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10 Minutes to a faster, safer Windows XP

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Switch to a Wireless LAN, quick and easy
Reviewed: Nikon COOLPIX 4300,
3.2 GHz Pentium 4, GeForceFX 5800

A Time for Alternatives

We are at an interesting time in consumer software again, after a long hiatus. The next version of Windows promises much, but is two years away. The two year old Windows XP is left holding the fort.

In the meanwhile, Linux is rapidly evolving a friendly face. For the first time, it seems to really be a viable option for computer-literate users. It is not quite there yet, but two years is a long time in computer years.

Internet Explorer 6 is the end of the line for the world's most popular browser. The next level of the IE experience, will only be available integrated into the upcoming Windows, two years from now. Web technology is among the most rapidly evolving, so using IE going forward means being tied to obsolete technology.
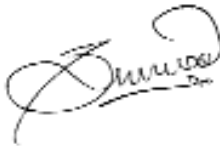
In the meanwhile, Netscape is no more, but its offspring do it proud. Mozilla Firebird is already far and beyond a better browser product than Internet Explorer—Web standards compliant, privacy aware, and with a great pop-up killer integrated.

The next MS Office is expected by year end, but the pretty new icons in the latest beta test versions don't really present an interesting upgrade story. Sure, the new XML capabilities will find takers in special applications, but that doesn't help you write a better letter. If it sticks to schedule, MS Office will make another attempt at tempting us in a couple of years.

In the meanwhile, solutions such as OpenOffice.org come nowhere near MS Office in feature count or polish, but they get the job done for free.

Open source applications have been following an erratic path to usability and effectiveness. In recent times, a lot has changed. And with all of the major Microsoft products holding off for two years, this may be the right time to dip your toes in strange waters, and feel the currents of change.

Even our President would approve.

sumod_hajela@jasubhai.com

Sumod Hajela
Assistant Editor

"For the first time, it (Linux) seems to really be a viable option... It is not quite there yet, but two years is a long time in computer years"

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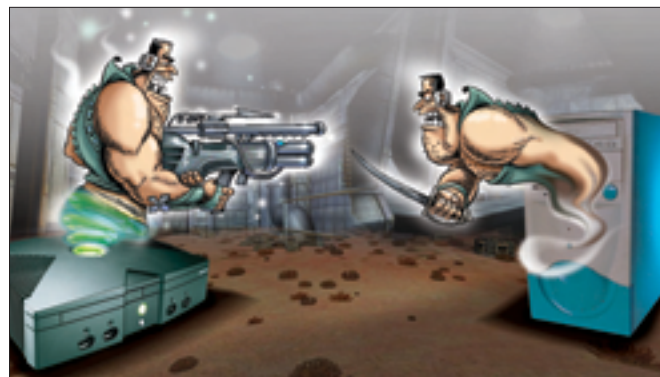
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Go memory shopping for your PC

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Reviewed this month

ON THE CD

HIGHLIGHTS

Alcohol 120%
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Mindware\Software\System

Cool Edit Pro 2.1
Type: Trial   Size: 16.17 MB
Mindware\Software\Multimedia

CursorXP
Type: Free   Size: 2.3 MB
Mindware\Software\Home

Forte Free Agent 1.93
Type: Trial   Size: 2.29 MB
Mindware\Software\Internet

Goldwave 4.26
Type: Trial   Size: 0.83 MB
Mindware\Software\Multimedia

IncrediMail Xe
Type: Free   Size: 5.55 MB
Mindware\Software\Internet

mySQL 3.23.57
Type: Free   Size: 12.67 MB
Mindware\Software\Dev Tools

Partition Resizer
Type: Free   Size: 0.09 MB
Mindware\Software\System

**PHP for Windows 4.3.2
with installer and manual**
Type: Free   Size: 5.96 MB
Mindware\Software\Dev Tools

phpMyAdmin 2.5.1
Type: Free   Size: 1.6 MB
Mindware\Software\Dev Tools

Sonic Foundry ACID XPress 3.0g
Type: Free   Size: 30 MB
Mindware\Software\Multimedia

Trillian .74
Type: Free   Size: 2.41 MB
Mindware\Software\Internet

TweakXP
Type: Trial   Size: 2.77 MB
Mindware\Software\System

WinDVD Platinum 5
Type: Trial   Size: 13.3 MB
Mindware\Software\Multimedia

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MINDWARE \ RESOLVE

This section helps you stay one step ahead of the others by carrying a hand picked collection of various useful 'Tips & Tricks', frequently asked questions (FAQs), some whitepapers, and assorted e-books. This month, we bring you Tips & Tricks on getting the best out of your favourite media players, and FAQs on hard disks. The Whitepapers that are included, aim at bringing you an insight on various storage technologies, such as RAID, and Storage Area Networks. Also, do catch up with some classic literature, in the E-Books section.

MUST TRY SOFTWARE

Rise Of Nations

Wheel and deal across time with history's eminent cultures with *Rise of Nations*. Create new cities, improve city infrastructures, and expand national

borders. Conquer foes through military might using everything—from slingshots to cannons to stealth bombers to nuclear weapons. Corner the market on key commodities, and consolidate power under your rule.
Type: Trial   Size: 194 MB
Playware\Arena\Games

Sonic Foundry Vegas 4

Vegas is a digital audio and video production suite, allowing non destructive composing, titling, audio/video recording, editing, mixing, surround sound production, unlimited tracks, and DirectX filters and more. Easy yet powerful controls allow for complex high quality keyframe track motion, complex composites, track envelopes, and loads of useful features.
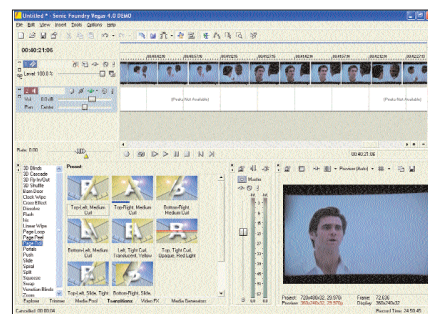
Type: Trial   Size: 41 MB
Mindware\Software\Multimedia

Microsoft Money 2003 Deluxe

Microsoft Money 2003 Deluxe is a complete personal finance solution that helps you manage your day-to-day finances, track and manage investments, prepare for taxes, and build a plan for your future! Balance your checkbook, pay bills, bank online, create a budget, reduce your debt, and organise your finances all in one place while receiving personalised financial guidance. Synchronise with MSN Money, to access your Money data on the Web, while you're away from home. You could also use Money for Pocket PC, and your Money data travels with you.
Type: Trial   Size: 0.5 MB
Mindware\Software\Office

Knoppix 3.2   Mandrake 9.1   Red Hat 9   Peanut 9.5

4 LINUX distributions

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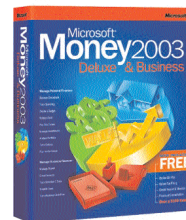
Flavours of Linux

If you have been pondering over which Linux distribution to try out, the Digit Special Linux DVD comes to your rescue. This DVD comes with not just one or two, but four superb Linux distributions in their latest incarnations. So, go ahead and savour whatever suits your taste buds the best!

Knoppix 3.2

With Knoppix you can try out Linux without risking your hard disk—create a live boot CD from the ISO file and start working within a full-fledged Linux desktop.

Mandrake 9.1

Mandrake is one of the most user friendly and easy-to-configure Linux distributions around that comes with eye candy galore.
Worth Rs. 1,900

Red Hat 9

One of the most well known distributions, the stable Red Hat 9 comes with an interface that draws the best from the KDE and GNOME desktops.
Worth Rs. 2,100

Peanut 9.5

Peanut packs in a colourful Linux desktop and a fine collection of applications, all packed into a tiny footprint.

Software

Office

GnuCash 1.8.4, QCAD 1.5.4, Tiki CMS/Groupware, Evolution 1.2 ...and other handpicked applications for your office
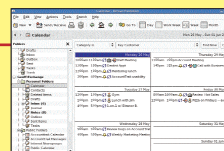
Internet

Mozilla Firebird 0.6, GAIM .64, Opera 7.11, Ethereal 0.9.13 ...apart from other Internet utilities

Games

America's Army: Operations, Unreal Tournament 2003, Sin, Quake 3 Arena ...and many more interesting games

Multimedia

XPde 0.3.5, GLAME 1.0.1, DivX 5.0.5 codec pack, Mplayer 0.90 ...plus lots of other stuff to keep you busy
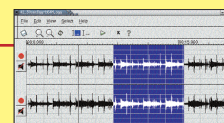
Dev Tools

J2SE 1.4.2, PHP 5.0.0 Beta 1, mySQL 4.0.12, Apache 2.0.46, phpMyAdmin 2.5.1 ...and many more of the latest development tools

System

VNC 3.3.7, gCombust 0.1.54, GnoRPM 0.96, Acrobat Reader 5.0.7, AWStats 5.5.1 ...and other tools to make better use of your PC
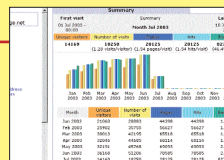
Note: If your DVD does not autorun, click on Index.html to enter the interface.
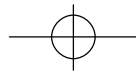
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WEB SPECIAL

Taking the weight off your lap

Wireless technology is seeing a new era, thanks to the latest mobile processors. We take a peek into what makes them tick.

MOBILE TECHNOLOGY

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August '03

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Mindware

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Size: 166 MB

WEB SPECIAL

One world, One language

¿Usted habla español? Well, neither do we, but you no longer need to speak, read or write a language to be able to communicate using it…

index ■ colophon

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DIGIT ■ AUGUST 2003

Intel sees chip industry plateau

Chip giant Intel says industry growth will slow down but remain in double-digits.

Chief Executive Craig Barrett said, "I do believe that growth rates will perhaps declind b bit. Maybe they will come down a few percentage points, but they will probably remain double-digit".

Intel saw its net income more than double in the second quarter of 2003. The company announced profits of $896 million compared to $446 million in 2002. Much of the increased profit compared to the 2002 figures were due to last year's write downs of areas such as online services, totaling $218 million. Intel says revenues for its key product areas in microprocessors and chipsets were essentially flat for the quarter as average prices and volumes remained stable from the previous quarter.

Intel is now to spend more on R&D in 2003 than it originally planned. The move to 65-nm processes from 90-nm is now expected to be around $4.2 billion compared to $4.0 billion. However, overall the company is remaining cautious over the global economy and says third quarter revenues will be between $6.9 billion and $7.5 billion. The company is pointing to the new generation of Pentium processors, Centrino systems and the emerging 65-nm processes to drive revenues forward in the future.

Mobile throwing competition

People have heard of and participated in all sorts of competitions. But this one combines the traditional test of strength with a taste of technology. Eastern Europeans conduct annual competitions for throwing mobile phones, yes you read it right. The current record is 66 metres, with a Nokia 5110. A company called Fennolingua, provides the mobile phones, and sponsors the competition. The fourth such competition will be held on 23rd of August, 2003 in Savonlinna, Finland. In case you want to show off your skills you can register yourself at the site *www.fennolingua.fi/mobile.htm*. Prizes are awarded based on style, aesthetics and the length of the throw.

ILLUSTRATIONS: Mahesh Benkar

SuSE in space

Linux developer SuSE secured a 2.4 million euro deal with the German Aerospace Center (DLR). SuSE Linux will provide the software infrastructure for the Columbus module that will be launched to the International Space Station in October 2004. The Columbus control centre provided by DLR will include monitoring and control of Columbus' on-board systems, the co-ordination of the European payload operation and the provision of the communication network for operations and data distribution. SuSE provides the software infrastructure for the module's data needs. Columbus will continue to send data back to earth for the next 15 years. To handle all this data there are 46 IBM Dual-Xeon servers, two Sun Solaris systems, almost 25 Terabytes of EMC CLARiiON CX600 storage, ADIC StorNext HSM, Legato Networker Backup as well as an ADIC Scalar10k tape library with more than 70 Terabytes of storage for backup and archiving. All this will be running on SuSE's Linux Enterprise Server 8.

■ White House mail services were struck by a distributed denial of service attack (DDOS) ■ Slackware—a volunteer distribution of Linux, turns 10

Decline in file sharing after RIAA threatens to sue individuals

The music industry, which has been perpetually frustrated by the continued popularity of peer-to-peer file sharing utilities, finally seems to have hit upon a tactic that works. At the end of June the RIAA declared that it would track individual users of these file sharing tools and sue each of them individually for sharing their files. The compensation claimed would be $1,50,000 per song traded. At that rate many users would soon be picking up a tab of a few million dollars. In just a week after the announcement, traffic on these networks has dipped noticeably. Nielsen-NetRatings reports that usage on Kazaa went down by 15 per cent. Other popular networks have also experienced similar declines, with Morpheus and iMesh losing 15 per cent and 16 per cent respectively. Another possible explanation is Apple's iTunes music store. The service has already sold over 5 million songs in the two months that it has been operational.
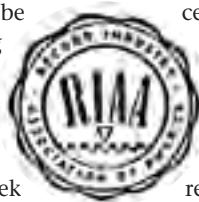
Hacking contest

When *www.defacers-challenge.com* announced a contest for hackers on the sixth of July, everyone in the online business was worried. According to the Web site, the first hacker to deface 6,000 sites; or the highest number of sites; would win a prize of 500 MB of Web space.

Concerns about the crippling of countless Web sites were unfounded, as the event was drawing to a close there was no sign of damage among the Web's most popular sites such as *Amazon.com* and *Yahoo.com*.

This contest caused various reactions across the industry. Security officials said that this contest received so much press attention, that it would only encourage more elaborate events in the future. But, only 500 to 600 smaller Web sites recorded defacements, which is less than the 3,000 or so sites that are defaced on a heavy hacking day.

Others were of the opinion that it was good thing, as it made people more aware about their security.

statattack

Primary reason for not using online banking in the US

Source: TowerGroup

Internet search engine usage (between March and April 2003)

Source: OneStat.com
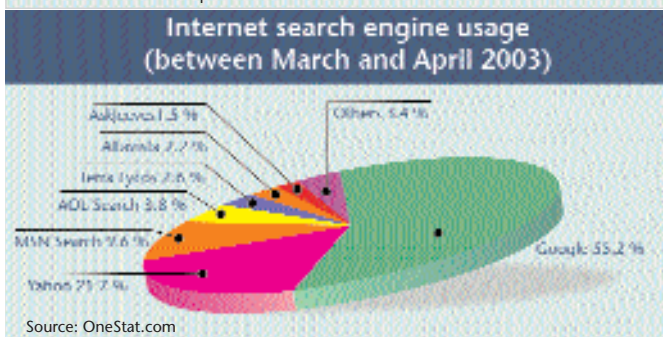
Sony hand-held engine

Sony recently released its Handheld processor dubbed 'The Handheld Engine'. The Sony CLI PEG-UX50 will be the first handheld to use the chip.

The handheld engine is optimised for handheld devices, with special emphasis placed on battery life and speed. It combines a Sony manufactured ARM926-based processor, a Digital Singnal Processor and a CXD2230GA graphics accelerator. This is the first time an in house processor is being used in the Sony Handheld.

INFOGRAPHICS: Sachin Dalvi

▪ Sony recalled 18,000 laptops because of the risk of users receiving slight electrical shocks due to faulty modems ▪ America's Army has been released for MacOS

Apple loses flavour with Adobe

Adobe has announced a new version of its video effects package After Effects 6, and video editing software Premiere Pro. In a significant development, the company said that Premiere will no longer be developed for Apple systems. The new version of Premiere has been redesigned and developed from the ground up for Windows XP. Adobe's core audience of creative professionals are often Mac users. But recently it is showing increasing signs of supporting only Windows, with Apple developing a lot of tools which overlap with their products. Adobe's strongest competitor in the video editing market is Apple's own video editing tool Final Cut Pro.

Adobe and Apple are not at loggerheads though; they continue to have good relations. After Effects continues to enjoy good sales on the Mac, and Photoshop remains the de-facto for photo editing, with Apple even using it as a performance indicator at the launch of the G5.

snapshot

P2P utility **Morpheus** had **231,000** unique users for the week ending **July 6**; **iMesh** had **214,000** during the same period.

Source: Nielsen/NetRatings, InternetNews.com

The 64-bit monster ...playing spoilsport?

The G5 processor powering the latest Power Mac, developed jointly by IBM and Apple, runs at frequencies up to 2 GHz. Benchmarks provided by Apple indicate that the system, powered by dual G5 processors, is considerably faster than the fastest Pentium 4 based system or even a dual Xeon processor configuration.

But these benchmarks are being questioned around the world. The rival machine that was used here was a Dell Dimension 8300, running a Linux operating system. There is belief that the Dell score would have been much higher if the system was running a Windows operating system with an Intel optimised compiler rather than the used GCC compiler used.

All of this is pure speculation, for example, the performance of *Quake III Arena* on the system is reported to be much higher. However, other computers around the world easily match and outperform the score of the G5. But, then again, the G5 uses a 64 MB ATI Radeon 9600, in contrast to the 9800 Pro card with 128 MB memory used by the Dell Dimension 8300.

Increased cell phone usage due to free incoming calls

Under the Telecom Regulatory Authority of India's (TRAI) new Interconnect Usage Charge (IUC), or access charge regime, all incoming calls in India have been made free. This came into effect on the first of May, and since then talk times on cell phones have shown a 20 per cent jump. The introduction of WLL services has also given a big boost to the total number of mobile users in the country, not only those adopting WLL, but also new users on the standard cellular (GSM) networks. Increased competition has pushed down prices and increased the total number of users on the networks. The new pricing structure also makes it more expensive in some cases to call mobile phones on GSM networks from a standard fixed line. STD calls between mobiles are also cheaper than between fixed lines. So, for many users calling mobile to mobile is now the best option. This sudden explosion of users, coupled with the longer talk times seems to have placed too much stress on the networks, with some users having to try a couple of times, before they can make a call or successfully send an SMS. Orange Vice President Harit Nagpal said, "Earlier, we used to handle traffic of about eight lakh SMS messages a day. Now the traffic has shot up five times with about four million SMS messages sent across our network alone."
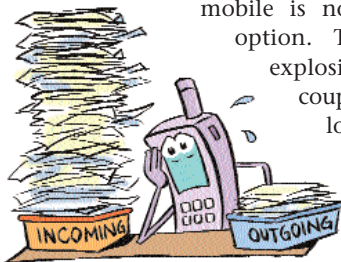
■ PC maker, Dell Computer, to change name to Dell ■ Hackers target a known Cisco router flaw, however no substantial damage is done

AOL lays off Netscape developers

In a move to reorganise its Open Source Mozilla browser team, America Online (AOL), laid off 50 employees involved in the Netscape Communications development subsidiary. Continuing support of current versions of Netscape and the Netscape Web portal is planned by the Company.

In an increasingly tough battle with Microsoft for browser market share, the lay-offs mark the latest setback for Netscape. More than 90 per cent of Web surfers currently use Internet Explorer, according to site visitor statistics published by Google.

"Netscape remains a key part of our multi-brand strategy. "We'll continue to support the browser and the portal," AOL spokesman Andrew Weinstein said.

The layoffs come as the loose Mozilla.org group transforms itself into a non-profit foundation. Some of the new recruits are expected to come from Netscape's ranks. However, a broad group of independent volunteers and staffers at other companies are expected to continue working on the open-source browser effort.

Nanotubes in screens

Motorola is working on a new display technology, using carbon nanotubes (CNT). Called the 'nano emissive display', the technology enables the manufacturers to produce large flat-panel displays at a lower cost. Motorola claims that the display quality will be better than that of plasma and LCD screens. If everything goes well, we could be seeing 50 to 80-inch CNT screens, costing the same as a 32-inch Cathode Ray screen.

It could also be used for producing much larger displays such as billboards. Carbon nanotubes can conduct electricity, withstand high temperatures, and are strong and light. These nanotubes, fire electrons at materials that emit light to produce colour displays. And scientists at Motorola Labs in Temple, Arizona have found a new way to grow nanotubes at low temperatures, which was the only hurdle to its implementation. This is important because the substrate with which they must bond are heat sensitive. Research on carbon nanotubes has been going on for 10 years, and on this new process for about four years. The technology can be easily adapted to be used by plants that manufacture plasma screens. Carbon nano tubes can be used to produce a variety of other devices such as transistors, memory chips, batteries and sensors. The company is holding talks with European and Asian manufacturers to bring the product to the market. Motorola had set up a factory in mid 90s in Temple to manufacture flat panel displays using microchip technology but the plant was closed in 2000 owing to certain technological problems. This time Motorola has promised there won't be a repeat act.

Commodore makes a comeback

Tulip Computers, owners of the Commodore brand, plan to re-launch due to an upsurge of interest in the obsolete Commodore 64 (C64) computer and its 1980s-era games. Tulip estimates that there are still 6 million Commodore users, who can choose from a range of 6,000 games which were developed for the system.

Hardware enthusiasts have written emulators for Windows PCs, Macintoshes, and now PocketPC-based PDAs to enable original Commodore games to run on those systems.

Tulip is working with Ironstone Partners, which will handle all sales of Commodore 64-related products worldwide and take over the main C64 Web portal. Tulip said that unauthorised use of the Commodore name by other organisations will soon be stopped.

Spot the hot spots sans the power

Ever been caught in a situation when the battery of your laptop is running low and you have to find a WiFi access point? Or when you are carrying your laptop in a bag? Every time you have to take out your laptop, wait for it to boot and check whether there is Wi-Fi coverage at that particular point. In all these cases, there has been the need for a device that could check availability of Wi-Fi coverage quickly and easily.

Kensington Technology Group (*www.kensington.com)*, a manufacturer of a broad assortment of devices, has come up with a product called 'WiFi Finder'. The 2.95 x 0.39 x 2.17-inch, three lights and only one button.

The button, of course, starts the search for the wireless LAN signal and if one is found, the lights will show its strength.

Kensington claims that its device is able to find 802.11b and 802.11g signals, if the hot-spot is up to 200 feet away. It also filters out other wireless signals such as Bluetooth. It is priced at about $25, and comes with a 1-year warranty.

Ring out the pests?

A new service allows cell phone users to download a sound that repels troublesome mosquitoes by South Korea's top mobile phone operator. According to SK Telecom, the sound is capable of clearing the insects within a range of one meter. The prime reason for such a service is that mosquitoes are a common irritant during the hot, humid summers in Korea.
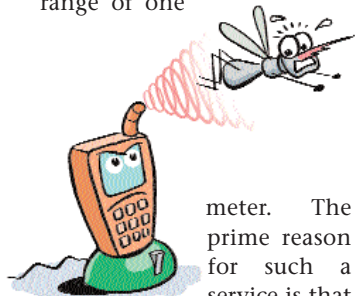
Subscribers of the service will be able to download the sound, which will cost 3,000 won ($2.54), from the firm's wireless Internet service from 21st July. The sound plays constantly, consuming precious mobile battery charge. It is faintly audible to the human ear.

Repelling the bugs will use up to 30 per cent more of the phone's battery power, said SK, which controls more than half of Asia's third-largest mobile market.

Critical flaw found in Windows

Microsoft announced three new security breaches in its software, including one 'critical' Windows flaw that allows a hacker to run any unauthorised code on victims' PCs. The flaw known as a buffer overrun vulnerability allows an attacker to use an unchecked buffer to run their own executable code. The flaw located in the HTML converter in Windows, is used by hackers to spread the code either by sending an HTML e-mail or by creating a special Web page that triggers a the code.

The vulnerability exists in most recent versions of Windows, including Windows XP, 2000, 98, 98 SE, Me, and NT 4.0 Server. The flaw is less effective in Windows Server 2003, because it ships with a setting known as Enhanced Security Configuration designed to minimise the risk of unauthorised code being launched. Microsoft has posted a patch for the vulnerability on its Web site.

Hijacked PCs spread porn

Two thousand Windows-based PCs with high-speed Internet connections in San Francisco have been hijacked by a stealth program and are being used to send ads for pornography, say computer security experts. The Trojan, dubbed 'Migmaf' or 'migrant Mafia', turns the victim computer into a proxy server that serves as a sort of middleman between people clicking on porn e-mail spam or Web site links. It allows the victim computer to fetch porn Web ads from an undisclosed server and pass the ads on to other computers, either through an e-mail spam or a Web browser.

The Trojan is also said to be responsible for a PayPal scam discovered last week. Designed to collect credit card information from people who filled in a form they received via e-mail claiming to be from Web payment provider PayPal.

snapshot

Spam filters on Microsoft's MSN and Hotmail e-mail services now block **2.4 billion** messages a day

Source: MSN

tomorrow'stechnology

SoundVu… audio/visual integration at its finest

SoundVu is a technology under development by NXT. The technology aims at producing audio and visual output from a single surface. By doing this, NXT aims to provide a speaker with virtually no footprint.

Due to its technology and size, SoundVu panels can better standard phone receiver systems. The sound quality provided by such a panel is much higher than a regular receiver. But the best advantage of this would be a dramatic change in the shape and design of the phone. This is mainly due to the integration of the audio and video units.

Such technology would also be very useful in high end multimedia phones. The SoundVu technology meets the needs of 3G handsets. NEC is one of the first electronic giants to have shown interest in this system. It has developed a laptop with a screen that works as a speaker.

■ Mozilla 1.4 has been released for Windows, Linux and Mac OS ■ A new bill pending in US Congress could make P2P file swapping a felony

The death of a PC

Dear Digit,
Congratulations! You have blown up our PC by suggesting that we use software such as SoftFSB. In no time, it multiplied our Celeron 900 MHz 4 times! Now, could we just ask you to be kind, and send us a a cheque of Rs 10,000 for the repairs that you have literally thrust upon us?
Thanking you,
Anant and Shantanu
Via e-mail

ILLUSTRATIONS: Mahesh Benkar

Dear Anant and Shantanu,
You have our sympathies for your loss. Over-clocking your PC is always a hazardous task, as we point out in every article that shows you how to go about doing it. Where a 10 per cent increase is considered significant, pushing your system to 4 times it's rated speed is certain to melt every chip. We publish your letter here as a cautionary note to all our readers—the speed gain by over-clocking brings with it a corresponding risk of burn out. Please be careful.

Crack who?

Dear Sir,
  Please do include software such as 3D Studio Max, Partition Magic, etc., in your forthcoming Digit interactive CDs. Also, increase the number of games, and reduce the useless funzone games. The bitter truth is that the popularity of your magazine is due to the crackdigit site. The more cracks available, the more popular will your magazine be. As the crackdigit site is down, I cannot find cracks to some of the games. I suggest that you entrust someone with the task of developing cracks.
Thanks,
Sartaj Sharma
Via e-mail

Dear Sartaj,
Over the last couple of issues, we have been discussing the ills of piracy in this space. Just to make it absolutely clear, we are not in any way associated with any crackdigit site, and are most certainly not getting into the business of "developing cracks" for software.

Buying trouble

Dear Sumod,
  With reference to the July 2003 editorial, I feel that India is the only country in the world where the customer for a computer peripheral has to go through ordeals that have no parallels. The importer, distributor, and the reseller mafia here, is unheard of in the other parts of the world. There are 'n' number of online stores abroad, from where you can buy PC components. 'If they're made, they're available' is their motto.
  However, try buying any component in India, and you are almost sure to be taken for a ride. Replacement and repair problems are better left unsaid.
  Thank you for acknowledging our plight and highlighting our woes.
Sartaj Sharma
Via e-mail

Dear Sumod,
  Apropos the editorial dated July 2003, the smoke screen is not yet completely off. Kudos for acknowledging the ground realities, and the deplorable state the customer is in today—an act long overdue.
Prices for a SATA hard disk are not available with the reseller because the distributor feels that there is no market for these drives. CRT monitors are withdrawn from the market overnight since the TFTs do not sell if their cheap cousins are around! Indeed, call centres know nothing about prices, or anything for that matter.
Big bullies, importing motherboards and processors, see which way the wind is blowing before answering your queries about an 875 chipset! Lamington road 'gurus' still wake up at 10 am, have lunch, and then tell you that the PC components have yet to come, which, in their parlance, means that the 'rate for the day' for all the parts is still being worked out. Don't be surprised if CPUs prices fall by 20 per cent between the time of purchase, and the arrival of the 3.43 Virar fast at Dahisar. The business carried out at Dalal Street seems to be far safer.
Ravi Mahadevan
Via e-mail

Dear Raja and Ravi,
Your experiences resonate loud and clear with all of us who have had the opportunity to buy PC components in the 'grey' market. The stories are always the same, the excuses are quite predictable. The problem is compounded by the fact that it is the rare reseller who has both knowledge, and the right attitude.

digit READER POLLS

Your vote counts

Q. Do you think publishing bad after-sales experiences that our readers endure will help improve vendor's service levels?

Yes	No
75.4%	**24.6%**

This month's question:
Question: Your reason for not trying Linux yet?
Don't know why I should try
To hard to install/use
My favourite application missing
Linux rules my desk!

*Log on to **www.thinkdigit.com** and vote*

Language babble

Hi!
I am a regular news stand buyer of Digit. I noticed that you were conducting a massive subscription campaign that entailed offering a 10-CD pack to the subsrciber. You made use of almost all the languages, except Kannada— the language of the state where India's IT capital is situated. Was this done deliberately? It seems to me that a state that contributes so much to the IT sector does not mean much to you. Is this the message that you wish to spread ? Please do clarify your stand in this matter.
Thank you,
Ganesh.
Via e-mail

I am appalled to see how partial you guys have been while advertising for your latest 10-CD pack offer. The June issue carried the advertisement in all languages—except in Telugu.
I thought that you would carry the advertisement in Telugu in thefollowing month, but that did not happen. Don't be under the impression that no one with Telugu as their mother tongue reads Digit. In fact, in my opinion, more than 1000 Digit subscribers are from Andhra Pradesh. I hope you will not repeat such a mistake in the near future.
Yours,
Y.Niranjan Prasad
Via e-mail

Dear Niranjan and Ganesh,
It is indeed unbelievable that we missed out on Telegu, and Kannada in our subscription campaign. We chose the languages quite at random, and from your response, you seem to have got the message. We had no intention to cause offence to the Telegu and Kannada speaking communities, or those that speak any of the couple of dozen other Indian languages we didn't use, out of the 40 odd recognised.

Trailer trouble

Dear Sumod,
First, let me congratulate you on Digit's second anniversary. The anniversary issue made for interesting reading. I have also noticed that the content that goes into Digit has improved substantially.
However, for the past two or three months, you have stopped publishing gaming articles. Please don't expect every gamer to buy *Skoar*, since it's not available as widely as Digit.
Secondly, a different player is needed to play each game, and movie trailers that are included on the playware CD. This is very irritating. Could you recommend a single media player for all these trailers? If not, then please change the trailers' format. I strongly believe it will help me, and others facing such problems.
maxpowersin@....com

Dear maxpowersin,
We cannot continue carrying gaming articles every month, simply because only a small number of our readers, such as yourself, are avid gamers. However, we will certainly carry the occasional gaming article to satisfy your needs. As for the multiple format movies, that is how the movies are made by the original creators. We do not limit our choices by format, and try to include all the software—players, as well as codecs, required to view them. You should find this software on the Playware CD, under the Players folder.

Short Bytes
Pleasantries

Hi Digit,
I could hardly believe my eyes when I read that the August issue would be carrying a DVD. It was music to my ears!. And, I alreadyhave a premonition that it's gonna be packed with a lot of surplus surprises.
I recently got the 10-CD pack that was promised with my subscription. It had all the utilies needed for my system. Indeed, the CDs have proven themselves to be useful.
Good job guys! Cheers!

S.Raghavendra
Via e-mail

Hi,
Read the SOS of Arvind Singh in the July 2003 issue. The same problem has been affecting my friend for the past one year. I have been removing it using IBM's DFT (Drive fitness Test) which I downloaded from the Net.
Arvind could use the 'Corrupted Sector Repair' option, available in the DFT to eliminate the problem. However, the repair may sometimes make the present installation unusable (missing explorer.exe, or registry damages). He should backup data from Windows to another drive before formatting the drive. Here's wishing the Digit Team a happy Anniversary.
Love,

Deepu
Via e-mail

Duck that Spam

VIPUL SHAH

In the last 12 weeks, every tech or non-tech publication contained at least one news item or article about spam, saying how bad it is, how the George Bush government will stop it by passing laws against it, and so on.

Let's face it! Spam is not going away no matter how many laws you pass against it. Stopping spam is far more difficult than carpet bombing a few countries. It costs almost nothing to send a million e-mails, and is enormously profitable—even if only 10 people respond, and buy a University Diploma, a weight loss product, or accept money from the wife of an ex-president of some African country. Until people on the Internet become more alert and savvy, spam is going to be major business, and also a major nuisance.

Most spam e-mails originate from China and some Eastern bloc countries. So, even if spam is outlawed in one country, your mailbox will still overflow with spam originating from other countries. The rate at which spam is increasing, one or two sender countries dropping out won't change the scene much.

Now, since we can't stop spam, we can at least try to duck it. There are few ways to do this. One very popular, but not very effective way, is to use anti-spam software such as Mailwasher. This software is free, and very good at detecting spam in your mailbox. It deletes spam before you download any e-mails and bounces all spam back to the sender in order to appear as an invalid address, and hope that the spammers will remove your address from their list. If your e-mail ID is not critical, you can just create new e-mail accounts every few months, abandon the old accounts and inform every one of the change.

I have started a strategy where if I can't completely stop spam, I can at least reduce it to manageable level. The older your e-mail address, the more important it is to you, and the more spam it attracts. So if you are someone who needs e-mail for your work, then you should allocate some money every year for e-mail—just as you do for mobile phones, faxes or ISP charges. You should sign up for a domain name, which now costs as low as $7 to $13 a year and buy e-mail hosting—20 MB or more—as it's not expensive. Usually the hosting company will create a master account

for you, and you can create multiple POP3 accounts or aliases for as little as Rs 300 to Rs 1,300 a year. If you don't want to create multiple POP3 accounts, create just one main account. It can be called *ab@yourdomain.com*. Don't give this address to anyone. Now create few aliases; How many depends solely on how many different categories you can sort your incoming mail into—for example, create a *yourfirstname@yourdomain.com* for all your personal contacts. Ask your friends to never submit this e-mail address to any Web sites which may offer them goodies in exchange for a friend's e-mail address.

Then create an alias—*bank@yourdomain.com* or *abcbank@yourdomain.com*—and use it for banking. Create a separate alias for every e-mail newsletter you subscribe to and so on. In my case, I write for various publications, so I have different aliases such as *digit@vipulshah.com* or *toi@vipulshah.com* for Times of India.

You can even create a *spam@yourdomain.com*, just for those Web sites which insist on your registering with them before you can use their services. Then you won't have to bother checking this e-mail, as it will be full of mailers and offers. Once done, create different folders in your e-mail software and use message rules to route all your incoming mails to the respective folders, depending on the address in the To/Cc field of incoming mails.

Now, you are not at the mercy of spammers. If one of the above aliases receives any spam, you can just disable it by adding it to the 'nobody' list, and all mails to this alias will start bouncing. Also, if you receive spam at *bank@yourdomain.com* you know your bank is leaking, selling or renting your e-mail address to spammers. You may add this address to the 'Nobody' list, and inform the bank that you don't wish to receive communication by e-mail anymore, or even consider taking your business elsewhere.

This strategy keeps your options open and lets you minimise spam, which you can't do with free e-mail addresses. We also know that dot com portals can crash, and thus, so can your free e-mail address. But your own domain name protects you from such uncertainties. d

Vipul Shah is a chartered accountant, and writes and consults on Internet, e-commerce, banking and finance technologies. He can be reached at digit@vipulshah.com

Line of Sound
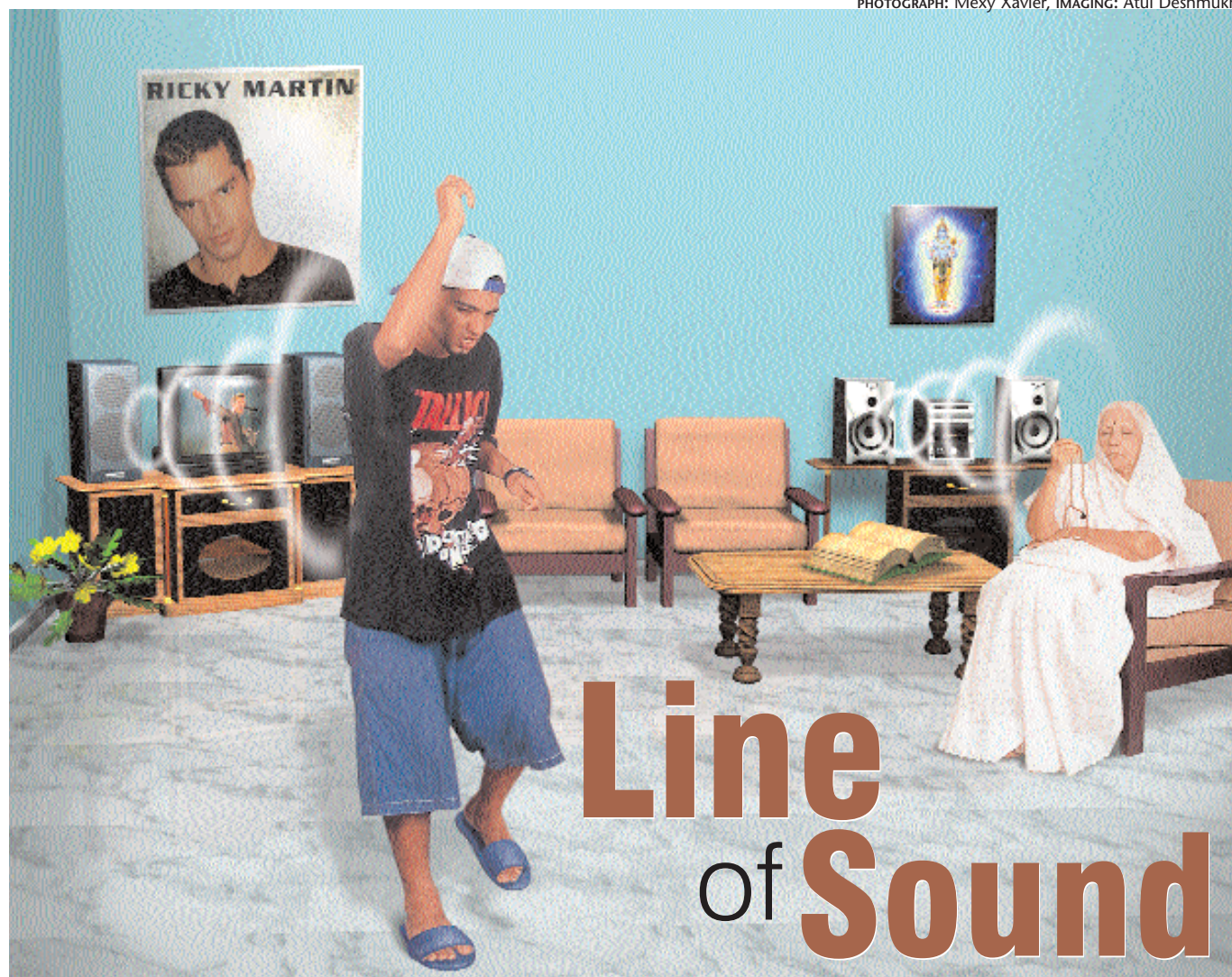
Sound, like light can now be directed, so that only those within its path can hear it.

For many decades now, the way we listen to music hasn't really changed. If you claim to be an audiophile, or a connoisseur of fine music, then you probably have your own personal acoustical preferences in instruments that reproduce music. However, it's interesting to know that the basic technology powering the speaker has remained just about the same.

At the moment, two companies that have been at the forefront of research in acoustics have decided to change that. The secret weapon in their arsenal is an often touted, but never quite realised technology that creates focused beams of sound, similar to the light beams coming out of a flashlight. The technology that powers this is known as audio spotlighting. It uses a combination of non-linear acoustics and some very fancy and complex mathematics. But it's real, and works fine enough to knock the socks of any other conventional loudspeaker.

Researchers have worked for many years to focus sound into a coherent and highly directional beam. It's never quite worked beyond the laboratory; at least, not until recently, when former MIT Media Labs researcher, Joseph Pompei, managed to crack the problem by studying current techniques and re-engineering them. Now, Holosonic Research Labs and the American Technology Corporation have come up with audio solutions that make use of audio spotlighting technology to create fine audio solutions for a wide variety of applications.

Lighting up sound

Audio spotlighting makes for an interesting theory, but you just can't focus, or direct a beam of sound the way you focus light using a flashlight. Perhaps just a little, by holding an open-mouthed funnel-shaped pipe close to your mouth and shouting. However, this still doesn't direct the sound as required.

The audible portions of sound tend to spread out in all directions from the point of origin. They do not travel as narrow beams—which is why you don't need to be right in front of a radio to hear music. In fact, the beam angle of audible sound is very wide, just about 360 degrees. This effectively means the sound that you hear will be propagated through air equally, in all directions.

In order to focus sound into a narrow beam, you need to maintain a low beam angle that is dictated by wavelength. The smaller the wavelength, the less the beam angle, and hence, the more

focused the sound. Unfortunately, most of the human-audible sound is a mixture of signals with varying wavelengths—between 2 cms to 17 metres (the human hearing ranges from a frequency of 20 Hz to 20,000 Hz). Hence, except for very low wavelengths, just about the entire audible spectrum tends to spread out at 360 degrees.

To create a narrow sound beam, the aperture size of the source also matters—a large loudspeaker will focus sound over a smaller area. If the source loudspeaker can be made several times bigger than the wavelength of the sound transmitted, then a finely focused beam can be created. The problem here is that this is not a very practical solution. To ensure that the shortest audible wavelengths are focused into a beam, a loudspeaker about 10 metres across is required, and to guarantee that all the audible wavelengths are focused, even bigger loudspeakers are needed.

Ultrasound to the rescue

Bigger loudspeakers and source apertures seemed like an insurmountable obstacle, until scientists started work on ultrasound. Pioneering research in the usage and propagation of ultrasound can be traced back to the 1960s, when Orhan Berktay and other acousticians were studying underwater sound propagation. Researchers discovered that if short pulses of ultrasound were fired into water, the pulses were spontaneously converted into low frequency sound. Ultrasound is sound that has very small wavelength—in the millimetre range. You can't hear ultrasound since it lies beyond the threshold of human hearing. Orhan Berktay studied this and wrote his semi-

Using ultrasound to generate audible sound

A highly directional ultrasonic column

Resultant audible sound is focussed and directional

Emitter

The length of the ultrasonic column determines the directionality at audio frequencies
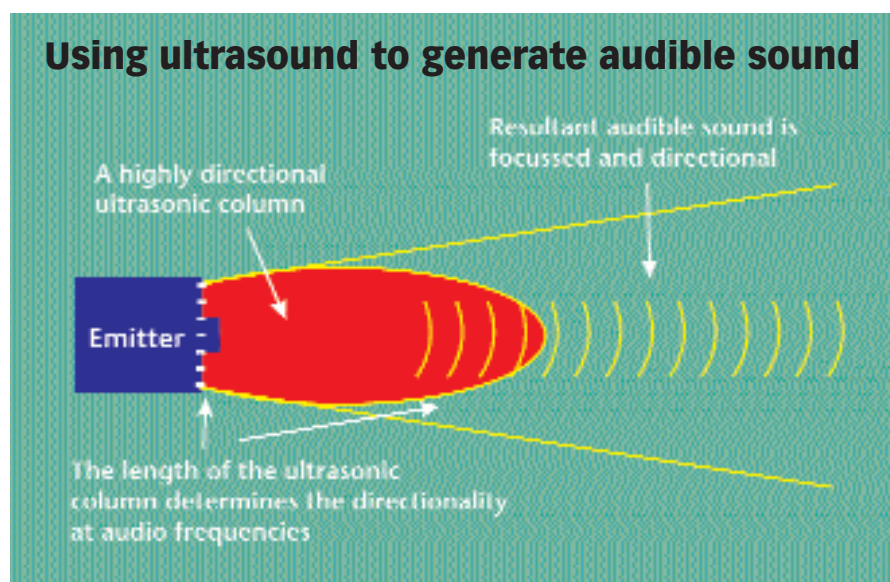
nal paper, which established that water distorts ultrasound signals in a non-linear, but predictable, mathematical way. The researchers finally went on to use this and create directional sonar, but there was a bigger use of Berktay's equation outside of sound propagation under water. Research in the early 1970s focused on sound propagation in air. This is when researchers started firing the inaudible ultrasound pulses into the air and discovered that air spontaneously converted the inaudible ultrasound into audible sound tones, hence proving that as with water, sound propagation in air is just as non-linear, but can be calculated mathematically. Joseph Pompei's acoustic device, the Audio Spotlight works just like that—it comprises a speaker that fires ultrasound pulses, which act in a manner similar to that of a long, narrow column extending from the front of the disc. The ultrasound column acts as an airborne speaker, and as the beam moves through the air, gradual distortion takes place in a predictable way. This gives rise to audible components that can be accurately predicted and precisely controlled.

However, the problem with firing off ultrasound pulses, and having them interfere to produce audible tones is that the audible components created are nowhere similar to the complex signals in speech and music. Human speech, as well as music, contains multiple varying frequency signals, which interfere to produce sound and distortion. To generate such sound out of pure ultrasound tones is not easy. This is when teams of

researchers from Ricoh and other Japanese companies got together to come up with the idea of using pure ultrasound signals as a carrier wave, and superimposing audible speech and music signals on it to create a hybrid wave. This is similar to the idea of amplitude modulation (AM), a technique used to broadcast commercial radio stations signals over a wide area. The speech and music signals are mixed with the pure ultrasound carrier wave, and the resultant hybrid wave is then broadcast. As this wave moves through the air, it creates complex distortions that give rise to two new frequency sets, one slightly higher and one slightly lower than the hybrid wave. Berktay's equation holds strong here, and these two sidebands interfere with the hybrid wave and produce two signal components, as the equation says. One is identical to the original sound wave, and the other is a badly distorted component. This is where the problem lies—the volume of the original sound wave is proportional to that of the ultrasounds, while the volume of the signal's distorted component is exponential. So, a slight increase in the volume drowns out the original sound wave as the distorted signal becomes predominant. It was at this point that all research on ultrasound as a carrier wave for an audio spotlight got bogged down in the 1980s.

Berktay's equation works
Then, Joseph Pompei realised that the focus should have been on the signal's distorted component. Now since the signal component's behavior is mathemati-

cally predictable, the technique to create the audio beam is simple; modulate the amplitude to get the hybrid wave, then calculate what the Becktay's Equation does to this signal, and do the exact opposite. In other words, distort it, before Mother Nature does it. Finally, pass this wave through air, and what you get is the original sound wave component whose volume, this time, is exponentially related to the volume of the ultrasound beam, and a distorted component, whose volume now varies directly as the ultrasound wave. Once you crank up the volume of the ultrasound, you can get as high as 80 decibels with just 5 per cent distortion—not the best in the world yet, but a far cry from the 50 per cent or so that the Japanese teams faced. The best speakers in the world can currently get distortion down to below 1 per cent and research is get-

ting the targeted audio beam very close to this point.

Since you can control and focus the ultrasound beam just like a flashlight, you can direct it such that you would hear the sound only if you were in the path of the beam. This is called directed sound. You could also bounce the beam off a reflecting surface, so that people in the path of the audio reflection can hear the sound. This is known as projected audio. In short, unlike ordinary speakers, you will hear the sound only if you disrupt the sound beam, whether you stand in its path or in the path of a reflection from an acoustic mirroring surface. If you step away from the path of the sound, you will hear nothing. In either case, the sound's source is not the physical device you see, but the invisible ultrasound beam that generates it.

This is where you are going to experience audio spotlighting

Personalised messaging:
Using targeted sound, you could message people in high activity areas such as construction sites, and factory floors.

Acoustic assault rifles:
You could employ sound to fire focussed, high-energy acoustic bullets that could be used as non-lethal weapons to deter crowds

Realistic movies:
With targeted sound, movies could become more realistic, with the sound moving, along with its source on the screen.

Discreet announcements:
In museums and exhibitions, using audio spotlighting techniques to discreetly inform people, without raising ambient sound levels

Consumer electronics:
You could use focussed sound in televisions, and home theatre systems, to give realistic sound effects.

INFOGRAPH: Parag Joshi

The sound ray is coming

The targeted or directed audio technology is going to tap a huge commercial market in entertainment and in consumer electronics, and the technology developers are scrambling to tap into that market. Joseph Pompei's Holosonic Research Labs developed the Audio Spotlight that is made of a sound processor, an amplifier and the transducer. Aim the transducer anywhere, and direct and project a three-degree wide sound beam that is audible even at 100 metres. The American Technology Corporation developed the HyperSonic Sound-based Directed Audio Sound System. Both use ultrasound based solutions to beam sound into a focused beam.

With something as radical as this coming into mainstream sound reproduction, analysts claim that this is possibly the most dramatic change in the way we perceive sound since the

invention of the coil loudspeaker. Sound as we know it, is a very three-dimensional sensation. But if you strip out the perception of depth and direction, for example whilst watching a movie on TV, we tend to associate the sound source as being very fixed, and hence unreal. This is where three-dimensional sound beaming comes in. The technology that the Holosonic Research Labs and the American Technology Corporation are lining up may seem to be a novelty of sorts, but a wide range of applications are being targeted at it.

The first lab rats are going to be those attending exhibitions and trade shows. With targeted announcements at crowded shows, audio spotlighting technology may possibly be the best way for exhibitors to draw people to their stalls and demonstrate their product to potential customers. Supermarkets and retail stores may not be very far behind either—stand in this aisle that features detergents and hear the sales pitch for a new washing detergent, stand in the other and find out about the latest meat bargains. Retail displays and kiosks are possibly going to be the first to get wired up. Soon after this, spotlighting technology can also be built into vending machines, which might entice you to stop by for a refreshing cold drink as you pass by. There is an even bigger market for personalised sound systems in entertainment and consumer electronics. You could be wired up for spotlighting in the future with your home theatre audio system, and could experience sound as it was originally heard, possessing direction and movement, and this will be tuned to your favourite couch-potato position. If you just have to watch that show that everybody detests, then you could use a personalised spotlight that turns off the audio for everybody, except you, since you will be sitting right in the middle of it. Movie theatres could also jump onto the bandwagon, with live moving voices coming in from all over the screen, movies would be truer

Take a ride in the MAXXcab and headbang to metal, while your parents listen to oldies

to life and enormously entertaining.

Holosonic Labs is working on another interesting application at the Boston Museum of Science that allows the intended listeners to understand and hear explanations, without raising the ambient sound levels. The idea is that museum exhibits can be discreetly wired up with tiny speaker domes that can unobtrusively, provide explanations. There are also other interesting applications that they are looking at, such as private messaging using this system without headphones, special effects at presentations as well as special sound theme parks that could put up animated sound displays similar to today's light shows. Holosonic has installed their Audio Spotlight system at Tokyo's Sega Joyopolis theme park. One of the most interesting applications though, is the one fitted in the DaimlerChrysler MAXXcab prototype truck. Holosonic put in four individual Audio Spotlights into the truck to let all the passengers enjoy their own choice of music. This has been successful enough for them to start looking at marketing this commercially.

American Technology Corporation has also been looking at emerging consumer and non-consumer markets, targeting consumer electronics and home entertainment as well as a decidedly niche usage in the military. The US Navy has installed sound beaming technology on the deck of an Aegis-class Navy destroyer, and is looking at this as a substitute to the radio operator's headphones. To keep track of what's going on around

Beaming alternatively

There are other alternative approaches to creating targeted audio, other than the ultrasound modulation technique. One is the parabolic dish approach that essentially uses antennae to focus and direct sound. Here, a relatively omni-directional loudspeaker is placed at the focal point of a parabolic dish pointing towards it. When the loudspeaker generates the sound signal, it acts as a point source, emitting waves that reflect off the parabolic dish which is pointed towards a particular direction. This is very much in use, but the problem here is that the size of the parabolic dish required to accommodate the longer wavelengths of lower frequencies is too large.

them, as well as the radio chatter, users generally keep one ear off the radio headset. With this system, all the information can be piped into the operator's ears, without them having to wear bulky headsets.

There are even bigger applications as far as the military goes. One of them is a very loud hailing device to catch the attention of ships further away, though it does not use ultrasound as the underlying technology. Still more interesting is the idea of non-lethal acoustic assault rifles that fire sound pulses. Pump up the normal sound being transmitted to about 150 decibels or greater, and you could fire out pulses that could disorient human targets, even causing them severe physical pain. The weapon could also be fine-tuned to bring on further discomfort. American Technology Corp is looking at Jeep mounted units that could be deployed as a mob deterrent.

Sounding right

There are even more interesting applications in the pipeline—car-based safety audio systems, discreet speaker phones and many more such interesting applications. Over the next few years, the way we experience sound may change dramatically. We will reproduce sound just the way we experience it in the real world. Is it time to trash your boom box? Well, not yet, but pretty soon, the next big bang in sound is going to come straight out of the air, riding on inaudible ultrasound. **d**

SRINIVASAN RAMAKRISHNAN
(srinivasan_ramakrishnan@thinkdigit.com)

Siemens SX1 Smartphone ▶▶
Get Siemens Smart

In this first smart phone by Siemens, the buttons are placed around the screen for a sleek look. It has a 64 K colour display, and weighs 110 grams. It has a video player, FM radio player, and a camcorder.

Aeons

An ensemble of elements that embody another vista of time…

▲ Sony CLIÉ PEG-NZ90
Will you CLIÉ?

The Sony CLIÉ PEG-NZ90 uses a 2-megapixel digital camera, featuring a built-in flash, and auto-focus capabilities. Along with this, it also features a Wi-Fi (802.11b) communications slot and integrated Bluetooth connectivity options.

Casio WQV3 Wrist ▶▶
Camera Watch
Smile at my wrist please

The Casio WQV3 is a wrist camera that allows you to take pictures in a digital format, which can then be sent to your PC. It uses a 25,344-pixel colour CMOS sensor to capture images, which are displayed on a 16-grayscale monochrome LCD panel. The watch has memory capacity that allows you to store up to 80 images. Infrared data communication is used to export the images.

◀◀ Fossil PDA
Watch my PDA

Fossil has incorporated the popular Palm OS into its watch to provide a product with unique functionality and style. Inputs are made using the touch screen and a 2 MB memory is provided to easily store files.

Ahead

▶▶
Handspring Treo 600
Treo's a company

The Treo 600 is a fully functional PDA which comes shaped in a phone for easier portability. It features a fully functional QWERTY keyboard layout and runs PALM OS 5.2.1 It will support 32 MB RAM and has a 160*160 pixel screen.

◀◀ CASIO DBCW150D-7
Wave-Ceptor Wrist Watch
The exact time

The Waveceptor watch from Casio provides you with the most accurate time standard. It is synchronized with the Atomic Clock that regulates accuracy using calibrated radio signals. Along with this, it has the regular databank functions that keep you organised.

Break on
through to the other side!

Why hasn't Linux invaded our lives? We take a look at the Linux penetration in Indian offices, and the different projects and programmes that look to introduce Open Source Solutions

Linux! Say the word amidst a crowd of computer novices, and you will witness a vanishing act. Linux has developed an image of being extremely complicated, and for most general users, a major headache. This is the primary reason why Linux is not even considered an operating system for the home user, despite its crucial advantage—cost-effectiveness. The same is the case for corporations and employees. Why lose out on productivity for no apparent reason?

But will this always be the scenario? Linux has been around for some time now. Hence the excuse that it is a relatively new entrant, and will take time to develop, now holds no weight.

OS on Steroids?

The major task of almost every PC is office productivity and games. On an average, the life expectancy of a PC in India is about 4 years. Now, consider upgrading your Windows every 2 to 3 years. This alone would set you back by as much as Rs 6,500. And when you look at licensed application software, few go further than another flagship Microsoft offering: Office could cost you as much as Rs 15,000. What this effectively means is that in a year, you could easily spend up to Rs 5,000 on your PC. And if you work in a corporate environment, multiply that figure by the number of employees in your firm.

Linux cost savings are also helping create a cheaper computing environment

around the world. A few noteworthy projects are making progress. One of them is the Simputer. It aims at providing access to computing at the grass root levels in India, and its ultimate goal is to enable illiterate people to use the device. Thus it aims at being inexpensive and Indianised. The Simputer trust has been developed to ensure that such a noble project does not fade away due to lack of interest or funding.

The problem with Linux lies in the availability of application software. Unlike Windows-based application software, Linux-based software isn't freely available, even in software stores. The major reason for this, in turn, is the lack of popularity of Linux. Then again, if it were popular and available in stores, the cost factor of buying Linux application software would come into play.

Trevor Warren, consultant for Red Hat, encompasses the problem of Distribution very simply, "Whatever your required application, there is a good chance you get it off the Net. Popular distributions provide a large number of applications off the box. The specific application that you may need is just a download away."

Linux is a lot more than a cheap buy.

> **Business takes a conservative approach. Trying to implement something that will take time and effort to understand defeats the principle of savings in free software.**

Frederick Noronha
A freelance writer and an active member of the Linux community

On its own, it is a stable solution and a great choice for many computing needs. This could be a very important reason for people to switch to Linux. When you run applications on a Windows environment, invariably you encounter a system crash or a lock-up at some point or the other. A very important fact that most experienced Windows users overlook is the underlying anxiety while working on the system. This anxiety is due to the worry that a system crash or lock-up can potentially disrupt an entire days work. But this is not so in the case of Linux. Since it is a derivative of Unix, its stability cannot be questioned. Uptime is usually measured in terms of weeks and months for a Unix-based OS.

The common perception of users is that Linux does not have technical support. But this is not true. The reason behind this is that people do not search for support in the right places. Similar to its distribution model, support for Linux is also based primarily on the Internet. For technical support, the open source community is the best solution.

But According to Trevor Warren, "The system of support is the same for Windows or Red Hat. Support and updates are available off the Web." Adding to this, you can also expect support from the large online Linux community.

To save on costs, State Institutions are ideally suited to switch to Linux. The West Bengal Pollution Control (WBPC) board has undertaken a project to develop an information system for their entire network, titled the 'Environment Man-

IIT: Affordable solutions for everyone!

The IITs have always been at the forefront of research into new horizons. With the Affordable Solutions Lab (ASL) at the Kanwal Rekhi School of Information Technology (KReSIT), practical deployment of Linux is now possible. The ASL is walking the thin line of making computational facilities cheaper without having to compromise on performance.

ASL can be called a simulation environment in the simplest of terms. Corporations interested in switching to low cost systems can bring their needs to the lab. Based on these needs, a test bed is set up, and the corporations can see their system function exactly as it will, when implemented. Also, the hesitation to make the switch is removed with the presence of such an institution as an IIT offering support.

Though the lab is in its initial stages, a lot of progress has already been made. During the set up, a set of tests are performed which make assessments regarding the performance, stability and security of a system. The basic set up is a server with connected diskless nodes (also called 'thin clients'), which receive information via a browser environment. This reduces the thin client system requirements, and ultimately the cost of the entire network. A typical thin client costs only about Rs 15,000, as opposed to Rs 20,000 for normal entry level desktop PCs.

Dr. Deepak B. Phatak is a professor who is closely involved with the operations of the lab. He is extremely optimistic about the results. According to him, the acceptance of a cheaper solution will be possible only if the end user is convinced that the solution is a safe and workable one. According to him the lack of interest for an Open Source OS is due to lack of applications. The only way that users can try out the OS is if applications do exist. But this results in a vicious cycle as major software developers will only make applications if a market exists for them. He believes that projects such as the ASL can help break this cycle. By providing a solution and backing it with the ASL name, an end user will feel reassured about trying out the system.

When asked about computing in general in India, he feels that a mutual participation is required. According to him, for Computer penetration to increase at a faster pace, his plan must be adopted.

Dr. Phatak says, "Governments, schools, colleges must increase their investment in IT by a factor of 4. At the same time, the industry should give solutions at a quarter of the current cost. 20 Million desktop PCs must be sold in order to make India an IT powerhouse. A 16X growth factor is required to attain this. This is only possible when the cost of a desktop drops to Rs 15,000. Only then will people will believe it. The ultimate aim is to make a PC cost less than a TV".

agement Information System'. It is one of the first forays into building a system on open source software. The WBPC board uses Linux servers to run their state-wide operation. But the move to the desktop has not been ignored. The WBPC has 110 computers in operation. As of now 12 computers are running on Linux. Once the simputer project is implemented, the operation and processing will be done by the servers, and most client tasks will be restricted to browsers—thus providing an impetus towards cheaper operating systems. Such a project explains just why a large body should make the switch.

Such a change is even more obvious for cash strapped educational institutions. Such programmes are under development in places across India. As of now, three sizeable projects are underway in Chennai, Goa and Kerala. Demo@Schools is a project that has now come under the hood of the Free Software Foundation. It aims at popularising free software to the masses. The project is trying to convince educational institutions to replace their proprietary software formats and provide free software replacements. In a similar manner, Goa and Kerala are seriously considering the adoption of GNU or

Why focus on India?

Well we all know that Linux is a sizeable power in the OS market. But, does Linux have a bearing in India? Yes! India is definitely an important global resource in terms of computing. The amount of technical brainpower coupled with the sizeable English speaking populace has made the Indian employee a much sought after worker. Thus it makes sense that the Open Source movement should catch up to India. The movement also gives programmers a chance to demonstrate their own skills independently rather than be forced to follow an organisation.

In India, most software currently being used is pirated. Software sales have suffered due to this. The gaming industry has almost given up on India, due to piracy. Here, Linux has an advantage. It is either free or available for such low prices that the question of piracy doesn't arise. The Indian users' need for cheaper introductory PCs can also be realised by offering a Linux OS pre-loaded.

Linux based solutions to educational institutions.

Linux: All Talk and no substance?
So far so good, but then, why is Windows the desktop of choice? A simple analysis of our computer market will provide the answer. When a PC is purchased, it is likely to come with Windows preloaded. System Assemblers do this simply because they do not wish to be confused, or confuse customers with multiple choices. Linux is not considered, simply because of user fear. This is one of the main problems of Linux. Since its inception, a lot has been done to make Linux user-friendly. But the problem here is that the end

> **It's a chicken and egg story. A mature product such as Tally is available for Windows. There is no reason to switch over because it is doing quite well. The other available packages do not have the functionality that Tally can boast of.**

Deepak Phatak
KReSIT, IIT Bombay

user is not aware of this fact. Also, the usability of Linux still does not match a Windows OS. With such an aura, would anybody use Linux?

If some heroic soul does make the decision to use Linux, he has to choose between many Linux distributions—Red-Hat, Mandrake, Caldera, etc. It is difficult to make an informed choice of which distribution is best for what scenario. This again makes an organisation think twice about making a switch. Though all the flavours of Linux are quite interoperable, many are concerned about support and compatibility with other systems.

Another problem that comes up is application selection. An organisation may probably have a set of applications, used by employees to perform various tasks. When the switch to Linux is made, applications that do the job just as well as their Windows counterparts need to be procured and deployed. After all of this, you still have to learn the differences in operation commands with Linux, and will have a long way to go before you become a power user.

Since Linux is open source, there are many companies that develop the different variants of Linux available today. In

contrast to this all the versions of Windows have a similar interface. But, there is more to this than meets the eye. According to Trevor, the problem lies in clearing the image of Linux. "Defining a proper Business Model for an Open Source development is a major hurdle. Linux is equally user friendly and application support is available. But the costs required to push this notion around the world are enormous."

The Transition Process…
It is not possible to simply switch from one OS to another. The transition period is one of the most important stages of the entire process. The final decision as to switch or not to switch is dependant on the success of the transition. During the transition period, one must critically test out the areas in which the system will be used most.

The first thing that must be done is a thorough analysis of the system. The two major roles of Linux as an OS are at the server level and at the desktop level. Linux has already been accepted as a good solution for a server. This is also due to the interoperability between a Linux server and Windows workstations.

But the real challenge is getting Linux to the desktop. While it may not be very difficult to convince a system administrator to switch to Linux, try convincing an accountant, using Tally on his Windows-based machine. The ultimate goal here is to provide the same operating environment at a lesser cost. A non-technical user should easily understand the applications and the desktop interface used.

Nowadays, this can be done easily thanks to the availability of different kinds of software for the Linux system. But the biggest problem is changing the mental outlook of the employee. "The most important task for both the system

The Open Source Institution

Linux is being touted as the key to proper e-governance. The obvious cost benefits in terms of OS licenses and the savings in the hardware usage lifecycle are enormous. Slowly, institutions and state run offices are realising that the open source world is ideal for them. In fact, most of these offices are yet to be computerised, thus the so-called transition period does not apply here.

Educational institutions are also trying to push Free Open Source software into their labs. This is an extremely important move, and will ensure that people are not restricted to proprietary or open source solutions. This will also allow people to accept and implement more affordable computing solutions for cash strapped educational institutions.

administrator or the home user is mapping his uses of the system. There are advantages and disadvantages to both. If you need Office productivity software and Internet access, Linux can provide a cheaper solution without skimping on the features. But if you are a gamer, Windows becomes the preferred choice", says Trevor Warren.

To master Linux, you need to have sound knowledge of the Command Line. But for a regular employee, is this needed? Nowadays, most Linux distributions have a decent GUI environment. Thus, if you can provide basic training to a user to operate in the Linux environment, he or she will be able to achieve the same productivity as on a Windows machine, at a much lesser cost.

An employee perspective…

While corporate planning and a complete analysis of using Linux is pleasing to the ear, an employee or home user has a radically different approach to computing. The PC is just a tool after all, and getting the job done as quickly and efficiently as possible is all that matters. Employees still have to maintain their deadlines, and the 'if it isn't broken, don't try to fix it' attitude still prevails.

The situation is even worse for the home user. Unless you have a resident geek in your family, you will never consider running a different OS. To become the ideal choice for the home user, Linux needs to have simple installations, ease of use, availability of common applications and good support for games. Home users don't want to use the command line. Does Linux fulfil all of these demands? Not quite. Linux does not have a difficult installation, but it could be made a lot simpler. The ease of use is not quite up to Windows standards, and Linux game support is still in its infancy. Then why would a person switch to Linux? In such a case, low costs do not matter. What is the point in having a free OS that does not allow you to run *Quake III Arena* with ease? This also results in piracy.

Making a decision to move to an Open Source system or remaining with a proprietary solution is no laughing matter. It takes a great deal of time and research. But the move definitely pays off if you do your analysis well. Large corporations such as LIC and IDBI have definitely shown an interest in moving towards a more affordable computing system. This has resulted in conferences and talks between experts, corporations, academia and governments. But a proper and concrete platform for people to discuss the future of Linux in India is still missing. Only when this platform is built will the final piece in the puzzle fit in.

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How we Test

It looks good and the technology is glitzy, but does it do the job?

The Digital Media Test & Research Centre (DMTRC) conducts a series of elaborate tests to evaluate the merit of each hardware and software product. To ensure that our readers have all the information they need to make an informed buying decision, engineers at DMTRC evaluate and review the latest hardware, software and technology services in accordance with the most up-to-date evaluation processes and methodologies used around the world.

Comparison Tests

We use a dual rating system, the first of which is applied to the Comparison Tests in which we compare the performance of products within a particular category.

Each product is evaluated under different parameters such as performance, value for money, features, warranty and support, etc.

Weightages are then applied to the various test parameters according to their importance for that particular category of products.

These weightages are then used to arrive at an overall grade for each individual product. An overall grade of A+, therefore, indicates that the product is close to perfection.

The Awards

Digit awards outstanding products by selecting a Best Performance and Best Value winner in each comparison test. The winner of the Best Performance Award will be the product that scored the highest in the performance segment of our tests. This award represents the best performing product in our tests and doesn't factor in any other parameter such as value for money, features, support, etc. The winner of the Best Value Award will be the product that scores the highest in our value for money parameter which is derived taking into account the ratio of a product's performance and features to its price. The product winning this award offers good performance at a great price.

In Bazaar

The second part of the rating system is used to evaluate individual hardware and software products in the Bazaar section. The evaluation covers parameters such as performance, ease of use, value for money and the build quality and features of the product in question and then arrives at an overall rating.

Here each of these parameters is given a weightage of 25 per cent and is rated on a scale of 5, which is represented by arrows (▶).

The greater the number of arrows, the better the product. This simple five-point rating system is designed to give you an easy-to-interpret assessment of a product. For example, a product that receives an overall score of five arrows signifies an outstanding buy!

	The 5-point Rating System used in Bazaar	
▶▶▶▶▶	**Excellent:** A brilliant combination of price, performance and features—far beyond expectations	
▶▶▶▶▷	**Good:** A good buy, better than most products in its category	
▶▶▶▷▷	**Average:** Reasonably competent but nothing spectacular about the product	
▶▶▷▷▷	**Mediocre:** Does not live up to expectations, needs improvement in many areas	
▶▷▷▷▷	**Poor:** has serious drawbacks and needs improvement before it can be used for its target application	

With the Gigahertz wars underway, the need for faster and [ ] hard drives was expected. We test the best hard drives ava[ ] the Indian market, to see which of them compliment your [ ] configuration, as well as your pocket

Every year, most computer users spend money on one particular component that is most fragile, and at the highest risk. It puts companies, and home-users alike, on pins and needles when it starts acting up, which just goes to show how important it is. It's the hard drive—a versatile digital storage medium.

Today, if you conduct a survey, you will notice that the minimum capacity of the hard drive that your vendor is likely to put in your system is 40 GB, unless you specify a different capacity. Does any one require such a mammoth digital storage space? Well, when you think about it, we don't even require the latest, and fastest Pentium 4 processors. It may not be the need of the hour, but it is always advisable to make your PC as future proof as possible, considering that the default installation of Windows XP needs about 1.2 GB—only for the operating system— then there are applications that increase in size with every new version. The latest games require at least 1 GB of space, the vast MP3 collection that you are going to collect over time, and last but not least movies—all these space mongering collectibles are sure to fill up a 250 GB hard disk in no time. Although, as of now, a 250 GB hard drive seems too large to be even considered, it will soon become a standard accepted level. Remember, what people said about the 40 GB hard drives when they were launched, while 4 GB was still the norm?

So why are we doing a HDD test? A gamer would like his hard drive to perform well enough to load 3D games faster. A multimedia professional needs to see the load time of his heavy graphic software dwindling, while a normal user just wants to get movies, documents, and songs copied, and ripped faster than ever before. With hyper-threading already on desktop PCs, multi-tasking has acquired a new dimension, and the hard drive subsystem needs to complement, and keep pace with latest components. Since SCSI is not only complicated, but also costly for desktop systems, one has to settle for IDE, or the latest Serial ATA drives.

However, in no way should these

drives be underestimated. An [ ] 133 drive can load applications, [ ] fer data at high speeds. The du[ ] tage of higher capacities, and [ ] hard drives is that you get optim[ ] for storage space. The per-rupee [ ] every MB of the data that you st[ ] hard drive, has come down o[ ] Ironically, you can get a highe[ ] hard drive for the same amoun[ ] spent on your existing hard dr[ ] calculate the capacity of the h[ ] and make a note of the amount [ ] spent on it, you can come up w[ ] to MB ratio that will help you bu[ ] hard drive that is within your b[ ]

This article will provide you [ ] insight needed to arrive at a pr[ ] sion when a new hard drive be[ ] need of the hour. We tested [ ] brands of hard drives, with capa[ ] range from the current entry-lev[ ] to the humongous ones. The [ ] that we have tested are the ne[ ] drives, and the newer Serial ATA [ ] also provide you with buying tip[ ] an informed buying decision w[ ] enable you to choose a drive tha[ ] your needs for a long time to co[ ]

Test process
The IDE and Serial ATA (SATA) d[ ] tested on a test PC that comprise[ ] tium 4 3.2 GHz, on an Intel i875[ ] terwood) motherboard, with 5[ ] Dual Channel 400 MHz DDR SD[ ] video card used was a GeForce 4 [ ] with 128 MB of DDR memory. [ ] SATA, 120 GB hard disk was in[ ] the port 0 SATA channel. All the [ ] drives were connected to the po[ ] channel, while the IDE drives [ ] nected to the Primary IDE chann[ ] ter drives. The necessary dri[ ] benchmarking utilities were loa[ ] the drive after installing Windo[ ] latest drivers for the main boar[ ] IDE channel were installed. The [ ] are the benchmarks used to ev[ ] performance of the hard disk

HDTach 2.6
In this test, sequential read a[ ] read burst speed, average access[ ] CPU utilisation are noted down[ ] the first in the battery of tests[ ]

conducted on the hard drives. HDTach 2.6 is used to test the hard drives without installing any other software on it. The logic behind this is that the software tests the raw unformatted hard drive and provides us with results, without making any modifications to the hard drive. A graph displays the results, as the data is read and written in real time. After the test is done, the suite calculates the total CPU power consumed by the drive during the test. In real world conditions, the drive is not likely to excede this CPU utilisation per-

Maxtor DiamondMax PlusII 6Y160M0

centage since the disk is continuously accessed during this test.

SiSoft Sandra 2003 Pro (File System benchmark)

This is a synthetic benchmark, and gives us vital information about the drive, such as transfer rate, sequential and random read as well as write speed, along with average access time. The benchmarking suite reads and writes the data to the disk continuously, and in the end, gives individual as well as overall scores. These scores of the tested hard drive are compared to that of other hard drives on a reference score sheet.

Real world tests (File transfer tests):

This is a new category that we have introduced to test hard drives. This test mimics a user's daily usage pattern. A user generally moves, or copies data from one place to another. It may just take a few seconds for a single file, but when moving huge amounts of data, it could take anything from a few minutes, to an hour. This can really get frustrating, and hence it becomes important to test the hard drive in a real world environment. The tests consisted of transferring an assorted file set of 1 GB, and a single file of 1 GB from one partition of the hard drive to another.

These test results are very important as they directly reflect the true performance capability of the hard drive's read and write speeds in a real world environment. Poor scores in this test indicate lower read and write speed capabilities of the hard drive.

Adobe Photoshop load time (Application load time): In this test, we made a fresh installation of Adobe Photoshop on the hard drive, and noted down the time taken for Photoshop 7 to start. This test gives the performance of the hard disk when put under load by heavy graphics software such as Photoshop.

Adobe Photoshop file load time: This is a very stressful test in which we loaded,

and recorded the time taken for Adobe Photoshop to open a 200 MB TIFF image file.

Test analysis

In all we tested 13 hard drives from three major manufacturers—Seagate, Samsung, and Maxtor. Of these 13 drives, Maxtor seems to be gunning for the future, and sent us three SATA drives, and one ultra ATA drive. On the other hand, Seagate seems to be playing safe, and sent one SATA, and two IDE drives. Samsung's bandwagon comprised of six IDE drives, with not a single SATA drive. The drive capacity ranged from a minimum of 40 GB to a mammoth 250 GB. Let's see how the drives fared on both the performance, and the features front.

Seagate Barracuda ST340015A

Features, specifications, and bundled accessories

On the features front, not a single drive matches the specifications of the Maxtor Maxline Plus II—it simply blows the competitors away. The Maxtor Maxline Plus II comes with a mammoth 250 GB of storage space, and an impressive 8 MB buffer, which makes for an unbeatable performance combination. All these features are further enhanced by the provision of the Ultra ATA 133 interface. In fact, all the tested Maxtor drives came with a 7,200 rpm spindle, and an 8 MB buffer. Not only is a larger buffer good for performance, it also comes in handy during disk intensive tasks.

The Seagate ST3160021A, sported the second best feature list amongst the ATA drives, followed by the twins from Samsung. The Samsung SP0411N, and SP0802N drives came in third, with a good amount of storage space, an ATA 133 interface, and a 7,200 rpm spindle speed, making them an ideal choice for desktop data storage, at an irresistible price. The other ATA hard drives, especially those from Samsung, were not feature rich but yet made an excellent bang for the buck with a decent performance, and price factors taken into consideration.

In the SATA category, nothing came close to the 200 GB Maxtor DiamondMax Plus. It comes with an 8 MB buffer that compliments the 7,200 rpm spindle speed really well. All the SATA drives from Maxtor come with both, the SATA and Molex

type of power supply connector, so that you don't get stuck if you don't have the SATA power connector cable. Feature wise, the 160 GB drives from both, Seagate, and Maxtor, were at par, employing the same amount of buffer, and spindle speed, the only exception being the power connector—Seagate only provided a SATA connector.

Performance analysis

Before we delve deep into the performance of these hard drives, we would like to clarify certain points. The first point is the difference in the two interfacing standards—the older IDE interface, also called PATA (Parallel ATA), and the newer SATA (Serial ATA). Though SATA is a new standard that was supposed to offer better performance than an IDE drive, this does not quite hold true. However, the limitations seem to be in the first generation of SATA drives. As newer versions of the same technology are released, the performance will increase. As of now, SATA only offers advantages such as smaller, and thinner cables that lessen the cluster of cables inside the PC cabinet, thus improving its thermal dynamics. Also, the cables are simpler to install, and moreover, since there is no jumper selection, or a master slave concept, installation is a cakewalk. One more thing that we would like to point out is that the older 5,400 rpm drives are now slowly vanishing. Hence, opt for a 7,200 rpm drive, since they offer a better performance, and are priced sensibly.

Maxtor DiamondMax PlusII 6Y20M0

HD-TACH

HD-Tach is an excellent benchmark to figure out the performance of a drive. This benchsmark offers the average read write speed, along with the burst speed, and the CPU utilisation of the drive. The burst speed is the speed at which data can be accessed from the drive's on-board read-ahead memory. The higher the score, the better the performance of the drive. At the same time, it is also

1/2 V AD

On the road to recovery

Need to recover your data from a crashed hard disk? Well, don't be disappointed. Here's how you go about doing it. (In this example, we have taken Ontrack Easy Recovery, and Lost & Found.)

■ As soon as you realise your hard disk has crashed, shut down your PC, so as to prevent any further damage. Then restart it, go to the BIOS, and check if the hard disk is being detected. If your hard disk is not detected, you won't be able to recover data through any software. You will have to send it to the data recovery centre.

■ Next, connect another hard disk to your PC to store the recovered data. However, ensure that the free disk space is more than the size of the data you need to restore; else the task won't be successful. Alternatively, you can plug in a zip drive, but make sure that the recovery software you're using supports such media. Note that you cannot recover data onto another partition that is present on the crashed hard disk. Hence, plugging in an additional storage media on which the data can be stored becomes mandatory.

■ Next, make sure you have a bootable floppy disk. Insert the floppy disk, and boot your
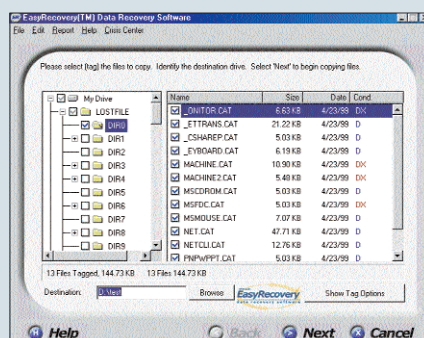
Recover lost files using Ontrack Easy Recovery

machine in the MS-DOS mode. Go into the BIOS, and change the boot sequence from there so as to make the PC boot from the floppy disk.

■ After you've booted in DOS mode, insert the recovery software floppy diskette. Here we've taken the example of Ontrack's Easy Recovery software, which is considered to be one of the most widely used, and effective recovery software. You can also use other software such as Stellar Phoenix Data Recovery Software, Final Data, etc.

■ After inserting the recovery software, you get an option to select the primary hard disk

(the one that crashed) as the recovery source, and the second hard disk as the restore destination.

■ The software then analyses the data that it has to recover from the crashed hard disk. In order to recover the data, the software tries to read the two copies of the FAT tables, and then reads the raw data on the hard drive, trying to match it to the FAT Tables. The data that matches the FAT table is the data that is visible to you, even after the crash. The data that does not match the FAT table is generally the data that you are trying to recover. Once it comes across raw data on the disk that corresponds to a file, but finds that there is no similar entry in the FAT table, it marks the data as a recoverable file, and adds it to the existing list of files it has from the FAT table. All the files that exist on the hard drive, whether in the FAT table, or detected by the software, are shown as recoverable files. Once this is done, you can choose the data to be recovered, which will be copied to the destination drive. The whole process might take hours to complete, depending purely on how much data has to be recovered.

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important to note down the CPU utilisation of the drive, since a high CPU utilisation, would slow down the entire system.

In the HD-Tach benchmark, nearly all drives performed on par with each other, with the read burst speed hitting the theoretical limit of 80 MBps, indicating that all the drives have good on-board controllers. The only drive that could not make it to the 80 MBps mark was the Samsung SV0602H, which registered a speed of 78 MBps—not a bad score, but comparatively slower than the rest. An important point to note was that all the drives were able to hit the 80 MBps mark, but at the cost of higher CPU utilisation.

In the SATA category, the Maxtor DiamondMax Plus9 160 GB drive sported the highest CPU utilisation of around 4.1 per cent. This was the only drive in the entire comparison test that exceeded 3 per cent CPU utilisation. With

Seagate Barracuda
ST3160023AS

such a high CPU utilisation, it is quite evident that the performance of this drive will be hampered in the real world environment that often involves multi-tasking. For example, if you are working on a document, and copying some files in the background simultaneously, the higher CPU utilisation will result in more CPU time being diverted to the copying of files rather than the document that you're working on.

The Seagate 160 GB ST3160023AS drive took second last place by utilising 2.1 per cent of CPU time. Both these drives had an unusually high CPU utilisation, as compared to the other drives in the comparison test. The 200 GB Maxtor DiamondMax Plus9 drive took the crown with the least amount of CPU utilisation, by tipping the pointer at just 0.4 per cent. Its lower capacity sibling—the 120 GB DiamondMax Plus 9, followed it.

Among the IDE drives, the Samsung's

SV0411N fared badly by utilising 2.5 per cent of CPU time. This was followed by Maxtor MaxLine Plus II, and Samsung's SP0802N that utilised 1 per cent of the CPU time during the test. Seagate's ST340015A and Samsung's SV1203N, took the top honours, utilising just 0.6 per cent of the CPU time.

SiSoft Sandra tests

The SiSoft Sandra tests came up with

Organising files and folders

The number of files and folders stored on the hard drive increases as you keep installing programs. If the files are not properly organised, the performance of the hard drive degrades, and you will end up wasting valuable time, searching for files. The best way to keep a check on this is to partition the hard drive, and allocate the partition size, according to the number of applications that are going to be installed on the system, and the amount of data that will be stored. As far as storing files and folder goes, here are a few simple tips to follow:

■ Always store your documents, and other working data, on the secondary partition.

■ Name the folder based on the data to be stored in it. For example, store all account files in a folder named accounts.

■ The file name should be such that it carries enough information regarding its content, the date it was created, etc. For example, Maxtor hard drive_august2003.doc

Defragment your hard disk frequently for faster access to data

■ Keep separate folders for different kind of files such as images, documents, and so on.

■ Try not to install games, applications, and other system utilities on this partition, as it will clutter the disk with other kind of data, and hence affect disk access.

Over a period of time, as data gets stored and deleted, it becomes imperative to defrag the data. This entails re-arranging the data at one place for faster access. Windows itself provides you with this utility, so you need not bother installing a third party program. To access this program, go to *Start > Program > Accessories > System Tools > Disk Defragment*. The time required to complete the defragment task will depend upon the hard drive capacity. The other useful built-in option is Scandisk, which can also be found in the System tools. It checks the hard drive for errors such as lost clusters, bad sectors, and so on. Defrag once a month to keep the hard drive free from any errors.

some surprising results. The Maxtor MaxLine Plus II 250 GB hard drive, with an ATA-133 interface, gave the highest results, scoring a drive index of 39,680 KBps. This drive has an 8 MB memory buffer, which translates to better scores when you take into consideration the sequential read and write speed. The MaxLine Plus II gave excellent results in the sequential read and write speed test, with scores of 58 and 56 MBps. These scores were even better than that of any of the SATA drives. Similarly, the Barracuda ST3160021A drive from Seagate also gave some astonishing results by beating all the SATA drives in this particular test, and returned a drive index of 37,727 KBps, which was second best to the Maxtor 250 GB drive. Excellent drive electronics, and the 7,200 rpm spindle enabled this drive to give such an impressive performance. The only drive that could not make a good impact was the SV0602H drive from Samsung, being a 5,400 rpm hard drive.

Sadly, none of the SATA drives could live up to the expectations. The results were monotonous, with the scores deviating a little from each other. The drive index of all the SATA drives

hovered about the 36,000 KBps mark, with the read and write speeds being more or less within the 52 - 54 MBps range. This clearly indicates that SATA needs to make a significant technology advance in order to beat the prevailing ATA standard. As of now, the ATA 133 standard still rocks.

File transfer tests

This test was introduced in our hard drive comparison tests to see how they fared in a real world environment. Any user with access to a PC uses it to transfer data in some way or the other. The hard drive plays an important role in this, since it is the data storage component. The faster the rate of data transfer, the better the hard drive.

The test file comprised of two sets of files. An assorted set of files, comprising of mp3 files, software installation setups, documents, and zip files, all of which amounted to 1 GB, were put in a single folder. These were then transferred from the main hard drive to the test hard drive, and then from one partition to the other on the test hard drive. A 1 GB movie file was also taken for the tests. The assorted set of files, and the movie file simulated the random, and sequential read and write speeds for the hard drive. The time taken to transfer the files was noted down as the result.

The results for these tests were quite similar all over. In the SATA category, the Maxtor DiamondMax Plus 9 200 GB drive showed the best results in this test by completing the entire file transfer in just 57, and 52 seconds for random and sequential read and write respectively. This hard drive is really good for people who need to transfer a lot of data, onto or off the hard drive. The Seagate's ST3160023AS took the second spot, by taking a slightly longer time than the

Maxtor's 200 GB drive, but, nevertheless, put up a respectable score.

In the ATA category, nothing could beat the Maxtor Maxline Plus II 250 GB drive in the real world tests. This drive lost out to its SATA sibling only because of its slightly higher CPU utilisation, taking some extra seconds to complete the copying of the file. This is a good point to show how even a slight difference in the CPU utilisation matters in the real world. The other drives, such as the ones from Samsung, and especially the SP0802N, displayed good real world performance with neck-to-neck scores with the Maxtor MaxLine Plus II. One good point to note is that the CPU utilisation of both the drives was on par. The Seagate Barracuda ST340015A was the biggest disappointment in the entire test. It was the only drive that came up with worst results.

Samsung SpinPoint V Series SV1203N

Photoshop test

In this test, we note down the time required to load Photoshop after its installation, and the time taken to open a 200 MB file. The drive with the higher buffer memory, and good read burst speed will definitely score better than other drives. A lot depends on the read ahead memory, and the drive controller, present on the drive itself. The Maxtor MaxLine Plus II 250 GB—which took just 4 seconds to load Photoshop, and needed just 29 seconds to

load the 200 MB test file—walked away with the crown. This can be attributed to the 8 MB buffer memory, and a good read speed burst of 9 MBps. We recommend it to anyone who wants a good drive for video editing. The Samsung SV1203N ATA drive was second in line, taking just 5 seconds, and 28 seconds to open Photoshop and the test file. Other drives such as the Seagate Barracuda ST3160021A, and the Samsung SP0802N, took around the same time.

All these drives have excellent onboard drive controller electronics resulting in high performance. The test results seem to be very much alike, with hardly any variation in them. However, even a second's difference could be of utmost importance. Unfortunately, none of the SATA drives gave results that justify them as the successors of the PATA technology. Coming in first, was the Maxtor 120 GB DiamondMax plus 9 drive, sporting a score that was neck-to-neck with the winner in this particular test. All other drives took longer times to load the same image file.

To sum it up...

The test concluded with some great insights, toppling some of the myths about the ATA 133 standards capability, and was an eye opener regarding facts about the SATA technology. Although many motherboard, and chipset manufacturers deny official support to the ATA 133 standard under the pretext of instability, the fact remains clear that even today, it has the capability to beat newer technologies such as SATA, which is in its

Decision Maker

	Entry Level Hard Disk	Good balance of performance and price	Super Fast and scalable Hard Disk
You Need	A steady going HDD that can store all your Movies, MP3's and other data with decent performance and a large enough capacity	A HDD with good performance, with large storage capacity, taking less time to copy files on and off the HDD. A Drive that is future proof and won't become obsolete in the wake of SATA becoming a standard.	A super fast drive with excellent performance, low latency, takes less time to copy data on and off the HDD and also supports future satandards.
Look For	A 7,200 RPM drive with atleast 40 to 80 GB of capacity with price per MB in the region of 5 to 7 paisa	A 7,200 RPM drive with 120 GB to 160 GB of space and providing 8 MB of buffer and having excellent read write speeds.	HDD with atleast 8 MB of buffer, spindle speed over 7,200 rpm, having extremely low CPU utilisation and having good over all performance with loads of real estate to store you data.
Our Pick	The Samsung SV0802N, SV0602H, SP0411N	The Maxtor DiamondMax plus 9 120, 160 GB and Samsung's SV1203N	The Maxtor Maxline Plus II, Maxtor DiamondMax Plus 9 200 GB
Price	Rs 4,500 to Rs 6,200	Rs 7,500 to Rs 12,000	Rs 15,000 and above

Maxtor Maxline PlusII 7Y250P0

nascent stages of development, and still needs to be nurtured to be accepted as the successor to the prevailing PATA technology.

We would definitely recommend a PATA hard disk for your existing motherboard, since it offers seamless compatibility, and performance, which is either better, or on par with the new technology.

Also, a SATA upgrade requires some additional investments in a new motherboard that has native support for the new technology.

But, in case you are one of those lucky souls who happen to be on the verge of an upgrade, investing in an SATA hard disk, and a SATA motherboard makes a good future proof solution, since apart from the near equivalent performance of the SATA drives, it also offers better thermal dynamics for the cabinet, and is simple to install and maintain.

The products that shone in the comparison test were none other than the trio from Maxtor, and one particular drive from Samsung. In the SATA category, no other drive could beat the performance of the 200 GB Maxtor DiamondMax Plus 9. This drive has the best features, with specifications that can put the ones from Seagate to shame. Not only do the features look great on paper but also deliver in the real world environment, which is clearly reflected in the tests. We recommend this hard disk for any user who wants the best of both worlds: a large storage capacity, and excellent performance.

Maxtor DiamondMax Plus9 6Y200M0

Similarly, this drive also wins hands down, when it come to value for money. It provides 200 GB of space at just Rs 15,000. The other drive that you can consider is the lower capacity Maxtor DiamondMax Plus 9 120 GB that came in second in the performance rig. We suggest this drive, if you are on the lookout for a decent capacity SATA hard disk that performs well, is feature rich, and is light on the pocket.

In the PATA category, the 250 GB Maxtor MaxLine Plus II wins hands down. Be it features, or performance—no other drive can match it. This was also the best performing drive in the entire spectrum of PATA and SATA hard disks taken together. At Rs 21,000, the drive offers a humongous 250 GB of space. We recommend this drive for professional audio and video editors, and gamers, who are always on the hunt for bigger capacity drives that are fast and provide top notch performance. The Samsung SP1203N 120 GB drive provides excellent value for money, considering the fact that it costs Rs 7,200, which gives it an excellent price per MB of 5.86 paise. At such a price, this hard disk is a must buy piece of hardware.

SANKET NAIK *(sanket_naik@thinkdigit.com)*
BHASKAR BANIK (*bhaskar_banik@thinkdigit.com*

1/2 VAD

DS Table

SCORE BOARD

CATEGORY	SERIAL ATA DRIVES				ATA DRIVES	
Brand	Maxtor	Maxtor	Maxtor	Seagate	Maxtor	Samsung
Model	DiamondMax Plus9	DiamondMax Plus9	Diamond Max Plus9	Barracuda	Maxline PlusII	PL40 Series
Model number.	6Y120M0	6Y160M0	6Y200M0	ST3160023AS	7Y250P0	SP0411N
Features (15%)						
Drive specifications						
Capacity (GB)	120	160	200	160		
Spindle speed (RPM)	7200	7200	7200	7200	250	40
Interface type (ATA 100/133/Serial ATA)	Serial ATA	Serial ATA	Serial ATA	SATA	7200 ATA 133	7200 ATA 133
Data buffer size (MB)	8	8	8	8	8	2
No. of platters	NA	NA	NA	2	3	1
Rated access time (ms)	9.4	9.4	9.4	8.5	9	11
Power connector	Molex and SATA	Molex and SATA	Molex and SATA	SATA	Molex	Molex
Price per MB (paisa)	6.92	7.02	7.32	8.06	8.20	10.99
Performance (65%)						
Synthetic tests						
HD Tach						
Read burst speed (MBps)	80	80	80	80	80	80
CPU utilisation (%) *	0.5	4.1	0.4	1.2	1	0.9
SiSoft Sandra 2003						
Pro Drive benchmark						
Sequential read (MBps)	48	53	53	52	58	52
Random read (MBps)	8	8	8	8	9	7
Sequential write (MBps)	46	52	53	55	56	51
Random write (MBps)	16	14	19	11	20	9
Access time (ms) *	7	6	6	6	6	8
Drive index (KBps)	32944	36282	36428	36027	39680	34592
Real world tests						
Assorted file transfer (sec)	92	87	57	89	80	83
Single file transfer (sec)	71	148	52	84	61	71
Application load time						
Startup time (sec) *	6	7	6	6	4	5
Photoshop 7 image load time (200 MB file) (sec) *	28	33	29	39	29	31
Warranty & support						
Replacement warranty (Y/N)	**	**	**	Replacement	**	**
No. of years	3	3	3	1	3	3
Overall score						
Features (15%)	13.8	13.8	13.8	12.60	13.80	11.80
Performance (65%)	40.46	36.32	45.42	37.50	45.94	40.48
Value for money (20%)***	16.57	15.08	17.08	13.13	15.38	10.05
Overall grade	A-	B+	A-	B	B+	C+
Vendor name	Cyberstar	Cyberstar	Cyberstar	Seagate Distrubution Singapore Pvt Ltd	Cyberstar	Samsung Electronics India Information & Telecommunication Ltd
Phone	011-26438216	011-26438216	011-26438216	1600 33 11 04	011-26438216	011-51511234
E-mail	yogi@maxtor.com	yogi@maxtor.com	yogi@maxtor.com	response.india@ seagate.com	yogi@maxtor.com	hddsupport@ samsungindia.com
Price (In Rs)	8500	11500	15000	13200	21000	4500

*Disclaimers: All prices are subject to variation, * Lower scores indicate better performance*

*** if possible repairs or else replacement   *** Calculated on the basis of price per MB*

Samsung	Samsung	Samsung	Samsung	Seagate	Seagate	Samsung
SpinPoint V Series	SpinPoint V Series	SpinPoint P Series	SpinPoint V Series	Barracuda	Barracuda	SpinPoint V Series
SV0411N	SV0802N	SP0802N	SV1203N	ST340015A	ST3160021A	SV0602H
40	80	80	120	40	160	60
5400	5400	7200	5400	5400	7200	5400
ATA 133	ATA 133	ATA 133	ATA 133	ATA 100	ATA 100	ATA 100
2	2	2	2	2	2	2
1	1	1	1	1	2	1
11	8.9	8.9	8.9	12.5	8.5	8.9
Molex	Molex	Molex	Molex	Molex	Molex	Molex
10.25	6.84	7.57	5.86	10.80	6.55	7.49
80	80	80	80	80	80	78
2.5	0.9	1	0.6	0.6	1	0.4
42	44	55	49	43	56	38
6	6	8	6	6	8	6
42	44	55	49	43	56	24
8	8	10	8	6	10	6
9	9	7	9	9	6	9
28444	29553	36860	32571	28914	37727	23975
101	104	85	84	767	131	135
85	81	63	75	1160	122	129
6	6	5	5	6	5	6
32	34	30	28	37	29	34
**	**	**	**	Replacement	Replacement	**
3	3	3	3	1	1	3
9.80	9.80	11.80	9.80	6.60	8.60	7.80
36.38	36.15	41.96	40.44	28.09	38.26	32.46
9.51	14.20	15.00	18.11	6.78	15.12	11.36
C+	B	B+	A	C-	B+	B-
Samsung Electronics India Information & Telecommunication Ltd	Samsung Electronics India Information & Telecommunication Ltd	Samsung Electronics India Information & Telecommunication Ltd	Samsung Electronics India information & Telecommunication Ltd	Seagate Distrubution Singapore Pvt Ltd	Seagate Distrubution Singapore Pvt Ltd	Samsung Electronics India Information & Telecommunication Ltd
011-51511234	011-51511234	011-51511234	011-51511234	1600 33 11 04	1600 33 11 04	011-51511234
hddsupport@ samsungindia.com	hddsupport@ samsungindia.com	hddsupport@ samsungindia.com	hddsupport@ samsungindia.com	response.india@ seagate.com	response.india@ seagate.com	hddsupport@ samsungindia.com
4200	5600	6200	7200	4425	10725	4600

Everyone's heard of Linux, most fear it, but the few daring individuals that use it, now swear by it. Is there a Linux distribution that can compare with Windows' functionality, leave alone replace it as the OS of choice? Let's find out…

"Hello everybody… I'm doing a (free) operating system (just a hobby, won't be big and professional…)." Linus Torvalds' first Linux announcement on August 25, 1991.

Those simple words describe Linux's humble beginning. Linux comes in various distributions (distros to the geekdom) that promise to be stable, and as user friendly as Windows. Well, are these just empty assurances, or can their claims be justified? The purpose of this comparison test was to evaluate the very best of these Linux distros. We also answer crucial questions that every office and home user wants answered—is Linux really ready for the desktop? Can I install Linux on my PC, and get the same productivity, and features that Windows offers? Can I transparently work with my existing data under Linux? This test answers them all, and comes up with some astonishing results to boot.

The available flavours were divided into two categories: Windows replacements, and Office Desktops.

The Windows replacement distributions are meant for a newbie scouting the market for an OS other than Windows. We chose Xandros, Lycoris, Lindows 3.0 and ELX Linux, for this category.

The second category includes distributions that do not attempt to give the same look-n-feel as the standard Windows desktop. Instead, they provide a very intuitive interface that can be used with little effort. They also bundle a whole lot of applications that make life easier for the office user. Red Hat Linux 9.0, Mandrake 9.1, and SuSE Linux Office Desktop were the distributions considered.

How we tested
The test process for the categories was almost identical. However, the weightage awarded to each component of the test process differed for the two categories. For Windows replacements, importance was given to their resemblance to Windows so that a novice user can make the right choice.

The Linux Shootout

Ease of installation

The installation utility was evaluated for ease-of-use. Special points were given to those flavours that took into account existing Windows partitions, and suggested mount points automatically. The ability of the partitioning utility to handle NTFS, and FAT32 partitions, was considered as a distinct advantage.

Suitability to Desktop

These tests gauged the ease with which a novice can configure, and get around his Linux desktop—for example, easily understandable desktop icons (My Computer, My Presentations, My Documents, etc.), which promote a familiar Windows environment. We also noted the ease with which a user could alter the desktop settings. Simple tasks such as setting the background image, changing screensavers, changing the default desktop resolution, etc., were taken into consideration.

Adherence to the File Hierarchy Standard (FHS) was also given special attention—for interoperability of applications between various Linux distributions.

The number of file systems supported by a Linux box, is a good indication of its suitability in a heterogeneous environment where it needs to co-exist with other operating systems. However, for the typical home, and office

desktop user, the area of major concern is the compatibility level between Linux, and Windows.

Office productivity tools

Office applications such as word processors, spreadsheets, presentation tools, etc., were evaluated, and their compatibility with standard Windows office applications was also determined.

For those who insist on using MS Office tools in Linux, Windows emulators are a viable option. They create an artificial Windows environment within Linux, thereby enabling a user to install, and run his favourite Windows application.

Hardware compatibility

To check the compatibility of the available distros with common hardware, we installed each flavour on 5 different test PCs that represented a pool of popularly available computer components. The

details of each configuration can be found in the hardware compatibility table.

The Windows killers

ELX Linux Power Desktop 2.0: This one is for everyone

The ELX installation was fairly simple. A neat listing of the steps involved on the left hand pane went hand in hand with an information box in the corner. Three install options—Default, Laptop, and Custom System—are offered. The Default install loads a majority of the applications, the Laptop loads only the bare necessities and the Custom install, as the name suggests, is just that. The partitioning utility is similar to that of Red Hat—the user has to assign the root partition. However, the assignment process is simpli-

ILLUSTRATINS: Mahesh Benkar
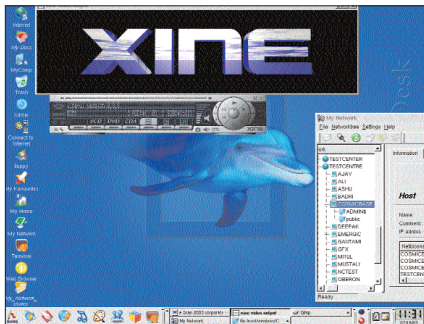
fied; instead of assigning partitions for individual directories, you can check the box labelled 'I want to use this as the main partition (/)'. Moreover, you can either use the remaining free space, or specify the the partition size in MB.

The install process is time consuming due to the installation of a whole lot of applications. Interestingly, this is the only distro that comes with 'Asia/Calcutta' as the default time zone.

After installation, the user is asked for basic configuration information, using KPersonaliser during the first login. ELX Power Desktop 2.0 has a very friendly desktop with simple Windows style icons, such as My Computer, My Network, etc.

Strangely, the minimum hard drive space mentioned was 1 GB, but the default install took up 3 GB of space.

ELX works well with KDE, but does not work properly with Gnome. The panel crashed during the first Gnome session, and we had to use the shortcut keys to start the X server; a novice user could not have done that. Also, the My Computer icon did not function under Gnome.

Accessing Windows shares is extreme-

ly easy. During installation, you are prompted to specify a workgroup name. Later, just click on the Network Neighbourhood icon to get a listing of all the machines on the network, and their network shares.

All applications are neatly categorised into six groups—Office, Internet, Multimedia, Graphics, Development tools, and Games. All these groups have icons (called Launchpads) on the task bar. Clicking on any one of these icons brings up a dialog box containing separate icons for the individual applications within that group. Point the mouse to any of these icons to get a brief description of its features. A button, to update all the applications in a particular group, is also provided. The Launchpad also acts as a front end to the apt-get package manager. Select 'Update all' from the Launchpad, to update all the packages, and their dependencies via ftp sites. For the root user (administrator), a couple of extra launchpads are provided. The system configuration Launchpad has a handy set of tools to make system configuration an easy affair.

Apart from some of these customised utilities, the rest of the tools are generally KDE-based utilities. For example, adding, or removing users can be done using the KDE User Manager (Kuser). Similarly, printer configuration uses the standard KDE Printer Manager. But what is commendable here is that a very simple way of accessing all the relevant tools is provided. Clicking on the My Computer icon on the desktop will bring up a window that has almost all the tools found

on a standard Windows computer including a Dial-up Account icon.

As can be seen from the comparison chart, ELX turned out to be a very surprising distro in many respects. Apart from using a very easy desktop, they have also developed some very simple but ingenious tools. The samba file sharing front end is a classic example. While the majority of distros used the Konqueror browser to access Windows shares, the separate tool provided by ELX is comfortable to use. Moreover, this distro is free for personal and educational use. The commercial licensing is also very reasonable.

Lycoris Desktop/LX review:
The problematic Windows look-alike

Lycoris has one of the most simple, and fastest installations of all the distros tested. However, even a small problem with hardware compatibility, such as an undetected mouse, could bring down the installation utility.

In terms of look and feel, Lycoris was the closest to the Windows desktop. It even has a default wallpaper that has a striking resemblance to the one that comes with Windows XP. A guided tour starts up during first boot, which walks you through all the features of the Lycoris desktop. This is very helpful to the first-time Linux user migrating from Windows to Linux.

Lycoris had the worst hardware support amongst all the distros. It did not configure on many of the test beds. Even on those that were configured, everything did not go smoothly. For example, on the HCL Beanstalk 4455 with Geforce2 MX 400, the desktop was configured, by default, at an uncomfortable resolution of 1,600 x 1,200. All the desktop icons were tiny and hardly legible. All attempts to bring the desktop to a lower resolution yielded strange results. On restarting the X server after changing the resolution, the desktop area went outside the monitor's viewable area. Although you could scroll up, or down on the desktop, this is definitely not desirable.

Overall, Lycoris was impressive with its near-perfect Windows desktop look and feel, but lost out on hardware support.
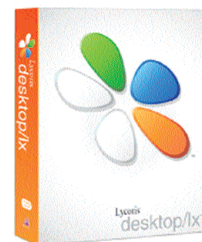
SCORE BOARD

CATEGORY	Windows killers			
Distribution name	Xandros	Lycoris	Lindows 3.0	ELX Linux
Ease of use	22.5	18	15	22.5
File system	2	2	2	2
Laptop support	2.5	0	0	0
Similarity to Windows	15	15	11.25	15
Suitability to office use	10	10	10	10
Printing subsystem	4	4	4	4
System administration	2	2	2	2
Internet readiness	1.2	1.2	1	1.8
Graphical configuration	4	4	2.75	3.5
Features	0.8	0	-0.4	0.8
Special features	4	3	2	4
Glaring deficiencies	2	3	3	2
Resource utilisation	1.8	2.4	2.4	1.8
Desktop hardware support	5.71	1.43	6.67	6.19
Economy	2	2	2	4
Overall score	67.8	60.6	52	67.4

CATEGORY	Hardware compatibility			
Distribution name	Xandros	Lycoris	Lindows 3.0	ELX
Graphics card				
nVidia GeForce MX 440 with AGP8x	✔	✖	✔	✔
nVidia GeForce2 MX 400	✖	✔	✔	✖
nVidia GeForce2 MX 200	✖	✖	✔	✔
NVIDIA Riva TNT2	✔	✖	✔	✔
SiS 6326	✔	✖	✔	✔
Ethernet card				
Broadcom NetXtreme Gigabit ethernet card	✖	✖	✖	✔
Intel Pro 100 VE	✖	✖	✔	✖
Dlink DFE-538TX 10/100	✔	✖	✔	✔
Intel EtherExpress PRO 100	✔	✖	✔	✔
Sound card				
Onboard CMI 8378	✔	✖	✖	✔
Onboard 5.1 support	✖	✖	✖	✖
Onboad Realtek AC'97	✔	✖	✖	✔
Aureal2	✔	✖	✔	✖
Yamaha DS-XG	✔	✖	✔	✔
Optical drives				
Samsung SW-240B CD-RW	✔	✔	✔	✖
Samsung SD-616Q DVD-ROM	✔	✔	✔	✖
Samsung SD-612 DVD-ROM	✖	✖	✔	✔
Samsung SM-348B Combo Drive	✖	✖	✔	✔
Modem				
Best data 56 Kbps data fax modem	✖	✖	✖	✖
Overall score	0.57	0.14	0.67	0.62

Xandros 1.0:
The best of the lot

BEST PERFORMANCE — digit — *AUGUST 2003*

The Xandros installation procedure is very simple. It gives two modes of install: Express install, and Custom Install. Express install does not allow partitioning of the hard drive, but preserves existing Windows partitions. Custom install, on the other hand, lets the user partition the hard drive.

After logging in for the first time, a First Run Wizard allows the user to configure the network, printers, etc., in a very intuitive fashion. For example, to configure a printer using the First Run Wizard, just select the type of printer (local or remote) and give the relevant information in the steps that follow. If you do not configure a peripheral device, using the wizard, you can do so later using the Control Centre.

Sharing files on a Windows network is also very easy. In the Control Centre just go to **Networking > Windows Networking**, enter the name of your workgroup, and you're done. You can now access the other computers on the network using the File Manager by going to **Home > Windows Network**. Search for other computers on the network, by going to **Find > Computers** in the main menu.

The Xandros desktop is basically a variant of the K Desktop Environment (KDE). Many of the tools that are available via the Launch menu are standard KDE tools. For example, the Process Manager runs the kpm tool, and the Run Level Editor is nothing but the ksysv application with the -caption option.

Clicking on the Windows key on the keyboard brings up the Launch menu— just as it brings up the Start menu under Windows. Such small improvements make the user much more comfortable with the GUI environment.

Xandros is considerably faster than the other distributions and provides a very intuitive and easy to use GUI. It even supports active user switching, just as in Windows XP. The users can switch even if their applications are running on their

respective desktops.

The Launch menu is very user-friendly, and very similar to the Windows Start menu. All the applications are neatly classified and arranged under specific categories. Also, The quick start guide gives a comprehensive list of all the topics that might be of interest to the novice user.

However, The per-seat license can get a bit heavy on the pocket. Moreover, while the Crossover office is a useful tool for individuals keen on using MS Office tools on Linux, it would have been cheaper if Xandros had bundled a cheaper emulator.

Lindows 3.0:
Linux with Windows licensing

Lindows 3.0 has a very simple installation procedure and is also one of the fastest installations; it barely took 5 minutes to install all the packages. This sounds
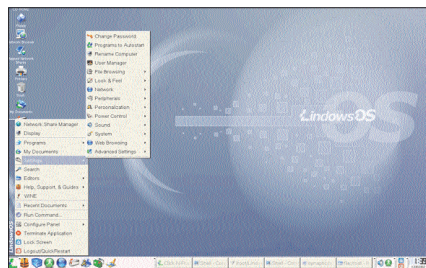
really impressive till you actually boot for the first time and realise that hardly any applications have been installed. This is primarily because of the Click-n-Run interface for installing and updating applications. The disk partitioning utility of Lindows is very easy to use and takes a different approach to all the other Linux distributions. It does not display the partitions using the standard Linux convention of hda1, hda2, etc. Instead it uses a very simple listing of all the primary, extended and logical partitions. This ensures that you are able to get around with partitioning even if you are not aware of Linux partition naming conventions.

Lindows provides all the fancies that are required to attract a Windows user. However, what really gets on your nerves is the limited number of applications that come along with the installation CD. Even basic office utilities such as spreadsheet viewers and presentation tools are not included in the basic installation. The Click-n-Run Express install CD promises to reduce the download time of all the applications from the Click-n-Run warehouse located at the Lindows Web site. This express CD installs many of the

Gaming in Linux

Unfortunately, the term 'Linux Gaming' has come to symbolise the ultimate oxymoron. Linux has always been considered the preserve of geeks, and geeks don't play games—they program like there's no tomorrow.

There has always been somewhat of a vicious circle revolving around Linux. Game developers have consciously steered away from porting Windows games to this platform since they don't perceive a market here.

However, few companies have tried to break this barrier. id Software released Linux versions for all of its recent games—The *Quake* franchise, and *Return To Castle Wolfenstein*. Another major development is the release of *Unreal Tournament 2003*, by Epic Games. Apart from these, there are games that come shipped with the Linux distros.

The two most popular arcade games that are included with Red Hat are *Chromium*, and *Tux Racer*. *Chromium* is a souped up version of *Space Invaders*, and involves blasting anything you come across to smithereens while flying your spaceship around, advancing to the next level, and repeating the procedure ad nauseum, ad infinitum. *Tux Racer* is slightly different in its approach. You basically control the Linux Penguin, and help it skate across an ice floor, looking for fish to eat, while avoiding obstacles. However, the game runs very slowly, even on a high-end system with a top-end graphics card, primarily because the drivers haven't been installed properly. You can also try out the free multiplayer 3D games, found at *www.sourceforge.net* or *www.rpmfind.net*. Good hunting!

libraries that are needed for the applications to install properly.

The concept of downloading applications from a central repository might not be feasible for a home user as the time required is mind boggling. For example, the average download time for StarOffice 6.0 listed at the Lindows site is seven and a half hours on a 56 Kbps modem, about an hour for a DSL modem, and 20 minutes for a T1 connection.

But before corporations with T1 lines think that it is feasible, we caution you about some licensing policies. The license for the Click-and-Run Warehouse is separate from that for the operating system and needs to be renewed every year. Moreover, a full membership of the warehouse (whatever that means), comes at an extra price. This feature can be easily bypassed by using the 'apt-get' installer that comes along with Debian Linux as Lindows is based on the Debian distribution.

What it all boils down to

Before starting this comparison there was a lot of apprehension about the very concept of comparing Linux distros that are touted as Windows replacements. "Isn't that a cheap marketing gimmick?", we were asked; and we didn't have an answer, then. But now, after completing the comparison, we have an answer—no it is not a marketing gimmick. The vendors responsible for developing these distributions have gone to great extents to make their offerings as user-friendly as possible, while retaining

the basic power and uniqueness of Linux.

In terms of Windows look-n-feel, usability and user friendliness, Xandros was slightly better than ELX Power Desktop 2.0. However, Xandros has complex licensing issues, and has to be bought, even for home use—it has a per seat or per user licensing policy. ELX, however, is free to download for home and educational use. Thus, from the economic point of view ELX beats Xandros.

In spite of all these features there are a few troublesome areas that have to be addressed, such as hardware compatibility. Another area that looks worrying is the pricing and the licensing policies. In particular installing applications on Xandros and Lindows can be bypassed by using the freely available tools from the Debian Linux distribution, which effectively means that they don't have to pay for the support provided by the respective vendors. This is also true for ELX. Apart from these annoyances all the Windows lookalike distributions gave good overall results.

Desktop Linux comparison

Red Hat Linux 9.0:
Old wine in a new bottle

Red Hat is probably the most recognised of all the Linux distributions. It has been installed in almost every thinkable form, from servers to clusters. But how suitable is it for the desktop? Of late, Red Hat is attempting to become more

Desktop environments

KDE

KDE is a network transparent contemporary desktop environment for Unix workstations. KDE seeks to fill the need for an easy-to-use desktop for Unix workstations, similar to the desktop environments found under Macintosh, or Windows.

KDE has the following features:

■ A beautiful contemporary desktop

■ An integrated help system, allowing for convenient access to help pages of the KDE desktop, and related applications

■ Standardised menu and toolbars, keybindings, colour schemes, etc.

■ Internationalisation: KDE is available in more than 40 languages

■ Centralised dialog driven desktop configuration

KDE applications

KDE has an office application suite, based on KDE's 'Kparts' technology consisting of a spreadsheet, a presentation application, an organiser, a news client, and more. It also includes a Web browser—Konqueror, which is a solid competitor to other existing Unix Web browsers.

GNOME

GNOME is a powerful graphics-driven desktop environment that enables users to easily use and configure their PCs. It's main objective is to provide a user-friendly suite of applications, and an easy-to-use desktop. It includes a start up panel, a desktop, standard desktop tools and applications, and a set of conventions that make it easy for applications to be consistent with each other.

Window Managers

One of the main distinguishing features of X is that it separates the window manager from the windowing system. X allows you to run any window manager that controls the title bar, and other decorations. You can run a window manager that looks and acts like the NeXT interface, the Motif interface, or the Open Look interface. Common window managers are mentioned in the box below:

Name	Description
fvwm	Looks like mwm; main window manager on Linux
fvwm95	Looks like Windows 95. Comes with Slackware Linux
WindowMaker	Uses NeXT interface.
AfterStep	Follow on to Bowman; uses NeXT interface.
Enlightenment	A color-intensive window manager.

user-friendly for desktop users.

The set up is quite simple. The tricky part is the disk partitioning utility that is not easy for a new user. Though it provides a graphical representation of all the partitions on the hard drive, it does not shield you from assigning a root partition or selecting a swap partition. Otherwise the install can be easily navigated by a user with a basic idea of Linux.

Starting off with Red Hat 8.0, Red Hat has embarked on an ambitious project, called the Blue Curve desktop initiative, that provides a highly integrated desktop environment. This inititive has drawn a lot of flak from the open source community, since it also restricts the ability of the user

info The older Linux lpd-based printing subsystem has now been replaced by the CUPS subsystem that has a very simple Web-based configuration utility, and supports many standard lpd commands.

to play around with the desktop. Thus, this Blue Curve initiative has removed a lot of the fun that was possible in the earlier versions of Red Hat. But it is a boon to the new user who does not care much about switching desktops and window managers.

Configuring your graphical hardware and adjusting display settings is also much easier now using the new 'redhat-config-xfree86' tool, which has replaced Xconfigurator as the standard tool for graphical configuration. But, there is a downside to using this new utility, it runs in graphical mode and the only way left to bring the X server to life in case of faulty hardware detection is by tweaking the X server's configuration file.

Red Hat does a good job of compiling applications from source code, and there are no issues as far as support for rpm packages go. But the package management system leaves a lot to be desired,

SCORE BOARD

CATEGORY	Office desktops		
Distribution name	**SuSE Office Desktop**	**Red Hat 9.0**	**Mandrake 9.1**
Ease of use	22.5	18	21
File system	2	2	2
Similarity to Windows	0	0	0
Suitability to office use	20	20	20
Printing subsystem	4	4	4
System administration	2	2	2
Internet readiness	1.2	1	1.2
Graphical configuration	20	18.75	20
Features	4	3	3
Special features	3	2	2
Glaring deficiencies	0.4	0.4	0.4
Resource utilisation	2.4	1.2	1.8
Desktop hardware compatibility	9.05	9.05	8.57
Windows emulation tools	4	3	0
Economy	3	5	3
Overall score	**90.55**	**84.39**	**83.97**

CATEGORY	Hardware compatibility		
Distribution name	**SuSE Linux Office Desktop**	**Red Hat 9.0**	**Mandrake 9.1 Standard Edition**
Graphics card			
nVidia GeForce MX 440 with AGP8x	✔	✔	✔
nVidia GeForce2 MX 400	✔	✔	✔
nVidia GeForce2 MX 200	✔	✔	✔
nVidia Riva TNT2	✔	✔	✔
SiS 6326	✔	✔	✔
Ethernet card			
Broadcom NetXtreme Gigabit ethernet card	✔	✔	✔
Intel Pro 100 VE	✔	✔	✔
Dlink DFE-538TX 10/100	✔	✔	✔
Intel EtherExpress PRO 100	✔	✔	✔
Sound card			
Onboard CMI 8378	✔	✔	✔
Onboard 5.1 support	✔	✔	✔
Onboard Realtek AC'97	✔	✔	✔
Aureal2	✔	✔	✖
Yamaha DS-XG	✔	✔	✔
Optical drives			
Samsung SW-240B CD-RW	✔	✔	✔
Samsung SD-616Q DVD-ROM	✔	✔	✔
Samsung SD-612 DVD-ROM	✔	✔	✔
Samsung SM-348B Combo Drive	✔	✔	✔
Modem			
Best data 56 Kbps data fax modem	✖	✖	✖
Overall score	**0.90**	**0.90**	**0.86**

more so in the area of checking and automatically installing dependencies before installing packages. These functionalities are currently provided only by the Debian-based apt-get, the ports-system on BSD-style operating systems, and the portage system on Gentoo Linux.

Red Hat has OpenOffice.org, which provides compatibility with existing Microsoft Office files. It is a very mature Linux distribution but does not adapt well in the office environment; rather the office user has to adapt to Red Hat, and that will take a lot of time.

Windows emulators

The purpose of Windows emulators is to provide an environment in which Windows-based programs can be executed on a Linux platform. All you need to do is load the emulator in Linux, which allows you to run your Windows application. Here, we look at the four commonly used emulators; Wine, CodeWeavers CrossOver Office, NeTraverse Win4Lin 4.0, and VMware.

Wine
Wine is an open source implementation that can be downloaded for free from *www.winehq.com*. It runs the Win 32 and Win 16 API on Linux. Hence, you can execute almost any of your Win 32, Win 16 or DOS applications. It provides X11-based graphical support, DirectX support as well as text based console. Support for sound devices, input devices, printing devices, scanners and CD writers, are also included. Even bug detection occurs similar to that on a Windows PC.

Code Weavers CrossOver Office
CrossOver Office has a small set of applications that can be emulated on Linux. The list of applications supported includes Microsoft Office, Lotus Notes, Microsoft Visio, etc. Its latest version, CrossOver Office 2.0.1, is available at *http://www.codeweavers.com/products/office/*

NeTraverse Win4Lin 4.0
Developed by NeTraverse, Win4Lin 4.0 supports more Linux distributions than any other. All you need to do is download, and install it. It supports applications from Microsoft Office, Macromedia applications, and Adobe. It also supports the wheel mouse, larger memory allocation, and a larger swap partition for Windows.

VMware
VMware takes advantage of the Intel architecture, which allows virtual machines to be created at the hardware level, enabling you to use more than one operating system on the same PC. It establishes a virtual network connection between the operating systems, allowing them to communicate with each other as if they were physical computers, connected via the LAN. So, you can access the Linux virtual machine through Network Neighbourhood in Windows and vice versa. The biggest advantage being that it can have either Linux, or Windows as the host operating system.

SuSE Linux Office Desktop:
The chameleon does it again

SuSE are tying to break up their Linux distros into two distinct categories; one targeted at the general user and the other targeted at the office user. This is much better than trying to satisfy the needs of all the users in a single distribution.

The installer interface is very simple for those who have had some previous experience with SuSE, but for a newbie it can get confusing—SuSE does not follow the step-by-step installation process that is commonly used by all the other distros. Instead it uses a Web page format—all the detected settings are displayed on a single screen. To change any of the settings, you have to click on the specific item. The problem with this kind of installation is that you might miss out some important settings that should have been changed. Otherwise the install is perfect—the default option provided in the installation, mounted all the existing Windows partitions by itself.

The hardware support was quite amazing; it didn't have problems installing on any of the testbeds. Also, apart from the bundled StarOffice 6.0, it comes with Crossover, which lets you run many Windows-based applications on Linux.

Compatibility with rpm packages was not a problem. But the most annoying part was the absence of the '*make*' utility needed for compiling from source. While the novice user might not consider this a shortcoming, users are not novices forever. Just as normal Windows users turn into power users after a few months of usage, Linux users generally demand much more from their distributions after a few months. This could be something as simple as compiling the open source alternative to MSN messenger (amsn).

Mandrake Linux 9.1 Standard review:
A magician without a wand

Installing Mandrake is quite simple. The installer is very user-friendly, and even a newbie won't have a problem when selecting options. The disk partitioning utility is slightly different from other distros. It is much more graphical and gives a multi-coloured view of the different partitions on your drive.

Mandrake 9.1 Standard comes with both Koffice 1.2.1 and OpenOffice 1.0.2, but StarOffice 6.0 comes only in the PowerPack edition. It comes with a whole lot of applications neatly grouped under various easy-to-understand categories such as Office, Networking, etc.

The Mandrake Control Centre is an excellent tool that lets you control all the hardware and software on your computer. The Software Sources Manager uses the CDs to manage the update process by default. It also lets you add extra sites for downloading the security updates. It lets you choose from a list of mirror sites. After configuring the proxy setting the updates work perfectly, but the list of sites is restricted. The updates take about 10 minutes to download on a T1 line.

The Windows partitions are mounted by default, but the user has to have prior knowledge of the mount points to access the partitions. The samba server management using the Mandrake Control Centre leaves much to be desired. It searches for servers on the network and lists all the available computers, but does not group them by workgroups. Moreover it has problems accessing Windows XP shares. Finally, you end up using the command line samba utilities to get your work done faster.

Overall Mandrake 9.1 is a good product but a little more effort is required to make it more user-friendly. While the operating system comes with a whole lot of goodies, it does not offer anything special for the typical office desktop user.

What it all means

In the Office desktop category SuSE Office Desktop outperformed all the others simply because it has been specifically developed for this particular segment. While the other distros (Redhat and Mandrake) are one-size-fits-all packages, SuSE has smartly moved away from this mentality and started addressing the needs of different target audiences. However, as far as pricing goes, Red Hat is the best option as it is freely downloadable, even for commercial use.

PRAVEEN KURUP (*praveen_kurup@thinkdigit.com*)

A-List Reviews

A listing of the best products in different hardware and software categories

Every Digit reader must surely be aware of the various comparison tests we do at our Digital Test and Research Centre. The comparison includes various products from all categories. They range from motherboards to keyboards, and other cool gadgets such as digital cameras and MP3 players. We grade these products based on their performance, features and their merit as per the money you pay for them. The 'A' listed products are those which are truly the best among the best—products that you can safely bet on. Read on to find out more about the product you have been hunting for all this time.

CPU + Motherboard

Pentium 4 3.2 GHz 800 MHz FSB
+ Ultra Fast
− Very costly
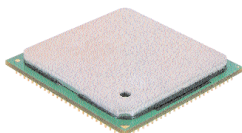
Specifications: 533 MHz FSB, 512 KB L2 cache, HyperThreading enabled
Contact: Nebula Technologies
Phone: 022-6730567
E-mail: pratik@nebulatech.com
Price: Rs 41,500

MSI 845PE Max2
+ Chock-full of features
− No serial ATA support
Specifications: Intel 845PE chipset, HyperThreading enabled, onboard 5.1 channel sound, FireWire, Gigabit Ethernet, RAID controller, USB 2.0, six PCI slots, AGP 4X
Contact: Priya Ltd
Phone: 022-2663611
E-mail: salesbom@priyagroup.com
Price: Rs 7,200

Display

LCD
SONY SDM-N80 18.1-inch LCD Monitor
+ Stylish looks combined with great performance
− External power supply takes up extra space.
Specifications: 18.1 inch a-Si (Amorphous-Silicon) TFT Active matrix panel, 1,600 x 1,200 maximum resolution, two USB ports, external power supply with connections for alternate display source, sound connectors, Mac-compatible display connection
Contact: Rashi Peripherals
Phone: 022-28260258
E-mail: ho@rptechindia.com
Price: Rs 1,49,000

Sharp LL-T153G *NEW*
+ Outstanding Performance
− No built-in speakers, minimal feature set
Specifications: Max resolution supported 1,024 x 768 @ 75Hz, 15-inch LCD, pixel size 0.29
Contact: Sharp India Ltd
Phone: 011-26431313
E-mail: lcd@sharp-oa.com
Price: Rs 22,500

Samsung Syncmaster 171S *NEW*
+ Good Performance, Wall mountable
− No built-in speakers
Specifications: Max resolution supported 1,280 x 1024 @ 76Hz, 17-inch LCD display, pixel size .264, rotating angle 160 degree /120 degree (H/V)
Contact: Samsung Electronics India information & telecommunication ltd
Phone: 011-51511234
E-mail: marketing@ samsungindia.com
Price: Rs 42,000

CRT
BenQ V991 - 19-inch
+ High resolutions, great performance
− No extra accessories
Specifications: 19-inch CRT (18-inch viewable size), 0.25 dot pitch, Shadow-mask CRT type, 115 MHz video bandwidth, flat picture tube, MPR II, TCO 99 emission standards compliant
Contact: Benq India Pvt Ltd
Phone: 022-25705231
E-mail: salesenquiryin@benq.com
Price: Rs 12,999

Printer

Laser
Samsung ML-1710 *NEW*
+ High-quality prints, low cost
− Memory can't be upgraded.

Specifications: USB interface, 600 dpi, 512 KB buffer memory, 250 sheet paper tray and 17 PPM
Contact: Samsung Electronics India information and Telecommunication Ltd
Phone: 011-51511234
E-mail: farrukh@ samsungindia.com
Price: Rs 16,000

Inkjet
Canon S530D
+ Feature-rich
− High costs
Specifications: USB interface, 2,400 x 1,200 dpi (colour)
Contact: Canon India Ltd
Phone: 011-26806572
Email: brijesh@canon.co.in
Price: Rs 21,747

Scanners

HP Scanjet 4570C
+ Excellent scanning performance
− Heavier and bulkier

Specifications: 1,200 x 1,200 optical resolution, USB interface, 48-bit colour depth
Contact: Hewlett Packard India Ltd
Phone: 011-28260000
Email: ashwini-k_aggarwal@ hp.com
Price: Rs 17,999

Primary Storage *NEW*

Maxtor 250 GB MaxLine Plus II
+ Tons of space
− Heats up
Specifications: 7200 rpm, 8 MB cache, ATA 133 interface
Contact: Cyberstar
Phone: 011-6438216
E-mail: yogi@maxtor.com
Price: Rs 21,000

Maxtor 200 GB DiamondMax Plus 9 *NEW*
+ SATA enabled
− Gets hot
Specifications: 7,200 rpm, 8 MB cache, Serial ATA interface

Contact: Cyberstar
Phone: 011-6438216
E-mail: yogi@maxtor.com
Price: Rs 15,000

Secondary Storage

MSI CD-RW CR52-A2
+ Can read and write 90 minute CDs
– Small problems with CDs written at 52X
Specifications: 52X write, 24X rewrite, 52X read speeds, IDE interface, 2 MB buffer, Exact-Rec and AWSS technology, BURN-proof, supports up to 790 MB disc capacity, horizontal and vertical mounting

Contact: Cyberstar Infocom Ltd
Phone: 080-2276986
E-Mail: narend@cyberstarin.net
Price: Rs 4,100

Input Devices

Microsoft Multimedia Keyboard
+ Great feel
– Comes at a high price

Specifications: 16 hotkeys, PS/2 interface, wrist support
Contact: Microsoft Corporation Pvt Ltd
Phone: 011-26292640
Email: connect@microsoft.com
Price: Rs 1,600

Microsoft Wireless Intellimouse Explorer
+ High precision and sensitivity
– Batteries make it heavy
Specifications: Optical mouse, USB interface, two extra buttons, 2 AAA batteries, infra-red, cordless
Contact: Microsoft Corporation
Phone: 011-26292640

Email: connect@microsoft.com
Price: Rs 3,380

Graphics Cards

Gainward FX 5800
+ Future-proof
– Gets very hot

Specifications: 128 MB DDR II memory, 0.13 micron, maximum resolution 2,048 x 1,536 at 85 Hz, AGP 8X, 128 MHz, RAM-DAC speed 500 MHz
Contact: Mediatech India Pvt Ltd
Phone: 022-56396696
Email: sales@mediatechindia.com
Price: Rs 37,975

Sound Cards

Creative SoundBlaster Audigy 2 Platinum
+ 6.1 channel outputs
– Not even remotely affordable
Specifications: DVD-Audio (24-bit with 192 KHz in stereo and 96 KHz in 5.1), 106 dB signal to noise ratio, 6.1 surround sound capability, EAX Advanced HD support, WMA 9 support, FireWire port
Contact: Creative Technology Ltd
Phone: 9820357713
Email: rajshekhar_bhatt@ctl.creative.com
Price: Rs 15,500

Speakers

Creative Megaworks THX 5.1 550
+ Mindblowing sound
– No digital inputs
Specifications: 5.1 speakers, 150 W RMS subwoofer, Five 70 W RMS satellites, Frequency range 25 Hz to 20 KHz, 99dB SNR
Contact: Creative Technology Ltd
Phone: 9820357713
E-mail: rajshekhar_bhatt@ctl.creative.com
Price: Rs 25,500

Mobile Phones

Sony Ericsson P800
+ Easy navigation

– Too many features for the average user
Specifications: Symbian 7.0 OS, expandable memory, excellent PDA functionality, triband, GPRS, WAP
Contact: Sony Ericsson Mobile Communications International
Phone: 011-26180808
E-mail: sudhin.mathur@sonyericsson.com
Price: Rs 39,995

Digital Cameras

Olympus C-5050ZOOM
+ Allows external memory in various formats
– Relatively low memory
Specifications: 5 megapixels, max-

imum resolution 2,560 x 1,920, optical viewfinder, Auto focus, CCD sensor, 1.8 inch TFT colour LCD display, 3X optical zoom, support for RAW, JPEG, TIFF picture formats
Contact: Komal International
Phone: 022-22631366
E-mail: indiaolympus@vsnl.com
Price: Rs 49,995

MP3 Players

Apple iPod 30GB
+ More space than you'll ever need
– Costs way too much
Specifications: 30 GB storage capacity, up to 25-minute skip protection, 2-inch (diagonal) greyscale LCD with LED back-light, dock connector, remote connector, stereo minijack,
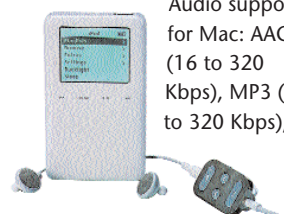
Audio support for Mac: AAC (16 to 320 Kbps), MP3 (32 to 320 Kbps),

MP3 VBR, Audible(6), AIFF, WAV; Audio support for Windows: MP3 (32 to 320 Kbps), MP3 VBR, WAV; size: 4.1 x 2.4 x 0.73 inches; weight 176 gm
Contact: Telecompac Infosys
Phone: 011-26688171
E-mail: bally@del3.vsnl.net.in
Price: Rs 32,000 for 30 GB, Rs 26,000 for 15 GB, Rs 21,000 for 10 GB

Laptops

Acer TravelMate C100 Convertible Tablet PC
+ Easy to carry and work with
– Slightly sluggish performance
Specifications: 800 MHz ultra low voltage mobile Intel Pentium III processor, 256 MB RAM, 10.4-inch TFT LCD display, 30 GB hard drive, USB (x2), Ethernet RJ-45, modem RJ-11, IEEE 1394 (FireWire), infra-red, optional 802.11b wireless LAN, five launch keys, four-way scroll key, built-in microphone and speakers, SmartCard slot, Type II PCMCIA slot
Contact: Acer India Pvt Ltd
Phone: 080-5219520/23
E-mail: ailenquiries@acer.co.in
Price: Rs 1,59,990

PDAs

Sony CLIE PEG-TG50
+ Great combination of features and performance
– Rapid battery consumption
Specifications: 200 MHz processor, 16 MB ROM/RAM, Palm OS 5, Bluetooth and IR capable, high resolution 320 x 320 TFT display with backlights, integrated keyboard
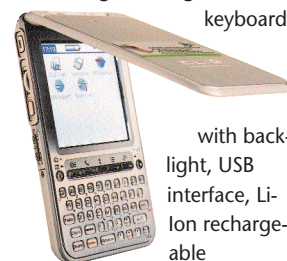
with back-light, USB interface, Li-Ion rechargeable battery, built-in voice recorder and MP3 player
Contact: Solar Systems
Phone: 022-56916834
E-mail: solarsystems@vsnl.net
Price: Rs 27,000

Bazaar

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

Intel Pentium 4 3.2 GHz
The Last of the Northwood

The Pentium 4 3.2 GHz runs on a 200 MHz quad-pumped FSB, giving it a total bandwidth of 800 MHz. It supports Hyper-Threading Technology (HTT), which gives it a significant performance boost, and has a really easy-to-install cooling fan. We tested this processor on an Intel D875PBZ motherboard with support for 800 MHz FSB, 512 MB of DDR 333 MHz Kingmax RAM in dual channel mode, with an MSI Geforce4 Ti 4800 SE graphics accelerator.

In the *Quake III Arena* test, the 3.2 GHz was able to pump 387 fps at normal mode, 377 fps at high quality mode and 292 fps at a resolution of 1,024 x 768 and 32-bit colour depth. These figures may seem a bit low, but the bottleneck was the DDR 333 MHz RAM and the Ti 4800 SE graphics card.

On the 3DMark 2003 benchmark, the 3.2 GHz returned 700 CPU marks—the highest we have ever come across. In the Sisoft Sandra 2003 Pro's CPU arithmetic tests, it gave 9,649 Dhrystones and 6,059 Whetstones, and yielded similar results with CPU multimedia tests. The Integer benchmarks saw a score of 14,693 and FPU SSE2 saw a huge 23,321. All these scores prove that the 3.2 GHz has an appetite for numbers.

In the memory bandwidth test, the dual channel displayed its advantage, scoring in the range of 4,000 and above. The new Intel silicon square was able to complete the video encoding process in just 70 seconds. However, in the PovRay 3.5 test, the CPU seemed to be lost, taking 29 seconds to complete the rendering. Overall, the new CPU set new records at times, and just failed to break existing records at others.

At a price tag of Rs 38,000, you could choose to ignore the 200 MHz increase and wait for something better—especially with the expected 64-bit Intel vs AMD war that is round the corner. But, for those of you who need the fastest CPU currently available, this is one of the best around—providing you can afford it.

Price: Rs 38,000
Contact: Nebula Technologies
Phone: 022-26848612
Fax: 022-26848618
E-mail: pratik@nebulatechnologies.com
Web site: www.intel.com

SPECIFICATIONS

Pentium 4 3.2 GHz, 512 KB L2 cache, Northwood core, 800 MHz FSB support

Intel Pentium 4 3.2 GHz	A-
Performance	▶ ▶ ▶ ▶ ▶
Build quality	▶ ▶ ▶ ▶ ▶
Value for money	▶ ▶ ▶ ▶ ▶
Features	▶ ▶ ▶ ▶ ▶
OVERALL	▶ ▶ ▶ ▶ ▶

Dell Latitude D600
Wireless anybody?

With the D600, Dell has gone in for a complete re-design of its Latitude series of laptops. The D600 measures 1.2 x 12.4 x 10.1 inches, weighs only 2.12 Kg, and is filled to the brim with features, such as the Strike Zone Technology that protects the hard disk from shock.

Its Centrino-based motherboard has the slower 802.11b (11 MBps) wireless LAN connectivity. Those concerned about the compatibility issues of Centrino with existing 802.11g network equipment can opt for the Dell TrueMobile Wireless LAN Solutions that gives an additional 802.11 b/g or 802.11 a/b/g mini-PCI card. It has dual band capabilities which enable it to hop on to both 2.4 GHz as well as 5 GHz frequencies.

The standard POVRay benchmark, which takes about 45 minutes on a Pentium 4, 2 GHz, took just 58 minutes and 47 seconds on the D600, proving its processing power.

The operating temperature shot up to 57 degrees after about 5 hours of use—very uncomfortable if you have it on your lap.

The keyboard is comfortable, and you can use the touchpad with a pair of mouse buttons below it, or the pointing stick with a different pair of buttons.

It has a diagnostic utility that can be used to recover your system after a crash. The diagnostic utility correctly diagnosed the problems that occurred after a system crash.

The laptop comes with a three year onsite warranty. Overall, it is a sleek, high performance mobile device that is perfect for executives on the move.

Price: Rs 1,53,366
Contact: Dell Computers Asia
Phone: 1600-33-8044 (toll free)
Fax: 080-5586107
E-mail: marketing_response@dell.com
Web site: www.dell.com

SPECIFICATIONS

Intel Pentium M 1.40 GHz, Windows XP Professional SP1, 512 MB DDR RAM (up to 2 GB supported), Removable 20, 30, 40, 60 GB hard drive, Combination DVD and CD-RW drive (8X24X10X24X), ATI Mobility Radeon 9000 graphics chipset, Intel PRO Wireless 2100 WLAN (802.11b) mini-PCI card, Integrated 56 K V.92 modem and 10/100/1000 MBps Ethernet LAN

Dell Latitude D600	A
Performance	▶ ▶ ▶ ▶ ▶
Build Quality	▶ ▶ ▶ ▶ ▶
Value for money	▶ ▶ ▶ ▶ ▶
Features	▶ ▶ ▶ ▶ ▶
OVERALL	▶ ▶ ▶ ▶ ▶

HCL Beanstalk 4455
Black beauty with a punch

The Beanstalk 4455 is the latest offering from HCL Infosystems, targeted at the home segment. The cabinet is matte black with a silver front, and the monitor is half silver, half black.

The PC comes with an original Intel D845PEBT2 motherboard—the best board in the 845 series, with features such as 5.1 channel sound, serial ATA controller, optical SPDIF output, etc. It has a pre-installed internal modem, Ethernet, both a DVD-ROM and a CD-RW drive for CD-to-CD copying. This last move seems bad, as a combination drive would have reduced the price considerably.

To complement the onboard 5.1 sound system, the PC comes bundled with 5.1 channel Altec Lansing speakers—the wooden sub-woofer gives out heart stopping bass, and the satellites produce good quality sound. The Beanstalk 4455 also comes with a small USB rumble effect gaming wheel that lets you feel the bumps on the road when playing those F1 simulation games. The bundled software includes MS Encarta (Indian edition)

and a complete suite of multi-lingual software.

The PC also comes with an external TV-tuner card and a handy remote. The 80 GB hard disk ensures that you don't run out of space for your favourite movies. However, the GeForce2 MX 2400 graphics card does not do justice to the configuration. It is the only component that seems out of place, and keeps this Beanstalk from qualifying as a high-end PC.

The PC also has good Linux compatibility—we installed RedHat 9.0, and found that everything worked smoothly.

At close to Rs 70,000 it is a little steep, but the excellent build, original Intel feature-rich motherboard, flat-screen monitor, Altec Lansing speakers and bundled software make this computer worthy of any home.

SPECIFICATIONS

Intel Pentium 4 2.66 GHz, 256 MB DDR SDRAM (333 MHz), 80 GB 7,200 rpm hard drive, 16X DVD-ROM, 40X12X40X CD-RW, 56K internal modem, 1 year onsite maintenance

Price: Rs. 69,990
Contact: HCL Infosystems Ltd
Phone: 0120-2520977
Fax: 0120-2533877
E-mail: raman@hclinsys.com
Web site: www.hclinfosystems.com

HCL Beanstalk 4455					B+
Performance	▶	▶	▶	▶	▶
Build Quality	▶	▶	▶	▶	▶
Value for money	▶	▶	▶	▶	▶
Features	▶	▶	▶	▶	▶
OVERALL	▶	▶	▶	▶	▶

Gainward GeForce FX 5800 Ultra
Force 10 from nVidia

When we received the big FX Power Pack from Gainward, we wondered how large the card was to warrant the humongous packaging. On opening the box, the monstrous graphic card with huge heat sinks on its front and back was a sight to see. The device is really thick and will occupy the neighbouring PCI slot with the elevated heat sink fins that ventilate hot air from above the core. It has a Molex power connector (like the one that goes to the hard disk) to quench its thirst for power.

The fan speed varies according to the load placed on the card. It's quiet, and runs at low speeds when working with non graphic-intensive applications, but whines like a jet turbine the moment a user enters the world of 3D.

This card has some features that no other card has. The Ultra runs at a clock speed of 500 MHz, with its memory clocked at 1 GHz. It supports the latest industry standards, such as DirectX9 and OpenGL 1.4, vertex and Pixel shader 2.0, which means the user will get to see more realistic water, grass and walls in games. There are some issues over the pixel per clock—nVidia claims it's 8 pixels per clock, but in some cases such as Z rendering + colour, it reduces to 4 pixels. All said and done, the specifications look pretty good on paper, making it decently future proof.

The card is indeed a performance warehouse, giving a high score of 286.7 fps in

Quake III Arena at a 1280 x 1024 x 32 resolution. The scene in *Serious Sam SE* was the same. Although the demo started with a few jerks, there was no stopping Sam in his killing spree. Everything was rendered instantaneously and without any kind of artifacting or jaggedness. In VulpineGL Mark, the 3D world was rendered with ease—the whole benchmark finished in half the time that the SiS Xabre600 took—with a score of 59.9 fps at 1280 x 1024 x 32.

This card still isn't the fastest card overall, because the 9800 Pro from ATi is already out, and has an improved and faster core. The 9700 Pro still manages to take the lead in many benchmarks and is available at a lower price. Only games such as *DOOM 3*, when released, will tell us which card is better for the games of the future. On the price front, this card is unaffordable to the majority, but the privileged few who can afford it will get a 5.1 channel sound card, a FireWire card, a *Duke Nukem: Manhattan Project* CD and InterVideo WinCinema DVD playback software.

SPECIFICATIONS

125 million transistors, 0.13 micron fabrication process, DirectX 9 and OpenGL 1.4 compliant, 500 MHz core clock, 1 GHz memory clock, 128 MB DDR II memory

Price: Rs 37,975
Contact: Mediatech India
Phone: 022-5639 6696
Fax: 022-2201 4083
E-mail: sales@mediatechindia.com
Web site: www.gainward.com

Gainward GeForce FX 5800 Ultra					A-
Performance	▶	▶	▶	▶	▶
Build quality	▶	▶	▶	▶	▶
Value for money	▶	▶	▶	▶	▶
Features	▶	▶	▶	▶	▶
OVERALL	▶	▶	▶	▶	▶

Samsung SGH-T500 Mobile Phone
One for the ladies

The first thing that you notice about the SGH-T500 is the external display surrounded by bright gem-shaped tiny LEDs. This phone has an excellent build quality and feels quite sturdy. It is extremely lightweight and is available in Ruby Red, Sapphire Blue, Pearl White and Topaz Gold.

The 32 zirconium stones lining the external display double-up as service indicators and flash in the selected colour namely, violet, blue, sky blue, green, or orange. The keys are flat and lack depth, but large enough to be used comfortably, and sport a blue back light. Two soft keys at the top of the keypad access the menu and the phonebook; the cancel key is placed in between. The four-way scroll key features an Internet shortcut key in the centre. You can store 500 contacts apart from those stored on the SIM card, and can assign different ring tones and service light colours to your contacts.

The phone has a voice memo feature, which allows you to save three records of 35 seconds each. Not really a phone for SMS junkies, the T500 does not support concatenated messages, and though it does have predictive text input, you cannot add new words to the dictionary. Other key features include polyphonic ring tones, a scheduler, alarm, calculator, To-Do list, world time, con-

version, timer, stopwatch, WAP 1.2.1 and three games. Though the phone supports picture messaging, it does not support MMS or other connectivity options such as InfraRed and Bluetooth.

More features that mark this as a lady's phone are calorie and fitness calculators, biorhythm and a pink scheduler for menstrual cycles. Even the internal LCD display doubles as a vanity mirror when turned off!

The T500 normally offers a good degree of voice clarity, but faces a few problems in areas of low network coverage. Also, since the keys lack depth, the two small rubber pegs at the bottom of the keypad get in the way when using the two corner keys.

Looking at the hefty price tag of almost Rs 30,000, it may make better sense to go in for high-end handsets, such as the Nokia 7650 or the Nokia 7250, which have digital cameras and cost less—especially if you don't care for stereotypes.

SPECIFICATIONS

80 gms, dual display (external monochrome 96 x 64 pixels, internal 65,000 colours 128 x 128 pixels), GSM 900/1800, Li-Ion 720 mAh battery, up to 200 hours standby time, up to 3 hours talk time, three games: Bowling, HamsterBox, HoneyBall

Price: Rs 29,099
Contact: Samsung India Information and Telecommunication
Phone: 011 - 5151 1234
Fax: 011 - 5160 8821
E-mail: chandrasekar@ samsungindia.com
Web site: www.samsungindia.com

Samsung SGH-T500 Mobile Phone	B+
Performance	▶ ▶ ▶ ▶ ▶
Build Quality	▶ ▶ ▶ ▶ ▶
Value for money	▶ ▶ ▶ ▶ ▶
Features	▶ ▶ ▶ ▶ ▶
OVERALL	▶ ▶ ▶ ▶ ▶

Samsung ML-1710 Laser Printer
The best things come in small packages

The ML-1710 is the latest addition to Samsung's extensive line of laser printers. The ML-1710 comes in a milky white body, decorated in slate grey. Despite its small size of 13.7 x 14 x 7.6 inches, the printer features a removable paper tray capable of holding around 250 sheets. The upper body serves as the output tray but can hold only about 40 sheets, after which the papers start flying around—a very small flap is provided to hold the printouts in place.

As far as specifications are concerned, the ML-1710 boasts an 8 MB memory buffer, which is quite effective as can be seen from its performance—the downside is that the memory can't be upgraded. The printer comes with a USB 1.1 interface. Samsung has done a good job of providing drivers for a host of operating systems, including all Windows versions and support for many Linux distributions. The drivers also have features such as watermarking and high altitude correction.

The bundled accessories include a 15A power cord and an extensive manual, but no USB data cable, which is quite strange for a USB printer.

The printer also comes with a Toner Save button that claims to save around 40 per cent in ink consumption. The front panel consists of just one multi-functional button and two indicating LED's. The

printer also supports a manual paper feed mechanism, located on the front side.

The ML-1710 is the fastest and the smallest laser printer available in India. It was able to print 15 pages in one minute—only 2 pages short of the claimed 17 ppm printing speed. The quality of the output was also great, considering the speed of printing. It printed the test image and combination document in just 17 seconds and 22 seconds respectively—by far the fastest we have seen.

Priced at Rs 16,000, the printer is ideally suited for a typical small office or as a home printing solution, and is a good buy for those on the lookout for a small, fast, good quality laser printer.

It may not be suitable for a large organisation due to the lack of networking capabilities, the smaller paper capacity and poor paper handling.

SPECIFICATIONS

66 MHz processor, 8 MB memory, 15 ppm, media type supported: A4 and smaller, special media such as transparencies, envelopes and postcards.

Price: Rs 16,000
Contact: Samsung Electronics India Information & Telecommunication Ltd
Phone: 011-51511234
Fax: 011-51608820
E-mail: farrukh@samsungindia.com
Web site: www.samsungindia.com

Samsung ML-1710 Laser Printer	B+
Performance	▶ ▶ ▶ ▶ ▶
Build Quality	▶ ▶ ▶ ▶ ▶
Value for money	▶ ▶ ▶ ▶ ▶
Features	▶ ▶ ▶ ▶ ▶
OVERALL	▶ ▶ ▶ ▶ ▶

Nikon COOLPIX 4300

Pricey affair

The COOLPIX 4300 is a 4.0 Mega pixel digital camera with 3X optical zoom. Other features brought to you, courtesy Nikon, include 12 scene modes that help those new to digital cameras to get the best images easily. The camera is compact and the buttons are easily accessible. Like others in its class, it has a video-out jack so that you can preview the images on a TV screen, and is bundled with rechargeable Li-Ion batteries for a cost effective solution for extended use. The USB connection makes for easy transfer of pictures to the PC, and a dedicated transfer hotkey is provided to make the task even simpler.

However, when used in manual mode, adjusting settings such as white balance and resolution is a little complex. This is irritating if you need to change the settings frequently, while shooting outdoors. The COOLPIX 4300 also captures small movie clips, but the absence of a microphone does not let you record sound clips.

When tested for image quality at the highest resolution supported by the camera, we got mixed results. In the Auto mode, the outdoor images were impressive, with brilliant colour reproduction and details. However, when shooting indoors, images were captured in detail but with a red tinge that was visible in PhotoShop, making the images look rather grainy. The camera also needs manual settings to get better depth of field. With everything set on Auto, you will not be able to get the desired depth in your photographs; which is a very important aspect of indoor photography.

The compact design and lightness of this camera makes it convenient for you to carry it on outdoor shoots.

However, if you are planning to take the camera with you on a long vacation, the 16 MB Compact flash memory might not be enough to store all your memories—at the highest setting in Fine mode, an image occupies between 1.8 MB and 2.3 MB. Using a lower setting of 1,280 pixels will bring the image size down to around 550 KB, which can also be printed later.

The camera is a good buy, if one plans to use it more outdoors than indoors, and is sufficient for the needs of the novice photographer.

SPECIFICATIONS

Weight 283 gms, 16 MB Compact Flash memory, 4.0 Mega pixel resolution, 3X optical zoomNikkor lens, f2.8 to f13.4 aperture range, 8 to 1/1000 second shutter speed range, 1.5 inch LCD, 4 cm macro mode

Price: Rs 44,000
Contact: Aver Software Technologies Ltd.
Phone: 022-2673 2955/ 6/ 7/ 8
Fax: 022-2673 3116
E-mail: aver@averphoto.com
Web site: www.nikon.com

Nikon COOLPIX 4300	B+
Performance	▶ ▶ ▶ ▶ ▶
Build Quality	▶ ▶ ▶ ▶ ▶
Value for money	▶ ▶ ▶ ▶ ▶
Features	▶ ▶ ▶ ▶ ▶
OVERALL	▶ ▶ ▶ ▶ ▶

Antec Sonata Piano Black Super Mini Tower

A gamers box with style

Antec, well known for their high quality power supplies and cabinets, have been in the Indian market for while. The Sonata Piano Black Super Mini Tower cabinet comes from Antec's LifeStyle series.

The cabinet looks stunning with its polished jet black exterior finish. It has a lockable front panel door. When opened, it reveals the power button, optical drive bays and the floppy drive bay. It has two USB, one FireWire and two audio ports in front, neatly hidden behind a small gleaming silver roll over flap. The 'Antec' logos drilled on both the side panels double as ventilators. On the rear of the cabinet, there is a power switch and a switch to select the voltage.

The side panels have thumb screws that you can open with your hands, and are also lockable to prevent unauthorised access. The interior is a bit cramped, but better than other cabinets in the market. The quality of the materials used for constructing the cabinet is excellent, and it comes bundled with cables and connectors. A striking feature is the large 120 mm temperature controlled fan on the back panel. The sensor detects the interior temperature and varies the fan speed accordingly. So if the temperature is lower, you get a quieter environment. There is also a provision to place another 120 mm fan behind the front panel, which would act as an air intake fan.

The cabinet has three 5.25 inch bays and six 3.5 inch bays. The 3.5 inch bays are displaced by 90 degrees (they face the side panelling) and are detachable; this allows easy installation of hard disk drives—you can take the bay out, place the hard disk on rubber grommets provided on the bay, screw it in and place the whole bay back. The cabinet comes with seven large power connectors and two small power connectors.

The Antec Sonata is priced at Rs 9,000, making it the most expensive cabinet targeted at the home segment. Considering its features, quality of construction, 380 Watt power supply, and 3 year replacement warranty, it is a great buy for gamers—if you can afford it.

SPECIFICATIONS

Mini Tower, Athlon or Pentium 4 compliant power supply, 380 Watt power rating, front mounted USB, FireWire and audio ports, Voltage (110/220) selector, 120 mm fan

Price: Rs 9,000
Contact: Cyber Space Abacus Pvt Ltd
Phone: 044-24917667
Fax: 044-52154188
E-mail: shunmugavel@theitdepot.com
Web site: www.antec-inc.com

Antec Sonata Piano Black Super Mini Tower	B+
Performance	▶ ▶ ▶ ▶ ▶
Build Quality	▶ ▶ ▶ ▶ ▶
Value for money	▶ ▶ ▶ ▶ ▶
Features	▶ ▶ ▶ ▶ ▶
OVERALL	▶ ▶ ▶ ▶ ▶

Altec Lansing XA3021
2.1 for the price of 4.1

The XA3021 speaker set is designed to stick out in a crowd. The subwoofer looks like a 500 pound bomb, a scuba diving apparatus, or an ultra-futuristic cappuccino machine, depending on which angle you look at it from. The satellites are designed to look like large studio microphones, with the ability to swivel vertically.

The wired remote control has three presets to control the bass level—TV, Gaming and Max Bass. The traditional volume control is replaced by a rotary dial that can change volume levels really quickly. However, if you're looking to turn down the volume a wee bit, it'll actually increase significantly before going down.

The speaker connections are different from what you'd expect—instead of inputs for the front and subwoofer channels, it has Left and Right channel inputs; typical of TVs. PC users should be aware that the sound card output needs to go into the 'Aux' Input for the system to work.

The bass is pretty powerful—too powerful at high volumes—and the treble reproduction is truly excellent. It's only at the highest levels that the treble begins to crack, but the bass gives way long before that. In fact, it only sounds good at low to medium volumes. Plastic just can't replace wood as a substitute for a subwoofer's case.

Overall, the speakers perform consistently with what you'd expect from a high-quality set. The real body blow comes if you glance at the price tag. Rs 6,750 is way above its deserved asking price. You can get great-sounding 4.1 speaker sets for less than that. The XA3021 looks like a bomb, and costs just about as much.

Price: Rs 6,750
Contact: Trifin Technologies
Phone: 011-26236061
Fax: 011-26436447
E-mail: trifin@vsnl.com
Website: www.alteclansing.com

SPECIFICATIONS

20 W RMS total power, 35 Hz to 18 KHz frequency response, 76 dB SNR, 5.25-inch long-throw woofer, two 3-inch full-range satellites, corded remote

Altec Lansing XA3021		B
Performance	▶ ▶ ▶ ▶ ▶	
Build Quality	▶ ▶ ▶ ▶ ▶	
Value for money	▶ ▶ ▶ ▶ ▶	
Features	▶ ▶ ▶ ▶ ▶	
OVERALL	▶ ▶ ▶ ▶ ▶	

SpeedUpMyPC 1.16
Memory monger

Most of us would appreciate a utility which allows us to free precious memory and assign more CPU power to programs. SpeedUpMyPC is a program from Li Utilities that serves this purpose—it help you free up RAM when needed. You get an option to set a limit of utilised RAM, after which the program will automatically start freeing up memory. You also have an option of 'Deep RAM Recovery', which frees up more memory. It can be used when your system is extremely sluggish, and saves you from restarting.

SpeedUpMyPC is also capable of monitoring CPU resources, and assigning them to the most important tasks. It depicts usage on a graph and allows the user to assign resources to any program currently running. Most importantly, it can also prioritise system processes, once a certain amount of CPU usage is set.

This program is capable of optimising the browser and Internet settings and can also automatically perform a bandwidth test to gauge your speed. However, we did not see any sort of boost in surfing or downloading.

SpeedUpMyPC can recover the PC from crashes. It does this by trying to terminate tasks that are possibly responsible for the crash, frees up the CPU and RAM, and restarts the Windows shell.

Overall, SpeedUpMyPC 1.16 does offer a good set of features and will boost system performance for those who use older versions of Windows, such as Windows 9x.

Price: $29.99 (approx Rs 1,399)
Contact: Liutilties
E-mail: contact@litutilties.com
Web site: www.liutilities.com

SPECIFICATIONS

Windows 95, 98, 2000 or XP, 10 MB free hard disk space, 32 MB RAM, Pentium 400 MHz or higher

SpeedUpMyPC 1.16		B+
Performance	▶ ▶ ▶ ▶ ▶	
Ease of Use	▶ ▶ ▶ ▶ ▶	
Value for money	▶ ▶ ▶ ▶ ▶	
Features	▶ ▶ ▶ ▶ ▶	
OVERALL	▶ ▶ ▶ ▶ ▶	

BenQ M100 Optical Mouse
Glow mouse

BenQ's new M100 optical two-button scroll mouse, is an entry-level optical input device. The mouse is an elegant electric blue, with silver coating on the buttons.

The M100 is built for both left-handed and right-handed users, and has a USB to PS/2 adapter. It displayed good precision in the games we played, namely, *Unreal Tournament 2003* and *Quake III Arena*. The mouse sensitivity is above par, and performed well even when the mouse sensitivity settings were lowered.

Although it costs as much as an entry level mouse, it matches the quality of a Microsoft mouse. It combines top performance and great value in a very attractive package, and is worth every penny you spend, and that's the bottom line!

Price: Rs 699
Contact: BenQ India Pvt Ltd
Phone: 022-25705230
Fax: 022-25705235
E-mail: kamleshsalunke@benq.com
Web site: www.benq.co.in

SPECIFICATIONS

Optical sensor, PS/2 interface (USB version with USB to PS/2 option also available), two buttons, scroll wheel with glowing LED

BenQ M100 Optical Mouse		A
Performance	▶ ▶ ▶ ▶ ▶	
Build Quality	▶ ▶ ▶ ▶ ▶	
Value for money	▶ ▶ ▶ ▶ ▶	
Features	▶ ▶ ▶ ▶ ▶	
OVERALL	▶ ▶ ▶ ▶ ▶	

RAMbling Memory

Agent 001 goes shopping in the volatile RAM market

The monsoon brings joy to all, and I'm no exception—I love walking in the rain and pretending to not have a care in the world. Unfortunately, it's a bad time of the year for our little white computing boxes. Sure the climate makes them run cooler, but the humidity can sometimes stop them cold—condensation can blow up components at times.

This weekend I was out on a stroll, enjoying myself while the rain gods showered the earth. Happily soaked, I returned home and poured myself a cup of hot coffee, sat down and switched on my PC. To my dismay, all I saw was a blank screen and heard the dreaded death toll of my RAM. Immediately I switched off, opened the cabinet and realised that my decision to keep my PC near a window, so that I could enjoy the real and cyber world simultaneously, was a big mistake. Moisture is a PC component's biggest enemy, and alas my RAM

chip had suffered a fatal blow. After a few feeble attempts at digital CPR, involving a hair dryer and trying out different RAM slots, I declared my chip to be indisputably dead.

After a quick eulogy and dump-in-the-dustbin funeral, I headed out to buy myself a new RAM chip. Being the end of the month, I was on the lookout for the cheapest solution available. My first stop was the *nukkad-wallah* computer shop. When I asked for a 256 MB SD RAM chip, he handed me a Hynix module and told me the damage would be Rs 2,500. After a brief pause to catch my breath, I asked why SD RAM was so expensive. He informed me that SD RAM was soon to be extinct, and is now sold as antiques. Dealers are not stocking SD RAM, as the faster and now cheaper DDR RAM is taking over. I couldn't believe my ears, as I had bought my now deceased SD RAM for Rs 1,200 only a few months ago.

So, I decided to venture further away from home, and went RAM shopping in Lamington Road. The first dealer I came across, was selling the same Hynix module for Rs 2,300, but was quick to suggest that I buy DDR RAM instead. "*Aare bhayyia*, when you can get double the performance at a cheaper price, *toh sochna kya*", he said. When I told him my motherboard didn't support DDR RAM, pat came the reply, "*Toh* motherboard *upgrade karo*".

My next stop was also fruitless, as the vendor told me he had stopped selling SD RAM a month ago—all he had was the different flavours of DDR RAM.

When I asked for prices, I was told that normal Hynix 256 MB DDR RAM was available for as low as Rs 1,700, the 333 MHz variety costs Rs 2,200, and the fastest 400 MHz version costs just Rs 2,800. Cursing my luck for buying a dinosaur, I moved on in my search for the elusive cheap RAM chip.

The next dealer had a new swanky, modern looking shop. He also sold only DDR RAM, but offered a choice of brands, such as Kingston, Cosair, Samsung, etc. Kingston is supposed to be really good, and also more expensive. Kingston RAM costs Rs 1,950, Rs 2,350 and Rs 3,500 for 266 MHz, 333 MHz and 400 MHz respectively. Onwards I went, looking for a solution to my problems. I was about to call it a day, and was resigned to buying a new DDR

ILLUSTRATION: Mahesh Benkar

RAM supporting motherboard, when I came across a very troubled looking vendor, who told me that he would get the RAM for me for Rs 1,800, but with only 6 months warranty. Immediately suspicious, I asked why that was so, and was told that he had a few pieces lying around which he had bought a few months ago for really cheap and was now just looking to get rid of them as no one was buying SD RAM anymore.

I wasn't too worried about the 6 months warranty, as I knew I would probably upgrade to a DDR-based motherboard way before then. So, after double checking the RAM, I headed off home, happy that I had got what I wanted, and cheap!d

SHOPPING TIP
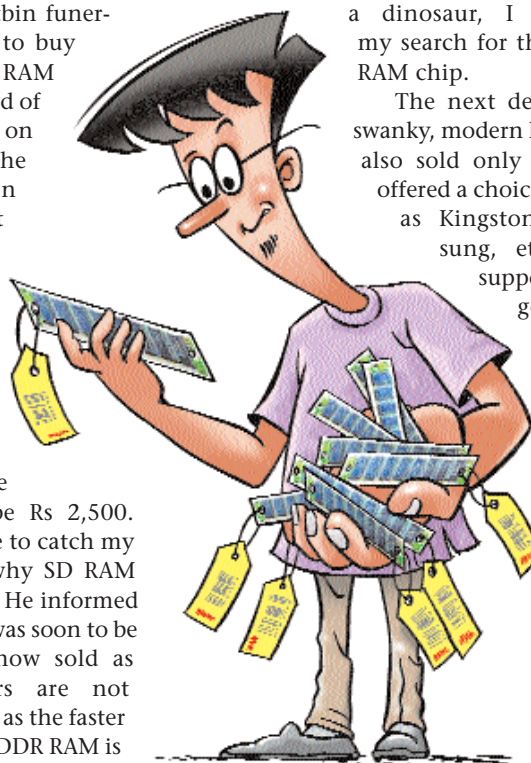
■ Never buy second hand RAM modules. Since they don't carry any warranty, you might end up wasting your money.

■ If you are buying a new PC, opt for a DDR RAM-based motherboard, as DDR is much faster, and cheaper as well.

■ Before buying a DDR 333 or a DDR 400 memory module, make sure it is compatible with your motherboard. This can be verified from the motherboard manufacturers Web site.

■ Insist on genuine RAM chips. Generally what we get in Indian market, are modules that are manufactured locally by soldering memory chips onto a cheap quality PCB.

■ Manufacturers such as Kingston, Corsair, Crucial, etc., offer a lifetime warranty (five years actually, a computer's lifetime not yours). Pay a little extra and opt for this warranty, to give you peace of mind.

Googology

Peek under the hood of the most popular search engine there is, and learn how to use it effectively

Finding a needle in a haystack may sometimes be easier than finding relevant search results on the Web. But with Google, you can refine your searches dramatically. It's the definitive search engine that can be used to scour the Internet for virtually anything—from a simple search for MP3s to issues such as Digital Rights Management, Google is sure to bring up results of relevance. Though most people are satisfied with typing in whatever they want and clicking search, power users need more. To get accurate results, you have to use certain tricks to properly link all sections of your query.

To search better, you have to know what to query for and more importantly, how the technology works.

Every Web site uses certain keywords to describe itself. These keywords are included in the code of the Web site and are called Meta tags. Most search engines compare these keywords to the query you enter, in order to check the relevance of the page. This process of checking a page is known as Web crawling. The problem with Web crawling is that Web sites can make improper use of Meta tags. Commonly generated search requests such as money, news and jobs are added as keywords to almost every Web site.

Google uses many search algorithms, and a large network of low cost PCs, to filter its results. The main algorithm used is PageRank, which votes for the relevance of a site. Each site that provides a link to the tested site is counted as a vote. Also, the vote of an important site is given higher priority. After this, a separate algorithm known as Hypertext is

used, which makes a detailed comparison of all the elements of the tested Web page. After this, the results are delivered to your system.

Google's advanced technology is all well and good, but the main question is "How do I search better?" All you have to do is follow some simple search tactics to get better results.

Understanding Your Google

When you perform a query, it appears in the Google page at the top. Below this, you will see some categories, which indicate that your query is listed in the Google directory. Then the results are displayed in the order of relevance. If your search uses very general terms, you may get hundreds of thousands of results. Thus, the best search is one that gives you fewer, but more accurate results.

If you use Google regularly, you may have noticed the 'I'm Feeling Lucky' button, located right next to Search. Clicking on this button will take you directly to the most relevant Web site—the first link that would appear if you had clicked on Search. If the query is related to an organisation, you will also see a stock quote of the company. Three more links are included with every result— 'Cached', 'Similar Pages' and 'More results from…'. The 'Cached' link allows you to view a snapshot of a Web site, taken when Google indexed the site. The snapshot may not provide the current version of the page, but is extremely useful if the

Web site in question is out of service. The 'Similar Pages' link allows you to view page listings that are similar or related to the query, and the 'More results from…' allows you to see search results from other Web sites.

The most basic aspect of query construction is clear thinking. You must be specific in your thinking of what you want to search for before typing in the keywords. A specific query will generate more accurate results than a query with commonly found keywords. For example, if you're searching for the lyrics of a song, try typing in a line from the song along with its name.

Google eliminates all common words such as 'The', 'And' or 'Of'. This is done because such words generate a lot of results. But if you are searching for 'Rise Of Nations', the 'Of' is necessary. To specifically include it, you have to search for 'Rise +Of Nations' or include the query in quotes—search for "Rise of Nations".

Another way to improve your search results dramatically is to use the Advanced Search feature. This allows you to construct your query with a variety of conditions. You can also provide exclusions to your

Refine your search result using the Advanced Search Options

query. The search query can then be filtered using various criteria such as language, file format, date and query occurrences.

Search operators, which are prefixed to a query, are another great way of defining your results. Google has 10 major operators that can be used to retrieve pages from its cache, look for the query in URLs, search for links to the query, etc. Some useful search operators are 'related', 'allintitle' and 'indexof'. For example, if you are searching for the E3 games Web site, try entering the query as 'allinurl: E3 games'. This will give you results of all sites with 'E3' and 'games' in the URL.

If the search is OS specific, try using Google topic specific searches. The topics include Macintosh, Windows, BSD Unix and Linux. Another feature is an exclusive .edu (education) and .mil (military) site search. You could also narrow your search to a specific school using the university search, which provides a listing of many universities. You can check out all these advanced search features by clicking on the Advanced Search button or visiting *www.google.com/advanced_search.*

More than vanilla
Google is not about plain Web Searches; it also has a comprehensive image, news and directory search.

The image search is extremely effective, with algorithms that analyse various fac-

tors, such as name of image and image caption. Images are then selected and processed, multiple instances are removed and finally the results are displayed as thumbnails. To refine image searches, try to restrict the resolution of the images. For example, to find 1,024 x 768 resolution images of natural beauty, search for 'nature 1024*768' rather than just 'nature'.

The 'Advanced Image Search' option, allows you to refine search results by searching for fixed file sizes, file format or colour values. You can also use the 'Safe Search' option to prevent explicit content from being displayed. To maximise your relevance, construct your query with keywords that may be included in the image or its caption.

A facet of the Internet that has been largely forgotten is Usenet. It is a system that transfers information inside specific groups, and can provide solutions and firsthand information from like-minded individuals around the world. It is considered to be the largest de-centralised source of information on the Internet. Google Group search can be used to track relevant information across Usenets. To do this, click on the Groups link.

When you search for Usenets, you must know the subject, the group or the author. When a search request is made, the results are displayed in a format similar to to standard Web searches, but only

groups related to your query are shown. For a precise search of Usenet archives, use Advanced Search. Apart from standard filtering, the Advanced group search allows you to specify a group name, author and subject.

You will always find information on the Internet, but the problem is verifying this information. The Open Directory Project (ODP), started by Netscape, aims to solve this. It is a large catalogue of Web sites categorised by people around the world. These voluntary editors review sites, and decide whether they should be included in the directory. The directories are classified broadly into sections such as arts, business, computers, etc. Within these directories, are more specialised divisions that can be used to make search results precise. Due to the level of precision involved in Directories, an advanced search option is not necessary.

Google uses its search technology to track information from about 4,500 news sources, to form Google News. The news is then placed in order of relevance, allowing you to look at news from various sources and study different news perspectives. In a test search, Google retrieved a news item that was posted only 35 minutes earlier!

Before: Using a plain image search can result in thousands of useless images

After: The advanced image search will yield better and relevant results

Use Google Group search to get exactly what you need, and nothing more!

Google News is taken from over 4,500 sources and brought fresh to your desktop

Advanced Ap(e)Ing?

Want to do more with the Google API? Check out the tutorial provided by IBM related to Google's API at *http://www-106.ibm.com/developerworks/edu/ws-dw-wsgoog-i.html*. It describes building Web Service Applications with Google. It has four examples that demonstrate the capabilities of the Google API and service.

Adding Google to your PC

Installing the Google toolbar is the simplest way to search the Net, as it docks with your IE browser. After this is done, you can search Google effortlessly using the search field in the toolbar.

And still some more

Answers *(http://answers.google.com)*, is yet another ace in Google's deck of cards. You can ask any question you like and have it answered by experts, albeit for a fee. But, some of the previously asked questions can be browsed freely.

Google labs is an interesting section which reveals what may be the final solution to the complete search experience. Some of the more popular projects are mentioned here; to see the entire list of revolutionary new search ideas, visit *http://labs.google.com/*.

Google Compute: Google supports a distributed computing project called Folding@home—a project dedicated to understanding the structure of proteins, thus providing better treatment for diseases. It installs along with the Google toolbar, and uses your com-puter's idle time. This is a great cause to help, especially if you have a broad-band connection.

Touch Typingoogle: If you are a touch typist, you must hate reaching out for your mouse. Like-minded developers in Google have developed keyboard short-cuts so that you can search Google without ever touching your mouse!

Quoting Google: If you want to view instant feedback on every search result, try out Google Webquotes. It provides quotes regarding search results.

The Next Step

Since Google has launched its API for free, programmers are taking advantage of this to present search results in many different ways. Here are a few examples:

Egobot: If you never wish to worry about constructing queries, use Egobot! It allows you to search for information using a question-answer format. It uses a specifically composed algorithm, with the Google API, to create a simple yet accurate answer. If anything, it will lighten your mood. *http://blog.outer-court.com/egobrowser/egobot.php*

Egobot, Google with intelligence?

Different Beats…

Tired of Google? Or want a new set of tools? Check out these popular alternatives to Google search.

Teoma: www.teoma.com uses the communities of the Internet to provide you with a relevant search. It also provides tips and tricks to refine your search.

AllTheWeb: In terms of database and search coverage, www.alltheweb.com is clearly better than Google. Bizarre search queries such as 'Russian Education' brought up more than twice the links that Google provides.

Kartoo: If you have a really fast connection, you may like www.kartoo.com. It is a

Interactive Results in kartoo.com

Meta search engine that draws an interactive map of all the results it receives. This makes for really interesting viewing!

The Invisible Web…

If you think of the Internet as a mammoth library, then you'll be shocked to know that more than 90 per cent of the Internet is not accessible using search engines. This portion of the Net is known as the invisible Web. This information could potentially enhance the search process and make your searches more relevant. One ambitious approach to search the invisible Web is Turbo10.

Turbo10 promises a search engine that can scan the invisible Net and produce better results. True to its word, the search did provide some different results. You can try it out at *www.turbo10.com*

Centuryshare Calculator: Centuryshare Calculator is a great tool for research. It provides the relevance of the entered key phrase along a timeline. When 'Beatles' was entered as the search string, the chart shows popularity from 1961 to 1970. This was the period when the Beatles worked, and created music. *http://blog.outer-court.com/centuryshare/*

Memomarker: The Web address of a site may change, but its description generally remains the same. Memomarker uses page descriptions to search the Web and provide you with accurate results.
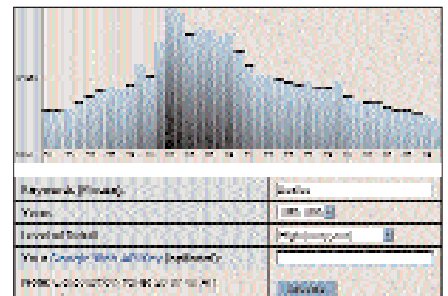
The Centuryshare calculator adds the perspective of time to searches
http://blog.outer-court.com/memomarker/

Googlism: Need a few more laughs? Check out Googlism.com. Search for anything under the sun and you're likely to find a quote about it. *www.googlism.com*

Google by e-mail: An innovation in every sense of the word, use this service to search for results via e-mail! Simply send a blank e-mail to *google@ capeclear.com*,

Have fun with Google

Google has a great sense of humour. Check out the links below and see just how good they are at making you smile.

Want to know more about Google Technology? Check out PigeonRank *(www.google.com/technology/pigeonrank.html)* and MentalPlex *(www.google.com/mentalplex/MPfaq.html)*. These are two revolutionary algorithms used by Google to sort sites in order of relevance. And make sure you tell us what you think of it!

Also, Google has a long list of logos that commemorate special occasions. Check them out at *www.google.com/holidaylogos.html*

And finally, make sure you see Google Zeitgeist. It has various statistics of Google users and their searches. *www.google.com/ press/zeitgeist.html*

If you're feeling really adventurous, check out *www.elgoog.com*. See results in a Google mirror... Literally!

with the subject as your query, and you will receive the search results as a reply.
Google API Web Search by Host

(GAWSH): GAWSH presents the Google results differently. All results are sorted by Web site, with all the relevant links displayed as a tree. This tree expands to view all links local to that site.
http://www.staggernation.com/gawsh/

Google API Relation Browsing Outliner (GARBO): GARBO is similar to GAWSH. But the tree structure is defined on the basis of related pages of linking pages. This allows you to club together sites of similar or redundant information.
http://www.staggernation.com/garbo/

Google API Proximity Search (GAPS): Completing the staggernation.com trio is GAPS. It is a unique way to search terms that are situated next to each other. For example, you can define how close the terms must be and in what order must they be placed. You may also specify secondary terms.
http://www.staggernation.com/cgi-bin/gaps.cgi

Touch Graph Google Browser: The Touch Graph Google Browser is a prime example of how the Google API can be
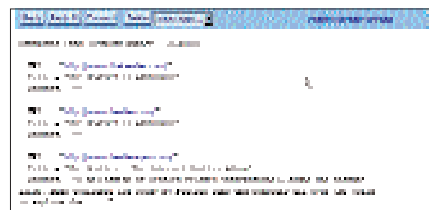
Using Google by e-mail, you can have your search results delivered to you by e-mail

used. A complex graph is generated which shows all sites related to the URL input. *www.touchgraph.com/TGGoogleBrowser.html*

Use these tricks to refine your search results, and remember that Google is constantly upgrading its search systems and adding new functions and services. Check out Google Labs for services under testing. Also, many more third party tools for searching are available. So make sure you keep learning new tricks to keep your searches accurate. You could also refer to books and Web sites that provide an insight into searching Google—such as the book *'Google Hacks 100 Industrial Strength Tips and Tricks'* that has been reviewed in the *Off the Shelf* section this month.

AAYUSH IYER *(aayush_iyer@thinkdigit.com)*
SAURABH KUMAR*(saurabh_kuma@thinkdigit.com)*

IM busy, 9 to 5
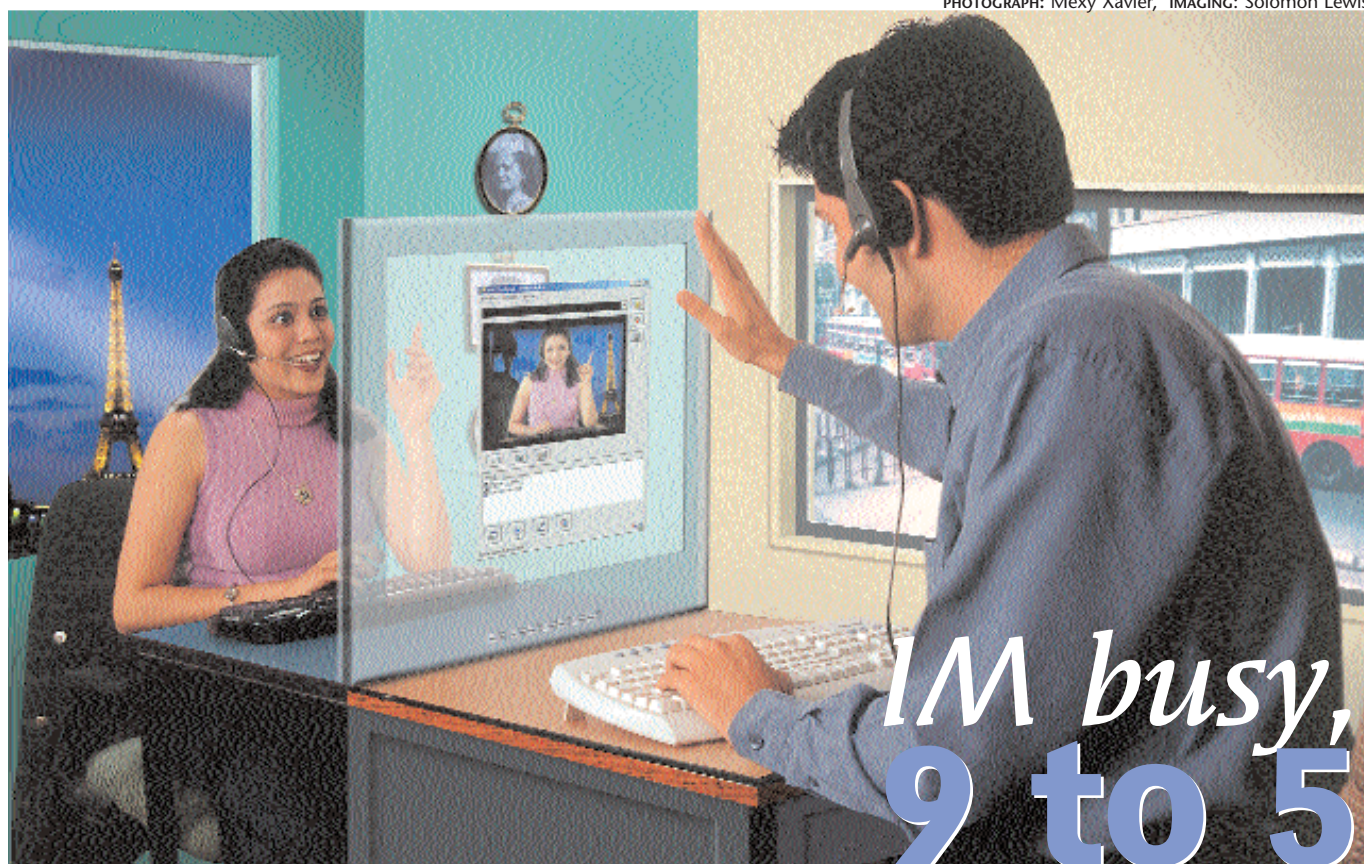
Instant Messengers are not just for idle chatter, they can also benefit your business!

3:30 am. Your eyes meet the piercing gaze of the boss. You need to come up with that one liner ASAP, or waltz your job away. An entire day's brainstorming with your freelancing friend has yielded nothing... And then, ping! He screams a bright idea to your desktop. Eureka! It's a clincher! The boss's gaze gets friendlier, and you, in turn, gratuitously doff your hat to your friend... sitting back in the US, and of course, Yahoo! Messenger.

Instant Messengers have been around for quite a while. A few years ago, someone came up with this brilliant idea that has made it easy for all surfers to communicate directly with each other. Today, a huge chunk of online traffic is peer-to-peer, i.e. directly from one person's computer, to another person's computer. And we are not just talking about the Napster

clones either. A lot of the traffic is actual communication between real people—be it sharing of ideas, conducting business, or simply staying in touch with mom and dad back home. It's all happening online, and in real time.

The first tool—I Seek You (ICQ)—was developed by three Israelis, in late 1996. Its core functionality is instant messaging (IM), that refers to short text messages, delivered 'instantly' to a user online. Simply download the software, install it, register, add your friends to your contact list, and exchange instant messages with them, whenever any of them come online.

Metcalfe's law states that the value of a network grows as the square of the number of users. Imagine if only you and three other people in the world had phones. This would make your phone practically useless. But as the network grows, so does its value. But because all your friends have phones, you can communicate with the person you want to, when you want to. Today IM is a rage, its users having grown to several millions worldwide—faster than fax, e-mail, cell phones, or the Web. So,

the more of your friends and contacts that are online, the more useful the communication tool becomes. Unfortunately, there are several competing standards for communication. Currently, each IM user can only communicate with users of the same IM. This effectively reduces the number of people, and consequently, the value of your network. For a casual user, the choice of network depends largely upon how many of your friends and contacts are on a particular network. Some users, are happy running multiple IM clients to have maximum connectivity.

Users see the benefits of IM every day, and large companies have been looking to gain a foothold over the IM market for some time now. There are four big players in the IM space today—ICQ, Microsoft's MSN Messenger, Yahoo! Messenger, and AOL's Instant Messenger (AIM). MSN grew in popularity because of its simplicity and its tight integration with its ubiquitous Hotmail service. Similarly, Yahoo! and AIM have capitalised on their strong user base, to enhance their popularity. Groups of friends, or office departments, generally like to use

one IM that the entire group uses to remain connected. Interoperability, or better still, a common standard, would greatly increase the value of the entire IM community, making the whole greater than the sum of its parts, so to speak.

One of the key benefits of online communication is presence. The fact that you can see the status of your contacts online lets you know whether they are contactable, and if they are, the effort required to contact them is minimal. This ease of use, combined with the impersonality of text messaging, tends to remove inhibitions and formalities, and allows for a more open and free exchange. Whilst presence is cool for your friends, it's a valuable asset for any business. Within the organization, a lot of time is saved because employees don't have to walk across to another department to ask a question, or dial an extension to find the concerned person not at her desk.

Accessibility to your clients is also greatly increased. How, you ask? It is truly impractical to have every client on your ICQ, or MSN contact list. So, what you can do is use one of ICQ's free services that run off your Web site. The most basic of these is the Online Status indicator that tells your visitors whether you are online, or offline. If you add your ICQ number, they can put you on their contact list, and you can begin conversing to solve the client's problem, or answer a query. Yahoo! Messenger users can also add their online status to their Web pages.

Every Web site has a page with contact details so that the creator, or company, can be contacted. This page can contain your online status along with a link, to take the visitor to your Unified Messaging Center on ICQ's servers (*http://www.icq.com/ICQ#*), from where the visitor will find several ways to contact you immediately—you can be contacted directly on ICQ, the visitor can add you to their contact list, or you can even be contacted on your mobile phone via SMS. Providing such a service will be a big boost to your business. Just imagine someone visiting your Web site and not buying something because he is sceptical, or needs some more information about the product. The ability to communicate with clients lets

info IDC expects there will be 506 million IM users by 2006, of which, nearly half will be business users

you answer queries, and convince them of your product. Though this has not yet been quantified, IM within the organisation can improve productivity.

There are some problems with IM in the office environment though. By far, the largest concern is security. Consumer IM applications send plain text messages, and are very vulnerable to eavesdropping. If IM is to become a viable communication medium in the corporate world, this issue must be addressed. When messages go out of the local network and onto the Internet, they open up security holes in the firewall—opening it to attack. These concerns can be addressed by deploying a company-wide standard, secure IM. Yahoo offers a secure IM, called Yahoo! Messenger Enterprise Edition. It has all the features of the standard Yahoo! Messenger, and boasts of additional ones that are targeted at the managed business network such as 128-bit encrypted messaging, integrated logging and archiving of messages, local administrative control, authentication against the company's corporate directory, and screen names using the employee's existing e-mail address.

Another problem is that IMs lend themselves nicely to purposes other than official business. Chatting with friends outside the organisation about yesterday's cricket match would be a waste of

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Status Indicators - ICQ & Yahoo

Adding a status indicator to your Web site involves adding some HTML code into the Web pages where you want your status displayed.

ICQ's basic status indicator does not link back to anything, so you can do two things to get surfers to reach you when you're online. The first is to write your ICQ number beside the status indicator, so that they can add you to their contact list. The other way is to make the status indicator link back to your Unified Messaging Center on ICQ's Web site. The sample code below does both of these. Don't forget to replace 'your_icq_number' in all three places.

**
<img src="http://web.icq.com/whitepages/online?ic
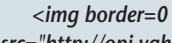
*q='your_icq_number'&img=21" border=0>
*
ICQ# 'your_icq_number'
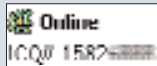
Visit *http://www.icq.com/features /web/ indicator.html* for more styles of indicators. If users can't see your online status go to **Main > Security & Privacy Permissions > General**, and click the Web Aware checkbox.

Yahoo makes better use of the status indicator by linking to a page that lets your visitor send you a message and even get a reply though a Web-based Java version of Yahoo! Messenger. However, it's in the early stages, and should get better sooner than later. You should also add your Yahoo! e-mail ID, just in case. Again, replace your_yahoo_id in all three places in the

code given below.
**
*<img border=0 src="http://opi.yahoo.com/online?u='your_ya hoo_id'&m=g&t=2">
*
Contact me on *'your_yahoo_id'@yahoo.com*

What about MSN? Microsoft does not provide any way of putting your status on your Web site. You could try a free service that offers to do so at *www.onlinestatus.org*. They have a few servers running, but the code on your Web page can only link to any one of them. When that server goes down, so does the status indicator.

company resources. Banning their use completely is a shortsighted solution, which ignores their potential contribution to the company. Organisations must develop their own policies for IM usage within the company. Besides, whilst implementing business grade IMs, a corporate policy must be in place to determine the nature of their use. Monitoring usage is the proverbial hot-potato—with CIOs wanting to know exactly what their employees are up to, and privacy advocates crying foul. Some companies already archive e-mails to monitor leakage of sensitive data. One can only assume that, as IMs becomes more pervasive, a similar system will be implemented for it too.

Besides, for text messaging, today's IM clients provide the basis for much richer forms of communication. Voice, and even video, can be carried over the same networks that carry text. Consumer IMs integrate all the facilities you need, into the clients. Once your audio is properly set up, starting a voice conversation with anyone on your contact list is just a couple of clicks away. The same can be said about video, assuming that both parties have Web cams.

Long distance calls, even to regular phones, are now being made through the Internet because of the cost advantage it enjoys. Calls through the Net, made using the services of Indian providers such as Phonewala.com, costs about Rs 5 per minute. International providers are even cheaper. These calls work on a technology called Voice over IP (VoIP). Simply put, the voice is encoded and compressed, then sent over the Internet as data packets—just like regular Internet traffic would be—and are decoded back to audio at the other end. It takes a lot of data to transfer very little audio. This means that the demands placed on the network are relatively high, often leading to poor quality of service. This network limitation usually exists at the so-called last mile, i.e, the connection between the home or office and the ISP. Connections between the phone provider's servers the world over, are generally speedy enough not to be an issue.
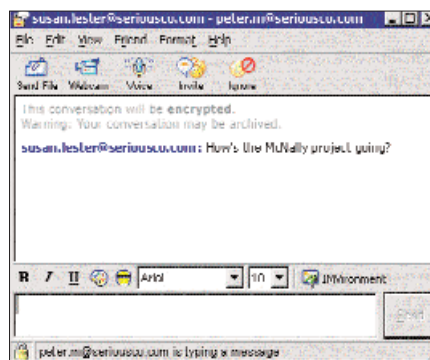
Yahoo! Messenger Enterprise Edition has 'professional' written all over it

Here's an idea to solve the last mile link problem, and eliminate the PC in the bargain. Users can call the phone provider's server directly using his standard phone. This keeps the voice as voice, until it reaches the server. The voice is then encoded and decoded at the servers, and transferred between them over the Internet at high speeds, providing much better voice clarity, and less delay.

We have already seen the integration of MSN messenger into Windows XP in the form of Windows Messenger. The next logical evolution is the integration of communication tools within our applications, allowing for better collaboration. Microsoft will soon release its own enterprise-grade IM server that will be branded as part of the office suite. Office Real-Time Communications Server 2003 (RTC) will be part of Microsoft's Office system of programs, servers and services. RTC is a server, which allows organization users to communicate in real time over managed networks, securely. RTC will also be extensible, allowing developers to integrate real time communication into their own applications. Microsoft touts the benefits of integration with other office

Unified messaging centre

ICQ offers several types of web panels, each with its own unique functionality. Choose one that offers all the functionality that you need without blocking up too much of your Web page. Check them out, and get the code to insert them into your page at *http://www.icq.com/panels/*.

ICQ Web-Pager Panel lets your site's visitors send messages straight to your ICQ.

Audio Setup

Using IMs, you can now initiate a voice conversation with your pal. The Audio Setup feature, present in most IMs, checks the audio peripherals, and analyses the quality of sound received, and transmitted.

Yahoo!
The first time you attempt to make a call in Yahoo! Messenger, it will automatically launch the Audio Setup Wizard. To do this, go to *Tools > Call...* Follow the instructions on screen, to complete the setup. The wizard even sets up echo reduction, and tests your connection's quality. After the wizard completes, it takes you to the phone interface, from where you can make long distance calls via Net2Phone's service. To have a voice chat with others on your contact list, double-click their name, and click the Voice icon, which is just below the menu bar.

MSN
MSN Messenger also launches its own Audio Tuning Wizard when you first try to have a voice conversation with any of your contacts. To initiate it, right-click on a contact, and from the menu, select 'Start an Audio Conversation'. Follow the steps to complete the tuning.

apps as 'collaboration in context', which reduces decision-making time, and increases efficiency. For example, when you're reading an e-mail in Outlook, you will be able to see if the sender is online, and initiate an IM conversation. The IM conversation may resolve the issue, or turn out to be more efficient than the usual process of mailing a reply, and then waiting for a response. Another place where the integration will be evident is the new SharePoint Portal Server. Using SharePoint, companies can make their own portals for their organization, or each departmental team may have their own portal.

One thing is certain about the future. More and more communication will happen over the Internet. Time and time again, it has proven to be endlessly extensible, adapting to future requirements, and taking on new roles with increasing bandwidths. Text, voice, video and data all help us do business faster and bring us closer together—all thanks to the wonder that is the World Wide Web. ◼

KAIZAD VAJIFDAR *(kaizad_vajifdar@thinkdigit.com)*
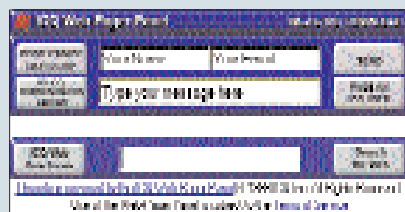
CONSOLE TO
WIN!

Here's why the gaming console proves itself to be the ultimate consolation for the ever-growing demands of the diehard gamer.

Meet Jack and Jill—two hardcore gamers in town. Between them, Jack lives in the gaming world and plays his PS2. As for Jill, the poor thing is still deciding the best upgrade for her PC—a thing that is never on Jack's mind. Her father is on the verge of filing a lawsuit against a company that releases a new product every six months.

Agreed, the gaming console-versus-PC argument is getting pretty old but that's not the bone of contention here. Instead, by comparing the architectures of consoles and PCs, we can understand the difference between them. It will also help in understanding the requirements of not just games, but all 3D applications.

Design of the consoles

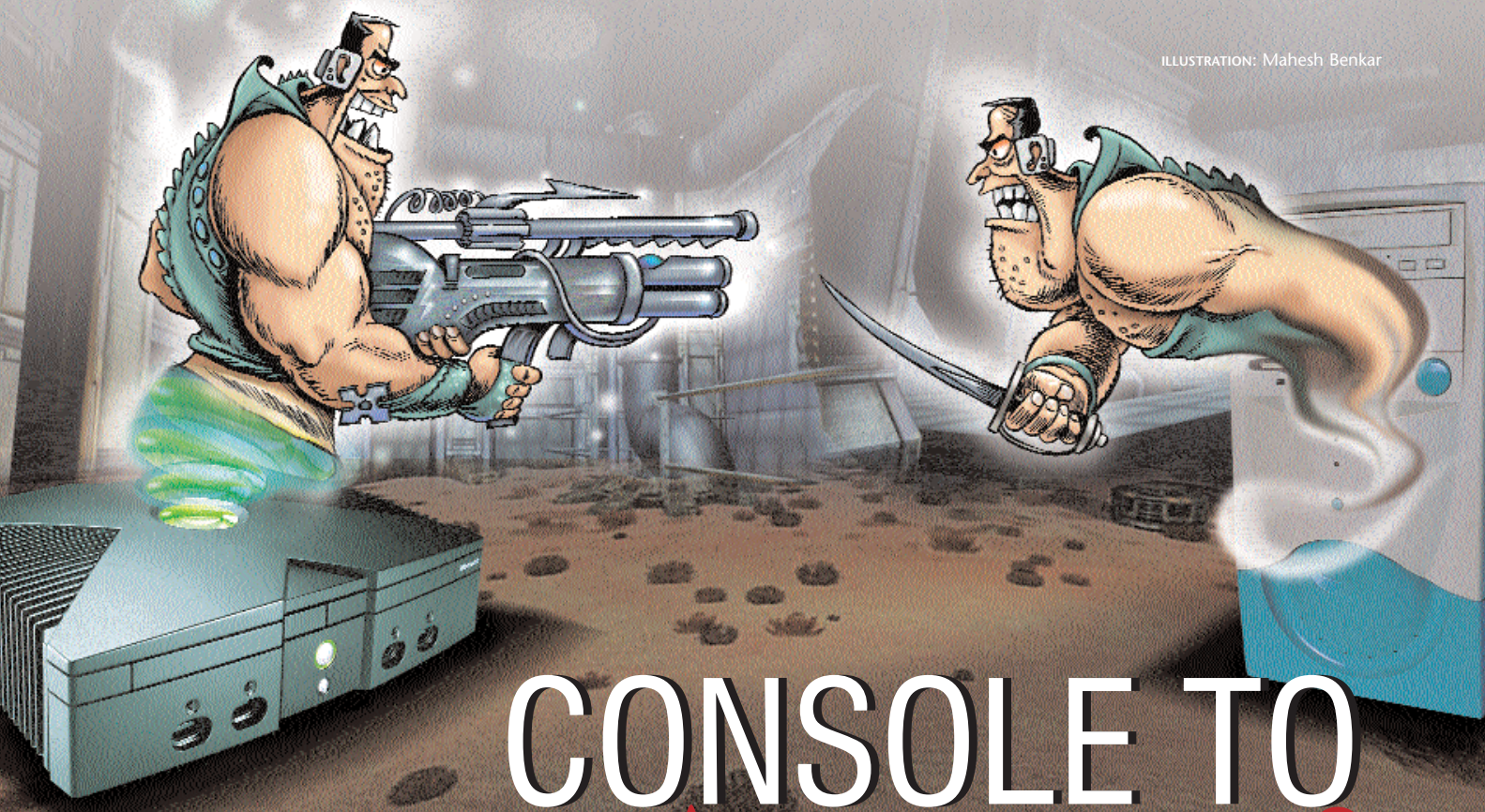In the gaming arena, there is a sense of superiority when a gaming console is compared to a PC. It is difficult to believe that a gaming console that was designed a couple of years ago, outperforms a PC that has a six-month product cycle. The fact remains that gaming consoles are better designed to handle the requirements of a gamer. It is actually a case of generalisation against specialisation.

The problem lies at the foundation of the design; the PC is designed for general purpose computing from the ground up. On the top there is some make up in the form of a GPU (sorry nVidia) and some buzzwords such as MMX, 3DNow, etc. Also, the PC platform is a perfect place for studying chaos theory. There are hundreds of manufacturers for the same number of components that make a PC. This throws up numerous restrictions—the video card manufacturer has to keep in mind the design of the motherboard, drivers may develop incompatibility with a specific component, etc. But a gaming console is developed for the sole purpose of playing games, and nothing else.

Another factor is that multimedia components have different processing requirements as compared to normal applications, such as office suites. In general-purpose software, different instructions are applied over localised data. In the case of a multimedia application, the reverse holds true. A set of instructions is repeatedly applied over large amounts of data—for example, the instructions for decoding an MP3 will be repeated over an entire file.

What do they actually do?

Good question. Let's look at the steps that are followed inside these boxes before they create those stunning visuals. In any 3D application, the first step is the creation of objects in a virtual 3D world. This step is called the geometry stage, where the objects and their positions are calculated. The output of this stage is what is called a 'display list'. This is a

series of commands and arguments that will be used in the next stage. The CPU, or the main processor, undertakes the task of creating the display list. In this stage, the CPU has to bring the required data closer to it, by moving it from the main memory to the cache memory.

The second stage is the conversion of the 3D scene to a 2D bitmap image. This is what video cards or GPUs are designed to do. Generally, this stage is referred to as rendering. Executing the display list creates the 2D bitmap image. The display list will contain tasks such as drawing lines and polygons, and giving textures and lighting. During this stage the GPU should be able to easily access the required data.
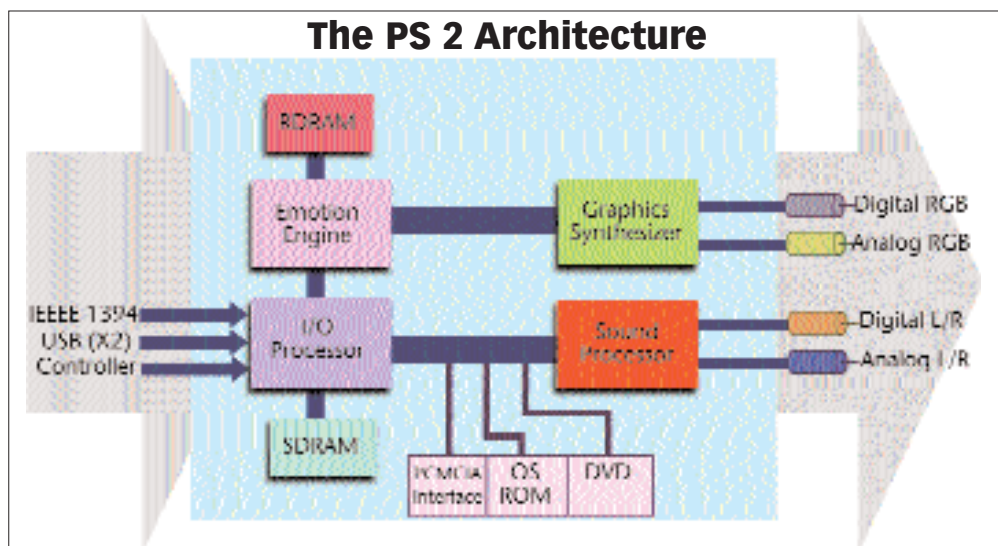
The final stage is the one that involves the least computation. Data is fetched from the frame buffer in a digital format, and converted into analog signals. These analog signals are sent to the monitor, which displays what you call 'stunning visuals'.

The consoles currently dominating the market are the Sony PS2, Microsoft XBox and Nintendo GameCube. Here, we shall take a look at the first two. Read on to find out how they work.

PLAYSTATION 2: The almighty
The gaming console market is dominated by the PS2 to such an extent, that it has become the gamer's mantra. Sony recently unveiled their upgraded PS2, the PSX with additional features, aiming at making it a complete entertainment box. As with other gaming consoles, the designers of the PS2 had the luxury of building a system exclusively for gaming. The heart of the PS2 is the now famous 'Emotion Engine', which was jointly developed by Sony and Toshiba.

For all its boasts, the architecture of the PS2 is pretty simple. Little do people realise that it is a perfect example of KISS (Keep it Simple, Stupid). The main components of the PS2, in order of importance are, the Emotion Engine, Graphics Synthesizer, Sound Processor and I/O Processor. Let's look at the simplest one first. The I/O processor (IOP) handles all the requests from the outside world.

info To put an end to finagling of the PS2 in India, Sony has announced that it would soon be launching the console in our country.

When the controller gives an input, the IOP sends it to the Emotion Engine, so that an update is made to the state of the game. The IOP is also responsible for running earlier PlayStation games. The sound processor is capable of producing CD quality audio to support the visuals. It supports formats such as AC3 and DTS—something that would be expected from a device of its class.

Coming to the serious stuff, the Emotion Engine has a 300 MHz MIPS III CPU as the core. Actually, the Emotion Engine comprises of many components, the important ones being a MIPS III CPU core, a FPU (Floating Point Unit), two vector units—VU0 and VU1, and a Graphics Interface Unit (GIF). These components are well connected. This is where PS2 scores over the rest of the pack. It has two advantages, namely bandwidth and strategically placed cache memory. The components of the Emotion Engine are connected to each other via a 128-bit bus. This is something unheard of in a PC. The reason why the bus width cannot be increased easily in a PC is that it has to maintain compatibility with existing applications. Increasing the speed will not affect legacy applications, but changing the bus width will.

The next difference is the cache memory. The sole purpose of the cache memory is to keep important data close at hand while processing. Hence, what matters more is the location of the cache memory, not just its size. The actual oper-

ations performed by the Emotion Engine depend upon the application. For example, in the case of a FPS game it has to execute the AI program for the enemy. In general, it deals with the behaviour of the game, such as AI and physics. But the ultimate output of the Emotion Engine is the display list.

The CPU teams up with the FPU and VU0, while the VU1 teams up with the Graphics Synthesizer (GS), through the GIF. The programmer decides the task assigned to these teams. They can be made to work in parallel and send the display list to the GIF together. Alternatively, the CPU group can be made to do some processing and send the result to the VU1, which will use the input and do some further processing and finally send the display list to the GIF. This parallel or serial option gives a lot of flexibility to the programmer.

The CPU has 16 KB of SPRAM (Scratch Pad RAM); this SPRAM can be used by the VU0 also. This piece of memory allows the CPU and VU0 to collaborate together. A 128-bit bus connects them to each other. Most of the time, the FPU and the VU0 act as co-processors to the MIPS CPU, but can be programmed to work separately. The VU0 performs operations such as floating-point divide, square root and inverse square root. The bulk of the processing that goes into 3D games involves doing a lot of these operations.

The VU1 acts more like a geometry processor for the GS. Since this involves more floating point calculations, it packs extra processing power and memory to do the same. Unlike the CPU team, where

The PS 2 Architecture

the CPU can control the other two components, the VU1 and GS are equals, and communicate through the GIF. As mentioned above, the VU1 keeps generating the display list and the GS turns them into bitmap images. The GS has a 150 MHz core with 16 pixel pipelines. Using these pipelines, it can churn out 75 million polygons and 2.4 billion pixels per second. Compared to current GPUs, such as the GeForce FX, this may seem meagre, but considering that the PS2 was released in 2000, this is impressive.

No doubt, the PS2 is a powerful machine, but it may not be better than the latest PC, thanks to companies such as Intel and nVidia. However, it is still a good buy.

XBox: The black beauty

Keeping up with its tradition of entering every relevant market, Microsoft entered the gaming arena with its famous XBox in 2001. The console is made of PC components such as a Pentium III 733Mhz (Coppermine), nForce chipset-based motherboard, 64 MB DDR RAM, 8 GB hard disk, a DVD drive, and runs on a stripped down version of Windows 2000. But that is where the similarity between a PC and the XBox ends. There is a tighter integration between these components that enables it to outperform a PC. Strictly speaking, the components are not exactly the same as PC components. Let's take a look at each of the components in detail.

The Coppermine processor comes with a 128 KB L2 cache memory. Although this makes it look like a Celeron, it's definitely not one. This is because the Coppermine core here has an 8-way set associative cache rather than the 4-way cache found in the Celeron. This makes it a Pentium III with half of its cache disabled. But the lingering question is, in the days of gigahertz wars, how does a 733 MHz processor compete? The answer to that is simple—even this much processing power is not required, at least for now.

The graphics solution provided by nVidia is similar to its nForce chipset with minor variations. Like the nForce, the XBox has the Integrated Graphics Processor (IGP) as the northbridge. The IGP acts as both the northbridge and the GPU. The difference is that the nForce

has a Geforce 2MX (NV11) class GPU, and the XBox has an NV2A core. The NV2A is something that lies between the GeForce 3 (NV20) and the GeForce 4 (NV25). It takes care of all the graphics processing; it provides hardware transform and lighting (T&L), something which the PS2 sorely lacks. In fact, the GS of the PS2 is much inferior to the NV2A, which has two Vertex Shaders—a huge benefit because a Vertex Shader is used heavily by current generation games. The strength of the GS lies in its parallel computation power and not in the functions that it provides. Like the GS, the NV2A takes care of all the graphics processing. So the CPU is left with AI, physics and managing the connection between individual elements, such as the hard disk. For performing these functions a Coppermine is overpowered as all the
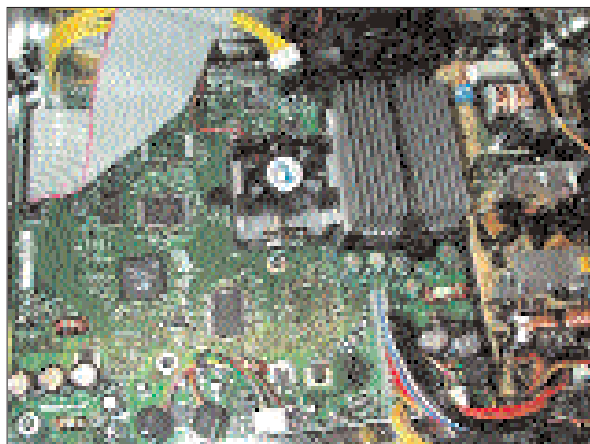
Take a peek under the hood of XBox

games are rendered at a resolution of 640 x 480 x 32, which is sufficient for NTSC television. XBox also supports HDTV output, for which a Conexant video encoder chip increases the basic resolution.

The southbridge is the Media & Communications Processor (MCP), which provides the audio solution. An interesting point is that a HyperTransport bus, which is used by AMD, connects the MCP and IGP. Audio is another area where the XBox is much better than the PS2. The MCP provides a Dolby Digital 5.1 audio output, compared to the stereo output of the PS2. This is a very important feature, as many games support this surround sound format. The MCP also offers a 10/100 Ethernet controller, which allows multiple Xbox consoles to be interconnected.

Another reason the XBox produces stunning visuals is that developers heav-

ily optimise the games for it. This is due to the fact that the system is not going to change, unlike a PC. While programming for the PC, no sane developer will develop a game that will run only on a top-of-the-line system. Any game that is released, now will be programmed to run on any card, ranging from a lower end graphics card, such as the GeForce 2 class, to the latest cards such as the Radeon 9800. This prevents the developer from optimising the game for a specific system. Also, unlike the PS2, the XBox is closely related to the PC, which makes it a friendly turf for PC game developers.

The end and future…XBox 2, PS 3

Microsoft and Sony are busy gearing up their warriors for the future. Not much is known about the XBox 2. After speculations that Microsoft has opted for ATi, there is a new round of rumours that Microsoft may design the processors on its own—it has apparently licensed some SGI patents. This would enable the company to strategically price the XBox 2. Also, the CPU for the XBox 2 is rumoured to have the ability to decode and execute instructions in Microsoft Intermediate Language (MSIL)—an integral part of .Net, while being compatible with Xbox at the same time.

Now, coming to Sony, the word that comes to everyone's mind when the subject of PS3 is brought up is the 'Cell'. Dubbed as a supercomputer on a chip, the Cell is the microprocessor that will power PS3 when it comes out, some time in 2005. Sony, Toshiba and IBM are developing it jointly. It will be fabricated using the 0.10-micron silicon-on-insulator (SOI) process technology. The PS3 will also make use of Grid computing. Grid computing is a variation of distributed computing, and presumably involves networked game machines sharing software, processing power and data.

On the whole, gaming consoles are the better option in the long run. After all, they are designed for gaming right from scratch. This has helped the industry understand the basic requirements of 3D and multimedia applications. Without a doubt, this will affect the designs of PCs in the future and make them gamer friendly.

MOULY ARUN PRABHU
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30Minutes Expert

Faster, Safer Windows XP

Windows XP is known for its beautiful new interface, coupled with the stability of Windows 2000. The only problem is, there are some chinks you may want to iron out. XP comes with a whole bunch of in-built applications that are really useful if you want to run a server or some database applications. The problem is that these applications all seem to start simultaneously, whether you need them or not, and use up precious system resources. The following is a guide to making XP work for you, without killing your resources.

The most effective way to disable services is by running the Windows Management Interface. Access it through either *Control Panel > Administrative Tools > Services* or go to *Start > Run*, type services.msc and press *[Enter]*. A window pops up that displays all the services, their descriptions and status—whether currently running or not. From here you can start, stop, pause, resume, or restart a service.

In the table below, we have provided the configuration settings for three types of PCs—Safe, Internet Gateway and Gaming. Those who want the maximum out of their system for games, should set the services according to the Gaming Configuration. And PCs used as Servers or Internet Gateways should use the list specified in the Internet Gateways configuration. The Safe configuration, is for those paranoid about security.

To disable services from here, just right-click a service and choose properties. Now, go to the list box named
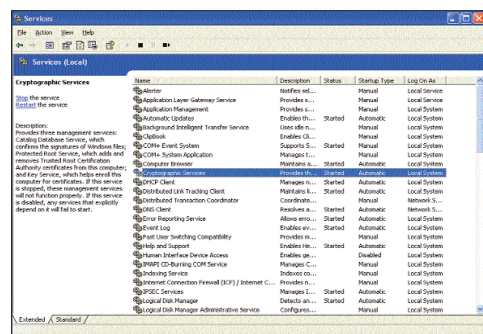
Services.msc lets you to tweak Windows XP
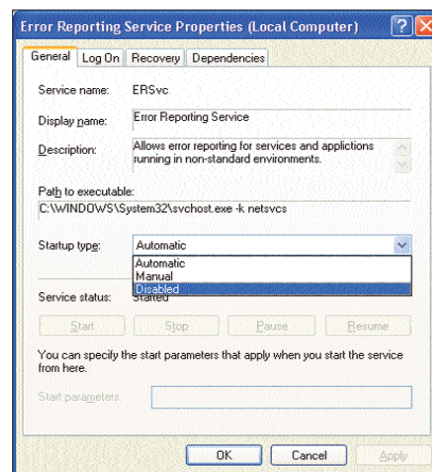
Disable services by right-clicking on them from the services.msc box

'startup type'. Select whichever of the three options (automatic, manual and disabled) is applicable.

Disabling most remote services will not only increase your PC speed, but also improve your security. For example, make sure to disable the Remote Registry Service, which basically allows your registry to be edited from a remote location—apart from the security risks, you're probably never going to want to edit your registry over the Internet anyway.

If you feel that you don't know whether you require this service or not just set it to 'manual' run. This way, Windows will not load it at startup, only when it is required. Finally, be careful about selecting from the services listed above, and remember to restart your PC after making the changes. You can now enjoy a faster and less resource hungry XP.

NIKETU SHAH (*niketu_shah@thinkdigit.com*)

The following is a list of those services available in Windows XP:

Display Name	Safe	Internet Gateway	Gaming
Application Layer Gateway Service	Manual	Automatic	Disabled
Automatic Updates	Manual	Automatic	Disabled
Computer Browser	Disabled	Automatic	Disabled
Error Reporting Service	Disabled	Disabled	Disabled
Help and Support	Disabled	Disabled	Disabled
Indexing Service	Disabled	Disabled	Disabled
Logical Disk Manager	Manual	Manual	Disabled
Network Location Awareness (NLA)	Manual	Automatic	Disabled
Performance Logs and Alerts	Disabled	Disabled	Disabled
Portable Media Serial Number	Disabled	Disabled	Disabled
Remote Access Auto Connection Manager	Manual	Automatic	Disabled
Remote Access Connection Manager	Manual	Automatic	Disabled
Remote Desktop Help Session Manager	Disabled	Disabled	Disabled
Remote Procedure Call (RPC) Locator	Manual	Manual	Manual
Remote Registry Service	Disabled	Disabled	Disabled
Routing and Remote Access	Disabled	Disabled	Disabled
Server	Disabled	Automatic	Disabled
Smart Card	Disabled	Disabled	Disabled
System Restore Service	Disabled	Disabled	Disabled
Task Scheduler	Disabled	Disabled	Disabled
WMI Performance Adapter	Disabled	Disabled	Disabled

Note

There may be services which may or may not be installed on your PC depending on whether it's Windows XP Home, or Windows XP Professional. Also, if it came pre-installed by your vendor, he may not have installed any or many of them. For more information visit *www.blackviper.com*

ILLUSTRATION: Solomon Lewis

Linux On
Linux Off

Far from being a numbing procedure, installing Linux is easy, user friendly, and completely reversible. Safe installation guaranteed!

There are some things that money can't buy and there are some things that money need not buy. With the open source movement gaining momentum, you are no longer forced to buy the basic software such as an operating system for your computer. The flagship product of the open source movement—Linux—has gained a lot of recognition in recent times.

This workshop will be your friendly guide to a beautiful place called Linux. If you are not happy with the change, or for any reason you want to revert your system

to the current state, don't worry. This is a perfectly reversible process. If you are a Linux geek, this is where you get off; this article is meant for Linux newbies.

Here's what you need before you can start off. First and foremost, you'll need the Linux distribution. In this workshop, we shall use Red Hat Linux 9. The distribution can be found in the accompanying DVD. You will find the images of the three CDs that are required for the basic installation. Burn the CDs and your Linux distribution is ready. Make any number of copies and distribute them. You will not be breaking any laws.

Preparation for Installation

Defragment your hard disk and check for any errors using scan disk. Make sure you do this as this ensures that free space is

clubbed together. Then, select the partition where you want to install Linux. It is recommended that you allocate at least 4 GB of hard disk space albeit the bare minimum is 450 MB. You can resize an existing partition to create a room for installing Linux or you can allot an entire existing partition.

STEP 1 If you want to resize an existing free partition, use the partition resizer tool. It can be found in the Mindware CD. It is recommended that you copy the program to a boot floppy, boot into the system using it and run the program. It has a very friendly interface. First, select the resize/move option. Then select the partition to be resized; the program will indicate resizable partitions, using the * symbol. After selecting, you can resize the partition; the program will indicate

Find them on the Mindware CD
Ranish Partition Manager Beta 2.43
Partition Resizer 1.3.4

the size of the resized partition and not the free space. So, make sure that you have resized correctly. Confirm the operation and reboot the system after it is completed. Run scandisk on the resized partition.

STEP 2 To remove an existing Windows partition and install Linux in it, make sure that no data is present in the partition. Copy its contents to another partition.

Installation

You have to start the installation by booting from the CD-ROM drive. To do so, make sure that the first boot option is set as CD-ROM. You can check this in the BIOS setup. Insert the first CD and restart the computer. You will be presented with a text-based menu. From here, follow these steps.

STEP 1 Press enter to start the graphical installation mode. Next, you will be prompted to test the media. The installation program will test your media for any flaws in it. Although you can skip this step, it is recommended that you check all the CDs at least once.


A Welcome Screen appears after selecting the graphical installation mode

STEP 2 Now, you will be presented with the Welcome Screen. Click next to enter the language selection step. No regional languages are supported; the default would be the language that you are reading. However, you can install other languages, if needed.

STEP 3 Keyboard configuration: Select 'U.S English' keyboard.

STEP 4 Mouse configuration: The installation program will probe your mouse and give a default option. If you are sure of the model of your mouse and find that it is wrongly listed then change it. If your mouse is connected to the serial port then make sure that the correct COM port is selected under device menu.
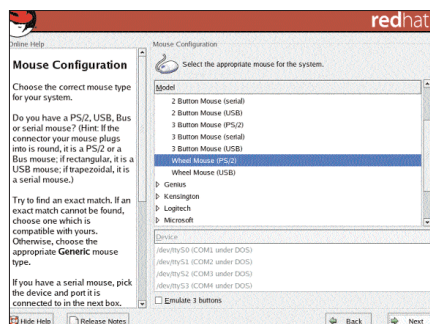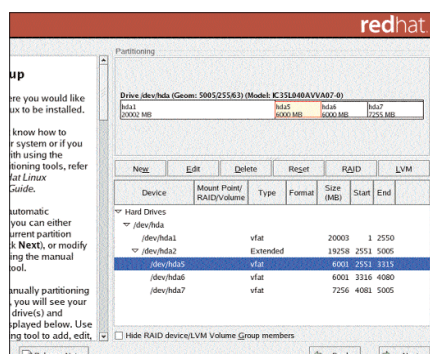

Change the default option for the mouse model, if it's wrongly listed

STEP 5 **Installation type:** Here, you can choose any one of the four options—personal desktop, workstation, server and custom installation. Select Personal desktop. You can always change it later, after the installation.

Choose the type of installation in the screen shown above

Manually partition the hard drives using Disk Druid

Partitioning

This is the mother of all steps. If you complete this step successfully, the rest is a breeze.

STEP 1 You can choose between 'Automatically partition', and 'Manually partition with Disk Druid'. The latter is recommended as it gives you control over the partitioning.

STEP 2 In the manual partition method, you will be presented a screen similar to the one shown. The actual screen will depend on your hard disk. If you have resized your partition, skip to the next step.

Otherwise, select the partition on which you want to install and click delete. If you are finding it difficult to relate the entries in the Disk Druid menu to the corresponding Windows partition, then refer to the box *Disk Druid—take it easy*.

STEP 3 Select the free partition, and click New. Now the add partition window will appear. In the mount point field, select '/'. Select the file system type as ext3. In the size field, select 'Fill to maximum allowable size'. If you get a warning,
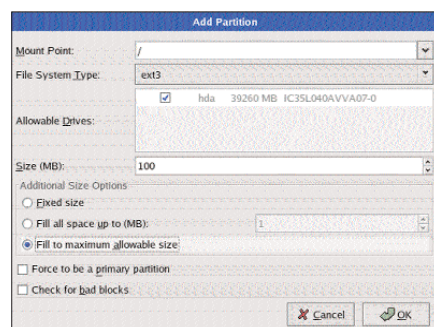
Click on the New button in the Disk Druid menu, to create a new partition

click continue. If you happen to make a mistake in this step, click the Reset button and start partitioning again.

Now the easier part of installation

After partitioning, the boot loader configuration and other configurations have to be done. Here's how you do it.

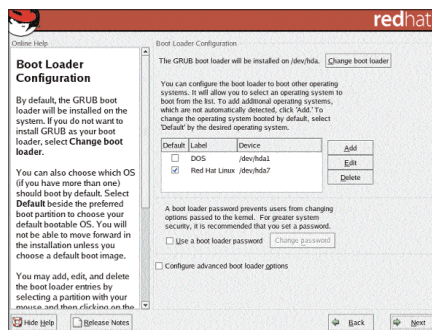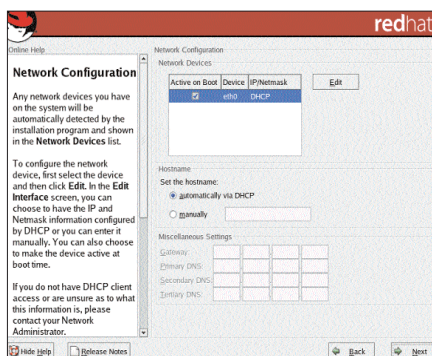*Choose your Boot Loader, and ensure that all the operating systems are present*

Ensure that the probed video card is correct, else change it

Enter the Network details in the Network Configuration screen

Choose the monitor that best matches the one attached to the PC

Partitions demystified

Partitions can be troublesome. Thankfully, hard disk partitions are much easier to create. To understand partitioning, you have to view the hard disk as a shelf for keeping books. Each rack is a partition and each hard disk has a partition table that keeps a record of the partitions. A partition table is designed to hold information regarding four partitions only. To over come this limitation, extended partitions were developed. They can contain many sub-partitions within them, which are called logical partitions. Primary partitions are the partitions, that can't be sub-divided. Older operating systems such as Windows 9x, have to be installed in a primary partition. Thus, the total number of extended and primary partitions should be four.

STEP 1 Boot loader configuration: Make sure you have an entry named DOS in the Label column, if Windows is installed in your system.
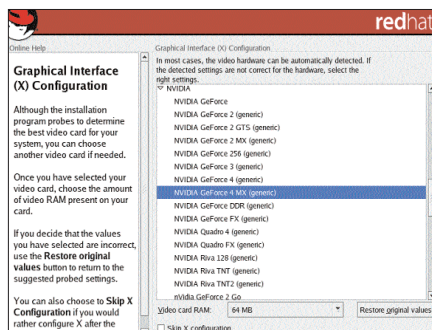
STEP 2 Network configuration: The details to be entered depend on your network. If you have any, contact your network administrator.
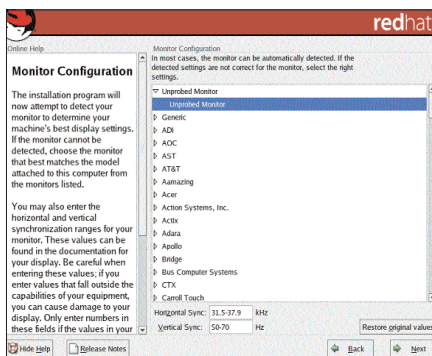
STEP 3 Firewall configuration: Select medium.

STEP 4 Language: English (U.S)

STEP 5 Time Zone: Asia/Calcutta.

STEP 6 Enter the root password. All Linux operating systems will have a super user with username root. This user will have full control over the system. Enter the password and click next.

STEP 7 If you want to customise the packages to be installed, select customise, else accept current packages and click next.

STEP 8 Click next to begin installation. During installation, you will be prompted to insert the other two CDs. The actual time taken for installation will depend on the system.

In the previous steps, you could click the back button, and make changes without any difference. But if you click next after these steps, new partitions will be created. This is the first change made to your system.

Post Installation

STEP 1 After the installation is over, you will be prompted to create a boot diskette. This is recommended, because if your boot loader fails or the MBR gets corrupted, you can boot from the diskette.

STEP 2 The next step is the video card detection. You will be presented with a list of video cards, with a default selection. Change it if the default option is not correct. Your card may be unrecognised if it is very old or one of the latest models—especially the onboard display cards. If it is unrecognised, then obtain the drivers from the Internet. For now, skip X server configuration. Then, you can boot into command prompt and install the drivers and X server.

STEP 3 Monitor Configuration: If your monitor is not in the list, select

Disk Druid—take it easy

After you have selected the Windows partition for installing Linux, you have to identify the respective partition in the Disk Druid menu. If your hard disk is connected as a Primary Master, it will be shown as hda, and a primary slave will be shown as hdb. Similarly, hdc and hdd will be shown for secondary master and slave respectively. Further, the first primary partition of the hard disk will be shown as hda1 and the next primary or extended partition will be shown as hda2 and so on. The Windows partition—the C drive, usually would be the first entry in this menu. Subsequent drives can be mapped to the next entry. For example, the D drive would be second entry, followed by the E drive and so on. But you have to ignore the entry for extended partition, as it is only a combination of the logical partitions under it.

Please note this will not be applicable

if your system has more than one hard disks and it runs on Windows 9x. This is because Windows 9x lists all the primary partitions before listing the logical partitions. You can check the number of hard disks and primary partitions your system has using fdisk. After starting fdisk, you will be presented with a menu having options to display the partition information and to change the current disk, among others. Note that the option to change the current disk will be shown only if you have more than one hard disk. Select the choice to display the partition information for the current disk. It will show all the partitions along with their details such as type, size, usage, etc. Then, change your current disk and display each partition's information.Using this information, you can now relate the Windows partitions to the ones mentioned in the Disk Druid menu.

STEP 2 Restart the system and select DOS from the boot loader options. Now, you will be presented with a menu that has two options—Windows XP and Widows recovery console. Select the latter.

STEP 3 If you have more than one version of Windows installed, you will be presented a menu of these. Then, select the Windows version where XP is installed, and clear the mbr by giving the *fixmbr* command at the prompt.

STEP 4 To remove the Linux partitions, boot into Windows, right-click My Computer and click on Manage. In the left side pane, select Disk management. On the right side, the systems view of the disk will be shown. Here, the Linux partition will be shown as an unrecognised partition that you need to delete.

STEP 5 The system will now show an unused partition. Select the partition and right-click it. From the menu, select create logical partition and then choose the file system and size. Now the system is back to normal.

That leaves your system in its original state. 🄳

MOULY ARUN PRABHU
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unprobed monitor and enter your monitor's horizontal and vertical sync.

STEP 4 Select your screen colour depth, resolution and login type in the next screen.

A screen will appear, confirming the completion of installation. Remove the CD from the drive and click next. The system will now be rebooted. The boot loader will start, and give you two options—DOS and Linux. Select Linux to enter the world of Linux.

Un-installing

If at all you need to revert back to the previous state that your system was in, follow these steps. First, if you are using Windows 98:

STEP 1 Go to the command prompt and clear the MBR by entering *fdisk /mbr* in the command prompt.

STEP 2 Then, to delete the Linux partitions, use Ranish partition manager (found on the Mindware CD). Run the Ranish partition manager, select the Linux etx3 partition and delete it.

STEP 3 Now a free partition will be shown in the menu. Select this free partition and start the partition wizard by pressing the Enter key.

STEP 4 Select the file system as FAT 32 and leave the size field as it is. Next, select the 'Save changes now' option. In the next menu, select the Format now option, and after that, select the

'Quick format without surface test' option. Then, restart the system.

There is no support for fdisk in Windows XP. Hence, to clear MBR, you have to boot into the system using the Recovery Console. The recovery console is a command line-based diagnostic tool. It has many features such as enabling and disabling services, format drives, etc. You must be an administrator to use the Recovery Console. Follow these steps to restore your Windows XP system.

STEP 1 You can install it from the Windows XP setup CD by typing *{X}:\i386\ winnt32.exe /cmd- cons* in the Run dialog box, where {X} is your CD drive letter.

Wires are a tangly web that can get on anyone's nerves. Wireless Networking solves the problem, but like a BMW, costs more for the comfort it offers

(Wire)Less is More

Computers can be used to talk to each other by connecting them wirelessly, using the latest Wi-Fi access points and adapters. Connecting machines situated on different floors, or in rooms several metres apart, will require long cables and a few hundred holes drilled all over the place. With wireless connectivity no drilling of holes or investment in cables is required—just plug the hardware into the PC and connect.

We decided to experiment with wireless connectivity, and that too with the cheapest ingredients—D-Link's DW-900AP+ access point, a DWL-650+ PCM-CIA card for the laptop and a DWL-520+ PCI-based card for our desktop PC. These components are also capable of securing home users sufficiently.

We considered a typical office environment, where a wired LAN exists but a few people want to have the freedom and portability that wireless offers. Thus, a hybrid LAN is formed, with some computers connecting with normal ethernet cards, and a few connecting with wireless adapters. In order to get seamless connectivity within the hybrid LAN, an interface between the wired and wireless LAN is required. This is where the Access Point comes in.

In order to achieve this real world scenario in out test centre, we connected two desktop PCs, one called 'master', the other called 'client', and a laptop. The access point and PCI and PCMCIA interface adapters will take care of the Wi-Fi. The master PC had a built-in LAN card, and a modem provided Internet access. We used Internet connection sharing software (WinGate or WinProxy5), to enable the client to access the Internet via the master.

In all, we needed an access point and wireless adapters. If we consider the current price of the D-Link Access Point, and PCI and PCMCIA-based adapters, then the total solution cost us approximately Rs 18,400. This amount appears pretty high as compared to a wired LAN, but is a boon for small businesses which operate from rented offices—especially if they are not allowed to alter the interior in any way, such as drilling holes. Not only is it convenient to set up, it's also very simple to move to a different location.

If you're looking to connect five or ten PCs on the same floor, and are willing to go through the hassles of networking them, then wired LAN is the cheaper option. But, if you want to have the latest technology, with a system that most 15-year olds could set up, and also have an aesthetically pleasant look to your office, then wireless is the way to go.

Set up and configuration

Setting up a Wireless LAN (WLAN) is really easy. However, depending on your network type, the requirements change. There are two ways to go about this, either you have a purely wireless LAN, where every computer is freely portable, or you share a LAN with wired computers, in a hybrid of wired and wireless LAN.

To configure a purely wireless network, you need to install the cards and configure them to run in Ad-Hoc mode, which can be done from the network connection wizard in Windows XP or the utility bundled with the Adapter card. Now, install a proxy server on the computer with the Internet connection (master) and set the others to access the Net through it. That's it; your network is up and running.

However, a word of caution; when buying wireless hardware, make sure they are compatible—802.11b (Wi-Fi) will not work with 802.11a/g hardware. Also, wireless equipment from different vendors may or may not work together. Buy

Jargon buster

Access Point: It is a piece of hardware which connects wireless adapters to a wired LAN. For home and SoHo (Small office Home office) networks it is connected to the LAN card on a PC, using a cross over cable.

Wireless Adapter: It is the wireless replacement for the network interface (LAN) card—available in the PCI and PCMCIA interface.

DHCP: Dynamic Host Configuration Protocol allows the adapters to automatically pick up IP addresses from the list defined in the DHCP configuration on the Access Point.

SSID: Service Set Identifier is a 32-character unique identifier attached to the header of packet transmitted over wireless LAN. SSID differentiates one WLAN from another, so that all access points and devices attempting to connect to a specific WLAN must use the same SSID. It is also referred to as a Network name.

The Setup Wizard makes the configuration of your LAN settings a snap

all your wireless hardware from a single vendor to avoid such problems.

Setting up a hybrid LAN is a tad more complicated. Follow the steps below to connect and configure an Access Point to set up your hybrid LAN:

STEP 1 Connect the Access Point to the existing LAN with a normal RJ45 cable, which costs around Rs 50 for a 5 meter cable.

STEP 2 Power up the Access Point and access the built-in Web server by entering its IP address (for example, *http:// 192.168.0.1*) in the browser of the master system. This will open a configuration page, from where the the rest of the Access Point configuration can be done.

STEP 3 Click on the Wireless tab. There are default values assigned to various fields. Change the SSID (Service Set Identification) to something else, such as 'home' or 'wireless' and assign a network key. Set it to run in infrastructure mode and set the WEP (Wireless Equivalent Protocol) to 64-bit from the drop down menu. The reason for not using 128 or 256-bit WEP encryption is that higher settings will lower the data throughput because of greater security checks. Under the LAN tab, there exists a default IP and subnet mask—do not change this. Click on the DHCP tab. Here, enable the DHCP server and assign a starting IP (192.168. 0.2) and ending IP (192.168.0.254) address for the client adapter to automatically pick up IPs. Enable DHCP only if you want the client PC to get its IP automatically, otherwise disable the DHCP server and manually assign the IPs for the client PCs.

PHOTOGRAPH: Mexy Xavier, **IMAGING:** Solomon Lewis
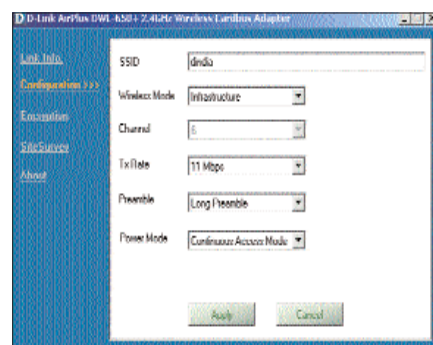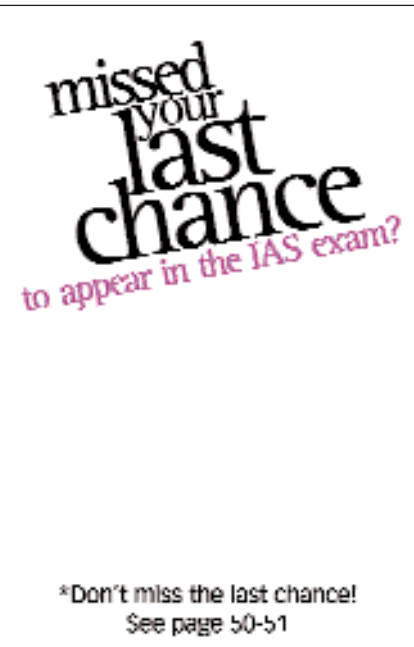
Configure the clients using the Wireless Adapter Configuration utility

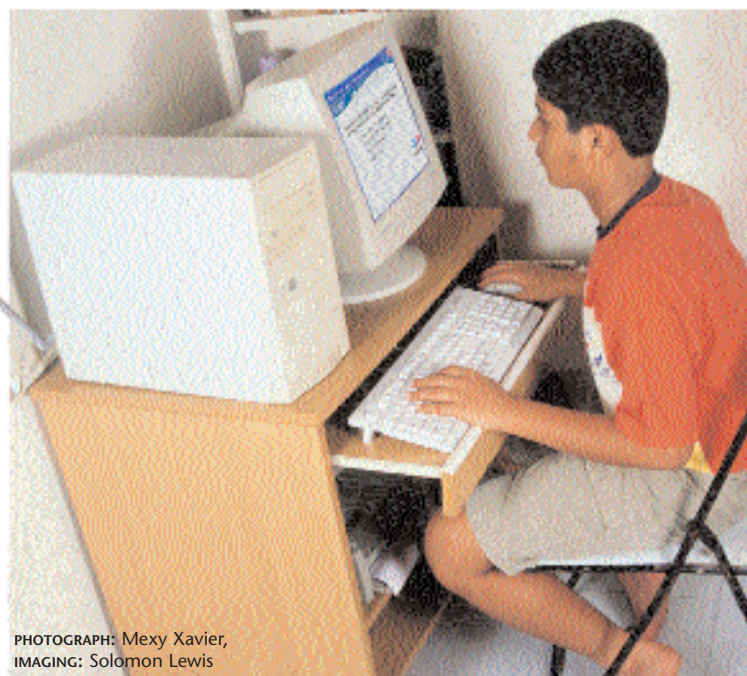### Can you afford the latest? The cost of setting up 5 PCs on a LAN (in Rs)

Component	100 MBps LAN	11 MBps Wireless hybrid LAN
LAN card	2,500	22,500
Access Point	Nil	10,000
Cable	500	Nil
Entry-Level switch	4,000	Nil
Total	**7,000**	**32,500**

Wi-Fi hacker alert

Security is a critical issue with wireless transmission. As the signal in a WLAN is freely transmitted in space, anybody in the vicinity has access to it. This can include a hacker sitting in a car parked just outside your home or office. SSID are used to identify the wireless adapters installed in a wireless environment, by access points. The SSID is broadcasted freely many times by an access point. A hacker with reasonable experience and the help of an 802.11 analysis tool, can sniff the network to get the SSID, and hence, free access to the home or office network. Wireless networks can enable WEP (Wired Equivalent Privacy), a form of encryption, available in 64, 128 and 256-bit that will keep amateur hackers away. However, an experienced hacker can gain access by monitoring the data transmission and decoding the WEP-encrypted information. WPA (Wireless Protected Access) a more secure encryption standard, is in under development and will be available soon.

Now, all you have to do is configure the clients.

STEP 1 Install the adapter drivers and then shut down the PC and plug the adapter card into the PCI/PCMCIA
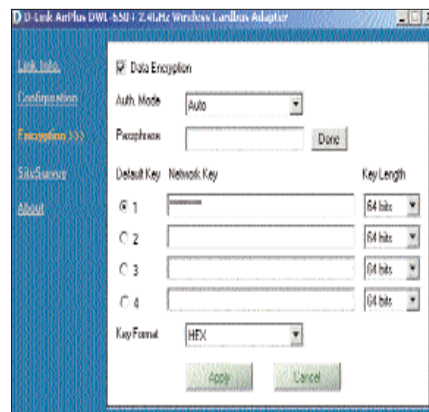
Set the encryption level as per your network

slot and restart the system. Wait for the driver to initialise the adapter.

STEP 2 Once the hardware is initialised, double-click on the adapter card configuration icon in the system tray. This will launch the configuration utility. Here the user doesn't have to do anything, as most of the settings, including SSID and encryption key, are automatically picked up by the adapter card from the Access Point.

STEP 3 Check the signal strength available at the place the wireless desktop or laptop is placed double clicking utility resting in the taskbar.

While setting up a wireless network, it is important to remember to place the access point carefully, as metal tables,
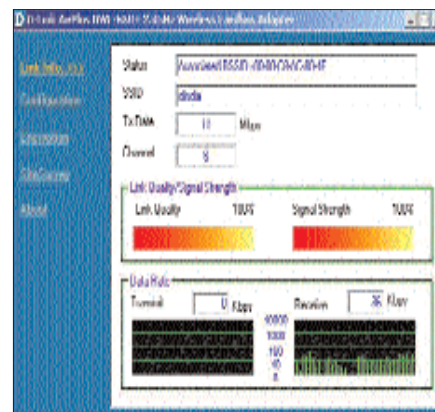
Fine tune the quality of your LAN connection using the Configuration utility

cupboards, and cabinets filled with clothes can cause a drop in throughput. Though a wireless connection is the best choice for a multi-storeyed house, there will be many obstacles, such as walls, flooring, metal tables and even microwave ovens, which might lower the data throughput. To avoid this, move the access point around to find the best place where the clients get the maximum signal strength. The same process will have to be repeated for the client placement. Once you find the best place for them, you're all set to do as you please in your networked haven. **d**

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1/2 page H.AD

5 Things about Windows...

ILLUSTRATION: Mahesh Benkar

...that You'll Never Miss Again

Common Windows tasks that you can now do in Linux

Only a few computer enthusiasts, and hobbyists look upon Linux as an alternative operating system. However, this scenario has been changing drastically. Now, ordinary users use Linux for typical desktop use such as word processing, making presentations, and listening to music. This is possible due to the availability of free as well as commercial office applications for Linux that offer good compatibility with existing MS Office files. But, there are times when something as simple as sharing a file with your friends across a LAN, or a printer configuration, can get confusing due to the lack of any coherent information source. This workshop helps you get around those small, irritating hiccups that stand in the way of using Linux to its fullest potential.

1 Use Windows Programs in Linux with CrossOver Office

Ever thought how nice it would be if you could install Microsoft Office in Linux? Well, here's your dream come true. CrossOver Office is a Windows emulator that installs your favourite Windows program, under Linux. This program has an ever-growing list of supported software.

We installed CrossOver office on Suse Dektop Linux, by executing a shell script. This shell executable is located in the /opt/cxoffice folder. As soon as you
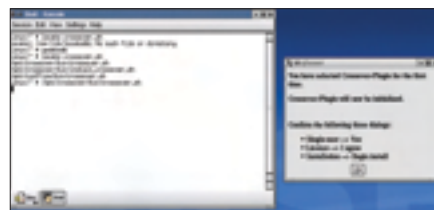
Run the crossover.sh script at the prompt to start the installation

execute the command: */opt/cxoffice/bin /crossover.sh,* the emulator starts installing. The script starts uncompressing the files, and installing them. During this process, it asks you to configure the proxy settings—since this utility has the capability to download files from the Internet, if necessary.

Once the installation of CrossOver Office is complete, install all your

Configure the proxy settings, if you are behind a firewall

favourite Windows programs such as Microsoft Office 2000, IE 5 or 5.5, Photoshop 7, Visio 2000, etc.

As soon as you click on Microsoft Office 2000, in the CrossOver Office install window, a new window pops up where you need to specify the source location of the set up files, for example, */mnt/cdrom,* to install the application via a CD.

The installation starts just like it would have on a Windows PC, asking you the serial key, license agreement,

Just select Microsoft Office 2000 and click on the 'Add' button to install it

acceptance to typical installation, etc. Now, you just need to restart the CrossOver emulator. Once the installation is completed, you can work with your most desired Microsoft Office applications, such as Word and Excel. These can be accessed by going to *Main menu > Windows Application Menu*.

To remove an application, go to *Main menu > CrossOver Office > CrossOver Office Setup*. Select the installed software, and click on the Remove button to start the application's un-installation program.

2 Access Windows Files automatically

Most users start with a dual boot system when they install Linux. Hence, transferring or accessing files created while working in Windows is the first problem faced. For example, you wish to open a Microsoft Word file from your Windows partition. Solve this by loading the Windows partition, using the mount command. To use the mount command, there are two essential requirements: First, you should have a local folder where you can map the Windows partition. And second, the physical address of the Windows partition. As far as local folder is concerned, you can create a new folder, called 'win-

Partitions are listed as /dev/hdxx

dows', within the /mnt folder, using *mkdir /mnt/windows.*

But, to find the physical address of your Windows partition, you will have to use a utility such as Hardware Browser.

Now, you have a local folder /mnt/windows, as well as a physical address of your windows partition /dev/hdb1. Now, at the command prompt, type *mount -t vfat /dev/hdb1 /mnt/windows.*

You need root permission to issue the command. So, log in as root, or change to root, using the *su* command. The mount command will load the Windows partition once. Hence, you will have to execute the mount command again, whenever you restart your PC. To avoid this, change
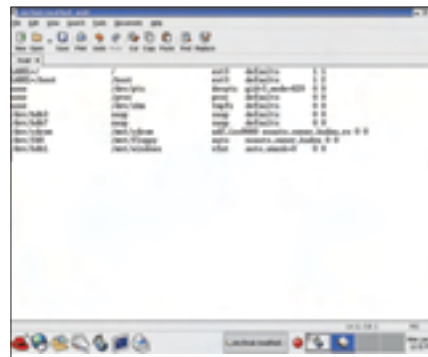
The fstab file lists all the available partitions and their mount points

the File System Table i.e. /etc/fstab. Open this file with any text editor such as vi, gedit, etc. This file is formatted in 6 columns seperated by spaces. You need to append the following line

/dev/hdb1   /mnt/windows   vfat
auto,umask=0   0   0

From now on, whenever you want to access the files of your Windows folder, go to /mnt/windows.

3 Share files and printers using Samba

With Microsoft's SMB (Server Message Block), it became easy to access Windows shares on a Linux PC, but the configuration was a headache. Now, SWAT (Samba Web Administration Tool) reduces this headache, by providing a Web-based utility, to manage the Samba server.

Start the service
First of all, you need to start the SWAT service. To do so, first modify the line 'disable = yes' to 'disable = no' within the file */etc/xinet.d/swat*, then restart the xinetd

Configure services

ntsysv is a simple graphical utility to activate and deactivate services. It gives you complete control as to which services should, or should not be running. First, type *ntsysv* at the terminal window, and press *[Enter]*.

You will see a list of services available that you can either enable, or disable. The services that are already enabled are the ones, which start when your

ntysysv lists all the services available on your Linux PC

PC boots up. Select, or unselect all the services needed, and press OK. Restart the PC for the changes to come into effect.

By default, the configuration is affected only to the current runlevel. If you wish to make similar changes to more then one runlevel, use the command: *ntsysv --level 35*.
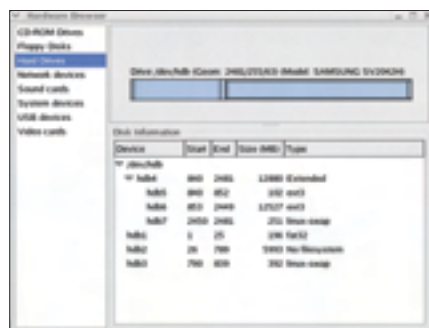
The configuration will affect all the runlevel number(s) specified after the --level option. In the example shown, the runlevel 3 and 5 will be affected.

service by executing the following command at the prompt: */etc/rc.d/inet.d/xinetd restart.*

Configure the SWAT service to run automatically every time the PC starts, by

You can adjust the Global settings in SWAT

executing the following command:
chkconfig -level 35 swat on.

Check if the application has started properly by typing:
chkconfig -list | grep swat.

The result should be 'swat: on'. Once it's verified that the service is running, let's see how it eases the configuration task.

Run the Utility
To start with the Samba configuration, go to the browser, and type *http://localhost:901/* in the location bar.

Next, specify the user name as root and enter the password to start off with the configuration. If you enter the wrong user name or password, it will not give you a second try. If you manage to mess this up, restart the xinetd service, as mentioned above. Use this configuration utility on a remote machine cautiously, since the username and password is sent as simple text (without encryption) across the network.

Configure
When you view the */etc/samba/smb.conf* file, you will notice that it is organised into sections. Although we won't be directly modifying the files, the GUI tool (SWAT) will modify it. The first section consists of global settings. It defines the server's overall attributes, including the two most important settings: workgroup name, and NetBIOS name.

The next section deals with shared folders. By default, one share is created called 'homes'. This is a private share, and is visible to the users, who use a valid username and password. By this share, users can access their own home folder over the network. To see the details of the homes share, select home from the drop down box, and press Choose Share. To save any changes you make, press the Commit Changes button. To add a new share, type the share's name in the text

SWAT lets you share folders with ease

box besides the Create Share button, and then, press the Create Share button. Type the folder name you wish to share along with security settings such as 'quest=yes', or 'guest=no', and Commit Changes. You have successfully created a shared folder in Linux that can be accessed even from Windows PCs.

Once the shares are created, check whether the users are configured properly to access the shared folders. To manage

Users have to be given access rights to the shared folders

the users for Samba, go to the Password section. This section is split vertically into two halves. The top half helps in managing Samba users on the local machine, while the bottom half helps in changing the password on the remote Windows PC. The username and password on the local and remote machine should be the same. Before adding a Samba user in the Server Password Management, check if the users are present on the local machine. If not, then add users in the local machine first. Samba has a limitation that only allows users with a valid local account to access the shares.

Sharing printers is very similar to sharing folders. It works for major Linux print services such as LPD (Line Print
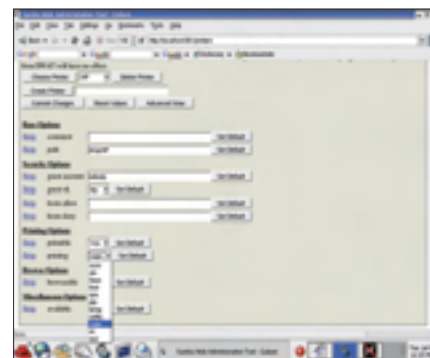
Sharing printers is very similar to sharing folders, using SWAT

The status section in SWAT lets you check the status of the Samba server

Daemon), and CUPS (Common UNIX Printing System).

Finally, check the Samba server's status in the Status section. It provides a button to start, stop or restart the server.

Install and manage printers using CUPS

CUPS provides a portable printing layer for UNIX-based operating systems. Most of the newer distributions bundle CUPS along. You can also download it at *http://public.planetmirror.com/pub/cups/1.1.4/*. Once you've downloaded CUPS, remove your old printing software. Then, install CUPS by typing: *rpm -ivh cups-1.1.4-linux-2.2.14-intel.rpm.*

Note that your filename may differ slightly. By default, CUPS installs with a Web-based, and console-based interface. It should start automatically when installed via RPM. To verify whether the cupsd daemon is running, execute the following, with the privileges of the root user: */etc/rc.d/init.d/cups status*

If you receive 'cups: Scheduler is running' as the output message, you are ready to explore the Web interface.

If not, start the scheduler, by typing */etc/rc.d/init.d/cups start*, with root privileges.

Once the CUPS scheduler is running,

The default CUPS screen provides you with online help

point your Web browser to *http://localhost:631/*. The :631 tells your browser to connect to port 631, instead of the standard Web port 80.

Clicking on 'Do Administrative Tasks', brings up the Admin screen

There will be a variety of options in your browser. Click on the first one—Do Administration Tasks—and you will be prompted to log in. Log in as root, using your root password, and the Admin screen will come up.

Although the 'Class and Jobs' section appears ahead of Printer, we will add the printer first. Press the Add Printer button, and you will be asked for printer name, host name and the printer's description.

Next, specify the device, device Uniform Resource Identifier (URI), make and model for the printer, one after the

The printer setup process lets you choose the model number

other. The file option lets you print directly to a file on the hard drive. The http option lets you print directly to the CUPS port. The ipp option lets you print to a queue with the Internet Printing Protocol. The smb option lets you print to shared printers, connected to a Windows PC—if you use Windows as a print server. If the printer is locally connected, specify the port to which the printer is connected. Once you furnish all these

Uncompress packages

Here's how to install a .tar file. Execute the following command: *tar -xvf <package>.tar*

This creates a folder by the name <package> and extracts the files in it. Next, change the current working directory to the <package> directory (using *cd <package>*), and compile the file again. To compile first you need to execute the *./configure* command.

Now, create a binary file that can be executed, with the help of the *make* command, and then install the compiled program, using the *make install* command.

The normal process to install <package>.tar.gz, and <package>.tar differs only by a step. The <package>.tar.gz file is first converted to <package>.tar file, and then the normal process of installing

Type in the device URI in the Admin screen

the tar files is followed. Converting the .tar.gz file to .gz can be achieved, using the command: *gunzip <package>.tar.gz*.

An alternative method is to combine both commands *(gunzip <package>.tar.gz* and *tar -xvf <package>.tar)* to a single command line: *tar -zxvf <package>.tar.gz*

You can even execute the same command, using pipes, as follows: *gunzip <package>.tar.gz | tar -xvf*

details, your printer set up is complete. Now, you can manage printers, classes, as well as print jobs.

The Classes option allows you to place a series of printers into a pool, or class. If you print to a class, instead of a specific printer, the first available printer in the class will receive the job. This is useful if you do a lot of high-production printing, and have a series of printers at a central location.

The CUPS Web interface lets you manage print jobs

Further, the Jobs option allows you to manage the print jobs in the queue. There is no button to add a print job; you can only manage the jobs using the Hold job, and Cancel job operations, which are provided as buttons.

Just like managing jobs, you have operations to manage your printers and classes. The Printers managing section lets you print a test page, start the printer, and perform other administrative tasks. It also shows the print job, and printer status.

Burn CDs on Linux

With CD-Writer prices falling rapidly, users are now switching to CD-Writers, instead of CD-ROMs. A CD-Writer's performance depends on the CD-Writing software being used. Traditionally, Linux only supported command line tools, to burn CDs, but now easy to use, graphical tools, such as gcombust, are available.

gcombust is a graphical user interface for traditional tools such as mkisofs, mkhybrid, cdda2wav, cdrecord, and cdlabelgen. Some of the features of gcombust are burn CD on the fly, iso image creation, Audio CD creation, Print

Click on the Add Directory button in the Data Files tab, to add files and folders

CD-covers, multisession support, and bootable CD support.

Since the gcombust package is available in the gz format, follow the steps shown previously to install it. When you execute the software for the first time, it will show you an error that says 'Configuration file not found'. Press OK, and then set the configuration in the Preferences window that opens up. You have to set these settings only once; hence forth you can directly get to the task of CD Burning. To burn a CD, go to the Data Files tab, and press the Add Directory button to add files, or folders.

Once all your files and folders are added, go to the Burn tab. Uncheck the

gcombust gives you continuous output during the burn process

'Dummy test run' checkbox, check the Burnproof checkbox, and then the Multi Session checkbox (if you wish to create a multi-session CD). Finally, press the Combust! button.

If you cannot locate your drive, use the 'Detect SCSI drive' button, and verify the drive, using the 'Check SCSI settings' button.

Most graphical utilities, such as gcombust, use a command line utility to accomplish their task. So, knowing how command line utilities operate is a great

Uncheck the Dummy test run checkbox in the Burn tab

Convert your MP3s to OGG

MP3 is the most common music format in use today. But, it is involved in legal issues. Converting to and from MP3 involves payment of royalty for encoding or decoding. On the other hand, ogg is a format that's free to use—a open source project which provides the same quality of sound at half the file size, thus reducing the disk space required to store your music. One of the easiest ways to convert MP3 to OGG is by using scripts.

The mp32ogg script is in Perl, available at *http://freshmeat.net/projects/mp32ogg,* and the pre-requisite is that you need to have the mpg123, and the oggenc packages installed on your PC. You will also need a couple of Perl modules that go by the names MP3::Info, and String::ShellQuote as well. Once, you have these, execute the Perl script named mp32ogg by typing *mp32ogg *.mp3*.

This will convert all the mp3s, within the current directory, to the ogg format, and create a new file with an ogg extension, for each mp3 file. Existing mp3 files are not affected, so relax while the conversion takes place.

help. In the command line, each burn process is two fold—first, create an iso image, then burn the iso image on the CD. To make an iso image, execute the following command:

mkisofs /home/user > /tmp/user.iso

Make an iso image from a CD using

dd if=/dev/cdrom of=/tmp/img.iso

Burn this iso image on a blank CD by executing the following command:

cd-record -v speed=12 dev=0,0,0 -data img.iso

If you wish to write to a re-writable CD, after erasing its content, type:

cdrecord -v speed=12 dev=0,0,0 blank=fast -data img.iso

Check the files in the iso, by directly mounting the iso file. For example, create a folder, say /mnt/iso. Then, mount the iso file by typing:

mount -o loop,ro -t iso9660 ./img.iso /mnt/iso

You can then browse through the image content, as you would with your CD-ROM drive. If there are any problems with the image, delete it, and create a new one.◘

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A file that needs to be locked away, an intriguing mark on the CPU, a motherboard that refuses to recognise hard disks... Here's the denouement to it all!

Windows 98 to XP

I was unable to install Windows XP Professional in the MS-DOS mode. I had to install Windows 98 SE first, and then upgrade it to Windows XP Professional. Is there a way to install Windows XP Professional without having to follow this procedure?
Mahendra

A You can install Windows XP by executing the winnt.exe within the i386 folder on the Windows XP CD. The setup then asks for the path of the source files, and starts the installation. Another alternative is to install it directly using a Windows XP bootable CD. To change the boot sequence, re-start your PC and press [Del] (or [F2], or [F12], depending upon your motherboard) to enter the CMOS setup. Change the first boot option to CD-ROM and keep the hard disk as the second boot option. Now boot your PC using the Windows XP CD. The setup should start automatically.

Keep less work at startup

I get a USERINIT.exe error, whenever I switch on my computer. The PC runs Windows XP Home edition.
Deepak Dugar

A This error occurs when Windows initialises the users environment. There exists a way by which you can start a program even before Explorer starts. This feature is used by software such as Norton AntiVirus, McAfee, etc., to execute the program automatically.

To eliminate the error, you will need to change the settings in the anti-virus program so that no virus scan is initialised at startup. Restart your computer and the error should not occur again. If it persists, then another application may be causing the error. You will have to find the program that starts at startup, and disable it.

Upgrade to higher capacity drive

I wish to upgrade my PC's BIOS to allow it to recognise large hard disks. I have a Pentium-II 266 MHz, 128 MB RAM, 4.3 GB hard disk, SG200A video card, 440LX motherboard, and the Award modular BIOS Version 4.1. I wish to have both Linux and Windows on this PC. My problem is that although I am keen on using a large hard disk, say 40 to 60 GB, my motherboard manual says it will not recognise hard disks beyond 8.4 GB. What I can do to solve this?
V.A. Kowshik

A This is a problem faced by many. There are three methods to solve this problem:

Update your motherboard's BIOS. Download the update available for your motherboard model at the manufacturer's Web site, and follow the steps given at the site, to flash the BIOS. However, they may not be an update available for your motherboard, it being too old.

Get an add-on IDE controller. Purchase an IDE controller card, install the drivers, and connect it to the high capacity hard drive. Though being an expensive solution, it will surely solve your problem.

Use utilities provided by your drive manufacturer:

If you use a Maxtor hard drive, download the utility at *http://www.maxtor.com/en/support/ downloads/big_drive_enabler.htm*

Seagate's utility is available at *http://www. seagate.com/support/kb/disc/capacity/index.html*

Maxtor's Big Drive Enabler provides support for larger hard drives

Video memory size

Q. I have a P4 1.5 GHz, 256 MB SDRAM, 40 GB 7,200 rpm hard drive and a 64 MB SDR nVidia GeForce2 MX 400 graphics card.

While fiddling about with my BIOS recently, I came across an option wherein the AGP aperture size is set to 64. I would like to know whether this is applicable only for integrated graphics chipsets. If not, what does it mean for my system configuration. Will increasing it to 128 increase my graphics performance?
Sai Krishnan

A. The AGP aperture is the portion of the PCI addressable memory range that is dedicated as graphics memory address space. It determines the amount of system RAM that can be allocated to the graphics card for storing texture details. It is recommended that the aperture size be half of your system RAM. Typically, set the aperture to 64 MB or 128 MB. As the memory on the graphics card increases, the system requirement decreases. Hence there is no need to set the aperture size to half the system RAM. The aperture size is in no way related to performance. Increasing it to the largest setting would not result in performance gains.

Can't boot

Q. I have a Pentium 4 processor, 128 MB DDR RAM and a 40 GB hard disk. When I boot up Windows XP, I get an error saying, "Unmountable boot volume" displayed on a blue screen. The error directs me to remove recently installed hardware or software first. Since I also have Windows 98 SE in another partition that works fine, how can I get rid of the error message?
Arvind Kumar

A. This problem occurs when you have a corrupted boot.ini file. Boot up using the Window XP CD. Press *[R]* when you get the Setup screen, to get to a DOS-like mode. Here, type **chkdsk /p** and press *[Enter]*. After it is done, type **fixboot**, press *[Enter]*, then *[y]* and then again press *[Enter]*. After this, type **exit** to reboot to Windows. This should solve your problem.

If it doesn't, boot into the CD again. Type **chkdsk /r** to switch to the recovery mode. When it is finished type **exit** to reboot to Windows. This should definitely help you out.

Relay not allowed

Q. The outgoing mail server for Dishnet DSL and NOW no longer works. Their help desk says that they have removed the facility to send e-mails from a domain account such as mine. What do I do now?
Paradise

A. It appears that you have an e-mail id on a domain other than that provided by Dishnet, or NOW. Many Internet Service Providers such as VSNL and Sancharnet, provide SMTP solutions.

Under this service, e-mails from private domains are relayed through their SMTP server. Purchase one of those services depending upon your need.
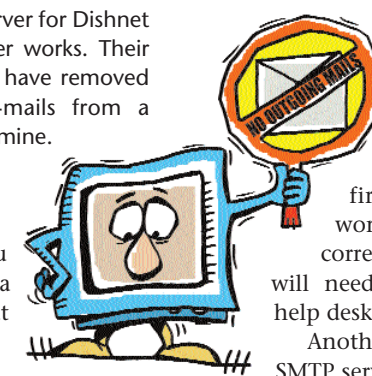
If you are unable to send e-mails through your Dishnet or NOW e-mail id, then first check the password. If you are using the correct password, then you will need to contact the ISP help desk.

Another solution is to get SMTP services for your domain from the Web hosting company that is hosting your Web site. You may also host your own SMTP server on a system that is connected to the Internet 24 hours a day. IIS under Windows NT is one such alternative.

ILLUSTRATIONS: Farzana Cooper

gpedit not available

Q. I tried to bring up the group policy editor by typing the command *gpedit.msc* in the Run dialog box in Windows XP. But, the PC gave up an error message saying, "Windows cannot find 'gpedit.msc' Make sure you typed the name correctly and try again". I tried several times, but to no avail. So, I tried to locate that file by using the search utility. I found that there is no file named gpedit.msc. Kindly help me!
Benenet

A. You probably have Windows XP Home installed on your PC, under which the gpedit.msc command is not available. Hence, you will need to upgrade your operating system to Windows XP Professional.

Graphics card or a processor

Q. I have a PII 300 MHz system with 128 MB RAM and a 32 MB Sis 300/305 AGP card. I have noticed that games such as *FIFA 2003*, which run very slow on my PC, run smoothly on my friend's computer—a
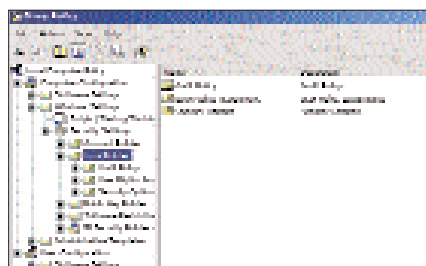
The group policy editor comes with Windows XP Professional

PIII 500 MHz system with only an 8 MB AGP card. I want to know what affects the graphics capability of a system—a processor faster by 200 MHz, or a graphics card with 16 MB of extra RAM? Is there any way I can improve the performance without buying new hardware?
Piyush Mishra

A. Your friend's PC is a PIII, which has an optimised instruction set that handles the graphics better than your PII. The processing speed also cannot be neglected; after all, everything depends on the CPU's processing power. Hence, a surplus of 200 MHz processing power will definitely make a difference.

Sorry, there is no way you can improve you system performance without upgrading the hardware.

Crack game

Q. I was using the trial version of the *7Tools Partition Manager 2003*. Ever since the trial period expired, I get an error message about the expiry that waits for a minute at the boot up screen, every time I start the PC.

I also receive a message saying that a CD is needed when I try to play *Age of Empires*. This error occurred after installing an update for the game, downloaded from the Microsoft Web site.
Vinodh

A. Upgrade to the full version of the Boot Manager. If you don't want to buy the program, un-install it and the mes-

sage should go away.

The reason why *Age of Empires* doesn't work anymore is that you originally installed the game from a pirated CD, or copied a cracked version from a friend. The crack modifies the game's .exe file to bypass the CD check. When you installed the update, the cracked file got overwritten by the update and it started checking for the original CD again.

The solution? None; one of the lessons to be learnt of playing pirated games!

Not enough memory

Q. I have a Celeron 1.2 GHz, Intel 810 motherboard, 128 MB RAM and a 40 GB hard disk drive. I am a multimedia student, and the software I use brings down my system resources. Whenever I connect to the Internet, I frequently get an error, indicating that there is not enough memory. Sometimes, it even causes my PC to hang. However, my friend's PC that has the same configuration with 64 MB RAM faces no such problems. Why is this so?
Parivesh Jain

A We assume that you are using Windows 98, since this and the previous versions are the main operating systems that faced such problems. This happens because browsers such as Netscape need a lot of resources, and operating systems restrict each application to a 64 KB limit. These applications do not release unused resources, and simultaneously demand more resources thus resulting in crashes.

To over come this problem, you need to install patches, or fixes available at the browser's Web site or upgrade the browser to a newer, more stable version.

Real Jukebox

Q. Every time I start my PC, I get a message saying, "Error starting program, A required .dll file, PNGU3263.dll, was not found." How do I get rid of this message?
Manoj

A This is a known problem with Real Jukebox. You get this error when the pngu3263.dll file is missing or corrupt. The solution is either you re-install Real Jukebox or disable it at startup. To un-install it, go to *Control Panel > Add/Remove Program*.
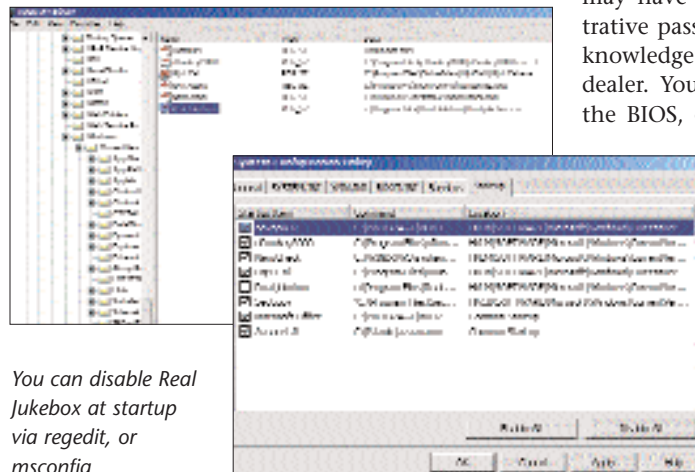
You can disable Real Jukebox at startup via regedit, or msconfig

To disable the program from starting automatically you have two options. One is using the msconfig utility. Go to *Start > Run* and type msconfig. Press [Enter]. Go to the Startup tab, uncheck all the entries related to Real Jukebox, press OK and restart the PC.

The other option is to directly modify the registry. Go to *HKEY_LOCAL_MACHINE\ Software\Microsoft\Windows\CurrentVersion\Run*, and delete all the keys pertaining to Real Jukebox. Playing around with the registry can cause Windows to crash, so it's a good idea to back up the registry before you use regedit.

Can't change BIOS setting

Q. My PC restarts automatically ever since I upgraded from Windows 98 to Windows XP Professional. If I try to enter the BIOS setup, none of the configuration options are highlighted, and I cannot change any of the settings. Help!
Kabeer J Barooah

A BIOS settings need to be highlighted so that they can be changed. The reason they are not highlighted is that someone may have set up an administrative password without your knowledge like maybe your PC dealer. You will have to reset the BIOS, either by removing the battery or changing the jumper on the motherboard so that the CMOS is reset. Refer to the motherboard manual for the proper jumper settings. Be very careful when changing the jumper settings, it being an intricate process. You could always get a professional to do the needful.

Mark of the CPU

Q. I have a PC with a Pentium 4 1.8 MHz processor. It is shown as Intel Pentium (R) 4. Its L2 cache is 256 KB. This perplexes me since I read somewhere that P4 has a 512 KB L2 cache. Also, why is that bracketed 'R' between Pentium and 4? Have I been taken for a ride? Please comment!
Prasad

A Don't worry, your hardware vendor has not duped you. In its initial stages, the Pentium 4 was built with only 256 KB cache. Later on, it was revised to include a 512 KB L2 cache. This can be confirmed by taking a look at the CPU packaging box. If it says that the CPU is a Pentium 4 1.8 A, then must be a 512 KB cache processor whereas if it just says Pentium 4 1.8, then it is a 256 KB cache processor. As for the R, it stands for 'REGISTERED TRADE MARK'. See? Nothing to worry about.

Walk with the world

Q. I have a PC with a Celeron 1.1 GHz processor, 128 MB RAM, a 40 GB hard disk, and an Asus motherboard. I have a separate 6 GB partition for Linux. First, I

Behind the firewall

Q. eDonkey2000, installed on my Windows 98 PC, does not connect to any of the available servers. Do I have to change some settings for it to work?
Mandar Sawant

A Check if your computer is behind a firewall. If you happen to be behind one, then you need to change the proxy settings. You will also have to get the port 4662 opened on the Internet server. Check the status of the port 4662 at the following Web site: http://www.preinheimer.com/cgi-bin/connectiontest/connectiontest.cgi

IRQ Locking

Q. I am unable to install the SBLive CT4830 sound card in Windows 2000, but the same hardware works fine in Windows 98. I think the problem lies in the IRQ sharing. I wish to know how I should lock the IRQ for my sound card.

Another problem is that whenever I burn a CD, it gets burned at a maximum speed of 8X, even if the CD supports 24X. If I try to burn the CD at a speed exceeding 8X, it gives an error message saying, "Buffer under run". Why is that so?
Tamal

A To manage IRQ settings for the sound card, right-click on My Computer and go to **Manage > Device Manager**. In the right pane of the window, double-click on Sound, Video and Game controllers. Now right-click on the appropriate sound card driver, and select **Properties > Resources**. Here you can change the IRQ settings for the device. To manually set the IRQ settings, first
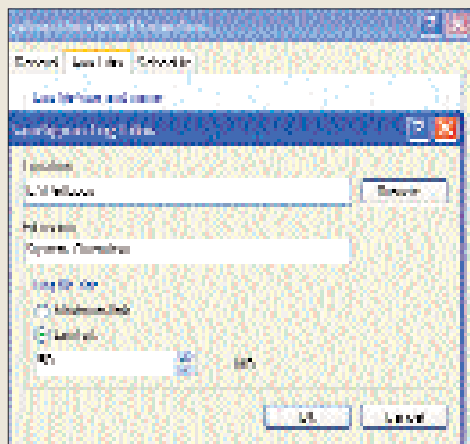
Resolve resource sharing conflicts by changing the IRQ settings

un-select 'Use automatic settings'. Under Resource Type, select IRQ and hit Change Setting. Now select the IRQ you wish to bind the sound card with.

The hard disk is unable to provide data to the CD-Writer at the speed that it is required to. This may occur due to many reasons—the hard disk maybe slow, or other applications might also be accessing the hard disk at the same time, or the data might be fragmented, or CPU utilisation by other programs maybe very high. To reduce such errors, use such tools as scandisk and defrag. Try not to run other applications while your CD is burning.

It is also possible that you maybe using an early version of a CD-Writer that does not support buffer under run protection. Hence, it maybe time to buy one of the latest models that support it.

Locking files in a Safe

Q. I wish to know how to password protect my important files and folders so that no one can peek into them?
Brajesh Manohar

A There are many utilities such as Secure Files 2.8, FileVault 2.7, bProtected 2003, noDelete 1.51, etc. to achieve this. Secure Files is one of the best. With this utility the files remain protected even if the application is not running. Add the files to be protected, add the password and close the application. That's it! The files are protected. They can only be retrieved after you start the application and provide your password. As soon as you stop the application from running, all the files

Password protect your documents, using Secure Files 2.8

marked for protection just vanish from their locations. They are visible only when the application is running. It also has an icon, which when pressed, clears the recent file list.

DLL file missing

Q. My Windows 98 SE PC has an Intel 815 motherboard and a PIII 933 processor. After updating the audio driver for my motherboard, I found that it is throwing the following error message at start-up – "Error starting program; a required .dll file - DEC2MIME.DLL not found." Due to this missing .dll file, the startup programs such as MusicMatch, Norton AntiVirus, Task Scheduler, Intel active monitor do not appear on the system tray and task bar. The programs work fine when activated, using the desktop icons.
S.S.Samanta

A The missing .dll file—DEC2MIME.DLL—is actually a Symantec decomposer file, which belongs to one of the recently installed Symantec products. What you can do is reinstall that Symantec product. It should solve your problem and your system tray icons will reappear.

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installed Mandrake 8.2 without any problem whatsoever. When I tried to install Red Hat Version 7, I got a message indicating that the disk space is not enough. 256 MB for Swap, 4.5 GB for Root (/), and 1.2 GB for home. When I tried to install Red Hat 9.1, the system hangs after 7 per cent of the installation. At my workplace, the same version installed itself smoothly without any glitches. Will you kindly help me?
G.Harish

A Do make sure that your distribution

is indeed Redhat 9.1. The Red Hat site lists Red Hat 9.0 as its latest stable distro. Running Red Hat 9.0 on your system will be quite torturous as the minimum system requirement is 128 MB RAM. The Red Hat 7 installation should work fine (even a Red Hat 8 needs 4 to 5 GB of hard disk space for a typical install). The low disk space warning could be because you allocated separate space to /home but not to the other directories such as /boot, /usr, /etc, and /var. Try allocating just the swap space and the / partition—

don't give a separate /home partition`. Allocating separate space for /home does not really make much of a difference on a home PC as the number of users will be very less.**d**

tips&tricks

Imagine
Imaging...

We tell you how to make your imaginations a reality. Master these tips and tricks on the three major graphics software. Create jazzy effects, and play with images in a much faster and efficient way.

GRAHIC DESIGN: Atul Deshmukh

contents

PAINT SHOP PRO 8

This image editing software from JASC Software now has a more polished look than ever before, and has lots of features which are unique to it. Find out how you can achieve special effects in few easy steps.

ILLUSTRATIONS: Farzana Cooper

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Curved text

To create curved text, first you need a curve on which to place the text. With the Preset Shape Tool, draw a circle on a new canvas. Switch to the Text tool. The cursor changes to the Curved Text cursor when you move it over the image. Click, and enter the desired text in the dialog box pre-

Use Paint Shop Pro to curve your text as desired

sented. If your text is not visible, it is because both, the fill and outline colours, are white. Click any colour on the palette to choose the outline colour and right-click to fill in the colour. If the letters overlap each other, increase the kerning—the space between the letters. Normally, auto-kerning works well. Click OK, and the curved text is seen.

To make the circle invisible, locate the layer that contains your text and vector object. Click on the '+' to expand the layer, right-click on the ellipse, and click properties. Uncheck the Visible checkbox; click OK, and the circle will disappear.

Custom moulded button

Open a new image with a white background and immediately add a new layer (layer 1). Select any background colour, and white as the foreground

colour. Create a circle, using the Preset Shape Tool with the following specifications: Type: Circle; Style: Stroked & Filled; Line Width: 22; with Antialias checked.

Add a new layer—Layer 2. Using the Webding font, hold in the Shift key, and type @ for the hammer and spanner symbol that we will be using in this example. Type in a font size of 100, and select 'Create as Selection'.

Back in your image, the selection will appear as a dotted line around the text. Do not release the selection, and your type will instantly disappear. If the entire font is on your screen you're ok, if part of it is off the screen, you will need to try again. Place the cursor in the middle of the window, and click to go back into the text editor. Click ok, and see if the entire phone symbol is on the window. Go to *Selections > Modify > Expand* on the Menu Bar, and expand the selection to 4.

Using the Flood Fill tool, fill your selection with the solid colour you used for a background colour. Using the Move tool, position the hammer and spanner symbol in the centre of the circle. If all has gone well, the phone symbol should be large enough to fill the inside of the circle, barely touching the edges. Unselect any selections, and merge all of the layers.

Once the layers are merged, use the Magic Wand to select the figure

You can create your buttons and icons easily in few steps.

again, and fill it with a Sunburst Gradient fill. Adjust the settings so that the white part of the sunburst is in the top left corner of the preview square.

Go to *Image > 3 D Effects > Outer Bevel*, and select the following settings: bevel, smoothness: 13; depth: 5; ambience: 0; shininess: 0; light white; angle: 315; intensity: 38; elevation: 47.

Invert your selection. Using the Flood Fill tool set to solid, fill the interior areas of your figure with the solid colour, selected as the background colour. Invert the selection again, and add a drop shadow with the following settings; Opacity: 100; Blur: 13; Horizontal: 0; Vertical: 0.

Glowing text

Create a new file with a black background, set to 16 million colours. For the foreground colour, select light purple—RGB (128,128, 255). Enter some text. Unselect the text by going to *Selections > Select none*. Go to

Glowing Text

Keyboard shortcuts for PSP 8

Menu Command	Shortcut	Description
File > Import > Screen Capture > Start	*[Shift] + [C]*	Start a capture
Edit > Paste > Paste As New Layer	*[Ctrl] + [L]*	Paste the clipboard contents into the current document as a new layer
Edit > Paste > Paste As New Selection	*[Ctrl] + [E]*	Paste the clipboard data into the current image as a new selection
Edit > Paste > Paste As New Vector Selection	*[Ctrl] + [G]*	Paste vector data in clipboard, into the current image, as a new vector selection
Edit > Paste > Paste As Transparent Selection	*[Ctrl] + [Shift] + [E]*	Paste the clipboard contents into the current image, using the background colour as transparent
Image > Crop to Selection	*[Shift] + [R]*	Crop Tool: Used to eliminate, or crop areas of an image.
Image > Flip	*[Ctrl] + [I]*	Flip image
Image > Rotate > Free Rotate...	*[Ctrl] + [R]*	Apply rotation to image
Adjust > Brightness and Contrast > Brightness / Contrast...	*[Shift] + [B]*	Adjust brightness and contrast
Adjust > Brightness and Contrast > Gamma Correction...	*[Shift] + [G]*	Apply gamma correction to the image
Adjust > Hue and Saturation > Hue/Saturation/Lightness...	*[Shift] + [H]*	Adjust the hue, saturation and/ or lightness
Selections > Float	*[Ctrl] + [F]*	Convert the current regular selection into a floating selection
Selections > Invert	*[Ctrl] + [Shift] + [I]*	Invert the current selection area

Neon Text

This method can also be applied to shapes such as hearts, found in the Webdings font, for example.

Neon text
Create a new file with a black background, set to 16 million colours. With white as your foreground colour, enter some text. Unselect the text by going to *Selections > Select None*. Go to *Adjust > Blur > Blur More*. Now go to *Effects > Artistic Effects > Solarize*. Set the Threshold to 128, and click OK.

Now, click the *Adjust > Color Balance > Red/Green/ Blue*, and enter these percentage values; Red: 100, Green: 0, Blue: 100, for a light purple colour. This is the final image.

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Effects > Edge Effects > Dilate, and repeat this thrice. This will expand the text. Now go to *Adjust > Blur > Blur More*. Do this thrice to create the glowing effect around the text.

Now, select dark purple— RGB(0,0,64) as your foreground colour. Enter the same text again, and move it so it superimposes the blurred text. This is the final image.

This effect looks best with a lighter colour on the outside, and a darker colour on the inside.

Golden text
Create a new image with white as your background colour, set to 16 million colours. Enter some text using in light grey—RGB (192,192,192). Keep the text selected throughout the entire tutorial. Now go to *Selections > Modify > Feather*. Enter 3 in the 'Number of pixels' field, to expand the selected area. Now, select

Golden Text

white as your foreground colour, and give the text a hot wax coating by selecting *Effects > Artistic Effects > Hot Wax Coating*.

Now, go to *Adjust > Color Balance > Red/Green/Blue*, and enter these percentage values: Red: 100; Green: 50; Blue: 0. Do this twice to get a realistic gold colour.

Finally, add a drop shadow for a 3D effect. Go to *Effects > 3 D Effects > Drop Shadow* with the following options; Color: black; Opacity: 100; Blur: 10; Vertical Offset: 4; Horizontal Offset: 4. This is the final image.

Water text
Create a new image with a white background, set to 16 million colours. Enter some black text, preferably with a thick font such as Arial Black. Keep the text selected. Now, select the Paint brush tool, and set it to Size: 50; Opacity: 100; Texture: Marble.

With white as your foreground colour, click and

Water Text

drag the paint brush over the text once. Unselect the text by going to **Selections > Select None**. Now go to **Effects > Edge Effects > Dilate**. This will increase the lighter areas of your text.

Go to **Adjust > Blur > Blur more.** Create a watery effect, by going to **Effects > Artistic Effects > Hot wax coating**. This will create a liquid effect. To add some colour, go to **Adjust > Colors > Red/Green/Blue**, and use Red: 0; Green: 20; Blue: 100.

Note that all colours are possible.

☒ Burnt edges

Open an image, and select a white background, set to 16 million colours. Use the Magic Wand tool, and click on the white area around the image. Invert the selection by going to **Selections > Invert**. This will allow you to work only on the image, and not the white border. Use the Paint Brush tool with white as your foreground, and create an edge as if has been burnt.

Click **Selections > Select None**, and select the white areas again, using the Magic Wand tool. Invert the selection, and if you wish, feath-

Burnt Edges Effect

er the selection by 2 or 3 pixels. This will give you a smoother edge. Use the Air Brush tool with black as your foreground colour. Select a brush size of 10, and opacity 50. Go around the image close to the edges to create a dark border. Use opacity of 20 to create a lighter border, further in from the darker one. You can also use dark brown to give more realistic burnt edge effect.

☒ Flying text

Start with any colour background. Choose a font, and some text. Press **[Ctrl] + [C]**

Flying text effect

to copy the text to clipboard. Now, unselect your text. Flatten the image by clicking **Layers > Merge > Merge All (Flatten).** Then, go to **Image > Rotate > Rotate Clockwise 90**. Next, go to **Effects > Distortion Effects > Wind**. Set the strength at 100, from the Right.

Then, go to **Image > Rotate > Rotate Anticlockwise 90**, to bring the image back to its original position. Now paste the text you had copied to the Clip Board. Flatten the image once again. Now, click the Selection tool from the tool bar, and drag it across your wind effect to cover the effect in the selection rectangle.

Now go to **Effects > Geometric Effects > Perspective-vertical**. Set the Distortion to 100 and Color to the background colour you are using. After that, unselect, and you'r e done.

☒ Creating styled lines

To create a styled line, press the arrow or preview window for Styled Lines on the Tool Options palette, then press the Custom button at the bottom on the Line Style selection list.

Here, you can manipulate several line properties. To set one of the caps, press the arrow button near the caps preview window, to get the selection box. Choose the cap you want by clicking it. You can then set the cap size relative to the line width, by pressing the cap's Size button and then setting the Height and Width for the cap. You add dashes and gaps in the Style pane of the Styled Line dialog box. The first time you press Add, you add a dash, which you can size by setting a value with the Length control, or by dragging the pointed
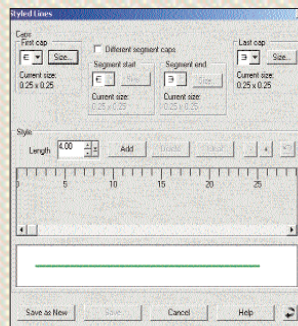
With Paint Shop Pro 8, you can create your own Styled Lines.

thumb in the control box. Press Add again, to add a gap. You can keep adding dashes and gaps.

To save your styled line, press the 'Save As New' button. Once you save your new line style, it's available with any drawing tool. You can create styled lines for all sorts of purposes, including navigation buttons for a Web site, or separator bars for a Web site, or newsletter.

☒ The Seamless Tiling effect

Turn any selection into a seamless pattern for applications such as painting, adding text, or creating
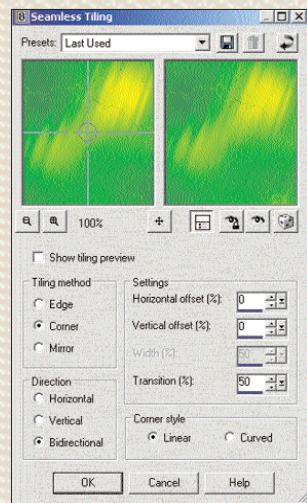
The Seamless Tiling Effect in PSP 8

backgrounds, with the Seamless Tiling Effect under the **Effects > Image Effects** menu. This feature gives you the option to create tiles using three methods. Try this effect. You are sure to like it.

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ADOBE ILLUSTRATOR

If you want a top of the line graphics program that deals with both raster and vector graphics, Adobe Illustrator 10 is the software for you. Use these small time saving tips to get the best out of this powerful tool.

Create custom styles

To create custom styles, set up objects with the strokes and fills you want to save as styles. Drag each of them to the styles palette. Do not delete them from the page yet. On the Styles palette, click the options triangle,

Create your custom styles and use them later to ease your work and attain consistency

and choose 'Select all unused'.

The unused styles are selected. Click the trash can at the palette's bottom, and say yes, when asked if you want to delete the selected styles. Follow the same procedure for brushes, swatches and symbols (symbols are in AI 10 only). You will now only have items used in the document in the palette. Next, delete the objects using the styles from the page. New styles are stored in the styles palette. Save the file, give it a descriptive name, and close it. Remember, the file must be closed to load the styles.

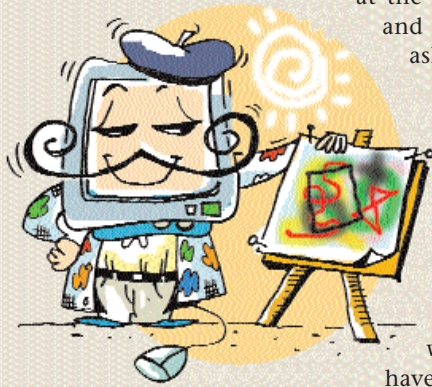To use the styles, go to *Window > Style Libraries > Other Library,* and navigate to where you saved the file. Highlight it and click Open to open it. The styles will be in the styles palette, ready for use.

Transferring vectors between Illustrator and Photoshop

Vectors are important as they are resolution independent—so they can be scaled up or down with no loss of detail—and they print clean, and crisp. Vector shapes can be easily modified; just a little tug on a handle turns a line into a curve. Vectors can be easily rasterized into pixels; it takes specialised programs to convert pixels into vectors. If vectors could be transferred between different programs, it would be a very handy feature. Here is how we can do it between Photoshop and Illustrator.

From Photoshop to Illustrator
Between Illustrator 9 and Photoshop 6, you can drag and drop paths, directly from Photoshop into Illustrator. Previously, you could only export, or copy, and paste. Just select the Photoshop path, and drag it to an open Illustrator document.

Export paths from Photoshop, by going to *File > Export > Paths to Illustrator.* You can choose a specific path from the Paths palette, a path from a shape layer, or crop marks that define the Photoshop file size. Note that the path exported to Illustrator, will have no fill, or stroke. Select all, or switch to the outline mode to see your vectors.

From Illustrator to Photoshop
You can also get vectors from Illustrator into Photoshop. If you select the Illustrator objects, and then copy and paste, a dialog box appears that lets you control whether you want the path converted into pixels (on their own layer), paths (added to Photoshop's Paths palette), or shapes (as a new shape layer).

Photoshop lets you control the conversion from precious vectors to bland pixels. If you choose pixels, a transformation box appears around the imported art work. Use the bounding box handles to scale, rotate, or skew the art work any which way you want. As long as you don't double-click, or press [Enter], you've still got resolution-independent vectors.

Finally, if you want to drag and drop from Illustrator into Photoshop, you can control the created object type as follows. With no key pressed, drag to create a pixel layer. Hold [Ctrl] to create a path. If a shape layer is currently active, the path will be added to that shape layer. Hold [Shift] and place the new object in the centre of the Photoshop file.

Make your own gift tags

You can create your own tags that are business card sized to put on gift boxes. By default, the 0 on the ruler is set to the left side horizontally, and the bottom vertically. Change it by clicking on the crosshairs on the rulers' top, and dragging it to the top left corner.

Unfortunately, you can't change the page margins in Illustrator. They're set to the unprintable area of your printer. You can move them around on the page, but you

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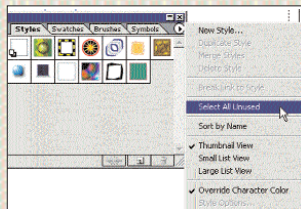
Create your own gift tags and put them on gift boxes!

can't change their size. Hence, you'll need to pull out horizontal guides to 0.75, 4.25, and 7.75 inches. Click on the ruler, and drag with your mouse, to pull out guides. You'll also need to drag vertical guides out to 0.5, 2.5, 4.5, 6.5, 8.5, and 10.5 inches.

Place the image you want to use. Select *File > Place*, and navigate to the directory with your image and double-click on the file name. Select the image, once you have it placed properly. Once it's selected, the bounding box, and small rectangles appear around it. Then, choose *Object > Transform > Move.*

Put in 0 for the horizontal position, and -2 for the vertical position. Negative numbers move objects down; positive numbers move objects up. Press the copy button—this places a copy of the object you selected, at the chosen position. Choose *Object > Transform >*

Transform Again, or the keyboard shortcut *[Ctrl] + [D]*, three more times.

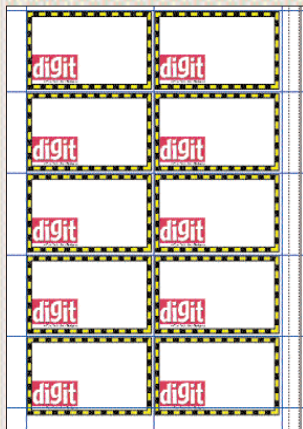Select everything (*[Ctrl] + [A]*). Then, choose *Object > Transform > Move* again. This time, enter 3.5 for the horizontal position, and 0 for the vertical position. Press copy, and all the graphics will be positioned as desired.

Print this, and you are ready with your Gift Tags.

Changing the default Illustrator file
If you want a brush, symbol, swatch, or style to be available whenever you create a new document in Illustrator, you can edit the Illustrator Start up documents in the Illustrator plug-ins folder. For example, if you installed Illustrator 10, the start file for CMYK will be called 'Adobe Illustrator Startup_CMYK.ai' and will be located in '*C:\Program Files\Adobe\Illustrator 10 \Plug-ins*'. Just open the file in Illustrator, add the content you want available, save, and close the document. The next time you create a new document in Illustrator it will be there.

Remember that unless you do a cleanup on every final document you save, by deleting unused brushes, symbols, swatches, and styles, everything you add increases file sizes. Hence, delete items you will never use from the start up file. Once again, this is not for the casual user. It's akin to changing the Windows registry.

Turn guides into vector lines
Go to *View > Guides > Lock Guides*, to unlock locked guides. Then, go to *View > Guides > Release Guides*, and the guides will turn into vector lines.

Changing tool pointer
You can change the pointer's appearance, from the tool pointer to a cross hair, for more precise control. More artwork is visible, when using a cross hair pointer. This is convenient for detailed drawing, and editing. To change a drawing tool pointer to a cross hair, press [Caps Lock], before you begin drawing with the tool. To make this change permanent, open *Edit > Preferences > General*, and check 'Use Precise Cursor', and click OK.

Draw straight
When you draw, or move objects, hold down the Shift key, so as to move them within a range of 45 degrees. This angle can be changed from *Edit > Preferences > General*. Enter the new Constrain Angle, and click OK.
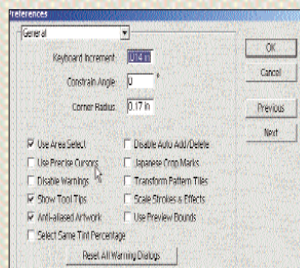
you can personalise a lot of things, through this Preferences Dialog.

Scratch disk
For best performance, provide Illustrator with ample swap space on the hard disk where it can temporarily store information such as the image information, undo information, etc. This will ensure its smooth functioning, especially if you work with large, complex graphics. Change the location of the scratch disk, by clicking on *Edit > Preferences > Plug-ins & Scratch Disk*.

Easter egg
By default, in the lower left hand corner of the drawing area, Illustrator displays the current tool being used. Click on it to view other items such as, the Date and Time, the amount of Free Memory, and the Number of Undo's. If you hold down [Alt] while clicking on the drop-down, you can choose such items as number of shopping days left till Christmas, a pair of eyes that follow your cursor, the number of mouse clicks, and the moon phase, among other things!

Custom brushes
To use an object as a brush,
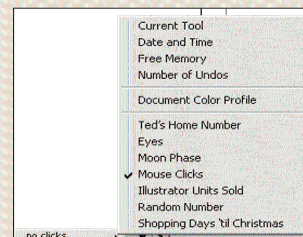
Alt Click and keep yourself updated with some interesting information.

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select the object, and click on the new brush icon in the brushes palette. In the new brush dialog box, select the kind of brush to create, and click OK. Set the properties for the brush from the Brush Options dialog box, and click OK to create the brush.

Artwork and preview
You can view some items in Preview mode, and other items in Artwork simultaneously. Place the objects on separate layers. Double-click the layers you wish to see in Artwork mode, and disable Preview from the layer Options dialog box.

Text on path
You can apply text around any object in Illustrator. First, create the object around which you want the text to appear. Select the Path Type tool. To do so, hold down the mouse button on the Type tool, until the options below it appear. Create an insertion point near the object's edge, and type the text.

Enter the new height or width value in the transform palette; hold down [Ctrl], and hit Enter, or Return. The other value will be entered automatically. More transform tricks here.

Use that Knife nicely
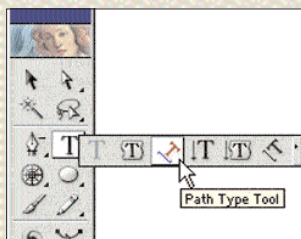Using the Knife tool, can have an uncertain outcome if you don't know the shortcuts to making it work. If you select the Knife Tool, and begin cutting a shape,

Use Path Type tool to curve your text the way you like.

it is very hard to try and keep that cut straight. Press [Alt], and then begin cutting, because if you begin cutting, and press [Alt] later, the cut will be crooked. If you have several layers without any item selected, and you begin cutting it with the Knife Tool, the cut will apply to all layers. If you want to cut only one item, make sure that it is the only thing selected.

Moving objects
Here's how to move one item from one layer to the next. Select the item you want to move. The layer with the selected item has a little square in it. Hover over the little square and you'll see a hand with a pointing finger. Press the Alt key, and drag that item to a new layer.

Find the complementary color for a selected item by holding down [Ctrl], and clicking inside the bar, when working in the colour bar area (the area at the bottom with all the colors). This gives you the colour immediately. It will not change the actual art piece, unless you actively select the item.

Manipulating layers
Selecting layers
Press [Ctrl] and click on a layer in the Layers palette to automatically select everything. This is the best way to select small, complex objects on a layer. To show only one layer, and hide all the others, press [Alt], and click on the eye icon to the left of the layer, in the layers palette.
Deleting layers
To delete a layer set, but not the layers within the set, go to the Layer palette dropdown menu, and choose Delete Layer Set. Click on Set Only, when the dialog box appears, and click OK.
Linked layers

Delete only the set, not the layers that are contained in it.

If you want to make the same change to more than one Type layer at the same time, just link all of the layers you want from the Layers palette, then hold [Shift], and make your changes to one of the linked layers. All of the linked layers will show the same change.

To delete your active layer, and the layers linked to it, hold [Ctrl], and click on the trash icon in your Layers palette. You can quickly lock all of your linked layers, by choosing 'Lock All Linked Layers' from the layer palette drop down menu. You can easily align your linked layers by selecting the Move Tool and looking at the Options bar. There's a selection of buttons that will align your layers to the left, right, horizontally, vertically, to the centre, and even adjust the spacing.
Using masks
If you want your Layer mask to have clean sharp edges, add a Vector mask. To do this, hold down [Alt], while clicking on the 'Add a Mask' button, at the bottom of the Layers palette. Mask a layer, or set of layers with Layer Masks already attached, by adding
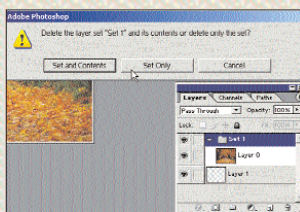
63

them to a layer set, and adding a mask to that set. To quickly and easily copy your Layer Mask, just click on the Layer you want the mask copied to, then click directly on the Layer Mask you want copied, and drag it to the Layers Mask icon.

More Layer settings

If you want to move more than one layer in your document, just link the Layers together. Do that, by clicking on the little empty box next to the eye icon in the Layers Palette.

Change your background into a fully functional layer, by double-clicking on it in the Layers Palette.

If you want to save your personal style as a Layer Style, you can add a Layer Style to its own layer by going to *Layer > Layer Styles > Create Layers*. It will appear on its own Layer beneath the original layer.

Change the opacity of the layer you're working on, by pressing a number on your keyboard. For example, typing 4 will set it to 40 per cent, typing 5 sets it to 50 per cent, etc. If you want it to be 52 per cent, just type in 5, and 2 quickly.

File handling

You can double-click anywhere on your open workspace, to bring up the Open dialog box.

When using the 'Save for Web' dialog box, you can see how your image will look on different platforms by using the arrow in the preview's upper right corner, and select-

ing which platform you want to see. Don't keep saving your images as JPEG, because Photoshop compresses the file each time. Save it as a loss-less format until you're done with the editing.

After working on a Photoshop document for a while, you may have some unseen data lying on the outside of the image. To get rid of this, and hence, shrink your file size, press *[Ctrl]+[A]* to select, and then, go to *Image > Crop*. To shrink the size of your Photoshop files further, go to *Preferences > File Handling*, and uncheck the box that says 'Always Maximize Compatibility for Photoshop PSD Files'.

To undo the save, just press *[Ctrl] + [Alt] + [Z]* a couple of times, until you see your layers coming back. To close all of your currently open images, press *[Ctrl] + [Shift] + [F4]*.

Manipulating images

Use the Clone Stamp tool, to clone from one open image to another quite easily. Just hold down [Alt], and click on the image you want to clone, then go to the original image, and start painting.

To quickly change the size of your preview thumbnail in your palettes, just right-click in an open area of the palette, and a menu will appear with your selections.

Gain lost detail of a shrunken image, by going under *Filter > Sharpen > Unsharp Mask*. In the dialog box that appears, try using a Radius of 1.0 and a Thresh-

old of 4, then play around with the amount until you are satisfied with the result. Crooked scans are common, and annoying. Fix them easily by selecting the Measure tool, and dragging it along the top edge of your image. Now, go to *Image > Rotate Canvas > Arbitrary*. Press OK, and Photoshop straightens the image automatically.
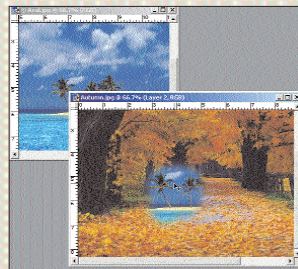
Clone one image into another

Playing with colours

Text colour changes when highlighted. To view the original text colour, and yet keep it selected, press *[Ctrl]+[H]*, to hide the selection.

To get a finger painting effect, hold [Alt] while using the Smudge tool. When using a spot colour gradient that fades to white, make white a zero percent tint of the spot colour. This ensures that the entire gradient is maintained in the separation.

CMYK colours

If you're working in CMYK mode, the colour picker is still in RGB. To get around this, press *[Ctrl] + [Y]*, while the colour picker is open. This is the Shortcut for Proof Colours found under the View menu. Get the best effect when sharpening flesh

tones in CMYK mode, by applying the filter to the image's cyan channel.

Text effects

To numerically enter the exact size for a type box, hold the Alt key, and click on your document using the Text tool. A 'Paragraph Text Size' dialog box will pop up. To quickly render your text layer, just right-click on the layer's name in the layers palette, and select Rasterize Layer. To get your fancy quotation marks back (the real ones, not the block foot, or inch mark), look under Preferences, and choose General Preferences. Here, you can choose to toggle the quotes with the 'Use Smart Quotes' selection.

Other useful tips

Gradient banding: To eliminate gradient banding when printing, go to *Filter > Noise > Add Noise*. When the dialog opens, enter 2 in the Amount field, select the Gaussian option in the Distribution section, and check the Monochromatic box. Now, just click OK.

View at 100 per cent: No matter what your current zoom level is, to view your image at 100 per cent, just double-click on the Zoom Tool icon.

Kerning and Tracking Adjust: To set the Tracking tighter, highlight the type, and press *[Alt] + [Left arrow]*. To loosen, use *[Alt] + [Right arrow]*. Adjust kerning, by clicking the cursor between the two layers, and using the same shortcuts. ◼

Off the Shelf

Rise of Nations
All rise! Here comes the emperor!

Rise of Nations, the latest contender in the race of RTS (Real Time Strategy) games, is much more logical, mature, and satisfying, as compared to previous titles.

It features eight ages, based on the human race's development checkpoints. Advance from one age to the next, based on research done in certain fields. Choose from a cartful of civilisations. Each nation has been painstakingly given a unique appearance in terms of uniforms, buildings, units etc.

The game supports up to eight nations on the map. A scenario editor is included to make your own maps. Take over nations through War, Diplomacy, Espionage, etc. Guard your borders till you advance

GETTING CIVILISED: *Develop a state-of-the-art city, complete with modern buildings and famous 'wonders'*

enough to build up a strong army, or plan a surprise attack on the opponent. You can team up with a nation to combine and attack a third nation.

The game has a remarkable artificial intelligence level. For example, if left idle, citizens automatically try to find work for themselves, be it raising crop, or repairing buildings. They automatically return to their previous work after doing the job you called on them for.

Static objects such as buildings, and moving units that allow for inter unit interaction, are rendered in intricate 2D graphics to allow for greater details. Hence, this provides a high level of detail and realism, for which a high end graphics card is a must.

Indeed, it is a well-planned RTS game and offers numerous ways to take the game forward. All in all, this game is worth a try.

Genre: Strategy ■ **Developer:** Big Huge Games ■ **Publisher:** Microsoft Game Studios ■ **System Requirements:** Windows: XP/2000/ME/98, 128 MB RAM, 500 MHz CPU, 800 MB disk space, 16 MB 3D card ■ **Online/multiplayer requirements:** 56.6 Kbps or better for Internet play
**Rating:** ★★★★☆

Muscle Car 2: American Spirit
Racing for the absolute beginner

Muscle Car 2: American Spirit is a racing game that's based on 1970s muscle cars, which were immensely popular in the US for their brute power and looks. The game has a weird interface that made browsing the menu a tough task. We were surprised to find that there was no option to change the controller settings. The game has four modes of play: Time Trial, Rally, Bandit and Career. You can select a car and the character accompanied to race in any of the four modes.

In the Time Trial mode, you have to race against the clock and cross various check points in a certain amount of time. In the Rally mode, the racer has to com-

RACING LESSONS: *Poor graphics make the car and the race circuits look dull*
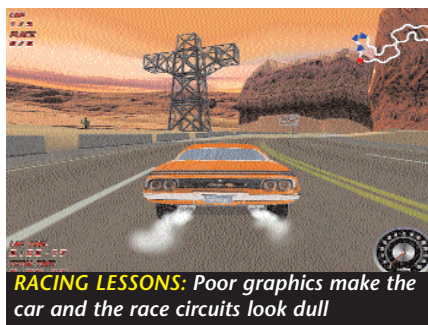
pete against opponents in race circuits, and place first, second or third to clear a track. In the Bandit mode you race against one opponent on street circuits—be ready to

handle cops who don't like the idea of street racing at all. Then there is the career mode where you can earn money by winning races. With this money you can buy better cars, upgrades, etc.

All the car models looked much the same, differing only in textures. It also has poor game physics and artificial intelligence. The opponents were bumping into each other for no apparent reason. The overall graphics quality was also disappointing. The tracks looked uninteresting as the scenes seemed to be repeating and we also found the tracks to be too long. This is not a game for die hard racers, but its low price tag makes it worth a try.

Genre: Arcade Racing ■ **Developer:** 3 Romans LLC ■ **Publisher:** Global Star Software ■ **Contact:** Sujata Infotech ■ **System requirements:** 500 MHz CPU, 64 MB RAM, 4X CD-ROM, 150 MB disk space, 8 MB 3D graphics card ■ **Price:** Rs 199 ■ **Phone:** 022-22846574/22885096
Fax: 022-22840234 ■ **E-mail:** sales@sujata.net ■ **Web site:** www.globalstarsoftware.com
Rating: ★★☆☆☆

Harnessing 3ds max 5
A journey through 3ds max

Inspired by *Matrix Reloaded,* and eager to try animation? Of all the 3D graphics software, 3ds max has traditionally been the beginners' choice. The beauty of *Harnessing 3ds max 5* lies in its emphasis on basics. It begins with a chapter covering the nitty-gritty of 3D, followed by an introduction to 3ds max. Its interface and usage is explained thereafter.

Rendering and special effects, in 3ds max, can be easily learnt. However, the same cannot be said about modelling fundamentals, which require a detailed understanding. The book covers this exhaustively; the chapter on 3D modelling is the largest. There is even a chapter on advanced modelling towards the end. Concepts such as modifier stack—one of the core features of 3ds max—have been explained in detail.

The book then picks up pace, and explains concepts regarding materials, cameras and rendering. The explanations provided are well aided by illustrations and screenshots. A summary and an exercise, provided at the end of each chapter, help you to fully understand the content.

The accompanying CD complements the book by including videos that explain the software's key features. Files for doing the exercises given in the book, are also included.

Although the book has done full justice of guiding a beginner to the intermediate level, it could have done better by touching on some advanced topics such as network rendering. Also, no introduction has been given to plug-ins such as character studio, combustion and reactor. It also does not come across as a book meant for advanced users. But have no second thoughts. If you want to dive into 3ds max, then this is the book for you, provided you have deep pockets!

Publisher: Autodesk Press ■ **Author:** Aaron Ross and Michele Bousquet ■ **Distributor:** Computer Bookshop (India) Pvt Ltd ■ **Phone:** 022-22317922 ■ **Fax:** 022-22623551 ■ **E-mail:** orders@cb-india.com ■ **Web site:** www.cb-india.com ■ **Price:** Rs 1,150
Rating: ★★★★☆

Google Hacks 100 Industrial-Strength Tips and Tricks
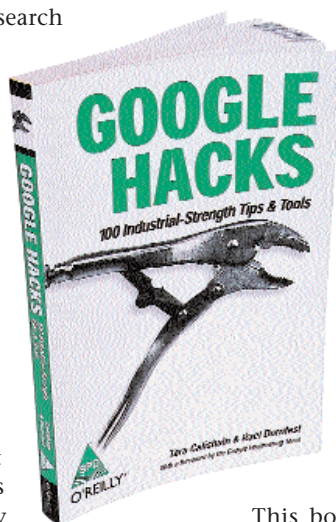## Search what you want…

Google is the undisputed king of search engines, and is your best bet to finding what you need on the Internet. The only problem is, if you don't search smart, you might get too many search results for general queries—a search for 'news' in Google throws up 237 million results. This book aims to help you conquer the art of searching.

The book describes different ways to exploit the Google search system. These are referred to as 'hacks', they are described well and yield precise and minimal search results. The book first describes basic search mechanics and then explains in detail how to use special keywords to refine your results. However, not all parts of the book are described visually, and placing screenshots in some places would have made the hacks easier to understand.

After the basic search tricks, the book also explains how to use special Google searches and services. It explains the Google Groups and Directory searches. It also talks about upcoming search techniques, found in Google Labs. After this, the book explains how to use the Google API. It also lists out various useful third party applications made using Google services. A final topic of interest is the Webmasters view to Google. It explains how to improve your Websites score in the famous Google Pagerank system.

For a more advanced user, the book provides program examples using the Google API. This is very useful if you want to use the Google search in a specific way. Many examples are provided which sort the results in different ways.

The language used in the book is simple to understand and the hacks work very well. This book is a good buy at its price, especially if you are an avid researcher.

Publisher: O'Reilly & Associates ■ **Author:** Tara Calishain and Rael Dornfest ■ **Distributor:** Shroff Publisher and Distributors Pvt Ltd
Phone: 022-27683337 ■ **Fax:** 022-23243339 ■ **E-mail:** spdinfo@shroffpublishers.com ■ **Web site:** www.shroffpublishers.com ■ **Price:** Rs 300
Rating: ★★★★☆

Tux Invasion

Digit suffered from penguin fever this month. And no, not from burning the midnight oil while working hard to collect 4.3 GB of the latest and best Linux 'distros' for you, but more from interest in learning what the hype was all about. With all the geekdom running around the office, talking Linux all day and shouting praises of 'Open Source ki jai', it was inevitable.

All throughout the month, people were buzzing around asking questions about Linux. The *nix guru's were the most sought after people, with followers hanging on to their every word when they gave their impromptu 'I-knew-Linux-was-the-best-all-along' sermons.

Even the writers team was bustling, with Aayush and Mouly arguing incessantly about whose Linux
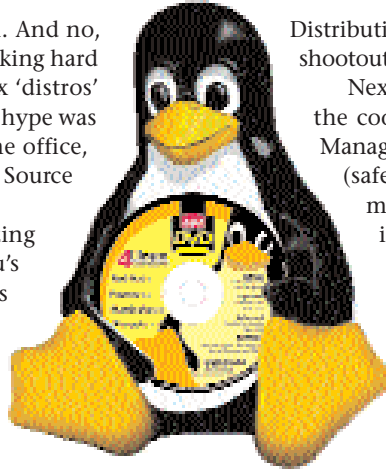
Distribution was better—thankfully the Linux shootout in test drive put an end to that problem.

Next, everyone wanted to load Linux, as it was the cool thing to do. Prashant, the CRN Brand Manager installed SuSE, Sumod installed Xandros (safely, with VMware on Windows XP) and many other swear-by-Windows non-techies installed various flavours of Linux.

All the hype, heated discussions and sermons apart, this month was a lot of fun with the penguin stampeding through the office. Let's hope things stay that way, as we do our bit to support the free OS movement. *Viva la* Open Source!

Digit's Hidden Hulks

Last month Nabjeet Ganguly (Consumer Marketing Manager), and the marketing team pulled off quite a coup by tying up with Paramount Pictures—the folks who make some real cool movies. Now if you have been following Digit (as you should have…) then you would have read about *The Hulk* contest last month in Digit (and seen the trailer on Playware). You can win free tickets to a screening of the soon-to-be released movie, and there's more-free holiday packages to exotic locations such as Kerala and Goa to be won!

Nabjeet is one of those guys who quietly pulls off some really cool deals like these. In his words, the "deal went through smoothly, since the movie is the sort that would appeal to all Digit readers", and now movie goers in ten of India's top Digit readership cities are going to see Digit logos and banners alongside the posters for *The Hulk*.

In fact, the trailers for the movie on the July Playware CD contain footage that has not been seen on any other Hulk trailers. But wait up, things are going to get all the more peachy. This month, Digit and Paramount Pictures are joining hands yet again for two much anticipated movies-2Fast 2Furious and Tomb Raider - The Cradle of Life. The Playware CDs again contain must-see high-action trailers from both the movies. And yes, there are contests galore. Digit readers now get to win 1,500 tickets for each movie—and vacation packages!

Now with the marketing team doing this, it was natural for just about everybody in Digit to demand a ticket. Since Nabjeet
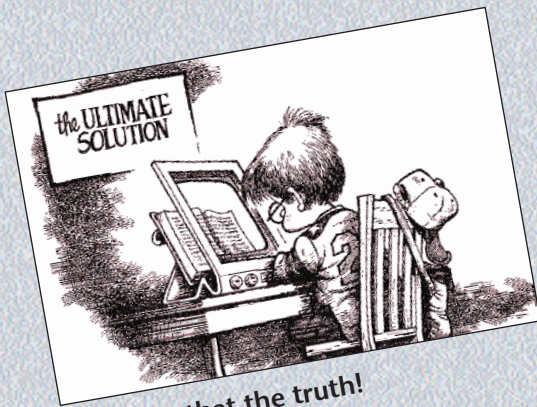
hasn't come forth with tickets yet, wild rumours are abounding about how Nabjeet and his team are going to 'black' the tickets—but you didn't hear this from us!

The hunt is on…

Three months after the first talent hunt, the newbies are no longer that, and have settled in. When asked how they were doing, the results varied from, "Fabulous! Man" and "The high speed Internet rocks!", to "Can't talk now, got a game review to do" and "The only problem is that my parents miss me, and I feel guilty, because I don't!" They seemed to be fitting in just fine, between game… err… reviews and surfing the Internet for (Ahem!) research.

What we needed was some new faces around, especially because we needed some new people to rag. So up came Talent Hunt 2. This time the sales and marketing department wanted to hire… The procedure was planned and finally the test began. It was scheduled to run for 24 hours starting at 12 midnight on the twentieth.

Once again, the response was phenomenal, and the dedicated server we had set up to run the tests was bogged down by 11 am. Rakesh Tiwari our systems administrator had to rush to set up another server just to be able to handle the traffic. Throughout the day there were people logging on to take the 175-question test. At 1 am the next morning Rakesh and Anurag Gour (Head Client Marketing) told us that 2,500 individuals had logged on to try their luck for the first round of tests. Here's wishing all those who took part the very best of luck. With the second round of tests (for the 200 short-listed candidates) around the corner, we're sure to get the cream of an already impressive crop. Watch this space for updates. d

the ULTIMATE SOLUTION

Much ado about 'Nothing'

▼

Ain't that the truth!

Nothing 4 Sale

I am legitimately trying to sell *nothing*.

It is hard to describe *nothing* but I can tell you that it is nothing like anything you have ever seen. There is no photo available because I do not know how to take a picture of *nothing*.

Some sellers have tried to trick buyers into buying *nothing*. This is not my goal. I am really trying to sell *nothing*. My friends tell me that people will buy *anything* on eBay. Now I want to see if it is possible to sell *nothing*. I also want to find out how much *nothing* is worth to someone? I want to find out the price of *nothing*.

If you want to be the first person to buy *nothing* from me, bid on this item. Bid as high or as low as you want to (there is no reserve price). I may or may not try to sell *nothing* again; it depends on how well this auction goes. But if you want to be the first one to buy *nothing* from me, then go ahead and bid on this item.

Note: If you bid on this item, you are bidding on *nothing*. If you end up with the winning bid, you will get *nothing*. I will ship *nothing* to you. There are no shipping costs associated with this item because it costs nothing to ship *nothing*.

Thanks

Now here's a believer in Extraterrestrial life forms, if we ever saw one

We bring you your horrorscope...

Leo
July 23 - August 22

This month you are sure to try something new. Being the Explorer that you are, get up, close all Windows, don your (Red) Hat and do a Mandrake style disappearing act.

Aur Ek Kal (Oracle)

Kabh se *boot* kiye baithaa hoon,
PC apne pyaar ka.
Kaise *type* karoon mein lekin,
Password izhaar ka.

Dil ki chaaron *drives* pe meine,
Jaana tujhko *search* kiya.
Yahoo, Yahoo, Google, Google,
Kitna paisa kharch kiya.

Tere chehre pe *gussey* ka,
Screensaver jab aata hai.
Mere chehre ka *display* tabh,
Greyscale ho jata hai.

Jinke *links* abh toot chuke hain, *(Ex-Boyfriends)*
Shortcuts woh *wipe* karo.
Apne dil ki *Init.ora* mein,
Mera *address type* karo.

Aakar dekho toh mujhko,
Mein *SQL prompt* pe rehta hoon.
Tere *login* ki chaah main kitne,
Scott/Tiger sehtaa hoon.

Chaahat hai tere pyaar ki *site*,
Raat-din mein *hack* karoon.
Patthar-dil daddy ka tere,
Software bhi *crack* karoon.

Buddha agar jo maan gaya toh,
Hum *connect* ho jaayenge.
*STG key serve***r** ki,
Phere phir saat lagaayenge.

Ginti ke bas bache hain baaki,
Mere jeewan ke yeh pal,
Tu jo aakar pyaar se chhoo le,
Mil jayega ***Aur Ek Kal***.

Jai Oracle, Jai Oracle

Contributed by SP Singh

Your chance to bite back!

Highlight the lighter side of computing. Mail your contributions to: Backbyte Digit, Plot D-222/2, TTC Industrial Area, MIDC, Shirvane, Nerul, Navi Mumbai 400 706 or e-mail us at backbyte@jasubhai.com