tech angle to it. The picture should have been shot by you, and should not have been published anywhere earlier. E-mail your picture with the subject **“DigiPick”** and your postal address **on or before the 20<sup>th</sup> of this month to [digipick@thinkdigit.com](mailto:digipick@thinkdigit.com)**. One prize-winning picture will be published each month.

Rs 13,250). So you could actually go out and get 42-inch LCDs for a fraction of their price if you were buying it online. Woolworths soon realized the mistake, and the correct prices returned all too quickly. However, in that time quite a few Christmas shoppers had already placed their orders. The retailer was forced to issue formal apologies to the frustrated buyers, informing them of the error and reversing their payments—thereby not honouring the sale.

In similar fashion, UK toy retailer Hamleys sold out almost their entire online stock recently. The surge in purchasing was due to a glitch in their system. Basically, Hamleys offer discount vouchers, which contain a code which you can apply to avail of a discount. Now some Web programmer overlooked the fact that buyers might

“accidentally” enter the same discount code more than once, thus multiplying the discount offered. It didn't take long for the glitch to be found though, and people flocked to the site to avail of as much as 60 per cent overall discounts. There were stories going around of buyers boasting of saving thousands of pounds while Christmas e-shopping! Some of the online spectators described the events on the day as Vikings visiting Hamleys, claiming that the site had been pillaged. Apparently, almost everything popular was sold out, or out of stock.

However, Hamleys' troubles were just beginning—they don't distinguish between online and offline stocks, and have one common warehouse for both. This meant that everything they had in stock had been sold to online buyers, and neither online

nor offline buyers would be able to purchase or order anything until they replenished their warehouse. Although the site was fixed up pretty quickly, Hamleys' initial knee-jerk reaction was to state that they would honour all sales. Saner heads seemed to have prevailed in the boardroom, however, because they soon retracted that statement, probably after a few accountants worked overtime to estimate the losses!

The store later mailed every buyer, telling them that their money had been returned, and offered them a generous (yet sane) discount of 25 per cent on the next purchase.

We, however, are left wondering whether Web programmers at the companies are getting fired, or whether some business executive is being patted on the back!

To elucidate, how can we be sure that this was a programming glitch, and not a weird and aggressive marketing tactic? It *did* get them into the news, and had thousands of buyers (read actual people with money) register and provide their contact information! Does this mean that we're going to see many more “glitches” on e-commerce sites? Maybe this will start a new trend, where programmers who make mistakes will be sought after! What's sad is that none of the buyers seem to have got their “highly discounted” products, and the retail stores are laughing all the way to the bank, with people just giving in and accepting the consolation discounts!

## People Who Changed Computing

### The Discman!

The CDs and DVDs we so wantonly use and throw today wouldn't have even been possible had it not



James T Russell

been for the mind of James T Russell. He started off with his inventions at the age of six, when he crafted himself a remote-controlled battleship, complete with a chamber for his lunch. After his B.A. in Physics, he worked as a physicist with General Electric, and was one of the first people in the world to use a colour TV and a keyboard with a computer.

Frustrated with the way his vinyl records were degenerating, he wanted to work on a system where audio could be read without any physical contact between the moving parts. The best way, he figured, would be if he represented the binary 0 and 1 as intensities of light—dark and bright respectively. Furthermore, by squeezing more dark and light areas into the same space, he saw that he could store huge amounts of music on a piece of film.

His work on optical data storage began in the Bettelle Memorial Institute, where he worked as a Senior Scientist, and he constructed his first prototype of a digital optical recording system. Data was recorded on a photo-sensitive platter, which became the first CD-ROM. The idea evolved through the 70s, but with few takers at first. Eventually, though, audio companies realised the obvious benefits, and the rest is history.



# Bluff

YOUR WAY THROUGH

## Gaming

More and more computer users have started gaming. However, for those of you left behind, especially in terms of all this first person shooter (FPS) business, where you need hardware that costs as much as some cars, here are some terms to help you make people believe that you've got game!

**BFG:** The full form is Big F\*\*\*ing Gun, and was made popular by the game *Quake III Arena*. This is the gun that can help even a gaming newbie frag an expert!

**Frag:** In FPS-land, the term "frag" is used to describe the killing of an opponent. Usually best used in multi-player games with lots of blood and gore.

**Camping:** Usually a gaming technique used in multi-player shooters, where you hide (camp) in a place where you think no one can find you, and snipe at opponents. Good gamers will generally hate it when they find a "camper," and the offender is usually fragged a lot.

**[Weapon]-whore:** Such as Rocket-whore, Rail-whore, etc. This is a derogatory term used to describe a person who always tries to get and use just one type of weapon. Usually a weapon that the "whore" has practised and is good with.

**Spawn:** The act of entering a multi-player game where you appear out of nowhere. Also used as *spawn-point*, the place you spawn; *spawn-kill*—fragging a player as soon as he spawns (usually considered a mean thing to do), etc.

**Usage:** The other day I was *Quake-ing* on a local server and this *rail-whore* just kept looking for places to *camp* and snipe. All I did was find the *BFG* and then *frag* his @\$\$. Got a couple of spawn-kills in too! He quit soon after!

# Wild Wild Web

## Santa "Illegal Immigrant"

Hazleton in Pennsylvania is a town with a sense of humour. They've banned Santa from their town this Xmas because he is an illegal immigrant. Naturally—has anyone ever seen Santa presenting his papers after his soot-ridden fall down the chute?

As a matter of fact, he's an illegal immigrant everywhere, because he is from The North Pole—not a country, last we checked.

Now, there's a site called [www.nosantaforhazleton.com](http://www.nosantaforhazleton.com). Here, the good denizens of Hazleton have penned their reasons for not allowing Santa in: illegal immigration increases crime and burdens local service setups.

A joke? Naturally, and you're pretty daft if you haven't gathered. The Web is Wild, but people aren't stupid. The site is up because the city council made a move to prevent landlords from renting rooms to illegal immigrants.

## Cuff-Links

The Web is Wild, hence this space. An Australian judge has now ruled that just *linking* to copyrighted material is illegal. But that's what Google does all the time, every picosecond of every day, right? But someone saw something wrong with Stephen Cooper's running a site called [pp3s4free.net](http://pp3s4free.net): he provided a search engine for MP3s. He'd made a *catalogue* of the material. Ah, *now* we get it! Google... no Google Catalogue, at least not in Oz!

## Women Hackers Exist

A woman recently sought revenge on her cheating boyfriend by hacking his MySpace page. She changed the welcome note on his page to: "I'm a pathological liar. I cheat regularly." Then a MasterCard-ad-style ending: "Finding out your boyfriend is a lying scumbag and changing his MySpace page so everyone can see... PRICELESS." See? Women *can* do such things!

## Missing Mama?

A Web site called "ask Amummy" in German is tailor-made for men who cannot look after themselves once they leave home. Like here, many German men live with their parents until their late twenties. If only you knew



Can't figure out what's on the page? We couldn't either—it's all in German!

German, you'd be able to get, at [www.frag-mutti.de](http://www.frag-mutti.de), directions on how to use a washing machine, fry an egg, etc. By the way, this isn't about fragging your mom! ("Frag" means "ask" in German.) Now translate the site using Google's translator and get some *really* cool tips on what to do with your microwave...

## QUAD CORES TO FLOP?

# Intel Thinks Quad-Core Not For 2007

In December, a Chinese site reportedly got hold of some slides of a confidential Intel presentation, which was supposedly meant for intra-company circulation only. The presentation is

reportedly about Intel's predictions about processor sales for 2007. According to the slide, displayed below, Intel doesn't expect their quad-core processors to sell much at all.

As the slide represents, Core 2 Duos will rule the roost for Intel in 2007—like we didn't expect that! What's surprising is that despite the newer quads shifting to the 45-nanometer fabrication process, which we hope will make them a little more affordable, their

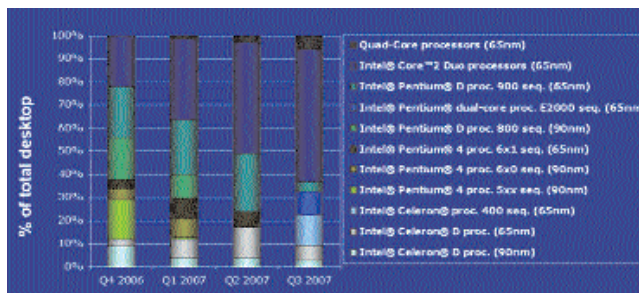
projected sales are still pitifully low, right up to end of 2007.

We've heard of conservative estimates, but really, now! With both Intel and AMD planning on taking the multi-core architecture beyond four cores, it's a little hard to imagine they will not be aggressively pushing their own quads a lot more.

## KILLER SPEEDS INDEED

# Lack Of Broadband In India Killing People?

Yes, you read that correct. It's an outside possibility, if a study by the UK-based Social Issues



The alleged Intel slide that was leaked on to the Net, and first reported by Chinese site [www.hkepc.com](http://www.hkepc.com)

Research Centre ([www.sirc.org](http://www.sirc.org)) is anything to go by.

Apparently, in a study of 2,500 Web surfers, a new type of disease—now dubbed Mouse Rage Syndrome—was discovered. The researchers tested to see what type of online experience could result in heightened stress levels, indicated by a faster heart-beat, increased perspiration, furious mouse clicking, and in some cases, the losing of control and the screaming at monitors.

For Western users, such experiences can be blamed on badly-designed sites, or those hosted on really slow servers. The test started with making users experience what the researchers thought was “the perfect Web site”—good layout, fast loading, easy navigation, etc. Next, they moved the users on to slow loading sites with ugly graphics and basically badly designed sites. This was when they noted changes in body language, heart rates and overall gauged the users stress levels. While some stayed calm, most showed negative

## No Smoking Please!

This month, we all decided to take up smoking! Now now, before you chide us for making tobacco companies richer, take a look at the Digital Passion > Lead Feature story... Yes, we were all inhaling lots of sweet smelling incense smoke, courtesy Fatbeing (Nimish), Raaabo, The Browne and Vijay “PJ” Padaya.

At least the smokers in the team can now stop cribbing about not being allowed to smoke *inside* the office!

As of writing this, which is a week after the “smoking,” most of us still get the taste of incense in everything we drink or eat.

Apart from that, we had a lot of feigned-sicknesses—no doubt the aftermath of a rather hectic December issue. Deepak was convinced that most of us had taken some part-

time acting classes.

There was more multi-player *Quake III Arena*, much to Deepak’s dismay, with Sanket and Agent001 joining in to put Raaabo back in his place. The rest of us still got fragged like hell, but it was so worth it to see Raaabo lose miserably as the two best *Quakers* in the office taught him some humility.

Deepak had to take a trip into town during rush hour—he had applied for a US visa for business—and swallowed more smoke in the traffic jams than we did during our smoking experiment. He claims it was worth it, though, because he got a 10-year visa!

Rumour now has it that we will soon be looking for a replacement editor, unless he actually comes back in January after his business trip! We’ll wait and see...

**DIGIT DIARY**

effects to the heart as well as the nervous and immune systems.

Now, while we’re waiting for the first “you killed me / my relative / my friend with bad site design” lawsuit to be reported from the West, we can all sit back and curse our luck.

Most of us probably

have been suffering from Mouse Rage Syndrome for some time now, but it has nothing to do with the sites themselves—but rather the pathetically slow speeds that we have to make do with here in India. We know for a fact that normally, lightning-fast sites can take ages to open

on even our 128 / 256 Kbps connections here in India, but perhaps the saddest part is that we can’t sue just anyone, like Westerners can! All we can do is tell you about this latest disease, ask you to calm down and take a breath or two. Don’t let your ISP kill you... literally! ■

## Blog WATCH

**Google, Web 2.0, and iPhone. Boring because the same topics keep popping up again and again—but some people’s takes can be interesting**

**Mark Cuban**

<http://snipurl.com/jan001>  
(<http://www.blogmaverick.com/2006/12/12/googlencms-itunes-and-zune/>)

### Googlenomics , iTunes and Zune

... Would it be worth it to Google to pay \$575 m and up per year to completely turn Apple upside down ? To completely pre-empt their ability to sell iPods ? To potentially introduce a new hardware device, or partner with someone who has one ? To sell advertising around the music rather than the music itself ? Is their a traditional Google arb here of 70c per song vs 70c of advertising around the song ? Could it sell that much advertising online to justify giving the music away ?...

**Alex Iskold**

<http://snipurl.com/jan002>  
([http://www.readwriteweb.com/archives/2006\\_web\\_technology\\_trends.php](http://www.readwriteweb.com/archives/2006_web_technology_trends.php))

### 2006 Web Technology Trends

...Undoubtedly 2006 has been the year of the social network. MySpace, YouTube, Facebook have been the three outstanding success stories—but also impressive was Bebo (in the UK particularly) and there was strong growth in existing web 2.0 networks

like Flickr and del.icio.us. The zenith of this social networking craze was probably Google buying YouTube for \$1.65 B.

... RSS continues to inch towards the mainstream—Yahoo integrated it into Y! Mail Beta, Microsoft is utilizing it more (e.g. integrated into IE7), Google came out with Google Base and the GData format (which is based on the RSS variant, ATOM). While 2006 can’t be seen as the breakthrough year for RSS in the mainstream, we will probably see RSS bloom in 2007 as a result of the groundwork done in ‘06 by the big Internet companies. Note that there have been recent murmurs that Yahoo is scaling back RSS, but I think this is a short-term trend only...

**Dan Frakes**

<http://snipurl.com/jan005>  
(<http://www.macworld.com/weblogs/editors/2006/12/flop/index.php?lsrc=editorsblog>)

### The iPhone a flop? Let’s wait and see

Let’s assume, just for a moment, that Apple really is planning on releasing an “iPhone,” a combination of a mobile phone, portable media player, and, possibly, a PDA. Will it be a big hit? Hugely successful? Who knows. I personally think it’s unlikely such a product would approach the popularity of the iPod. But I don’t think it would do nearly as poorly as Kanellos predicts.



December 2006

### It's All Good

Yesterday, I got my gift that was due for over two months; I also got the December issue of *Digit*. Wow! It's simply superb! You guys rock. What an amazing mag! I could never expect more!

How can you guys manage to give away so many goodies at such a nominal price? I have heard people writing about the cost being too much, but just calculate—and you can't imagine! How can you all put up such a mind-blowing issue in just one month?? A 210-page magazine—I think it's worth 500 bucks, if not more!

I liked Agent001 this time the best. But one thing—I have my pre-board exams going on. And your magazine has kept me so busy these days—I think I may just keep myself from giving the exam or fail miserably! I just can't take my eyes off the magazine for a moment—and the only remedy that I see is to burn it (*you know I can't!*) Thanks for such a wonderful issue, and last but not least—the new interface is too cool! Fantastic visual appeal and user-friendliness.

Keep up the good work, guys.

**Arkadyuti Mukherjee**

Dear Arkadyuti,  
We worked hard on the December issue, and we're glad to see—from letters like yours—that our efforts have paid off. We also worked very hard on the disc interface—thanks for the compliments! Passionate appreciation is most welcome!

— Executive Editor

### Mr Disgruntled

Although I am not a subscriber of *Digit*, I have gone through almost all your issues, and for the last four months, I've been a regular reader. I would like to remind you that your magazine is very high-priced. Rs 125 or 200 for a

common man like me is not a joke. However, that wouldn't have been a problem if your magazine were informative enough. But looking into it, it's obvious that you are not keen on educating your readers through the newer trends; you are only eager to earn more revenue through advertising.

Look into the December issue. Out of 210 pages, well above 40 per cent—exactly 84 pages—are full of advertisements. I think your readers are fools (including me, I accept) to pay that much for only advertisements. And what about the other pages? Except three to four articles, like Agent 001, Q & A, Tips & Tricks, etc., the others are about gadgets... through which you earn heavily.

Again, regarding your CDs... where's the useful stuff? What will we do with shareware? I find nothing of value. If I'm paying you, I should only get freeware...

I thought I'd write an essay, but I'm fed up. I know you will never publish this letter.

**Saji Paul**

Dear Saji,  
We appreciate constructive criticism, but we cannot agree with all your points. For one thing, ads are the lifeline of many a magazine. You've mentioned that 84 out of 210 pages are ads; and if you don't look at the ads at all, why not just think of it as a 126-page issue? What about everything we've packed into those 126 pages? As for many articles being about gadgets, we write about stuff that interests our readers—you obviously aren't a typical reader! And how do we "earn heavily" by featuring gadgets?

Regarding the disc contents, first off, we do provide lots of freeware. Secondly, you are not paying for software when you buy an issue—the shareware is there for you to try out. We're saving you download time and possibly money (if you pay by the hour for your connection). If you like the shareware, buy it—what we're doing is, we're making it available for your perusal. In any case, we're sorry to have disappointed you.

— Executive Editor

### At Your Service—Always

I am a student of class VIII, and though I do not have a *Digit* subscription, I haven't missed a single issue since last year. You people are sure a doing an awesome job. The December issue was fantastic, and so was the *Fast Track*. The Tips & Tricks, Beat That, Gender

Benders, and Digipick make the magazine even better. I really wish you could turn *Digit* into a weekly magazine.

Software like Corel Office, Google Desktop, Autopatcher, and the *Digit* Archive CD was *reaaaally* great. One more thing: I was really eager to try out *Need for Speed: Carbon*. I found it in your December issue, but the DVD was corrupted. Could you help me?

**Shameek Sarkar**  
Kolkata

Dear Shameek,

Our customer service helpdesk is always at your service. Unless you've already done so, just call or write in, and you'll get a replacement immediately!

— Executive Editor

### The Many Faces Of Tech

Your lead article *You're Being Watched* is timely. The article throws light on the psyche of voyeuristic minds, and the interview aptly sums up the working of voyeurs at large. The advent of round-the-clock news channels added a whole new ugly dimension to this episode. Not only individuals but also the media has a share in spreading this perverted attitude.

Going by the recent trends on news channels—sting operations, MMS scandals—it seems they have buried the ethos. The private life of citizens is being snuffed out by this obtrusive attitude of the media. Private life is publicised and sensationalised. "Bug and make bucks," that's the current mantra.

Hi-tech gadgets, faster processors, larger bandwidths, gigabytes of memory to digitize every bit of our lives, uploading, downloading and sharing content is now possible with a single touch of a button.

Proud, yes, but I am worried at the same time. Who knows—one day you may end up on a big show (read reality show at its worst) à la Jim Carrey in *The Truman Show*.

My intention is not to paint a grim picture—all I want to say is we need technology to make this world a better place to live in, but on the other hand, it's the collective responsibility of individuals to see to it that this happens. It's not the technology that is bad—it's the mind that perverts it.

A Happy New Year to Team Digit!

**Dr I Sai Krishna**  
Hyderabad

## Write to the Editor

E-mail: editor@thinkdigit.com

Snail Mail: The Editor, Digit, D-222/2, Om Sagar Building, MIDC, TTC Industrial Estate, Nerul Navi Mumbai 400 706

Digit will publish the best letters on these pages. Letters may be edited for clarity. Please include your complete address in all communication.

For subscription queries, call the help desk at 022-27629191/9200, fax 022-27629224, or send an e-mail to help@jasubhai.com

# Inbox



LETTERS  
OF THE  
MONTH

## There Is A Way!

In the December issue, Biswadeep Misra had asked you about the code for checking the total time on a Nokia phone. There is indeed a code to check the total talk-time. Type in \*#92702689# and scroll down, and in the life timer selection, you will get the total talk-time.

Sivi Nair

## Yes, We're Human!

First of all let me tell you—not that you don't know—*Digit* Rocks! I have been reading it for quite some time now.

The reason I had to write this mail is, I would like to draw your attention to the question in *Check Your TQ*, page 208, December 2006, which asked what company had come up with its own version of Firefox. The correct answer was given up as Microsoft.

It was a prank... I can't believe even you guys fell for that! Check out [www.msfirefox.com](http://www.msfirefox.com) and [www.msfirefox.net](http://www.msfirefox.net)!

Anyway, keep up the good work...

Prashant

Dear Prashant,

Thanks for writing in. We realised our error a while ago—unfortunately, we created the TQ page when we first spotted the “news.” We soon came to know it was a joke, but we couldn't do anything about it. Of course, we're going to offer the standard excuse—we're all human! Hope you can pardon this boo-boo on our part!

— Executive Editor

## Digit Under The Scanner

I absolutely must thank you for your marvellous gift in the form of the December issue. The softcopy of 23 issues of *Digit* and the *Fast Track* editions—it's great. In fact, I had started scanning all the Tips & Tricks pages and other useful, informative pages and keep it as a softcopy on my hard disk! I went ahead, and thank God... now everything is on disk!

Vinod Kumar V K

## Coasters Galore

I have been a subscriber to *Digit* for the last three years. I have the following question to ask: What is the life of a rewritable CD in terms of rewriting? I use Moser Baer Protection+ rewritable 10x CDs for writing data CDs. After rewriting for about 15 times (at 10 x speed), these CDs

stop working! I use Nero Burning ROM. What can be done to increase CD life?

P B Kakathkar

Dear Mr Kakathkar,

The life of rewritable CDs is usually stated as 1,000 cycles, though in reality, it usually works out to about a hundred. We haven't tested the media you've mentioned, so we can't speak about it with authority. Still, 15 really is too low. Perhaps you're getting counterfeited media. Another thing is, remember to keep rewritable CDs as scratch-free as possible—use a soft cloth to clean them, cleaning in a straight line away from the centre. Store them safely too!

—Executive Editor

## Export Quality!

I live in Sri Lanka, and to my best belief *Digit* is not available here right now. Whenever one of our family members goes to India, my first request would be to purchase a copy of your magazine.

I found your tips section especially interesting in solving several problems. The hardware comparisons are a blazing hit! I've got a question. As a 17-year-old, advanced-level college student use my desktop PC for animation, audio, and graphic design. A friend recently advised me to upgrade my PC, and I decided on a 3.0 GHz Pentium D processor—and was advised an Intel mainboard. Are Intel 945 boards a good buy? I need support for 1 GB of DDR2 + DDR dual-channel, onboard VGA, and FireWire. How about Gigabyte or MSI? I can spare 4 to 5K.

Why not include a collection of e-books on topics like literature, technology, fiction, and other educational guides? Thanks in advance... the magazine rocks! Keep the good work!

Varanga de Silva  
Colombo, Sri Lanka

Dear Varanga,

Thanks very much for your kind remarks. Regarding e-books, well, you never know how the magazine will evolve—keep looking!

As for the motherboard, our resident expert Agent 001 is the right person to ask, but while we're at it, I might as well go ahead! Looking at your requirements, Intel G965 boards will fit the bill, but they'll be a bit expensive. Opt for any 945G chipset-based board, in particular the GA-945GM-S2: it was the Silver winner in the motherboard shootout we carried in November '06 issue.

—Executive Editor

## Ecstatic!

I am writing this letter with overwhelming ecstasy. I am a poor tea estate worker, working in one of the tea estates in Munnar under the management of Tata Tea Limited.

My meagre wage scale has not permitted me to purchase a computer during the past 26 years of tenure of employment, and I haven't even viewed any of the CDs obtained along with *Digit*! I just merrily read the magazine, and dreaming of the contents of the CD since July 1998 was my passion!

By God's grace, I am the owner of a junkyard machine, and have experienced the treasure trove in every CD/DVD. It is amazing, and I take this opportunity to garland the team behind every issue of *Digit* with my tears of ecstasy! You all are really deserving, dear boys!

Jagdish K

## Girlfriend Material?

*Digit*... you are my best friend!

I am a regular reader and subscriber to your magazine. Firstly, congratulations to all of you for completing five years successfully as the best tech magazine.

If someone were to ask me to choose between a beautiful girlfriend or *Digit*, I'd reply—*Digit*! I just can't live without it. I am doing Computer Science and Engineering, and you people give me lots of useful articles, software, and tech information through your magazine.

I would like to pray to God for you people who make us successful. Wish you all the best, and keep going the same way!

Durgesh Kshirsagar

Dear Jagdish and Durgesh,

I'm touched. Touched to see that our magazine reaches out not only to the minds of our readers, but in some cases, their hearts as well.

Jagdish, we're all happy for you for having finally procured a computer—and we're so glad we have been part of your happy experience. But Durgesh, we must advise you never to dump a girl in our favour!

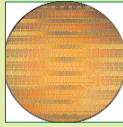
Jokes apart, my thanks to both of you for the heartfelt compliments—they keep us going.

—Executive Editor

# Wii And You

**1** Intel recently announced its 45-nanometer chips, referred to as...

- a) Penryn
- b) Barcelona
- c) Woodcrest
- d) Jim



**2** The Wii has been in the news since its launch. Which of the following is false?

- a) Nintendo will offer sturdy straps in replacement of broken ones
- b) The console is also available with an inbuilt hard drive
- c) The Wii got a "sledgehammer" treatment like the PS3 did
- d) GameCube discs can be used on the console

**3** Time Magazine's Person of the Year for 2006 is...

- a) Chad Hurley, co-creator of YouTube
- b) "The iPod"
- c) Tom Anderson, co-founder of MySpace
- d) "You"

**4** What does MIME of e-mail fame stand for?

- a) Multiple Intranet Mail Exchange
- b) Multi Internal Mail Extensions
- c) Multipurpose Internet Mail Extensions
- d) Multimedia Interactive Mail Exchange

**5** Alan Shugart, a pioneer of the hard disk industry, died recently. He founded:

- a) Seagate
- b) Western Digital
- c) Samsung
- d) Hitachi GST

**6** According to e-mail security firm Postini, what percentage of all e-mail was spam, in October 2006?

- a) 15 per cent
- b) 35 per cent
- c) 55 per cent
- d) 90 per cent

**7** Which of the three below is not involved in the development of the Cell processor?

- a) Sony
- b) Toshiba
- c) IBM
- d) Intel

**8** Recall from college... which of the following is not a physical network topology?

- a) Tree
- b) Bus
- c) Mesh
- d) Matrix

**9** One Apple product was named after Steve Jobs' child. It was named...

- a) Mac
- b) Lisa
- c) Pippin
- d) Newton

**10** Which of the following is *not* a lossless graphic compression format?

- a) GIF
- b) PNG
- c) JBIG2
- d) DJVU

**11** "BOFH" stands for B\*\*\*\*ard Operator From Hell. Whom does it refer to?

- a) The CEO (of an IT company)
- b) The incompetent phone operator downstairs
- c) The contemptuous system administrator
- d) A clueless user

**N**ero Burning ROM was named after Roman Emperor Nero, who is supposed to have been playing his lyre while Rome burned—though that's apocryphal. And the process is called "burning"—so you get the idea. Sheer genius or cheesy copywriting?

**Did You Know?**

Answers	
1. a) Penryn	1. a) The console is also available with an inbuilt hard drive
2. b) The console is also available with an inbuilt hard drive	2. b) The console is also available with an inbuilt hard drive
3. d) "You"	3. d) "You"
4. c) Multipurpose Internet Mail Extensions	4. c) Multipurpose Internet Mail Extensions
5. a) Seagate	5. a) Seagate
6. d) 90 per cent	6. d) 90 per cent
7. d) Intel	7. d) Intel
8. d) Matrix	8. d) Matrix
9. b) Lisa	9. b) Lisa
10. d) DJVU	10. d) DJVU
11. c) The contemptuous system administrator	11. c) The contemptuous system administrator

Got an interesting question? Send it in with the answer to **TQ@thinkdigit.com** Mark "TQ" in the subject area.

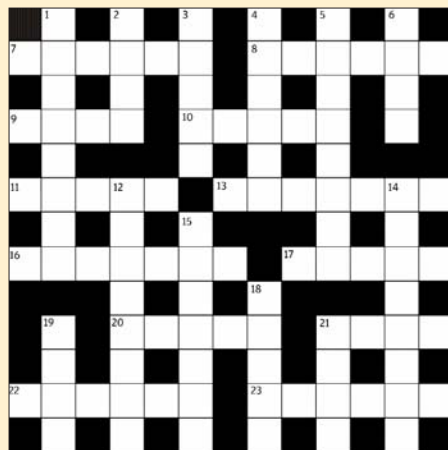
## Crossword

### ACROSS

- 7. Small Java programme that runs on a web browser(6)
- 8. Collection of data items arranged for processing by a programme (6)
- 9. Advanced Mobile Phone Service(abbr) (4)
- 10. 'Myst' sequel—best selling puzzle and exploration computer game from Broderbund (5)
- 11. A two-player black and white game with perfect information (5)
- 13. Language 'in dots' for the blind (7)
- 16. Software package for mechanical engineering(7)
- 17. 'Spider and worm' type of programme roaming on the net (5)
- 20. Indian global IT service provider '-----Computer Systems' in Mumbai SEEPZ (5)
- 21. Robert -----invented the TCP/IP protocol (4)
- 22. A cellular operator named after a fruit (6)
- 23. To load a computer's operating system (4,2)

### DOWN

- 1. Trojan horse that can be used to send unsolicited e-mail through the compromised computer (4,4)
- 2. Common Lisp Object System(abbr) (4)
- 3. To copy data from a CPU to memory (5)
- 4. A computer programme that interacts with a particular device or software (6)
- 5. 'S' in STM- a device that obtains images of atoms on the surface of materials (8)
- 6. ----Site-not paid for (4)
- 12. Online----- selecting and buying merchandise via the Internet (8)



- 14. ---- optics- transmission of visible light signals over optical fiber cable for great distances (4,4)
- 15. Codename for version 10.3 of the Apple Macintosh OS X (7)
- 18. Block structured, procedural language intended for application and embedded system development (5)
- 19. Serial-----where a modem or printer is connected on a PC (4)
- 21. Thousands of Lines Of Code(abbr) (4)

December's Winner: Kumar Vijay Ernakulam, Kerala. Send in your entries to **TQ@thinkdigit.com** on or before **January 20**. One lucky participant will win **Mastering**

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Last Month's Solution



Crossword by Nitta Jaggi

# Tabloid TECH

People And Events That Grabbed The Headlines—For Better Or For Worse

## We Told You So!

Speaking to an invited party of bloggers and Web developers at Seattle headquarters, Mr Gates of Bill fame happily said, “DRM is not where it should be,” as blogger Steve Rubel reported it. “In (sic) the end of the day incentive systems (for artists) make a difference.” And then came the pronouncement: “But we don’t have the right thing here in terms of simplicity or interoperability.”

Blogger Michael Arrington said Gates’ short-

term advice for people wanting to transfer songs from one system to another was to “buy a CD and rip it.”

Now Suw Charman, of the Open Rights Group, said it was a “bit rich of Bill Gates to make his comments, given how much DRM is stuffed into Vista.” And we know how much MS swears by DRM anyway...

But we told you so. We told you last month Mr Gates had become more amiable, more matter-of-fact, and, in general, more prone to telling things the way they are. See?

## “You’d Have To Be Nuts”

Reporters from British online tech tabloid *The Register* caught Intel executives in an unusual, perhaps inebriated, mood where they, in a manner not befitting them, verbally pooh-poohed the competition. Intel “vowed to overwhelm AMD” with a regular “cadence” of product releases that run on a “tick-tock” fashion: Intel will slap a new architecture upon the market (the tock), then follow up with a less dramatic manufacturing process, core, voltage, and cache shifts (the tick).

“From our perspective, 65nm is kind of old news,”

said Intel manufacturing chief Tom Franz. Lofty perspective, we’d say. But you’ll have to hand it to Intel: AMD happens to be truly behind, looking to move to 45nm in 18 months. But the Intel execs talked about the 18-month plan “as a figment of AMD’s imagination.”

“They are so dreadfully behind,” said Intel senior vice president Pat Gelsinger. (Pure, unadulterated scorn. Not good.) And here’s where it hotted up: Gelsinger went on, “You’d have to be nuts” (to think AMD will come close to beating Intel to any manufacturing milestones).

Salvo #3: “I was very pleased to read that a number of analysts have downgraded AMD.”

To our surprise, there hasn’t been a peep from the other side yet. Perhaps AMD execs are more graceful. (Or maybe they just don’t want to highlight the beating.)



## Here We Go Again...



Every time Yahoo! releases its list of year’s most-searched-for items, we talk about it here. What’s worse, every time the list is released, it’s the same person on top. Even the headline is the same: “Oops she did it again.” So there you go—you know who we’re referring to without our having to spell it out.

Here are the eight celebs who made it to the top-ten list, with the millions of pages that mention them (in brackets).

#10: Lindsay Lohan (2.9): The most influential person of 2006 based on US newspaper column inches! Debate raged over her substance abuse, and her being a role model for young women.

#9: Pamela Anderson (7.1): We’ll bet it’s something to do with the science of pneumatics.

#8: Chris Brown (1.3): For his music. We haven’t listened to

any of it—and we’re hoping it’s not horrible.

#7: Beyonce Knowles (1.2): We aren’t too much into the R&B scene, so we’re not sure why she figures here.

#5: Paris Hilton (11.6): For her on-camera antics, we presume. Once a star...

#4: Jessica Simpson (6.5): Seems to have released a few interesting videos. Some people call her ugly.

#3: Shakira (2.2): You know a civilisation is on the decline when the butt-shaking abilities of a woman drive the world to seek her out.

#1: You-know-who (9): You know a civilisation is on the decline when it’s *nothing* that drives the world to seek information about someone.

Footnote: type in “britney google” into Google and go to the first non-sponsored result. The horror of it all will come forth.