



digit

>> Your Technology Navigator

dare to BUILD 1

10 or choose from Branded PCs

Backup to Recovery:   

We review the varied options to ensure your documents don't pay the price

25 easy steps towards peak performance of your PC



Set up the arena for Quake3 or Unreal Tournament on Linux

5 great PDAs to choose from:
A comprehensive look at hardware & software available



Finally! Next Generation Technologies to rescue you from the Huge Data Explosion



PLUS

Reviewed: Samsung DVD HDD Recorder, NEC MultiSync LCD 1560v, VIA C3 Processor, Iomega 120 GB Portable HDD

The Personal Entertainer


Would you buy a TV from your local computer hardware shop? The major computer companies are betting that you will. Microsoft has been pushing hard to break Windows out of the PC box, with Smart Phone editions, Pocket PC editions, and the much talked about Media Centre edition. Of the whole bunch, the Media Centre edition is most likely to come to a device near you. It is a version of Windows XP with software that makes finding and using digital media simple. It drives the Media Centre PCs that aim to take over the prime spot your TV currently occupies.

Digital technology pervades entertainment, and all of that digital content is accessible to a PC. A PC provides the most flexible way to control and manage content as well, so naturally it is increasingly the common touch point for that content. This is where PC vendors smell opportunity. As always, the changes are early to the US, and then flow out to the rest of us.

That the PC hardware industry has plummeted over the last couple of years is no secret. While Dell and HP command large shares, both have poor profit margins. High-value consumer electronics, on the other hand, is a growth area. Would you buy an HP digital camera? How about a Dell MP3 player? They both connect to a PC, so they could simply be accessories like a printer. Consumer electronics companies are already selling you these devices, and barring Apple, no PC manufacturer has managed the transition. Dell specialises in entering markets and winning primarily on price wars.

Coincidentally, that is the core strength of the Asian 'unknown' brand manufacturers. The technology for VCD and MP3 players is quite commoditised, with very little variation in the basics, so it may not be surprising that Chinese and Taiwanese exports dominate the entry-level markets everywhere. In India, these low-cost players simply own the VCD and MP3 player markets. Asian manufacturers make the devices that are branded by the MNCs and sold worldwide. Next up, are low-cost digital cameras from Taiwan that will knock the bottom off digital camera prices.

Either way, look forward to a flood of affordable digital media and entertainment tools headed for your PC.



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Sumod Hajela
Assistant Editor

“That the PC hardware industry has plummeted over the last couple of years is no secret”

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Reviewed this month

HARDWARE

Bazaar 89

- Creative Sound Blaster External USB Sound System
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- Fujitsu Lifebook B2620
- NEC MultiSync 1560v LCD monitor
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digit
interactive

FREWARE

Dotfuscator Community Edition 1.1
Jumbles your code to prevent reverse engineering
Size: 7.32 MB
Mindware\Software\Dev Tools

Nullsoft Scriptable Install System 2.0 Beta 3a
Create flexible installers for your software
Size: 1.32 MB
Mindware\Software\Dev Tools

FreeProxy 3.5
Share your Internet with other networked PCs
Size: 3.84 MB
Mindware\Software\Internet

Spybot - Search & Destroy 1.2
Weeds out those pesky spyware
Size: 3.5 MB
Mindware\Software\Internet

BSPlayer 0.86.500
A light-weight multimedia player
Size: 1.05 MB
Mindware\Software\Multimedia

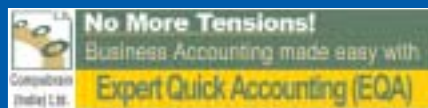
CDex 1.51
Copies Audio CD songs to the hard disk
Size: 1.51 MB
Mindware\Software\Multimedia

Gspot 2.21
Identifies the encoding used for audio or video in a movie
Size: 0.2 MB
Mindware\Software\Multimedia

IrfanView 3.85
Quick and easy viewing of multiple image formats
Size: 0.79 MB
Mindware\Software\Multimedia

MailWasher 2.0
Helps minimize the effects of Spam
Size: 1.4 MB
Mindware\Software\Office

Rain 2.0
Keeps your CPU cool when idle
Size: 0.14 MB
Mindware\Software\System



KNOW YOUR CD

PLAYWARE\GALLERY

Bored of the same look of your computer everyday? Time to give your PC a new look? The Gallery section of the Playware CD brings you an assorted collection of desktop wallpapers, media player skins and themes. We have skins of both Winamp 2 and Winamp 3, and Windows Media Player 9. Also included, are wallpapers of various themes such as nature, sports, abstract art and even Indian movie stars! The themes sub-section is the place to find themes that can transform the complete



look and feel of your Windows PC.

MUST TRY SOFTWARE

Silent Storm

Silent Storm is a turn-based game, set in based around the environment of World War II—your objective is to sabotage the



enemy's move. 75 WWII weapons can be deployed among 40 soldiers who are from about 30 different nationalities. You can destroy anything on screen, including buildings and dungeons.

Size: 199 MB Type: Trial
Playware\Arena\Games

Diskeeper 8

Diskeeper 8.0 is the latest version of the powerful disk defragmenter for Windows. It can defragment your files, folder and even core Windows files. It can run in the background and minimise fragmentation. Version 8 can also intelligently suggest the existing fragmentation level and the ill-effects of the same.



Size: 19.5 MB Type: Trial
Mindware\Software\System

StreamSicle 2.0

StreamSicle allows you to start a MP3 server and a light Web server on your PC.



People connecting to the server can request songs and enjoy a jukebox-like system.

Size: 11.1 MB Type: Free
Mindware\Software\Multimedia

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WEB SPECIAL



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

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The screenshot shows the Digit website with a blue header. The main content area is divided into several sections. On the left, there's a sidebar with links like 'HOME', 'PAGE 100', 'COLUMN', 'TECHNOLOGY NEXT', 'ORIGINAL', 'PASSPORT', 'NETRETURNING', 'PERFORMANCE', 'RESOLVE', 'WORLD', 'UNWIND', 'TIPS & TRICKS', 'SELECT', 'TEST DRIVE', 'ENLIGHTEN', 'REINVENT CARD', 'DIGIT INTERACTIVE', 'RENEWAL', 'PLAYWARE', 'DIGIT CD ARCHIVE', and 'STAY UP-TO-DATE'. The main content area features a large image of a Digit magazine cover for November '03, a search bar, and several article teasers including 'Just tell us which products you own', 'Install Linux without burning its image', 'Computing for Absolutely Everybody', and 'Taking the weight off your Lap'. There are also links for 'Subscribe' and 'Feedback'.

BY DEMAND

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



▶ **MediLexicon Medical PC Search Box 2.0**
Size: 1.42 MB
Mindware

▶ **Star Wars Jedi Knight: Jedi Academy**
Size: 87 MB
Playware

Expect these on the December 2003 CDs

WEB SPECIAL

Line of sound

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



FORUM

Want to brainstorm? Start a discussion? Share an idea?
Log on to www.thinkdigit.com/forum

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news feed

DIGIT | NOVEMBER 2003

hypothesis

Vanderpool

■ What is it?

Vanderpool is the codename for the hardware technology that Intel expects to build into its processors in 5 years. These processors will be able to run several operating systems simultaneously on a single computer.

■ What does it do?

Operating Systems are the gatekeepers of a computer's hardware, giving access to applications as required. Running more than one operating system is not possible without additional software that creates a virtual machine. Vanderpool allows you to create virtual machines within the processor itself.

■ How does it work?

Vanderpool does not eliminate the need to run virtualization software, but it does make it simpler. It creates a hyper-OS on top of which other OSes can run. Hence you can run several versions of Windows, along with Linux.

snapshot

Skype, a tool to make free calls, was downloaded **1.3 million** times since its launch on **Aug 29th 2003**

Source: Skype

India, China the rising stars: Intel Chairman

Intel's Chairman, Andrew S Grove, observed that India and China dominates US in important high technology sectors. India's booming software industry, which is increasingly doing work for US companies, is capable of surpassing America in software and technology service sectors by 2010. He said that US's software and service businesses are under siege by countries such as India and China, who have the advantage of cheap



ILLUSTRATOR: Farzana Cooper

labour costs and strong incentives for new financial investment.

According to industry figures, more than half a million technology jobs were lost from mid-2001 to mid-2003.

The Gartner Group estimates that 10 per cent of the jobs at US information technology vendors will move offshore by next 2004.

Phone check-mates grand master

Ruslan Ponomarev, a Ukrainian chess grandmaster, was disqualified during a match because his cell phone rang. The 20-year old Ponomarev was playing against the Swedish grand master M Evgeny Agrest at the European Team Championships, when a phone call ended it all. Mobile phones are banned during a game as a player can receive information, or access a computer database of possible moves. Ponomarev, the youngest World Champion of 2002, now earns the distinction of being the first person to be banned under the new law. Incidentally, it was also the day of his birthday. Ponomarev protested by refusing to sign in the score-sheets where the players are required to record their moves and the result of the match. The match was drawn with the score of 2-2.

Go ahead Rambus

"It's not over until the fat lady sings, and today, the fat lady sang", said Rambus general counsel John Danforth on 6th October, after the US Supreme court refused to hear



Infineon Technologies' appeal against Rambus. This clears the way for the chip maker to

prove that memory makers are violating its patents. Rambus stands to gain up to \$1 billion as royalty, if Infineon is proved

to have infringed the latter's intellectual property. The results

of this case will impact similar suits Rambus has filed against Hynix and Micron Technology.

Web search hogs

Web surfers find themselves redirected to unfamiliar Web sites, or find that their browser preferences have been changed without their knowledge. The domain registrar—VeriSign—attempted to redirect mistyped domain names to its own search page. In October 2003, a Trojan horse called QHosts, changed domain name system (DNS) settings to redirect visitors to such Web sites, as Google.com, to an alternate search site laced

with ads—all in the name of coveted Web search hits.

Google was deluged with complaints from Web surfers about their site being not reachable. Experts expect an increase in search hijacking attempts according to the given value of search traffic.

VeriSign's temporary experiment represents more fights to come. Even search engine and security consultants agree, saying other search attacks are sure to follow.

■ Sun release Solaris for AMD64 ■ Benchmarks indicate that the Big Mac—a supercomputer built using Power Mac G5—maybe the second fastest on Earth

Intel's not inside

Wearable Pentium processors are still not in vogue on the streets, and while there's the possibility of wearable computers, Delhi-based Aditi Enterprises certainly aren't



looking at marketing them. The compa-

ny was selling clothing under the brand name 'Pentium' and was predictably restrained by the Delhi High Court from doing so. This, thanks to a lawsuit filed by Intel. Intel put forth that although it was primarily a technology company, it had been involved in promoting souvenirs such as T-shirts, bags, jackets and other accessories bearing the Intel and Pentium trademarks. The court ruled in favour of Intel, and decided that the clothing manufacturer cannot be permitted to use the brand name, and should that happen, the losses to Intel Corp. could not just be monetarily compensated.

Fade to fade away piracy

Game developers have come up with a technology that allows users to play with pirated copies of their creation. Under the new system, an illegal game would run but not ideally; you would not be able to play it well. Take a first-person shooter as an example: a missile can be fired, but it will not hit the target; or for a racing game, the brakes may not work, etc. A game thus protected, will run fine initially, but just when you're hooked, you'll find eccentric behaviour. All meant to encourage users to buy legitimate copies of games.

The technology aptly named Fade, uses the error correction mechanism found in optical drives and has been jointly developed by

redalert

Nav32

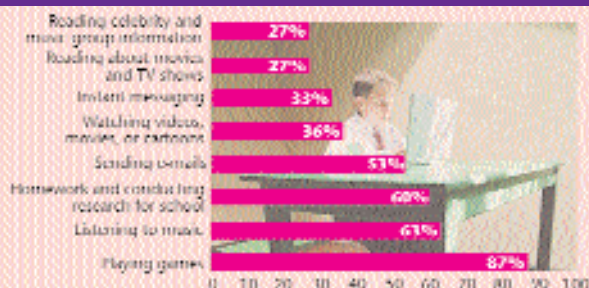
This trojan horse arrives as an e-mail attachment with the sender's address as updates@symantec.com. The attachment is named nav32.zip. When the attachment is unzipped and executed, the trojan copies itself to the Windows folder and modifies some registry keys. It then connects to the IRC server, itc.ourmoney.pp.ruz, from where the hacker can gain control of the system, and use it to perform activities such as launching DOS attack, updating the trojan, etc. Visit www.symantec.com/avcenter/venc/data/w32.ircbot.b.html for removal instructions.

BAT.Deav.Worm

BAT.Deav.Worm propagates through networks such as KaZaA and iMesh. When the worm is executed, it deletes .exe, .dll, .dat and .ini files. Then it copies itself into the file-sharing software's shared folders under various file names for propagation. Later, it deletes all files with the extensions .doc or .zip, from the C drive and proceeds to shut down Windows. Visit <http://securityresponse.symantec.com/avcenter/venc/data/bat.deav.worm.html> for a removal tool.

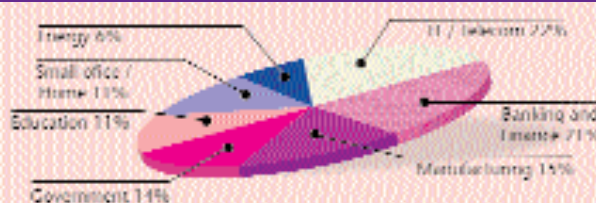
statattack

What do Kids do Online?



Source: America Online/Digital Marketing Services Inc

Indian Domestic IT Market



Source: Nasscom

INFOGRAPHICS: Sachin Dalmi

macrovision

Macrovision and Codemasters. Games protected using Fade will contain code that disguises itself as scratches on an optical storage disc. When an illegal copy of the disc is made, the CD-Writer makes a duplicate without those scratches, due to the error correction mechanism. Later, the game looks for the code, and if it isn't found, the version is tagged as illegal.

The technology has been implemented in a game called *Operation Flashpoint*—in the pirated copies, guns shoot off-target and bullets run out faster than normal. Macrovision plans to release a copy protection scheme called SafeDVD. Here, a pirated DVD would stop working after a key point in the movie's plot.

snapshot

The US is expected to face a labour shortage of 5.6 million by 2010

Source: Nasscom

■ MSN debuts free MSN Video—a free video streaming service ■ More camera phones sold than Digital still cameras in first half of 2003

E-mail your personality

Every e-mail you send, contains clues about your personality. At least that is what scientists at the Edinburgh University believe, and have hence created a program that analyses your e-mails to sketch your personality. Christened Personality Style Checker, this tool can be used by corporate bodies to write letters that project a particular personality.

Spotting the personality is only a secondary function of the Personality Style Checker—it integrates with a word processor and can be used like a spell checker. When executed, the program will highlight the words that don't project the specified personality and offer alternative words that can be used.

The same technique can be used with incoming e-mails to detect the personality of the sender. By looking at the words used and punctuation style followed, the program picks out the personality type. The programs uses a database of set personality types that has been built by observing real-life human personalities, and their pattern of speech and writing.

snapshot

1.1 Terabytes of data were sent at **5.4 Gbps**—the fastest data transfer rate over the Internet—between **Geneva** and **California**

Source: CERN

SHIFTy anti-copying measures

All sorts of copy protection schemes have been devised to protect CD content, but here comes the easiest one to bypass. SunnComm's copy protection technology was used by BMG in a recent Anthony Hamilton Audio CD. Princeton PhD student, John Halderman, found out the anti-



copying measures were circumvented, by as little as holding down a strategic key. What John Halderman learnt was that simply holding down the [Shift] key would prevent the anti-copying program from loading up using the Windows autorun feature, hence circumventing the measures.

Both BMG and SunnComm say that they knew about this, and they claim that the protection measures, though easily breached, are enough to deter casual listeners from copying them. In fact, in an effort to appease digital music junkies, BMG has also included pre-ripped tracks on the CD that could

be then played on a computer, and be copied, though limited number of times. Another

interesting development was that shortly after the Princeton student put up his paper on the anti-copying technology used on his Web site, SunnComm threatened a lawsuit, claiming losses to the tune of \$10 million, but later retracted following an intense barrage of criticism by e-mail.

TV on pipe

Within the next 2 years, the biggest competitor to cable TVs could be computer cable TV. Taking a head start in this race to provide IPTV (Internet Protocol based Television), Reliance Infocomm, has collaborated with Microsoft to provide quality television broadcasts and video-on-demand services. After having laid the required cabling for their countrywide high-speed network, Reliance is looking forward to offer people broadband access to the Internet, with Web surfing and multiplayer online gaming. They are also looking at piping in TV through the network,

providing users access to over 1,000 channels of cable TV. Microsoft, in turn, is providing the software support needed to run the network. Also,

with the steady acceptance of the Windows Media Player 9 compression technology, Microsoft claims that they can offer standard broadcast quality television over an Internet

connection of 1 MBps. Of course, there are stumbling blocks, such as the availability of cheap set-top boxes that could receive and decode Internet TV, but both Microsoft and Reliance Infocomm are optimistic.



heroes

Extreme processors
Intel and AMD have released the desktop version of server processors that have loads of cache to better their performance. Their target audience of the Pentium Extreme edition and the Athlon64 FX are targeted squarely at gaming enthusiasts, who have deep pockets and a huge appetite for performance.

Indian Mobile Market

With a 100 per cent growth rate in the cell phone market, the number of Indian mobile subscribers are set to exceed those with a landline connection by the end of 2004. The Indian market is known to be one of the fastest growing mobile phone markets in the world.

zeroes

OS/2-powered ATM

Bank ATM machines are set to shed their loyalty to OS/2 and move to Windows, since IBM is discontinuing support after the year 2006. Although IBM is officially encouraging migration to Linux, two large ATM vendors have already switched to Windows.

Exploding Mobiles

Three Nokia mobile phones—two in The Netherlands and the third in Vietnam—exploded with in a span of two months. Nokia claims that counterfeit batteries were the culprits behind the explosions, though that is proved to be the reason for only two of them. A Kyocera phone also exploded in a car in Nebraska, USA—the cause for this one is still unknown.

IBM airbags notebook

IBM recently launched two ThinkPad notebooks—the ThinkPad R50 and the Thinkpad T41—with a new data protection feature. The Active Protection System technology is somewhat similar to the one used to deploy air bags during a car crash. A device containing a microchip detects whether



the notebook is falling or being dropped, and accordingly, freezes the hard drive's read and write head until the system shows it has stabilised.

Robert Enochs, IBM's segment marketing manager for the ThinkPad P Series, expects the new technology to bring about a decrease in warranty expenses. Initially, IBM will incorporate the technology only in the two new ThinkPad models, incorporating the feature into other models in the future.

Vying for your ears online

Music lovers seem to have the gods smiling down on them; at least on those who play their music on computers. Apple Computer is to expand its online iTunes Music Store service to Windows-based computers. Sony too announced the launch of an online music



service, while RealNetworks declared an add-on download component to its Rhapsody service. Napster also launched its new service, Napster 2.0, which is very different from the original Napster. It now charges only 99 cents for a single tune to anyone who downloads its free software. At \$10 a month, one can listen to an unlimited number of streaming songs.

Similarly, MusicMatch and BuyMusic are operating online music download services that are aimed at Windows users.

Apple said earlier that it had sold 10 million songs through the iTunes store, serving just the relatively small Macintosh market. According to RealNetworks, subscribers listened to more than 21 million songs in the month of September, representing a 30 per cent jump in usage since August 2003.

Applaud the King's Return

As the visual effects work that they approached Weta in

On the *Lord of the Rings* trilogy enters its final leg, the baton will be carried home by none other than Mumbai-based Applause Entertainment. The final part of the epic, *Return of the King*, is expected to premiere in December 2003. The prestigious contract will be executed in Applause's Mumbai office and will be headed by N. Madhusudhanan. The movie's director, Peter Jackson, owns New Zealand-based Weta Productions, who did the effects for the first two prequels. Applause Entertainment's Chief Operating Officer Anshumaan Swamy said



May and did a multi-layered test shot for them. The job was completed in record time and they were selected for the contract, expected to be worth between \$130 and \$140 million. The Applause team have big shoes to fill, after the spectacular effects of the first two films won the Oscars.

second largest market share, the DBTEL Group showed intentions of establishing a subsidiary or a branch office in India in the near future. Currently though, it has appointed Chennai-based Munoth Communication Ltd as its distributor. Tu said that DBTEL plans to capture 20 per cent of the Indian market share by the end of 2004.

DBTEL Cells in India

DBTEL, a Taiwanese telecom company, plans to launch 10 to 11 cell phones by the end of November 2003. Although it has yet to reveal the price range of the new handsets, Lewis Tu, director of DBTEL, indicated that the low-end models would cost roughly around Rs 4,000 to 4,500.

Referring to India as the



second largest market share, the DBTEL Group showed intentions of establishing a subsidiary or a branch office in India in the near future. Currently though, it has appointed Chennai-based Munoth Communication Ltd as its distributor. Tu said that DBTEL plans to capture 20 per cent of the Indian market share by the end of 2004.



Spam

Guiding spam

Three of America's top advertising trade groups have come together to formulate guidelines that will legitimise e-mail-based marketing messages. The groups claimed that since spam was killing the potential of e-mail marketing, it made sense to have all marketers adhere to guidelines that would ultimately help a customer differentiate between legitimate commercial e-mail and spam. The guidelines, being self regulating, are pretty interesting: some of the nine listed guidelines include providing a valid e-mail address that belongs to the sender, a clear and reliable option for customers to let themselves exit from the list, and that e-mail addresses should be added with the consent of the owner, and addresses should not be sold to or shared with other parties without prior approval.

Spam smarts

A study conducted by DoubleClick Inc found out that 65 per cent of consumers delete spam without reading it and 4 per cent read it to see if it's of any use. The numbers compare favourably with those of last year, when 60 per cent deleted it and 5 per cent read it. DoubleClick says that consumers are using different techniques to combat spam—ranging from bulk mail folders, to separate e-mail addresses. In another study by the Pew Internet and American Life Project, respondents believed that spam was one of three top priorities for their companies.



■ USA-based ClearSpeed Technologies has designed a 25 gigaflops chip ■ Yahoo! launches SmartSort—a new online customised shopping tool

ATi get driver driven

Nvidia drivers are generally considered to be superior compared to other drivers in the video card market, but lately, ATi broke new ground by introducing new features in the latest Catalyst drivers. The company has features such as resetting the video card, over-clocking, better support for Linux and a better interface. The star of the features is VPU Recover that lets you reset only the video card. This will be very



useful as the entire system becomes unusable after a system crash. A hardware crash occurs if a hardware piece is unable to communicate with the corresponding device driver. When the VPU Recover feature is enabled, the display driver will be able to detect when the video card stops responding to its commands. Once the hardware hangs, the system will be restored depending on the severity of the crash. If both fail, a software rendering method is used to restore the system. The company has also introduced the error report feature, similar to the one in Windows XP. After any video card related crash the system will send an error report to ATi; if desired, this feature can be disabled.

snapshot

Blaster worm
infected more than
5,00,000
machines in
August

Source: Symantec

Half-Life 2 stolen 2

"I need the assistance of the community" was the title of the Gabe Newdell post confirming that the source code of *Half Life 2* was stolen. Newell is the founder and managing director of Valve Software, the developer of the game. In a post on the games forum Newell said that



around September 11 2003, someone gained access to his mailbox. The hackers then managed install keystroke loggers on several systems at Valve Software, exploiting a buffer-

overflow error in Microsoft Outlook's preview pane. These tools apparently helped the hackers copy the source code.

Newell appealed to the Half-Life community to help nab the culprits; any information regarding the incident can be mailed to help-valve@valvesoftware.com. Fortunately, the hackers couldn't lay their hands on the maps and sounds that are vital to recreate the game as visualised by the game developers.

Wheeling off

Once hailed as the future of personal transportation, the Segway human transporter is now in trouble—all thanks to a power problem. The Segway is a two-wheeled device on which the rider stands up on a platform between two wheels; the device is powered by a battery that runs an electric motor, and the vehicle is steered by a handlebar. A combination of onboard computers and gyro-



scopes keeps the rider balanced on the two-wheeler.

Segway and US Consumer Product Safety Commission (CPSC), found that if the batteries run down, there may not be enough power to keep the vehicle upright. Segway has recalled all 6,000 machines sold so far, and all current human transporters have received a software upgrade that should fix the problem.

quoteworthy

"The primary mission of Google is to get you what you want, rather than what someone thinks you want"

Eric Schmidt, CEO of Google, while discussing the future of search. Google is looking at personalisation as a means to improve its search results

"The cellphone market is enjoying 100 per cent growth. Each month, one million new users are added"

R. N. Jha, India's Minister of Telecommunications and Information Technology, speaking at the Telecom 2003 trade fair in Geneva

"But if you think you can experience the power of the Internet on a 1-inch screen, you've got to be out of your mind."

Martin Cooper, inventor of the cell phones playing down the 3G hype, stating that 3G will continue to disappoint

tomorrow's technology

Oily e-paper

E-paper has the ability to exchange the information displayed electronically. E-Ink uses positively charged white particles and negatively charged black ones, changing the polarity to bring either to the front. Another technology uses half-black and half-white spheres. These are flipped, depending on what is required. These work ade-

quately for text, but neither can display moving images.

Researchers at Philips, Netherlands, have come up with a technique that could overcome this and greatly increase brightness. The display works on electrowetting—a technique that allows for rapid control of fluids at micrometer scales. Each pixel consists of a white substrate,

with an electrode above it. Above that is a layer of coloured oil and water. The water stays on top due to a water-repelling insulator. The oil contracts when a voltage is applied—allowing the white substrate to reflect light. The state changes in a span of 10 milliseconds, which is more than enough for smooth video.

Take my CDs

Hello Digit,
I have 30 to 35 Digit CDs in good condition. I format my PC once in a while, and install some utilities from the latest CD. I don't know how to utilize all these CDs. One of my friends just disposes the CDs after a month, but I don't feel like doing that. I have tried to exchange them, but my friends are regular readers of Digit too. Can you tell me what to do with my CDs?

Raman Garg
Via e-mail



ILLUSTRATOR: Mahesh Benkar

Dear Raman,
That's a problem that never occurred to us! We are sure many readers would have gaps in their CD collections that you could help fill. The best avenue for this right now is the thinkdigit.com forums where you could post a message and give the CDs to interested readers.

digit

Registry hacks

Dear Sumod,
Your booklet on Q&A was simply superb. What I have noticed is that the best way of getting rid of a problem is tweaking the registry. This subtle art is known by a very few. So how about an issue on Windows Registry?

Secondly, A-list is very useful, but limited. All you do is let us know about the best! We need to know about every-thing. So how about listing categories, and the listing all the products available in the market?

Ashish Kalantri
Via e-mail

digit

Dear Ashish,
The A-List is reserved for products that we can unreservedly say are the best available in their category. We cannot hope to list every product available in the market, which would fill entire books, in one or two pages.

Directly editing the registry is a powerful and dangerous tool. We have suggested solutions and tweaks that involve editing the registry, but it is important to exercise caution when delving into critical system areas. We will look at covering the more interesting registry hacks soon.

AMD adorer

I was horrified to see the front page of the October 2003 edition commenting "Athlon FX 64 performance champion, or still second best". You never gave the hardware specifications for the Athlon FX 51—no motherboard was mentioned, nor the chipset. According to you, AMD has a 400 MHz quad-pumped FSB, compared to 200 MHz in Intel 3.2 GHz. It supports 64-bit cinematic games, while your Gigahertz monster is going to fail in 18 months. AMD killed Intel in almost every game, P4 failed even in *Quake III*. The term 'cinematic experience' comes from AMD. Even if you boast and recommend your fake Gigahertz monster, your readers know the truth. It is just a matter of time that costly and non-upgradeable Intel processors are thrown out of the market.

Venkatraman
Via e-mail

Dear Venkatraman,
The processor was tested with an nForce3 motherboard, 512 MB DDR 400 RAM and a GeForce FX 5900 Ultra video card. The processor specifications are indeed impressive, but the performance numbers speak for themselves. While the Athlon may eventually enable cinematic experience when 64-bit games are released, its current performance with 32-bit tasks is not conclusively superior. Of course, these are early tests with software that is not optimised to handle the new processor as we said in the review, but these are the software the processor will have to deal with for the time being. We intend to revisit these tests when more 64-bit software becomes available.

In our recommended PC configurations in this issue, you may notice that we recommend Athlon because they are great value for money. However for now, the Pentium 4 3.2 GHz will continue to remain on top of our performance charts.

digit

Grateful about RAM

Dear Sumod

I happen to be a dealer of assembled PCs in Baroda. In your August issue, Agent 001 talks about branded memory from Corsair and Crucial. This was good news, as I have always wanted to give my customers good quality RAM. You also mentioned that a lifetime warranty is valid for 5 years, and not 3 years. In India, people do not give attention to the quality or quantity of RAM; even branded PCs bundle only a pathetic 128 MB RAM with their 2.4 GHz machines. It's like giving Ferrari cars tyres rated 4,170 Km/h to machines capable of only 300 Km/h. I do hope to see more interesting articles from you to help people buy better products.

Sundeep Govindan
Via e-mail

digit

Dear Sundeep,
Balancing the budget across the key sub-systems in a PC is a fine art, and RAM seems to be the most overlooked component. As you rightly point out, 128 MB is fine for Windows 98 users, but any desktop version of Windows or Linux released in the last two years would perform much better with a little more. It's not just branded PC makers, even assemblers hinder their computer's performance with high speed processors and slow everything else. It's great to see an aware assembler for a change. Keep up the good work!

digit READERPOLLS

Your vote counts

This month's question:

Question: How do you get your music?

- ☐ Buy original cassettes and CDs
- ☐ Download MP3s

- ☐ Borrow or record from friends
- ☐ Don't listen to music much

Log on to www.thinkdigit.com and vote

Devise to advice

Dear Editor,

Earlier, Digit used to carry articles that were of interest to the common man such as an architect or a doctor. Today, the articles are about technology, security, Internet and some tests. The article on technology in combat was good, it touched the technology used in the Defence industry quite superficially. Also, there was no mention of technology used by the Indian Defence Forces.

The comparison tests dwell more on how the products are tested, and less about the product themselves. Earlier, every product was rated individually, with its pros and cons clearly spelled out. Now I have to run with a fine comb to find out if you have mentioned something about the product of my interest. Also, products should be tested for performance only, and not price, as they can be slashed. This is unjust not only to the product, but also to the reader.

I think that one CD is more than enough; there isn't much to offer in two CDs, and storage becomes a problem.

Most of the CDs that you offer with your subscriptions have only shareware or Freeware that is available in the Digit CDs. This time, when I renewed my subscription, I got royalty free Clip Art CD that I had already got as part of a previous subscription.

People like me, who are transferred from one city to another at regular intervals, find lugging along old issues of Digit very cumbersome. In my case, it has lead to a number of fights with my wife. It would be a lot better if the old issues could be given on a CD.

Ashish Rikhye

Via e-mail

Fastmail fanatic

My heartfelt sympathies to all those who are still stuck with their ailing Hotmail accounts. Reading all that useless spam everyday, and getting a measly 2 MB for storage space are just some of the irritating things a Hotmail user has to go through everyday. I did some research and zeroed in on one of the best e-mail providers-Fastmail (www.fastmail.fm). Fastmail has been hailed by several sources as the fastest and slickest e-mail service on the planet. I found it to be so. The interface is clean and many of which are customisable. Since I have switched to this service, I have not received a single spam! I am in no way connected with anyone associated with Fastmail, but I am simply in awe of the service. I think all Digit Readers must be informed of it.

Prayaas J. B. Rana

Via e-mail



Dear Praayas,

Thanks for the tip. Indeed many free e-mail service users could benefit from this. However, e-mail is a lot like a telephone number. If you use it a lot, then changing can be a big pain for people to get in touch with you. That's why for many who first get hooked on e-mail with Yahoo! or Hotmail, stay hooked.

Dear Ashish,

Thank you for sharing your ideas on how to improve the magazine. You will be glad to see that we are already implementing some of these changes. The comparison test format has been changing to individual product reviews over the last few months for most comparisons. While we continue to recommend products that give the best value for money, the performance rating is given for all individual product reviews.

We are already considering the possibility of making our issues available on CD, and the interest of preserving the domestic harmony of a loyal reader only lends more urgency to the matter!

Dear Gaurav,

The best way to place an order for an older copy of Digit would be at narayanan_r@jasubhai.com, or at the addresses and phone numbers provided on the services page. It is unlikely that the Digit Encyclopaedia of Technology subscription offer will be extended.

Your suggestions on A-List and Zero1 are interesting, and we will look at implementing them soon. However, it is not feasible to test last year's products in current comparison tests, unless they are still being sold by the company in question.

Agent 001 discovered many irregularities in the RAM market, including what turned out to be fake and substandard products labelled with most of the leading brands, making a comparison test a difficult proposition. We are going to highlight these problems in future issues. If our or any of our readers have had problems with fake branded products, we would like hear about them.

Queries and requests

Sumod,

How can I place an order for the past issues of Digit? I did not find any subscription form in the magazine, or on your Web site for ordering past issues at vintage prices.

I plan to subscribe Digit for one year from Jan 2004. But will the Digit Encyclopedia of Technology offer be extended that long? It would be wonderful if you could specify the month in which a particular product has been tested in your A-List. The same applies for your Zero1 awards too. You could also mention (at least) the former year's winners in the Zero-One awards, if they are not outdated.

I also request you to test the previous year's winners in the subsequent year's comparison tests. At least Agent 001 should test and survey the various brands of RAM available in India, and recommend or award the leading brands instead of testing them.

Gaurav Kale

Via e-mail

Short Bytes

I liked the September Issue very much. I got the solution of my problems before asking you. I found the answers to all my problems through QnA, even before I asked them! I also liked the 'Sound Advice' story, and have converted my old songs into digital music using the tool provided on Mindware. Can you test car stereo systems, cassette players, car CD players in the upcoming issue?

Raghav Ranjan

Via e-mail

I'll have to get into the habit of receiving surprises from Digit. Last year, I won a Celeron PC, and now a 3-month subscription!

Vikram Bhatia

Via e-mail

E-mail: readersletters@jasubhai.com

Send your letters marked 'Readers Letters' to the Digit office:

D-222/2, MIDC, TTC Industrial Estate, Om Sagar Building, Nerul, Navi Mumbai 400 706,
Phone: 022-7629191/9200 Fax: 022-7629224

In Search of Search

Soon, you're going to have mountains of information—both on your hard disk and on the Net—and a terrible time finding anything. Or will you?

The world produces up to 2 exabytes of data every year—that's 2,00,00,00,000 gigabytes. Martin Stone at ComputerUser.com predicts, "It's taken 3,00,000 years for humans to accumulate 12 exabytes of information. It will take just 2.5 more to create the next 12 exabytes." How do we make use and sense of all this data? How do we archive and track it? How much of it is useful? These are pressing questions, now more than ever before.

All this data resides on personal hard disks, corporate databases, CD-ROMs and of course, on the Web. Most of it is unstructured—it is in free-text form, unlike structured data, which is readily machine-readable—a filled-in electronic form, for example. The unstructured nature of most data means that retrieving information is a non-trivial business. There is more data out there than we can easily make sense of, which is why there is a lot being done along this direction.

Metadata and search

Metadata is data about data; it can be as simple as just the author, date and time a document was created, or be as informative as a list of keywords and key-phrases that describe what the document is about. Sufficient metadata would remove the ambiguity that typically occurs in a search. For example, a search on 'personal search' could mean both a search for a dating service, as well as a search for a personalised search engine.

One of the reasons that search engines are not as efficient as they could be, is that not enough people bother tagging their Web pages with metadata. If every author of every Web page annotated the page with metadata that documented exactly what the page was all about, search might have been a rather simple business.

In its early days, Yahoo! used metadata to manually index pages; Google uses the PageRank algorithm, which seems to work pretty well. Also, Google computes metadata automatically,

not manually. Others, like Vivisimo, generate metadata automatically, and auto-categorise pages by generating a taxonomy.

The Web currently lacks standards for metadata, which would make the task of automated indexing easier. The most advanced initiative to address this problem is the Dublin Core Metadata Initiative, which is geared towards attaching metadata to files for indexing systems to collect. A set of metadata elements have been created by the programme, as well as methods for incorporating them in Web pages. The metadata can be derived by humans as well as crawlers. In a similar vein, the Yahoo database is a commercial project that classifies Web sites by subject area. The Dublin Core has become an important part of the emerging infrastructure of the Internet.

Semantics in search

The problems with search engines, as we've all experienced, are all too

familiar: irrelevant results, too few or too many results. This happens because a search engine does not know exactly what you are searching for. Think of a search engine as an agent that you send on a mission. You need to communicate with it for it to do its job properly, but you can only communicate using a few choice words. This is the problem. As of now, we cannot tell a search engine to 'find me all pages that talk about data acquisition techniques being pursued after 2002'. We have to use the keywords: 'data acquisition techniques'. The problem is two-fold: first, contextualisation—the search engine needs to understand what you're searching for; and second, insufficient tagging—Web pages need to be tagged with metadata, so that a search engine knows that a page contains what you're looking for.

Regarding contextualisation, we might envisage a search engine in the future that will do natural language processing (NLP), and figure out what you mean, when you enter a query in English. This is one approach that

Voice Search

Search, for most of us, means only text-input based search, but it is now possible to use audio to search. The best application of this would be to find music in a collection: often, we find ourselves in a situation where we can hum the tune of a song but can't recollect its name. Progress is being made towards a situation where you hum the tune into a mic, and the system reports the closest matches. For example, Philips has developed a technology called Audio Fingerprinting. The company claims that the technology can be used to give complete information on a song such as name, artist, and album, by sending three seconds of a song to its server.

A cell phone user would be able to hold the mobile's receiver near the music source, and get the server to respond with information on the song. Google is also in the process of developing voice-based search: in its current form, the user needs to dial a number, speak out keywords, and then click a link at <http://labs1.google.com/gvs.html>. The results are displayed in a new window.

How Search Engines Work

Crawlers, or spiders, are the programs that most search engines use to document the Web. Some search engines do not use crawlers, relying instead upon human-fed information about pages, while others use a combination of both. Crawlers visit Web sites to read the information in them—both the content as well as the meta-content, or meta-tags, and follow the links that the site points to. The information that the crawler gathers is sent back to a central database where it is indexed; this indexing is what enables the pages to be retrieved upon demand, when you do a search. Crawling is a continuous process—crawlers work all the time, 24 hours a day, 7 days a week, visiting and re-visiting pages so that the indexed information is up-to-date.

Given keywords, a search engine scans its collection of indexes to see if the keywords are present. If they are, the engine uses metadata to determine how relevant each document that contains those strings is likely to be. How search engines differ is in the algorithm they use for their crawlers. Google uses an algorithm called PageRank to map the Web. PageRank checks to see how many pages link to a given page, and increases the 'importance' of a page if more pages link to it. This page is more likely to show up in search results. Also, the more 'important' the pages that link to this page are, the more important this page becomes, and so on. Thus, the most important page is the one that is linked to by several other important pages.



Stephen Robertson
Researcher,
Microsoft Research
Cambridge,
England

“ I don't personally see any major breakthrough in the next five years, but I see existing technologies becoming more widespread and people becoming more dependent on them ”

string refers to. When you launch a search for 'Introduction to Java', the results would also contain pages described, or tagged as, 'Java tutorials'.

Alternative Search

Latent Semantic Indexing (LSI) searches by looking at the meaning of the

some researchers find an interesting possibility, but solving the NLP problem is hard. NLP is being put to use to an extent, though, in IBM's WebFountain programme.

Consider when you need information on 'Kolkata'. You'd probably enter the search string 'Kolkata information', or something similar. The results will not contain pages that refer to the city as 'Calcutta' without an instance of the word 'Kolkata', but you, on the other hand, would expect these pages to appear in the results. This is another limitation of current search engines—they only look for exact word-to-word matches, and don't understand the meaning of your search string. This is where semantic search comes in. Semantic searching allows you to retrieve information that is similar in meaning to what the entered search

words, not just by matching keywords. The first step is to extract meaningful and relevant words from a document—for example, in the sentence 'The car was developed by the famous Indian design house', the important words would be 'car,' 'developed,' 'Indian,' and 'design'. Similarly, keywords need to be extracted from the document. Once the keywords are brought together, the Term-Document Matrix (TDM) is generated. In this current form, the TDM only represents the presence or absence of a keyword in a document, but linguistically some keywords will have more importance than others. This is performed in the next step, called Term Weighting. The 1s in the matrix are modified to reflect the importance of the keyword in the document. Consider the keyword 'DDR RAM', appearing in two documents, one explaining DDR RAM, and the other listing new RAM

technologies that appeared in 2002. After Term Weighting, 'DDR RAM' would have a higher value under the column of the former document.

The next step is Normalisation; this ensures that large documents with a lot of keywords do not override smaller, but potentially more important, documents. The values under the columns of larger documents are reduced to give every document a fair chance. Now consider that in the matrix, generally, a certain keyword would appear only in a few documents, and therefore the resulting matrix would be sparse—a matrix with most of the elements being 0s. Using a mathematical procedure called Singular Value Decomposition (SVD), the matrix is compressed so that it has fewer zeroes. By this process, keywords with semantically closer meanings come together. Using this index with supplied keywords, we can retrieve documents having a value higher than a critical value.

LSI indexes need to be modified every time a document is added; to worsen things, the SVD step is computation-intensive, and in the end, a 7,000 docu-

ment collection takes about 40 minutes to index. This makes LSI out of bounds in its current form for Web search engines, but LSI can be used for searching through personal documents, or a fixed but large number of documents. For instance, LSI is used in the Mac OS 10.2 spam filter.

Contextual Network Graphs (CNG) is an alternative to LSI, and uses graphs



Tim Bray
Co-creator, XML

// ... the fact of the matter is that there really hasn't been much progress in the basic science of how to search since the seventies. ... We're not likely to get an intelligent search engine anytime soon //

instead of matrices. In CNG, documents and keywords are represented in an interlinked graph, with documents and keywords as nodes. This makes it easier to scale, and is not as computationally intensive as LSI. Here again, the problem is that CNG is a relatively new technique, and can't handle long queries like LSI can.

Searching is a difficult proposition even with current hard disks. Imagine

Personal Search

What about the data on your own hard disk? If you have an 80 GB or even a 40 GB hard disk, you know how difficult it is to find a particular file, or a file containing a particular snippet of text. Search engines such as Sleuthhound (www.pcworld.com/downloads) are available for searching your hard disk. An expanded version of this idea is Atlantis InterNetworks' Comet Data Engine (www.atlinet.com), a combination of a Web crawler and a search engine, for use with Windows. The data engine is used to index and search HTML and other text documents on the intranet and on the Internet. It is composed of three component engine—the Acquisition, Indexing and Retrieval engines. These components work together to provide high speed indexing and search services—essentially, working to minimise the effort of searching for any piece of data, wherever it may be located. Software like these are mostly just improvements upon current search capabilities.

Search Needs	
While most of us may be satisfied with current search engines, there is a lot that has to be done and that can be done	
Current Problems and Requirements	Solutions
Current search engines look for exact word matches, not semantic matches	Semantic search techniques such as LSI and CNS, and related techniques such as NLP, can give meaningful results
Search results should be presented in a way that allows for easier identification of results	Presenting the results in a visual or more useful way, say, grouping results like Vivismo does
Organising and searching local files is tedious	Continuous indexing and use of query-based virtual folders
Need for alternate methods of entering a search query, like voice search to search from mobile phones	Voice-based search such as the one being tested by Google labs
Ability to retrieve unstructured information like unannotated images and videos	Image recognition techniques to be used with search techniques
No personalised search tool that searches in many locations such as local disk, Internet, Inbox	Search systems that index multiple locations; expected to appear in Longhorn

the situation in a few years, when you'll probably have an 800 GB hard disk, containing your entire media collection, along with other data. Can you trust existing search tools to perform a search on so much data? Microsoft has recognised this problem, and is reportedly working on a new file system, dubbed WinFS, that will help users get better search results, both offline and online. The file system allows anything that you've seen on your PC to be retrieved by the local search engine later. This means that anything that you do on the system—online activities such as reading e-mail, or browsing the Web, and offline activities such as working with local files—will be monitored and indexed by the OS. With Longhorn—the upcoming version of Windows—there should no difference between searching offline and online. One of the methods of achieving this is continuous indexing. Indexing is a feature that was introduced in NTFS to enable quicker searches. A lot of radical changes are expected in Longhorn, but nothing concrete has emerged yet.

Another feature that is expected

from WinFS is Virtual Folders. To understand Virtual Folders, think of a music collection that is stored together on the hard disk physically—there won't be any folders. However, when you open the collection, the files will be grouped according to artist name. You can also choose to view by album name, and selecting an album will list music files with that respective album name. This is basically grouping the files based on certain metadata. For pictures, users can add tags to describe a picture—one picture can have more than one tag. Using this tag, pictures can be grouped and folders created on the fly. This is not a new idea—it is used in music software such as Windows Media Player.

Learning in search

Search engines may learn by observing the user's interaction patterns, and behave accordingly. One approach is to provide the engine with both positive and negative feedback, based upon its performance. For example, if a search on 'orchids' returns forty results, and the user clicks on one of the results, this is noted in an index. Later, if someone does a search on a related term, say 'flowers', the results that have a high score for 'orchids' are returned first. This needs a database of related searches. On

the other hand, if no results in the first search were clicked, all the results get a negative ranking.

Stephen Richardson of Microsoft says that clever searching facilities can be embedded into personal software. He suggests that, for example, while you're writing a document in your word processor, "It could be, automatically or at some prompt from you, searching for material on your disk that relates to what you're writing about. The trick here is that you will not need to formulate a query, because the text you are writing will serve that purpose." He goes on to say that such a system might learn in other ways too, for example, learning about what kinds of source you tend to consult for what purposes.

A new search frontier

WebFountain is a search platform that IBM researchers have been working on for some years, and it may be available soon. It will not be a free search engine—it will be a paid service aimed primarily at businesses and corporations.

WebFountain aims at gathering intelligent and contextual information—going beyond mere keyword search. After crawling the Net, WebFountain will be able to bring back

1 col AD



Jargon Buster

Semantics: 'Semantics', put simply, means 'meaning'. Thus, 'the semantics of a computer program' would refer to what the program means, rather than what language it is written in, and so on. 'The semantics of search', therefore, refers to search engines and crawlers being aware of the meaning of the data they are dealing with, rather than treating it as mere strings.

Free-format Query: A query expressed in natural language, as opposed to, for example, a boolean query like ('flowers' OR 'orchids') AND NOT ('roses').

Crawlers: The programs that most search engines use to document the Web. Crawlers visit Web sites to read the information in them, and follow the links that the Web site points to. The information that the crawler gathers is sent back to a central database, where it is indexed. This indexing enables the pages to be retrieved upon demand.

Natural Language Processing: The technology that processes strings expressed in natural, or human languages such as English, and turns them into something machine-understandable. For example, 'the dog eats the frog' would be converted into a machine representation that incorporates the concepts of dogs and frogs, the activity of eating, and so on.

Keywords: Keywords and Key-phrases are words and phrases, respectively, that describe, or point to, what a document or Web site is about. For example, the keywords and key-phrases for this article would be 'search', 'search engines', 'information retrieval', and so on.

Term Document Matrix: A TDM is simply a matrix with 0s and 1s, where a 0 means that the keyword defining the row does not appear in the document defining the column, and a 1 means that it does.

intelligent answers to free-format questions like, "What are the state-of-the-art search engines today?" WebFountain President Robert Carlson says, "WebFountain begins to associate names and people in articles about a certain subject and gathers specific information that can be used as a business intelligence tool." It aims at dealing with large volumes of text, which it collects, stores and analyses. It performs data mining on the data it collects, discovering trends and patterns within.

The three primary components of WebFountain are the Platform, the Data and the Multi-Disciplinary Text Analytics. The first of these, the Platform, is an infrastructure that incorporates various technologies in order to provide complete customer solutions: spiders, miners and other focussed applications. The Data includes data from the internet, newspapers, magazines, blogs and so on. And the third component—the Analytics—consists of technologies and techniques such as NLP, statistical approaches, probability-based approaches, machine learning, AI, etc.

The search bandwagon

Microsoft's Vice President in charge of the Windows division, Jim Allchin, said, "Google's a very nice system, but compared to my vision, it's pathetic." These words signalled Microsoft's entry into the search engine market. Longhorn hopes to search documents irrespective of their location. Microsoft's MSN portal currently uses the Inktomi search technology, but Microsoft recently

Google Alternatives

A crucial aspect of search is the presentation of the results. The current breed of search engines—Google and AltaVista—list results by ranking; but this gives no additional information about each Web site, except a short description. It's easier to make a selection if there's a visual representation of the results. For example, the search engine KartOO (www.kartoo.com), displays results with arcs linking to similar topics, keywords, etc.

Another search engine that does things differently is Vivisimo (www.vivisimo.com); it presents the results in groups, called clusters. For example, if you try a search on 'cricket,' the clusters that show up would be 'world cup,' 'test,' 'sports,' 'cricket club,' and so on. This helps you zoom in onto your desired result site easily.

Teoma (www.teoma.com) is a search engine with a difference—it applies a

measure called 'authority' to determine the relevance of a site. To determine the level of authority of a particular site, Teoma employs proprietary techniques called Refine and Results. Refine refers to Teoma's organising of sites into the communities that occur on the Web—for example, Web sites about music downloads, or those that contain technical papers. These different communities are presented in the browser's results page under Refine. From here, the user can choose the line of search to go along, greatly helping with ambiguity in searches. Next, Results refers to the analysis of the pages, ranking them based on the number of sites that link to it. This is different from Google's approach; where Google takes into consideration all sites that link to a page, Teoma only considers which sites within a particular category of interest refer to a particular page.

announced plans to develop its own algorithmic search engine. It not just Microsoft that's trying to enter the search business: Yahoo!, for instance, has bought Inktomi, even though it currently uses Google's search engine. Amazon.com is another company that has entered this arena. The Seattle-based Amazon has launched a subsidiary named A9, which concentrates on the development of a search engine tuned for e-commerce. These developments are an indication of how serious the busi-

ness is getting.

The Semantic Web is a vision of Tim Berners-Lee, best known as the inventor of the World Wide Web. It aims at structuring information on the Web so that it can be used much more easily by machines, and has been underway for some time now. If it really takes off, it promises to make a difference in the way we deal with online data exchange and e-commerce. Progress in information retrieval and search is likely to be slow, but it is moving at a steady pace. With more and more companies realising how important the business of search is, we can expect more focus on this area of information technology. Indexing data and providing metadata are keys to reducing the problem of the data deluge. People will realise the importance of metadata and indexing more and more, and it is likely that indexing will become more routine. Data mining—the process of extracting previously unknown, and interesting, patterns and information from masses of data—is likely to become more ubiquitous, as we reach the stage where we have too much information and not enough knowledge. ■

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www.dublincore.org

The official Web site of the Dublin Core Metadata Initiative, which aims at developing standards for online metadata.

www.semanticweb.org

The official Web site of The Semantic Web, an initiative that aims at marking up and linking the Web in such a way that it will be more accessible to machine understanding, among other things.

http://javelina.cet.middlebury.edu/lsa/out/search_engines.htm

A site that explains how search engines work, the intricacies of dealing with unstructured data using taxonomies, latent semantic indexing (LSI), and more.

www.unstruct.org

This Web site is all about unstructured information and its management, including how search engines do it, news about projects such as WebFountain, and so on.

<http://tbray.org/ongoing/What/Technology/Search/>

The Search section of the Weblog of Tim Bray, co-creator of XML. Discussed here are several aspects of the search problem.

www.almaden.ibm.com/WebFountain

The homepage of IBM's Almaden Research Center's WebFountain project. WebFountain is a project that aims at going beyond keyword search, bringing intelligence and context into the picture.

Belkin Nostromo SpeedPad n52 ►►
The Swiss-knife of gaming

By combining the functions of a keyboard and a gamepad into one sleek device, Nostromo SpeedPad will take your gaming skills to new heights. It offers an astonishing 104 programmable functions, and comes with a 360 degree mouse and 8-way directional pad.

Price: \$49.99



In the Name of Input

If you thought keyboards and mice were boring,
think again



◄◄ **Combimouse**
An ergonomic marriage

Combimouse is a keyboard with a built-in mouse. This yet-to-be released device comes in two independent parts: while the left-hand part is stationary, the right-hand part is the combination of an optical mouse and keyboard and can be moved around. The latter can also be used as a standalone device with other mobile devices.

Price: NA

Gyration Ultra GT Cordless Optical Mouse ►►
Flying mouse

Ultra GT's mouse has a motion-sensing technology that allows you to use the mouse even in mid-air. You can take this mouse on a flight within a radius of 30 feet of your PC—line of sight isn't required either. It also comes with GyroTools, a software that lets you perform actions with the flick of a wrist. Of course, you can also use it normally on the desktop.

Price: \$79.95



Kinesis Evolution Keyboard ►►

Height of ergonomics

This keyboard comes in two modes—an integrated touchpad on one side, or with dual touchpads. Adjust the orientation of this keyboard in all three axes—each module can be adjusted independently. The dual touchpad model allows you to click with one touchpad and drag with the other. The keyboard also comes in a chair-mounted version.

Price: \$619



◄◄ SafeType Keyboard Vertebrate keyboard

SafeType claims to be the only keyboard that can place a user in an Orthopaedically Neutral position—as the keyboard's orientation can't be altered, you are forced to sit in a position that's healthy. This keyboard can increase productivity tremendously—if you can touch type.

Price: \$295



Rotokiller RTR-720 Mark II ►►

For the venerable

This is a hand assembled gaming mouse, built using steel and nylon. While moving, the mouse can be rotated between the fingers, courtesy its unique circular design.

It has a rotary-grip and silicone rubber buttons with backlights—you can even adjust the brightness of each button. Gamers will love the 8-way scroll that lets you directly select a weapon.

Price: \$69.95



A thousand rupees will buy you a computer at Mumbai's Lamington Road. Astonished? Well, here comes the fine print. Don't expect the bells and whistles, but for that kind of money, you can pick up a working 386 complete with a black and white monitor.

Before you dismiss the thought, consider this: How much computing power is adequate? Let's be honest here—all we do is run standard office applications, listen to music, surf and communicate via e-mail and instant messengers. People are slowly waking up to that fact. Believe it or not, there's a huge market for secondhand computers. You just have to know where to look.

The buyers and the sellers

Digging into the world of secondhand computers is an eye-opener. You can pick up an old, working 386-based computer with a black-and-white monitor for a mere Rs 1,000, and a 486 comes for an additional Rs 500. Ask Jitubhai Patel, who calls himself *Jitubhai Joone Computerwale* (old computer seller). Working out of a cramped office in a Mumbai suburb, he sells almost everything—right from old working computers, down to ever component of a PC. As he puts it, "Why pay Rs 4,500 for a brand new monitor, when you can buy an older one for Rs 1,800 from me"? Though the prices go up with the specifications, here's the insider

secret—it's still not stratospheric. Second-hand resellers such as Jitubhai will sell you a Pentium III with a multimedia kit for Rs 12,000.

So how do resellers source such systems? The primary source of such hardware are corporates—especially banks. Many of them get rid of their old systems routinely, after the extensive computerisation they have gone through over the past decade or so. Both, Jitubhai as well as Sanjay and Kalpesh Jain, of Rishab Computers, Lamington Road, Mumbai, routinely pick up their hardware through such house-clearing sales.

Other sources include schools and people who sell their PCs or parts of it, while

The much-neglected secondhand PC market is slowly gaining in popularity, owing to the practical no-nonsense options that they offer...

More for Less



PHOTOGRAPH: Jiten Gandhi,
IMAGING: Solomon Lewis

upgrading. The fact that not all such systems work properly doesn't deter resellers who fix them, using parts from other PCs.

What's in it for you? The biggest factor here is the price. (See box, *"The Truth about hardware"*). There exists a substantial market for such machines, especially in small towns and villages beyond Mumbai. According to Jitubhai, such users make do with old hardware such as 486 and Pentium PCs because, "they just want a computer that gets the work done". City buyers though, tend to be more discriminating, and settle for "nothing less than a Pentium II", generally with all the possible frills possible, with their budget.

The government's ongoing computerisation drive is another area where a lot of secondhand hardware finds a home, given the fact that there is a constant demand and that most schemes are cash strapped. Computers could perform such tasks as word processing, data entry and accounting effortlessly five years back. So it only stands to reason that five-year old legacy PCs should still be able to do so, just as competently today. Most offices still use PCs for the same purpose.

Going mobile

Not only does secondhand mean 'for less money', it also mean 'more for the same money'. Enter secondhand laptops. Typically, laptops cost upwards of Rs 45,000 since their components are smaller, lighter and consume less power. Vishal Sagar of Plug n Play Technologies, in Mumbai's Lamington Road, says that laptops have great 'real estate value'—you can fit it into places you could never fit a desktop, and take it and use it wherever needed. "A lot of people come to me asking for a Celeron or Pentium 4 desktop, and I converted them to Pentium III laptop users."

Vishal deals in laptops, including refurbished ones. "We take laptops that are in working condition, and we test them thoroughly. We take Pentium IIs and Pentium IIIs; generally secondhand Pentium 4s and Athlons are not available. AMD laptops are not very popular. We identify a role (for the computer), and offer a solu-

tion. If portability is available at low cost, it makes economic sense for people who make sales presentations, etc. Laptops are mainly used for Internet access, accounting work and presentations, though you could even run Photoshop on a Pentium III. The idea is getting your work done with less—you don't need the best, and you don't need the fastest.

Though laptop prices vary depending on specifications and conditions, generally a Pentium II costs between Rs 28,000 and Rs 35,000. He showed us a Compaq Pentium II with a 300 MHz processor, 64 MB RAM and a 10 GB hard disk, priced at Rs 32,000. A Pentium III can set you back by anything between Rs 38,000 and Rs 43,000. One common misconception is that you cannot upgrade laptops or that you have nowhere to turn when things go wrong. Some things such as RAM can be upgraded and hard disks can be replaced. "You can start with a basic secondhand



Jitubhai Patel
Proprietor
J.S. Equipments

...The attitude is, when you get home a Ferrari, sell the Maruti...

laptop and add optional parts such as a CD-Writer, a LAN card, a bigger hard disk, more RAM and even WiFi, an Infrared port and Bluetooth. As far as CD-Writers go, you will be restricted to external writers as you may not get an internal writer that fits where your old drive used to."

After-sales service is not a problem either. "In most cases, authorised service centres will service your secondhand laptop just as willingly as they will a new laptop, but procuring replacement parts may cause delays. The largest problem is the LCD screen. An LCD cannot be repaired, so it must be replaced, at a cost of Rs 20,000. It may be better to buy another secondhand laptop at Rs 30,000." It's just easier to avoid buying with screen problems.

Buying smart

Before running out to a store, identify the primary role of your PC, which makes it easy to identify the kind that you should

Watch Out!

- Certain secondhand components are more likely to fail than others. Ensure that the hard drive is in good condition; bad sectors indicate an imminent drive failure.
- The motherboard should be also be checked.
- As far as CD-ROM drives go, avoid the Creative 52X since its failure rate is rather high.
- Also, ensure that the secondhand modem works before you buy one.

buy. The dealers we spoke to said that many people often walk in with just a vague idea of what they want, like, "I'm looking for a Pentium 4", and that certainly doesn't help!

Most of the reasonably modern computers in the secondhand market can surf the Internet, or run a spreadsheet application well enough. You may not be able to run the latest software, but if your work gets done with less, it scarcely matters.

Service, though, as far as secondhand desktops go, can be a tricky issue. The resellers we spoke to typically do not offer any hardware support beyond installation, and most don't provide any software support. So an Annual Maintenance Contract from a reputed maintenance company might make sense. Another common concern with older PCs, whether existing or being bought secondhand, is procuring the right device drivers. Everyone we spoke to dismissed the problem as trivial—thanks to the Internet. As you might imagine, without modem drivers you're doomed. Most devices have at least generic driver support in Windows XP, but don't run Windows XP unless you have a Pentium III with 128 MB RAM at the very least. Newer Linux distributions also feature good support for older devices. However, the latest distributions such as Red Hat Linux 9 have some steep hardware requirements for the GUI version.

Seeing them in action

Arvind Chandrasekar, an IT professional from Delhi, is the proud owner of an impressive collection of antique PCs that includes a Sinclair ZX Spectrum Plus with all of 48 KB of RAM, a BBC Micro Computer, a PC XT and an old 386. Over time, he's put these oldies to several uses. Until recently, Arvind's cable TV service provider used his ZX Spectrum to display the screening time of a movie on the local cable TV

channel. Although you may not buy one of those from the secondhand market, it still goes to show that there's always something to be done with old hardware.

Looking at more typical uses such as connecting online, all the dealers we contacted agreed that it doesn't cost much to get a PC that can. A non-expensive, reasonably fast system such as a Pentium II or a Celeron with a colour monitor and a multimedia kit would be a great computer to connect online. Quite a few cyber-cafés do just that. Pawan Gola, of Softech Cyber Café, Mira Road (a Mumbai suburb), runs several such Celeron systems that have 64 MB RAM, along with a Pentium III PC as the main server. He hasn't had any major hardware related problems with them—his major headaches are ensuring that worms and viruses don't wreak havoc.

Accounting, data entry and DTP work are yet other applications where a secondhand computer can be used. Accounting, in fact, is one application that can be done with an old computer. Though surrounded by laptops and PDAs, Plug n Play Technologies' Rushabh Shah still runs his accounting work on a 386, using DOS-based accounting software. For many years now, several banks have continued using legacy PCs to tackle accounting work, using older accounting software. They have worked fine, though they don't have the frills and extra features that newer software offer.

Fact of the matter is there's an application for just about any old computer. Arvind, for instance, lent his colleague's son his old BBC Micro, who uses it to practice BASIC. Computer classes also invest in older systems, since 2-year old computers will easily run compilers for many languages. Linux scores right over there, with even older versions of Linux having built-in support for several programming languages. Arvind's PC XT holds a lot of sentimental value for him, since it was his main rig for the longest time. He did extensive assembly coding on it and found it an enjoyable experience. He currently runs his 386 as a router for his home network. It runs a stripped down Debian Linux distribution. His friend set up the router, but he's pretty confident that he could now manage doing it himself. As he jokes, "it's not rocket science."

World-wide too, people have done a variety of things with old computers. Jack-

The Truth about Hardware

Complete Secondhand Systems

Desktop

386 with Mono Monitor - Rs 1,000
486 with Mono Monitor - Rs 1,500
PI with Colour Monitor - Rs 4,500
PII (350) with Multimedia*- Rs 8,000
Celeron (500) with Multimedia - Rs 9,000
PIII (550) - Rs 12,000

Hard Disk:

4 GB - Rs 1,500
8 GB - Rs 1,800
20 GB - Rs 2,300

RAM:

16 MB EDO - Rs 225
32 MB SD - Rs 300
64 MB SD - Rs 575

LAN Card - Rs 100
Modem - Rs 350
CD-ROM - Rs 400
VGA Card (PCI) - Rs 250
VGA Card (AGP) - Rs 400

Laptop

PII - Rs 32,000
PIII - Rs 42,000

For Laptops

40 GB hard disk - Rs 7,300
64 MB Laptop Memory - Rs 1,800
External USB CD-RW - Rs 5,700
PCMCIA LAN card - Rs 1,500
Battery (OEM) - Rs 6,000
Battery (Original) - Rs 8,000
Replacement LCD - Rs 2,000

Note: The 386 and 486 will only run DOS or Windows 3.11. To run Windows 95, you should have a Pentium PC with 16 MB RAM. These are indicative prices and they vary depending on the rest of the parts and on the condition of the machine.

*Multimedia would include a CD-ROM drive, sound card and speakers

son 'Metalrock' Low, a student at the California State Polytechnic University, Pomona, and his friends use a variety of systems, from a 486 onwards, for a range of tasks—right from running Web servers and FTP servers to programming and listening



Jackson Low 'Metalrock'

California State Polytechnic University, Pomona
Founder of the MusiIRC.com IRC network

"I personally use my Unix 486 box as an IRC server and MP3 player"

to music. He currently runs custom-tuned IRC daemons on a 486 Unix box as well as an Athlon 1 GHz running FreeBSD. A friend of his runs a Web server hosting a site on a range of 25 MHz systems!

But look...

There will always be an inherent risk when buying secondhand. Asif Syed, director of Lemon Net—a company that provides computing as a service for a contracted period of time to home users—says that buying a secondhand PC is a

"criminal waste of money". He goes on to explain that unlike business-buyers who buy PCs for others to use, home-users buy their computers for personal use. This makes the user experience all-important. "A computer has multiple purposes. And its value comes from the benefit the consumer gets from those purposes. So, if the user experience is not as good, the benefit is less." Hence, by buying a secondhand PC, you're essentially "buying something already outdated, which has lost its inherent money value." In addition, you always need to upgrade software, and to do that you also have to upgrade hardware. Spending Rs 10,000 on a PC worth Rs 5,000 does not increase its value that much. The bottom line as he says, is that "you have to keep spending to keep using it well."

A valid point, yet Arvind Chandrasekhar's approach to secondhand PCs is quite a practical one: "Brand new PCs make sense for first time buyers. Once you know what you're doing, it's okay to buy secondhand." If you do have some prior experience with computers, then you probably have a fair idea of what you need a PC for.

Hence, if you do your homework and invest wisely, you could get hold of a used PC, and get your work done for less. ■

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How we Test



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

To ensure that our readers have all the information they need to make an informed buying decision, reviewers at the Digit Test Centre conduct comprehensive tests to evaluate the latest hardware, software and technology services in accordance with international standard evaluation processes and methodologies.

Our test results may be presented either as Comparison Tests, or as individual reviews in the Bazaar section. The representation of the results is different for each in the interests of clarity, but the test process for both is identical in all respects.

Of all the products we test, only the best make it to the A-List.

Comparison Tests

In the comparison tests, we compare the performance of products within a particular category. Each product is evaluated under different parameters such as performance, value for money, features, ergonomics, 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 scores for features, ergonomics and performance for each individual product. A detailed test process is included with each comparison test, and explains the parameters that were taken into consideration, along with weightage allocation and reasons for the same.

In Bazaar

The evaluation of products in Bazaar also covers the same parameters such as performance, ease of use, value for money, build quality and features of the product.

Here, each of these parameters 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 a value for money score of five arrows signifies an outstanding buy.



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 combined with rest of the package including features, ergonomics, bundled accessories etc. This award represents the best performing product in our tests in terms of the complete package that is offered to a customer. 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 ergonomics, performance and features to its price. The product winning this award offers a good combination of performance and features at a great price. Since value for money takes into account all scores for all parameters including the price, this score will be used to arrive at a grade (e.g. A+) for each product.


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

A Brand Affair

12 PCs, seven brands, all trying to fit your pocket, whilst vying for our stamp of approval



GRAPHICS DESIGNER: Atul Deshmukh



More often than not, buying a new PC brings up the dilemma of whether you should opt for the slightly expensive branded system, or settle for a locally assembled PC. The price factor has always been a sore point that has kept the humble masses away from branded PCs. However, branded players are trying their best to cut the stranglehold of the assembled PCs by offering machines priced below Rs 25,000. Festive seasons also play a part in determining the pricing policies, and you will find a whole lot of goodies—not to mention the astonishingly low price—given along with these PCs to increase sales.

With the recent attempts at providing entry-level PCs at a price comparable to that of an assembled PC, doubts have been raised about the quality of these systems. Our branded PC test covered seven brands and 12 contenders that were priced in the range of a paltry Rs 20,000 to an enormous Rs 60,000.

The Branded PC market has been dominated largely by the likes of HP-Compaq, IBM, HCL, Zenith, PCS and lately by Dell, LG and Samsung. There are many other local brands such as Datamini, Dart, etc., who also make their presence felt in this highly competitive market. Most computers were in the Rs 30,000 to 35,000

bracket. There were certain exceptions such as the Value PC from Zenith that was priced at an attractive Rs 20,000. After putting these PCs through our rigorous tests, it was clear that the quality standards maintained by some vendors still holds true in some cases; as for the rest, they were no better than the run-of-the-mill assembled machines.

We divided the computers into two categories—the first was the entry-level bracket that included PCs priced up to Rs 50,000. The second category consisted of PCs above Rs 50,000 and formed the mid-tier PC section.

Those who did not make it

We missed out on brands such as Dell, IBM and Acer, much to our disappointment.

IBM refused to send their PCs, just like the last time.

Acer was willing to send their machines, provided we did individual reviews instead of comparisons.

Dell's PCs are built as per customer-requests, and only brought in after a confirmed order—this takes about a month.

Ingram Micro released their latest computer-line on the 16th October—too late to be included.



How We Tested

Apart from a distinctive logo, the branded PCs we received had a national presence, with authorised service centres in at least all the metropolises. All of the systems were tested on Windows XP, though some of them were bundled with Linux. This created a common testing platform that yielded results that could be directly compared with each other. Peripherals such as monitors and speakers were also tested. The testing procedure involved three primary parameters—features, performance and value for money—with appropriate weightages given to each.

Features

Features comprised 45 per cent of the overall scores. The features score of a PC was based on how it performed in the four sub-sections.

System configuration and bundled peripherals: Specifications such as the processor type, the amount of RAM, hard disk type, motherboard, the presence of a CD, DVD, or CD-RW drive, graphics card, motherboard etc., were noted. Extra points were given for the presence of additional peripherals such as gamepads, good speakers, etc.

Build quality: Here, we logged aspects such as the overall layout of the components, roominess and airflow within the chassis through additional fans and ducts. The sturdiness of the CD or DVD drive tray, the quality and feel of the buttons, mouse and keyboard, build quality of flaps over the front USB ports, etc., were also observed. Easy accessibility to the interior of the chassis was considered as a plus.

Upgrade: We recorded the extent to which the processor and the RAM could be upgraded. We also looked for the AGP slot, the PCI slots and the number of USB and serial ports. The presence of bays to accommodate additional hard disks and optical drives such as DVD drives, CD-Writers, etc., was also checked.

Package contents: Here, we took a look at the documentation and software bundled along with the system. The inclusion or exclusion of contents such as the OS installation CD or restore disk, free software, driver CDs, manuals, setup guides, power cables, etc., was also taken into account.

Performance

Performance made up the remaining 55 per cent of the overall score. We used a battery of benchmarking software to evaluate the performance of the processor, the memory, the graphics card, the audio and the I/O sub-system.

The PovRay 3.5 test logged the time the processor took to render the default scene. Other CPU tests were the video encoding test that used Virtual dub to encode a 50 MB file into the DivX format, and the audio encoding test that employed dbPowerAmp to convert a WAV file into the MP3 format.

While the 3DMark 2001SE test benchmarked the systems that had a graphics controller onboard, the 3DMark 2003 test was used to test PCs with a graphics card. The UT 2003 benchmark was used across the board.

SiSoft Sandra evaluated the performance of the hard disk and the CD-ROM, while the Displaymate benchmarking tool assessed the monitor on features such as resolution and sharpness. The RightMark Audio Analyser (RMAA) analysed the integrated sound card for frequency response, total harmonic distortion, etc.

The PCMark 2002 test evaluated the performance of the CPU, memory as well as the hard disk. For the real world analysis, we ran a multitasking test in which we noted the time taken to open a 200 MB TIFF file, while encoding video in the background. Besides this, the PSbench test (www.psbench.com) simulated various tasks in Photoshop such as applying filters, clockwise rotation, etc. In all, the suite had 21 tests. Each test ran thrice and an average score was taken.

We ran Zdbench Davis Content creation 2003 and Business Winstone 2002 test for synthetic benchmarking of the overall system performance. For CD-Writer and Combination drives, we included the CD-R and CD-RW write speed test, and the CD-RW erase test.

Value for Money

This was computed by taking into account the system's performance and its features, in relation to the price. The higher the index, the better the PC scores in that particular category.

Compaq Presario S5030iL

Built to last

The Compaq S5030iL has a distinctive silver-black look, and an impeccable build quality that was not matched by other PCs. Its JBL platinum speakers yield great output when placed on the desktop.

It comes with 128 MB DDR RAM, a 40 GB 5400 rpm drive and a Pentium 4 2.4 GHz on a SiS 650 chipset-based motherboard that has an AGP slot, three PCI slots and offers onboard LAN, video and six-channel sound. The multimedia keyboard and optical mouse were the best we saw in the comparison. Also bundled along, is a 56K PCI modem. No additional software such as anti-virus suites and office applications have been provide;

nor are Windows drivers. The S5030iL's performance was mediocre, since its components could not keep up with the processor. It finished third in the Audio encoding test.



Similarly, the gaming tests proved it to be no head turner. The onboard graphics could hardly match the latest gaming requirements; the 3Dmark2001 SE test simply failed to run due the lack of enough RAM. This was also the cause for poor scores in the ZDbench test. An extra 128 MB RAM will help boost its performance. Also, since it comes bundled with Turbo Linux, you will need to shell out some extra cash for Windows.

At Rs 36,150, it's slightly expensive but expect solid build quality and good reliability in return.

Compaq Presario S5030iL		B
Performance	■ ■ ■ ■ ■	
Features	■ ■ ■ ■ ■	
Build quality	■ ■ ■ ■ ■	
Value for money	■ ■ ■ ■ ■	

Price: Rs 36,150
+ Decent performance
- Just 128 MB RAM

Compaq Presario S5010iL

No beauty in this beast

The S5010iL is similar in design, build and aesthetics to its Pentium sibling. It has an AMD Athlon XP 2400+ mounted on an MSI motherboard, based on VIA KM266 chipset with a mere 128 MB DDR RAM. The onboard video controller displays lacklustre performance. The motherboard has one AGP slot, three PCI slots, two memory slots, onboard LAN and six USB ports. The multimedia keyboard and the optical mouse are a delight to use. A 56K PCI modem is also provided.

Turbo Linux is pre-installed and a Linux recovery CD is provided; no additional software is given.



The S5010iL failed miserably in certain tests. Though on par with most of the PCs in the pure processor test, it nose-dived in the video encoding

and audio encoding tests despite its DDR RAM. The graphic sub-system yielded very poor results while running *Quake III* at 640 x 480; changing the resolution caused the system to reset. *UT2003* ran at the normal and high settings, but failed when we set it to the maximum. The same was true for the hard disk tests where the results were below par.

However, it displayed decent scores in the ZDbench test and handled the load with aplomb in the multi-tasking test.

Though it's relatively cheap at Rs 27,500, it has many chinks in its armour, namely the scanty software bundle and its below par performance.

Compaq Presario S5010iL		B+
Performance	■ ■ ■ ■ ■	
Features	■ ■ ■ ■ ■	
Build quality	■ ■ ■ ■ ■	
Value for money	■ ■ ■ ■ ■	

Price: Rs 27,500
+ Good build quality
- Dismal performance

Dart Emerald Value PC

Low on features, decent performance

The Value PC came in a metallic black tower complimented well by a black monitor. The roomy cabinet looked quite nice with metal studs on the plastic dummies in the front.

A good configuration comprising a 2.4 GHz Pentium 4 and a 40 GB Seagate Barracuda hard drive was marred by the presence of just 128 MB RAM. Three PCI slots have been provided—there is no AGP slot. The absence of an optical drive surprised us, as they are very cheap. The mundane multimedia keyboard and the optical mouse sported enhanced ergonomics. The absence of a LAN card, a PCI modem and speakers also marked it negatively. Accompanied by Windows XP Home Edition, it had no other additional software.



Performance-wise, the P4 2.4 GHz was mainly responsible for the decent scores in the processor sub-system tests, while the 128 MB RAM marred the results in the memory-intensive tests. It gave a commendable 132 frames at lower resolutions for *Quake III*. However, *UT2003* saw the frame-rate drop below playable rates, indicating that the onboard graphics barely meet the latest gaming requirements. Similarly, the ZDbench test saw it pitching in an average performance.

The expensive price tag seems fine when you consider the bundled Windows operating system and the 3-years warranty. Had it not been for the missing optical drive and speakers, this otherwise balanced offering from Dart would have been complete.

Dart Emerald PC		B-
Performance	■ ■ ■ ■ ■	
Features	■ ■ ■ ■ ■	
Build quality	■ ■ ■ ■ ■	
Value for money	■ ■ ■ ■ ■	

Price: Rs 35,000
+ Bundled Windows OS
- No CD-ROM drive

Dart Emerald Performance PC

A decent performer

The Dart Emerald Performance PC was more or less similar to the Value PC. It has a whopping 256 MB RAM, a Seagate Barracuda 7200 RPM 40 GB hard drive and a Pentium 4 2.4 GHz on an Intel 845GVAD2 motherboard that provides no upgrade options when it comes to graphics, as there is no AGP slot. No onboard LAN is provided either. Also, included is a CD-ROM drive and a 17-inch monitor. The multimedia keyboard and the optical mouse complement the package well. However, there weren't any speakers. It comes bundled with Windows XP Home edition, but misses out on office suites











and games.

The performance gain over the Value PC is hardly noticeable. In the gaming arena, it barely showed any significant improvement over the value PC, with the variation being a little over 1 per cent.

Quake III saw an increase of a mere 4 frames, and the *UT2003* results were similar. However, the ZDbench content creation saw its score jump by a whopping 8 points—a good example of what the extra 128 MB can do to your system. Similarly, the PSbench test results saw the time reduce drastically by 133 seconds over the Value PC.

Priced at Rs 39,000, it is definitely expensive. Also, increasing the RAM to 256 MB, including a 17-inch monitor and cramping in a CD-ROM drive does not make this system a Performance PC, since important sub-systems such as the graphics are on the lower side. It also lacks upgradeability.

Dart Emerald Performance PC		B-
Performance	 	
Features	 	
Build quality	 	
Value for money	 	

Price: Rs 39,000
+ Good hardware configuration
- No speakers

Datamini Festiva MG

A Vanilla PC

The Festiva MG model gave the impression of being a standard run-of-the-mill type PC, with no frills or thrills thrown at you. Design-wise, it lacked the aesthetic appeal associated with a good branded PC, and looks quite dated.

On the configuration front, the PC did come up with decent components—a Pentium 4 2.4 GHz with 256 MB DDR 266 RAM plugged on an MSI 845 chipset-based motherboard. Upgradeability was limited by the absence of an AGP slot and an onboard LAN controller. The monitor displayed below-average quality and seemed like a 14-inch, though it was a 15-inch. The multimedia keyboard and the ball mouse were not up to the mark, when compared to those of the other PCs.

In order to lower the price tag, critical components such as the internal modem and speakers did not make it to our lab; nei-

ther is an OS nor extra software or games included—all you can expect is the drivers CD.





















The Festiva MG could barely beat the similarly configured



Dart Performance PC. It was on par with it in the processor subsystem tests, as well as all the processor tests. However, the gaming tests saw the Dart PC shoot past by a

small margin.

The Datamini Festiva MG offers a decent package at Rs 31,700, but sans an OS and other software. The Dart Performance PC beats it hands down, but costs an extra Rs 8,000, which includes the cost of the OS and 3-years warranty. Bottom line—not a good buy.

Datamini Festiva MG		B
Performance	    	
Features	    	
Build quality	    	
Value for money	    	

64-bit Computing

The launch of 64-bit processors from AMD and Apple heralds a new era in desktop computing. HCL and Zenith have already started work in this direction. So what do all the extra 32-bits mean to you? Will the new processor be faster than what we currently have on our desktop? To put it right, it's no more about the clock cycle speed, but rather about the amount of data that is processed in a single clock cycle. A 64-bit processor will process double the amount of data, as compared to any 32-bit CPU. This translates to improved overall system performance in demanding applications such as game development studios and video encoding, where the file sizes run into gigabytes. Another advantage is the increase in the memory addressable capacity, which is currently at 4 GB due to the 32-bit addressable lines. With 64-bit, you can address a mind-boggling 16 billion GB of memory.

AMD has launched two variants of its 64-bit desktop processor—the Athlon 64 and the Athlon 64 FX, with subtle differences between them. The latter is a better option and offers a dual-channel memory controller. Also, both the variants come with 128 KB of L1 cache and 1 MB of L2 cache, with support for AMD's 3DNow! and SSE2 instructions.

Similarly, Apple has come up with its G5 processor for Mac users. Though Intel has the 64-bit Itanium processor for the server market, no word is out from them on the desktop front. Currently though, 64-bit OS, applications and device drivers are not available off the shelf. The new Athlons will work as 32-bit processors in Windows XP, their full potential coming into the picture once Microsoft launches its much awaited 64-bit version of Windows. Apple's latest OS, Panther, will get an upgrade that will support 32-bit applications making 64-bit requests to the CPU, but a true 64-bit OS has not been formally announced.

LG My PC

Not My PC, is it yours?

The LG PC promotes the thin-and-mean look, with all its components cramped into a sleek grey cabinet that can be mounted horizontally or vertically on the provided stand. A decent LG 700s 17-inch monitor is also included.

The PC had a Pentium4 1.9 GHz coupled to a Biostar motherboard, based on an 845GL chipset with just 128 MB DDR RAM. Upgrading is a big challenge since there's hardly any space for expansion. Also, the motherboard has no option to upgrade to a graphics card, since it lacks an AGP slot. Fortunately, a LAN controller and six-channel sound are integrated; a 56K PCI modem is also provided. The multimedia keyboard provides good tactile feedback, but the mouse makes for sore wrists. Turbo Linux is pre-installed and other than the Windows drivers CD, no additional software is provided.

Due to the processor's lower clock speed, performance was decent in the processor-intensive tests, but it was surpassed by all other PCs, the only exception being the PCS value PC. Gaming performance was poor, due to the lack of a graphics card, but it was better than the Compaq systems. It failed to complete the Zdbench Content test as it has only 128 MB RAM. It also took a long time to complete the processor-intensive tests.

It's definitely expensive, considering that it has low-end hardware specifications and just bundles Turbo Linux. Instead, look out for options that offer better configuration and better performance at the same price.

Price: Rs 32,800
+ Plenty of bundled software
- A tad expensive



LG My PC	B-
Performance	▮ ▮ ▮ ▮ ▮
Features	▮ ▮ ▮ ▮ ▮
Build quality	▮ ▮ ▮ ▮ ▮
Value for money	▮ ▮ ▮ ▮ ▮

PCS Oriion Silver Magic Multimedia PC

Jazzy PC

The PCS Multimedia PC had the least number of features of all the PCs we tested. The roomy cabinet sports a jazzy metallic finish that was again highlighted by the silver finished monitor and peripherals.

It comes with a Pentium 4 2.4 GHz mounted on a Kobian motherboard based on the Intel 845 chipset with 128 MB DDR RAM. The onboard Intel graphics controller handles the video capability. In terms of upgrade options, the motherboard has just two PCI slots, and two memory slots. An AGP slot was not provided. The multimedia keyboard and a dated mouse. Further, the 15-inch monitor does not justify it being called a performance PC. It was pre-loaded with Windows XP Home edition and came with no other software.

The processor sub-system was all fired up because of the presence of the Pentium 2.4 GHz—the processor performance was on par with the Dart PCs, with this system losing by a very small margin. The audio-encoding test results were commendable. The hard disk performance was quite low, and this will reflect in day-to-day tasks. This also caused it to log very low scores in the PSbench test.

At Rs 34,700, the multimedia PC is slightly overpriced. Overall, a better hard disk and a 17-inch monitor would justify the price.

Price: Rs 34,700
+ Windows XP OS provided
- Too less features



PCS Oriion Silver Magic Multimedia PC	B-
Performance	▮ ▮ ▮ ▮ ▮
Features	▮ ▮ ▮ ▮ ▮
Build quality	▮ ▮ ▮ ▮ ▮
Value for money	▮ ▮ ▮ ▮ ▮

Branded Vs Assembled		
Parameters	Branded PC	Assembled PC
Configuration	Since branded PC are pre-configured in terms of hardware components, you have little choice when it comes to customising them.	Assembled PCs offer the advantage of configuring the hardware components to your need and liking.
Authenticity of components	Rarely do you end up with a fake component in a branded PC, since they are directly sourced from the manufacturers.	Ensure that you get original components for an assembled PC by buying them from an authorised dealer.
Quality control	Branded PCs usually go through stringent quality-control processes, with each component being tested for reliability and fault tolerance to ensure trouble-free operation.	Assembled PCs are rarely confined to any sort of quality-control process, and hence the chances of trouble setting in at early stages are high.
Support	Branded PCs have an excellent after-sales support system in place that's always a phone call away. Major PC brands in India have support round the clock in all major cities, besides providing various levels of support such as e-mail, etc.	The after-sales support for assembled PCs depends on your assembler's network and reach. However, the service provided by them is nowhere near that provided by branded players.
Availability	Availability can be a problem with branded PCs, since they have limited reach, especially in smaller cities. This scenario is changing quite fast.	Availability is never a question since you'll find a system assembler round every corner today.
Price	You not only pay for the system price, but also for other support services, genuine software and taxes. Hence, they usually cost more than assembled PCs with the same configuration.	Assembled PCs cost lesser than their branded counterparts for the same configurations, since they just come with assurances, and at times, pirated software.
Package Experience	The package experience, or in other terms, the satisfaction derived is always on the higher side for a branded PC.	Similarly, a good assembled PC can provide the same level of satisfaction as the branded PC, but that happens rarely.

PCS Oriion Silver Magic Value PC

Not as magical

Similar in design and aesthetic appeal to its elder sibling, the Value PC uses the all-metallic framework for its CPU, and the silver-black theme for the rest of the peripherals.

It has a Pentium 4 1.7 GHz mounted on an Intel 845GLAD motherboard with 256 MB DDR RAM. The motherboard has a LAN controller, a six-channel sound card and three PCI slots, but lacks an AGP port, which is a must when upgrading to a better video card. The multimedia keyboard and the ball mouse is the same that comes with the Performance PC. The Value PC also comes pre-loaded with Windows XP home edition, but does not come with any other bundled software.

In performance, the Value PC could hardly match the 2.4 GHz processor PCs, finishing last in the processor tests. It took around 55 minutes to complete the PovRay test, while the rest took 40 minutes. Owing to the onboard video controller, the scene was no different in the gaming test; it could hardly give the performance needed to play the latest games such as *Halo* and *Warcraft III*. The Value PC also gave a dismal hard drive performance like its elder sibling.

Priced at Rs 31,900, the Value PC is a decent buy as it offers you an original Intel motherboard and 256 MB DDR RAM. It's great for typical office work, Internet surfing and for watching movies, but don't bank on it to play games.



Oriion Silver Magic Value B-	
Performance	■ ■ ■ ■ ■
Features	■ ■ ■ ■ ■
Build quality	■ ■ ■ ■ ■
Value for money	■ ■ ■ ■ ■

Price: Rs 31,900
+ Decent features
- Motherboard lacks AGP slot

Zenith Value PC

Zenith for the masses...

The value PC has a dark-grey chassis, with a metallic-silver finish for the front. The 15-inch monitor also has the same metallic grey treatment.

It's powered with an Intel Celeron 2 GHz, coupled to a Gigabyte motherboard, based on the Intel 845GV chipset with 128 MB DDR RAM. The motherboard, however, does not offer much option for future upgrades—the AGP slot is missing. However, a six-channel sound and an onboard LAN controller are included. The multimedia keyboard and the mouse sported a jazzy finish that spoils the appeal of the otherwise good-looking system. The choice of an operating system and



other software comes at an extra cost.

Though powered by a Celeron, the system showed average performance. Processor-intensive tasks took a long time to accomplish. In fact, it finished last in the PovRay test, taking around an hour to complete it. In the gaming tests, the results were pretty much the same, and the absence of any graphics card is sorely felt. In the ZDbench tests, the business application test failed, due to the scanty RAM in the system.

The Value PC is attractively priced at Rs 20,000, which excludes the operating system and taxes. However, even with all the added cost, it would be dearer by just Rs 4,000. Zenith has done its homework right and offers an excellent proposition—especially, if you need a PC just to browse the Internet and run some light office applications.

Zenith Value PC A-	
Performance	■ ■ ■ ■ ■
Features	■ ■ ■ ■ ■
Build quality	■ ■ ■ ■ ■
Value for money	■ ■ ■ ■ ■

Price: Rs 20,000
+ Attractive price
- Lacks a performance punch

HCL EzeeBee PC

Easily wins

Targeted at the value segment, the chic-looking EzeeBee is painted in black all around, with the face painted in matte silver, and it scores a 7 out of 10 in the looks department.

It comes with an Athlon XP 2200+ mounted on a Gigabyte motherboard, with an enormous 256 MB DDR RAM. The motherboard had a 4X AGP slot that allows you to upgrade to a better graphics card in the future. Similarly, the motherboard also offers integrated six-channel sound, a LAN controller and USB 2.0 ports. The speakers did not make it to our test lab. The scanty software bundle includes PowerDVD software and Nero burning Rom; the OS comes at an extra cost.

The HCL EzeeBee was a better performer than the Compaq S5010iL. Due to its processor's higher clock speeds, the S5010iL overpowered the humble EzeeBee in the processor sub-system test, but with minimal differences. The better graphics controller offered more frame-rates in *UT2003*. Similarly, the *Quake III* tests gave playable frame-rates, except in the case of the higher resolution tests. The EzeeBee beat the Compaq PC in the memory test with significant differences, and also showed better performance in the hard disk test. This was also the case in the Multi-tasking test, where it beat the hide out of the Compaq system.






Priced at Rs 26,500, it's a good buy if you consider the package it gives you, compared to the Zenith Value PC and the Compaq AMD PC. It wins the best performance as well as the best value award, without a doubt.








HCL EzeeBee PC A-	
Performance	■ ■ ■ ■ ■
Features	■ ■ ■ ■ ■
Build quality	■ ■ ■ ■ ■
Value for money	■ ■ ■ ■ ■

Price: Rs 26,500
+ Great value for money
- Needs a better graphic card

CATEGORY

ENTRY-LEVEL BRANDED PCS

Brand	Compaq Presario	Compaq Presario	Dart	Dart	Datamini
Model	S5010iL	S5030iL	Emerald Value PC	Emerald Performance PC	Festiva MG
System Configuration					
Processor (Manufacturer Clock speed)	AMD Athlon 2400+	Intel P4 2.4 GHz	Intel P4 2.4 GHz	Intel P4 2.4 GHz	Intel P4 2.4 GHz
Hard Disk (Brand, Sizein GB, Speed in RPM)	Western Digital /40/5400	Seagate / 40 / 5400	Seagate / 40 / 7200	Seagate / 40 / 7200	Seagate / 40 / 7200
Memory (Amount, Type)	128 MB DDR 266 MHZ	128 MB DDR 333 MHZ	128 MB DDR 266 MHZ	256 MB DDR 266 MHZ	256 MB DDR 266 MHZ
Graphics (Name, RAM)	Integrated	Integrated	Integrated	Integrated	Integrated
Motherboard	MSI	OEM	Intel 845GVAD	Intel 845GVAD	MSI
Chipset	VIA KM266	SIS 650	Intel 845GV	Intel 845GV	Intel 845G
Slots (PCI, AGP, Memory)	2 / ✓ - 4X / 2	3 / ✓ - 4X / 2	4 / ✗ / 2	4 / ✗ / 2	3 / ✗ / 2
Onboard Graphics	S3 Pro Savage	SIS integrated	Intel Extreme Graphics	Intel Extreme Graphics	Intel Extreme Graphics
Sound	Realtek Six Channel	Realtek Six Channel	Sigmatel Six Channel	Sigmatel Six Channel	Realtek Six Channel
LAN	✓	✓	✗	✗	✗
USB 2.0	6 ports	6 ports	4 Ports	4 Ports	4 Ports
Peripherals					
Monitor (Type, Size)	CRT / 15"	CRT / 15"	CRT / 15"	CRT / 17"	CRT / 15"
Keyboard (Interface,Technology)	PS/2 / Wired	PS/2 / Wired	PS/2 / Wired	PS/2 / Wired	PS/2 / Wired
Mouse (Interface, Technology)	PS/2 / Optical	PS/2 / Optical	PS/2 / Optical	PS/2 / Optical	PS/2 / Optical
Optical drive (Speed, Type)	48X IDE CD-ROM	48X IDE CD-ROM	✗	52X IDE CD-ROM	52X IDE CD-ROM
Speakers (Brand, No. of Channels)	JBL Platinum / Stereo	JBL Platinum / Stereo	✗	✗	✗
Modem (Type, Speed)	Internal PCI 56K	Internal PCI 56K	✗	✗	✗
Extra peripherals (Joystick, Headphone-Mic, Web cam, UPS, Printer, Scanner, etc)	✗	✗	✗	✗	✗
Upgradeability					
Maximum Processor Speed Supported	AMD Athlon 2800+	Intel Pentium4 2.8 GHz	Intel Pentium4 2.8 GHz	Intel Pentium4 2.8 GHz	Intel Pentium4 2.8 GHz
No. of 5-1/4-inch bays	2	2	3	3	2
Package Contents					
Operating System	Linux	Linux	Windows XP Home Edition	Windows XP Home Edition	No Bundled OS
Recovery CD/Driver CDs	✓ / ✓	✓ / ✓	✗ / ✓	✗ / ✓	✗ / ✗
Manuals and Setup Instructions	✓	✓	✓	✓	✗
Bundled Software	✗	✗	✗	✗	✗
CPU Sub-system (12%): SiSoft Sandra					
Whetstones/Dhrystones	3010 / 7534	3284 / 6404	3167 / 6530	3167 / 6267	3164 / 6211
PCMark2002 Pro (CPU Index)	5519	6014	5849	5874	5826
POVRay 3.5 Benchmark	35 Min 1 sec	37 Min 4 sec	38 Min 30 sec	38 Min 28 Sec	38 Min 37 Sec
Video Encoding (Virtual Dub) secs (Lower the better)	133	111	109	105	106
Audio Encoding (DB Power Amp) secs (Lower the better)	84	65	68	66	66
Video Sub-system (10%): UT 2003 Flyby Demo (fps)					
Normal (640 x 480 x 16)	16.78	36.9	26.31	27.52	27.22
High (800 x 600 x 32)	11.43	27.5	18.19	19.51	17.78
Max (1024 x 768 x 32)	Failed	18.6	13.11	14.36	12.8
Quake III Arena 1.32 Demo (fps)					
Normal (640x480x16)	51	73	132.3	136	123
High (800x600x32)	Failed	56	59	61.5	52.8
Maximum (1024x768x32)	Failed	38.2	14.9	34.6	24.7
3DMark 2001 SE	Failed	Failed	1102	1520	1493
Displaymate (Scale of 5)	3.5	3.5	3	3.1	2.6
Memory Sub-system (10%): SiSoft Sandra					
Int Alu/Float FPU RAM bandwidth	932 / 912	2107 / 2137	1823 / 1855	1913 / 1925	1811 / 1842
PCMark2002 Pro (memory Index)	2313	4669	4441	4650	4720
I/O Sub-system (HDD) (6%): SiSoft Sandra					
Sequential Read / Sequential Write MBps	33 / 31	41 / 24	48 / 48	53 / 52	53 / 53
Random Read / Randon Write MBps	6 / 11	10 / 10	8 / 9	8 / 8	8 / 9
Avg. Access time (Secs) (Lower the better)	9	5	7	7	7
PCMark2002 Pro (Hard disk Index)	681	501	1061	1178	1134
Overall System Benchmarks (10%)					
Business Winstone 2002	15.4	Failed	23.6	29.6	27.6
Content Creation 2003	21.6	Failed	29	37.8	37.8
Multitasking (secs) (Lower the better)	107	167	117	90	98
PSBench (secs) (Lower the better)	583.65	512.45	470.91	337.63	348.10
Audio Sub-system (2%)					
RMAA (scale of 5)	1.67	1.62	1.58	1.54	1.61
Speaker performance (scale of 5)	3.5	3.5	0	0	0
CDROM/CD-RW/DVD (scale of 5)	0.40	0.80	0.11	0.43	0.40
OVERALL SCORE					
Performance (55%)	17.83	19.67	20.66	22.79	22.12
Features (45%)	18.20	18.20	13.40	14.40	9.90
Performance + Features (100%)	36.03	37.87	34.06	37.19	32.02
Value for Money	3.64	2.91	2.70	2.65	2.81
Grade					
Price (Rs)	27,500	36,150	35,000	39,000	31,700

					MID-LEVEL BRANDED PCS	
HCL	LG	PCS Orion Silver Magic	PCS Orion Silver Magic	Zenith	HCL	Zenith
EzeeBee	MY PC	Value PC	Multimedia PC	Home PC	Beanstalk 4658	Premium PC
AMD Athlon 2200+	Intel P4 1.9 GHz	Intel P4 1.7 GHz	Intel P4 2.4 GHz	Intel Celeron 2 GHz	Intel P4 2.4 GHz	Intel P4 3.2 GHz
Samsung / 40 / 7200	Seagate / 40 / 7200	Samsung / 40 / 5400	Samsung / 40 / 5400	Western Digital / 40 / 7200	Samsung / 40 / 7200	Western Digital/40/7200
256 MB DDR 266 MHZ	128 MB DDR 266 MHZ	256MB DDR 266 MHZ	128MB DDR 266 MHZ	128MB DDR 266 MHZ	256 MB DDR 400 MHZ	512 MB DDR 400 MHZ
Integrated	Integrated	Integrated	Integrated	Integrated	Ennyah Geforce FX-5200	Asus Geforce4 MX-440
Gigabyte	Biostar	Intel 845GLAD	Kobian	Gigabyte	Asus P4P800	Intel 8656BF
VIA KM266	Intel 845GL	Intel 845GL	Intel 845G	Intel 845GV	Intel 865PE	Intel 865G
3 / ✓ - 4X / 2	3 / ✗ / 2	3 / ✗ / 2	2 / ✗ / 2	3 / ✗ / 2	3 / ✓ - 8X / 4	3 / ✓ - 8X / 4
S3 Savage Pro	Intel Extreme Graphics	Intel Extreme Graphics	Intel Extreme Graphics	Intel Extreme Graphics	Intel Extreme Graphics	Intel Extreme Graphics
Realtek Six Channel	C-Media Six Channel	Sigmatel Six Channel	C-Media Six Channel	Realtek Six channel	SoundMax Six Channel	SoundMax Six channel
✓	✓	✓	✗	✓	✓	✓
6 Ports	4 ports	4 Ports	4 Ports	6 ports	6 ports	8 ports
CRT / 15"	CRT / 17"	CRT / 15"	CRT / 15"	CRT / 15"	CRT / 17"	LCD / 17"
PS/2 / Wired	PS/2 / Wired	PS/2 / Wired	PS/2 / Wired	PS/2 / Wired	PS/2 / Wired	PS/2 / Wired
USB / Optical	PS/2 / Ball	PS/2 / Ball	PS/2 / Ball	PS/2 / Ball	USB / Optical	USB / Optical
COMBO Drive48X/24X/48X/16X	52X IDE CD-ROM	52X IDE CD-ROM	52X IDE CD-ROM	52X IDE CD-ROM	Combo drive 48X/24X/48X/16X	CD-Writer 48X/24X/48X
✗	LG Custom, Stereo	PCS Custom, Stereo	PCS Custom, Stereo	Mercury, stereo	✗	LCD integrated speakers
Internal PCI 56K	Internal PCI 56K	✗	✗	✗	Internal PCI 56K	✗
✗	✗	✗	✗	✗	Gamepad and Headphones	✗
AMD Athlon XP 2600+	Intel Pentium4 3.06 GHz	Intel Pentium4 2.8 GHz	Intel Pentium4 2.8 GHz	Intel Pentium4 3.06 GHz	Intel Pentium 3.2 GHz	Intel Pentium4 3.2 GHz upwards
2	1	4	4	3	2	1
Linux	Linux	Windows XP Home Edition	Windows XP Home Edition	No Bundled OS	Windows XP Home Edition	No Bundled OS
✗ / ✓	✗ / ✓	✗ / ✓	✗ / ✓	✗ / ✓	✓ / ✓	✗ / ✓
✓	✗	✗	✗	✓	✓	✓
✗	✗	✗	✗	✗	Microsoft Encarta, School Whiz, Ankur Prof office suite, Power DVD and Nero 5	✗
2755 / 6786	2438 / 5126	2240 / 4736	3161 / 6836	2656 / 5663	4480 / 7010	6061 / 9946
5145	4556	4116	5791	4627	5952	7705
38 Min 46 Sec	49 Min 46 secs	55 Min	38 Min 31 Sec	56 Min 10 Sec	18 Min 31 Sec	28 Min
119	138	145	107	141	92	71
91	91	98	67	90	67.23	49
20.3	20.92	21.9	31.9	26.5	115	87.77
13.7	14.97	15.51	23.1	17.7	81	57.68
8.2	11.44	11.36	16.3	12.07	53	36.49
40.4	100	98	107	54	206	247
25.2	48	50	65	39	147	132
11	11	28.4	18.5	11.3	83	77
612	Failed	1219	1303	Failed	1650	3561
2.9	2.7	2.9	3.6	2.8	3.1	2.6
1308 / 1240	1756 / 1801	1890 / 1916	1824 / 1847	1336 / 1763	4040 / 4042	4483 / 4506
2548	3309	3475	4723	3381	6912	7463
49 / 50	40 / 39	25 / 25	25 / 18	28 / 35	40 / 37	46 / 46
7 / 9	8 / 10	5 / 5	6 / 6	7 / 11	8 / 8	7 / 9
8	6	9	9	7	7	8
1245	690	589	485	686	957	1085
25	18.8	19.9	19.8	Failed	28.5	33.1
26	Failed	25.4	25.7	21.8	Failed	49.3
89	109	128	139	132	64	23
374	531.38	530.63	558.75	639.15	350.00	207.73
1.02	1.44	1.62	0.98	1.29	0.61	1.66
0	2.5	3	3	2.5	0	1.5
3.52	0.42	0.46	0.13	0.43	2.86	2.73
22.79	17.36	18.29	19.73	16.43	28.62	36.56
17.90	15.30	12.40	10.40	12.40	31.10	20.40
40.69	32.66	30.69	30.13	28.83	59.72	56.96
4.11	2.77	2.67	2.41	4.00	3.24	2.64
						
27,490	32,800	31,900	34,700	20,000	51,490	60,000

HCL Beanstalk 4658 and Zenith Premium PC

Tug-of-brand

These PCs from Zenith and HCL had the best configuration of them all. The basic difference between them and the rest, was the high performance hardware, which delivered on all counts.

While the Zenith Performance PC offered the Pentium 4 3.2 GHz, while the HCL Beanstalk 4658 settled for the Pentium 4 2.4 GHz. Both processors support 800 MHz FSB and Hyperthreading. In the processor sub-system tests, the Pentium 4 3.2 GHz crushed all records to come out tops, followed by the HCL system.

Both used top-notch motherboards—Zenith has Intel's 865GBF motherboard, whereas HCL uses the Asus P4P800, which supports dual-channel DDR 400 MHz memory, AGP 8X and has extra features such as onboard six-channel sound, LAN controller, USB 2.0 ports, etc. In addition, the Zenith system has 512 MB of DDR 400 MHz memory modules, whereas the HCL is content with 256 MB. Both machines were configured in dual-channel mode. The Zenith, due to its higher clock processor, was better at extracting the most out of the memory, but the difference between the two was not significant.

The HCL PC boasts of the Ennyah GeForce Fx-5200 graphics card, while the Zenith PC comes with just an Asus Ge Force4 MX 440-8X card. The DirectX 9-compliant FX-5200 lets you play all the latest games with the eye-candy switched on. The GeForce4 MX 440 is DirectX 8.1-compliant, implying that the eye-candy will be rendered by



The HCL Beanstalk 4658 did a marvellous job on the gaming front

Price: Rs 51,490
+ Great package
- None

HCL Beanstalk 4658	B
Performance	■ ■ ■ ■ ■ ■ ■ ■ ■ ■
Features	■ ■ ■ ■ ■ ■ ■ ■ ■ ■
Build quality	■ ■ ■ ■ ■ ■ ■ ■ ■ ■
Value for money	■ ■ ■ ■ ■ ■ ■ ■ ■ ■

PowerMac G5

The Power Mac G5 is the latest and the most powerful addition to the Power Mac range of workstations. The single most discerning attribute is the fact that it's powered by the G5 processor—the world's first 64-bit processor for the desktop computer.

Keeping up with tradition, Apple has never compromise on its design and features. The handles on the top of the case are of great help to carry it around. Its titanium-coloured case is divided into four separate zones on the basis of the operating temperature. This eliminates the need for powerful fans and leads to a quieter system. The Power Mac G5 also comes with the now ubiquitous SuperDrive, as well as support for USB 2.0 and FireWire. Wi-Fi connectivity is also supported through Apple's own Airport Extreme device.

Its true potentials remain hooded, due to the absence of a 64-bit OS. Sometime soon, the emergence of a 64-bit operating system will unveil the difference of 64-bit processing on your desktop.



the CPU. However, the Zenith PC took a good lead while playing *Quake III* at lower resolutions, where the processing is passed on to the processor, but the FX-5200 card showed its mettle at higher resolutions, scoring marginally over the Zenith. Overall, both these PCs are better at gaming than the rest of the crowd, and provide playable frame rates. The small margin by which the hard disk on the Zenith PC performs better than the one on the HCL system gave it a lead in the multi-tasking test. It opened a 200 MB TIFF



The Zenith Performance PC came with a sleek LCD monitor

file from the hard disk in just 23 seconds—less than half the time taken by the HCL PC. Though the credit for this was shared by the higher clock processor, it shows how a fast hard disk can boost the PC's overall performance.

While the HCL PC came with a 17-inch flat screen CRT monitor, the Zenith PC stood out from rest with its crisp, extremely good-looking 17-inch LCD. The HCL PC also brought along a combination drive, headphones and a 56k PCI modem—all of which the Zenith missed.

As for software, the HCL PC came with Windows XP Home Edition, Ankur pro Office suite, the Microsoft Encarta encyclopedia and lots of other applications. As for the Zenith PC, neither is an operating system, nor additional software provided. Instead, it provides a customised software package for which you need to pay extra.

Zenith's powerhouse is priced at Rs 60,000, excluding local taxes and the cost of the software, whereas the HCL costs Rs 51,490. In terms of performance, the Zenith PC beats the HCL by a significant margin. Yet,

	Decision Maker		
	Entry-Level PCs	Low-End PCs	Mid-Level PCs
You need	A PC for browsing the Internet, basic office work and playing MP3s, audio CDs and video CDs.	A PC that can be used in the office, can indulge into occasional gaming sessions and be used for entertainment purposes.	One that runs all the latest and upcoming games, works with professional applications such as Photoshop without hiccups, and does a whole lot of multi-tasking.
Look for	A PC with 1.7 GHz processor, 128 MB DDR RAM, a 40 GB hard disk, integrated six-channel audio, decent speakers and onboard graphics	A PC with a 2.4 GHz processor, 256 MB DDR RAM, a 7200 RPM 40 GB hard drive, and if possible, a graphics card and onboard six-channel sound with decent speakers	A PC with a processor above 2.4 GHz, with features such as 800 FSB and Hyperthreading, more than 256 MB of DDR RAM, a DirectX 9-compliant graphics card and a 7,200 rpm hard disk
Our pick	HCL Ezeebee, Compaq S5010iL and Zenith Home PC	Compaq S5030iL, Dart Emerald performance PC	HCL Beanstalk 4658, Zenith Performance PC
Price	Upto Rs 30,000	From Rs 31,000 to Rs 45,000	Above Rs 45,000

Contact details							
Brand	Compaq	LG	Dart	PCS	Datamini	HCL	Zenith
Company	Hewlett Packard India Ltd	LG Electronics India Pvt Ltd	Dart Computers Pvt Ltd	PCS Industries Ltd	GES Technologies Ltd	HCL Infosystems Ltd	Zenith Computers Ltd
Phone	011-26826000	0120-2560900	07104 - 232565/75	022-28521177/2635	022-28290296	0120-2520977	022-28377300
Fax	011-26826053	0120-2560921	07104 - 232570	022-28520193	022-28290145	0120-2533877	022-28377297, 28364859
E-mail	seema.dawar@hp.com	response@lgezbuy.com	dartcomp@nagpur.dot.net.in	arunnarayan@pcsil.com	gesmktg@ges.co.in	raman@hclinsys.com	one-up@zenith-india.com

HCL has a better package to offer than the Zenith at a lower price. Hence, opt for Zenith, if you want the best branded PC available, else go in for the all-rounder HCL Beanstalk 4658.

Price: Rs 60,000
+ High performance hardware
- OS not bundled

Zenith Performance PC 	
Performance	
Features	
Build quality	
Value for money	

And the winner is...

We voted the HCL Ezeeb as the best choice in this gamut of systems since it offers good package for the price. It was a clear winner because of its excellent performance, great features, good upgrade options and a sound price. Performance wise, though the Dart Emerald Performance PC was on par with the HCL Ezeeb, it lost out when other factors such as features and upgrade options were taken into account. The Compaq S5010iL also equalled the Ezeeb in terms of features, but lost due to its dismal performance in most of the tests.

Coming to value for money, the competition heated up with the Zenith Value PC cutting the barrier with its terrific price, followed by the HCL Ezeeb with its excellent price-to-performance proposition. In the end, the HCL Ezeeb took the crown from

the Zenith Value PC by an extremely small margin of 0.1 units. Both these PCs provide excellent value for money on their own terms, and are designed to meet the needs of two different segments. The Zenith Value PC is a system for people who intend to buy a computer that helps them with their basic office work, and provides some decent entertainment—all at a modest budget. On the other hand, the HCL Ezeeb offers enough power to run all applications, and also provides upgrade options at an acceptable price.

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Buying Tips

- ✓ Have a clear idea about your requirements, so that you can buy a PC with specifications that meet your needs.
- ✓ All branded PC vendors offer a mere 128 MB of RAM in order to cut costs. If you plan to use Windows XP, we strongly recommend at least 256 MB.
- ✓ Choose a configuration that is as future-proof as possible. Look out for maximum expansion options such as PCI slots, an AGP slot, USB ports, etc.
- ✓ With all the new PCs offering the fastest processors and the latest graphic cards, thermal dynamics is of great importance. Hence, look out for additional cooling fans in the cabinet.
- ✓ As far as monitor size goes, choose a 17-inch monitor since they are pretty affordable these days. Similarly, don't settle for anything lesser than a 40 GB hard disk, running at 7200-rpm.
- ✓ Invest in a decent graphics card that gives optimal performance, if you plan to use your PC for multimedia, 3D content creation, games etc., rather than settling for the onboard graphics option.
- ✓ Check the various finance schemes available, but don't fall prey to the free gift schemes. Instead, take a look at the package offered.
- ✓ Make sure there's an authorised service centre close to you.

1/4th AD



PC-ing IT TOGETHER...

Know how to put together a PC that goes well with your budget...

We've been testing individual PC components for so long that we thought it was about time we put them all together to make a complete PC. And since anything worth doing is worth doing twice, we put together two!

Both our PCs are at budgets that left enough for a post-assembly party, and performance enough to make us proud. The All-Rounder PC would cost Rs 60,000, and the configuration is steady enough to let us play a flight simulator, while encoding a DivX movie. It should be able to briskly handle any task you throw at it, while not burning a hole in your pocket. Our 'Back to Basics' machine is an affordable Rs 20,000, perfect for surfing the Internet, working with office applications or simply watching a movie.

Digit All-Rounder PC

We had affordable performance on our minds while building the All-Rounder. We actually did go a bit overboard and splurged an extra Rs 500, but every Rupee is accounted for in the benchmarks.

Processor: AMD AthlonXP 2800+

Price: Rs 10,500

Why we chose this: Firstly, it costs a

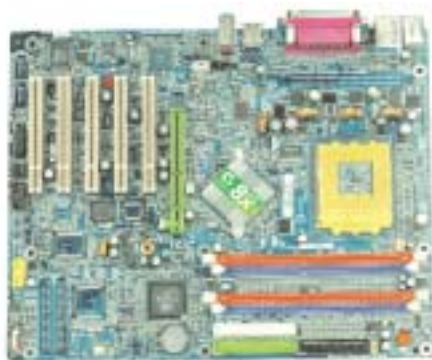


decent Rs 11,200; secondly, it runs at 2.25 GHz and is the first to use the 333 FSB, based on the Thoroughbred core. It can run multimedia applications and play high-end games at decent resolutions. The Pentium 4 2.8 GHz is higher priced, and gives almost equivalent performance. So, this is a fair deal.

Motherboard: Gigabyte GA-7N400-L

Price: Rs 6,500

Why we chose this: This motherboard complements the processor perfectly, and features the latest nVidia nForce 2 Ultra 400 chipset with DDR 400 SDRAM support, and also ATA-133 hard drives. So, if you plug in a DDR 400 RAM module and use a 7200-rpm Ultra-ATA hard drive, your system is bound to give you peak performance. This means that the ultra-real-



istic fire effects in *Unreal 2* won't lag, and a DivX movie encoding will not take ages to complete, because of the memory subsystem. The AGP slot supports AGP-8X video cards, while the LAN connector can easily access broadband Internet. The onboard AC'97 sound plays six-channel audio. It provides support for future AMD processors, while the RAM can be upgraded to a whopping 3 GB using 4 DIMM slots.

RAM: Zion DDR 333/PC2700 256MBx2 SDRAM DIMMs

Price: Rs 4,900

Why we chose this: The DDR 333 RAM is the most viable option for a good quality high clock-speed RAM. DDR 266 is run-of-the mill, while DDR 400 is mighty expensive and difficult to obtain. DDR 333 RAM is already widespread, and it's just a matter of time before it becomes the norm. It gives better performance while playing games, and also provides an extra bit of power when working with resource-hungry applications such as Adobe Photoshop.

Hard Drive: Samsung SP0802N 80 GB

Price: Rs 4,900

Why we chose this: Samsung's 80 GB hard drive provides the space we needed for our applications, movies, songs, etc. The 7,200-rpm syncs effortlessly with the graphics card and the memory subsystem. It meant fast application load times and a decent data access rate—all for Rs 4,900 with a 3-year warranty. And yeah, it also has service centres strewn all over the country.

Graphics Accelerator: Gigabyte Radeon 9600 PRO 128MB

Price: Rs 14,100

Why we chose this: Firstly, because it supports DirectX 9 (okay, we admit we



were building this one solely for gaming). A major chunk of the budget was allotted to the graphics card because watching DVDs, playing games, 3DSMax modelling—all require a video card that has ample memory and clock speed. High-end cards other than this

would have taken up half the budget allotted, while lower-end cards barely provide decent DX9 support. The Gigabyte Radeon 9600 PRO 128MB was the mid-level category winner in our previous issue, beating the nVidia GeForce FX 5600 cards.

Keyboard: Microsoft Multimedia Keyboard

Price: Rs 1,200

Why we chose this: The Microsoft Multimedia keyboard is a class apart from the standard equipment bundled with most PCs. It has multimedia keys, along with a host of shortcut keys that let you access e-mail, an instant messenger, Media Player, the My Documents folder, etc. The sturdy palm-rest can handle extended typing sessions with relative ease. At Rs 1,200, it was quite a deal.

Mouse: Microsoft Basic Optical Mouse

Price: Rs 725

Why we chose this: It looks nice, is easy-to-use and works on any surface except for glass. It doesn't need cleaning, and doesn't get stuck.

Monitor: LG Studioworks 700S

Price: Rs 6,900

Why we chose this: Any respectable computer today has to have a 17-inch monitor, and the LG 700S fits the bill perfectly, giving decent performance at an affordable price. It has a flat outer screen, with an anti-glare coating, and the clear OSD menu is easy to operate.

Speakers: Artis S880 4.1 speakers



Price: Rs 3,500

Why we chose this: A decent set of 6.1-channel speakers costs a lot. We chose the Artis S880 4.1 speakers that have four discrete channels, with the subwoofer. Although it isn't an earth-shaking speaker set, the sound is ample and tight enough for DVDs, mp3s and games. However, it does distort at higher levels. The bass is tight and punchy, while the highs and mid-ranges are handled reasonably well by the satellites.

The Upper class All Rounder

It's hard to be satisfied with your PC, when there's always an upgrade around the corner.

The Enthusiast Upgrade pack

Processor: Pentium 4 3.2 GHz

Motherboard: Intel D875PBZ

With the Pentium 4 EE and Athlon 64 FX yet to catch up with India, this is the obvious choice. More than an upgrade, this is a complete system makeover. The processor and the motherboard complement each other perfectly.

Graphics Accelerator: GeForce FX 5900 Ultra 256 MB DDRII

With the Radeon 9800 XT still to be released in India, this is the only card that has the raw muscle power to tear any game

that you throw at it to pieces. It's absolutely future-proof and costs the Earth!

While the above upgrades apply only to the rich and the famous, the following ones create a sense of brotherhood and equality.

RAM: Hynix DDR 400 256 MBx2

Price: Rs 6,700

This upgrade lets the system utilise the motherboards' DDR RAM speed, and enhance performance by at least 10 to 15 per cent.

Speakers: Creative Inspire 5.1

Price: Rs 6,200

These exploit the 5.1 processing the sound card already provides.

Cabinet: Mercury KOB-142

Price: Rs 2,100

Why we chose this: This cabinet has two extra cooling fans, in addition to the SMPS power supply fan. The SMPS power rating is 300 watts, which was good enough for our configuration. Three 5.25-inch bays and two 3.25-inch bays should be enough for all your drives. Aesthetic colours and button placements make it all too irresistible.

Optical Drive: Lite-On Combo

LTC-48161H

Price: Rs 4,250

Why we chose this: The LTC-48161H reads and writes at 48X, re-writes at 24X, and reads DVDs at 16X—all for Rs 4,250. The bundled software include CD-burning software and PowerDVD. Rock-solid performance and rock-bottom price made this our unanimous choice—everyone who disagreed was quickly clobbered!

Floppy Drive: Sony

Price: Rs 410

Why we chose this: Well, for old times' sake; and also in case we needed to boot using a boot disk, and the CD-ROM drive disobeyed.

Modem: D-Link Internal 56K

Price: Rs 525

Why we chose this: We chose the D-link in particular because of its low cost

and the availability factor. Plus, repair and replacement facilities offered by the vendor were very good. It also gave a decent price-to-performance ratio.

Digit 'Back to Basics' PC

Here's a PC that defines 'Value for Money'. If you are not an avid 3D gamer and your work does not involve graphics or video processing, you will not miss the superfluous power of the more expensive PCs.

Processor: AMD Athlon XP 1800+

Price: Rs 3,350

Why we chose this: Two reasons. One, performance; two, price. It's better than a Celeron 2.0 GHz, and gives performance equivalent to a Pentium 4 1.5 GHz. Based on the Palomino core, its price is absolutely right for the Back to Basics PC. Plus, we could run games and multimedia applications without worrying about the minimum system requirements and resources.

Motherboard: MSI KM2M

Price: Rs 3,750

Why we chose this: This is a neat feature-packed little motherboard that puts others to shame. It has a ProSavage8 2D/3D Graphic Controller, Realtek ALC 650 codec, an AGP slot, and four memory slots—two of which support SDRAM (168-pin) DIMMs, while the others support DDR RAM DIMMs. It supports Ultra DMA 66/100/133 operation modes, and

connects up to four IDE devices. The limitation is that it supports memories of the DDR 266 clock speed only. This leaves the door open for an upgrade to the AMD 2600+.

RAM: Hynix DDR 266 128MBx1 DIMM

Price: Rs 800

Why we chose this: This was the only viable option; other exotic brands burn a hole in the pocket. The Hynix DDR 266 is an above-average performer, and two DIMMs put together met our resource needs adequately.

Hard Drive: Samsung SV0411N 40GB

Price: Rs 3,200

Why we chose this: Samsung drives are good performers and are affordable. This entry-level hard drive comes at a decent Rs 3,200. The only drawback is that it runs at 5,400 rpm, which does not translate into performance equivalent to the other, faster drives. However, it suffices to run applications and play videos.

Graphics Accelerator: Onboard

Why we chose this: We're sticking to the integrated ProSavage8 2D/3D Graphic Controller, since it plays games at low resolutions, and also DVDs—which is just about all the multimedia that this PC can handle.

Keyboard: Logitech keyboard

Price: Rs 275

Why we chose this: Decent-build quality, a reputed name in input devices and the killer price were all the reasons we needed. Although no multimedia or shortcut keys are provided, it met our basic needs.

Mouse: Samsung Scroll Mouse

Price: Rs 300

Why we chose this: A scroll-functional mouse, from a reputed company and a good price-to-performance ratio. What else could we ask for?

Monitor: Samsung 56V

Price: Rs 4,900

Why we chose this: The Samsung 56V was the obvious choice because of its performance as well as the price. It performs as good as the best 15-inch monitor, which is one major reason it was included in this configuration.



A Higher Basics

We have some upgrades for our Back to Basics PC too that we thought would turn it into a nice mid-range PC.

Processor: AMD 2400+

Price: Rs 5,200

The board supports up to AMD 2600+, which is pretty difficult to obtain, so the next best one would be the most suitable upgrade to rev up the performance of the Basics PC.

RAM: Hynix DDR 266 256MB DIMM

Price: Rs 2,150

The recommended amount of memory for Windows XP is 256 MB, which gives a performance increase of at least 5 to 7 percent. This is reflected in the faster load times of applications and games.

Graphics Accelerator: MaxTone GeForce 4 MX 440-8X

Price: Rs 2,600

This video card can play all recent games

without any problems, but at low resolutions. Still, it's quite acceptable for the price at which it retails.

Monitor: LG StudioWorks 700S

A larger screen size makes for a good computing experience. Also, you can get higher refresh rates at higher resolutions, reducing eye-strain when working at a stretch. With 17-inch monitors becoming the accepted norm, and the prices at an all-time low, this upgrade is inevitable.

Speakers: Creative Inspire 2.1

Price: Rs 2,700

This set of speakers is far better than the little Creative SBS 20 twins. The sub-woofer packs in some nice punchy bass, and is complemented by the satellites. The mid and high ranges distort after you raise the volume over the three-fourth level, but then you would rarely need to pump it that high.



Speakers: Creative SBS 20
Price: Rs 675

Why we chose this: It's a nice pair of desk-top speakers that's suitable for listening to music, and for the occasional gaming bit.

Cabinet: Mercury KOB-132
Price: Rs 1,150

Why we chose this: Well, it's a sturdy cabinet, with an extra fan and an option for attaching another one. It has a Micro-ATX form factor that complements the micro-ATX motherboard with three 5.25 expansion bays and one 3.25 expansion bays—roomy enough for even airflow, and the price is just right.

Optical Drive: Samsung 52X CD-ROM
Price: Rs 1,050

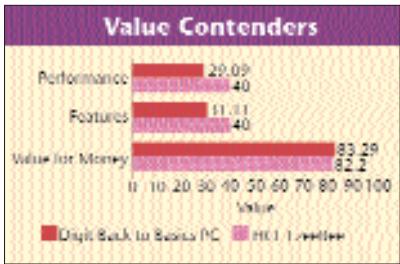
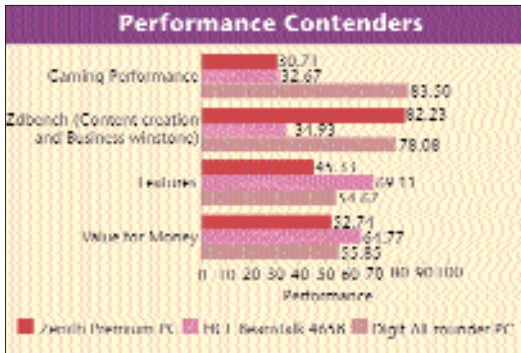
Why we chose this: We chose this basic drive that lets you watch VCDs, listen to MP3 and Audio CDs and also transfer data, because of its low price and high usability.

We used the same modem and floppy drive for this system since they did the job quite well.

Fight, fight!

Once we got our machines up and running, it was time to pit them against the branded masters we were testing.

The competition was tough and the results were mixed—our home-bred PC lead the score in the gaming arena, while HCL packed maximum features and also gave the most value for money. Game, work with multimedia and regular office applications ran



without any issues, and yielded performance, somewhere in between the 2.4 and 3.06 GHz bracket. The graphics accelerator included is one of the best, and is

not even present in the high-end PCs that we received for our tests. We also packed in double the memory and hard disk space than the Rs 51,000 Beantalk. This more than justifies its price, which amounts to Rs 60,510.

A similar scenario emerged when we compared our Back to Basics PC with similarly configured entrants. Its performance was equivalent to the PCS Pentium 4 1.7 GHz system. Though not the best performer, it does enough to keep you happy at Rs 20,685.

Our home-assembled systems performed well, and gave the branded entrants a run for their money—something that did us proud! ■

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Palmistry

PDAs offer you computing that's mobile, cheap, and they look really cool too. We take a look at the best available in the market, so that you can make the right choice

Personal Digital Assistants (PDAs) or handheld computers are becoming mainstream faster than some of us believe. Though the rate of evolution has not been as fast as compared to that of mobile phones, as seen in the last few years, PDA vendors have recognised the evolving needs of consumers, and have tried to keep pace by launching feature-rich models that cater to various usage patterns. This gets us back to the very critical question of why anyone would require a PDA. Sure, you could get one if you have the money, and put your cellphone to shame. However, apart from their enormous flaunt value, PDAs can do a lot of very useful tasks that make them worthy of possession.

Current models can do much more than store hundreds of your contacts and text notes—they can get you organised, entertain you by playing games, music and video clips, and exchange data wirelessly. Some can even take photographs and make phone calls. Convergence of various technologies in the mobile segment has converted the traditional PDA to a versatile secretary, maybe more. It's not uncommon to come across hybrid devices such as the Sony Ericsson P800 that offer the combined functionalities of a mobile phone, a PDA and a camera, all rolled into one swanky package.

The big players such as Dell, HP Compaq, Toshiba, Sony, Sharp and Palm, all have a slew of models catering to various user requirements and run different platforms such as Palm OS, Linux and Microsoft Pocket PC. Though not many vendors sell PDAs officially in India at the moment, the grey market is always happy to oblige. If not, you

can always ask your US-based cousin to get one for you. This month we look at some of the main platforms available for PDAs, the kind of applications you can run on them, and some of the devices running on these platforms.



IMAGING: Solomon Lewis
PHOTOGRAPHER: Jiten Gandhi

PALM

Since the introduction of the first Palm Pilot in 1996, Palm has been an immensely popular platform for handhelds. It enjoys tremendous support from third-party application developers, and there aren't too many things that you can't do on it—from basic PIM-level tasks, business tools, games, to accessing the Internet and even wireless connectivity!

Palm Zire

Using post-its? Grow up to Zire!

The entry-level PDA from Palm, the Palm Zire is compact and elegant. It runs Palm OS 4.1. The Zire features a 160 x 160 pixel greyscale screen, a glossy white front, with the rear done in grey.

Powered by a 16 MHz Dragonball EZ processor, the Zire has 1.8 MB of RAM for programs and data, and 2 MB non-flash-upgradeable ROM. 1.8 MB is more than enough for storing quite a few contacts, memos and calendar entries. However, if you want to work with several applications at the same time, or need advanced features such as a wireless connection, you need to look further.

Screen contrast is good, but it lacks a backlight; however, this means that battery life is extremely good. There are two scroll buttons, but just two application buttons for contacts and the calendar. Dedicated buttons for Memos and To-do lists are missing, so you can't run games that require four buttons. There's no expansion slot either. Syncing is done using the mini-USB cable, or using IrDA. Since there's no cradle, you need to tap the star button on the silkscreen to initiate HotSync. The plastic digitiser layer on the screen is fairly responsive, and text entry using Graffiti is easy. The Graffiti area silkscreen includes Clock and Contrast icons, and a star icon that launches HotSync by default.

The bundled CD contains Palm Desktop, Chapura Pocket Mirror for synchronisation with MS-Outlook, and four games.

Overall, the Palm Zire is a very appealing package, considering its ease of use, and the price tag of Rs 7,500. You can get it about Rs 500 less in the grey market.

Price: Rs 7,500

+ Good value for money

- No backlight

Palm Zire		A-
Performance	▶▶▶▶▶▶▶▶▶▶	
Features	▶▶▶▶▶▶▶▶▶▶	
Ease of use	▶▶▶▶▶▶▶▶▶▶	
Value for money	▶▶▶▶▶▶▶▶▶▶	

Palm Zire 71

Carry on chic

The Palm Zire 71 is one of the best deals you can get for a PDA today. It's powered by a good processor, and is backed by an obscene amount of quality software. With a funky blue-and-silver colour combination, it comes with a healthy 320 x 320 pixel screen and more than 64,000 colours. The screen is very readable, exceptionally clear, uniformly lit and bright. The processor is blazingly fast for applications and games. Ably supporting the power offered is the latest Palm OS 5.2.1—complete with excellent colour support and faster in-built applications. There's 16 MB of internal memory.

The button layout is a pleasure to work with. The handheld comes bundled with a good selection of software, including an SMS application, Audible Player for audio books, RealOne Player

and several others.

The Zire 71 comes with an SD Memory slot, an Infra-red port and the standard Palm Universal Connector. The handheld sits on its cradle via this connector, which can also be used to connect to other peripherals, such as a modem and a keyboard. The bundled software can talk transparently with Microsoft Outlook, and can maintain a single data point for all PIM tasks.

There are issues of course. If you go multimedia-happy, the battery won't see you further than 4 to 5 hours; the stylus could have found a better home, away from the power button; the rear of the unit is slippery. And it comes across as a less-than-average music solution.

But these are small niggles at worst—the snappy processor and stable OS make the unit a joy to work with. Reading an e-book finally becomes an enjoyable proposition. While the software bundle is good, the library available online is breathtaking.

The Zire 71 is a great buy for its price, it can be yours for as little as Rs 23,000. A small addendum to sway opinions: it can also take photographs! Though the resolution is not so pleasing at 640 x 480, it's a camera nonetheless.

Price: Rs 23,000

+ Feature-rich

- Below average audio

Palm Zire 71		B+
Performance	▶▶▶▶▶▶▶▶▶▶	
Features	▶▶▶▶▶▶▶▶▶▶	
Ease of use	▶▶▶▶▶▶▶▶▶▶	
Value for money	▶▶▶▶▶▶▶▶▶▶	



How We Tested

We had an assortment of platforms for this evaluation, so we didn't compare them head-to-head in terms of pure performance. The broad parameters we focussed on were features, bundled applications and ease of use.

Features: We looked at storage space; type of screen—whether it was colour or greyscale, and whether it was backlit; expansion options provided, such as an SD card slot; connectivity options provided, such as IrDA; Bluetooth support; battery type and life; and extras such as a docking cradle, built-in speaker, camera and so on.

Bundled applications: We looked at the applications that came pre-loaded with the PDA, as well as those on the accompanying CD.

User friendliness: In the ease-of-use department, we looked at the interface, number of hard buttons, and whether they were user-customisable or not.

Palm Platform and applications

The Palm platform enjoys wide popularity. This has resulted in several software coming out, all of which offer similar features. People, as a result, are confused about which software to choose for a particular task. We've identified and categorised the most common tasks that you would use your Palm for, in order to help you choose the software most appropriate for each category.

Personal Information Managers

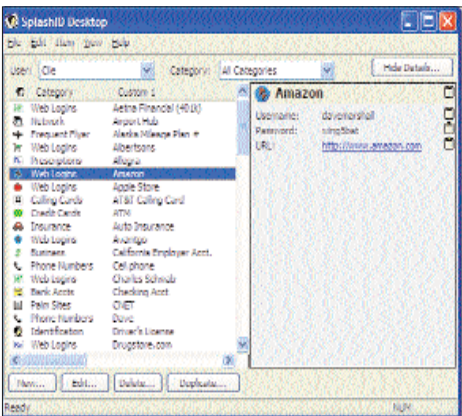
Personal Information Managers (PIMs) are programs that let you manage time and contact information—calendar, and task and address applications perform these functions. Although Palm handhelds come along with a Datebook, To-do and Address book, the functionality offered is minimal.

There are several replacement programs that add features to the basic Palm applications. Agendus is one such, which lets you manage information on your contacts. It offers a very comprehensive calendaring option for your tasks, and lets you read office e-mail and allows for linking To-dos with contact history. It also adds other features such as repeating and alarmed To-Dos, single-pane lookup of pending tasks, and much more.

DateBk5 is a program similar to Agendus. If you're looking for something more lightweight, consider HappyDays, a freeware application designed to help you remember dates of importance. Diddlebug is another freeware reminder program. Also worthy of mention is BugMe!, a reminder program with alarms.

Password Managers

These are programs that help you securely store passwords to Web sites, login details and other sensitive information, on your Palm handheld.



A companion desktop software for Windows and Macintosh lets you view, edit and synchronize sensitive personal information with your handheld

SplashID and SecureIt are two such programs. The security offered is good enough for ordinary use. SplashID supports high-resolution displays (320x320), and offers unlimited categories, colour and icon support. SecureIt is freeware.

Databases

A database is generally used as a repository for bulk information. One can store details about their video cassette library, MP3 song collection, etc. For example, you can download a huge and fairly comprehensive database on Hollywood movies collated from the movie Web site IMDB.com (Internet Movie Database) and impress your friends with movie trivia. Visit Memoware (www.memoware.com) for more on available databases; you will also find a healthy collection of free databases at the HandDBase Web site (<http://www.ddhsoftware.com/handbase.html>). Several programs help you create a database for the Palm. Of these, HandDBase is a powerful solution that is fairly easy to learn with database templates. It comes with extensive documentation and offers data encryption.

Also available is MobileDB4; it is compatible with Microsoft Excel, Access and Filemaker, and brings along a Windows desktop companion.

A database can be used to store records of everything from birthdays, to the periodic table of elements

Office suites

Two major suites—Documents to Go and Quickoffice—let you type, edit and present documents on the Palm handheld. These offer applications for word processing, spreadsheets and office presentation. Both talk fairly well with Microsoft's Office suite for Windows; for example, a Word file can be viewed on a Palm handheld with bullets, headings and so on, intact. Moreover, hardware accessories let you use the handheld as a mobile presentation platform. Quickoffice also lets you create and view a PowerPoint file in native format. Documents to Go adds PDF support, lets you browse e-mail and view pictures on the Palm.

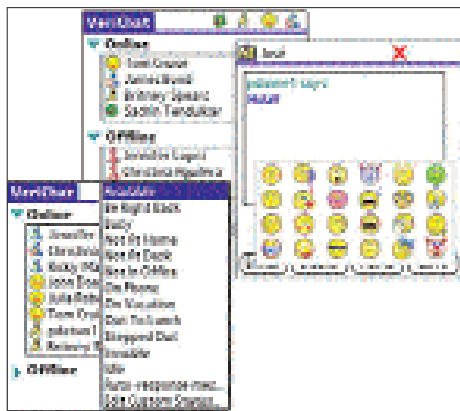
Quicksheet, part of the Quickoffice suite, is perhaps the best spreadsheet application available for the Palm platform

For those who only need word processing, Wordsmith is a powerful software that can read and write Microsoft Word and RTF documents.

Messaging

Almost all Palm handhelds come with a functional Infra-red port; most high-end models support Bluetooth and Wi-Fi as well. This makes for great communication possibilities—be it using a handheld for typing SMS messages, or for chatting with friends over the Internet.

FunSMS supports a variety of phones and networks, with which one can send SMSes to multiple recipients. One can add signatures, use templates and request status reports. By categorising incoming messages and exporting them to Memo Pad,



VeriChat is a unified instant messaging application that works with Yahoo!, ICQ, MSN and AOL chat networks

one can also manage SMSes. Pixier MMS can create multimedia messages (MMS) using your handheld.

Chatting is ably handled by VeriChat, which allows syncing between users of the ICQ, MSN, Yahoo! and AOL messenger services. The service can forward instant messages to your

mobile phone when you are not connected to a network.

ICQ has a Palm version that shares many of the features of the desktop version. If you have a server-side contact list on your Windows desktop, ICQ mirrors your contacts to the handheld as well.

While a native version of MSN Messenger is not available for the Palm platform, MSN Messenger Force can send messages to users; it can also check your Hotmail account for e-mails.

Multimedia

Palm handhelds are now powerful enough to handle multimedia services, ranging from listening to music to watching movies. Most media has to be stored externally on an SD or MMC card.

RealOne has a Palm version of its software. This can convert your current files and port them to the handheld. It offers decent options and is freely available; it is, however, upstaged by AeroPlayer and Pocket Tunes. Both are commercial products that offer MP3 and Ogg Vorbis playback, skins, DSP plugins, advanced playlist facilities, the ability to control playback from another program, and more.

For movie playback, the Kinoma Player delivers full screen, high resolution video and is compatible with Palm OS 3.1 and later. Supporting playback from SD and MMC external memory, the software also supports video, VR objects, VR panoramas, animation and still images with synchronized audio. Its companion application, Kinoma Producer, can encode almost all popular formats into the format supported by the player.



Personal Information Managers

Agendus: <http://www.iambic.com/agendus/palmos/>

Agendus for Windows: <http://www.iambic.com/agendus/win/>

DateBk5: <http://www.pimlicosoftware.com/datebk5.htm>

HappyDays:

<http://www.palmgear.com/software/showsoftware.cfm?prodID=6289>

Diddlebug:

<http://www.palmgear.com/software/showsoftware.cfm?prodID=16870>

BugMe!:

<http://www.palmgear.com/software/showsoftware.cfm?prodID=839>

Password Managers

SplashID: www.splashdata.com/splashid

SecureIt: www.schau.com/sit/index.html

Databases

HandDBase: www.ddhsoftware.com/handbase_palm.html

MobileDB: www.handmark.com/products/mobiledb/

Office suites

Documents to Go: www.documentstogo.com

Quickoffice: www.cesinc.com/quickoffice/

wordsmith: www.bluenomad.com/ws/prod_wordsmith_details.html

Messaging

FunSMS: www.fun4palm.de/english/funsms_info.htm

Pixier MMS:

http://electricpocket.com/products/pixermms_palm.html

VeriChat: www.pdaapps.com/verichat/

ICQ: www.icq.com/download/installpalm.html

MSN Messenger Force:

www.ruksun.com/mobile_computing/palm/Products/msn_messenger-force/

Multimedia

Pocket Tunes: www.pocket-tunes.com

AeroPlayer: www.aerodrome.us

RealOne: www.real.com/realonemobile

Kinoma Player: www.kinoma.com

Must haves

iSilo (www.isilo.com): Essentially a document viewer, iSilo can read native as well as Palm DOC files. It can additionally be used for offline browsing. Those looking for a free equivalent should consider Plucker (www.plkr.org).

TomeRaider (www.tomerader.com): Most e-books meant for handhelds are in the TomeRaider format. This range covers everything from the classics to erotica. Find thesauri, dictionaries, and encyclopaedias available for this program at www.memoware.com.

Games (www.astraware.com): There's a large library of games for Palm handhelds. Recommended amongst them are *Bejewelled*, *Glinx*, *Mummy Maze*, *GTS Racing Challenge*, *Zap!2000*, *Insani-quarium*, and *Ricochet*.

Recommended sites: FreewarePalm (www.freewarepalm.com) is a repository of freeware titles for the Palm platform. Handango (www.handango.com) and PalmGear (www.palmgear.com) are the sites to visit for the latest and greatest in Palm powered software. Memoware (www.memoware.com) and PDABooks.org (www.pdabooks.org) are for e-books.

Pocket PC

The latest version of this platform which debuted in April 2000, is called the Windows Mobile 2003. The Microsoft handheld platform enjoys its own fan-following amidst users and application developers. The latest version sees significant improvements in communications and multimedia, with an improved Connection Manager for setting up connections, the inclusion of Pocket MSN for instant messaging, and a new application for viewing and editing images, called Pictures.

Toshiba Pocket PC e350

A PC in your pocket

The e350 is extremely light, and has a gunmetal finish that gives it an elegant but serious look. Measuring 8 x 12.5 x 1.24 cms, the e350 is a mere 149 grams, and runs Microsoft Pocket PC 2003. Its 3.5-inch TFT colour screen can reproduce up to 65,536 colours at a 240 x 320 resolution. Horsepower for the e350 is provided by a 300MHz Intel PXA255 XScale processor, complemented by 16 MB of ROM and 64 MB RAM.

The package comes with a detailed user manual and a leather carry pouch. On the front face are four application buttons, a five-way navigation pad, and a speaker, with a voice-recorder button and a jog dial on the left of the device. The installed application set includes most applications you'd need; there are also two games—Jawbreaker and Solitaire. However, the e350 misses out on an image viewer/editor application.

The transreflective screen is bright and crisp in most lighting conditions, though you may like to keep the backlight on most of the time. Sound output is average even if you crank up the vol-



ume. For a Windows user, migrating to the e350 should not be a major issue. Text input options include an onscreen soft keyboard, Letter Recogniser, Block Recogniser and Transcriber. The characters appear as typed text on the screen. The Block Recogniser is useful for those familiar with the Graffiti tool. Using the Transcriber, you can write complete sentences anywhere on the screen, and the device converts them to text after a short pause.

Getting the e350 to talk to a PC is fairly simple. If your computer has an Infrared port, you can sync wirelessly. In case you don't, you need to connect the supplied docking cradle to the USB port after installing ActiveSync on the computer.

The power source for the e350 is a 1,000 mAh Lithium Ion internal battery. The power adaptor can be plugged into the docking cradle and also directly into the device. Battery life is about 5 hours with continuous use and intermittent use of the backlight.

The e350 is a neat device for a professional on the move. However, the price tag of Rs 29,990 may put it out of reach for most.

Price: Rs 29,900
+ Various options for text input
- Expensive

Toshiba Pocket PC e350		B-
Performance	▬ ▬ ▬ ▬ ▬	
Features	▬ ▬ ▬ ▬ ▬	
Ease of use	▬ ▬ ▬ ▬ ▬	
Value for money	▬ ▬ ▬ ▬ ▬	

The Pocket PC Platform and applications

Pocket PC is a young entrant to the world of handhelds. It is therefore understandable that the variety of software that is available for a Palm solution, is simply not present on this Microsoft platform. Nevertheless, there is a healthy variety of software available.

Personal Information Managers

In the Personal Information Manager (PIM) category, two solutions are widely used: Pocket Informant and Agenda Fusion. The difference is minimal—both allow for multiple views of your scheduled appointments, such as monthly and daily; moreover, alarms can be set for individual notes while templates help ease setting up of common tasks.

Also available for the Pocket PC is ListPro, which helps in organising To-do lists and the like. While it is not as feature rich as the others, it's not bad performance-wise. If you're looking for simple appointment management software, SPB Pocket Plus, with its Repeating Alarms, can help.



Pocket Informant replaces built-in PIM applications with better versions, along with cool additions

Password Managers

To manage passwords, the Pocket PC platform has a pretty comprehensive solution. eWallet stores information in password-protected categories. You're first required to supply a password, based upon which the encryption key is generated. This allows for greater security—eWallet does not store the password in your wallet file, or anywhere on your PDA or PC.

Nice Start protects the entire handheld using password protected access. To provide greater security, it can lock your handheld after a certain number of incorrect password entries. It also has the ability to log all password activities, thus allowing you to find out if someone tried to use your device without your knowledge.



Categories help organise sensitive information into individual cards

Databases

SprintDB Pro is arguably the best program to create databases on a Pocket PC handheld. It is fast, compact and easy-to-use, whilst supporting both Pocket Access files and letting you create custom databases. It also allows for direct printing from a handheld via Infra-red and serial connections.

Office suites

While a single product to take care of all office application needs is absent, several stand-alone products do a wonderful job of filling in. SpreadCE is a spreadsheet application with around 300 functions, and is generally considered much more powerful than Pocket Excel.

PhatPad, an advanced notes organiser, is widely used for basic editing needs. It allows you to draw pictures, jot text notes, or put a mix of pictures and typed text on a virtual scratch pad. There's flexibility in editing options such as Undo and Copy and Paste. You can also export your notes and drawings as JPEG or BMP files, e-mail them as attachments, or transfer them between handhelds via Infra-red.

ProWord is the best dictionary program on the Pocket PC platform. It includes up to 150,000 definitions, and is fairly quick to load and run.

File Edit Insert Format			
=abs(pmt(c4/c6,c9,c3))			
	A	B	C
1			
2			
3	Principal		E40000.00
4	Annual Interest Rate		7.00%
5	Terms (years)		30
6	Periods (per year)		12
7	Start Date		1/9/99
8	Monthly Payment		E266.12
9	No. of Payments		360
10			
11	Payment	Payment	Beginning
12	no.	Date	Balance
13	1	1/10/99	E40000.00
14	2	1/11/99	E39964.02
15			
Sheet1			
Start 17/10/99 10:40			

SpreadCE does a pretty good job of mimicking Microsoft Excel on the PC

Messaging

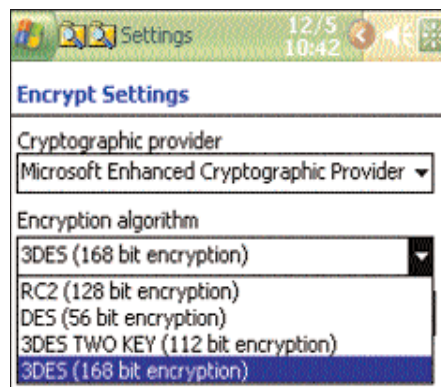
A Pocket PC version of MSN Messenger is available from Microsoft. Also for download, are appropriate versions of ICQ, AOL Instant Messenger and Odigo. Yahoo! Messenger is missing, though.

If you're looking for a means to access Web-based e-mail on your handheld, OneMail provides a comprehensive solution. You can access all your Yahoo!, MSN, AOL, and Hotmail accounts. It can also act as an offline browser.

Utilities

You will find several replacement file managers and browsers to the default explorer on the Pocket PC platform. Resco Explorer 2003, for example, is a decent tool to browse your file system with, offering much more than the default. It is quite like Windows Explorer—it shows all the files and folders on your handheld and storage card. It is also pretty handy if you want to encrypt your files or to compress them. Total Commander is also a similar program, moreover it is free.

If battery life is a concern, you can underclock your handheld using a program such as the Pocket Hack Master. Finally, Remover is a good tool to keep your machine clean of stray files and other trash, while BatteryPack 2003 performs a host of neat tricks such as monitoring battery life and storage space on your handheld.



You can encrypt your files or compress them to save space

Live Organised!

Most people still wonder about the use of a PDA, and whether it could actually be useful for them. Here are some scenarios where the basic functionalities of a PDA would be of practical use for anyone.

- If you need to get up a bit early, you'd probably use an alarm clock. You can set an alarm on a PDA, and set it to ring at regular intervals. Moreover, you can set recurrent alarms, which saves you time—and you don't have to remember to set an alarm every day.
- If you maintain your contacts in a diary, and you lose it often, you can use a PDA and punch in all your contacts with their various details such as e-mail, company name and so on. All your contacts remain intact and in one place.
- At office, you've got things you need to do, and you're lost if you rely on, say, your personal assistant to remember them for you. Now you can stop relying on anyone—use a PDA as your

personal reminder.

- Every file you've noted down on your PDA can be beamed across to a cell phone or a PC, so you can work with them whenever you like. Similarly, you can transfer your files onto the PDA and work with them while on the move.
- If you get drained out after getting home from office, you can keep up your good spirits using your PDA—listen to your favourite MP3s or play games. You can also download Web pages for offline browsing, so you can read them as and when you like.
- One tends to carry magazines on a journey. For a change, transfer your favourite e-book onto your weightless PDA.
- So many of us have business clients or relatives abroad, and some of us tend to forget that there is such a thing as time difference. You don't want to wake up your cousin at an ungodly hour; use a PDA to view world times in a glance.



Personal Information Managers (PIM)

- Pocket Informant:**
www.pocketinformant.com
- Agenda Fusion:**
www.developerone.com/demo/fusion5.htm
- ListPro:** www.iliumsoft.com
- SPB Pocket Plus:**
www.spbsoftwarehouse.com
- Password Managers**
- eWallet:** www.iliumsoft.com
- Nice Start:** www.trancreative.com
- Databases**
- SprintDB Pro:** www.kaione.com
- Office suites**
- SpreadCE:** www.byedesign.freemove.co.uk

- PhatPad:** www.paragraph.com/phatpad.html
- ProWord:** <http://shop.store.yahoo.com/pilot-gearsw/proword.html>
- Messaging**
- OneMail:**
www.pocketpcportal.com/Onemail.htm
- Utilities**
- Resco File Manager:** www.resco-net.com
- Pocket Explorer:**
www.citadeldevelopment.com/products/pexplorer.aspx
- Pocket Hack Master:** http://www.pocket-gear.com/software_detail.asp?id=7258
- Battery Pack 2003:**
<http://www.omegaone.com/PocketPC/Battery-Pack.html>

- Must-haves**
- Icbar:** (<http://www.freewareppc.com/utilities/icbar.shtml>) Icbar is a freeware task bar and application manager that gives you greater control over all your running applications.
 - Microsoft Reader** (<http://www.microsoft.com/reader/>) : With the recent spate of free e-book releases from Microsoft and the ClearType font, Reader is a definite keeper.
 - Network Monitors:** Use GPRS Monitor (<http://www.softspb.com/products/gprsmontor/>) to track data transfers via GPRS, CDMA or GSM networks or IP Dashboard (<http://www.hudsonmobile.com/products.html>) to quickly monitor the state of all your wireless and wired network connections.

Penbex

There is very little in the form of third-party tools for the Penbex operating system, at least for the English-speaking audience. The official Web site has a software download section that tries to cover major categories that would appeal to a user. Nevertheless, coverage is lacking and available applications have very basic functionality.

Pushpam HandsPC 1600

In desi hands

The handsPC 1600 from Pushpam is a colour PDA with a very average look. The body is metallic silver with chrome buttons. The stylus is plastic at the top and bottom with metal in between. It has five buttons; one of them is a four way button, which comes in handy while playing Tetris.

This model is powered by a Motorola DragonBall VZ33MHz processor, with 4 MB of ROM and 8 MB of RAM. The screen is 160 x 160 pixels and backlit. The device has a Compact Flash slot which stores MP3 files. The PDA runs on a Li-Polymer rechargeable battery.

Available on the 1600, is custom software for LIC agents. The pre-loaded applications are quite straightforward. The Infra-red port makes data transfer from both PC and cell phones easy. Syncing with a PC and transfer between PC and PDA is fast.

It was hard to enter an 8-letter word without a mistake—we had to refer to the manual. A sore area is applications, which are available only on the Penbex Web site. Battery life is good, though—approximately 7.5 hours. The device runs the Penbex OS, and the internal 8 MB memory may not be sufficient even for LIC and other insurance agents, at whom the device is targeted; you'll require an additional 128MB CF card that costs Rs 3,000.

If one is looking for a colour PDA as an upgrade, this is one of the alternatives, with local support available.

Price: Rs 14,700
+ Fast synching
- Entering text is difficult

Pushpam HandsPC 1600 B-	
Performance	■ ■ ■ ■ ■
Features	■ ■ ■ ■ ■
Ease of use	■ ■ ■ ■ ■
Value for money	■ ■ ■ ■ ■

Pushpam HandsPC 1300

Excuse for a handheld

The HandsPC 1300 feels rather heavy. It sports a dual-tone finish, and has four buttons on the front face and two on the left side. The unit comes with a leather pouch.

The 1300 is powered by a Motorola Dragonball VZ328 processor at 33 MHz, and has 4 MB ROM and 16 MB SDRAM. The screen is 160 x 160 pixels, backlit. The unit's rectangular block design requires you to grip it firmly, since it is prone to slipping. It also lacks a speaker—instead, it only has a buzzer. There's an infra-red port which did not work with either a Sony Ericsson or a Siemens phone. However, the serial cable functioned smoothly.

The unit was sluggish—we tried to write the number '1' quickly, and only 70 per cent of it came up on the screen. There were problems in the battery department—it showed a full battery, but kept flashing a warning that the battery power was low and that the unit would shut down. This was after using it for just 3 hours.

The power cable is plugged in near the serial connector—this is an odd design; it increases wire clutter, and also renders simultaneous transferring of data and charging the unit impossible, if the PC is on the floor.

In all, the 1300 is expensive, at Rs 12,400—even if one takes into consideration the price of the customised LIC software.

Price: Rs 12,400
+ Fast synching
- Sluggish response

Pushpam HandsPC 1300 B-	
Performance	■ ■ ■ ■ ■
Features	■ ■ ■ ■ ■
Ease of use	■ ■ ■ ■ ■
Value for money	■ ■ ■ ■ ■



Contact details	Brand	Palm Zire and Palm Zire 71	Toshiba Pocket PC e350	Pushpam handsPC 1600/ 1300/ 1100
	Company	Tech Pacific	HCL Infosystem Ltd, Frontline Division	Pushpam Infotech Corporation
	Phone	022-5596 0303	0120- 244 2368	9520 4215162
	E-mail	manishl@techpacindia.com	response@hclinsys.com	sachin@pushpam.com
	website	www.palmone.com	www.pda.toshiba.com	www.pushpam.com

Pushpam HandsPC 1100

An eye for insurance

The 1100 comes with a leather pouch, and it sports a decent build quality. There are a total of seven buttons. Like the 1600, this PDA has preloaded applications for insurance agents.

The HandsPC 1100 is powered by a Motorola Dragonball EZ 16 MHz processor with 4 MB of ROM and 8 MB of RAM. This is too little, but given the number of applications that come preloaded, the space is sufficient. However, if new applications are installed, you will need to delete older applications to accommodate them.

The Infra-red port makes transferring notes and scheduling from either a PC or a cell phone easy.

The stylus bundled with this PDA has a full plastic body, and a smooth tip that provides ample grip. We did find it little difficult to get the proper characters without following the format specified in the manual. Downloading an application from the PC was very easy—a matter of a few clicks. This unit showed hardly any drop in battery power when kept on for more than 7 hours.

In all, this is a good PDA, but Pushpam needs to reduce the price, as there are many models in the grey market that can do all


the functions at a much lower price point. However, insurance agents will find it useful because of the customised software.

Price: Rs 11,000

- + Good battery life

- Expensive compared to feature set

Conclusion

Penbex has minimal support as far as third-party application availability is concerned, so it's not something we'd recommend; both the Palm OS and Windows Pocket PC platforms enjoy enormous application support, and quite a few applications can be downloaded for free as well. Two PDAs that stood out were the Palm Zire 71 and the Toshiba Pocket PC e350; both colour, running the latest versions of Palm OS and Windows Pocket PC, respectively. Though the e350 has a faster processor and more memory, it is also comparatively expensive. The deciding feature was the Zire 71's built-in camera, and that's the one we recommend. 

DEEPAK DHINGRA *deepak_dhingra@thinkdigit.com*

AHMED SHAIKH ahmed_shaikh@thinkdigit.com

CATEGORY		PDAs					
	Brand	Palm	Palm	Toshiba	Pushpam	Pushpam	Pushpam
	Model	Zire	Zire 71	Pocket PC e350	handsPC 1600	handsPC 1300	handsPC 1100
CPU / MEMORY / SCREEN	CPU Speed (MHz)	16 MHz	144 MHz	300 MHz	33 MHz	33 MHz	16 MHz
	CPU Type	Motorola Dragonball EZ	Texas Instruments OMAP310	Intel PXA255 (XScale)	Motorola Dragonball VZ	Motorola Dragonball VZ328	Motorola Dragonball EZ
	ROM	2 MB		16 MB	4 MB	4 MB	4 MB
	RAM	2 MB	16 MB	64 MB	8 MB	16 MB	8 MB
	Screen						
	Touchscreen	✓	✓	✓	✓	✓	✓
	Backlight	✗	✓	✓	✓	✓	✗
	Colours	Greyscale	16-bit	16-bit		Greyscale	Greyscale
	Diagonal Screen Size (inches)			3.5			
Screen Size (pixels)	160 x 160	320 x 320	240 x 320	160 x 160	160 x 160	160 x 160	
STORAGE / EXPANSION	Compact Flash Slot:	✗	✗	✗	✓	✓	✗
	SD Card Slot	✗	✓	✓	✗	✗	✗
	Connectivity						
	IRDA	✓	✓	✓	✓	✓	✓
	Modem	✗	✗	✗	✗	✗	✗
	Bluetooth	✗	✗	✗	✗	✗	✗
	VGA Port	✗	✗	✗	✗	✗	✗
USB	✓	✓	✓	✗	✗	✗	
SOFTWARE	Operating System	Palm OS 4.1	Palm OS 5.2.1	Microsoft Pocket	Penbex OS	Penbex OS	Penbex OS
	Applications	Address Book, Date Book, Clock, To Do List, Memo Pad, Calculator	SMS, To Do, Expense, HotSync, Memo Pad, Note Pad, Card Info, Date Book, Solitaire, Calculator, Palm Photos, Palm Reader, World clock, Address Book, AudiblePlayer, Kinoma Player, RealOne Player, Kinoma Producer, Palm VersaMail 2.5, PowerOne Calculator, Adobe Acrobat Reader for Palm OS	PC 2003 Pocket Word; Pocket Excel; Pocket Outlook; Windows Media Player 8 for Pocket PC; Calculator; Solitaire; Acrobat Reader for Pocket PC; Pocket Internet Explorer	Address Book, Date Book, Clock, To Do List, Note Pad, Calculator, Games, MP3 player, Recorder	Address Book, Date Book, Clock, To Do List, Note Pad, Calculator	Address Book, Date Book, Clock, To Do List, Note Pad, Calculator inbuilt
SIZE	Size (inches)	4.4 x 2.9 x 0.6	2.9 x 0.7 x 4.5	3.1 x 4.9 x 0.5	4.6 x 2.8 x 0.6	4.8 x 3.2 x 0.5	4.6 x 3 x 0.6
	Weight (gms)	108	150	149	120	155	140
	Battery						
Battery Type	Li-ion	Li-Polymer	Li-ion	Li-Polymer	Li-Polymer	Li-Polymer	
OTHERS	Extras						
	Speaker	✓	✓	✓	✓	Buzzer	Buzzer
	Camera	✗	✓	✗	✗	✗	✗
	Options						
	Docking Station	✗	✓	✓	✗	✗	✗
	Voice Recorder	✗	✗	✓	✓	✗	✗
	Headphone Jack	✗	✓	✓	✓	✗	✗
Price (Rs)	7,500	23,000	29,990	14,700	12,400	11,000	



Facing turbulent days of disk crashes, system failures, etc.? Here's a fleet of software that helps you recover and restore precious bytes of records from those technical storms...

Picture this—you're alone in your office at night, at your terminal, typing out furiously for the presentation you're about to deliver the next morning, when, ZAP—the lights go out. You're left fumbling around in your chair in total darkness. When the lights switch back on in a few minutes, you realise to your horror that you hadn't saved your presentation. PowerPoint generally does a poor job of recovering from unsaved files. So you start up EasyRecovery, and with a few mouse clicks, you're back on to your presentation, thanking the universe for watching over you.

EasyRecovery and other similar software do seem miraculous, considering that they can retrieve lost files and deleted documents. All these software serve one basic purpose—they let you bring your PC to its original state with a minimum of trouble. The tools for this fall clearly into

four categories—hard disk imaging tools, rollback utilities, backup software and recovery tools.

Hard disk imaging tools create complete images of your hard disk that can be used later to replicate your data across multiple PCs or hard disks. Rollback utilities, as the name suggests, take periodic snapshots of the entire system, generally called restore points, and then let you 'roll back' the system to any of these previous states. This is possible even if some or all of the important operating system files are missing. The crucial aspect in this case is the time required, and the accuracy, of the restoration. Backup software are programs that let you back up data to a safe place—on another hard disk, or across the network—so that you are not left out in the cold when you lose your data. In recovery tools, the focus is on recovering lost data, without getting into the hassle of backing it up first. These tools

are not a replacement for restoration utilities, but they provide a much simpler approach to recovering lost data.

The plus point for backup-and-restore utilities is that 100 per cent recovery is guaranteed, even with drastic system crashes. The same cannot be said about recovery tools, since they basically scan the hard disk for lost files, and might not be able to recover overwritten data. The advantage, in case of recovery software, is that there are no elaborate procedures to follow—just run the software when some data is lost, and retrieve it. In the case of backup-and-restore utilities, you have to set up restore points and periodically back up your data. This also consumes space.

Find it on the Mindware CD
Restore IT, Second Copy 2000, Ontrack
EasyRecovery Professional 6.03





How We Tested

We evaluated each of these software taking various factors into consideration, including:

Ease of use: We looked at the general interface of the programs, and their utility, considered the design and feel, and how easily it could be comprehended by a lay person. We also looked at the documentation available, and the amount and degree of relevant help available to the user, for each menu and function.

Features: Here we looked for any additional utilities and tools that were included with the software, adding functionality. Also, we looked for any particular characteristics present in one tool and absent in the others.

In each of the sections that follow, the bases on which we evaluated the performance of the software is further explained.

The test process for Recovery Tools was very elaborate, and tested almost every aspect of the software. Our test bed consisted of a system with a P4 processor and a Seagate 120 GB SATA hard disk as the primary hard disk, with Windows XP Professional as the operating system. For the actual tests, we attached a 40 GB parallel ATA Seagate hard disk in slave mode. On this test bed, we created a 1 GB partition for the test.

Apart from ease-of-use and features, the performance parameters that we tested were:

Scanning speed: A sample 438 MB folder containing a random collection of Word documents, Excel spreadsheets, HTML files and Zip archives was copied onto the test disk, and then deleted. The time taken by each utility to scan through the partition for the deleted was then noted.

Recovery of deleted files: For this test, we copied a fixed number of files of sizes between 10 KB and 60 KB to the test drive. After deleting these files, the recovery suites were taken through their paces, and the accuracy in both the recovered file sizes and the data within the files was evaluated.

Recovery of entire partition: In this test, we tested for data recovery in the eventuality of loss of data due to a crashed partition. We first created a simple file and folder structure on the test partition. After this, we deleted the whole partition and then used the tools to analyse the raw space on the disk. During this test, we paid particular attention to the recovery of the file and folder system, looking not just at the accuracy of the actual files recovered.

DISK IMAGING SOFTWARE

This category consists of tools that let you create exact images of a hard disk, or specific partitions, that can be used at any later time to restore the PC to the same state as before. They can be used to make exact copies of a disk. One of the main uses of these imaging utilities is to create a replica of your current system on a new system. These utilities also come in handy when you have to quickly migrate your system to a new hard disk—or perhaps onto the same hard disk in a different partition—and do not want to go through the hassle of installing the OS, and then re-installing all your applications.

When we tested these imaging utilities, one of the most important parameters was speed, both in creating images and in restoring the image onto the test machine. We tested two products in this category, Norton Ghost 2003 and Drive Image 7.0.

Norton Ghost 2003

Ghost in the machine

Norton Ghost has a very easy-to-use interface. Wizards guide you through all tasks, without exposing the intricacies. There are three categories under which all tasks are grouped—Ghost Basic, Ghost Advanced and Ghost Utilities. Under Ghost Basic come all the basic backup and restore tasks. Ghost Utilities consists of the Norton Ghost Boot Wizard, which helps in creation of a boot disk for various scenarios—restore from removable media, restore from shared folders, or restore from peer-to-peer network. Norton Ghost makes the task of backing up or restoring between two PCs simpler, by providing a peer-to-peer wizard.

The software supports a variety of removable storage media—



Click 'Run Now' to complete the creation of a new task in Norton Ghost 2003

restore your PC, to find that the image is corrupted. Also, if you're one of those who wouldn't trust a piece of software, you can go ahead and browse the contents of the image using the Norton Ghost Explorer. The explorer also comes in handy when the image is corrupted, and a few important files have to be extracted from it.

Norton Ghost has some additional utilities that come in handy. One of these is the GDisk utility that can be used to create and manage partitions.

Norton Ghost was the slower of the two software in terms of time taken to create an image, but it was, however, able to compress the image file to 52 per cent of original size.

Overall, Norton Ghost is attractive because of its easy-to-use interface and loads of features, but loses out on performance to Drive Image 7.

+ Feature rich, separate image integrity check tool provided
- Very slow operation

CDs, DVDs, USB drives, ZIP drives and Firewire—onto which the hard disk image can be transferred. It even supports creation of images across a network. Thanks to the Image Integrity Check tool, you won't have to wait until when you have to urgently

Norton Ghost 2003

Performance	▮ ▮ ▮ ▮ ▮
Features	▮ ▮ ▮ ▮ ▮
Ease of use	▮ ▮ ▮ ▮ ▮
Overall	▮ ▮ ▮ ▮ ▮



Drive Image 7

Speed Junkie

Drive Image 7 is another popular imaging utility. What was really impressive about it was its speed—it beat the pants off Norton Ghost in the performance tests. Drive Image, like Norton Ghost, supports creation of images to multiple removable storage media such as CDs and floppies, as well as creation of images across a network. It also lets you break up the image file into 640 MB chunks so it fits on multiple CDs.

A feature thats unique to Drive Image is the ability to create disk images at scheduled times. You can create backup jobs, which hold all the information regarding the data to be backed up and the destination. Now the backup jobs can either be scheduled to run at various intervals or invoked manually from the backup jobs section.

On the interface front, Drive Image has a very simple interface that can be switched between Basic and Advanced view. This means that users who are familiar with the program can perform complex tasks faster, without using the wizards. There is support for compression of images built-in. The user can choose between three levels of compression—standard, medium and high.

For advanced users, Drive Image 7 has a utility that lets you view partition information, utilities that let you backup and restore the MBR, and a utility to clean the boot sector. The last one is particularly helpful when trying to recover a disk from boot sector virus infections.

Though Drive Image 7 as many features as the high-profile Norton Ghost, it zooms past in performance tests. Just goes to show us that not much lies in the name or banner; the performance is where it's at!

+ Fast image creation and restoration, scheduling of backups possible
- No updating possible

Drive Image 7	
Performance	■■■■■
Features	■■■■■
Ease of use	■■■■■
Overall	■■■■■

Conclusion

Overall, both these imaging tools provide similar features and equally simple interfaces, but Drive Image 7 provides an advanced view that is helpful for users who'd like to bypass the wizards. In the case of Norton Ghost, the only options available for advanced users are command line options—this could be daunting for most users. In terms of compression, Norton Ghost provides better compression at default settings. The real differentiating point is the time performance figures: Drive Image took about half the time to carry out the same operations.

CATEGORY	IMAGING SOFTWARE	
Product	Symantec Norton Ghost 2003	PowerQuest Drive Image 7
Ease of Use	24	17.25
Installation (Scale of 5)	4	4
Configuration (Scale of 5)	4	3.5
Interface (Scale of 5)	4	4
Updating (Scale of 5)	4	0
Features	27	27
Backup on removable media	✓	✓
Backup on network drive	✓	✓
Drive-wise image creation	✓	✓
Partition-wise image creation	✓	✓
Individual file extraction from images	✓	✓
Restore to different location	✓	✓
Cloning	✓	✓
Separate Image Integrity check	✓	✗
Image Explorer provided	✓	✓
Scheduled image creation	✗	✓
Performance	13.67	20.81
Backup Time (seconds)	336	183
Restore Time (seconds)	285	189
Compression (%)	52	70
Total	64.67	65.06
Web site	www.symantec.com	www.powerquest.com

ROLLBACK SOFTWARE

This category consists of utilities that restore your computer to a previously backed-up restore point. A Windows crash is a regular experience for PC users. Sometimes, even a single corrupt file can bring down your entire system—in such a situation, rollback utilities take you back in time to a point where everything was fine.

RestoreIT

Restore automatically

RestoreIT is easy to install. It needs a separate partition for holding the backup image. If your hard disk does not have free space for a new partition, the installation procedure automatically resizes the existing partition to make space. It modifies the Master Boot Record (MBR), so that the software gets control of the machine before the Windows boot loader does. So, even if an entire partition gets erased, you can restore the partition without the need for any bootable media. If the MBR gets erased, however, RestoreIT cannot restore the partition—because if the MBR is overwritten, RestoreIT won't be able to boot itself up.



Restore IT lets you do incremental or static backups of data

RestoreIT regularly creates incremental backups each time you start your machine. If you do not shut down your machine frequently, it still makes an incremental backup once a day. If you want to, you can schedule the software to automatically restore the parti-

tion. This could be needed in a server machine, where, on restart, the boot partition gets restored automatically. So if the server behaves crankily, you just need to restart the machine—the machine will reach a stable point, and continue normal operation from there on.

An important point is that RestoreIT took more than twice the time taken by other software in this category, for a restore.

If you want to rollback to a certain period you can do so reasonably easily with Restore-IT, but in case of a disaster like a lost MBR, you're stranded.

- + Messing up with backup data is less likely
- Very slow

Restore IT	
Performance	▀ ▀ ▀ ▀ ▀
Features	▀ ▀ ▀ ▀ ▀
Ease of use	▀ ▀ ▀ ▀ ▀
Overall	▀ ▀ ▀ ▀ ▀

GoBack 3.0

Recover files with virtual drives

At installation, GoBack consumes approximately 10 per cent of the disk space, in any partition that has enough free space. In our case, the hard disk was a 4 GB one, and GoBack created a gobackio.bin file of about 411 MB. This file is used to store an image of the hard disk at System Safe Points. By hard disk is meant the entire disk—this software does not allow you to monitor just a single partition of a drive. Though partition-wise monitoring is not supported, there is a file recovery facility.



GoBack backs up your drive during installation

To recover individual files, there's a unique feature called 'Create GoBack Drive.' This creates a set of virtual drives. If you have three partitions—C, D and E—when you choose 'Create GoBack Drive,' three virtual drives, F, G and H, are created. These give you access to all the files at that particular System Safe Point. You can create these

drives for any System Safe Point.

This software does not allow the user too much freedom. It creates safe points whenever it detects activities such as an application install, a file modification, and so on. GoBack has a feature called Auto Revert, which is similar to that of RestoreIT. It also has a feature to disable itself. However, if you disable GoBack, all previous System Safe Points are erased.

This software is very similar to RestoreIT, except for the virtual drive feature—which makes it the better of the two.

- + Very Fast, utilises 10 per cent space of total hard disk size
- Monitors entire drive

GoBack 3.0	
Performance	▀ ▀ ▀ ▀ ▀
Features	▀ ▀ ▀ ▀ ▀
Ease of use	▀ ▀ ▀ ▀ ▀
Overall	▀ ▀ ▀ ▀ ▀

Conclusion

In terms of function, both software come into action before the OS does, and can be used to revert the system. But if faster is better, GoBack is the winner. It also features a near one-touch revert option. Even if not the best, it's certainly better than RestoreIT.

CATEGORY	ROLLBACK SOFTWARE	
Product	FarStone RestoreIT	Symantec GoBack
Ease of Use	15.75	21
Installation (Scale of 5)	3.5	4
Configuration (Scale of 5)	3.5	4
Interface (Scale of 5)	3.5	3
Updating (Scale of 5)	0	3
Features	12.86	12.86
Backup on removable media	✗	✗
Backup on network drive	✗	✗
Drive-wise	✓	✓
Partition-wise	✓	✗
Individual file extraction	✗	✓
Restore to alternate location	✗	✗
Scheduling	✓	✓
Performance	2.08	23.84
Backup Time (seconds)	801	47
Restore Time (seconds)	867	85
Compression (%)	66	19
Total	30.68	57.70
Web site	www.farstone.com	www.goback.com

BACKUP SOFTWARE

We looked at some backup tools for home and SoHo users. Apart from folder-to-folder backup, most utilities also support backup across a network, which would be needed in an office environment. In all, we tested four software in this section—Second Copy 2000, WinBackup, Save-N-Sync v3.0 and AutoBackup.

Second Copy 2000

Make a second copy

Second Copy is a small backup utility, not a full-fledged backup-and-restore software. It can just copy data to a specified alternative location. If you lose a file, you'll need to manually extract the file from the alternative location—it acts as a one way process.

Configuring the software consists of creating profiles, which store the source and destination paths as well as the type, time and interval of backup desired. The interval can be every few min-



Second Copy 2000 lets you choose the type of backup for each profile

Wipe out that Data

The realisation that data cannot be completely deleted has spawned a large industry that makes money by helping corporates delete sensitive data. The basic idea is to overwrite the specific file to be deleted multiple times with garbage data, thereby rendering the file illegible. There are lots of freeware and shareware utilities available for this purpose, such as Ultra Wipe and SysShield File Shredder. In extreme cases, companies use special equipment to 'degauss' the hard drive—a procedure that removes all magnetic properties associated with the hard disk.

utes, hours, or days—or simply at startup or shutdown. When the backup process starts, the software checks for modified or deleted files, and appropriately updates the destination folder. There are various options for the type of backup. Simple Copy just dumps modified files from the source directory to the destination directory. Then there is Exact Copy, which relocates the modified files and also deletes the source files; Move moves the files from source to destination. Options such as Compress and Exact Compress are provided; these provide a single zip file as output.

The Synchronize option synchronises the files between the source and destination locations: if you have a file called my.doc in the source location, Second Copy creates a copy in the destination folder. If you now modify the file in the destination folder, Second Copy automatically copies the file to the source folder, thus maintaining the latest version of the file.

Second Copy is best suited for small-office users, with a local network connecting individual machines to a dedicated file server.

- + Provides a variety of copy types
- Backup data is not secured; no support for backup on removable media

Second Copy 2000	
Performance	■ ■ ■ ■ ■
Features	■ ■ ■ ■ ■
Ease of use	■ ■ ■ ■ ■
Overall	■ ■ ■ ■ ■

WinBackup

Winning backup

WinBackup provides a highly secure environment for both the application and the backups. The backup is secured in one of two ways—encryption of 128 or 256-bit AESs, and user-supplied passwords. You can provide a password for the application as well, to deter hackers. Like a couple of other products (Second Copy and Save-N-Sync), it does not keep the backup files in open format, thus preventing any accidental corruption or deletion.



'Schedule Backup' lets you schedule the frequency at which backups are done

You can also save the resulting image file in compressed form, by activating the 'Compress data to save space' option in the Backup Settings. One good feature is that whenever you select a folder, the size of the final compressed file is immediately displayed. This feature helps decide where to place

the resulting file. Like other software, WinBackup has a scheduler, and also in-built support for data backup directly onto CD or DVD. It also supports spanning of backup files across more than one CD or DVD. If the event that the file is too small for an entire disk, it supports multi-session CDs or DVDs, which efficiently utilises a single medium to its full capacity. All in all, security, coupled with support to create backups directly on CD and DVD, as well as performance, makes WinBackup the clear winner.

- + Security; spanning across media
- Backed-up data is not secured by default

WinBackup	
Performance	■ ■ ■ ■ ■
Features	■ ■ ■ ■ ■
Ease of use	■ ■ ■ ■ ■
Overall	■ ■ ■ ■ ■

Save-N-Sync v3.0

Sync your data

Save-N-Sync is a data synchronising tool. As in Second Copy, you can create more than one source and destination pairs. Data is then copied between the pair of locations. The synchronisation can be one-way or two-way at the same time. By one-way, we mean all the modified files from source are copied to destination, while two-way means the latest file, be it at source or destination, is updated to the other place. For example, if the version of 'my.doc' at source is the latest, it is copied to the destination folder; and if the file at destination is newer then it is copied to the source folder.



Save-N-Sync v3.0 lets you specify the source and destination paths as well as the type of synchronisation needed

Synchronisation can be scheduled with the in-built scheduler. The software took nearly 50 per cent longer than any other software, to copy the test data. While copying an entire drive, it didn't copy files from the System Volume Information folder. So, if you run Windows XP, there's a possibility that XP's System Restore function may not work after backing up the entire disk.

The unique Variable Path Selection feature inserts variables in the source or destination path fields—say you want to back up data on a particular day of the week, you can specify 'e:\back-up\%day%\'. Whenever SNS starts, it replaces '%day%' with the day of the week. You can even use the date, username, etc., as variables. An important feature is extensive support for command line arguments. This is useful for system administrators, who may want to configure logon scripts and batch files.

SNS does lag a bit on performance, but its unique features make it stand out from the others.

- + Variable path selection, command line support
- No compression, no scheduling, no support for backup on removable media

Save-N-Sync v3.0	
Performance	■ ■ ■ ■ ■
Features	■ ■ ■ ■ ■
Ease of use	■ ■ ■ ■ ■
Overall	■ ■ ■ ■ ■

Computer Forensics

Data recovery and presentation of legal evidence has lead to a complete computer forensics industry. Of all the factors involved, data recovery and analysis is probably the most important. These forensic experts don't just use the professional recovery software available in the market—they usually use their own customised tools. Even then, all recovery cannot be done using software; a lot of it depends on the techniques used by the experts. Each recovery case is unique in some way, and has to be dealt with differently. But what really matters in the end is the amount and quality of data recovered, and the way it is presented to the legal authorities.

Auto Backup 2.2

Automate your backup and restore

Auto Backup (AB) is yet another tool to create backups—the alternate location could be a separate partition or physical drive, a network drive, or an FTP location. Both the backup as well as restore operations can be performed on individual files or folders, or even entire drives.

AB's unique feature is that it can create self-restoring archives.



Just double-clicking an executable file starts off the restore process. The software has all the standard features such as scheduling, compression, and security. There are three compression modes—Fastest, Middle and Maximum. When it comes to security, there's integrated 256-bit encryption, plus optional user-provided password encryption. This is to be compared with WinBackup's optional 128 bit AES encryption, optional 256 bit encryption, or optional password protection.

AB has a multi-threaded system, so that backup and restore can be executed simultaneously. The software loses out, however, in terms of performance—it is certainly not the best.

- + Easy-to-use interface, secure
- No support for backup on removable media

Auto Backup 2.2	
Performance	■ ■ ■ ■ ■
Features	■ ■ ■ ■ ■
Ease of use	■ ■ ■ ■ ■
Overall	■ ■ ■ ■ ■

Conclusion

Though AutoBackup took the top slot in the ease-of-use test, WinBackup came ahead of the others in both the features and the performance departments. Support for backup on removal media and security turned out to be the major factors in taking WinBackup to the top slot in the features test. WinBackup did have some good competition from Second Copy in performance, though.

Precautions

Data loss typically comes at the most unexpected of times, but following a few simple precautions can lead to a much better chance of recovering data. First of all, don't shut down or restart the machine. Next, don't install any additional software on the damaged drive. This also includes data recovery software. These should ideally be installed before data loss. If not, these software should be run from a CD-ROM or floppy drive. The most important thing to remember is that the lesser the activity in the system after data loss, the more are the chances of recovering the lost data.

CATEGORY	BACKUP SOFTWARE			
Product	LIUtilities WinBackup	Centered Systems Second Copy 2000	Peer Software Save-N-Sync	Han Soft AutoBackup
Ease of Use	17.25	17.25	16.5	18
Installation (Scale of 5)	4	4	4	4
Configuration (Scale of 5)	3.5	3.5	3.5	4
Interface (Scale of 5)	4	4	3.5	4
Updating (Scale of 5)	0	0	0	0
Features	27	18	9	24
Backup on removable media	✓	✗	✗	✗
Backup on network drive	✓	✓	✓	✓
Output single file	✓	✓	✗	✓
Drive-wise	✗	✗	✗	✗
Partition-wise	✓	✓	✓	✓
Folder-wise	✓	✓	✓	✓
Restore to alternate location	✓	✗	✗	✓
Security	✓	✗	✗	✓
Compression	✓	✓	✗	✓
Scheduling	✓	✓	✗	✓
Performance	32.26	31.50	21.05	22.35
Backup Time (seconds)	124	127	190	179
Total	76.51	66.75	46.55	64.35
Web site	www.liutilities.com	www.centered.com	www.peer software.com	www.han-soft.com

RECOVERY SOFTWARE

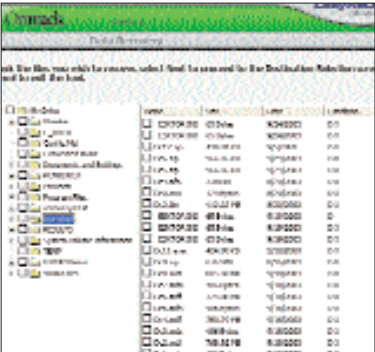
In this category, we tested three popular data recovery software: OnTrack EasyRecovery Professional 6.03, R-Studio FAT 2.0 and, Stellar Phoenix 2.0. All of these are primarily meant for recovering data from crashed or corrupted hard disks.

Ontrack EasyRecovery Professional 6.03

Just a little off track

The first thing that we noticed while testing Ontrack's EasyRecovery Professional 6.03, was its eye-catching and user-friendly interface. It's well laid out, with all the important function buttons for the recovery functions conveniently placed on one side for easy browsing. It also sports a cool green XP look.

Of the three software tested, EasyRecovery has the most features. It provides a number of diagnostic tools, which are useful for checking the physical status of the drive and analysing the integrity of the file structure on the partitions. For example, the size manager displays a horizontal bar graph for each folder and file to give a more visual insight into the utilisation of the space on the hard drive. Files can also be tagged to display files of a particular size in a different colour. Another useful feature is the specific recovery of data from corrupted Office documents and Zip archives. This is very handy, especially after a power failure, to recover any unsaved data. We got a good opportunity to



Backup Strategies

Every user has to adjust her or his backup strategy according to their requirements. One of the primary decisions is the frequency of backup. For home users, where the amount of data generated is not too much, a manual backup—as and when required—will be enough; but in the case of a small firm consisting of about 10 to 20 employees, it won't work. In this case, a systematic schedule needs to be set to make sure that the data on each computer is backed up regularly. Moreover, the data backup schedule should not interfere with the regular working schedule of the users. The best option, therefore, is to schedule backups at night after office hours. The next important aspect is the size of the backup. Almost any backup software worth its name provides at least two levels of backup—full and modified. In Full backup, all the data from the specified location is backed up irrespective of whether the data is modified or is in its original form. This form of backup is the most inefficient and consumes lots of space. Modified backup is a much more sophisticated method that can let you back up only the modified parts of the data, thereby saving system resources.

test this feature right after a blackout in the test centre with a Word document. Although MSWord did recover most of the document, EasyRecovery managed to repair with only a minimal loss of formatting.

An interesting tool in EasyRecovery is its floppy-based self-booting diagnostic DataAdvisor tool. This is different from its emergency bootable diskette—as it does not perform any recovery functions. However, it is very good at identifying a disk's current health and predicting the problems it may encounter in the future. This makes it invaluable for system vendors and their customers alike, as the performance and life of a hard disk can be determined beforehand, which will lead to fewer replacements after sales, and better customer satisfaction.

During our tests, we noticed a number of helpful warnings that were generated, asking to save the recovered data on any media other than the affected hard disk. This level of alertness was missing from the other two tools. EasyRecovery also has a in-built file viewer which can be used to preview files like text files, Word documents etc. Although we found that this viewer has fairly limited capabilities, it can still be used to selectively recover specific files, particularly when you have a large partition and the list of files that can be recovered is large.

Purely in terms of performance, EasyRecovery was at best on par with the others, especially in the document recovery test with only 8 files completely recovered, both in terms of size and content. The scanning time too was quite high, only a few seconds faster than R-Studio.

However, despite all the mediocre test results that it displayed, EasyRecovery really stands out as the only recovery tool in our tests with nifty features that can be used by users unfamiliar with the recovery process and experts, alike.

- + Very simple and easy-to-use interface
- Slow scanning

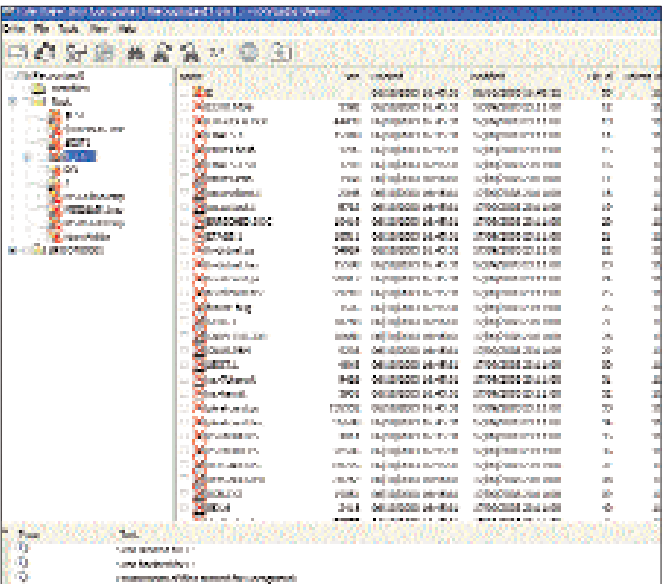
Auto Backup 2.2	
Performance	■ ■ ■ ■ ■
Features	■ ■ ■ ■ ■
Ease of use	■ ■ ■ ■ ■
Overall	■ ■ ■ ■ ■

R-Studio FAT

Slow Joe

R-Studio FAT comes across as recovery software developed for system administrators, rather than for the average home user. This is well-reflected by the interface, which is very detailed and lists out the details of every storage device connected to the computer—even the floppy drive showed up, along with the free space and the internal geometry of the disk.

Surprisingly, in our tests, R-Studio was the only tool which supported remote recovery over a network, albeit only after installing its companion software, R-Studio Agent. R-Studio Agent can also be remotely installed over a network. R-Studio also supports the creation of disk images which are perfect, byte by byte copies of entire partitions. Though the software cannot schedule the regular creation of disk images, the images that we



R-Studios provides a very detailed interface that lets you select the files to be recovered

Data Destroyers

Data loss can occur due to a number of reasons. Some of the common ones are listed below:

Virus attack: Many viruses are notorious for deleting files. Some try to delete or overwrite the partition table, which stores the start and end locations of the data partitions on the disk.

Accidental deletion of files: This is a very simple reason for data loss: the user deletes some important files without moving them to the recycle bin first. The user may also delete files from the command prompt, or through applications that do not utilise the Recycle Bin, for example, WinRar.

Physical problems with the hard disk: This is by far the most common reason for data loss, and also the most difficult to remedy. Hard disks can develop a multitude of problems, starting from faulty read and write head alignment, to a badly damaged head actually glued to the hard disk platters due to stiction (static friction).

obtained were perfect copies. Another useful feature is support for making software RAID's or virtual volumes. Virtual volumes are a feature found only in NT-based systems, by which partitions can be spread across separate physical disks without the need of separate hardware controllers.

In our scanning speed test, R-Studio was the slowest, taking 50.2 seconds to scan through our test folder. This unusually long scanning time can be very tiresome for those with large disk partitions. To circumvent this, a raw region spanning several partitions can be selected directly from the hard disk for recovery without affecting the data on the disk. This effectively shortens the time required for scanning through the drive. However, this mode is meant for service technicians and hard drive experts only, as the fields for the raw region to be selected have to be filled in according to the disk's geometry. A more detailed explanation in the manual would have been helpful. The manual itself needs a little more depth, as it only covers the basics, assuming that the user has prior knowledge about data recovery.

Later, in our second test, R-Studio actually lost one document, whereas the other two had recovered all files, at least in a partial state. Also, in the next test, while R-Studio did recover the deleted partition satisfactorily, it could not restore the original directory and file structure in the recovered output.

Finally, R-Studio is a tool more suitably targeted for professionals, rather than home users, as it offers a few extra utilities which otherwise would cost more to procure.

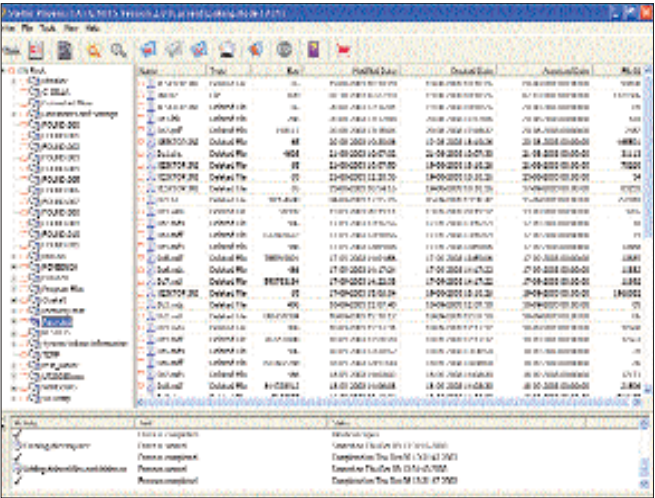
- + Feature-rich, in-built restoration capability
- Cryptic interface that needs slightly more technical expertise

Auto Backup 2.2				
Performance	4.0	4.0	4.0	4.0
Features	4.0	4.0	4.0	4.0
Ease of use	4.0	4.0	4.0	4.0
Overall	4.0	4.0	4.0	4.0

Stellar Phoenix FAT & NTFS

Not so stellar

Stellar Phoenix is a data recovery tool from Stellar Information Systems Ltd, an ISO 9002-rated Indian company specialising in hard disk recovery utilities. It had the smallest



Click on 'Recover' to start the recovery process in Stellar Phoenix

How do They Do it?

Whenever you delete a file, it's never completely erased from the hard disk—the file's entry is merely removed from the File Allocation Table (FAT). The FAT contains the name and location of each and every file on the hard disk, and this table is checked by the OS every time it boots. So, even after the OS deletes the file's name and location from the FAT, the file is still present on the hard disk in raw form. At this point, if the user realises his error immediately and wants to recover the data, the chances of recovery are very good. This is because recovery software generally don't rely upon the FAT—they, instead, scan the disk for its raw data content. As time passes, the odds of recovering data get slimmer. Also, if you try to recover an old file after adding some new data, the file may not be recoverable at all, as the newer files may have been written into the space once occupied by the older one.

Answers to quiz from page no. 122:

Crossword:

Down:

1 Hyperthreading,
2 PowerPC,
3 Transmeta,
6 Morgan Core,
7 IA64, 8 Celeron,
11 Cell

Across:

4 PentiumM,
5 ExtremeEdition,
9 Xenon,
10 Cache,
12 Opteron,
14 a, 15 c

Answer:

1 a, 2 b, 3 c, 4 a, 5 c,
6 a, 7 d, 8 d, 9 c,
10 b, 11 a, 12 a, 13 a,
14 a, 15 c

1/4th AD

installation size, with a footprint of a little over 2 MB. However, this small size is reflected poorly in its clunky and bare interface. The layout is similar to Windows Explorer, but the main window opens with nothing displayed. A more helpful approach could have been adopted for average users, with possibly even a simple wizard included.

The online help in Stellar Phoenix is not very extensive, but it does include a brief chapter on the physical installation of a hard disk, which if printed, could be very useful for a novice to install a new device after a disk crash.

In our speed tests, Stellar Phoenix zoomed through the test folder and completed the scan in an astounding 12 seconds.

Unlike the other tools tested, Stellar Phoenix doesn't support the creation of a rescue boot disk for booting up a system immediately after a crash. Actually, it couldn't detect the floppy drive at all. On certain occasions, it failed to correctly detect the test hard disk, displaying an unknown device identifier instead.

As for the rest of our tests, Stellar Phoenix performed exceptionally well in the partition test by recovering the complete file and folder structure. In the documents test, the results were similar to EasyRecovery with the same ratio of 8 and 7 files recovered, fully and partially respectively. In the end, Stellar Phoenix is a good product, but could do with some improvement to become a truly world-class product.

- + Very low scanning and recovery time, very small installation size
- Low on features

Auto Backup 2.2	
Performance	■ ■ ■ ■ ■
Features	■ ■ ■ ■ ■
Ease of use	■ ■ ■ ■ ■
Overall	■ ■ ■ ■ ■

Conclusion

On the whole, in terms of ease of use and user-friendliness, OnTrack's EasyRecovery was far ahead of the others in the comparison. However, the performance of R-Studio in the tests later, and also the presence of its additional tools, made the difference, and hence it emerged on top. As for Stellar

Windows System Restore

Microsoft, too, has a recovery utility called System Restore, built into Windows. System Restore, however, has very limited functionality compared to recovery suites. System Restore was incorporated into the newer OSes, starting with Windows Me and XP. System Restore can be done by manually setting restore points at regular intervals and restoring from them, or using Automatic restore points usually set by the computer at pre-determined times. It is usually active by default, but if you need to activate it, right-click My Computer, and then click Properties from the menu. In the next dialog box, click on the System Restore tab and uncheck the corresponding checkbox. This tab also allows for more advanced control on the amount of space that can be reserved for System Restore on each drive. This is very important as each restore point takes up quite a bit of space, and as the restore points add up, the effective free space gets reduced, and the hard disk gets fragmented. However, older restore points can be cleared by Disk Cleanup, leaving only the most recent point on the disk.

CATEGORY	DATA RECOVERY SOFTWARE		
Developer	Ontrack	R-Tools Technology Inc.	Stellar Information Systems
Product Name	EasyRecovery Pro	R-Studio FAT	Stellar Phoenix
Ease of Use	24	18.75	15
Installation (Scale of 5)	4	4	4
Configuration (Scale of 5)	4	3	3
Interface (Scale of 5)	4	2.5	3
Updating (Scale of 5)	4	3	0
Features	15	22.5	0
Emergency recovery boot disk creation	✓	✓	✗
Recovery over network	✗	✓	✗
Specific file repair tools	✓	✗	✗
Supports system restoration tools	✗	✓	✗
Performance	11.77	12.82	18.84
Scanning speeds (seconds)	39.39	50.1	12.7
Installation size (MB)	53.6	3.39	2.12
Deleted files completely recovered	8	7	8
Partially recovered	7	7	7
Lost	0	1	0
Complete partition recovery (Scale of 5)	3	2.5	4
Total	50.77	54.07	33.84
Web site	www.ontrack.com	www.r-tt.com	www.stellarinfo.com

Phoenix, although it did really well in the tests, it would have fared much better with a better interface, and possibly a small wizard.

And the winners are...

The loss of data due to an OS crash or a disk failure is often a traumatic experience for novices and can make them wary of computing. It's of even greater concern to business firms that depend heavily on facts and figures stored on hard disks. Hence, it is imperative that corporate houses, as well as home users have a pre-defined back-up and recovery strategy.

Drive Image 7 and GoBack are the two software that are well suited to the task of large-scale data management. GoBack proved itself worthy with the speed and efficiency with which it took snapshots. The fast and one-touch restore capabilities of Drive Image 7 showed that it's capable of managing huge amounts of data with agility.

For small offices and home users, daily backups are not so much of a hassle as compared to restoration of files. This makes WinBackup the most obvious choice—it provides high security, encrypts backups, and even saves them on multiple CDs.

Of all the software tested in our comparison test, a few stood out on the basis of their reliability and user-friendliness. A good combination of performance and features makes Second Copy 2000 a viable alternative for use in small offices that are fitted with a simple LAN. R-Studio proved itself a very reliable software that can recover data in the event of a crash. Its network recovery capabilities made it a tool favoured by network administrators. On the other hand, EasyRecovery, with its eye-catching interface and simple wizards is, by far, the utility best suited for users who are not familiar with the process of recovery.

PRAVEEN KURUP
praveen_kurup@thinkdigit.com
MUSTALI KACHWALA
mustali_kachwala@thinkdigit.com
ANIL GANGOLLI
anil_gangolli@thinkdigit.com



Products that topped our performance tests

CPU

Pentium 4 3.2 GHz 800 MHz FSB
 + Supports 800 MHz FSB and Hyperthreading
 - Very expensive
Contact: Nebula Technologies
Phone: 022-26848612
E-mail: pratik@nebulatech.com
Price: Rs 38,000

Motherboard

Intel 875 PBZ
 + Native support for SATA
 - No possibility of over-clocking
Contact: Nebula Technologies
Phone: 022-26848612
E-mail: pratik@nebulatechnologies.com
Price: Rs 13,000

Primary Storage

Maxtor 250 GB MaxLine Plus II
 + Tons of space
 - Gets heated
Contact: Cyberstar
Phone: 011-6438216
E-mail: yogi@maxtor.com
Price: Rs 17,000

Secondary Storage

CD-Writer Sony CRX 300A
 + Top performance, vertical mountable, half height, Mt. Rainer support
 - No CD-R or CD-RW media
Contact: Rashi Peripherals
Phone: 022-28260258
E-mail: ho@rptechindia.com
Price: Rs 6,250

Graphics Card

Gainward GeForce FX 5900 Ultra 256 MB
 + Unmatched performance
 - Very expensive
Contact: Mediatech India
Phone: 022-56396696
E-mail: sales@mediatechindia.com
Price: Rs 37,875



Speakers

Creative Megaworks THX 5.1 550
 + Mindblowing sound
 - No digital inputs
Contact: Creative Technology Ltd
Phone: 9820357713
E-mail: rajshekhhar_bhattach@ctl.creative.com
Price: Rs 25,999

Input Devices

Microsoft Multimedia Keyboard
 + Great feel
 - Comes at a high price
Contact: Microsoft Corporation Pvt Ltd
Phone: 011-26292640
E-mail: connect@microsoft.com
Price: Rs 1,600

Microsoft Wireless Optical Desktop

+ High precision and sensitivity
 - Batteries make it heavy
Contact: Microsoft Corporation
Phone: 011-26292640
E-mail: connect@microsoft.com
Price: Rs 4,500

The A-List

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

Display

LCD Monitor SONY SDM-N80 18.1-inch
 + Stylish looks combined with great performance
 - External power supply takes up extra space
Contact: Rashi Peripherals
Phone: 022-28260258
E-mail: ho@rptechindia.com
Price: Rs 1,49,000

Laptop

Dell Latitude D600
 + Good design, has dual band 2.4 GHz and 5 GHz wireless
 - Temperature shoots up after prolonged use
Contact: Dell Computers Asia Pvt Ltd
Phone: 1600 33 8044 (Toll free)
E-mail: marketing_response@dell.com
Price: Rs 1,53,366

Multi-functional Device

Canon MP 730
 + Lots of features, easy to use and low running cost
 - Bulky
Contact: Canon India Pvt Ltd
Phone: 011-26806572/7317
E-mail: rajeev.singh@canon.co.in
Price: Rs 34,995

Laser Printer

Samsung ML-1710
 + Extremely fast
 - Does not support USB 2.0
Contact: Samsung Electronics India information and Telecommunication Ltd
Phone: 011-51511234
E-mail: farrukh@samsungindia.com
Price: Rs 14,990

Inkjet Printer

Canon S530D
 + Supports direct printing from digital cameras
 - Expensive
Contact: Canon India Ltd
Phone: 011-26806572
E-mail: rajeev.singh@canon.co.in
Price: Rs 24,995

Sound Card

Creative SoundBlaster Audigy 2 Platinum
 + 6.1-channel output
 - Expensive
Contact: Creative Technology Ltd
Phone: 9820357713
E-mail: rajshekhhar_bhattach@ctl.creative.com
Price: Rs 15,199

Scanner

HP Scanjet 4570C
 + Excellent scan quality
 - Heavy and bulky
Contact: HP India Ltd
Phone: 011-26826000
E-mail: ashwini-k_aggarwal@hp.com
Price: Rs 17,999

PDA

Sony CLIE PEG-TG50
 + Runs Palm OSS and has a 320 x 320 TFT LCD display
 - Rapid battery consumption
Contact: Solar Systems
Phone: 022-56916834
E-mail: solarsystems@vsnl.net
Price: Rs 27,000

Mobile Phone

Sony Ericsson P800
 + Easy and intuitive navigation
 - Blocky design makes it bulky
Contact: Sony Ericsson Mobile Communications International
Phone: 011-26180808
E-mail: sudhin.mathur@sonyericsson.com
Price: Rs 33,500

Digital Camera

Canon IXUS 400
 + Cerabrite body, better buttons layout, wide shutter speed range
 - Ultra compact body hampers handling
Contact: Canon India Pvt Ltd
Phone: 011-2680 6572
E-mail: Shyam@canon.co.in
Price: Rs 49,995

MP3 Player

Creative LX 100
 + Decent feature set, easy to install, large LCD
 - No bundled software, no ID3 tag support
Contact: Creative Labs Asia
Phone: 9820357713
E-mail: rajshekhhar_bhattach@ctl.creative.com
Price: Rs 9,799



Products that are the best value buy

CPU

AMD XP 1800+

- + sufficient power for normal desktop use
 - Difficult to install the heat sink
- Contact:** AMD Far East India Ltd
Phone: 011-26238620
E-mail: amd@surfgold.com
Price: Rs 3,400

Motherboard

ASUS A7S266

- + Support DDR and SD, onboard video, onboard sound, onboard graphics, USB 2.0
 - Not appropriate for gamers
- Contact:** Neoteric Infomatique
Phone: 022-24172600
E-mail: sales@neoteric-info.com
Price: Rs 3,600



Primary Storage

Samsung SV1203N 120 GB

- + Noise Guard and ImpacGuard
 - 5400 rpm drive
- Contact:** Samsung Electronics India Information Telecommunication India Pvt. Ltd
Phone: 011-515111234
E-mail: marketing@samsungindia.com
Price: Rs 7,200



Secondary Storage

CD-Writer

Benq CRW5224W

- + Cheap
 - Data cable not bundled
- Contact:** BenQ India Pvt Ltd
Phone: 022-25705231
E-mail: salesenquiryin@benq.com
Price: Rs 2,800



Graphics Card

Compro Paladyn FX 5600 128 MB

- + DirectX 9.0 compatible
 - Very expensive
- Contact:** Mediatech India
Phone: 022-56396696
E-mail: sales@mediatechindia.com
Price: Rs 11,275

Speakers

Adcom ACSPSW-660 2.1

- + 2 satellite speakers and one mini sub-woofer, performance in the gaming sector was quite good
 - Maximum volume causes distortion
- Contact:** SABs
Phone: 022-23808564
E-mail: sabs@vsnl.net
Price: Rs 550

Display

CRT Monitor

LG StudioWorks 700S

- + High resolutions, great performance, anti-static, anti-glare, anti-reflection surface treatment
 - No extra accessories
- Contact:** LG Electronics India Pvt Ltd
Phone: 0120-2560900
E-mail: response@lgezbuy.com
Price: Rs 6,700

Input Devices

Samsung PC Keyboard

- + Unmatched value for money
 - No multimedia buttons, wrist support not bundled
- Contact:** Samsung Asia Pvt Ltd
Phone: 022-2281/ 4886
E-mail: marketing@samsungindia.com
Price: Rs 300

Logitech scroll mouse

- + Ambidexterous design
- Contact:** Rashi Peripherals
Phone: 022-28260258/ 59
E-mail: ho@rptechindia.com
Price: Rs 475

Branded PC

HCL EzeeBee

- + Winner of Best Value and Best Performance
 - Needs a better graphic card
- Contact:** HCL Infosystems Ltd
Phone: 0120-2520977
E-mail: raman@hclinsys.com
Price: Rs 26,500

Laptop

ACI Emerald PIV

- + Integrated Web Camera, FireWire port and an Ethernet connection, can play games such as *Quake III*
 - Bulky, no manual
- Contact:** Allied Computer International (Asia) Pvt Ltd
Phone: 022-26366800
E-mail: sales@aci-asia.com
Price: Rs 79,990

Multi-function Devices

HP PSC 2110

- + Good print quality
 - No fax capabilities
- Contact:** Hewlett Packard India Ltd
Phone: 011-26826000
E-mail: seema.dawar@hp.com
Price: Rs 9,999

Laser Printer

Samsung ML-1510

- + Good image quality
 - Slow print speed for combo document
- Contact:** Samsung Electronics India Information and Telecommunication Ltd
Phone: 011-51511234
E-mail: farrukh@samsungindia.com
Price: Rs 11,000

Inkjet Printer

HP 3325

- + Very small form factor
 - 765 KB of buffer memory
- Contact:** HP India Ltd
Phone: 011-26826000
E-mail: ashwini-k_aggarwal@hp.com
Price: Rs 2,999

Scanner

HP 2300

- + Low warm-up time
- Contact:** HP India Ltd
Phone: 011-26826000
E-mail: ashwini-k_aggarwal@hp.com
Price: Rs 3,499

PDA

Palm Zire

- + Affordable, good battery life, comprehensive PIM applications
 - No Palm Universal Connector, no backlight, no expansion slots
- Contact:** Tech Pacific Technology (India) Limited
Phone: 022-55960101
E-mail: aparna@corvoshandwick.co.in
Price: Rs 7,500

Digital Camera

Kodak DX6340

- + 3.1 megapixel camera with 4X optical zoom
 - only 16 MB memory provided
- Contact:** Neoteric Infomatique
Phone: 022-24172600
E-mail: rajeev@neoteric-info.com
Price: Rs 23,900

Mobile Phone

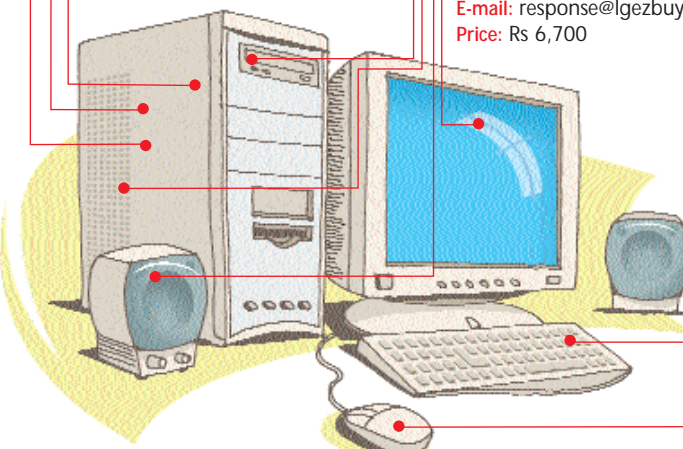
Sony Ericsson T200

- + Light-weight, perfect grip, WAP 1.2.1 browser and 43.2 Kbps GPRS, PIM features
 - Keys are hard and noisy, unusual socket for the charger
- Contact:** Sony Ericsson Mobile Communications International
Phone: 011-26180808
E-mail: sudhin.mathur@sonyericsson.com
Price: Rs 6,495

MP3 Player

Ennyah Digisound II DS601

- + Fast data transfer, feature-rich
- Contact:** Great World Tech Pvt Ltd
Phone: 022-23892828
E-mail: sales@gtechworld.com
Price: Rs 6,500 (approx)



Bazaar



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

VIA C3 Processor on VIA C3M266 motherboard

Cool processing

The new 1 GHz processor from VIA is based on the Nehemiah core, which dissipates very little heat, and has enhanced multimedia capabilities—thanks to the SSE instruction set. It is one of the X86-based



processors that feature a random number generator on hardware, which can be used for various data encryption services for greater security in network-based transactions.

We tested it on a VIA micro ATX motherboard based on the CLE266 chipset. The board comes with integrated graphics and onboard 6-channel sound. The embedded MPEG 2 decoder promises smooth DVD playback. It also has support for USB 2.0 and FireWire, and an onboard LAN chip.

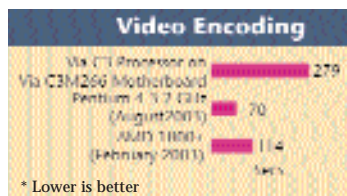
We ran the PCMark 2002 benchmark, and got a CPU index of 1130—much lower than the scores given by competing processors. It took 279

Price: Rs 2,350 for C3 1 GHz processor; Rs 4,750 for C3M266 motherboard

Contact: Priya Ltd
Phone: 022-5666 3100
E-mail: prom_bom@priyagroup.com
Web site: www.via.com.tw

seconds to encode an MPEG file to DivX. This is twice the time taken by the AMD Athlon 1800+.

The ZDBench Content Creation 2003 score was 7.8, ruling out multimedia content creation. It yielded a playable frame rate in the *Quake III* test, but without an AGP slot, there's no way you can upgrade. The CPU-motherboard combination is powerful enough to play DVD videos and music without any hiccups, but when it comes to serious computing tasks, the system simply fails.



SPECIFICATIONS

Processor: 1 GHz clock speed, 133 MHz FSB, 128 KB L1 cache, 64 KB full speed L2 cache, support for SSE instruction set, socket 370 interface

Motherboard: Support for socket 370 processors, upto 2 GB DDR SDRAM, integrated graphics chip and MPEG 2 decoder, onboard audio and LAN chip, USB 2.0 and FireWire support

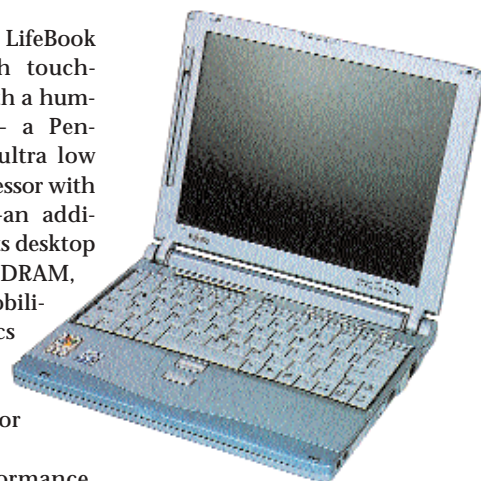
VIA C3 Processor on Via B+ C3M266 Motherboard

Performance	    
Features	    
Build Quality	    
Value for money	    

Fujitsu Lifebook B2620

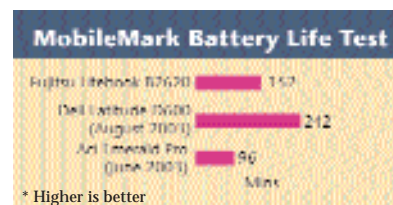
Featherweight notebook

The Fujitsu B2620 LifeBook has a 10.4-inch touchscreen TFT LCD, with a humble configuration—a Pentium III 850 MHz ultra low voltage mobile processor with 512 KB of cache—an additional 256 KB over its desktop variant; 256 MB SDRAM, and an ATI Rage Mobility 8 MB graphics card. The biggest drawback is the absence of a CD or DVD drive.



To check performance, we ran Content Creation 2003 from ZDBench—the B2620 scored a respectable 17.2. In the SiSoft benchmark, it gave a slow drive index of 11776, due to the slow 30 GB 4,200 rpm hard drive. In the processor benchmark, it scored well—1137 Whetstones and 2308 Dhrystones for integer and floating point computations, respectively. To test battery life, we used MobileMark 2002 from BAPCo, which showed a battery life of 152 minutes—low compared with the Centrino-based Dell Latitude D600, which logged 242 minutes. Overall, this notebook is best suited for the corporate user, who

mainly uses office applications and presentation software. It is over-priced at Rs 1,20,000, since you can get a Centrino-based notebook for as much.



SPECIFICATIONS

Intel Pentium III Mobile 850 MHz processor, 256 MB SDRAM, 30 GB Hitachi hard drive, 10.4 inch TFT LCD display, ATI Rage Mobility graphics card with 8 MB RAM, Windows XP Professional

Fujitsu Lifebook B2620 B-

Performance					
Features					
Build Quality					
Value for money					

Ennyah Digisound II DS601 MP3 Player

Compact all-in-one

The Ennyah DS601 measures just 88 x 32 x 20 mm. The body is metal, and it comes with the driver CD,



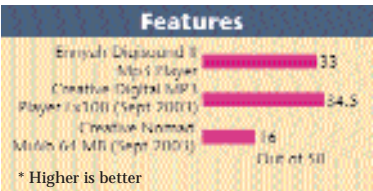
a USB extension cable, user manual, headphone with neck strap and one AAA battery. It can play MP3s and FM radio; it records voice and can be used to transport files.

The DS601 automatically creates a folder where all voice recordings are stored. Using the device for transporting files was easy, and the 26 x 96 mm LCD displays an animation of the file transfer procedure. We managed to transfer 50 MB of MP3s to the player in 1 minute and 33 seconds—the fastest we've seen in solid-state players.

Price: Rs 6,500 (approx)
Contact: Great World Tech Pvt Ltd
Phone: 022-2389 2828
E-mail: sales@gtechworld.com
Web site: www.ennyah.com.tw

The sound was crisp and clear—the treble was good but the bass lacking. The single AAA battery lasted about 7 hours at normal use.

Overall, with 128 MB of storage and a price tag of Rs 6,500, this device comes across as great value for money. It even beats our previous winner—the Creative Nomad MuVo 64MB, which offers 64 MB storage for Rs 6,000.



SPECIFICATIONS

128 MB memory, supported formats: MP3, WMA, built-in LCD with white backlight, voice recording, FM tuner, FM recording, data storage, USB interface, dimensions: 88 x 32 x 20 mm, weight: 46 gms (without battery)

Ennyah Digisound II DS601 MP3 Player	
Performance	★★★★★
Features	★★★★★
Ease of use	★★★★★
Value for money	★★★★★

Samsung ML-1510 Laser Printer

The no-frills laser printer

The Samsung ML-1510 laser printer is remarkably small, and is lighter than most laser printers. The paper tray has a capacity of around 250 sheets. Printed output is either ejected from the top or from the rear tray.

There's no LCD display, only a large button on the top with two LEDs indicating the status and the toner-save feature. The printer has extensive support for all major distributions of Linux and MacOS.

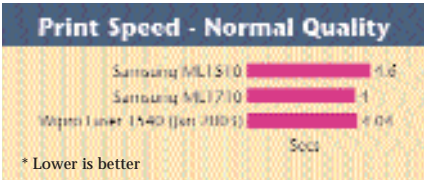
The accessories bundled include the driver CD, a 15-amp power cable and a USB cable.

In our speed test, it printed 13 pages per minute, which is one less than its claimed 14 ppm—



a shade slower than the Wipro Laser 1540 which is Rs 250 cheaper than the 1510. Though 17 seconds in the image test was amazing, it yielded a dismal 35 seconds in the combination document test. However, it did deliver better image quality than the Wipro Laser 1540. The MS-Word print test showed only a marginal difference in quality.

The clincher is the low price tag of Rs 11,000, making



it ideal for the SoHo segment, and those upgrading from older dot matrix printers.

SPECIFICATIONS

2 MB buffer, 13 ppm, USB 1.1 interface, paper sizes supported: A4, letter, transparencies, labels

Price: Rs 11,000
Contact: Samsung Electronics India Information & Telecommunication Ltd
Phone: 011-5151 1234
E-mail: farukh@samsungindia.com
Web site: www.samsungindia.com

Samsung ML-1510 Laser Printer	
Performance	★★★★★
Features	★★★★★
Build quality	★★★★★
Value for money	★★★★★

Western Digital WD2500JB Hard Drive

Huge and fast

The WD2500JB hard drive from Western Digital offers 7,200



rpm speeds. This hard disk has three platters—each can store about 83 GB of data, with an 8 MB buffer.

The drive has a read burst speed of 70.1 MBps, as compared to 80 MBps for the Maxtor 250 GB drive. This can be attributed to the differences in interface; the Maxtor has an ATA133 interface as compared to Western Digital's ATA 100 interface. The random write speed of 17.33 MBps was also worse than the Maxtor's 20 MBps.

Price: Rs 17,500
Contact: Western Digital
Phone: 022-2588 4538
E-mail: ajay.kapure@wdc.com
Web site: www.wdc.com

Though the WD2500JB lags in terms of features and performance, it certainly came out well on the value for money front—with 6.84 paise per MB, as compared to 8.2 paise per MB that Maxtor had to offer for its 250 GB.



SPECIFICATIONS

Buffer Size: 8 MB, Read Seek Time (Average): 8.9 ms, Average Latency: 4.2 ms (nominal)

Western Digital WD2500JB Hard Drive	
Performance	★★★★★
Features	★★★★★
Build quality	★★★★★
Value for money	★★★★★

NEC MultiSync LCD 1560v

Slim and speakerless

The NEC 1560v is a flat panel LCD monitor with a black frame and compact design. It doesn't have in-built speakers. The Auto option in the OSD menu

with just a little Red, Green or Blue visible at the edges, though there was a little streaking. The monitor has uniform brightness, even when viewed at 1024 x 768. It has a fine dot pitch of 0.297 mm. The screen is mildly reflective, which causes eye strain when the display is dark.

This monitor, like all LCDs, is more suited to offices where space is a scarce resource. If price is a worry, bulk buys are eligible for discounts.



automatically adjusts the monitor's refresh rate, and wraps the screen to the raster. The buttons are placed on the bottom edge, and are inconvenient to access.

We ran several test slides from DisplayMate Video Edition to check the monitor's performance under extreme conditions. It scored well in almost all the tests. The focus and resolution was very good



SPECIFICATIONS

Contrast ratio 400:1, brightness: 250cd/m2, max resolution: 1024 x 768 at 60 Hz, weight: 5.5 Kgs, 0.297 mm dot pitch

Price: Rs 20,500
Contact: Shiba Comp Pvt Ltd
Phone: 011-2743 0278
E-mail: shiba@del2.vsnl.net.in
Web site: www.nec.com

NEC MultiSync LCD 1560v		B+
Performance	▶▶▶▶▶	
Features	▶▶▶▶▶	
Build quality	▶▶▶▶▶	
Value for money	▶▶▶▶▶	

Creative Sound Blaster External USB Sound System

A moving sound system

Creative has come out with yet another external USB sound device, targeted at those who want a quick and easy sound upgrade. This small device comes with a

clip and Velcro strips to attach the device to your laptop or desktop. Other accessories include a USB cable and a 'Y' splitter cable.

The sound chip supports EAX, for environmental sound effects. It has audio Line-In and Line-Out ports for stereo or 2.1 channel sound, and also



supports 5.1 and 6.1 channel sound and external optical devices via its Optical-Out and Optical-In ports. The product comes with an installation CD that contains drivers and Creative Media Source software, with virtual surround and a 10-band graphic equalizer.

The sound card can be set up in seconds—just connect the USB cable and install the driver. The output is a little low on treble, but the bass is good due to the bass boost.

Price: Rs 4,299
Contact: Creative Labs Asia
Phone: 98203-57713
E-mail: rajshekhhar_bhatt@ctl.creative.com
Web site: www.creative.com

At Rs 4,300, this device gives you the advantage of portability and simplicity. However, we recommend this only to laptop users, as desktop users can get a better sound card for the same price.

SPECIFICATIONS

USB 1.1 interface, analog line-out, headphone output, SPDIF optical output, analog-digital output selector, mic input

Creative Sound Blaster External USB Sound System		B
Performance	▶▶▶▶▶	
Features	▶▶▶▶▶	
Ease of use	▶▶▶▶▶	
Value for money	▶▶▶▶▶	

Samsung DVD HDD Recorder DVD-H40S

Move away VCR

The DVD equivalent to a VCR—the Samsung DVD-H40S can play DVDs as well as store programs, images, etc., on its in-built hard disk. It can record programs from television broadcasts, or media files from DVDs and CDs on its 40 GB hard disks.

It has a friendly GUI. You can only choose between two storage modes—40 hours of video, 250 MP3s and 10,000 JPG images, or 30 hours of video, 2500 MP3s and 10,000 JPG images. It comes with a huge full-function remote that needs both hands to control it.

The DVD-H40S is a great advantage over conventional VCRs—you can record a series of TV programmes, and start watching stuff while it's still recording. Videos can be

recorded at 2, 4 and 6 Mbps. The video output is excellent, and it has optical and co-axial digital output ports, as well as input ports for devices such as a camcorder, VCD, VCR and sound system. The only drawback was the lack of CD- or DVD- writing support, and an interface to transfer data to and from a PC—which one would expect at Rs 45,000.

SPECIFICATIONS

DVD, VCD, MP3 and CD playback, Dolby Digital and DTS support, 40 GB hard disk, video-in/out jacks, Component Video Out jacks, S-video In-Out jacks, one Digital Optical Audio Out, one Digital Co-axial Audio Out, RF antenna input and output

Price: Rs 44,990
Contact: Samsung Electronics India Information & Telecommunication Ltd
Phone: 011-5151 1234
Fax: 011-5160 8818
E-mail: digimax@samsungindia.com
Web site: www.samsungindia.com

Samsung DVD HDD Recorder DVD-H40S		B
Performance	▶▶▶▶▶	
Features	▶▶▶▶▶	
Ease of use	▶▶▶▶▶	
Value for money	▶▶▶▶▶	

Antec LANBOY Mini Tower Case

Gamer's choice

This cabinet will definitely get a second look at your next LAN party. The Antec LANBOY is targeted at the gaming community. The cabinet is a silver-grey combination of colours, with an all-aluminium body, making it extremely light-weight and sturdy.



A plastic door on the front panel conceals the optical and floppy drives. It has two USB ports on the front panel for easy installation of external USB devices. It has a transparent left side panel, which lends it character.

The side panels have thumb screws for easy access

to the inside. The cabinet comes equipped with six regular IDE connectors, two floppy drive connectors and two Serial-ATA connectors. Its mini-tower form factor makes the inside slightly cramped, but easily manageable for an experienced hand. It has detachable 3.5-inch bays for easy installation of multiple hard disks. The cabinet also has room for two fans, one in the front and one at the back. It also has a neon-blue LED beneath the power supply, which looks fantastic in the dark.

Priced at Rs 6,500, it costs almost three times a regular cabinet. However, for those who need a 350 watt power supply and feel that looks are as important as performance, this is a decent buy.

SPECIFICATIONS

Mini tower, Athlon and P4 compliant power supply, 350 watt power rating, two front mounted USB ports, voltage (110/220) selector.

Price: Rs 6,499

Contact: Cyber Space Abacus Pvt Ltd

Phone: 044-2491 7667

E-mail: antec@theitdepot.com

Web site: www.antec-inc.com

Antec LANBOY Mini Tower Case B-	
Ease of use	■■■■■
Features	■■■■■
Build quality	■■■■■
Value for money	■■■■■

Iomega HDD 120 GB USB 2.0 and FireWire

Easy backup

Iomega has introduced its 120 GB external hard disk, which has a spin speed of 7,200 rpm, for both desktop and laptop usage. It supports PC and Mac systems, and can be connected through USB and FireWire ports. The necessary cables and the power adaptor are also provided.

The hard disk supports

USB 1.1, 2.0 and FireWire. We used SiSoft Sandra 2003 to



test the drive's performance when using a USB 2.0 interface—it did remarkably well in the file transfer test, taking just 32 seconds to transfer a 700 MB file, and 55 seconds for a 700 MB set of assorted files. There was, however, a 40 to 50 per cent degradation in performance when we used the USB 1.1 interface.

Overall, the drive performs satisfactorily, and its high storage capacity makes it perfectly suited for backing up large video and image files. The price tag of Rs 16,950 is

Price: Rs 16,950

Contact: Neoteric Informatique

Phone: 022-2417 2600

Fax: 022-2418 5294

E-mail: sales@neoteric-info.com

Web site: www.iomega-asia.com

not high, and this is a must-buy for laptop as well as desktop users who require additional and portable storage space. Remember that it needs an external power source, so you can't use it on the go.

SPECIFICATIONS

120 GB capacity, USB and FireWire interface, 7200 rpm rotational speed, USB and FireWire cables, power adaptor and power cable provided, Norton Ghost 2003 pre-loaded

Iomega HDD 120 GB USB 2.0 and FireWire B+	
Performance	■■■■■
Features	■■■■■
Build quality	■■■■■
Value for money	■■■■■

EasyDisk Mini 128 MB USB drive

Ultimate portability

EasyDisk Mini is a light and compact 128 MB USB disk based on Flash memory technology. The device comes with the driver CD, manual and a USB extension cable. To install the drive in Windows XP, all you do is plug the disk into any USB port—the drive shows up in Windows Explorer as a removable drive, in a matter of seconds. Windows 9X users need to install the drivers though.

EasyDisk uses USB 1.1, which limits the data transfer rate to 12 Mbps. To test performance, we used SiSoft Sandra benchmarks on a Pentium 4 3.06 GHz machine with 256 MB DDR RAM and an 845GE motherboard. The read transfer rates were close to 1 Mbps, and the write rate

was 663 Kbps. In the file transfer test, it took 60 seconds to copy a 40 MB file to the drive, and just 33 seconds to copy it back to the hard disk.

This drive is about Rs

1,000 cheaper than comparable products from Iomega or Zoltrix. It even throws in a free e-mail client—not really useful, but free. The EasyDisk performs as well as its competitors do, and is cheaper. What more could you ask for?

SPECIFICATIONS

128 MB USB, USB 1.1 support, weight approx. 9 grams, dimensions 6.5 x 1.7 x 0.9 cms

Price: Rs 3,500

Contact: GNH Systems

Phone: 022-2490 1333

Fax: 022-2490 4777

E-mail: usbflashmemory@hotmail.com

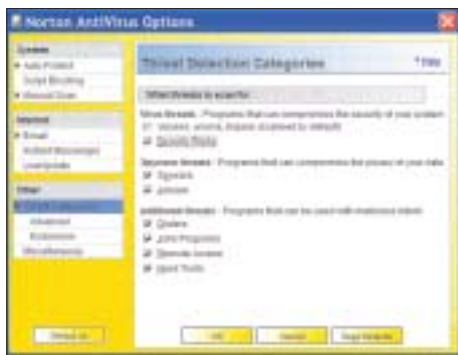
Web site: www.easydisk.com

EasyDisk Mini 128 MB USB drive A-	
Performance	■■■■■
Features	■■■■■
Build Quality	■■■■■
Value for money	■■■■■

Norton AntiVirus 2004

Old wine in a new bottle

Symantec always claims to **S**tevy trust on their customers, but have done quite the contrary with their latest



anti-virus offering. Norton AntiVirus 2004 has a product activation feature, similar to Windows XP. Those who use Norton AntiVirus 2003 will not find much of a change, except for the ability to prevent spyware, joke programs and assorted hacking tools. The new version also claims to detect dialler programs, but couldn't catch a single dialler in action when we tested it. We installed adware programs, and Norton detected a

Price: Rs 2,025
Contact: Tech Pacific
Phone: 022-5596 0303
E-mail: manishl@techpacindia.com
Web site: www.norton.com

Expert Quick Accounting

Numbers made simple

Expert Quick Accounting is targeted at both large and small businesses, and does not require any sort of training. It provides a multi-



Cydoor program and deleted the file successfully. Another useful feature is that Auto Protect loads at boot up, instead of when Windows loads, offering better protection to Windows 2000 and XP users.

T h o u g h Symantec's competitors are incorporating a firewall with their anti-virus packages, Norton 2004 still doesn't have one, in either the Standard or Professional versions. In all, Norton AntiVirus 2004 is a useful buy only for new users: if you have a previous version, renew your subscription.

SYSTEM REQUIREMENTS

Windows 98/Me/2000/XP, 300 MHz or higher processor, 128 MB RAM, 85 MB hard disk space

Norton AntiVirus 2004					
Performance					
Features					
Ease of Use					
Value for money					

user environment with multi-level security, allowing several users to use it when installed on a network. You can also assign tasks to other users on the same computer.

There's a comprehensive inventory management and stock tracking system to track fast selling items, estimated profits etc. You can track stock status through FIFO, LIFO, etc., and get a detailed stock valuation

through area, party and item-wise classification. It has over 100 customisable reports, and a warning and reminder system to help you keep up-to-date with cash, stock, reminders and appointments. The software is fully customisable, and allows you to decide what unnecessary menus and functions you want to hide. There is a built-in calculator and back-up reminder, which is a big help.

When you run the program, your desktop colour

Price: Rs 3,000
Contact: Compubrain India Ltd
Phone: 040-460 7074
E-mail: info@compubrain.net
Web site: www.compubrain.net

depth is changed from 16 bit to 32 bit, and there's nothing you can do about it.

The product is designed to be friendly, and you are provided with free telephonic technical support, and a CBT that gives you a demonstration.

SYSTEM REQUIREMENTS

Windows 95,98,Me,NT,2000,
XP, Pentium 233 MHz or high-
er, 64 MB RAM, 50 MB hard
disk space

Expert Quick Accounting	
Performance	★★★★
Features	★★★★
Ease of Use	★★★★
Value for money	★★★★

WinTasks 4 Professional

Trojan killer

WinTasks 4 Professional allows you to control the utilisation of your computer's resources. You can start and stop processes, change their priority and examine them.

The Autostart Window shows you the processes that start automatically while booting or rebooting your computer. You can enable, disable, and add or remove a program from the registry. A statistics window shows you the CPU usage, and how the internal memory is being used. This information is constantly updated, and you can choose the refresh rate—1 minute, 10 minutes, 2 hours or 24 hours. Using Win-



Tasks 4 Professional's built-in script you can create functions that automate the handling of processes and resources.

The software is suited for expert users, as the main toolbar overwhelms you with information. There is no CPU and memory usage display for Windows 98, and the software just does not support Windows Me. New users should refer to the Help files before trying to tweak their systems. Overall, at Rs 1,997.50, it's a decent buy.

SPECIFICATIONS

Pentium 200 MHz or higher,
Windows 98, NT, 2000, XP, 10
MB hard disk space, 32 MB
RAM, 4X CD-ROM drive

WinTasks 4 Professional	
Performance	★★★★★
Features	★★★★★
Ease of Use	★★★★★
Value for money	★★★★★

Pocketful of Palm

Once bitten by the mobility bug, Agent 001 sets out on the search for a Palm

After the laptop dream went up in smoke, I decided to think smaller—PDA smaller. I'd been waiting for an excuse to buy a PDA, and memories of my crushed laptop lust did just that. "Why don't you buy a PDA?" a vendor had suggested, pushing his laptops away from my hungry gaze. "It's got everything you need", he said, "and you won't have to worry about the battery dying, or your arm breaking".

That's about all the convincing I needed.

What Lamington Road is to hardware and software, Mumbai's Heera Panna shopping centre is to consumer electronics. Looking at the myriad of mobile phones on display, I spotted some handhelds. Upon asking, the salesman whipped out a cute little Sony Clie—a J22 with 16 MB memory at Rs 16,000. Unfortunately, it wasn't charged (none of the handhelds in his shop were), so I couldn't switch it on. When I asked to see something else, he showed me Palm's Tungsten. This was even smaller than the Clie, since the buttons at the bottom slide up to cover the scribble area when you're not using it. This was only Rs 500 dearer, and he recommended it over the Clie since it was 'original Palm' and had Bluetooth. It also features the newer version 5 of the Palm OS. You can use Word and

Excel files on it too.

More PC-like though, were the PDAs running Pocket PC that I found in the next shop. There was Compaq's 1910 for Rs 14,000, which featured a 100 MHz processor and 64 MB of memory. The salesman pointed out that only 47 MB was usable, since the pre-installed programs use up the rest. Though this did not come with a cradle for charging or synchronising with your PC, I liked it—it featured an expansion card, ran Word and Excel, and had a large sharp screen—quite impressive considering the price. He also had the newer 5550 model, which is fully loaded with a blistering 400 MHz processor, 128 MB memory, Bluetooth, WiFi and even a fingerprint reader for security. It also had a SIM card compartment that wasn't currently operational. All this for a hefty Rs 34,000! For a couple of thousands more, I could have the XDA O2—a full Pocket PC PDA with a working GSM phone. With it, I could surf the Net using GPRS directly. This particular dude also had a lot of accessories for iPaks—a keyboard for Rs 5,000, an additional 128 MB memory for Rs 2,600 and a 56k modem attachment for Rs 3,750.

I also came across a lone shop selling the Palm Zire71. "Fifteen thousand, five hundred", said the man when I pointed to the box in the show window. It's got 16 MB and a camera concealed by a sliding back. The screen was better than any under that name, but I still wanted to look further. So I moved on to Mumbai's business district, Fort.

Walking along, I spied a couple of Palms in a watch repairer's stall. I walked up and asked him if he sold PDAs too. Turns out he repairs them.

"So what typically goes wrong?" I asked. Power circuitry, normally, is the problem. "And the repair costs?" Though he was mostly non committal, claiming that he would have to see each case, generally he charges between Rs 500 and Rs 800.

I also encountered some overpriced vendors, selling Palm's older 515 for Rs 12,000 and the Tungsten for Rs 18,000. The 515 features the older Palm 4.1 OS and 16 MB of memory. Casio Pocket Viewers were the most popular devices—and for good reason. Prices for a 2 MB version start at Rs 3,200, and go up Rs 4,500 for a 6 MB version. These are pretty basic in function, offering the typical organisation tools (address book, appointments, etc.) and black and white screens. On the plus side, they do offer synchronisation with your PC.

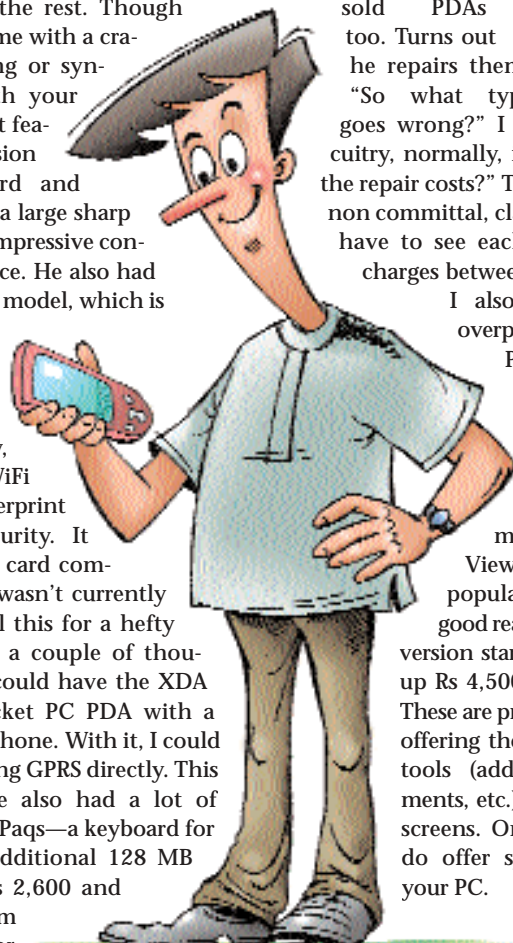
Even secret agents have a heart, and mine was set firmly on the Zire71. The solid build,

the cool blue look, the cooler sliding camera and the coolest screen, all had me by my wallet strings. Since I was already reaching deep into my pocket, I reached a little deeper and forked out some extra for a 128 MB memory card for Rs 2,600; sure to come in handy once I got to collecting evidence with its camera! ■

ILLUSTRATOR: Mahesh Benkar



- Be sure to check everything in the shop—the grey market does not guarantee anything.
- Look at the user manual to see what accessories should be supplied. Don't come home to realise that you didn't get a cradle.
- As far as screens go, don't rely on specifications; consult your eyes.
- Pocketability is an important criterion. All the features are useless, if you leave it at home because it's cumbersome to carry.
- If you have a GPRS phone or laptop with Bluetooth, then look for Bluetooth on your PDA too. Don't ask why!



Word Wide Web

Is the novelist, or the poet in you suffocated? Give them all the literary space they need, online!

One are the days, when to publish his or her work, a writer, a poet or a journalist, had to be dependent upon print media. With the Internet affecting all aspects of our life, online publishing has become an important part of the media. The reasons are quite obvious. Just think about the effort, money and time required if you wanted to publish a story that you have written. You've got to prepare a manuscript, make copies of it and send it to numerous publishers. And then, depending upon the publisher's evaluation of your work, it may, or may not be published.

With online publishing, you can send your work to a number of publishers, the world, over, in a very short time at low costs. Even if your work is not published anywhere, you can always publish your

work on your own Web site or sites specific to your musing. Further, the reach of the Internet is far better than the print media, enabling your work to get a wide, yet targetted audience.

If you are an amateur writer, there are Web sites where you could publish your work, get feedback and improve your writing. A seasoned writer will have the benefit of more people reading his or her work. If

you are a researcher, you can get your papers read by experts throughout the world. Online publishing basically involves online newspapers, magazines, journals and e-books. Some of these talk about general topics, while others are very specific in terms of the matter they cover.

General writing

Apart from regular print magazines, there are many journals and magazines that are published online. These magazines do not come with a subscription fee, neither do they charge anything to include articles—in fact, some even pay the writers. The number of such Web sites is huge and they can be very general, covering almost all subjects such as ArticleCity.com (www.articlecity.com), to ones such as Story Bites (www.storybytes.com) that publish

stories strictly based on their word count.

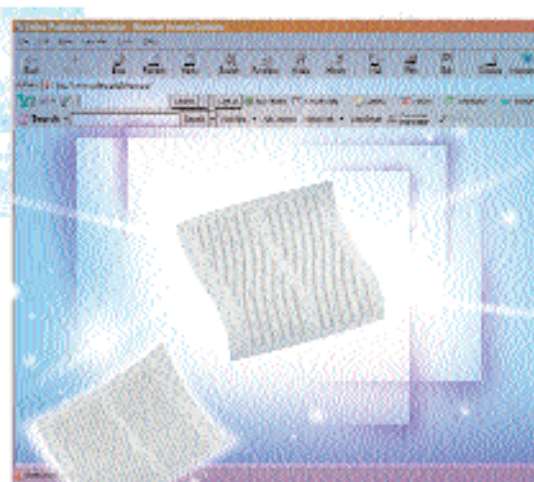
There are many e-zines, that have only an online presence such as Sulekha (www.sulekha.com), and Freshlime Soda (www.freshlimesoda.com). Sulekha is an e-zine for Indians across the world. Apart from the regular articles, three new articles contributed by readers are published everyday. You can contribute to the columns, news stories, e-cards, photo album, art, reviews, information on events, Indian baby names and Coffeehouse sections of the e-zines. If you think that you can write a script for an Indian movie, then Write Angle (www.sulekha.com/b4u/) is opportunity knocking at your door. Write Angle is a joint venture between Sulekha and B4U—the music channel, which is being launched with a global contest of great movie story ideas. The winner of this contest will win Rs 2 lakhs and a globally telecast interview among other prizes. This contest is held yearly. Sulekha has also entered the print media with Sulekha Select, which is a collection of selected writings taken from nearly 1,200 writings published on the Web site since 1998.

Freshlimesoda.com is an Indian magazine published by a team of enthusiastic people. It features different sections on features, fiction, poetry, art, reviews, columns and opinions. Anyone can submit an article here for publishing; an editor decides if it is to be published.

MouthShut.com (www.mouthshut.com) is India's first and largest, peer-to-peer information exchange portal. Here, you can write your opinion on thousands of products and services that are manufactured and sold in India. Thus, it provides critical data to manufacturers to improve customer satisfaction, marketing strategies



ILLUSTRATION: Mahesh Benkar



and product development.

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EServer, found at www.eserver.org, is a Web site where scholars, artists and writers can share and discuss their works. Here, you will find work on contemporary art, Internet, studies, drama, design, multimedia, accessible publishing, and current political and social issues. In addition to written works, hypertext, audio and video recordings are also published. It was founded in 1990 and till date, there are more than 30,000 works published. You will also find a section on better writing for online publishing.

Bohème Magazine (<http://boheme.magazine.free.fr>) is a non-profit, monthly journal of arts, literature and opinion. Published by the Bohème Magazine Group—an informal collective of young artists from seven countries—the magazine features poetry, short stories, non-fiction articles and visual artwork such as paintings, photographs, etc. This site doesn't charge anything from the reader or the writers for publishing their stories.

Tell me a tale

Stories are the first thing that we start reading as children, and many of us love reading those fairy tales even today! Whether you are a reader or writer, you will like www.short-stories.co.uk. It is a vast collection of short stories that are classified under children's, crime, fiction, horror, humour, nonfiction, romance, sci-fi and hyper-fiction. The length of the stories range from one page, to more than 25 pages. The site accepts contributions. If the editors select the story, you receive a page on the site where readers can access all your stories, as well as biographical or event information, story background and links. Readers can post their comments on the site, which you can use to evaluate your work. For less experienced authors, who feel they are not quite ready to submit their stories to the main site, but would still like some feedback, head to 'Short Stories Uncut'. This section has a form wherein new writers can submit their work, which gets published without any editing. Feedback is obtained in the form of comments that are posted on the Web site.

Story Bites (www.storybytes.com) is a monthly e-zine and weekly electronic mailing list, which features short stories, ranging from 0 to 2048 words. Yes! You read that correctly. The smallest stories on this site have a word length of zero. For example, the story titled 'The Life and Times of the Laziest Man Who Ever Lived' just has "" as its text. The index is arranged by story length—ranging from 0 to 1, 2, 4, 8,... till 2048, all to the power of 2. This site is again, free for readers and writers.

Read on the move

With the increasing penetration of mobile phones even in smaller towns, it has now become a necessity. Apart from normal voice conversation, mobile phones also enable text messaging or SMS, and Internet access. This has given rise to a whole new genre. You will find many sites on the Internet that feature stories short enough to be read on the phone's display screen.

One such interesting Web site is UK based www.the-phone-book.com, a digital publishing project that commissions international new works of ultra-short fiction for quarterly distribution. The stories are divided into three categories—mini, micro and SMS. The SMS stories are the smallest, the micro stories slightly bigger and the mini stories are the biggest of the three, but still small enough to be read on the phone screen. This site also has the audio version of stories. The WAP version of the Web site at www.the-phone-book.com/index.wml can be accessed from any WAP-enabled phone.

You can e-mail your work to editor@the-phone-book.com. You can also send it online using the form that is available in the Submit section of the Web site. If your literary piece is selected, you will be contacted via e-mail regarding copy-editing and payment procedures. Once this round of formalities is completed, your story is put up on the Web site's WAP section, and also made available as audio recordings.

If you happen to be an avid SMS user, there is a site called One-Sixty (www.centrifugalforces.co.uk/onesixty) that has SMS poetry. Here, you will find poems and sto-

ries that are never more than 160 characters in length. As expected, this is a free-for-all service, where you can send your stories to be published, and read other stories as well.

The poet in you

Poetry, they say, is the best medium of expression. If you believe so, there are many sites for you on the Internet where you can read poems written by established, as well as budding poets. Similarly, there are sites where you can submit your poems and see them published and admired. One such Web site is Plagiarist (www.plagiarist.com). It is an online archive of over 9,000 poems. Besides the archive, there is a Poetry Discussion Forum, Plagiarist Poetry Resources (such as essays and lectures), and other things related to the writing and appreciation of poetry. This site also has a service called the Plagiarist PoetryNotes where their staff provides detailed analysis and background information on a single poem for a sizable fee. This site does not accept poems from unpublished authors, so you cannot submit your first work. Instead, it advises you to join the discussion forums and post your work in the Members' Poetry Post section.



This beautifully designed site has a good collection of short SMS poems

If you want to win \$20,000, Poetry.com is the site for you. Poetry.com (www.poetry.com) has a huge collection of poems from over 4.6 million poets. It also has sections such as Poetic Techniques, Live Events and Listen to Poems, where you can listen to the poems in the audio format. It runs poetry contests from time to time, and awards cash prizes.

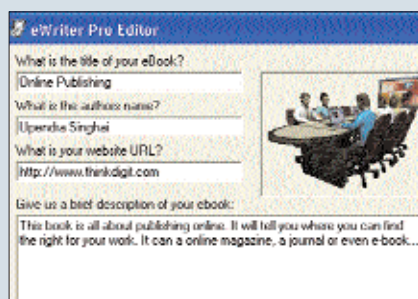
Tomes online

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To be a Writer

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UPENDRA SINGHAI

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short-stories.co.uk has a fine collection of stories, arranged in different sections

30 Minutes Expert In Search of a Codec

Got a video file that you can't play? Try this...

So you've just downloaded a video clip of a complete workshop, and Windows Media Player refuses to play it, and so does every player you download. Blame it on the missing codec.

So exactly which codec (coder-decoder) is your file missing? Ask the file! That's right. The first four bytes of a video file store information about the encoding process used. There are tools available on the Net that can read this information, telling you which codec is missing.

Gspot, available at <http://www.headbands.com/gspot/download.html>, is a tool that can be used to recognize the codec used to encode a video file. After installing Gspot on your system, you can start it from the **Start Menu > Programs > Gspot > Gspot Codec Information Application**. Open a video file by clicking on **File > Open**. The main window lists all the

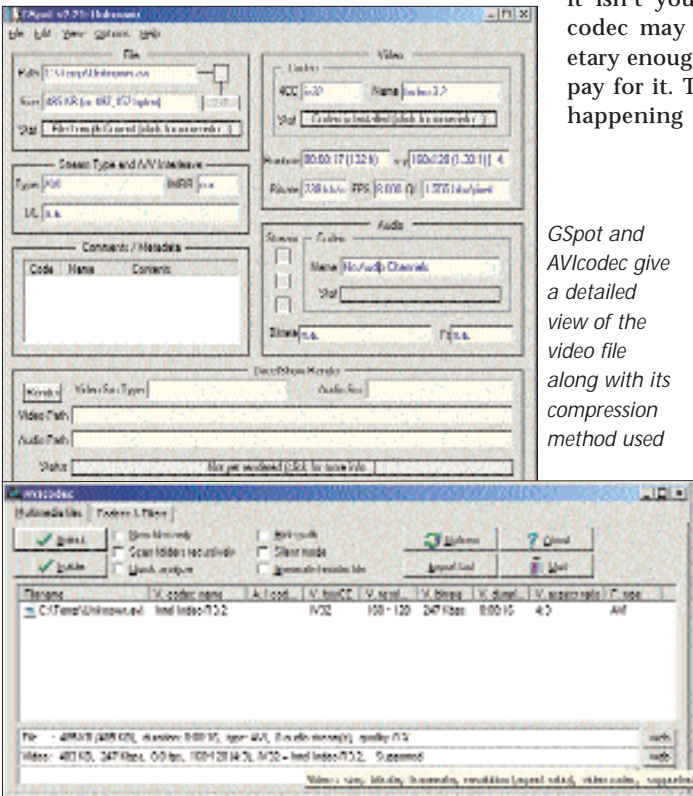
details of the video file open—it shows the codec using which the particular file was coded, the bit rate, the number of total frames, the frame rate, the video dimensions, and so on.

You can also use another program known as AVIcodec (<http://avicodec.duby.info/>), which has a more complex interface. It is similar to GSpot, but gives much detailed information such as the audio bitrate and the audio frequency.

Now that you know which codec your video file is missing, you can either download it, or download a media player that comes with its own codec pack. If it isn't your lucky day, your codec may be rare or proprietary enough to require you to pay for it. The chances of this happening are slim, since

codec packs such as Nimo codec pack, K-Lite, Elisoft codec pack, etc., are widely available for free. Never install more than one codec pack on your system, unless it's incomplete. This may lead to codec clashes or version mismatches, which will allow neither of the packs to play the file. Also, during installation, check whether

GSpot and AVIcodec give a detailed view of the video file along with its compression method used



Find it on the Mindware CD
**GSpot v2.21, BSPlayer
v0.86 build 500, Elisoft
Codec pack v13.505**



BSPlayer gives a lot of options for playback, while The Core Media Player has a very simple interface

the pack installs previous versions of the same codec such as DivX 3.x and 4.x. This confuses the player, and the system will not be able to play any DivX encoded files, even after uninstalling the codec pack. It is better to note the codec needed, and install it individually.

A better alternative is to use a third-party media player, which comes with its own codec pack. BSPlayer (www.bsplayer.org), one of the finest players a file can get—be it audio, video, or DVD. Not only does it come with its own codecs, every codec has been updated, so that you get only the latest versions. BSPlayer allows you to customize your viewable area ratio to 4:3, 16:9 or the original aspect ratios. Core Media Player (www.corecoded.com) is not as feature-rich as BSPlayer, but the interface is similar to Winamp. This player is light on system resources.

With all this codec control, there's nothing stopping you from watching your favourite movies. Happy viewing.

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Virtual Private Networking

In the cyber-village world of today, VPN is a safe haven for chosen connectivity

In the digital age, it is not necessary for a team of workers to be in the same building. They can collaborate without even meeting each other, forming a 'virtual team'. Given the current connectivity scenario, a security consultant in Bangalore can work with a system administrator in New York, using inputs from a colleague in Berlin.

When companies expand operations, the biggest problem they face is that of connecting to their branch offices. A leased line is a solution if the company has only a few offices; when the number of offices increases, the number of connections required to inter-connect them increases exponentially, along with cost. This is where Virtual Private Networking (VPN) comes in.

VPN, as the name indicates, is a private network used only by a restricted set of people, and has no actual physical connections between nodes. The network is built by establishing virtual connections via a public network, such as the Internet. Since data is transmitted over the Internet, encryption and security play a vital role in VPN.

Generally, VPNs can be used in two ways—the first is Remote Access, wherein employees can access the company's Intranet from remote locations, such as their homes. The second is to connect various offices of a company, also called site-to-site connections. This technology does not offer anything unique per se, and can be considered an evolution of the Local Area Network (LAN) and Wide Area Network (WAN) technologies. A combination of these two is also possible.

The ingredients

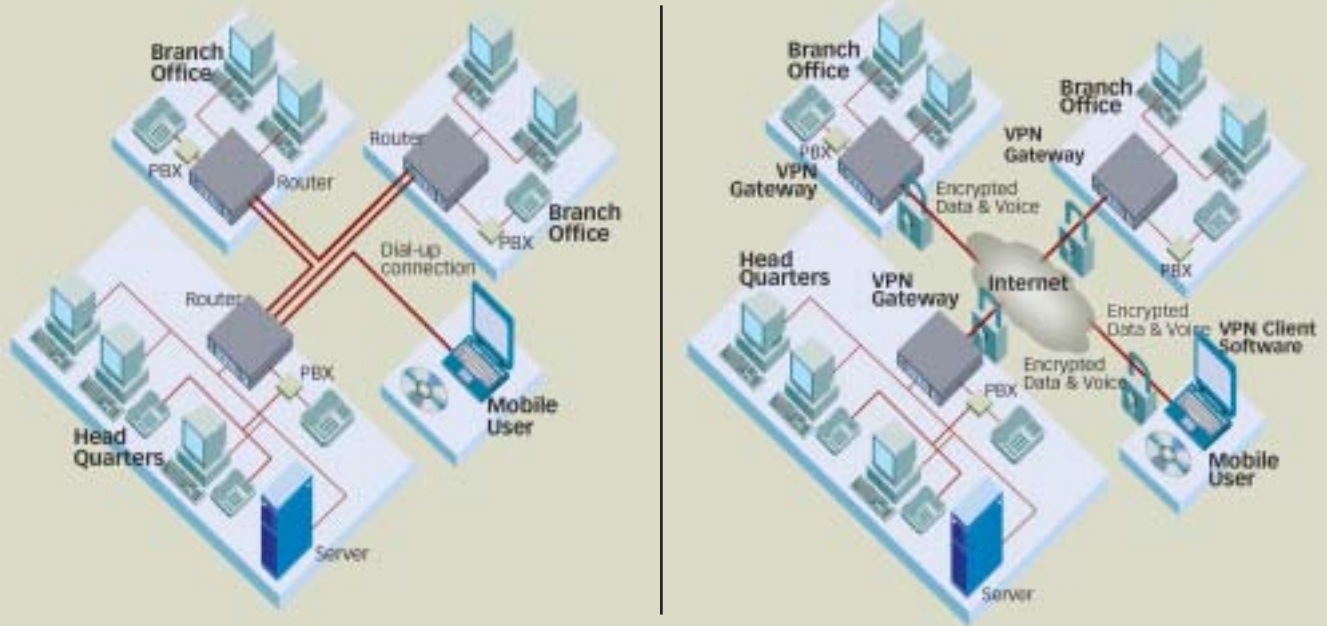
Data is sent between two networks as discrete units called packets. The format of the packet varies depending on the protocols used. When you try to connect two different networks, you may have to send a packet that the destination network cannot understand. Tunnelling provides a simple solution to this problem by encapsulating a packet within another packet, which the destination network will be able to understand. VPN uses this technique to connect different networks.

Generally, a VPN consists of two components—the gateway and the client. The gateway is a combination of hardware and software, set up at the company's physical location. Each LAN has its own VPN gateway, which is the entry and exit point of the LAN. A VPN gateway can communicate with more than one client simultaneously, by using multiple

GRAPHIC DESIGN: Atul Deshmukh

VPN Vs Leased Lines

INFOGRAPHIC: Solomon Lewis



A visual comparison of VPN and leased lines reveals the simplicity of the former

tunnels. The number of tunnels supported by a gateway depends on the hardware and the speed of the connection. The gateway performs functions such as initiation, authentication and managing the tunnels after the connection is set up. The gateway then routes the data to the corresponding node in its network. It also encrypts the data before sending it, and decrypts the data that is received. The VPN client provides remote access to a VPN gateway, and performs similar functions, such as authentication, encryption and decryption. Apart from these, the client also authenticates the user who wants to access the corporate network. The security of a VPN is managed at three points—the client, the target network and the gateway.

Info The VPN services and equipment market in India is expected to grow to Rs 1,276 crores by 2005, up from Rs 168 crore in 2001. Source: IDC

The client is not a replacement for anti-virus software or security updates. The client should be virus free and have all security updates before connecting. The target network should also have a limited access set for remote users. This way, even if an unauthorised user gains access to the network, the possible risk and damage is minimised. It is also important to remember that data is unencrypted after it passes the gateway, and can flow freely in the network. Thus, a secure gateway is also crucial to maintain security in a VPN.

The architecture of any network is like a building—like the floors of a building, a

network is made up of layers. The lowest layer is the physical medium, such as coaxial cable, twisted pair cables, etc. The top-most layer is the layer where applications such as browsers work. The intermediate layers, from top to bottom, are the presentation layer, sessions layer, transport layer, network layer and data link layer. When data is transmitted, it flows from the application layer to the intermediate layers of the sender's computer, travels over the physical medium, and then moves to the application layer in the destination system. Each protocol operates at a specific layer in the network; for example, IP operates in the Network layer. Similarly, the PPTP operates in Layer 2 of the network.

PPTP, IP... huh?!

PPTP (Point to Point Tunneling Protocol), L2F (Layer 2 Forwarding), L2TP (Layer 2 Tunneling Protocol) and IPSec (IP Security) are VPN protocols that are used to transmit packets. The main function of these protocols is to encrypt data and tunnel it through the Internet.

PPTP is an extended version of the PPP (dial-up protocol) that provides support for VPN. It was developed by a group of companies led by Microsoft. Similarly, Cisco developed the L2F protocol for secure private dial-up networks over the Internet. The L2TP protocol is an IETF (Internet Engi-

neering Task Force) standard that combines the best of the PPTP and L2F. It can be used wherever PPTP or L2F is being used today. The IPSec protocol was also developed by the IETF, and operates in the IP layer of the network. IPSec offers two modes of encryption—Transport and Tunnel. Each packet has a data portion and a header portion, with details such as destination and source address. In the transport mode, only the data portion of a packet is encrypted, whereas in the tunnel mode, both the header and the data portions are encrypted. Though criticised for its complexity, this is the most secure protocol currently available.

MPLS VPN

There are two types of VPNs. IP VPNs operate at layer 2 of the network, and are based on a connection-oriented model—a connection has to be established between the sender and the receiver before the data can be transmitted, as in a telephone conversation. In the connectionless model there is no need to establish a connection for data transfer—it is similar to sending an e-mail or an SMS. A VPN based on the connectionless model is more scalable than a connection-oriented one, and is recommended for larger networks. This is because large networks deal with thousands of tunnels, which may lead to lower throughput, or variable bandwidth if the connection-oriented model is being used.

MPLS (Multi-protocol Label Switching) networks operate at layer 3 of a net-

work. Special routers called LER (Label Edge Routers) mark each packet entering the network. The network handles the packet based on the label. For example, packets marked 'urgent' will go into a high bandwidth line, while routine traffic might go to other lines. This translates into a network that is more scalable, and less complex. Thanks to the connection-less model, the service provider will be able to offer different classes of service to different users. For customers, MPLS VPN offers predictable performance without compromising on any other aspect of the network.

Who can use it?

VPN can be built over any network, even within a LAN. First, a VPN server has to be installed on a server operating system such as Windows 2000 server. Once this is done, VPN clients can be installed on any networked system.

Companies based at multiple sites can use VPN to connect all their offices. Leased lines are extremely expensive to lay and maintain, as a dedicated line has to be set up between the end points and has to be renewed annually. VPNs give a consistent throughput, as the line is used exclusively by the company, without any sharing of bandwidth.

A VPN also helps you access your company's Intranet from your home, and executives on the move can synchronise their

laptops with their office desktops. The next step in this direction is the creation of a large scale virtual organisation.

Indian VPN

All this looks good on paper, but has anyone attempted to set up a VPN?

Bharat Petroleum Corporation Limited (BPCL) wanted a low cost solution to extend ERP (SAP R/3) access to its remote locations and partners—about 130 users spread over 110 locations. VPN was chosen over VSATs and leased lines, for an obvious reason—cost! These remote locations needed connections to carry out SAP transactions, which don't require high bandwidth or an 'always on' connection. The VPN implementation started in November 2001 and was completed by March 2002. BPCL opted for the CISCO model that supports up to 1,500 simultaneous tunnels. The central gateway is located in Mumbai, and is connected to the Internet via a 2 Mbps link. Scalability is important in any retail business—new outlets are added every month and then have to be connected. With VPN, all you need to do is install a VPN client.

Popularly referred to as the Bible of cricket, Wisden offers an online version of its services as Wisden Online (www.cricinfo.com/wisendotcom/). Apart from statistics, the site offers multimedia content, competitions, etc. As both the Bangalore and London Wisden offices maintain the site, they had to be connected. Although there are

How BSNL connects India?

BSNL and MTNL offer a different breed of VPN services. They support only voice—one can use a modem to send and receive unencrypted data. In simple terms it acts as an EPBAX that's spread over large distances. It's the perfect solution for small businesses, such as travel agencies, who often need to talk to their peers in other cities. You can also use it to have cost effective chats with your girlfriends all over the country.

only two offices, the distance between them makes a leased line impossible. Wisden opted for a VPN network. The network runs on the Windows platform, using a Checkpoint firewall. The benefit of this was seen when Wisden launched a live pay-per-view video stream of England's match against India, early in 2002. The Web site got a huge response for this service, and provided a stable broadcast throughout the match, despite fluctuating demand. Part of the credit goes to their VPN network.

The Indian VPN services market is filled with many players, mostly telecom companies that set up the network and maintain it. Companies such as Cisco, Checkpoint, Microsoft and others, provide the software and hardware components used in the network. Some of the better known service providing companies are VSNL, Touchtel and Tata Teleservice. MTNL and BSNL offer only voice service.

What it all leads to

As with any technology, VPN also has its share of woes. The irony is that its strength is also its drawback—the Internet, with its unpredictable delays and the susceptibility to attack. MPLS helps one to overcome this problem, and is poised for rapid deployment by the industry—simply because, though it isn't perfect, it is still the best solution available. Due to increasing competition, companies are forced to adopt cost cutting measures. In the e-commerce era that we live in, good connectivity can make the difference between the success or failure of a business. Without a doubt, VPN is the most cost effective solution for companies to keep their employees connected.

In a secured environment, VPN is bound to become the connecting line for dispersed corporate networks. The increase in the number of vendors offering VPN is indication enough of its rising popularity. ■

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Jargon Buster

IPSec: This covers authentication and encryption of data traffic over the Internet. For IPSec to work, the sending and receiving devices must share a key. IKE protocol is a key management protocol standard which is commonly used in conjunction with the IPSec standard.

Leased Line: A communication line that is exclusively laid for the private use of a company, or an individual.

Layer 2 Forwarding (L2F): L2F was developed by Cisco, and is a layer 2 tunnelling protocol similar to PPTP.

Layer 2 Tunnelling Protocol (L2TP): L2TP can send encapsulated PPP packets over IP, x.25, frame relay or ATM networks.

Point-to-Point Tunnelling Protocol (PPTP): This is an extension of Point-to-Point protocol (PPP) built to provide remote access that can be tunnelled through the Internet. PPTP encapsulates PPP packets

using generic routing encapsulation (GRE) protocol, which gives PPTP the flexibility of handling protocols other than IP.

Tunnelling: The technique of encapsulating one protocol within another, such as IPX within IP. In the context of security, it refers to encrypting IP within IP so that the traffic may be routed securely.

VPN Concatenator: Also called VPN gateway. Data from the Internet has to enter the VPN network of a company through the VPN concatenator. It decrypts the data coming from the Internet, and encrypts the data before sending it back out over the Internet.

VPN Tunnel: This describes the connection between two or more private nodes, or LANs over a public network, typically the Internet. Encryption is used to maintain the confidentiality of the data when travelling over the Internet.

Project Cleanup

Fast and smart ways to maintain your hard disk

Invalid system disk. Insert system disk and press any key to continue.—the dreaded hard disk failure or file system corruption message that none of us ever want to see, but chances are that most of us will, at some point or another! Most of us don't really take care of our hard disks; we just install programs blindly, and dump all sorts of junk onto it. Only when we see this message, or run out of disk space, do we even bother to clean it up. In order to make our hard disks last and perform better, all that is needed is a little tender, loving care (TLC).

The hard disk, by far, is the most important component of your PC. If your processor blows up, you get a new one; the same goes for the motherboard, RAM, or any other components, but the day your hard disk crashes, it's time to worry. Not only does your PC come to a stand still, but all your presentations, movies, music, documents and valuable data is probably lost forever. Sure, you can try to recover it, but that's a tedious process and most often, you will fail miserably. At best, you can format, reload the operating system and cross your fingers and pray that this time, it will last a bit longer.

Call in the sweepers

In order to keep your hard disk in

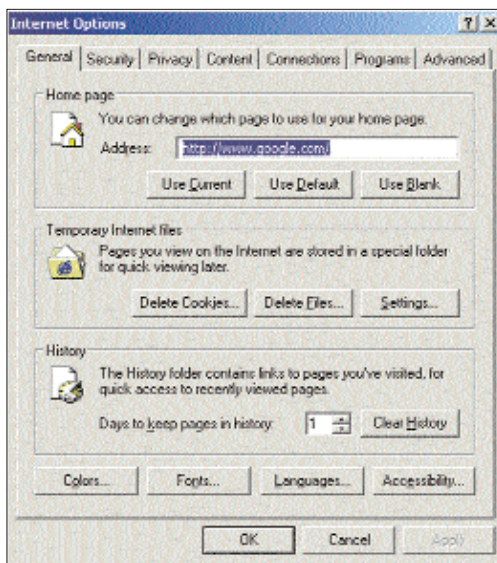
shape, the most basic requirement is a thorough cleanup. You need to delete all the junk that was installed by programs during their installations. To do this, go to the `\Windows\Temp` folder, and delete all the files there. Now, empty the Recycle Bin by right-clicking on it and selecting 'Empty Recycle Bin'. The next step is to clear all useless Internet files from Internet Explorer. Go to Tools > Internet Options in Internet Explorer. Here, click on Delete Cookies, Delete Files (select the 'Delete all Offline Content'

checkbox), and Clear History.

Besides these basic measures, there are third-party applications, such as WindowWasher and Norton CleanSweep that clean your hard disk for you.

Norton CleanSweep: Norton CleanSweep lets you select the files you want to remove to clean your hard disk. Start the CleanSweep wizard through `Start > Programs > Norton SystemWorks > Norton CleanSweep > Cleanup > Norton Fast & Safe Cleanup`. In the main dialog box, click on Settings and select all the options given, including the Temporary Internet Files. This will remove all traces of your junk data. Click on OK, and in the main window, click on Clean Now. This will clean all the junk files, and show a report of the total bytes freed up. Close the window, and return to the SystemWorks window.

You can also go to `Norton SystemWorks > Norton CleanSweep > Internet`, and select the 'Internet Cache Cleanup and Cookie Cleanup' option. This will clean up the cookies accumulated while surfing the Internet. Alternatively, you can select the ActiveX Cleanup and Plug-in Cleanup for removing outdated or unused plug-ins, or ActiveX controls that Internet Explorer downloads automatically.



Using Internet Options, delete all the temporary files created while surfing



The Internet Junk Cleanup option in Norton Cleansweep helps clear cookies

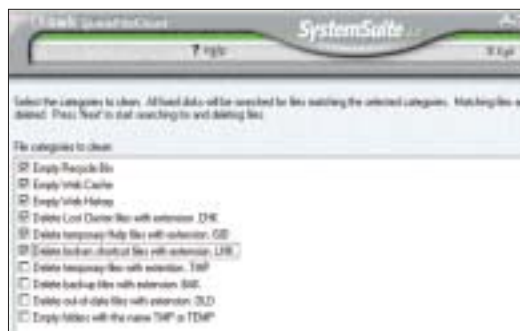
Applications that do not have their own un-installers can be removed using CleanSweep's Uninstall Wizard. Go to *Norton CleanSweep > Cleanup > Uninstall Wizard*, and you will see programs that do not have un-installers. Select the program to be removed, and click Next. You will get an option to back up the program that you are un-installing—in case you change your mind later and want the program back, complete with current settings. Select Yes, and choose the directory to back up to. You will be offered the option of manually choosing which files to delete—choose No, and click Next. The last screen will show you the total amount of data, in bytes, that will be deleted, and a list of the selected files—you can choose to keep certain files by deselecting them. Click OK to return to the main window, and Finish to uninstall the program.

Ontrack System Suite: In Ontrack System Suite, you can go to 'One Stop Solutions' and select Cleanup for a totally automated sweeping of the Registry,

Temporary Internet Files and other unnecessary files from your system. Click Next to see a log of the files cleaned. Click Done to close the window.

In the Cleanup section, you can manually select the files you want to remove— choose from Internet Cache, Internet History, Internet Cookies, ActiveX, Plug-ins and QuickFileClean. Click on QuickFileClean, and choose to empty the Recycle Bin and delete the Web Cache, Web History, Lost

Clusters, Temporary Help files and Broken Shortcut files. Clicking Next will start the scan, and later, you will get a report



Ontrack Quick Cleanup removes junk files, cookies and unnecessary files

of all files cleaned. Click Done to close the wizard and return to the main window. Similarly, run all the other wizards for a thorough cleaning.

Ontrack has its own in-built sub-applications, each performing a specific task. For example, the Uninstall module uninstalls applications, and other modules perform tasks as varied as moving programs to different folders, or even a different computer, backing up an application and archiving it. The archive feature creates a compressed backup of an application before un-installing it.

The first time you run the program, it will analyse your computer and your files to create a log of files linked to specific programs. Once



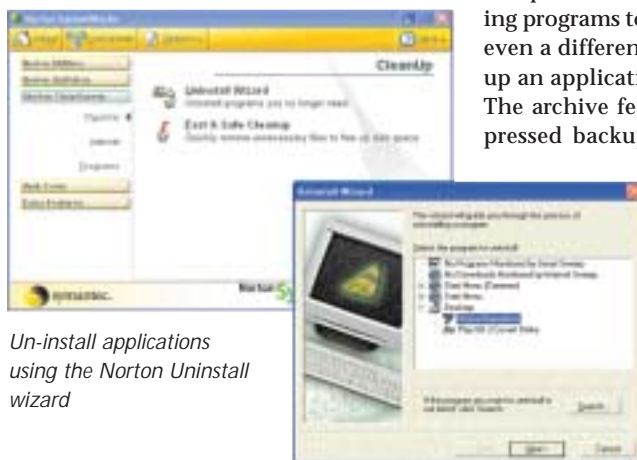
Use Ontrack Uninstall to remove applications safely, and easily

this is done, it will show you a list of programs, sorted by categories such as Desktop, Start Menu, Executables and Monitored. Clicking on a category scans all the files in its list, after which you can select a file or executable to be un-installed. It will run the program in the background, and find the related files and registry values. Then, it shows a screen containing a list of all the files pertaining to the application. Select the files to be removed, and click on Next. You will see an alert with SafeSelect enabled—this is a backup of all the files that are to be removed. Depending on whether you want to back up the

file or program, select or deselect this option, and press Next. Click Done when finished. Similarly, you can remove files from other categories.

In-house maintenance

The first thing you should do is create a swap file partition on any drive other

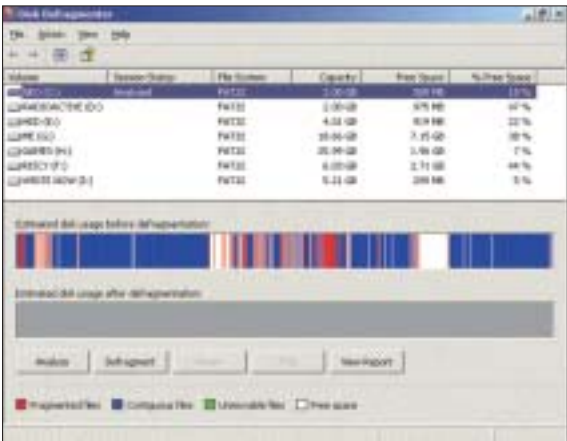


Un-install applications using the Norton Uninstall wizard



ScanDisk: The easiest way to keep your hard disk in good condition

than the one where Windows is installed. This way you will ensure better performance, and also not risk corrupting your hard drive. Back up your data on another hard disk—if you don't have one, use a friend's. ScanDisk: Before running Scandisk, close all other applications using their close commands—*File > Exit*—and not through End task in the Task Manager. Now, open My Computer, right-click on your C drive and select Properties. Go to *Tools > Check Now*, select 'Automatically fix file system errors' and 'Scan for and attempt recovery of bad sectors', and click Start. After ScanDisk is done checking the drive, reboot the PC and repeat the process for all your partitions and drives. In Windows XP, you will not be able to scan the Boot drive (the drive on which Windows is loaded), while Windows is running; instead you can schedule Error-checking for the next time the computer starts. Now reboot your computer, and let Scandisk run.



The Windows 2000 and XP Defragmenter shows a graphical chart of the files stored on your computer

Disabling Safety Sweep

Fast and Safe Cleanup does not clean files that it marks as yellow or red—files it thinks are important or cannot be deleted. So to remove these files, you will have to disable the Safety Sweep feature in CleanSweep by going to *Options > Norton CleanSweep* in Norton SystemWorks' main window. Set the Safety Sweep option to 'Off'.

Caution: Be careful when deleting files, as you may delete an important file such as a Windows system file, or a DLL file shared by an existing program.



Defragment your hard disk regularly with the help of Windows Defragmenter

Disk defragmenter: After running ScanDisk, you need to defragment your data. This makes your hard disk faster and more organised, and should ideally be done every 15 days. To start this utility, go to *Start > Programs > Accessories > System Tools > Disk Defragmenter*, select the drive that you want to defragment first, and click on Defragment. In Windows 98 or Me, set the utility to 'Rearrange files so my programs start faster' and 'Check the drive for errors', and set the 'I want to use these options' to 'Everytime I defragment my hard drive'. This is so that you won't have to choose each time you run Disk Defragmenter, whether you want it to arrange your frequently used programs at the beginning of the drive (where they can be accessed faster). In Windows 2000 or XP, you get the

option to Analyze or Defragment. Choose Analyze to see how fragmented the drive is, and you will be told whether defragmenting is required. If so, click Defragment to see a graphical representation of the Defragmentation process taking place. Do this for all your drives.

In-house maintenance Third-party hard disk managers are also available. Though heavy on your pocket, they do a more precise job



You can change a lot of settings in Norton Disk Doctor before defragmenting

of maintenance than Windows does. Norton Utilities: One of the most popular and precise applications is Norton Utilities. This suite does a perfect job of hard disk maintenance. The Suite features a module called Norton Disk Doctor that does a thorough job of correcting file errors. Install Norton Disk Doctor, and start it by going to *Start > Programs > Norton SystemWorks > Norton Utilities > Find and Fix Problems > Norton Disk Doctor*. Press Continue and a window, where you can see a list of installed drives or partitions, pops up. Select the drives you want to scan by checking the boxes next to them. Click on Options; in the dialog that pops up, select 'Enable Free Space testing', and click OK. Finally, select 'Fix Errors' in the main screen and press Diagnose to start checking your drives. Ontrack SystemSuite: Another utility that is widely used is the Ontrack SystemSuite. This suite is quite advanced and very user-friendly. It offers a wide range of features, such as DiskFixer that



Change Ontrack's options to control the way it scans your hard disk

scans the hard disk for any errors. Click on it to start the DiskFixer Wizard that will list all the drives available for scanning. Select the drives you want to scan, and at the bottom of the window, click on the Settings tab. Select all the tests and choose Duplicate under the Crosslinks option, and select Delete under the 'Lost Clusters' option. Select all the scans under Surface Scan, and click OK. Back in the main wizard screen, select 'Automatically fix errors without asking me', 'Save Undo Information' and 'Scan disk surface for read errors'—which helps by doing a more thorough physical test of your hard disk. This will take some time. Click Next to see the screen where the fixer shows a complete map of your hard disk while checking it. As the disk surface scan has been selected, the time taken will depend on your PC's configuration.

Speed Disk: Defragging using Speed Disk in Norton is quite easy. In Windows 98, start Speed Disk by going to *Start > Norton SystemWorks > Norton Utilities > Optimize Performance > Norton Speed Disk*. The first dialog box shows you a list of available drives. Select the drive which you want to



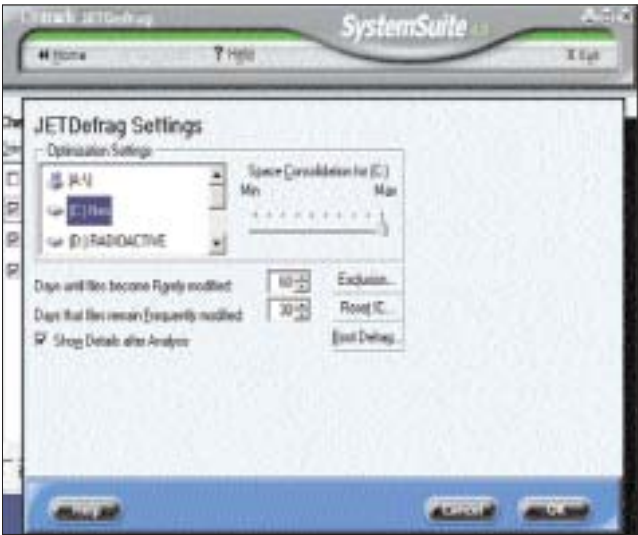
Sort files according to how often they are accessed, when defragmenting using Norton Speed disk

defragment, and click on Settings. Click on 'Optimize swap file' to defrag the swap file, if it is fragmented. You can also arrange files by the date they were created, accessed, used or file size. These options should be selected only if you know which files go where. You can also select specific files and files with wildcard characters. This results in a customised and efficient defragmentation process. You can use wildcards to specify the files Windows uses, and they will be arranged in the starting portion of the drive. This makes them accessible faster.

For Windows XP, there are no direct options for setting such criteria, but you can manually add the file-names you want by clicking on Drive Options. In the tabs

named Files First, File Last, Files at End and Unmovable Files, you can add the file-names with wildcards so as to place them accordingly. Clicking on Add Wildcard opens up a file where you can enter wildcard characters in filenames, or directly file extensions such as .exe, .dll, .hlp, etc. Under Add File, an Open File dialog opens asking for files to be added—you can select multiple files at once. Finally click OK and then Start, to begin defragmenting. You can do the same for other partitions as well, such as your Games partition, where you need maximum performance.

Ontrack JETDefrag: Ontrack advises you to use DiskFixer before using JETDefrag. This is to ensure that no errors occur during the defragmentation process. Click on OK, and select the drives you want to defrag. Select Analyze Drive at the bottom-left of the window to analyse the level of fragmentation of your drives. Click on Settings, and move the Space Consolidation slider to the Maximum end



Ontrack JETDefrag lets you sort files according to the minimum and maximum number of days since they were accessed

Info Never stop the defragmentation process once started. Even if the progress bar stops, do not shut down the computer. If there is no activity for 20 minutes, switch off the PC, but remember, files lost while doing this are irrecoverable.

of the slider. This will eliminate the slack space, and pack the files more tightly ensuring maximum defragmentation. Under 'Days until files become Rarely modified:' you can specify which least accessed

files will go—if you specify the number of days as 60, then the files not modified for 60 days will be considered as rarely used or modified—the higher the number of days, the more files will be placed at the end of the drive. In the option 'Days the files remain Frequently modified:', set the number of days specifying files that are frequently modified. These files will be placed at the start position

of the drive so as to hasten access to them. So the lower the number, the more recent files will be placed at the beginning of the drive. Click OK, and then click Next. In the Warning dialog box, click OK to start the defragmentation process. Do not open, or run anything while it is running. After it's over, press Done and close the main window. Shut down Windows, and leave it off to cool down from the heat produced by intense hard disk activity.

Always remember to perform these actions, no matter what utility you choose, as regularly as possible. Doing this every 10 to 15 days will prolong the life of your hard drive, and also make a noticeable difference in speeds and access times for your applications and games.

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License to



Linux gaming has for long been considered an oxymoron, but things change....

Linux! Say the word and you'll have most gamers running for cover. The truth is, gaming on Linux isn't as hard as most people think it is. In fact, there are even Linux LAN parties, mostly in the US and Europe of course. Here, we'll show you how to set up your favourite games on Linux.

The devil and the deep sea: Downloading installers

Most Linux installers, games or otherwise, are simple shell scripts that just have to be run at the command prompt to install software. These scripts are very complex beasts that can take care of every aspect of installing or un-installing, but the majority do not have a graphical interface—not really ideal for those used to 'Double-click > Next > Next > Next > Finish' installers.

To complicate things further, most browsers, Linux-based or not, cannot recognise the shell script as a program. After reading the first few lines of code, they decide that it's a text file instead. Even if you right-click and select 'Save as', the files are saved as HTML files. The only solution we could find was to use the 'mv' command, and rename them to the original filename later.

The frying pan to the fire: Prerequisites

Like any other operating system, Linux too needs to be configured properly before you venture into the world of games. Some prerequisites are well configured graphics and

cards, and installation of all the libraries (similar to DLLs in Windows), required to play a majority of the games. Luckily, most libraries required are already installed on your system; the

ones that are not, will be covered in this workshop. As far as the configuration of the graphics and sound cards are concerned, they vary from vendor to vendor, but a few broad steps are outlined here.

In Linux, all devices are represented as special files under the '/dev/' filesystem. The sound and video devices are no exception. The audio device is represented as '/dev/dsp', while the graphics device is represented as a frame-buffer device. The frame-buffer device is an abstraction layer that provides a simple interface to the capabilities of the graphics hardware.

Although generic sound drivers are provided with the Linux kernel, several enhanced drivers are also available that can be easily incorporated into the operating system. Another important prerequisite is 3D accelerated drivers. The majority of the new games will not work with generic Linux distribution drivers. The best solution is to download the drivers for your specific graphics card from the vendor's Web site. In the case of nVidia, the latest drivers (NVIDIA-Linux-x86-1.0-4496-pkg2.run) can be downloaded from www.nvidia.com. Now, run the script from the command prompt. This will install the drivers in the right locations. These drivers have to be installed from the command prompt, after shutting down the GUI (X server). After installing the driver, you'll have to make a few changes to the '/etc/X11/XF86Config' file. Open the file using any text editor, scroll to the section 'Device', and change the driver from 'nv' to 'nvidia'. Now, restart the X server using the command 'startx', or by rebooting into the Graphical mode.

If you have an ATi card, download the drivers from www.ati.com. These drivers are in rpm format, so use the 'rpm -ivh' command to install them.



A rock and a hard place: Setting up OpenGL

OpenGL is the primary requirement for playing 3D games on Linux, and usually comes pre-installed. If this isn't the case, you have the task of installing it. OpenGL comes in various flavours. One of the popular ones is the freely available Mesa3D variant, available at www.mesa3d.org, or at <http://mesa3d.sourceforge.net>. You need to download the tarball package of the latest version, and install it. There are two parts to download—MesaLib and MesaDemos—of which only MesaLib is required to play OpenGL games: MesaDemos only contains all the demos that come along with the Mesa library.

Untar it, and then run the following command:

```
./configure --prefix=/usr
```

For Redhat 8.0, 9.0 and Mandrake 9.1, the following command should be used:

```
export LDFLAGS="-lstdc++"
```

```
./configure --prefix=/usr
```

After this, use the following commands:

```
make
```

```
make check
```

```
make install
```

These steps will install the Mesa libraries to their required destinations. Do this carefully, as even small mistakes could lead to major errors during installation.

Mountains and molehills:

The games

There are many games available for Linux; here are some of the more popular ones, and the steps required to set them up.

Quake III

It's been quite a while since *Quake* was ported to Linux. It is also one of the few games with very few problems and extensive documentation. There's a very comprehensive 'How To' document on the Linux Documentation project Web page. Installation is simple—just download the rpm package,



Quake was one of the first popular games to be ported to Linux

The X Factor

Though Xbox is the gaming console from the Microsoft world, diehard Linux junkies have found a way to hack into it and install Linux. There is a very active project called the Xbox Linux project, which exists with the sole purpose of making a Linux distribution for the Xbox. So far the results have been pretty impressive.

Why would anybody want to install Linux on an Xbox, you ask? Put simply, an Xbox costs about \$179, and has a Pentium III 733 MHz processor with a signifi-

cantly superior graphics sub-system and loads of memory. It's the ideal solution to cheap Linux boxes! As for all those pretty games, Linux geeks have figured out a way to dual boot the Xbox, so you now have a cheap, stable and fast Linux box that can morph into a gaming monster at will. Another interesting point that diehard Linux fans make is the Xfactor: anything called 'X' is related to Linux or Unix, and so the Xbox should be renamed LinuXbox!

and use the `'rpm -ivh'` command to install it. This will create a `/usr/games/quake3` directory, and place all the base files there. All the commands will also be installed in the proper locations. Just type `'quake3'` at the command prompt to start the game.

TORCS

TORCS is one of the best OpenGL-based 3D racing simulation on Linux. Installing TORCS is slightly tricky. First download the TORCS-1.2.1-src.tgz package from www.torcs.org, or torcs.sourceforge.net. If you need opponents (robots) to play with, download the three robot packages (TORCS-1.2.1-src-robots-base.tgz, TORCS-1.2.1-src-robots-K1999.tgz and TORCS-1.2.1-src-robots-berniw.tgz). Now, untar all



TORCS is a pure Linux game, and one of the best racing games today

these packages, then `'cd'` to the `torcs-1.2.1` directory, type `'./configure'`, then `'make'`, and finally `'make install'`. This will compile the game and install it in `/usr/games/torcs`. Next, download all the data packages—TORCS-1.2.1-data.tgz, TORCS-1.2.1-data-tracks-base.tgz, TORCS-1.2.1-data-cars-extra.tgz, and TORCS-1.2.1-data-cars-Patwo-Design.tgz. You only need the first data package to play the game, but the other packages make the game more interesting. Copy the data packages (the .tgz files) to the `/usr/games/torcs` directory,

and untar them. After this the game is ready, and you can start playing it using the `'torcs'` command.

Unreal Tournament

It's been a long time since *Unreal*, too, was ported to Linux. The older *Unreal* demos are available for download from www.unrealtournament.com. The download file, `utde-`



Once you install UT2003, just pop in your UT2003 CD to play the game

`mo-linux-x86-348.tar.gz`, is not source code, so just untar it into the `/usr/games` directory—no need to compile.

For UT2003, just download the installer script from www.ut2003.com and run the script with the game CD in the CD-ROM drive. You'll have to mount the CD and run the 'give execute rights' for the CD using `'chmod'`, to play the game.

Nuclear chess

Nuclear chess is a chess variant that is great fun, whether you can play chess or not. In this game, when one piece captures another, both pieces as well as the neighbouring pieces are lost, making each game short and loads of fun.

Installing nuclear chess is quite simple—just download `nuclearchess 0.9.2.tar.gz` from www.linux-games.com, untar it, and compile the source code.

Sin

Sin is a traditional first person shooter centred around rescuing a group of hostages. Installation-wise, this game was one of the simplest—just run the ‘SineDemo_x86.run’ script at the command prompt. This creates a directory called ‘SinDemo’ in the current directory. Change to this directory, and then start the command by typing ‘Sin’ at the command prompt.

America’s Army

America’s Army is developed by the US army, and is based on the Unreal engine. It has a graphical installation utility—just download armyops-lnx-1702.sh.bin from www.americasarmy.com; this is the installer script that invokes the installer GUI. To run the script, open a terminal window with ‘xterm’, ‘cd’ to the directory containing the script and type ‘./armyops-lnx-1702.sh.bin’ at the command prompt. If



The graphical install utility for America’s Army is similar to installing games in Windows

the downloaded file does not have executable rights, you will have to manually set it using the command ‘chmod a+x armyops-lnx-1702.sh.bin’.

Asteroids3D

Asteroids3D is the OpenGL implementation of the popular 2D asteroids game you find on every Linux system. Just download the compressed tarball from the Web site, and compile it using the ‘make’ command. The prerequisite for this game is that OpenGL should be installed on your system. Moreover, it must be installed at the default location (/usr/local/openssl), if you want ‘make’ to work. Otherwise, you’ll have to edit the Makefile that comes along with the source code. Open the Makefile in a text editor and edit the lines starting with ‘INC’ and ‘LIB’—the ‘INC’ stands for ‘Include’, and specifies the location of the OpenGL files to be included; the ‘LIB’ stands for ‘Libraries’, and specifies the location of the OpenGL libraries. Modify the ‘INC’ section from

```
‘INC=-I/usr/X11R6/include -I/usr/
local/openssl/include’
to
‘INC=-I/usr/X11R6/include -I/your_
opengl_directory_path/include’
Modify the ‘LIB’ section from
‘LIB=-lglut -lGLU -lGL -lX -lX11 -lXext -
lXmu -lXi -lpthread -L/usr/X11R6/lib -
L/usr/local/openssl/lib’
to
‘LIB=-lglut -lGLU -lGL -lX -lX11 -lXext -
lXmu -lXi -lpthread -L/usr/X11R6/lib -L/
your_opengl_directory_path/lib’
```

The handwriting on the wall

Gaming on Linux is currently not the hottest trend, and the available games are primitive and unsophisticated

Old warhorses

Some games have been available on Linux for ages, and still are. These are the Solitaires of the Linux world, but obviously with the Linux twist—they are more difficult than their Windows counterparts. These include games such as Sokoban, Xboing, Asteroids, etc.

Xboing is a breakout game that is quite popular. It’s got lots of extra features, such as bullets that not only blow up the bricks, but also the ball used to break the bricks. Then there’s the occasional skeleton that eats up the balls, and the paddle shrinking powers, as well as some troublesome features such as disappearing walls—you can’t bounce off the walls, and end up running all over the place to get a few points.

Sokoban is a real brain teaser. In this game, you have to move diamonds around from their initial position to the



Play your favourite classic games in Linux

final highlighted spots. Easier said than done, though—even the basic levels can be taxing at times.

compared to their Windows counterparts. Installing and configuring them is also more complicated. But all said and done, gaming on Linux definitely seems to be going along the right direction. It’s only a matter of time before all this catches up and reaches the level currently available on Windows. All the libraries are in place and driver support from vendors is also being improved. The only thing remaining is game developers getting serious about Linux, and considering it a viable platform to leverage their skills. That, too, seems to be getting better by the day. Commercial gaming companies might take a while to warm up to Linux, since numbers are really important to them, and selling games for Linux will be profitable only if there are enough Linux users. With the increasing refinement of Linux, and its consequent adoption, gaming on Linux should be something to look out for in the near future. ■

PRAVEEN KURUP

praveen_kurup@thinkdigit.com

Vroom, Vroom, Whoosh, Zing, Crash, Kaboom!

Environmental audio is used by game developers to give those amazing effects that are produced when a car whizzes past you in a car race, or if a rocket passes by in a first person shooter. To generate these effects, programmers use various specialized audio APIs (Application Programming Interfaces), which provide an easy and uniform way of interfacing with the sound card. For example, these APIs provide simple functions to create the effects of attenuation of sound with distance, or implementing the Doppler effect, based on the relative velocities of the source and the tar-

get. Some of the popular APIs available on Windows are Direct Audio (part of the DirectX suite), EAX, A3D and OpenAL. Of these, OpenAL has been successfully ported to Linux, and is currently used by many games to achieve environmental audio effects. Currently, OpenAL is available for download from Creative but not via HTTP or FTP; you have to login to a CVS repository (the place where they keep all the source code), and download the source code. Most of you will be saved the hassle, though, as almost all Linux distributions come bundled with OpenAL.



Weird resolutions, truant system files, the dreaded Blue Screen, Linux problems, whatever your problems, chances are they'll be answered here...

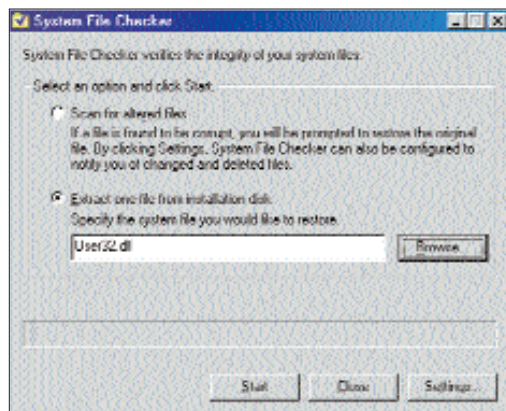
Missing system files

Q. I get the following error message when running the demo version of *SuperBike 2000* on my Windows 98 SE system: 'Error starting program: The IMM32.DLL file is linked to missing export USER32.DLL: User32InitializeImmEntry Table. A device attached to the system is not functioning'. Please help me.

Saktidip

A A corrupt or missing instance of the files you've mentioned might be playing spoilsport! Replace them using the 'System File Checker'. Click on *Start* > *Run*, type 'sfc' and press [Enter].

Choose 'Extract one file from installation disk', type 'C:\windows\system\user32.dll' and click Start to begin the process.



System file integrity checker in Windows 98

You'll need the original Windows 98 CD, or the location of the CAB files from where you installed the operating system.

Repeat the procedure for imm32.dll, which is also located in the Windows System folder. If that doesn't work, try uninstalling and then re-installing the game.

Trouble with monitor resolution

Q. I have a Pentium 4 1.8 GHz PC with 512 MB DDR RAM, an nVidia GeForce4 440MX graphics card and a 14-inch Samsung Samtron 45Bn monitor running Windows XP Home Edition. Whenever I try playing *Warcraft III Reign of Chaos*, the startup video runs smoothly, but when the game begins, the monitor goes blank, its power LED starts flashing and I can only get sound. It returns to Windows normally when I press [Ctrl] + [Alt] + [Del]. I tried changing the resolution and refresh rate of the monitor, but that didn't help. Help!

Girish Joshi

A The monitor blanks out because the game switches to a resolution and a refresh rate that it does not support. You'll need to reinstall the game, and set its resolution to a lower value. Also, set your desktop resolution to a low value, say, 800 x 600 x 16, before you run the game.

While you're at it, upgrade your

graphics card drivers, and install the latest version of DirectX from www.microsoft.com/directx.

Deadly blue screens

Q. I have an AMD Athlon XP 2400+, 512 MB DDR RAM, a Radeon graphics card and an Asus A7V8X motherboard running Windows XP Professional. The problem is that whenever I play a game, I get a blue screen error asking me to disable cache and shadowing, or remove any recently installed software or hardware. Also, does my motherboard have any compatibility issues with my graphics card as far as the supported AGP voltage is concerned?

Sachin Siva

A Boot the system and press [Del] to enter the BIOS. Here, go to the Advanced Settings option—you will find an option to disable video cache and shadowing. Also, you can try lowering the AGP Aperture size to the minimum (generally 4 MB) and the AGP speed from 8X to 4X or 2X.

As for incompatibility in terms of voltages, your PC wouldn't boot if there was one! So relax, Sachin, your system is fine.

What is System Zone2?

Q. I have a Pentium 4 2.4 GHz processor on an Intel 865GBF motherboard. I get a message from Intel Active Monitor while playing games such as *Need for*



Speed 2 or Project IGI, stating that System Zone2 has exceeded its temperature limit. What is System Zone2 and how do I solve the problem?

Ashish Yadav

System Zones refer to specific areas on your motherboard where important chips are located. System Zone1 refers to the area near the PCI expansion slot, and System Zone2 refers to the area where the system RAM is located. The error message occurs if the warning temperature for the Active Monitor program has been set too low for your system. You need not worry as long as your PC doesn't crash after playing games. Simply set the warning temperature a little higher in the monitor program.

3D device missing

I have an nVidia Riva TNT2 graphics card on my Pentium 4 1.5 GHz system with 128 MB SDRAM running Windows XP. I can play *Cricket 2002* and *Fifa 2000* properly on my system. However, ever since I changed my cabinet's position, all my games showed up error message saying that they required graphics acceleration. Also, though the Device Manager lists the graphics card, it does not show up in the 3dsetup of the games. Installing the latest drivers did not help. What do I do now?

Rakesh Khan

Looks like you will have to go in for a clean install of your graphics drivers. First un-install them from *Start > Settings > Control Panel > Add/Remove Programs*, reboot your PC, and when Windows prompts you, select your card type as 'Standard VGA'.

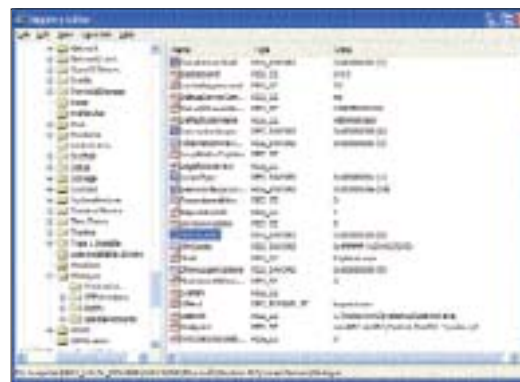
Now, restart the system, install the latest drivers and reboot. Next, install the latest version of DirectX and reboot your system one last time.

Since you've changed the location of your unit, there's a possibility that the jerks it experienced might have loosened a card or two. So, check the RAM sticks and AGP card to make sure they're seated firmly.

Turning off Windows file protection

I have a PC running Windows XP Professional. Instead of using Style XP, I replaced Windows uxtheme.dll and also the system32.dll.

When I rebooted my computer, a Windows file protection error message appeared, stating that certain files that were required to run Windows properly had been replaced and needed to be restored. Thereafter, it asked for the Windows XP installation CD. I cancelled the message and ever since then, I get the same error whenever I reboot my



You can turn off File Protection by editing the registry

PC, or try to access the CD-ROM drive. Sigh... Do I have to live with it all my life?

David Lalsama

No David, you don't. The best option here is to load the Windows XP installation CD when prompted, and allow Windows to restore the missing files. Of course, you can also disable Windows File Protection—the system that prevent users from deleting system and program files by editing a registry value. Be very careful when you do this.

Go to *Start > Run* and type 'regedit', navigate to the SFCDisable key in 'HKEY_LOCAL_MACHINE\SOFTWARE\Microsoft\Windows NT\CurrentVersion\Winlogon' and edit it to hold the value '0xFFFFFFFF'. If you want to re-enable File Protection, just reset this value to '0'.

Installing Windows 2000 Professional

I am unable to install Windows 2000 Professional in MS-DOS mode. I had to install Windows 98 SE first, and then upgrade it to Windows 2000 Professional. Is there a way to install Windows 2000 Professional without having to follow this procedure?

Amey

Yes, there is. You can install it directly using a bootable Windows 2000 CD. To change the boot sequence, re-start your PC and press [Del] ([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 2000 CD. The setup should start automatically.

If you do not have a bootable Windows 2000 CD, you can still install it using a bootable Windows 98 CD. First, boot into MS-DOS using the Windows 98 CD. Next, swap the Windows 98 CD with

Incorrect temperature readings

I have a Pentium 4-based PC with an Intel D850GB motherboard. During normal operation, Intel Active Monitor shows the 65 C - 66 C temperature in System Zone1 whereas the safe temperature indicated is 50 C. What needs to be done to reduce the temperature? I have an ATX cabinet and I have an additional fan installed next to the SMPS but apparently, it does not circulate much air.

Murli



ILLUSTRATIONS: Mahesh Benkar

You are facing this problem because of the older BIOS that provides incorrect information to the Intel Active Monitor. You need not worry about your system being overheated unless the system shows any

odd behaviour, such as frequent system crashes. Update your BIOS from the Intel Web site (www.intel.com), and the problem should be solved.

As for keeping the system cool, just ensure that you are using a good-quality

SMPS such as Antec, and always opt for a large and roomy cabinet.

Check the orientation of the installed fan.

One fan should expel hot air from the case, while the other draws in air from the outside. If both the fans drive air in

the same direction, it'll actually increase the internal temperature. Clear the airflow path of the processor fan by securing the IDE and power cables with a rubber band or string.

your non-bootable Windows 2000 CD and then type 'drive: \i386\winnt.exe' at the prompt. This starts off the installation in MS-DOS mode.

Retrieving Linux partition

Q I have a PIII 933 MHz system with 128 MB RAM and a 20 GB hard disk. I have two Windows partitions and one Linux partition. I run Windows XP and Mandrake 8.1, and the dual boot system worked fine. However, the boot option disappeared when I installed Windows 98 on the Windows partition, and the Linux partition is inaccessible. How can I boot into Linux and retrieve my Linux partition?

Arindam Sarkar

A The Windows 98 installation flushed the Master Boot Record, and hence you lost the boot loader (LILO or GRUB) that was installed by Mandrake 8.1. There are a number of ways to restore the boot loader.

One of them is to use a utility called LOADLIN that is present in the Linux CD under the DOS utilities folder. Copy this utility into a folder called, say, LOADLIN in the C drive. Next, boot to Windows 98 in MS-DOS mode and type 'C:\LOADLIN> LOADLIN vmlinuz /dev/hdb1 ro' at the command prompt. Here 'vmlinuz' is the Linux kernel image that's located in the DOS utilities folder of the Linux CD and '/dev/hdb1' is the location of your Linux partition. The kernel should be available in the same directory as that of LOADLIN. This loads the Linux operating system, and then type 'LILO' when you get to the Linux command prompt.

If this does not fix it, do a minimal install of Mandrake 8.1 using the installation CD. Here, choose to upgrade when you get the install options, but don't select any files for upgrading. This way, the setup installs the boot loader and the whole installation finishes in about 10 minutes.

CPU cooler for AMD

Q I own a Compaq Presario S3010IL PC that has an AMD XP 2000+ processor. SiSandra2003 reports that my CPU fan is spinning at 981 rpm only, and the system fan speed is 1,850 rpm. I verified this with the BIOS information, and found them to be the same and that's the reason why the system becomes hot after a few minutes of operation. I would like to know the recommended fan speed for the AMD Athlon XP 2000+.

Devasish

AMD overclocking.

Q I just upgraded my PC to an AMD AthlonXP 2000+, Asus Nforce motherboard and a 40 GB hard disk. I heard that the Athlon XP2000+ can be safely overclocked up to 2 GHz.

How do I do that?

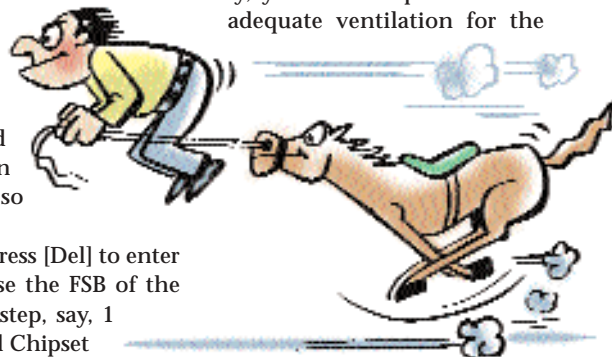
Girish Kulkarni

A AMD processors can be overclocked easily, but do bear in mind that doing so reduces their life.

Start the system, press [Del] to enter the BIOS and increase the FSB of the processor by a small step, say, 1 MHz in the Advanced Chipset features. At the same time, also increase the memory speed in the same way. Keep doing this until you have a stable system. Frequent crashes after tweaking the system indicate that it has been overclocked above limits. You will have to decrease the above-mentioned FSB speed.

You also need to have some of the

following accessories to ensure that you don't blow up the processor. The first and foremost is a quality heat sink and fan combination—ideally, a copper heat sink with a high-rpm fan on it. Secondly, you need a spacious cabinet with adequate ventilation for the



circulating air to bring down the temperature within the cabinet.

As said earlier, overclocking tends to reduce the life span of all the components and it also makes your warranty void. Indeed it's risky; so don't do anything unless you know what it is you intend doing.

A SiSoft Sandra does not measure the fan speed; it just takes the data available from the BIOS and displays it. Also, the BIOS is often incorrect in measuring the actual fan speed, temperature, etc. Hence, you cannot take its word for the spinning speed.

Open the chassis and check the speed of the fan. As a thumb rule, if you can make out or read the name written on the fan, then, yes, it's slow. However, if it's blurred out and the green AMD logo looks white, then the fan is running at the right speed. It is just the BIOS that is reporting the wrong speed, for which you can ask Compaq support to provide you with an updated BIOS. The recommended fan speed for the Athlon XP is approximately 5000 rpm and it is always good to go for a faster one, say the Volcano series from Thermaltake.

Can't delete from floppy

Q While formatting a floppy, I received a message that it was already formatted. However, it would not let me store a 500 KB file on it saying that the drive was full and I needed to insert another floppy. I did so and the error appeared yet again. So, I tried deleting the files, but even that did not happen. I bought a

new floppy drive and installed a new cable, but it was of no use. However, the disk worked fine on my friend's computer. I think the motherboard has some defect and needs to be replaced. Also, are there any IDE cables that work with floppy drives?

Akash Chhibber

A Akash, had there been a problem with your motherboard, the floppy drive would not have turned up in Windows Explorer. Since you can see it there, nothing is wrong with the board. Check the 'Standard Setup' in the BIOS settings to see if the floppy disk type is set to '1.44 MB'. Also, the 'Floppy Disk Controller' in the 'Integrated Peripherals' menu should be set to 'Enabled'. In 'Advanced BIOS Setup', set 'Boot up floppy seek' to 'Enabled'. This forces the BIOS to check for a working drive every time it boots.

Try deleting the contents of the floppy, by getting into DOS mode and typing 'a: DEL *.*' at the prompt, or format it in the DOS mode using 'format a:'.

Floppy drives use their own connectors and cables. They do not use an IDE interface and consequently, do not work with an IDE cable.

FAQs

Sound problem with games

Q I have a P-III 1 GHz, 128 MB RAM and a KOB 815etfsx Mercury motherboard. I use Windows 98 as well as Windows XP. My problem is that whenever I play 3D games, sound becomes scratchy and later it just stops sounding right.

I have to restart my PC to rectify this. Is there a solution?

Harpreet Singh

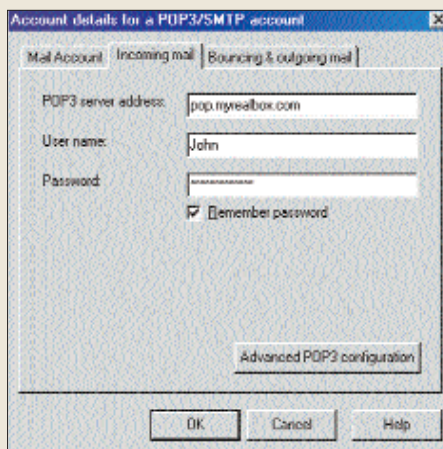
A Since you haven't mentioned which 3D games you run, we assume the problem occurs in all of them. Scratchy sound is usually a result of outdated or corrupt sound drivers. Update them to the latest available version. You'll need to refer to your manual to figure out the codec you've installed, in case you're using the onboard sound. You could also download and install DirectX 9.0b from Microsoft's Web site (www.microsoft.com/directx).

Configuring MailWasher 2.0

Q I have a problem related to MailWasher 2.0.40 beta. During the installation process, it gave me a message stating that I should give the address of the SMTP and POP server. How do I do that?

Pratyesh Somani

A It is a must to enter the addresses for the incoming (POP) and outgoing (SMTP) mail servers, else



Configuring MailWasher 2.0

MailWasher won't filter out the spam messages. Obtain them from your e-mail client settings. In the case of Outlook Express, go to **Tools > Accounts**. Here, select the account name, click **Properties** and go to the **Servers** tab to get the above-mentioned addresses.

Playing trailer videos

Q I have a Pentium 4 with 128 MB RAM and a 32 MB S3 Savage4 graphics card, running Windows Me and Windows XP Professional. The trailers of games and films on Digit CDs do not play on either Windows ME and Windows XP.

Also, I am unable to play games such as Quake III ever since I installed DirectX 9 drivers on Windows Me.

Malkeet Singh

A Most of the trailers provided on the Digit CDs are in DivX format so as to reduce the file size while maintaining video quality. You need to install the DivX codec, which is on the Mindware Digit CD, to play these files.



The Divx video encoder

Download the latest drivers available for Savage4 from www.s3graphics.com for Windows Me. If this does not fix it, revert to the older version of DirectX using System Restore. Go to **Start > Programs > Accessories > System Restore**. Select a restore point prior to installing DirectX 9 from the list. This restores your system to the previous DirectX configuration.

RPC error

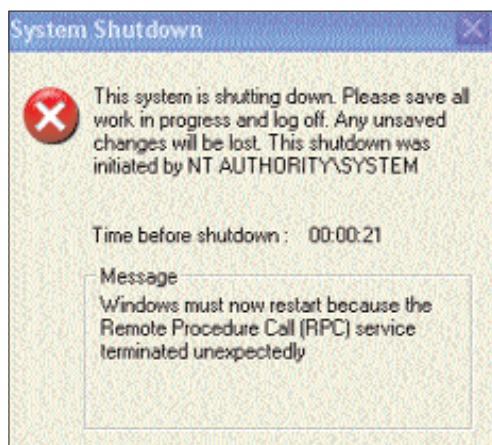
Q I use Windows XP Professional. While working, I get a Remote Procedure Call (RPC) error and my PC starts a shutdown procedure by showing a countdown of 1 minute, after which it actually restarts! This happens quite often. Help needed, sincerely!

Kalpesh Gajjar

A Yikes! It's the win32.Blaster worm that's infected your system. Here's how you manually remove this worm from your system. Press **[Ctrl] + [Alt] + [Del]** to bring up the Task Manager and remove any currently running instance of msblast.exe.

Enable the Internet Connection Firewall in Windows XP. Go to **Control Panel > Network Connections**,

right-click your Internet connection and select **Properties**. In the **Advanced** tab, under **Internet Connection Firewall**,



This is the error message that MSBlaster brings up

check 'Protect my computer and network by limiting or preventing access to this computer from the Internet' to enable the firewall. Now, apply the security patch available for this worm at the Microsoft Web site.

A detailed description about the worm, its solution and update is available at <http://support.microsoft.com/default.aspx?scid=/directory/worldwide/ja/kb/light/t009/7/02.asp>.



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tips & tricks

ILLUSTRATOR: Mahesh Benkar



If gaming's your thing, here comes a collection of tips to get the best gaming rig ever. Right from hardware and software issues, to tweaking and extracting that extra from your graphics cards, this is the place to park your rig and get to work

Power Tweaks

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XP LOVIN'



Prevention is better than cure

Make sure you back up all your data before you attempt to change anything—this could save you a lot of time and hair later. Create a System Restore Point by going to *Start > Programs > Accessories > System Tools > System Restore*, click 'Create a restore point' and then click Next. Now, name the restore point, and the date and time will be automatically added. Finally, click Create. Also, remember to backup your registry. Go to *Start > Run*, type 'regedit' and press [Enter]. Go to *My Computer > File > Export*, and select 'All' in the 'Export Range' area at the bottom, choose a directory and file name, and click Save.

Boot-up time

Use the Welcome screen for logging in, as it enables faster boot ups. Disable Fast User Switching, and if you have only one user account on

your PC, leave your password blank. Now you won't be asked for your password every time you boot, thus reducing your booting time.

If you have multiple accounts on your computer, go to *Start > Run*, type 'control userpasswords2' and press [Enter]. Clear the checkbox that says 'Users must enter a username and password to use this computer'. Now, go to Advanced tab and click



Decrease the bootup time by disabling password entry by users

Advanced. Click the Users folder, and right-click the 'HelpAssistant' account. Choose Properties, and make sure the 'User cannot change password', 'Password never expires' and 'Account is disabled' checkboxes are checked. This is necessary for security purposes.

Healthy hard drives

Go to Windows Explorer, right-click your hard drive and choose Properties. Clear the checkbox that says "Compress drive to save disk space". Also, clear 'Allow Indexing Service to index this disk for fast file searching'—this relates to the Indexing Service, which indexes your files to reduce the time needed to search the hard drive for a specific file. If you disable it, normal performance becomes better. In the subsequent dialog box choose 'Apply changes to [Drive letter]:\, subfolders and files' and click OK. This will improve the performance of your hard drive.

For optimum performance, it is necessary to ensure that your hard drives are error-free. For this, scan your hard drives and defragment them regularly. Right-click on your drive letter in Windows Explorer, go to Tools and click 'Run Now...' or 'Defragment Now'. You can also use Diskkeeper, which is faster and more powerful, to Defragment your drives.

To increase the per-

formance of the disk drives, press [Windows] + [Pause/Break] to bring up the System Properties dialog box. Click on Hardware, and then Device Manager. Now click the '+' sign next to Disk drives to expand it, and double-click the disk name to bring up the Properties box. Click on the Policies tab, and select 'Optimize for Performance', check the 'Enable Write Caching on the disk' checkbox and click OK. Now under 'IDE ATA/ATAPI Controllers', double-click on 'Primary IDE Channel', go to Advanced Settings and check 'DMA if Available'. Do this for all the IDE channels.

Looks or power?

Open the System Properties by pressing [Windows] + [Pause/Break], go to the Advanced tab and click on the Settings button under Performance. Click 'Adjust for Best performance'—this turns off all the bells and whistles, sets the theme to classic Windows and improves performance tremendously, especially in low-end systems. Now, click on the Advanced tab and click Change in the Virtual memory area. For optimum performance of your computer, it is necessary to set the virtual memory size correctly, depending upon the amount of RAM installed. It's better to have a dedicated partition for the paging file, rather than using the system partition. Make sure that Virtual Memory is around 1.5 times the RAM, or higher if you use



Set the same initial and maximum Virtual Memory size for better performance

memory-intensive games and applications. Make sure the initial and maximum sizes are the same—if Windows has to increase the paging file size, the performance gain is lost. For more information on Virtual Memory, visit <http://aumha.org/win5/a/xpvm.php>.

Fine tuning

Go to *Start > Run*, type 'msconfig' and press [Enter] to open the System Configuration Utility. In the Start Up tab, uncheck programs that you don't want to load at start up. If you're not sure about an entry, leave it unchanged. Finally, click OK and restart your PC. Now, go to *Start > Run*, type 'gpedit.msc' and press [Enter] to open Group Policy Editor. This is applicable only for Windows XP Professional. Enable the following policies:

User Configuration > Administrative Templates > Windows Components > Windows Explorer > Remove CD Burning Features
User Configuration > Adminis-

trative Templates > Windows Components > Windows Explorer > Remove Shared Documents from My Computer

Computer Configuration > Administrative Templates > System > Remove boot / Shutdown / Logon / Logoff messages

User Configuration > Administrative Templates > Start Menu and Taskbar > Turn off user tracking

Computer Configuration > Administrative Templates > System > Turn off Autoplay

Computer Configuration > Administrative Templates > Windows Components > Internet Explorer > Disable Showing the Splash Screen

Computer Configuration > Administrative Templates > Windows Components > Windows Messenger (Enable both items)

User configuration > Administrative Templates > Desktop > Remove My Documents icon from Desktop

Tuning the registry

Though editing the registry can give you power, it can damage your operating system as well. Always backup up your registry before editing it. Once you've taken a backup, open the registry editor—go to *Start > Run*, type 'regedit' and press [Enter]. To improve the shutdown and restart process, navigate to *HKEY_CURRENT_USER\Control Panel\Desktop*, and edit the following entries:

'HungAppTimeout=4000', 'WaitToKillAppTimeout=4000', 'MenuShowDelay=20' and

'AutoEndTasks=1'. Here, 1000 means 1 second.

Now, navigate to 'HKEY_LOCAL_MACHINE\SYSTEM\CurrentControlSet\Control\Session Manager\Memory Management\PrefetchParameters' and change the value of 'EnablePrefetcher' to 5.

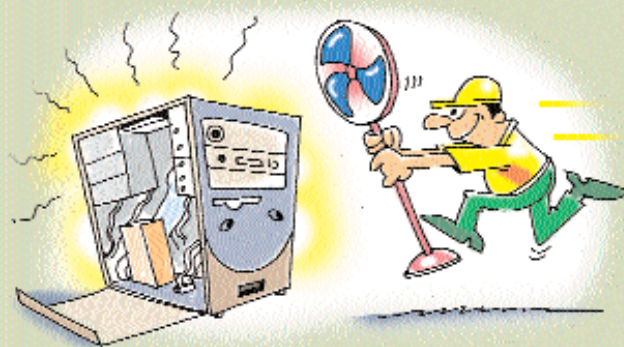
To remove the Outlook Express splash screen, go to 'HKEY_CURRENT_USER\Identities\{Unique Identity}\Software\Microsoft\Outlook Express\5.0', create a new DWORD value named 'NoSplash' and set its value to 1.

To disable Balloon tips, go to 'HKEY_CURRENT_USER\Software\Microsoft\Windows\CurrentVersion\Explorer\

Advanced', and create a DWORD value named 'EnableBalloonTips' and set it to 0.

To turn off the 'low disk space' notification, go to 'HKEY_LOCAL_MACHINE\SYSTEM\CurrentControlSet\Services\lanmanserver' and create a DWORD value named 'DiskSpaceThreshold' and set its value to between 0 and 99. This will denote the threshold free space in percentage, before the notification pops up. This is especially helpful when you have a partition that is almost full, but don't want to delete anything from it such as a swap partition with a fixed swap file.

UNDER THE HOOD



BIOS tweaks

On POST, press [Delete]—or [F2], depending on your BIOS—to enter the BIOS Setup utility. You can also use utilities such as TweakBIOS for this. Customise the following settings:

Disable 'Boot Up Floppy Seek'. Most newer systems don't require this.

Set the Boot Sequence to boot from the drive where Windows is installed.

Disable 'Video BIOS Shadow'.

Enable Shadow System BIOS—see if it increases performance for your system, otherwise disable it.

Disable 'Video BIOS Cacheable'—most new video



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cards do not need this.

Enable 'Video RAM Cacheable', only if you have older cards, Disable it for newer cards with more than 16 MB RAM.

Set '8 & 16 bit I/O Recovery Time' to 0 or N/A, if you do not use ISA cards.

Enable 'SDRAM Precharge Control' unless it causes problems with your system.

Set the CAS Latency Time to 2 for fastest performance. This sets the time delay before the SDRAM starts to carry out a read command.

Set the RAS-to-CAS Delay to 2T. This inserts a delay between the RAS (Row Address Strobe) and CAS (Column Address Strobe) signals.

Set the RAS Pre-charge Time to 2T. This is used to set the number of cycles for the RAS to store its charge before the memory refreshes.

Disable 'Memory Hole'.

Disable 'Passive Release'.

Disable 'Delayed Transaction'.

Choose PCI or AGP for 'Init Display First', as per your display card.

Set the KBC Input Clock to 16 MHz. This setting is related to the Super I/O chip.

The AGP Aperture size determines how much of your system RAM is shared with your graphics card, to help it function smoothly. Set it according to the amount of RAM on your system: If you have 128 MB or

more, set it to 64 MB or 32 MB. If you have less than 128 MB of RAM, set this to half or quarter the amount of RAM you have—if you have 96 MB, set this to 48 MB, or 24 MB, etc. Make sure you allot at least 16 MB to the graphics card.

Overclocking

Caution: Overclocking your CPU will void your warranty, and if done improperly, will shorten the life of your CPU, or even cause a burnout. If you still want to overclock, do so with extreme caution—do not push your CPU beyond a reasonable limit. Done properly, it can yield significant performance boosts.

If you have an Intel motherboard, chances are you cannot overclock your CPU, as Intel desktop motherboards are generally locked. On the other hand, the performance motherboards from Gigabyte and MSI let you tweak a little.

Before overclocking your CPU, you have to change the FSB. Increase the default

value from the BIOS in small increments, say from 133 to 135 or 140. Now, change the CPU ratio setting marginally. As all Intel CPUs are locked, this is only applicable to Athlon CPUs. Remember not to change the voltage settings, as it may cause overheating.

Fan please

Ideally, ensure that there are at least two fans within the cabinet. A fan in the front will suck fresh air into the case, while a fan behind will push out the warmer air. An SMPS with two fans will also help.

Cables, cables

Cables from the SMPS are quite often slack; wind up the excess length; if possible, tie up the power cables with string, anchoring them to the top of the cabinet.

Bunch data cables together using duct tape—or split flexible PVC tubing, and place the cables within it. Not only does this keep your cables tangle free, it also keeps them from collecting dust, as well as keeping your cabinet airy. Also, make sure that there are no cables directly above the CPU or graphics card fans.

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ATI TWEAKING



OpenGL settings

For optimal performance with the OpenGL API, flip across to the OpenGL tab. Under Main Settings, enable the Custom Settings option.

Under Custom settings, move the slider for the Anti-Aliasing settings to the extreme left, which in this case, is 2X. Select the Perfor-

mance option here, and set the Anisotropic Filtering slider to the least possible value. Similarly, set the Texture Preference, as well as the Mipmap Detail Level, to High Performance. You can choose to leave the Application Preference options for all the settings disabled. Finally, turn off the Vertical Sync option.



Change FSB first, before changing the CDP ratio



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Direct3D settings

The Direct3D settings menu is similar to that of the OpenGL settings. In the main settings, enable the Custom Settings option. Under Custom Settings, reduce Anti-Aliasing and Anisotropic Filtering to the least possible values, and



Use the Direct3D settings menu to fine tune your ATI graphics card

enable Performance instead of Quality. Adjust the Texture Preference and MipMap Detail levels to High Performance, and turn off Vertical Sync.

Advanced ATI Tweaks

To access some of the hidden features of the ATI Radeon cards, use PowerStrip. It will let you comprehensively tweak all standard and hidden features of your Radeon card.

Performance counts

PowerStrip resides in the System Tray. To access all the features, right-click on the icon, and choose from the

available options. The performance options are located by going to *Performance profiles > Configure*. From here, you can tweak the performance features of the Radeon without entering the Catalyst driver applet. Using PowerStrip, you can also tweak other settings, such as the ideal Colour and Display profiles.

Overclocking and pushing it

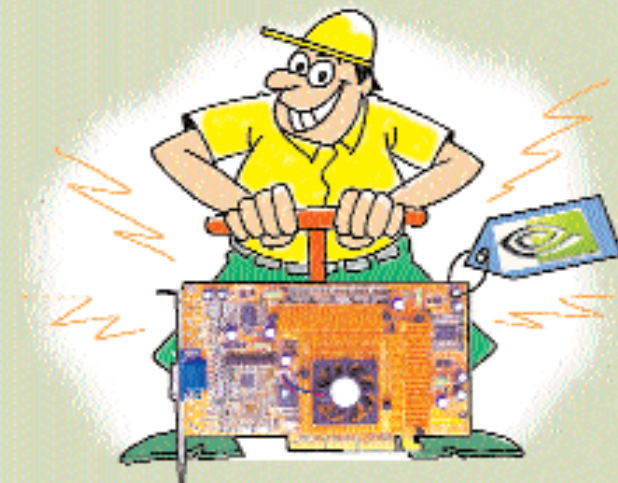
To obtain the best out of your card, you can overclock your GPU and graphics memory speed; but remember, doing so will void your warranty. Moreover, you may damage your card irreparably.

You can overclock your Radeon using PowerStrip; the standard ATI Catalyst driver interface will not let you tweak the GPU and memory speeds. This can be done by moving the sliders within the Clock controls section of the Performance profiles applet. If they appear to have been disabled, check and see if the 'Disable clock controls' option has been selected, and if so, deselect it. Overclocking will lead to a performance boost, but do it cautiously, in 5 MHz increments. Move both the Engine Clock and the Memory Clock speeds up by 5 MHz, and test the system to ensure that it's stable. Once you feel that you've got that additional punch in performance, leave the sliders in position.

Remember, too big an increment will damage your card irreparably. You can choose to save the setting as a performance profile for future

use. Watch out for excessive temperature increases; ensure that your cooling unit is working properly before attempting this.

nVidia TWEAKING



Performance

Under the Performance and Quality Settings option in the fold out menu, you can tweak the card for best performance. First, move the Image Settings slider to High Performance. After that, move the Anti-Aliasing slider to the left, to 'Anti-Aliasing - Off'. Similarly turn the Anisotropic Filtering to the Off position. After this, deselect the Texture Sharpening option.

Direct3D settings

Under the Performance and Quality Settings option, you can set the Performance and Compatibility options for the Direct3D API-based applications. Select 'Best Performance for Mipmap Detail Level', and leave the PCI Tex-

ture Memory Size at its default level. You may need to enable Fog table emulation if you see a plain white screen while playing a game.

OpenGL settings

This is located next to the Direct3D setting; set the 'Default Color Depth' to 16 bpp for good performance; remember that setting it to 32 bpp will result in a performance hit. Turn off Vertical Sync and disable Anisotropic Filtering.

Unlocking hidden features

To unlock the more subtle features within the Detonator drivers, use tools such as nVHardPage (<http://www.nvhardpage.com>). Run the utility. To get the hidden options,

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under the Tweaks tab, enable Activate Cool Bits, Activate Hardware options, Activate AGP Options and Activate Display Orientations. Depending on the nVidia card you have, you should see several new options activated within the Detonator driver, including Clock Frequencies, AGP Settings and Hardware Options.

Hardware options

Hardware Options will let you reset the AGP settings on your machine. The motherboard setting is automatically detected and you can manually set your AGP setting to the highest value supported by your motherboard and graphics card.

Overclocking your nVidia

Overclocking your nVidia card might give your gaming a performance boost, but again, this needs to be done with caution. Keep in mind that if you recklessly overclock, your graphics card might go kaput.

By default, the overclock-

ing options are not exposed within the nVidia driver, but if you have enabled the Activate Cool Bits option through nVHardPage, you can run up the clock frequencies of your GPU and graphics memory.

To do so, click on the Clock Frequencies option. Enable the 'Allow clock frequency adjustments' option. You may need to reboot to enable it. Once enabled, you can change the Core Clock Frequency, which controls the frequency of the GPU. The Memory Clock Frequency controls the speed of the graphics memory on the card. Ideally, increase the frequencies by a factor of 2 to 5 MHz at a time and test the settings. Raise the levels of the GPU speed, as well as the graphics memory, synchronously. Remember, don't move the sliders by ridiculous intervals—you will damage the card. A little overclocking, on the other hand, may give you just that little boost you crave for. Also, watch out for excessive heat—it might make sense to get additional cooling fans mounted within the case.

TNT and TNT2 cards

If you have a TNT or TNT 2-level card, this will be of interest to you. While a lot of new games may demand no less than a GeForce class card, the fact remains that with a slight tweak, you could still command the best

from your TNT card. You may have a little trouble with the very newest Detonator drivers, since these have optimizations for the latest cards, and may tax TNT. Be on the lookout for older, stable drivers, such as those in the 20-series family.

Setting the cards

Set the AGP aperture size to

half or quarter your system RAM size. Now, open the nVidia settings and make these changes: Set Mipmap Levels to 'Best Performance'. Enable 'Enable Fog Table Emulation', under the Direct 3D Settings tab. If you have a powerful CPU, choose 'Default Color Depth' as 'Always use 32 bpp', otherwise choose 16 bpp.

GAME TWEAKS



Quake III

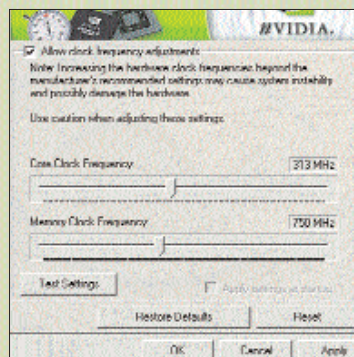
Advanced Tweaks

Simple tweaks can be set straight from within the game, and these commands should be entered at the console. The console is accessed by typing '~' during the game. To invoke the same settings every time, you could create a new document and enter all the desired settings. Then name it, say, custom.cfg. During game play, pull down the console and type '/exec custom.cfg' to load in your custom configuration file. You can also enter the settings into the q3config.cfg file, and invoke it automatically at

runtime. Make sure you precede each command setting with the word 'seta'.

The Gun: This command will allow you to toggle the gun display; for the best performance, turn off the gun display. Use `cg_drawGun 0` to turn it off, and `cg_drawGun 1` to turn it on.

Shelling hard: Though seeing the ejected shells popping out of your gun may feel realistic, it takes its toll on performance; to get the best, disable it by using `cg_brassTime 0` and `cg_brassTime 500` to turn it on. **Sixteen makes sense:** While you may be scoffing at run-



Overclock your nVidia card by dragging a few sliders, but be careful



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Turn off eye candy in Quake III to get higher frame rates

ning *Quake III* at 16-bit colour, keep in mind that swiching over to 32-bit rendering, though it's higher quality, will definitely give that frame rate drop. Optimal settings would be *r_colorbits 16* while going back to 32-bit would be *r_colorbits 32*. **Sky, no sky:** While all the dynamic sky effects and see-through portals look great, turning them off will yield much better performance. To set optimal performance use *r_fastsky 1*. To go back to eye candy, use *r_fastsky 0*

Pretty flashes: Weapons in *Quake III* come with some very realistic lighting and flare effects, but at the cost of performance. To turn it off, use *r_dynamicLight 0*. Turn it back on with *r_dynamicLight 1* **Curves cost more:** Turning off those pretty curves in *Quake III* could do wonders for performance. Do that by setting *r_nocurves 1*. If you want to get back to the curves, use *r_nocurves 0*

UT2003

Advanced tweaks

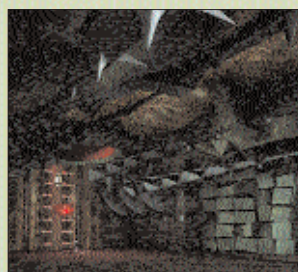
UT2003's main settings can be accessed from the *UT2003.ini* file located under the System folder of the

install. While all the simpler graphics tweaks can be set from within the settings menu, you can tweak this file to give that extra performance boost. Open the *UT2003.ini* file in any text editor to try out these tweaks. Before you start to edit the file, be sure to back it up, in case you want to restore the original settings. Scroll down the file and locate all these settings under [*D3DDrv.D3DRender Device*], unless mentioned otherwise. **Pre-caching textures:** Set '*UsePrecaching=False*' to disable loading of textures into video memory while loading the level, especially if you are using a graphics card with 32 MB of video memory. This should give you smoother gameplay. On the other hand, should you have a card with 64 MB or more, you can set this to True.

Trilinear texture filtering: Setting '*UseTrilinear=True*' will enable trilinear texture filtering, which will give you enhanced quality but you might suffer a performance hit on older cards. To turn it off, set it to False

Compressed lightmaps: If this is enabled, your loading times will increase, but you should see increased in-game performance. Enable it with '*UseCompressedLightmaps=True*'. On the other hand, if you happen to have a very high-end graphics card, such as one with 128 MB of video RAM or more, you can disable this to get more realistic, uncompressed lightmaps.

Minimum frames: Again,



Anti-Aliasing, Anisotropic Filtering turned off in UT2003

this one is recommended only if you happen to have

jumping frame rates and would like to stick to a defined value. Locate '*MinDesiredFrameRate= 35.000000*' under [*WinDrv.WindowsClient*]. As you can see, the default is 35 frames per second. Increase this to a value that you believe is sustainable for your system. *UT2003* will compensate by reducing eye candy through the game play, and try to maintain the frame rates around this number.

TWEAKING PDAS



Unlike mobile phones, PDAs are like mini-computers and can be tweaked to yield better performance. A PDA can be tweaked in two ways—overclocking and using a tweak utility. Everything is faster when a PDA is overclocked; unfortunately the battery drains quicker too. The other option is to use a tweaking utility that raises the CPU clock speed only when required—such as when playing a game—and lowers the clock when using less CPU intensive applications. This provides you with a device that is fast when you

need it, and the battery lasts longer too—unless you play games all day!

Caution: before playing with clock frequencies, make sure you know what you're doing, or else you might damage the CPU. Remember, overclocking increases CPU power and reduces battery life, while underclocking reduces CPU power and increases battery life. Also, be careful to make changes in small increments, and check the performance-to-stability ratio. Last but not least, always backup your data.

The utilities available depend on what CPU and



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At Your Service

You should turn off unwanted services. This frees up system resources, which the games can utilise.

STEP 1 Creating a Hardware Profile

Go to **Start > Control Panel > System**. In the Hardware tab, click the 'Hardware Profiles' button. You will see a profile named 'Profile 1(Current)' in the Available Hardware Profile list. Click the Copy button to copy this profile and name it 'Gaming', or any other convenient name. Don't make any further changes, and click OK twice to close the windows.

STEP 2 Disabling Services for Gaming

Go to **Start > Run**, type '*services.msc*' and press [Enter]. Disable all the services mentioned below by right-clicking and selecting **Properties > Log On > Disable**.

- Routing and Remote Access
- Alerter
- Application Layer Gateway Service
- Application Management
- Background Intelligent Transfer Service
- ClipBook
- COM+ System Application
- Computer Browser
- Distributed Link Tracking Client
- Distributed Transaction Coordinator
- Error Reporting Service
- Fast User Switching Compatibility Help and Support
- IMAPI CD-Burning COM Service
- Indexing Service
- Internet Connection Firewall (ICF) / Internet Connection Sharing (ICS)
- IPSEC Services
- Logical Disk Manager
- Administrative Service
- MS Software Shadow Copy Provider
- Net Logon
- NetMeeting Remote Desktop Sharing
- Network DDE
- Network DDE DSDM
- Network Location Awareness (NLA)
- NT LM Security Support Provider
- Performance Logs and Alerts
- Portable Media Serial Number
- Print Spooler
- Protected Storage
- QoS RSVP
- Routing and Remote Access
- Remote Desktop Help Session Manager
- Remote Procedure Call (RPC) Locator
- Remote Registry
- Removable Storage
- Secondary Logon
- Security Accounts Manager Server
- Smart Card
- Smart Card Helper
- SSDP Discovery Service
- System Restore Service
- TCP/IP NetBIOS Helper
- Task Scheduler
- Telnet
- Themes
- Uninterruptible Power Supply
- Universal Plug and Play Device Host
- Upload Manager
- Volume Shadow Copy
- Windows Image Acquisition (WIA)
- Windows Installer
- Windows Management Instrumentation Driver Extensions
- Wireless Zero Configuration
- WMI Performance Adapter
- Windows Time

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operating system your PDA runs. For example, in PDAs with Intel XScale processors and Palm OS, such as the Sony CLIE and Palm Tungsten, there is a utility called Lightspeed (<http://www.clievideo.com>). If you have a Pocket PC with an XScale processor running Windows CE, you can use Pocket Hack Master. It allows you to overclock your 400 MHz CPU to 500 MHz.

Pocket Hack Master has Turbo and Run modes, which tweak the memory and LCD multipliers to run accordingly. You can also set the SDRAM latency, refresh-rate or refresh-cycles. This pro-

gram also shows you running processes, threads, loaded DLLs, etc. One of the best features is the ability to set Scale



Use Pocket Hack Master to overclock your XScale-based Pocket PC

gram also shows you running processes, threads, loaded DLLs, etc. One of the best features is the ability to set Scale triggers for the CPU load—this basically increases the CPU speed when a particular load is reached. Download it from <http://download.com.com/3000-217810193651.html>.

Another utility for XScale processors is XCPUScaler (<http://www.immiersoft.com>). It allows you to dynamically scale the processor speed of Pocket PCs and Windows Mobile 2003. It allows for a change in speed of up to 50 per cent. A very useful feature of this application is Auto Scaling—it increases or decreases CPU power depending on how CPU-intensive the currently running

application is, thus increasing battery life.

iPaq 1910 users can use Clear Speed (<http://revolution.cx/speed/speed.htm>). This gives you the option of controlling the Pocket PC speeds and backlight, based on how much power is remaining in the batteries. Basically, when your battery is full, the CPU runs at full power, and as the batteries drain, the speed reduces—this increases battery life. iPaq users can also download the JS Overclock utility to squeeze every ounce of speed from their CPUs. Get it at <http://www.jimmysoftware.com/Software/Overclock>.



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Off the Shelf



Microsoft Flight Simulator 2004: A Century of Flight

Flights of Fancy

The developers of the game have gone to great lengths to recreate the look and feel of a real aircraft. It starts with a brief overview of some important controls and manoeuvres in the form of videos. Then you get a training lesson from an irritating instructor in a Cessna 172B. Once you've got that pilot's license, it's on to commercial jets.

The effects are sensational with a high level of realism. If you take off in a blizzard, and forget to de-ice your wings in the pre-flight check, prepare for sluggish handling and a difficult flight. Even airports and cities are well detailed, with realistic landmarks.



Gosh, they even placed a pilot in the cockpit. How cool is that!

You can choose to fly any plane made in the last 100 years, from the Kitty Hawk (the Wright brothers' first flying machine)

to ultra-modern super jets and even the Robinson R22 II helicopter. Unfortunately, planes made in Europe such as the Concorde and the Airbus A340 are omitted.

There are two single player modes: one where you go on historic flights, and another where you choose your plane, weather conditions, flight path, etc. Though you can play this game with a keyboard, a joystick is almost essential. This isn't a combat simulator, so unless you like circling an airport while others try their best to land or crash, the multi-player mode is pretty useless. Overall, it's only the price tag that kills the fun.

Genre: Simulation ■ **Developer:** Microsoft Game Studios ■ **Publisher:** Microsoft Game Studios ■ **Distributor:** Sujata Softech ■ **System Requirements:** 450 MHz CPU, 128 MB RAM, 1.8 GB disk space, DirectX 9 ■ **Price:** Rs 3,495 ■ **Web site:** www.microsoft.com/games/flightsimulator
Rating: ★★★★★



Rainbow Six 3: Raven Shield

Die another way

Another excellent team shooter! *Rainbow Six 3: Raven Shield* takes the art of squad-based tactical combat and bundles it with the Unreal engine. It starts with a briefing on a terrorist situation, and then you have to choose your men, the equipment they'll use, and go through a planning screen. You move slowly through the level, gauge the threat situation, locate the terrorists and be very very careful. Needless to say, you die a lot, as a single bullet kills and terrorists are trigger happy, both with you and the hostages.

There have been substantial improvements in the HUD and command system. The new Fluid Motion function allows you to take complete control of every movement—you don't have to peek com-



LET'S SEE NOW—Bad guy's dead, hostage is safe. Time to call it a day

pletely around a corner. Instead, you can gradually ease your head around it and

stay out of the enemy's firing line.

The AI has also been improved tremendously. The enemy is also more aggressive, and can respond to both sound and sight. Your team is also helped by the new AI—spin around and you'll see each member of your team pointing in different directions, like they should.

The only disappointment in the graphics are the vehicles; everything else is greatly improved. The sound is also great, except for the monotony of the accents. The biggest disappointment is the multi-player LAN restriction. Overall, it's a great game, and with the innumerable mods available online, there's never going to be a dull moment.

Courtesy SKOARI

Genre: Tactical Shooter ■ **Developer:** Red Storm Entertainment ■ **Publisher:** Ubi Soft Entertainment ■ **Distributor:** Milestone Interactive
System requirements: 800 MHz CPU, 256 MB RAM, 32 MB 3D video card ■ **Price:** Rs 920 ■ **Web site:** www.raven-shield.com
Rating: ★★★★★



Bioinformatics - A Beginner's Guide

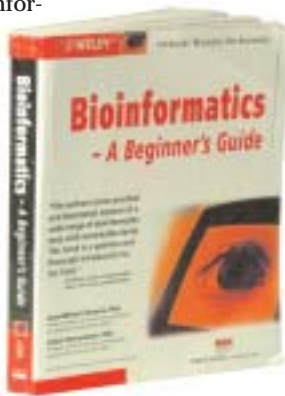
The DNA of simplicity

Man and the chimpanzee share about 96 per cent of their genetic material; the Human Genome Project generated 10 terabytes of data; Nascent Industry is already worth \$2.5 billion... These facts sum up Bioinformatics, an entirely new field that integrates molecular biology with mathematics and IT. It's a synergy of genomics, substitution matrices, progressive algorithms, Internet tools, computational methods, information storage and database analysis.

The Internet, with its endless amount of information, is an immensely powerful tool, but power is nothing without control—this book helps one

harness this awesome power and helps navigate through the plethora of information on bioinformatics.

This book is well researched and written by two of the world's leading Bio-gurus, Jean-Michel Claverie and Cedric Notredame.



It begins with an overview of the field and then guides you step-wise, through core applications such as the analysis of protein, DNA or RNA sequences, how to perform multiple tasks, finding a gene using various analysis tools, and how to explore different software programs and database collections. Though the book isn't exhaus-

tive, it's a boon for researchers and small and medium scale biometric firms without deep pockets—there are several free Web sites mentioned here. The authors steer us along using a bit of humour, and a lot of intensity and clarity.

Various software programs and database resources are demystified, and the authors provide tips and tricks to tweak these powerful tools to maximise performance. Popular programs such as Clustalw and BLAST, and databases such as Swiss-Port, have been used as examples.

An extremely useful feature are the listings—major databases, software programs and Resource Locations. This is a handy guide for the intrepid travellers into the world of RNA, DNA, genes, and millions and millions of Adenines, Cytosines, Guanines and Thymines.

Publisher: Wiley Publishing Inc ■ **Author:** Jean-Michel Claverie, Cedric Notredame ■ **Distributor:** Wiley Dreamtech India Pvt Ltd
Phone: 91-11-23260877/ 23270877 ■ **Fax:** 91-11-23275895 ■ **E-mail:** wdt@vsnl.net ■ **Web Site:** www.wileydreamtech.com ■ **Price:** Rs 269
Rating: ★★★★★



Linux Server Hacks

Hack that bird

The Linux operating system is capable of a lot, most of which is far from obvious. It is not uncommon for a less-experienced user to search the Web for hours before stumbling upon a rather obvious answer, which requires nothing more than the clever use of a few utilities. This is in contrast to the Windows world, in which everything is presented in the most easily available way possible. However, that is another religious debate.

Linux Server Hacks, by Rob Flickenger, is a classic O'Reilly publication—tiny, but packed with really useful content. The book describes itself as 'written for users who already understand the basics', which



is apt. If you're not completely comfortable with the command line, or if you think the MS-DOS Command Prompt is an expert utility for Windows administrators, you'll want to steer clear of this book.

Although there are some general tips here that would be of use to Linux power users, most are largely targeted at people who use Linux boxes as special-purpose servers. The eighth chapter is dedicated to 'Information Servers', which broadly covers tips for Apache, MySQL, FTP servers and BIND.

The Networking chapter shows you some clever things to do with IPChains,

IPTables and tunnelling. Of particular note for the subversive is a neat way around NAT, which is popularly used to grant controlled Internet access in office environments.

The book also has interesting exercises in the more mundane—taking backups, monitoring services, tracking file changes and so on. There's even a chapter on scripting which, unless you're fairly well-versed with Unix shell scripting, will seem like complete gibberish.

Overall, this is an indispensable book for the regular Unix administrator looking to speed up routing tasks or just looking to save time better spent goofing off. Home and novice desktop Linux users, please stay away for your own good. You have been warned.

Publisher: O'Reilly ■ **Author:** Rob Flickenger ■ **Distributor:** Shroff Publishers and Distributors
Phone: 000-2763 4290 ■ **Fax:** 000-2768 33 37 ■ **E-mail:** spd@vsnl.com ■ **Web Site:** www.oreilly.com ■ **Price:** Rs 299
Rating: ★★★★★

A Picture Speaks a Thousand Words

When most parents wanted their children to become doctors and engineers, children found a respectable art that involved science, and didn't starve you for the first 25 years of your career. This art-turned-profession also gave the male of the species a legitimate reason to look at the female of the species through a view-finder, and vice-versa. Now what have photographers got to do with Digit, you ask. We have two of the kind here in Jasubhai Digital Media, Mexy Xaviers and Jiten Gandhi. Photography for a technology magazine is not as glamorous as, say, for a lifestyle publication—the iMac being our definition of glamour! Jiten and Mexy accompany us on interviews and our events out of town and are never ones to miss a photo opportunity. Here are some of their prize-finds of this year.



Jitenbhai caught this guy wheeling away used monitors in a suburb of Mumbai while he was on his scooter home—Just in time for our secondhand PCs story!



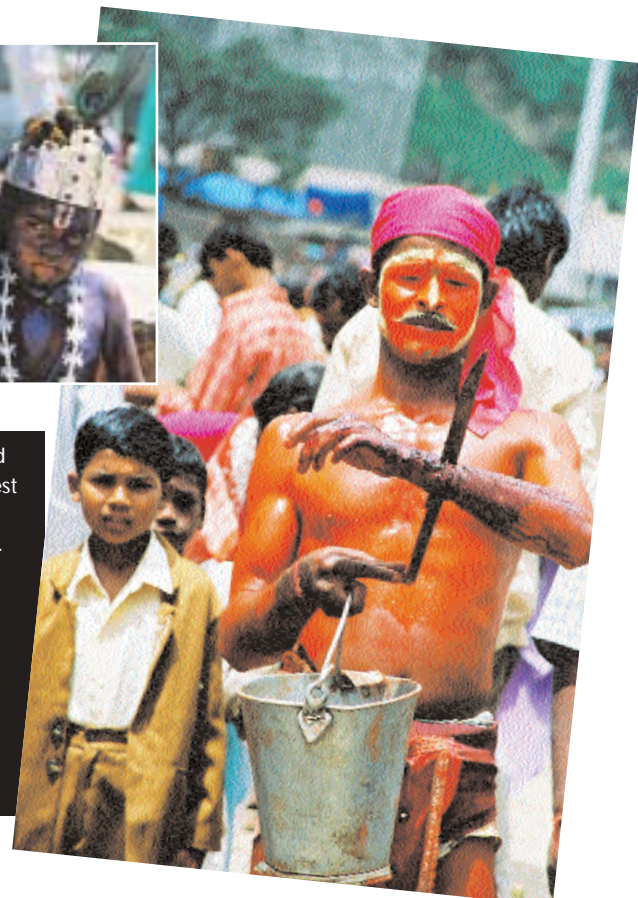
Jiten snapped this is on the way to IIT Mumbai. The sign board says that it's a police checkpoint! Wonder if the dog knows?!



A PUC van under a barren tree makes a pretty picture for Jiten



Mexy happened to be at the latest Kumbh Mela held near Nasik. The man in red has a knife through his arm, and would twang it to prove its authenticity



What was the code name of Athlon XP?

- a. Palomino
- b. Barton
- c. Sledgehammer
- d. K9

2 On what processor does the PlayStation 2 run?

- a. Cell
- b. Emotion Engine
- c. NV3A d
- d. Hitachi SH4

- b. Pioneers in the Semiconductor industry
- c. Manufacturers of 64-bit processors
- d. Code names of the Itanium series.

8 The Indian supercomputer PARAM Padma is powered by which processor?

- a. Sun SPARC
- b. Intel Itanium
- c. AMD Opteron
- d. IBM Power4

- a. Size of memory controller
- b. Support for x86
- c. FSB
- d. None of the above

12 US missile Tomahawk employs processors from which company?

- a. AMD
- b. IBM
- c. Intel
- d. Motorola

13 Which was the first 64-bit processor to reach 1 GHz?

- a. Compaq Alpha
- b. Itanium
- c. MIPS
- d. Opteron

14 What technology does Transmeta use to reduce the temperature of its Crusoe processors?

- a. Code Morphing
- b. Long Run
- c. Speed Step
- d. EPIC

15 The latest processor from VIA is based on?

- a. Intel Pentium III
- b. RISC core
- c. Nehemiah core
- d. Barton core

Powered by



did you know

In 1998, Susan Wojcicki, an Intel employee, rented a room to two students for \$1700 a month—They wanted to start a dotcom business. Later their business outgrew that room, and became a world-wide success. Susan left her job and joined their company—Google.

numberette

It took **30 years** for the PC industry to reach a CPU speed of **1 GHz**, but just **18 months** hence to reach **2 GHz**

digit QUOTIENT

1 to 5 You have a long way to go...

6 to 10 Good, if you like being mediocre

11 to 15 Your next job could be with us!

Got an interesting question? Send it in with the correct answer to quiz@thinkdigit.com

For answers turn to page 71

3 Who is this man in the picture?

Psst: He invented the Microprocessor

- a. Ted Hoff
- b. Jack Kilby
- c. Vinod Dham
- d. Andy Moore



4 If Intel: MMX, then AMD:?

- a. SSE
- b. 3D Now!
- c. AMD64
- d. Hypertransport

5 What was the maiden processor from AMD called?

- a. K7
- b. 80386
- c. 8080A
- d. Athlon

6 Which processor takes the credit for the special effects in *Jurassic Park*?

- a. MIPS
- b. Pentium
- c. Sun SPARC
- d. Alpha

7 Merced, McKinley, Madison—What are we talking about?

- a. CEOs of Intel

9 What is Katmai better known as?

- a. Head-quarters of IBM
- b. First 32-bit desktop processor
- c. Pentium III
- d. Code name of the next AMD processor

10 Which of the following appeared in the Top 20 Robots and Tech inventions of 2002 prepared by the Time magazine?

- a. Aibo
- b. Itanium
- c. Earth Simulator
- d. None of the above

11 What is the difference between Athlon64 and Athlon64 FX?

Across

- 4 Processor in Centrino
- 5 Latest Avatar of Pentium IV
- 9 Add a lot of cache to Pentium you get
- 10 Memory on a processor
- 12 Sledgehammer

Down

- 1 Intel's Two in One
- 2 PC in iBook
- 3 Cooler alternative to Intel and AMD
- 6 Morgan Core
- 7 Intel's 64-bit set
- 8 Introduced without L2
- 11 Sony's secret weapon

