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April 2003

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Tested

21 Printers

22 Scanners

A Quantum Leap for Computing

uick Networking Tricks

eek inside the Centrino

The Indian Game Arena

PLUS

Investigating Computer Education

Reviewed: Tablet PC, Barton, Unreal 2, SuSE Linux 8.1

Jasubhai DIGITAL MEDIA

International price: United States $5

Drop Carrier

Starting April 2003, the Telecom Regulatory Authority of India (TRAI) has recommended that the duration of local calls from fixed phone lines be reduced from 3 minutes to 2 minutes. This has far-reaching implications for dial-up Internet users, as their telephone charges will increase substantially under this new pulse rate plan.

Modem users in India pay a dual charge for accessing the Internet: first, for using the infrastructure of their fixed line telecom operator to access their ISP's network (your modem connects to your ISP's modem via BSNL/MTNL's phone lines), and secondly, the subscription fees of the ISPs themselves. What this means is that you could now end up paying Rs 36 per hour as telephone charges alone, apart from your regular Internet access fees!

However, in order to avert the expected backlash from dial-up Internet users, TRAI has increased the off-peak hours, during which ISPs will provide discounted rates, from 8:00 PM to 8:00 AM. But they haven't specified the level of concession to be offered and have left it on the ISPs to decide what benefits the end users will receive.

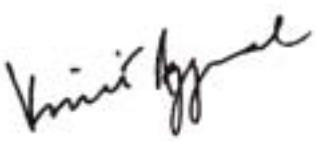
This is quite obviously a patch-up solution and TRAI knows it.

The actual problem for dial-up Internet users lies within the telecommunication tariff structure itself. Most dial-up Internet users fall into the category of heavy network users, as they utilise the telecom operator's network for extended periods of time. If TRAI were to introduce a tariff structure, which benefits extended use, then telecom operators might face the precarious situation of their networks being congested by a larger number of simultaneous users who would then find it economical to make calls of longer duration. This would force the telecom operators to upgrade their backend infrastructure, in order to support their existing users, which effectively throws any suggestion of a reduction in call rates out of the window!

Previously, opting for an always-on broadband connection, like cable or DSL, made perfect sense for hardcore Internet junkies. But usage patterns are not important any more, as dial-up Internet isn't cost-effective, not even for casual surfers who use the Internet for only 30-45 minutes a day.

Also, with most cellular operators ramping up their networks for 3G, wireless Internet is an option worth considering. Reliance and TATA use CDMA 2000 1X technology, which means they can offer data connectivity speeds of up to 144 kbps. Hutch/Orange and BPL Mobile already offer GRPS connectivity on their networks.

The bottom line is this: if you use a modem to access the Internet, it's time to re-evaluate your options. The good news is that there are plenty of options to choose from, be it cable, DSL or wireless.



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Vinit Aggarwal
Assistant Editor

"You could now end up paying Rs 36 per hour as telephone charges alone, apart from your regular Internet access fees!"

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Alexsys Team 2.3
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Mindware\Software\Office

Eternal War: Shadows Of Light
Size: 33 MB, Type: Trial
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Feed The Snake
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Size: 33.8 MB, Type: Trial
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SolSuite 2003 v13.2
Size: 3.46 MB, Type: Trial
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PLAYWARE\ARENA\GAME TRAILERS

The game trailers' section in your Digit CD brings you videos from the latest and upcoming games. Get ready for a sneak peek into the graphics, out of the world special effects and realistic character modelling, way before the game is released!

This month we bring to you trailers for the upcoming *Rome: Total War* and *One Must Fall: Battlegrounds*. *Rome: Total War* is the next generati strategy game, se Roman period. Tl promises realistic a to-life graphics an *One Must Fall: Battle* an online 3D mu game, with some pr martial arts movie- cial effects. Players will get to play tles or all-out brawls and integra and hazards into their fighting st

MUST TRY SOFTWARE

IGI 2: Covert Strike

In *IGI 2: Covert Strike*, you play David Jones, a highly-trained former SAS soldier, now working freelance for IGI. The second edition of the spiralling story will take you through Russia, across Libya and into China, in three linked campaigns, as you infiltrate a wide variety of locations including military airbases, harbours and secret government installations. Don't expect an easy ride: completely new Artificial Intelligence systems give your many enemies the ability to work together as effective teams. You will have considerable resources backing you up—whether hacking a security computer, sniping a guard from a distant tower, or storming a courtyard with all guns blazing.

Size: *138 MB* ***Type:*** *Trial*
Playware\Arena\Games

Ulead PhotoImpact 8

This is the total image editing solution for your PC, with a graphics editor that provides 13 image galleries, and includes an HTML assistant and helper program. You can manage and enhance digital photos, create graphics and produce high-impact Web pages for personal or business use, including interactive slide shows and video CD slide shows. Add creativ images with filters, special effects, and unique 3D tools. Include interactive photo slide shows on your personal Web page, or bu show CDs that you can watch PhotoImpact is a graphics tool s none, especially when it comes ing with photos.

Size: *76 MB* ***Type:*** *Trial*
Mindware\Software\Multimedia

EasyOffice v5.1

EasyOffice is a fully featured, free commercial use, office suite tha patible with Microsoft Word and Excel formats. It comes with a word processor, a presentation tool, an a accounting tool, a database des culator, a compression tool, and not least, a tool to read aloud entries, whether a complex data financial calculation.

Size: *69.2 MB* ***Type:*** *Free*
Mindware\Software\Office

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Convert your DVD movie into DivX format and preserve your favourite flicks in top-notch condition forever—this is how you can do it.

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DIGIT APRIL 2003

hypethesis

Grantsdale chipset

■ What is it?

Grantsdale will be Intel's most significant chips et revision in almost a decade. Expected in the year 2004, it will usher a slew of innovations into the PC, such as a new graphics core, PCI Express (formerly known as 3GIO) and the NewCard expansion card format that will support wireless communications.

■ How does it work?

The most significant change will be the inclusion of PCI Express as a graphics card interface, replacing the current AGP standard. Adopters will thus be forced to invest in a new compliant graphics card, and a new motherboard. The chipset will support the LGA 775 socket, used by the Tejas processor, and will serve as a transition between the Tejas and Prescott processors—supporting both. The chipset will support both a 533 MHz and a 800 MHz front-side bus.

■ What does it do?

It supports wireless communication and offers next-generation graphics cards a significant boost in data bandwidth, over the current AGP interface. PCI Express uses a series of point-to-point channels to communicate information, in either x1, x2, x4, x8, x12, x16, or x32 dual channels, with 2.0 Gbps of available bandwidth per channel. The chipset also supports up to either DDR333 or DDR400 memory.

Discerning scanner

Current face-recognition technology works by matching images obtained from security cameras with two-dimensional pictures of known suspects that exist in a database. The problem with 2D documentation is that any change in the facial angle, lighting condition or expression can lead to the system's failure.

Russian identical twins, Alex and Michael Bronstein, claim to be staring at the face of a solution. Their technique maps the human face in three dimensions, by using algorithms and a 3D facial scanner. The surface of a face is scanned using points of light, and stored within a computer as a 3D-image. The computer uses algorithms to measure the distance between several sample points on the facial surface. These distances are converted into straight lines in 3D space, creating a digital sculpture of the original face, which is almost as unique as a fingerprint.

ILLUSTRATION: Farzana Cooper

Having succeeded in differentiating between the twins, the system is awaiting a patent for commercial use.

Office 2003 peeks from behind the curtains

Microsoft has unveiled new features that will constitute Office 2003, the next version of its popular office suite. Sharing the spotlight are two new members of the family: OneNote and InfoPath.

OneNote is an electronic tabbed notebook that allows you to type, draw, scribble and directly drag and embed content from Web sites. InfoPath is meant as a tool to create XML documents—the tag-language that finds extensive service within Office 2003, especially MS Word.

Other new features include Business Contact Manager, an Outlook add-on. The Beta 2 of Outlook also offers spam-filtering features, and a new version of Publish boasts more powerful desktop-publishing features. Microsoft also plans to add Information Rights Management technology, that lets users protect documents and email messages.

3D monitors

In an effort to bring 3D visuals to monitors and LCD screens, a consortium of high-tech companies has been formed. 3D monitors consist of two TFT panels separated by a parallax barrier. Each eye receives a slightly different image, creating the illusion of depth. While objects in the background do not pose problems, viewing objects in the foreground can cause the eyes to shift back and forth rapidly, creating eye strain. Such related health issues, and hardware and software compliance, will form the agenda of two sub-committees of the consortium.

LCD displays of the future will display 3D images without the need for special glasses

To run programs in 3D on these screens, users will not need special glasses or additional software. Named the 3D Consortium, it includes Sony, Sanyo, Microsoft, Kodak, NTT Data and Sharp. Sharp already sells a cellphone with a 3D screen for the NTT DoCoMo network in Japan and has a notebook that runs a 3D version of Quake.

snapshot

The cellular industry in India added 5.93 lakh subscribers to their services last month

Source: Cellular Operators Association of India

■ 72,000 Tablet PCs shipped in the fourth quarter of last year ■ Benetton plans to track inventory with chips embedded into its creations

Tejas, Tejas, burning bright

Late 2004 is likely to see the birth of Intel's new baby, christened Tejas. Introduced at a clock speed of well over 4 GHz, it is expected to cross the 5 GHz mark in its lifetime. It will be fed by an 800 MHz Front Side Bus, and will have a 90 nm fabrication process. Tejas will also bring along new instructions, an enhanced HyperThreading and an improved Level-1 cache.

Perhaps the most visible difference, will be that Tejas will come without pins—it will use a 775 contact, Land Grid Array (LGA). The processor will be nestled within a direct socket loader, which will serve a triple-purpose—maintaining contact with the motherboard, protection and insulation—from the potentially damaging heatsink. The Grantsdale chipset will baby-sit Tejas, and oversee the transition from the Intel Prescott to the new kid on the block.

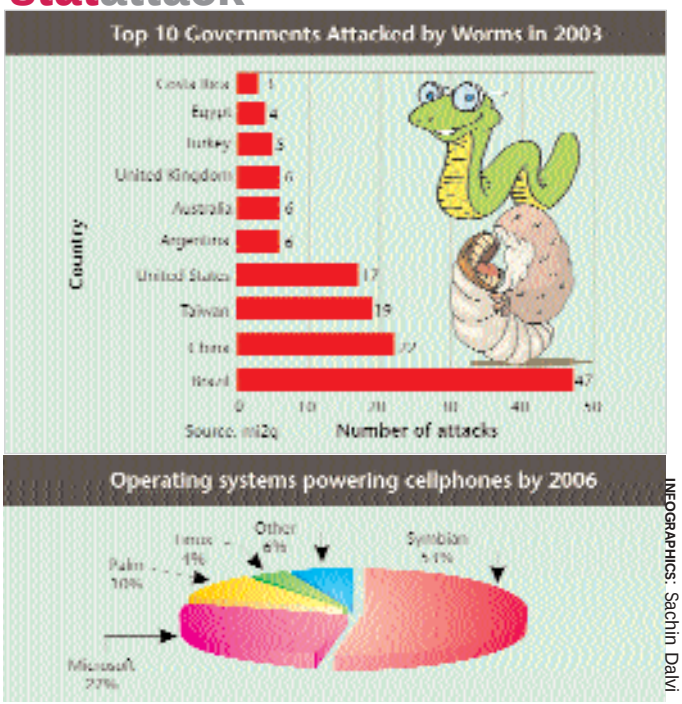
Intel's Tejas will launch on a 90 nm fabrication process

When PC met TV

VIA has announced its CoreFusion platform which, it hopes, will form the basis for a new generation of LCD-equipped home entertainment PCs. The platform combines the 1 GHz Nehemiah C3 core and the ProSavage CLE266 Northbridge—all on a single chip. The C3 core contains 64 KB of on-die L2 cache and a 16-stage pipeline. It is the first x86 CPU with a hardwired random number generator, powering data encryption of its PadLock engine. The C3 also supportsIntel's SSE multimedia-oriented instruction set.

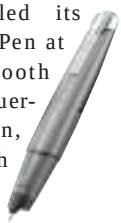
This solution will connect with the UniChrome AGP 8x graphics core to offer a small form-factor, low-power solution for entertainment applications. Products based on the technology are expected to arrive later this year. VIA demonstrated one such product, the StarHub PC/TV, at CeBit. The Southbridge consists of VIA's VT8235 and VT8237 bringing in USB 2.0, Ethernet, ATA-133 , Serial-ATA and six-channel surround sound to machines such as the StarHub.

statattack



INFOGRAPHICS: Sachin Dalvi

A pen for your thoughts



Nokia unveiled its new Digital Pen at CeBIT. This Bluetooth device also masquerades as a real pen, complete with standard ink cartridges. For PCs that do not support Bluetooth connectivity, the pen comes with a USB cradle. The Digital Pen is designed to send notes and pictures, via Bluetooth-enabled cell phones—piped as GIF images. The pen uses a proprietary 'digital paper' to convert your scribbles into constituent bits and bytes.

Nokia plans to release the Bluetooth digital pen by the third quarter of 2003.

redalert

Operatic dance

In what appears to be the first incident of its kind, the Opera browser has a serious security flaw that deals with the incorrect handling of long file names in the download dialog box. This flaw lets malicious entities create a filename that causes a buffer overflow in Opera that can be exploited to execute dangerous code on the target machine. Opera has promptly released an update patch for this, which affects all Opera 6.x and Opera 7.x browsers. Users should upgrade to the 7.03 version of Opera which addresses this problem. The upgrade can be accessed at ***http://www.opera.com/windows/changelogs/703/***

Kabhi game, kabhi worm

The new Windows worm, Bibrog-B, is currently spreading through ICQ, file sharing networks as well as e-mail by disguising itself as a shooting game. While users are playing the game, the worm is copied into the hard drive and spread through e-mail and file sharing networks. It displays fake versions of Web sites, such as Hotmail, Citibank, MSN or Yahoo!, and steals confidential user data, such as authentication details. The worm comes in form of an executable in e-mail. All leading anti-virus software developers have released patches, with Symantec having put up its Bibrog-B virus information page at ***http://securityresponse.symantec.com/avcenter/venc/data/w32.bibrog.b@mm.html***

■ Hermine, a talking washing machine, was displayed at CeBit ■ Bell Canada offers WiFi at pay phones ■ Red Hat expands operations in India

Think light

IBM India has announced new notebooks, with select models including Intel's just-launched Centrino mobile technology, which provide wireless connectivity while helping to deliver high performance and extended battery life. A full 30 per cent thinner than its T30 predecessor, the ThinkPad T40 has a travel weight of just over 2 Kg and measures about an inch thin. The ThinkPad X31 is approximately 1-inch thin, weighs 1.5 Kg, and at up to six hours, claims to have the longest system battery life in the industry.

The latest IBM Notebook

All three models—the ThinkPad T40, X31 and R40—feature select models that are equipped with IBM's Embedded Security Subsystem (ESS). This is an IBM ThinkVantage Technology that combines hardware and downloadable software to authenticate users, and help protect data and private information in both wired and wireless communications environments.

The new notebooks will be available from 5 April, 2003. The ThinkPad T40 notebooks will cost Rs 1,99,900, while the ThinkPad R40e start at a price of Rs 1,39,900, while the ThinkPad X31 will be priced at Rs 1,49,900—all prices excluding taxes.

snapshot

The average e-mail account received 2,200 spam messages last year

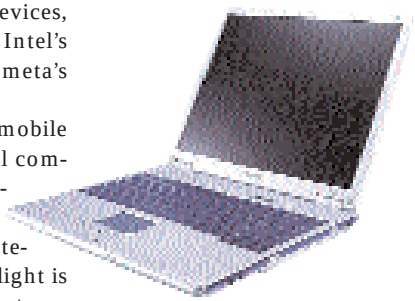
Source: *Jupiter Research*

Notebooks chip merrily

The thin-and-light notebook space is becoming increasingly claustrophobic, with AMD having announced a new line-up of devices, close on the heels of Intel's Centrino and Transmeta's Astro offerings.

Unveiling 12 new mobile chips, five of them will compete in the thin-and-light segment; the rest will go into the full notebook space. Thin-and-light is defined as devices that are about an inch in height and weigh less than 2 Kg.

AMD is announcing five low-voltage Mobile Athlon XP-M chips for this space—the 1400+, 1500+, 1600+, 1700+ and 1800+. The processor frequencies range from 1.2 GHz to 1.5 GHz, with a peak power of 25 watts. They also offer 384 KB of combined Level 1 and Level 2 on-chip cache. In the full notebook space, AMD is offering four new Athlon XP-M chips based on the company's Thoroughbred core—the 2000+, 2200+, 2400+ and 2600+—and three others—the 2200+, 2400+ and 2500+—based on its Barton core. These chips range in frequency from 1.67 GHz to 2.13 GHz.



The new AMD processor is designed to power thin notebooks

While chips with the Thoroughbred core offer 384 KB, the Barton core comes with 640 KB of combined cache. Larger on-die caches allow faster data access. Products from OEMs, including HP and Epson Direct, are expected to arrive using these solutions.

Movies on the go

Benq, the Taiwanese electronics maker, plans to incorporate the new Media2Go OS on a portable device that is half cellphone and half-digital audio-video player. The device will showcase multimedia, such as pictures, audio and movies, using MPEG-4 formats. The device will incorporate 10 to 20 GB of storage in the form of a 1.8-inch hard disk, made by either Hitachi or Toshiba.

MPEG-4 is the next-generation, global multimedia standard, delivering professional-quality audio and video streams over a wide range of bandwidths. MPEG-4 was defined by the Moving Picture Experts Group, the working group within the International Organisation for Standardisation (ISO) that specified the widely adopted, MPEG-1 and MPEG-2 standards. Hundreds of researchers around the world contributed to MPEG-4, which was finalised in 1998 and became an international standard in 2000.

Media2Go is based on Windows CE, and provides complete support for a broad range of media formats, including Windows Media Audio, Windows Media Video and MP3.

heroes

Anti-spam movement

Yahoo!, Dell Computer, Oracle, Microsoft, Sun Microsystems and AOL Time Warner, gathered, to talk about the problem that unsolicited bulk email has created for legitimate marketers, technology developers, ISPs and their customers. The goal of the forum, called JamSpam, is to produce an open, interoperable anti-spam specification that serves as a universal solution to both edges of the spam sword.

... more action

The Anti-Spam Research Group too is exploring fundamental changes in the Internet architecture to eradicate spam. It suggested that the SMTP should be replaced, to adjust to other Internet standards in order to stymie unsolicited mass-mailings.

zeroes

U.S military

Some units of the U.S military are clamping down on email from their soldiers and sailors, situated in the Persian Gulf. Computer security experts opine that the enemy would not devote much attention to hacking into email from the troops. The military's sensitive operational information is kept on a proprietary network, called the Secret Internet Protocol Network that is not connected to the Internet.

Macromedia's new Web site

Macromedia's redesigned Web site does not work with some browsers, such as Safari and Opera. The redesign uses sophisticated animation to navigate menus and other tasks. Macromedia said the site works with those browsers (but very slowly), which represent less than 5 per cent of traffic.

■ Americans turn to foreign Web sites for unbiased war coverage ■ ATi Radeon 9600, first mobile graphics chip to support GDDR-2M

Play away the pain

A study conducted by the Jesuit University in West Virginia, sheds some light on the positive effects of the distraction caused by playing video games. Researchers followed two avenues of gaming: active video games and passive, mental video games. The volunteers were monitored for blood pressure, pulse and oxygen saturation. They filled questionnaires that served to ascertain their level of competitiveness and aggressiveness. The study found that active video games reduced pain ratings and increased pain tolerance.

Surprisingly, personality traits prior to the gaming sessions were not a significant factor in affecting pain measures. The North American Society for the Psychology of Sport and Physical Activity will be able to peruse and analyse these findings come June.

"Cyberterrorism overhyped", says expert panel

A security panel, comprising security and technology experts, opined that the threat posed by cyber-terrorism has been overhyped. The Net is unlikely to be used as a tool for terrorism, the panel submitted at the CeBit technology fair. "The hype is coming from the U.S Government," said security expert Bruce Schneier.

Fellow panelist and head of security firm RSA, Art Coviello, was of the opinion that some of the warnings on cyber-terrorism were in reaction to the September 11 attacks. He added that section of the media were responsible for amplifying this concern into a threat scenario. "Some of these stories are very entertaining and sell a lot of newspapers," he said.

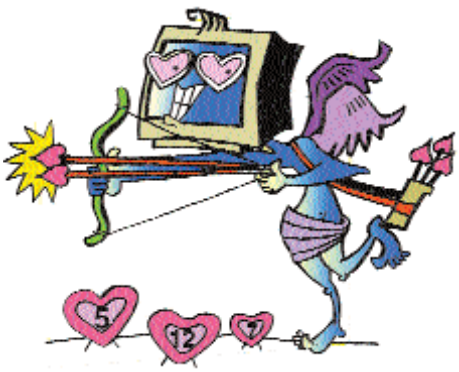
A terror group that wished to extract panic from the populace was unlikely to turn to the Net, Mr Schneier added. Panel members pointed out that companies face more serious threats from ordinary criminals, fraudsters and pranksters than they did from technology-literate terrorists.

A match made in math

A team of MIT neuroscientists have launched a Web site called EasyMixing.com to test whether a person's facial features trigger insights into his or her persona.

Visitors to the site are asked to rate pictures of members based on a mini-questionnaire, and are asked to guess various personal activities, such as the person's favourite past time. The results are stored in a database.

Researches hope to develop a statistical tool from this exercise that will let matchmaking Web sites offer a trimmed down list to a visitor, based on personal preferences. "Instead of wading through several hundred images, you get short list of top 20 or 50 compatible profiles," said Pawan Sinha, an assistant professor of computational and neuroscience at MIT. MIT is developing this tool from the view of a future entrepreneurship concept.



.NET is a joke, says Sun

Sun Microsystems CEO Scott McNealy called .NET a joke at a press conference in Singapore. On a tour of Asia, he told the audience that the "world is down to two developer camps: One is .NET, the

other is Sun ONE Java. Java is the number one development platform. Viruses are a feature in .NET, but Java has security built in. I find it funny how the default setting in Win XP lets in Office macros but blocks Java." He added that "Sun ONE runs on every system and processor. Microsoft .NET runs only on Windows. It's mankind versus Microsoft. .NET is a joke." But when asked in Beijing if Sun could eventually triumph, he said "It's difficult for me to defeat Microsoft. Microsoft has a lot of cash in hand."

snapshot

Using the Internet2 network, 6.7 gigabytes of data; the equivalent of four hours of a DVD quality movie was sent in less than a minute over a distance of 6,800 miles

Source: Stanford Linear Accelerator Center

■ Gateway cuts jobs, shutters stores ■ Sony to shift PlayStation 2 console production to China ■ Yahoo! to launch a paid video subscriber service

Matrix lives?

Controversial futurist Ray Kurzweil is well-known for making bold statements about the near future. He correctly predicted the rise of the Internet; that a computer would beat a grandmaster in chess by 1998; that LCD displays would soon surpass CRT displays. But his latest Web site prediction takes some serious swallowing.

Kurzweil argues that the future will resemble *The Matrix*. The exponentially increasing computer technology, plus an increasing ability to comprehend the mechanics of the human brain (to then reverse-engineer it), will allow us to have "sentient...programs—the

ability to directly download capabilities into the human brain, and the creation of virtual realities indistinguishable from the real world."

He points out that the raw computing power of the brain (estimated to be 20 quadrillion instructions per second) will be soon be available and inexpensive.

Moore's Law, he opines, will continue indefinitely, as new computing paradigms replace silicon chips. Virtual Reality will then be pervasive, and human beings will spend most of their time living and interacting in simulated environments. "We will make a hundred years of progress, in 25 years. The next 10 years will be like 20, and the following ten years will be like 40. The 21st century will therefore be like 20,000 years of progress."

E.T. might call home

SETI@Home is a popular distributed network, set up to look for signs of extra-terrestrial intelligence. The network has picked up millions of radio signals—indicators of intelligence—since 1999.

Over four million people have downloaded the screensaver onto their personal computer. When idle the screensaver is activated, and crunches the data that it receives from SETI. Each packet is a 100-second segment of noise, collected by the Arecibo radio telescope. SETI is notified whenever a signal appears to have been emitted from a single source.

Over 350 million such signals have been spotted in the radio data. But in the 24 hours available, the astronomers are able to revisit a maximum of 150 signals. According to Dan Werthimer, the chief scientist for the SETI@home project, there is a one in 10,000 chance that an extraterrestrial intelligence was the source of a candidate signal.

COPA termed 'anti-adult': ACLU

A three-judge panel of the third U.S Circuit Court of Appeals, has ruled that the Child Online Protection Act (COPA) restricted free speech, by barring Web site operators from posting information inappropriate for minors, unless they limited the site to adults. The ruling upheld an injunction blocking the government from enforcing the law.

The court stated that, in practice, the law made it too difficult for adults to view material protected by the First Amendment, including many non-pornographic sites. The law has never been enforced. The American Civil Liberties Union (ACLU), which initiated the legal challenge, said the law would have made it a crime to communicate a whole range of information to adults. The government may ask the Third Circuit to rehear the case or appeal to the U.S Supreme Court.

quoteworthy

"In almost all cases, virus writers were computer-obsessed males between the ages of 14 to 34 years. They have a chronic lack of girlfriends, are usually socially inadequate and are drawn compulsively to write self-replicating codes. It's a form of digital graffiti to them."

Jan Hruska, Chief Executive of British-based Sophos, the world's fourth-largest antivirus solutions provider, in an interview to Reuters

"Just like cellphones and cellular infrastructure unleashed telecoms, we believe in this decade wireless notebooks are going to unleash computing"

Intel Chief Operating Officer Paul Otellini, at an event in Tokyo

tomorrow'stechnology

Fuel cells to power mobiles

To power notebooks and other mobile devices, technology companies are looking to fuel cells. NEC and Hitachi are trying to device such cells for the mobile segment. The rechargeable batteries of today, do not offer the power or the capacity that will satiate the hunger of the mobile devices of tomorrow. Both companies demonstrated their offerings at the Nano Tech 2003 show, recently held in Japan. Toshiba also announced to the world a successful development of a prototype fuel cell. They plan to commercialise their offerings by 2005.

NEC's system uses 'carbon nano horns' as an electrode, that can pump 12W of power. It is trying to incorporate monitoring and management systems to ensure smooth and stable power generation. Hitachi is looking at the PDA market, and employs metallic nano particles as electrode catalysts.

■ Amazon.com awarded patent for online retailing chat technology ■ Samsung phones first to use Palm OS 5 ■ Xbox cracking project goes Linux

ANALYSIS

SMS in हिन्दी

English, spoken only by a minority in India, is ironically the language of choice in computers, mobile phones and almost any other gadget. But soon this will change. A Canadian firm called Zi Corporation is working to let you SMS in a local language, and Hindi is its first target. But is it so hard to provide an option to send SMS in any vernacular language?

Mobile operators currently offer a pretty mundane vernacular SMS service. A user has to select the necessary option, and use the English alphabet to enter a message (which is a phonetic representation of a regional language). This message is then sent to an operator, who converts it into the correct font, and sends it back to the user. Now, the user can send it to the intended receiver. This is a long procedure, and the entire exercise is like typing a *desi* word in a chat window, coupled with the latency of waiting to hear from the operator.

The other option, available in a few phone models, such as the Nokia 3350, is akin to the method of installing a regional language font and entering text, using a phonetic keyboard. Mildly put, this is a big hassle. First, one has to change the language to Hindi; then enter the Messages menu. Typing a message in Hindi is rather cumbersome without the predictive mode. As a result, it is quite key-press intensive and monotonous, as there are up to nine Hindi letters and symbols on one key.

We tried sending a Hindi message from the Nokia 3350. It was received and displayed perfectly on a Nokia 3315, without switching the phone-language to Hindi. However, the message could not be edited easily on the 3315. Next, we forwarded the message to a

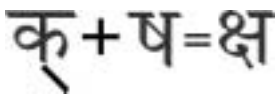
Nokia 3310. The 3310, which does not have a Hindi language pack installed, displayed junk on the screen.

Computers fundamentally deal with combinations of ones and zeroes. Unicode provides a standard where letters and characters are stored, and understood, by assigning a unique code to each one. Currently, the Unicode standard contains 34,168 unique binary codes for 24 language scripts. However, the Devanagari script, on which Hindi is based, is not fully supported by Unicode.

The incompatibility with Unicode is largely attributed to ligatures in the Devanagari script. A ligature is a character, letter or type, such as æ, which is obtained by combining two or more letters. There are almost 400 ligature combinations found in the Devanagari script, compared to a handful in English. The other problem posed by ligatures in Hindi, is that the resulting combination can be totally different in shape from the initial characters used—the '*ksha*' letter is a common ligature.

The scenario can become pretty overwhelming, because of the problems and technology involved.

Zi Corporation plans to introduce the first predictive text input for mobile phones



in Hindi. eZiText Hindi uses an innovative keyboard layout, but the predictive text input is similar to that used in phones today; multiple key taps are not necessary for character selection.

A flash demo on their Web site, ***www.zicorp.com***, demonstrates how easy it is to type messages using eZiText—the word dhanyavad can be typed in six key-presses. Even on a desktop QWERTY keyboard, using the free MyHindi font, it takes more than six key-presses.

Mobile phones in the Indian market today typically do not handle ligatures, and the few that do are incomplete or contain ligature display errors. To address these issues, Zi provides a package of ligature rules to help manufacturers localise their device implementations, by resolving display and other interface issues.

eZiText uses the same core engine for all alphabetical languages. Accordingly, most eZiText implementations have at least two languages, generally a regional language, say Hindi, and English. As a result, language input in the same message can also be mixed.

Native speakers of other Indian languages need not feel left out. Zi also offers another product—eZiTap, a predictive multi-tap system, which is language independent. eZiTap has a predictive engine, but no word database. The engine 'learns' words, which are multi-tapped the first time, and predicts them in the future. This offering has the potential to take SMS to every dialect spoken in India. However, one must note that a handset needs to support the font and script of the language in question.

But, do you require another mobile phone to start messaging in your mother tongue? Gary Mendel, VP Sales & Marketing, told us, "Several licensees are currently implementing eZiText Hindi for multiple products due in 2003. Zi has over 70 customers, including Sony Ericsson, Alcatel, Samsung, LGE, Kyocera and DBTel."

Hindi SMS should be a reality very soon, and it should set the ball rolling for full-fledged messaging in other regional languages too. Here's hoping that *Sehwag ki Maa* will be able to message her son in any language she pleases.

■ Media2Go portable devices to hold up to 175 hours of video ■ RIAA warns 300 companies on piracy ■ Expedia sets wartime refund policy

Computing sorely needs lateral thinking

Leslie D'Monte
Managing Editor, Digit

> "It's not always physics, or biology, that is needed to give computing a tectonic shift. And, then, this is not what bothers end users"

Physics and biology promise to provide a volcanic thrust to computing. Myriad concepts are floating around. Take for instance, Quantum computing, which uses traits of particles such as atoms and electrons. Theoretically, they are hundreds times faster than today's computers at solving very large problems. Where the digital computer uses binary digits (bits), the quantum computer uses quantum bits (qubits). Such a computer could resemble the coffee cup on your table.

Then there's DNA computing, which draws its power from the memory capacity and parallel processing. While a DNA computer takes much longer than a normal computer to perform each individual calculation, it performs an enormous number of operations at a time—massively parallel. DNA computers also require less energy and space than normal computers. A thousand litres of water could contain DNA with more memory than all the computers ever made, and a kilogram of DNA would have even more computing power.

Now bacteria are very cheap to manufacture. Scientists can grow trillions of bacteria in a laboratory for a few dollars as against the couple of billion dollars required to build a semiconductor fabrication plant. Little wonder that scientists have thought of bacterial computing too.

These computers may not do the same tasks as traditional computers such as surfing the Web. In all likelihood, they will be used in the study of logic, encryption, genetic programming and algorithms, and a plethora of other things that are currently beyond our imagination.

Even the network is benefiting. Researchers from Humboldt University in Germany have found that autonomous pieces of computer code can work like ants and bacteria. They have devised a way for electronic agents to assemble a network without relying on a central plan. The cue has been taken from insects and other lifeforms whose communications lack central planning, but who manage to form networks when individuals secrete and respond to chemical trails.

It's not always physics, or biology, that is needed to give computing a tectonic shift. And, then, this is not what bothers end-users. These developments may merely be relegated to the area of intellectual gymnastics for the *junta*. What is sorely needed is a dose of lateral thinking. Chip giants have realised that end users need something more than mere power—that is, ease of use and fewer crashes to begin with. So they took a break from pumping adrenaline into their processors, and started thinking from the consumer point of view—about you and me.

So now you have the concept of autonomic computing, whereby PCs can protect, diagnose and heal themselves. Companies such as IBM are already making laptops that can be diagnosed and repaired with a simple press of a key. Network administrators are benefitting from this development, and the end-user is heaving a sigh of relief.

You also have the recent development called Centrino. It's after a major impassé that the chip giants are looking at mobile computing with the respect and attention it deserves. All this while, the chip makers such as Intel and AMD would simply take a desktop processor, reduce its frequency and voltage, and conveniently pass it off as a mobile processor. Little, or no, consideration was being paid to the battery life (a vital point) or weight. With no option, the user would have to lap it up. The laptop users among us should surely be glad to get some weight off our laps, and have a battery that can last 4 to 5 hours. Centrino, with its new architecture, has changed all that. Transmeta, with its Astro mobile processor, too has thought on similar lines.

Centrino mobile technology has also brought about an increased awareness of the advantages of being connected sans wires. Thanks to Centrino, we can get around the clutter of cables and think of WiFi (and later of 802.11a/g, and even ultra wideband) being a part of our motherboards. Just hit a WiFi hotspot (as in the U.S) and presto! You're connected to the world.

And as computing becomes as easy as switching on the lights or fan, we can revert to thinking about how we can use them. As for me, I just wish I could use my computer to post a gigantic mid-air message which reads: "War never decided who was right, only who was left".

Worth Fitting in this Groove

Ashok Hingorani

> "...even old hacks like us find it exhilarating to discover new ways to use it everyday"

The power of today's IT world can drastically work against you. The more powerful it gets, the more you are at risk in your personal world. The more you use it, the more you expose yourself and leave a trail for others to ambush you.

You need a way to plan your activities, share those photos of your last holiday with close friends, swap music, voice chat with friends, write papers together, do course work and even publish your own Web site and special interest forums. But doesn't that seem an expensive proposition in terms of time and money, neither of which you or me have an excess of? How many different programs will you buy, install and learn? And how will you keep all this information private and secure? Forget viruses, where do you keep snapshots of your previous girlfriend, so that your current one doesn't find them?

Check out Groove, the collaboration platform. I'll use that techie term, because this is not just a single application such as e-mail, ICQ or an instant messenger. This one tool does it all—it gives you the means to hide and share your files, in real time, with only the ones you choose to. Safe in a Groove workspace, you can say goodbye to viruses and spam, and all the risks of the open Web. You can even have your own private peer-to-peer network, which is not only powerful and easy to use, but impregnable as well.

This is one technology that you don't even have to set up as it does the technical work for you, as they all should ideally. In fact, there are no setup options. Just install and run—all settings are done automatically and internally to best suit your system.

One of the greatest advantages of Groove is its persistence. Everything you input, except for voice, is saved for later. Nothing gets lost, even if you format your machine. A copy of every file will exist with your peers, and they can restore it to you painlessly. In three years, I have never lost a single thing that I stored in Groove.

Groove comes with a full set of tools that you will typically need, and most of which are used by you in their pen and paper form. You can write together using the built-in Notes Editor, plan events using joint calendars, manage or even create images and video, sketch and paint together, track projects and events and even play games online, in privacy.

For some serious fun, you can create your own blogs, Web sites and forums that will air your thoughts and those of your peer group to the world. It's like having your own publishing house. Fight for world peace, or just the garbage collection in your neighbourhood—Groove tools and built-in Web services will do all the interaction and connectivity for you, with no technical demands. This is one powerful, mother of all software tools, and even old hacks like us find it exhilarating to discover new ways to use it every day. As technology writer Jon Udell said in a recent article, "Groove is at a place today, where MS and Sun, etc, would be happy to be by the year 2006..."

At the heart of Groove is the very human belief that people need to communicate and share for a better personal experience. Groove works by adding value to your network and trust based networks grow naturally.

Groove starts off for free, and remains so if it is for personal use. You can download from ***www.groove.net***, install it and off you go. All of Groove's functionality and 80 per cent of the tools are included in the free version. You are limited to three workspaces per account, but you can create multiple accounts. When you put it to professional use and need its full power, it costs only around Rs 1,500 for the unlimited, standard version. If you're a student, you get a discount.

Groove understands how important you are—the IT managers and CEOs of tomorrow. Hence, the technology is made easy and affordable so everyone can use it and discover a better, safer way of living in a wired world.

The author is the CEO of Computact Software. He can be contacted at computact@hotmail.com

Undue Credit

Vipul Shah

> "India needs to take the cue. Else, for lack of a will (and not technology), we will find consumers reverting to paying by cash"

I never felt the use for a credit card a decade ago. The scene has changed dramatically since; I now send greeting cards to my relatives in the U.S, created from the pictures I have shot with my digital camera. I usually upload the images on a Web site, specify the kind of card I want and pay a dollar or two for printing or stamping, and mailing. My U.S-based relatives get my card by post in three days flat. All possible due to credit cards.

However, there is still a nagging fear that if credit card numbers and expiry dates fall into the wrong hands, it can create havoc for the owner or for the bank that has issued it. Last month, the systems of an U.S-based credit card processor company—Data Processor International—were hacked, and eight million credit card numbers were stolen. This is around 2.7 per cent of America's total population. What happens to these stolen numbers? Most end up in the hands of Eastern Europe-based mafias. No prizes for guessing the outcome then.

In case of such frauds, U.S-based banks reverse the disputed charges without asking questions. However, in India you may have to shell out a few hundred rupees for a new card. Most Indians, thus, are wary of using credit cards to shop online. Major portals offer COD (Cash On Delivery) to get around this fear.

To counter this fear, American Express was the first to introduce a clear plastic card, called the Blue Card, in 1999. Since then,the design has been copied by many banks for their credit cards. The Blue Card offers you the choice of never using a real card number and expiry date. It is a smart card with a microchip on it (like GSM phone cards), with 32 KB memory for small applications and data, and also comes with a free card reader (serial port), and software on CD.

Using the card, one can generate new disposable single-use card numbers with expiry dates (usually within 2 months)—this is called Private Payment. Once you use this number to make a purchase either online, by phone or by mail, it can't be used again. It stays active only for any charge reversals/credits.

VISA and MasterCard have similar chip-based smart card plans called EMV, which stands for 'Euro-VISA-MasterCard'. In the future, they plan to convert point-of-sale terminals that verify your card, to be able to read these chips.

The tamper-proof microchip can contain your picture, your thumb impression or any other authentication detail. Visa has also started a 'Verified by VISA' plan for online purchases with a user-selected password. GemPlus, Oberthur and SchlumbergerSema are major suppliers of plastic cards to credit and debit card companies worldwide, and are now ready with their SmartCard products. Surprisingly, mobile phone companies and security companies are their major customers.

The mobile phone is already being used for making payment in countries such as Finland. You just have to dial a number listed in a vending machine, or an advertisement, and the amount is debited to your mobile phone bill. In mobile phone-based payments, just having a number is not enough. You need to actually have the phone in your control to spend money from it.

PayPal is another pioneer that is stealing the thunder from credit card companies. You don't have to give any vital information to open a PayPal account. PayPal also offers a 'virtual debit card' to its verified users in the U.S.

Eventually, the future of the payment industry lies in biometric technologies. Smart cards with a 512 KB flash memory has already, been introduced by SchlumbergerSema. These cards can be read by terminals/card readers, and then verified against the actual thumb impression or face or voice or iris.

India should take the cue, and leverage the advantage that these technologies offer. Else, for lack of a will (and not technology), we will find consumers reverting to paying by cash.

Vipul Shah writes and consults on Internet, e-commerce, banking and finance technologies. He can be reached at vipuls@yahoo.com

"I've not Shot Film in Six Years"

Dennis Biela
Digital Photographer

> "The most expensive camera is not necessarily the best for you; each camera is for made for a different purpose"

Dennis Biela is carrying two bags and looks like an average traveller. But, if you peek into his bags, you will never call him average—no matter, in what context.

An Apple Powerbook in one bag, and all kinds of photography equipment in the other. Strangely, you won't find a single film roll. Biela, a U.S. government-certified expert in digital imaging, explains, "I've not shot on film in six years." Coming from a highly-respected professional photographer, whose clients include BMW, the statement is so much more than a matter of fact.

A self-confessed Mac-phile, and founder of the Wayahead Group, Biela recounts how he got started with digital photography when he needed to touch-up a few shots of a BMW racer, taken in the mid 90s. Soon he bought himself a PowerMac, took a loan to buy a Kodak DCS1 digicam and forgot all about darkrooms. Since then, he has been a beta tester for Kodak and Canon, and also the photographer and lecturer for Apple Computers.

While in India to promote Apple's QuickTime Virtual Reality technology, he readily admits, "I love (Macromedia) Shockwave" but quickly adds that the plug-in architecture of QuickTime makes it a superior technology. "QuickTime is like a bucket, you can put anything in it."

And that's exactly what he has done with QuickTime's VR extension. He is currently working on a major project with The National Air and Space Museum in Washington, DC. He demos a few VR media files on his notebook—all are inside shots of classic airplanes, including the famous Wright flyer. His plan is to rent out handheld computers to museum visitors, who can view the insides of these airplanes on a palmtop, while touring the museum.

Currently, the car industry is the biggest user of QuickTime VR. Biela says Macs are his choice for digital imaging because of the user-friendly interface. When questioned about consumer-end digital cameras, Biela cites that digicams are making their presence felt—Kodak is 40 per cent down in its film-roll business.

Biela has some advice for digital photography newbies—"the most expensive camera is not necessarily the best for you; each camera is for made for a different purpose." His favourite example is that, "You need a really fast camera for clicking kids, who hardly ever pose for pics as compared to mountains, which never move." He also urges beginners to "shoot in raw mode, if your camera supports it." For archiving purposes, he suggested two CD-R backsups and InMedia software for cataloging.

More importantly, he stresses on the fact that there are no better or worse photographers; just photographers with different styles. Leveraging technology can really add to a photographer's style. And this is what Biela does best. An anecdote he detailed will suffice to prove the point:

A friend was getting married and could not afford to hire Biela in a professional capacity. So, he requested Biela to do the job for free. Biela quickly agreed. At the wedding, he clicked away with his digital camera and at the reception he started waving his wand. He dumped all the photos from the camera to his PowerBook, which was hooked onto a video projector. He then used iTunes (bundled with Mac OS X) and created a slideshow. The wedding guests, were thrilled and wanted to buy prints of the pictures. Customer's credit cards were charged—the pictures will be delivered via an online photo-finishing firm. He also burnt DVDs of the slideshow on his laptop. The DVDs sold at $39.95 a pop, and by the end of the day Biela had made a cool $3,200 from a free wedding.

As we're winding up Biela says, "You have to be more savvy on the computer." He also says to watch out for online photo-finishing firms, some of which will make a lot of money and change the way we photograph our loved ones.

Biela is happy with the way technology has changed his world, "It's a good thing," he says, adding, "There's lots of stuff to keep track of and learn, and I can decide what I need or don't." In the last few years, Biela confesses, he decided to use film just once—at his sister's birthday party.

As told to Vivek Shankar

Hurrah to contests!

Hi Vinit!

Contests! Contests! And more contests! What are the chances of winning? What are the (realistic) odds? Considering that this 'carnival' is going to be a quarterly affair, I wonder if readers get to choose what contest giveaways they'd like to see, or have... If so, and if you're open to suggestions on this subject, how about a contest that gives away free copies of 3ds max 5 + Combustion, or even Maya (or something cheaper)... Should entice interest amongst the pixel folk, no doubt.

Natraj Jayaraman
Via e-mail

Dear Digit Team,

I was just waiting for the pie and you gave it. The lots of Play and win Contests. I really love it all. Thanks for making my dreams come True. With Love.

Jacob Das
Via e-mail

digit

Hi Natraj and Jacob,

We're glad you love all these contests. We've got around 6,500 responses. What are your chances of winning? Simple! You'll just have to be luckier than the others. And we do have plans to give away software. Price is no factor; we're just waiting for some large-hearted sponsors. If you have someone in mind, do let us know. And watch out for another contest carnival this June!

Shattering myths

Hi Vinit,

Even though Digit gave the AMD Athlon XP 1700+ the Best Value award in February 2003, my hardware vendor insists that AMD processors need an air-conditioned room to operate or they get burnt out really fast. He mentions that these processors are not suitable for use in typical Indian conditions and recommends that I opt for a Pentium 4 1.7GHz instead.

Siddharth Utsav
Via e-mail

Hi Vinit,

I have heard that some games and other software might not run on an AMD based system. Is it true that most developers designed their software keeping an Intel Pentium processor in mind? Please suggest whether I should invest in an AMD processor?

Chetan Gupta
Via e-mail

digit

Hi Siddharth and Chetan,

You can safely purchase AMD CPUs without worrying about compatibility issues. While some games and applications might be optimised for Intel CPUs, the fact remains that they will run on any x86-compliant processor (AMD processors are fully x86 compatible and can also make use of some of the Pentium optimisations). As far as heat generation is concerned, this is a common problem with the latest CPUs and you are advised to use a vendor recommended heat sink and fan; most of the time the problem lies with the incorrect installation of these cooling devices so I'd recommend getting your CPU professionally installed. Also ensure that you don't skimp on your system's power supply unit and pick up at least a 350 Watt SMPS.

Show me the security!

Dear Vinit,

After checking out some spy software that can log every key press I make, I'm paranoid about using public computers at a cyber-café or allowing anyone to use my computer as someone might install such software and hack my Internet banking passwords. Even though there are detection tools available for such Trojans, how do I ensure that these scanners are installed on every machine I use?

Vijay Vatyani
Via e-mail

digit

Dear Vijay,

Security and privacy are big concerns for almost every computer user and paranoia on this front might not be such a bad thing after all. An extremist will tell you that everything we do can or is being watched at all times. However there are a few things that we can do to circumvent being spied upon: Install a personal firewall on your home PC to filter all outgoing network traffic, always update your anti-virus software, use strong passwords and never click on any unfamiliar e-mail attachments. Also, refrain from engaging in any online activity on public computers if the information you are accessing is sensitive in nature (online banking, shopping, etc).

Remember, in the U.S, a company has the legal right to monitor and observe all their employees in any job-related place or function. Sounds scary, doesn't it?

digit READER POLLS

Your vote counts

Q. Are you satisfied with the current packaging of Digit?

Yes	No
48%	52%

We welcome and encourage suggestions on how to improve the Digit packaging. E-mail them to readersletters@jasubhai.com.

This month's question:

Question: Which anti-virus software do you use?

Choice of Answers (for Web site only)

☐ Norton ☐ McAfee ☐ AVG ☐ PC Cillin

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

Head2Head: Should we, shouldn't we?

Hi Vinit,
I have been a Digit subscriber for the past one year, and I look forward to receiving it at the end of every month. However, with all due respect, the Digit Diary section can be safely dropped from the magazine and the space thus saved could be used for other popular sections such as Q&A and Quick Start.

Vidyut Naik
Via e-mail

ILLUSTRATIONS: Farzana Cooper

Dear Sir,
March issue's Digit Diary was outstanding. I would love to meet Jitenbhai and share some chicken *tandoori* with him. Deign to throw in at least one such page every month. It brings a breath of fresh air to our tech-filled minds and gives us the strength to survive till the next issue.

Vidyut Naik
Via e-mail

digit Hmm... Do tell us what you think of this month's Digit Diary

You still are a part of us

Dear Sir,
Thank you for the result of the first elimination quiz of Jasubhai Digital Media Talent Hunt. But I am sad to know that I have not passed according to your electronic system. I would still like to work as a Digit Ambassador to improve the visibility of your products. Please send me some more information. I am in my last semester of Diploma in Computer Application, and my exams are in May, 2003. Please inform me if you are looking for fresh talent in the nearby future, whenever you are need of it. I will always be eager to work with your company.

Rajesh B. Thallar
Via e-mail

Respected Sir
Thank you for such a nice and encouraging mail. I was really sad that I didn't make it through the competition, but I gave the exam very honestly. It would have been a dream come true for me to work in your company. It was really good of people such as you to motivate youngsters such as us to give this online examination. At least, now I really know where I stand and can work on my flaws. I'm definitely interested in working and being a part of your team.

Deepti Arora
Via e-mail

Wanted: some PCI lovin'

Vinit,
Your graphics card test in the March 2003 issue was useful for only those readers who have an AGP slot on their motherboard. However for 810E chipset based motherboard users like me who don't have an AGP slot but still have a keen desire to play the latest games, what are the options available in PCI video cards?

Harpreet Singh
Via e-mail

digit Harpreet,
You could buy a PCI graphics accelerator for your system, but these cards aren't as fast as their AGP counterparts and are becoming less and less common. In fact, I would seriously recommend that you consider replacing your motherboard with one that has a separate AGP slot before splurging on a graphics accelerator as this would provide you with more upgrade options (check out our comprehensive motherboard comparison test in the February 2003 issue).

digit Hi Rajesh and Deepti,
We have received hundreds of e-mails, expressing similar sentiments. We had to select only 300 from the thousands of candidates who participated in the online test. Believe me, it was a very tough choice. But do not despair. Stay geared. There will be many more such opportunities. We are very glad that you want to be a part of the extended family, by being Digit Ambassadors. You will shortly get more details in this regard.

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
E-mail: readersletters@jasubhai.com

Short Bytes

Dr. Digit in the house

Dear Vinit,
The article 'Health Hazards' (February 2003) was a real eye-opener. I was experiencing a few of those symptoms myself, but never realised that it was because of the long hours I was spending in front of my PC. Thank you, Dr Digit, for making a difference.

Ashish Mehta
Via e-mail

Waah! Waah!

Dear Vinit,
After reading the articles in your magazine for almost 2 years, I'm now quite comfortable with all aspects of technology. Thanks for making a novice like myself into an expert.

Aditya Dixit
Via e-mail

Goof Ups

Hi Vinit,
I was surprised to read that IBM ASCI White is reported as the world's fastest supercomputer. (Page 29, March 2003 issue) Would like to inform you that it's NEC Earth-Simulator, which is the world's fastest till date.

Sanjay Dhuria
Via e-mail

Hi Sanjay,
Yup, it was a genuine mistake. It should have read "one of the fastest supercomputers".

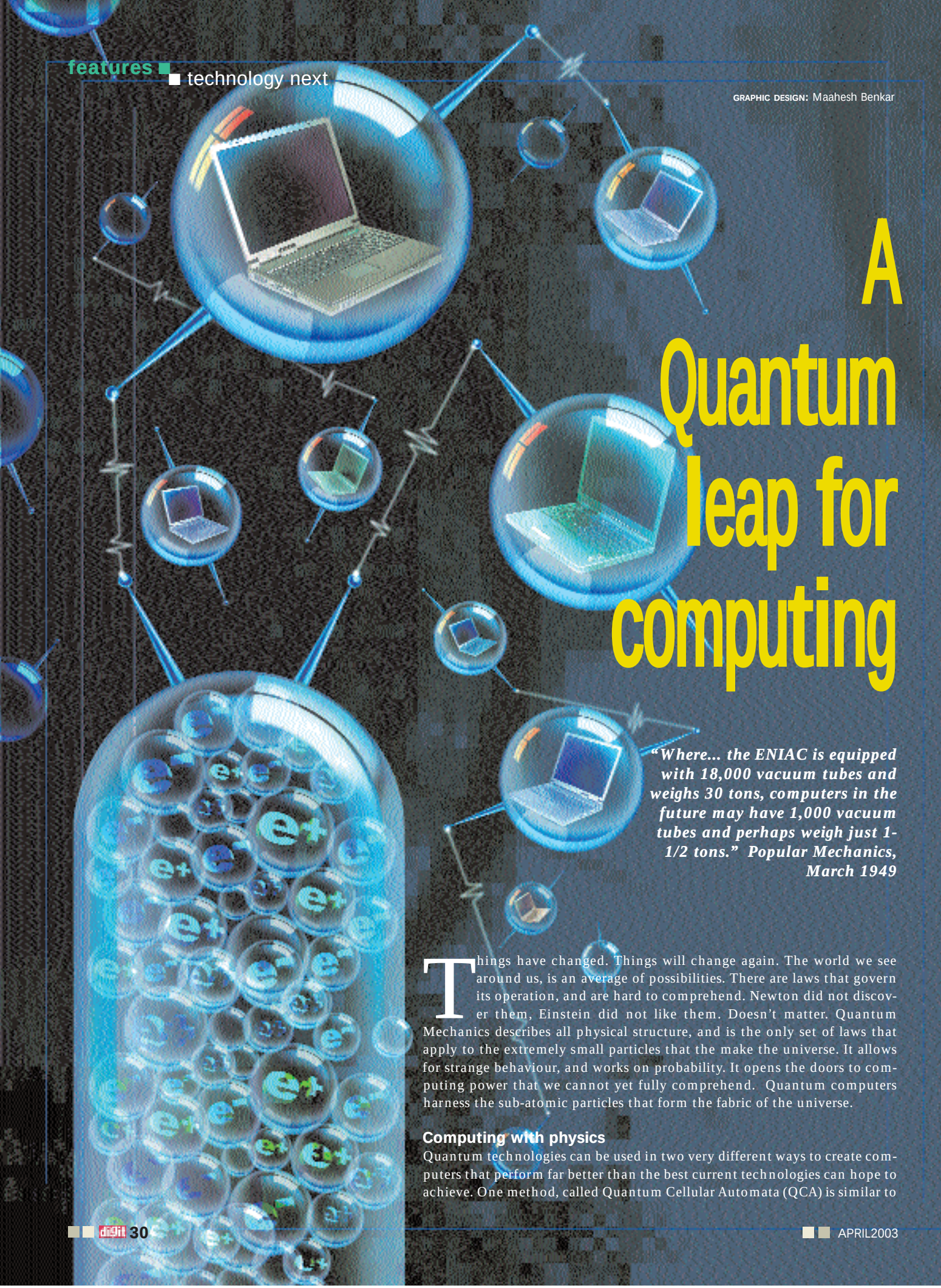
Dear Sir,
I noticed a few glaring errors during the Talent Hunt test—the links from the Nav menu on the left, such as Magazines, Multimedia, and Internet. It's a case of relative links gone wrong.

Dr Bijlani

Dear Dr Bijlani,
Thank you for alerting us. We will keep this in mind.

Notice any goof-ups? Write to goof@jasubhai.com

GRAPHIC DESIGN: Maahesh Benkar



A Quantum leap for computing

"Where... the ENIAC is equipped with 18,000 vacuum tubes and weighs 30 tons, computers in the future may have 1,000 vacuum tubes and perhaps weigh just 1-1/2 tons." Popular Mechanics, March 1949

Things have changed. Things will change again. The world we see around us, is an average of possibilities. There are laws that govern its operation, and are hard to comprehend. Newton did not discover them, Einstein did not like them. Doesn't matter. Quantum Mechanics describes all physical structure, and is the only set of laws that apply to the extremely small particles that the make the universe. It allows for strange behaviour, and works on probability. It opens the doors to computing power that we cannot yet fully comprehend. Quantum computers harness the sub-atomic particles that form the fabric of the universe.

Computing with physics

Quantum technologies can be used in two very different ways to create computers that perform far better than the best current technologies can hope to achieve. One method, called Quantum Cellular Automata (QCA) is similar to

current electronic technology in that it uses the concept of blocks of computation units, such as adders, stores and wires. The difference is that the building blocks are not transistors, but Quantum Cells that leverage quantum effects. The other kind makes use of quantum physics to change computing, the way electronic computers surpassed the old mechanical variety. Of the two, QCA is simpler and more likely to be in use commercially in the medium term.

Quantum Cellular Automata

Quantum Cellular Automata comprises a series of tiny Quantum cells arranged in patterns to harness their interactions for computing. Each cell is composed of a group of four or five quantum dots. A quantum dot is a nano-structure, created to trap and hold a single electron. It consists of a highly insulating material, enclosing a very small island of conducting material. This conducting material can hold an electrical charge—an electron. As temperatures increase, the size of the quantum dot must decrease to be stable. Current research indicates that these quantum dots would have to be 1 nanometer (nm) in size at room temperatures. Compare this to current CPU fabrication at 130 nm or 0.13 microns.

The quantum dots are arranged as shown in Figure 2, to create one Quantum cell. There are only two electrons in one cell, though you see four quantum dots ready to hold them. The quantum dots are divided into two pairs, each sharing an electron between them via a quantum-tunnelling junction. The electron can take advantage of quantum tunnelling, to instantly appear in the paired quantum dot, without ever needing to overcome the resistance of the insulation. That's quantum weirdness for you.

Both electrons have a negative charge, and repel each other so when one electron takes up residence at a dot, the other must go to the diagonally opposite corner. This way you have a simple binary state, where the electrons can be made to toggle between the two diagonals,

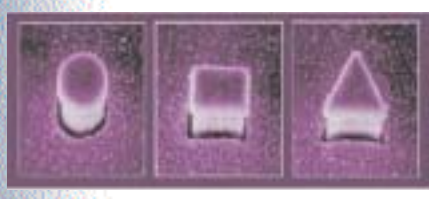


Figure 1: *Quantum dots can take various physical shapes.*

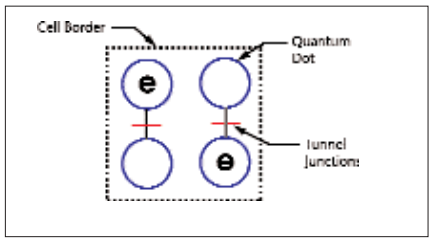


Figure 2: *Quantum dots placed near each other form Quantum cells*

forming one bit of storage.

Computing with QCA

When you have a row of bits lined up in your computer's RAM, they normally do not interact with each other at all. Each stores its state on its own, and minds its own business. But quantum cells are different. Very interesting effects appear when you bring two cells together. If you line up two cells, edge to edge, they will both assume the same diagonal. Again this is because electrons prefer not to stay close to each other. The charge one—the electron in the first cell—repels the electron in the second cell, forcing it into the opposite quantum dot.

If you lay down a line hundred cells

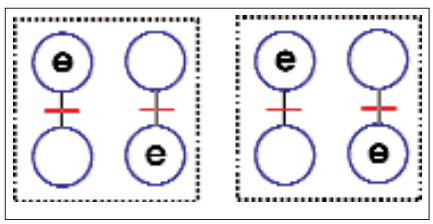


Figure 3: *Quantum cells in proximity affect each other.*

long, and flip the electrons at one end, all the cells along the line will also flip to that state. You would have created a simple wire that transfers the bit set at one end to the other end. This property of quantum cells can be used to create logic circuits for Boolean logic.

While quantum cells have yet to be fabricated at anywhere near room temperatures, theoretical researchers have been busy working out the mathematics and logic needed to use QCA. Already QCA have been shown to implement, exactly the same logic as transistor-based circuits do now.

This begs the question that if QCA are just another way to implement what we have today, why should we be bothered? One direct trend in transistor-based computing is the need to stuff more and more transistors close together, to boost speeds and efficiency. Transistors are already so small that quantum effects are beginning to show themselves. If smaller devices are to be made, they must harness quantum effects, and not just work around them.

Current leakage in conventional circuits not only effects the efficiency of chips, it also limits how small and how near the components of the circuit can be before they begin interfering with each other. QCA do not suffer from this problem because they depend on the fact that there is zero leakage, only manipulation of trapped electrons. Both these advantages mean that Moore's law can continue to progress into sub-atomic realms.

Quantum bits and superposition

In conventional computing, we are accustomed to the term bit representing a state, usually denoted as 0 or 1. Any physical object capable of holding two steady states can be used to hold a bit. For example, bits are stored as the state of a magnetic domain on your hard disk surface, or as a capacitance charge in RAM, or as we saw in QCA, the position of electrons in a Quantum Cell.

As we reduce the size of physical storage for one bit, approaching sub-atomic particle sizes, a strange phenomenon takes over—the particle begins to exhibit Quantum Mechanical behaviour. The most odd manifestation of this is that the bit can suddenly be 0, 1 or both at the same time! To be precise, the state of the bit is a probability of being 0 or 1. As long as the bit is isolated from the rest of the world, its state is a probability distribution. As soon as the real world peeps in, it drops into one determinable state. We cannot accurately predict which state it will be in, without actually observing it. This behaviour is called superposition, and is one of the big mysteries of quantum theory.

If your remember Young's experiment

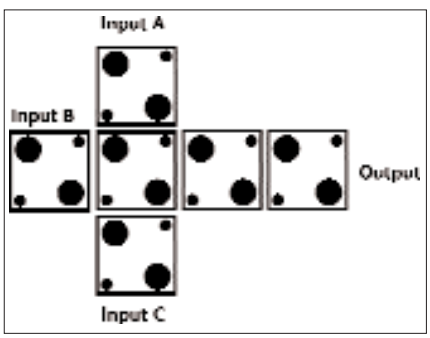


Figure 4: *Logic gates made from QCA perform the same operations as conventional transistors*

from higher school physics, you will have seen superposition in action. It is this behaviour, of being in both states at once, that can be harnessed to perform almost miraculous feats of computing--such as examining both sides of a coin at once, investigating simultaneously the calculations of both a positive and negative input, and instantly searching vast databases.

A bit, represented as a quantum mechanical particle, is called a Quantum Bit, or qubit for short. Any property of a quantum mechanical particle can theoretically be used to store a qubit, and—in these early days—researchers are experimenting with many different kinds of materials to hold qubits. Electron 'spin' and polarization of photons seem to be the most popular media.

A photon is a particle of light. Polarization of a photon is simply the plane along which the light wave vibrates. Wave or particle? It's both! Spin is a property that is very hard to describe, and is usually just abstracted as the direction of rotation of a particle. There is more to it, though, since you may come across particles with 1½ spin as well. Enough to make your head spin!

Fit to be tied

Not satisfied with all the funny business about determining the state of the qubit, we must also deal with quantum entanglement. If you were baffled before, please brace yourselves for this one. Two quantum particles, a pair of photons or electrons for example, can be 'entangled', such that any change in one particle is instantly reflected in the other.

Here is a simple thought experiment you can try at home. Hold on to a mental picture of two particles in close contact, transmitting their state to each other. Now take them 10nm apart. Change the state of one, and the other undergoes the same change. Now take them 10 metres apart, repeat process and get the same result. Now take them 10 kilometres apart. Repeat. 10 light-years apart. Repeat. No matter the distance, entangled particles are soul mates like no other. Scientists in a Dutch University demonstrated last year that entanglement works even when one of the particles is fired through a sheet of metal, thick enough to block light. Albert Einstein himself described it as "spooky action at a distance." We are in good company.

Boundless opportunities

It doesn't take much effort to figure out that such a means of communication opens up huge opportunities, including wireless circuitry in quantum computers and teleportation sometime in the next century. Scientists from the University of Vienna in Austria have indeed been able to teleport qubits around over a stable link of quantum entangled photons. Using entanglement to 'wire' qubits together is essential in manufacturing a quantum computer. A discovery early this year in the University of Michigan heralds a promising new technique to entangle three or more electrons to communicate 'spin'.

According to the University of Michigan News Service, here is how they did it—"In the presence of an external magnetic field, a resonant laser pulse creates localised excitons (bound electron-hole pairs) of radius ~ 0.005 microns in the CdTe well. Electrons bound to donor impurities within that radius, feel the presence of the exciton in such a way that they became entangled after the exciton is gone. The process involves resonant Raman transitions between Zeeman split spin states. In the experiments, the signature of entanglement involving 'm' electrons is the detection of the 'mth'-harmonic of the fundamental Zeeman frequency in the differential reflectivity data." Interesting.

Calculation

The strength of quantum computers is not that they can take a stream of calculations and process them in serial order at high speeds—like the hot P4 or Athlon XP that powers your desktop computer. They are massively parallel computation devices, and if you are thinking of supercomputers with thousands of CPUs, think again.

Combine the ability of a qubit to be in two states at once, with instantaneous connections through entanglement, and you have the makings of a quantum computer. One that can evaluate the probability of a combined set of states of hundreds of thousands of qubits in a single step, and produce the result instantly. In that instant of observation, the qubit array could have been in all of billions of possible states. Yet at the end it must choose one, and that is the result of the calculation. The killer application for parallel computing at this unparalleled scale is Grover's Search Algorithm—a quantum algorithm to search across an unordered list.

A traditional computer must examine each item in the list for a match, in serial order. A computer with 10 CPUs could do this in 1/10th the time. A quantum computer, on the other hand, can—with enough qubits—examine thousands of items at once, faster than yet possible. Similarly quantum algorithms for factoring large numbers are expected to create havoc in cryptography. Encryption algorithms hide behind the fact that there isn't enough computational power to crack the code, especially with larger keys. Quantum Computers will be able to rip through them with ease...but don't expect the Model3000ZX Quantum Crack-o-matic anytime soon.

> Quantum entanglement is hard to explain. The best way to understand it? ... "spooky action at a distance"
>
> —Albert Einstein
> Scientist

Quantum cryptography

One of the fundamental problems in cryptography, is how do you get the encryption key (or password, if you prefer) to the receiver, secretly. There is currently no way to guarantee that a snooper has not read the key on the way to the receiver. One workaround is Public Key Cryptography, that involves a shared public key which the whole world knows, and a hidden private key that only you can use. As explained earlier, with quantum computers, it will be possible to crack even large keys. It will also be possible to infer the private key for a given public key. No need to panic already, though, since quantum computers aren't expected anytime soon.

Yet another fundamental and counter-intuitive property of quantum particles is the slipperiness. According to Heisenberg's

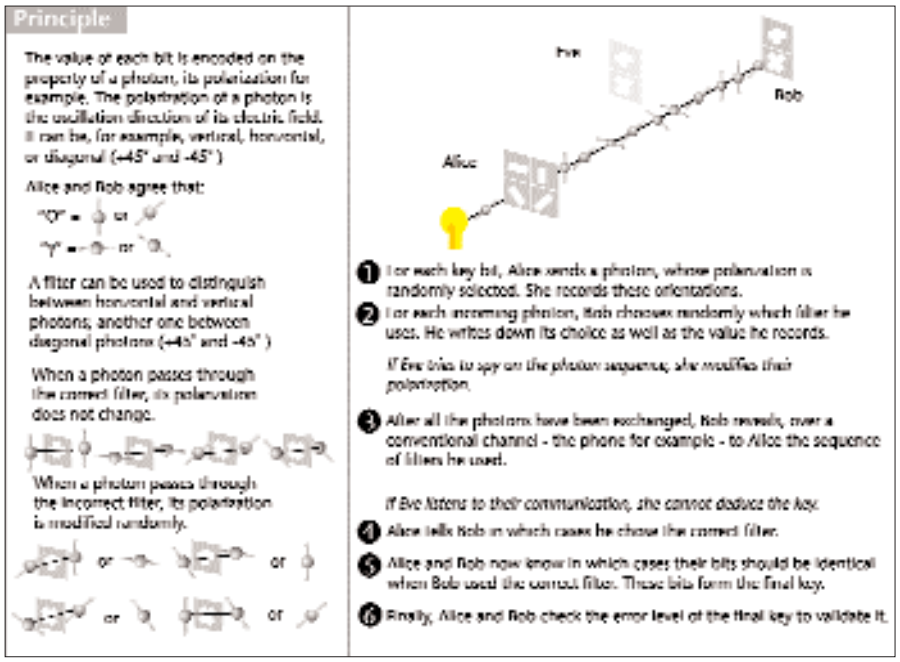


Figure 5: *Operation of Quantique's QKD technology*

Uncertainty Principle, you can be certain of either the momentum or the location of a particle, but not both. Measuring one will inevitably alter the other. This implies that if Alice sends Bob one quantum particle in a known state, and a snooper attempts to read that state, he will alter the particle in some measurable way.

The state of the art for key distribution is Quantum Key Distribution (QKD). QKD involves transmitting the bits of a key as qubits represented by quantum particles. Photons are the choice in current commercial products, since they can easily be carried over familiar media such as fibre optic cables. After all, a photon is just light. MagiQ and Quantique are pioneering companies with commercial QKD technology available now. Both claim to have deployed in some large companies and defence installations. Both are currently limited to tightly controlled fibre optic installations with range under 60 km. British Defence researchers have managed to transmit usable photons across 23 km of open air, and hope to eventually be able to bounce them off satellites hundreds of kilometres up for global coverage.

Sites to Visit

Los Alamos Quantum Cryptography
www.idquantique.com
Getting started with quantum computing
http://www.qubit.org/library/introductions.html
Interactive Young's Experiment for Quantum Superposition
http://www.colorado.edu/physics/2000/schroedinger/
[Originator of Quantum Computing Theory]
http://www.qubit.org/people/david/David.html
Belcher's Research on using Virus to make Quantum Dots
http://www.cm.utexas.edu/belcher/Research/
Introduction to Quantum Cryptography
http://www.cs.dartmouth.edu/~jford/crypto.html
[Commercial Quantum Key Distribution kits]
http://www.idquantique.com/

Applying the brakes

While there is significant progress being made in the field of quantum computing, researchers are still grappling with some fundamental problems in the fabrication of actual computers. One of the most difficult problems is that of Decoherence. For a qubit to function usefully, it must be completely isolated from its surroundings or the 'environmental noise' will cause decay of the quantum state. As yet, qubits have been maintained only for fractions of a second at a time. However, this situation is improving steadily.

The second major problem is that of fabrication. At quantum scales, light cannot be used to etch the control structures required. It is too broad a brush. Electron-beam lithography has been used to create quantum structures on conventional semiconductors in NEC, Japan earlier this year. This is a significant breakthrough, because it demonstrated the integration of quantum computing technology with existing semiconductor-based systems. Scientists at the University of New South Wales in Australia have fabricated, what appears to be the first mass producible silicon-chip qubit that can be read by sensitive transistors. They expect to have it performing useful processing but 2007.

A more far-fetched, yet apparently successful, attempt to build layers of quantum dots using a virus was made at the University of Texas. Scientists managed to create modified viruses that captured Zinc Sulphide molecules to form quantum dots. The viruses were then made to self-organise into a sheet of regular crystalline structure with uniformly spaced quantum dots. Work remains to be done to connect the dots, but the scientists are optimistic.

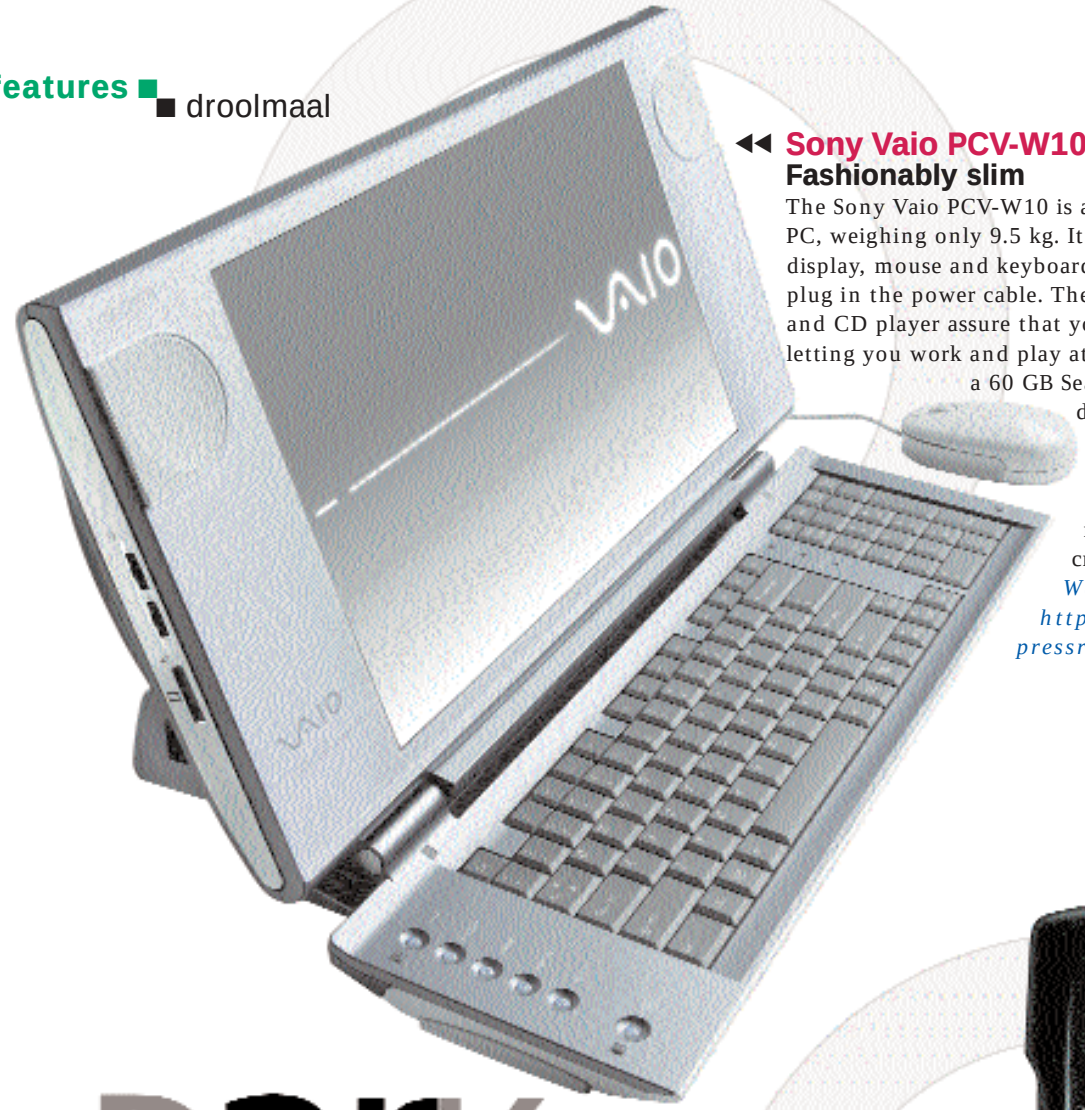
While these are the major roadblocks on the way to a successful commercial quantum computer, there is theoretical evidence to show that quantum computers may be energy guzzlers, consuming megawatts of electricity to keep two steps ahead of Decoherence. Better materials and techniques to reduce Decoherence would reduce energy consumption.

Throwing some light

In 1982, Richard Feynman indicated the possibility of quantum computers. That's when work began to prove it was possible, and figure out the theory behind its workings. David Deutsch, a scientist associated with Oxford University was awarded the Paul Dirac Prize for 'pioneering work in quantum computation leading to the concept of a quantum computer…' in 1998.

It took 50 years for computers to progress from gigantic building filling monsters to compact boxes on the desktop, that led the information revolution. Quantum computing is in its first decade yet, and already many basic problems considered insurmountable have been cracked. While we suggest you not line-up for a quantum *QuakeX* tournament anytime soon, it is quite a fairly safe bet that quantum computers with 'Qintel Inside' will be powering our not so distant future.

SUMOD HALEJA



◀◀ Sony Vaio PCV-W10
Fashionably slim

The Sony Vaio PCV-W10 is a cleverly-designed slim PC, weighing only 9.5 kg. It has a built-in flat panel display, mouse and keyboard. All you need to do, is plug in the power cable. The integrated speakers and CD player assure that you are never dull, by letting you work and play at the same time. It uses a 60 GB Seagate ST360020A hard disk, and the body of the unit is neatly hidden behind a 15.3-inch, wide-aspect ratio, adjustable liquid-crystal display.

Web site: http://news.sel.sony.com/pressrelease/2831

Dark Beauties

The final destination to indulge your fetish for funky devices

NOKIA 8910i ▶▶
Truly titanium

The Nokia 8910i attracts attention with its full colour screen, and the black outer cover made of pure titanium—Strong as steel, light as aluminium—true titanium makes you instantly aware of possessing the extraordinary.

The phones' slides open smoothly upon touching its subtle side-triggers, thus revealing the keypad and selection keys. Weighing a meagre 112 grams, the 8910i equipped with MMS, Java, High Speed Circuit Switched Data (HSCSD) and GPRS. Bluetooth capabilities support data swapping, and audio transfer with other Bluetooth-enabled devices. The phone packs up to four-and-a-half-hours of talk time, and around 300 hours of standby time.

Web site: http://www.nokia.com/nokia/0,,4610,00.html

CASIO ProTek GPS Pathfinder ▶▶

Time for a little GPS

Casio puts its GPS technology into a wristwatch. The ProTek GPS Pathfinder is designed to receive and process data from GPS satellites orbiting the globe. With a look at your wrist, you can find the current latitude and longitude, heading and distance to a destination, current speed, waypoints and progress between waypoints. And that's not all. You can even store all this navigational information in the inbuilt memory for future reference. So, the next time you head out on a trek, forget the compass and the other tools. Just carry the Pathfinder, and you will never lose your way again.

Web site: http://www.casio.com/gps/top.html

◀◀ Technics SL-1210M3D

Lay down the vinyl and scratch

The Technics SL-1210M3D is a unique tool of trade for both amateur and professional DJs, given its versatility and reliability. The SL-1210M3D is a combination of two killer technologies—it's quartz synthesised, and has a direct drive motor to ensure an accurate pitch and speed playback with minimum wow and flutter. The direct-drive offers a very high torque that allows for precise ramp-up speeds from a cued position. Another feature that helps keep a steady beat, is the continuous pitch/speed adjustment—up or down 8 per cent—along with a reset button. The SL-1210M3D is encased in a heavy duty die-cast aluminum cabinet and base material to reduce vibration, and has disc slip mat and a pop-up stylus illumination.

Web site: www.technics1210.com

Apple PowerBook G4 ▶▶

A 17-inch fruit

Built upon a 1 GHz PowerPC G4 processor, nVidia graphics and a slot-loading SuperDrive, Apple has come up with a promising portable solution that's crowned with a 17-inch display! Encased in a durable aluminum alloy enclosure, the PowerBook is an inch thin, and just a little over 3 kg. It's the first notebook to offer built-in Airport Extreme 54 Mbps 802.11g wireless networking, high-speed FireWire 800 and a backlit keyboard with ambient light sensors. It can connect wirelessly to cellphones and other Bluetooth-equipped peripherals.

Web site: http://www.apple.com/powerbook/index17.html

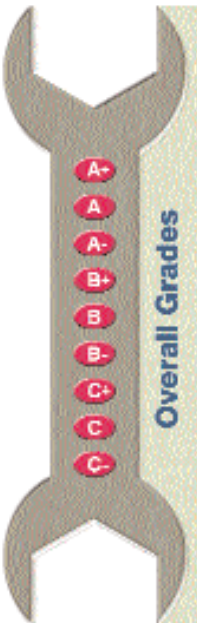
How we Test

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

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

Comparison Tests

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



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

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

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

The Awards

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

In Bazaar

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

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

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

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

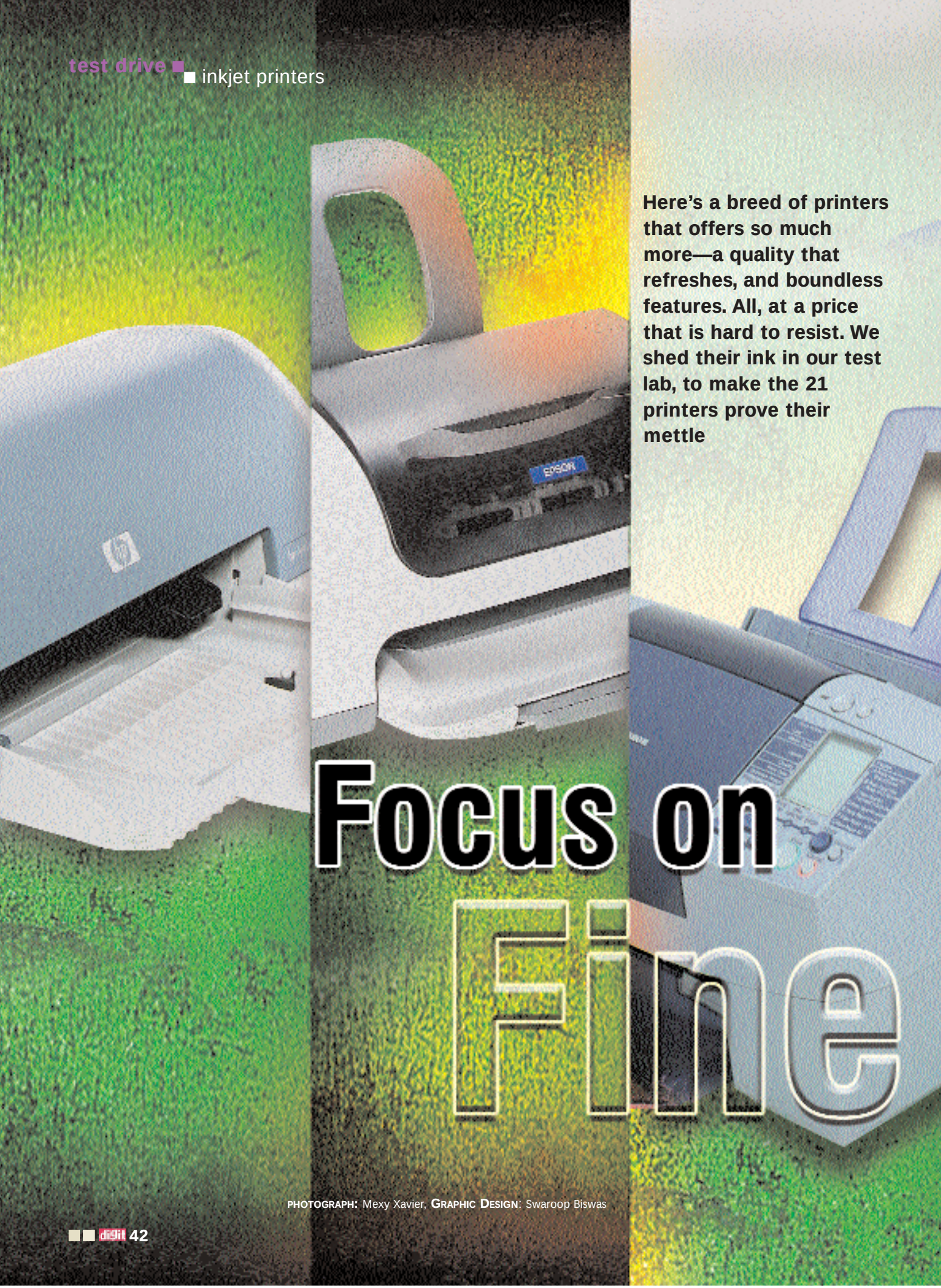
In Test this Month

Scanners and printers pay a visit to the Santa's workshop that is our Test Centre. Price is playing nice and the features are raining upon us mortals—all in all—these products present some pleasantly surprising results. 22 scanners and 21 printers from the leading market vendors (HP, Canon, Epson, et al) are put under the microscope for your viewing pleasure. We hope to help you choose the right desktop companions for home, business and professional use.

The Bazaar section overflows with goodies. First up is a Tablet PC from Toshiba; is it as great an innovation as we've been led to believe? Find out. Also fresh from the market is the AMD Barton XP 3000+. Marketed as the definitive answer to Intel's P4 3.06 GHz processor, we put it through the paces and find out if it has the legs to carry it past both the P4 and its own AMD sibling, the Thoroughbred core.

Maxtor packs a whopping 250 GB into a disk and we have the result on our test table; flip the pages to find out if this beast is also a performer.

For the audio enthusiasts, we have some great news: a THX-certified, 5.1-speaker set from the stables of Creative. A 150W RMS subwoofer and 5, 70W RMS satellites shook the Jasubhai building to its foundation! There is of course, more. Hope you enjoy our offering as much as we enjoyed testing it!



Focus on Fine

Here's a breed of printers that offers so much more—a quality that refreshes, and boundless features. All, at a price that is hard to resist. We shed their ink in our test lab, to make the 21 printers prove their mettle

PHOTOGRAPH: Mexy Xavier. GRAPHIC DESIGN: Swaroop Biswas

Prints

A revolution is on the cards. Gone are the days when people would shy away from an inkjet printer because of the cost involved, and settle for an aging dot matrix printer instead. Due to the fierce competition between the major players in the printer market, costs have drastically fallen, making inkjet printers increasingly affordable for the masses. Where a year ago, an entry-level inkjet printer would cost around Rs 6,000 to Rs 7,000, today the same costs around Rs 3,000 to Rs 4,000.

But before you buy a printer, you need to chalk out your needs, budget and the frequency of your printing. A user who prints two-odd pages, once or twice a week, will find investing in a costly printer an overkill. An entry-level printer would meet his needs, and provide acceptable quality at a good price. The same entry-level printer will not meet the needs of a professional who demands quality printing at high speeds. Again, for gadget enthusiasts who indulge in convergence, printers now allow direct printing of photographs from a digital camera, skipping the intermediary PC.

The usage pattern for any printer shows text printouts at the top of the chart, followed by combination documents of text and images—Very rarely does one, other than a professional, use a printer solely for printing images. Any entry-level printer can satisfactorily print text-only documents. Higher-level printers provide

excellent additional features such as dual-side printing capabilities, direct printing from digital cameras and separate ink tanks, especially for printing photographs and the like. Thus, the entire gamut of printers can be explored, depending upon one's needs. Keeping this in mind, we tested 21 inkjet printers from leading vendors in the Indian market. We evaluated each printer for three application areas—home printing, office printing and professional printing—to help you choose the one best suited to your needs.

How we tested

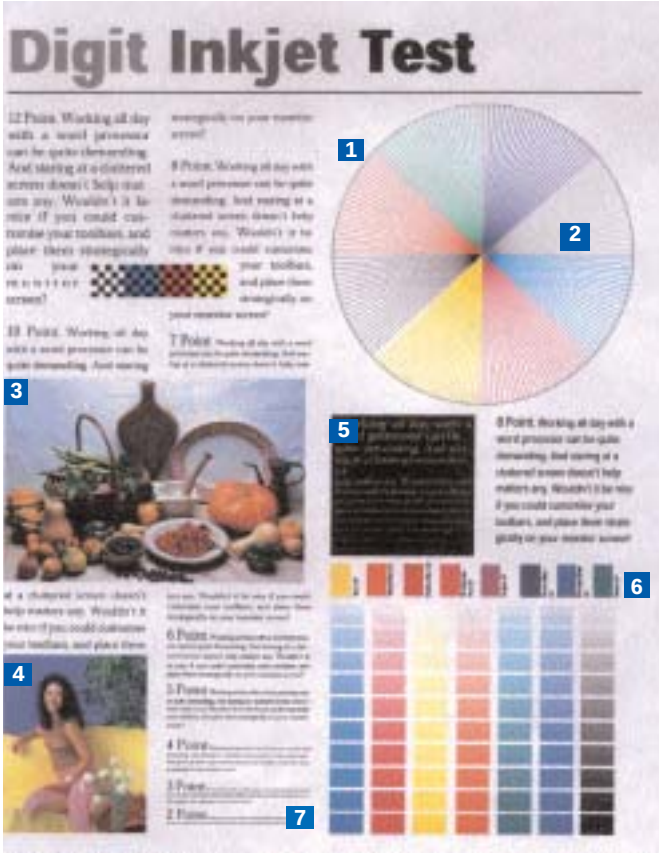
Having established the areas of home, office and professional printing to evaluate a printer, we decided to further define the areas according to the printing quality offered and features available. For the home segment, the distributed weightage was 50 per cent for price, 30 per cent for performance and 20 per cent for features. A printer that gave decent printing speeds, acceptable photo printouts and affordable (in the price range of Rs 3,000 to 5,500) was considered an ideal home solution. For establishing a printer as an ideal office printer, the score was divided and price got 20 per cent, performance got 50 per cent and features, 30 per cent. In the time-saving environment of an office, speed takes paramount importance over any other factor. Features such as dual-side printing, ink status through driver, larger buffer memory, etc, were also given the due consideration. For professional printing, the overall score was split into 20 per cent for the price, 50 per cent for performance and 30 per cent for features. The only difference here was that, under performance, speed was given lower priority and the output quality more importance.

We tested all the printers on a text document, a combination document that contained both text and pictures, and a pure image document. With the benchmark score in hand, we then calculated the Suitability to Task Index (STTI) for each application area. With this STTI score in hand, we could easily define a printer's suitability to any of the three defined application areas. For example, if a printer's STTI for the home segment is 70 points, 67 for the office category, but 85 for the professional application, then it is more suited to professional applications.

All the test files, except the image file were printed for two different quality settings. The text and the combination document were printed at normal and best quality settings; the image file was printed using only the best quality settings. For printing the text and combination document, we used a 75 GSM (gram per square meter) normal paper, whereas for the image file, we used a 140 GSM photo-quality paper. These test documents incorporate every small detail that a printer needs to reproduce the smallest point text, lines and specular effect on metal.

The combination document has many sections with text of varying points; lines, circles, seven colour bars of decreasing gradient and a small picture at one corner. Each of these subsection tests the printer's ability to reproduce tiny details. The varying font-size tests the printers' ability to differentiate between adjacent fonts and reproduce the smallest possible text. Whereas the circle of lines test a printer's ability to reproduce lines without jarring the edges. Similarly, the seven colour bar tests the colour reproduction capabilities of the printer's cartridges.

The image document is made up of many elements, with varying contrast and brightness areas. This document tests the printers



1 Uniformity of the outline circle: *We checked for misalignments and missing patches*
2 Resolution test: *We examined the printer's ability to reproduce closely packed converging lines*
3 and 4 Quality of photos: *Specific details for each photo were mapped (clarity of the grille pattern, the shine on the fruit, and so on)*
5 Yellow text on black background: *This area helped us evaluate the printer's ability to print high-contrast text*
6 Number of distinct colour bars: *There are 10 bars in each colour pattern, and each bar has two shades. If a printer could print two distinct shades for each bar in every colour pattern, it was awarded a maximum score of 10*
7 Readability of fine text: *This text is in varying point sizes, ranging from 6 to 2 points. The printer was awarded one point for each readable line*

Crouching Printer, Hidden Costs

The norm, while buying peripherals, is to base purchases on their price tag. For printers, there are other significant running costs involved, primarily the cost per page.

For instance, assume that a black ink cartridge for the printer you have bought costs Rs 1,000, and can ideally print 2,000 pages. You will thus be paying 50 paisa for every page that you print. The exact cost will vary depending on the printing quality you use (Draft will be cheaper, while High-quality printouts will cost you dearly), but this is a fairly reliable method of comparing running costs across the board.

So what does this running cost mean to you? Well, if you just print a page a week, this figure means absolutely nothing. On the other hand, if your printer will be used to a great extent (several pages a day), keep the cost per page in mind. A seemingly cheap printer with a high cost-per-page figure will end up being more expensive in the long run, than a costlier printer with low running costs.

colour reproduction ability on a photo paper, an ideal output should look as striking and brilliant as that taken from a studio.

All these printers were tested on our test bed, comprising an Intel Pentium 4 2.2 GHz processor seated on an original Intel 845 GEBV2 motherboard, with 256 MB DDR RAM and a 40 GB 7,200 rpm ATA IV hard disk. Windows XP was our operating system. For the graphics sub-system, we used a SiS Xaber 600 graphics card. We used Word XP for printing the word document, whereas Adobe Acrobat Reader 5.0 was used to print the combination document. For printing the image file, we used Adobe Photoshop 7.0. The printers that came with both parallel and USB interface where tested only on the USB port.

How they fared

If you are out in the market trying to purchase an inkjet printer, you will notice that the majority of the vendors will recommend an HP or a Canon as a suitable solution. Such is the cult status that these companies have acquired within the printer market; but there are other printers companies, such as Epson and Lexmark apart from Olivetti and Sharp (which are the least known brands) that are just as good. If you think that a high price indicates the performance of a product, you may be in for some disappointment. The additional price is often more for the extra features, than the speed, hence a lower-priced printer may be not have too many features, but can be the fastest on the block. Considering all these factors, we decided to take them all on a printing spree to find out which of these printers did their job the best.

To Market, to Market

- Choose the printer based on the kind of print quality you require—i.e. in general, Inkjet printers offer excellent quality as far as images and graphics are concerned, whereas a laser printer offers excellent text quality printouts. (We haven't tested laser printers in this issue.)
- While buying an inkjet printer, do check the page per minute speed (ppm) since the manufacturer's rated speed is always with context to the printer's fastest mode of printing and not its best quality mode, which is used quite often.
- If you intend to share the printer over the network, look out for the amount of buffer memory—the more the better.
- If you are buying the printer for photo printouts, always take a test print to ensure the required quality. Also remember that most printers require a separate ink cartridge for photo-quality printouts; check this, else you will have to shell out an additional amount for a photo cartridge.
- Check the type of interface supported by your PC, generally all PCs today have USB ports, so buy a printer with a USB interface, as it offers a higher speed of data transfer.
- Consider the total cost of ownership, and not just the purchase price. Depending on how many pages you print, even a small difference of a rupee will save you a sizeable amount of cash over the lifetime of the printer.
- Check whether the printer supports additional features, such as ink status determination via software so that you can change the cartridge upon indication.
- Check the manufacturer's Web site for the type of support they offer in the form of regular software updates, patches, etc.
- Ensure that the footprint of the printer is such that it sits comfortably on your desk.
- The printer should come bundled with the requisite cables, or you may have to spend more purchasing them separately.

Home printing solutions

So who is a home user? Exact definitions apart, a home user is one who usually takes one or two odd prints—infrequently. Most of the printing material is textual, with an odd photo print. Hence, price plays a major role in the buying decision, followed by performance and support from the printer manufacturer.

After the relevant scores were gathered, we calculated the Suitability to Home score, which determined the success of a particular printer in this application area. To further narrow down on the ideal solution for this application area, we took into consideration the price. Thus, the printers that cost between Rs 3,000 to Rs 5,500—and scored greater than 65 STTI—are suited to home printing. Based on this, we present the following analysis.

The best printers for home users

For a printer to be suited to a home user, it should have a decent printing speed, with acceptable print quality under both normal and best ink settings. Also, there shouldn't be too much of a time difference between printing text and image documents. The quality of the photo printout should be satisfactory.

The HP 3325 printer came out on top of the home-printing group because of its excellent price to performance ratio. This printer was the least-priced printer in the whole test, and defied the 'higher the price, better the performance' theory.

The HP 3325 took only 18 seconds to print out the text page, and only 169 seconds to print the image document; this feat is amazing when considered that photo printing devices, such as the Canon S530D, took 223 seconds! The final image quality was not sacrificed upon, and all the details were reproduced at a more-than-satisfactory level. Marrying such a fine performance with the low price tag of Rs 2,999 produced the excellent STTI score of 65.79.

The Lexmark twins, Z25 and Z35, that fall in the same price band, showed below par performance. Although both these printers were as good as the HP 3325 at printing black and white text printouts, they failed to catch up when the work demanded colour printing. They took 569 and 570 seconds respectively, to print the image document. All this combined, gave them a low STTI score of 43 and 45, respectively.

The HP 3420 also performed acceptably in all the tests, but lost some valuable points to the speed of printing, by taking longer to print the image file. The only reason it lost on overall grounds at the STTI index was because of its price—a good Rs 1,000 more than the HP 3325. Other printers scored a higher STTI score, in the order of 79, but simply didn't fit the bill. Hence the HP 3325 was the clear winner.

Our recommendation for an ideal home printing solution would be the HP 3325 since it hits the sweet spot with good performance and a price that fits everybody's pocket.

Office printing solution

When office resources such as printers, are shared over a network, the printing speed is of most importance. Features, such as a printer's buffer memory, directly affect its performance—since data transfer rates and queuing time between print jobs come into the picture. Practical features, such as checking the ink-status through the provided driver, can further help a system administrator, as a time-saving device. With USB 2.0 connectiv-

Wear your Attitude: Iron-on Transfer

Step 1: Select the image file that you wish to transfer onto your t-shirt. To print the file, set the printer setting to Best quality and paper type to Transfer Paper. You also need to check the Mirror option. Before you print the image on your costly transfer paper, print it on a normal paper in order to check the colour and size of the image. Once satisfied, print it on the transfer paper.

Step 2: Take a t-shirt and place it on a flat and firm surface, such as a table, so that the under surface does not bend and provides even heating to all parts of the paper.

Step 3: Place the Iron-on transfer paper with the printed side down on the t-shirt and arrange it properly, such that the edges are parallel to the t-shirt's edge.

Step 4: Set the iron to the maximum heating possible and move it over the iron-on transfer paper, such that it receives even heating across the entire area.

Step 5: Take care not to over heat the paper, stop ironing when the paper turns slightly dark in colour and start peeling the paper from one edge.

Step 6: As you peel one edge off the paper and ensure that the transfer has taken place. Continue to peel slowly, with one hand holding the t-shirt in place.

Step 7: After peeling the paper you will see a plastic coating over the printed surface don't try to remove it; it will go once you wash the t-shirt.

For a Better Relationship with your Printer

1. Before you start using your new printer, align the cartridges using the accompanying software.
2. Always store the cartridges in a cool and dry place and within the provided container; never in the open.
3. Use the power switch on the printer to switch it on, rather than directly using the surge protector.
4. To avoid paper jams, clean the rollers and the internal mechanism with a mild cleaning alcohol. Set the paper guides carefully while placing the paper in the tray for printing.
5. Always use good quality paper to prevent paper jams; use the manufacturer's recommended print media for optimum results.
6. While printing photos, use the manufacturer's recommended photo paper, else the ink won't dry and the results won't live up to your expectations.
7. Over a period of time, the printouts tend to become faint and lines will run across the page. This happens due to the ink drying up around the nozzle: to restore the original print quality, many inkjets come with a nozzle cleaning function that blows ink through the nozzle, unclogging it. Look for this feature, especially if you use your printer infrequently.
8. For optimum and trouble free performance, insist on an original ink cartridge. Do not get them refilled to save on money.
9. Air bubbles in the cartridge can cause the printer to shut down. Never shake the ink cartridge as that can creates bubbles.
10. It is very important to replace cartridges as soon as they dry up, or they can clog the print head causing poor quality printouts.

ity, a printer can do the job much faster than with an aging parallel port. Moreover, the provision for a network adapter can further increase its usability, since this means that it can be shared on a network, rather than on some machine.

We looked at all these factors to evaluate the printer's suitability to this particular application area. To further hone the conclusion, we factored the performance scale with the price of the printer, to arrive at the overall STTI for office applications. For any printer to be an ideal office companion, it had to score above 78 STTI and cost between Rs 6,000 to Rs 11,500. Based on all these considerations, we present the following analysis.

The best printers for office printing

The bulk of the work in any office comprises black and white text printouts, with occasional colour ones. Therefore, the text printing speed was of utmost importance here, and was given more weightage over photo printing. Similarly, combination documents also form a chunk of the office work and hence contributed equally to the overall score. To assess the quality of the output, we tested using the image file; though printing of a photo image is rare in an office environment. Since the upper limit of the price for an office printer was kept at Rs 11,500, the features that these devices offered, were also noted. With so many conditions, very few printers showed the potential of an ideal office solution.

The Epson Stylus C61 was one such printer that came out on the top, riding solely on the steam of its performance. This printer achieved a STTI score of 84 by performing well in all the departments that make a printer ideal for office use. With only 32 KB of buffer memory, we expected it to perform badly in the

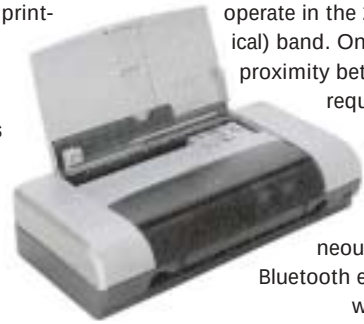
Cut those Wires

With the rapid growth of mobile devices such as palm tops and handhelds capable of word processing, a need for printing documents directly has emerged. This, in turn, has lead to the development of wireless printing solutions. Many leading vendors have introduced printing devices that support wireless technologies such as IrDA and Bluetooth.

IrDA is an acronym for Infrared Data Association. IR devices work using infrared technology, and hence don't require cables or a PC to connect to a printer. Since they work using infrared rays, there should not be any obstacles between the communicating devices.

Some of the HP printers with IrDA support are HP DeskJet 340, HP LaserJet 5MP, and HP LaserJet 6MP, HP 2100M and HP4050N. Some of these are available in India and the rest will make it to our shores pretty soon.

Bluetooth is a late entrant. It is a low cost, low power, wireless, radio frequency technology that allows various electrical devices to communicate between each other. Bluetooth devices operate in the 2.4 GHz ISM (industrial, scientific, medical) band. One of the advantages of Bluetooth over IrDA is that proximity between the communicating devices is not required—distances of up to 32 feet are accessible. Moreover, Bluetooth does not suffer from line-of-sight restrictions. One fascinating aspect of Bluetooth-enabled devices is their ability to communicate with each other transparently and spontaneously, when they come within range. Thus, a Bluetooth enabled cellphone can be configured such that it will automatically print out all its stored messages using a Bluetooth printer as soon as you enter your office, without any manual intervention.

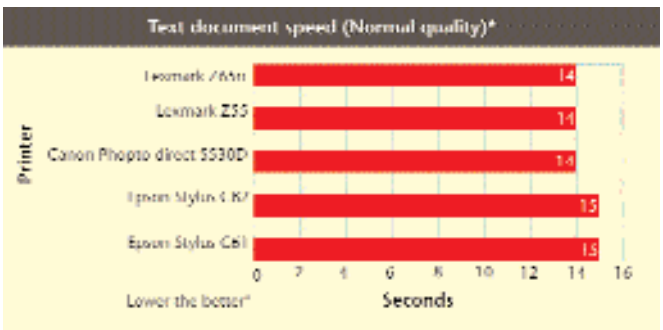


The HP 450CBI is truly a mobile printer with an IRDA and optional Bluetooth connectivity

Bluetooth supports point-to-multipoint communications: a single printer can simultaneously connect to both your cell phone and your computer. The HP 995c Bluetooth Printer is one such inkjet printer with built-in Bluetooth support, though it is currently absent in the Indian market.

speed test, but it proved us wrong by being one of the fastest. Upon investigation, we attributed this to its USB 2.0 interface. The Epson C61 took only 15 seconds to print the text document—standing second to the Lexmark Z65n, which took 14 seconds. It printed the fastest in the combination document test, taking only 27 seconds. However, while printing the image file, the 32 KB of buffer memory proved to be a bottleneck, and the printer took an unexceptionally long time of 749 seconds. The quality of printing, though, was unquestionably high. All these results accumulated in the STTI score of 84.

The Epson Stylus C82 came very near to its sibling, the C61, but lost on price grounds and thus scored 78 on STTI. Though there wasn't much of a difference between the two Epson's, on the performance level—both printers were neck and neck in the entire test. The major differences were marked by the features—the C82 has separate ink tanks as opposed to the combined ones used by C61. The advantage of this is that you can replace the one that drains out first. Also, a paper thickness selection switch allows you to shift between the normal paper and envelopes, that are much thicker. The printer also shows ink status while printing and the percentage of the job completed. The Epson Stylus C82 was worthy of mention, even though it was Rs 350 more than the cut-off price for this application area because of its feature set.



One more printer that made its mark in the office-user segment was the HP 6122. This printer was also a tad above the price cut-off mark, but it made up with excellent output quality. It scored 80 on STTI largely because of the output quality rather than printing speed—it has a decent speed at printing both, text as well as combination documents. One point that needs to be highlighted is the difference in the time taken to print the image file between this printer and the Epson C61. While the Epson C61 is the fastest printer for printing text and combination documents, it takes very long time to print an image file. The HP 6122, though slow at printing text and combination document, wins hands down at printing image files. It has a mammoth 8 MB of buffer memory, which this makes this feat possible.

There were other printers that performed very well, such as the Canon S530D, which scored 89 on the STTI but was too expensive to be included in the office segment.

Our recommendation for an ideal office printing solution would be the Epson's Stylus C61. The reason is the performance that one gets for the price on offer; this professional looking printer costs just Rs 7,500, which is the right price for an office printer.

Professional Printing Solution

A professional printing solution is chosen on the basis of the pure quality it delivers, rather than fast speeds or nifty features. This application area demands the best hardware that prints at high resolutions, with next to perfect colour reproduction, and overall good image contrast and brightness. Along with these criteria, other features such as direct printing from camera, USB 2.0 interface for faster data transfer and bigger memory buffer are

also noted. This is done, considering that large-sized image files are most likely to form the bulk of the tasks, and printers with lesser memory will cause a bottleneck. All these features weighed higher than speed while calculating the STTI.

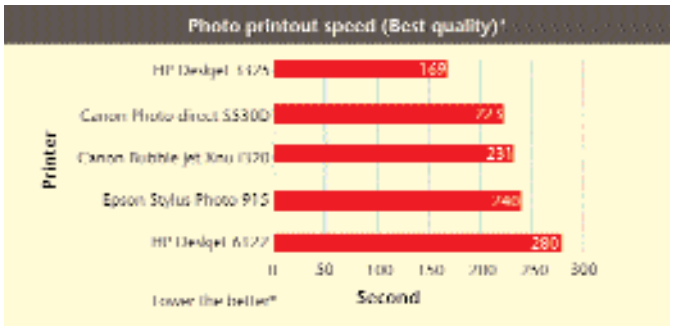
To further narrow down on the overall score, we factored the performance score with the price in such a way that, any printer that cost between Rs 10,000 to Rs 20,000, and scored above 76 STTI, would be considered for this application area.

The best printers for professional printing

With the aforementioned considerations, all the printers were assessed, based on the quality of output, and this got us the test analysis for the best possible professional printing solution.

When it came to quality, nothing could beat the HP 6122—this printer reproduced colour and the finer details from the test picture with every bit of accuracy. For example, the combination document contains a group of different elements, such as wood, fruits, glass articles, etc; the wall has many bumps—none of the printers could reproduce these bumps and the other features on the wall as accurately as the HP 6122. Further, even the details on the fruits—such as the light reflection—were excellent. This was also one of the printers that could reproduce all the seven colour bars perfectly. And, it wasn't too slow either; while the fastest printer took around 14 seconds to print the text file, the HP 6122 finished in about 17 seconds. Similarly, the time required for printing the image file is also less than the average time taken by other printers. Coming to the features, this printer comes with a mammoth 8 MB memory buffer, supports dual-side printing and has a paper-tray that can store up to 100 papers. The printer scored 76 on the STTI score.

Fine details on the test image were used to ascertain the detail reproduction of a printer. As seen here, the HP 6122 1 came out best; the Canon S530D 2 showcased averge detail reproduction while the Olivetti Arjet 22 3 produced the worst details



Canon was not to be left behind in the quality front, and came very close to dethroning the HP 6122, but lost on the price front. Canon S503D is loaded with features, and hosts support for all the latest possible technologies. It performed equally well throughout the test and displayed the same vigour as the HP 6122. But, its crucial contending aspect was the quality of output. Only in certain areas did it lag—the bumps on the wall and the light reflection on the fruits were missing.

The S503D does not compromise speed for quality's sake. It took only 14 seconds to print the text file, and similar results were found for the combination-document (88 seconds) and the image file printing where it was amongst the best (223 seconds).

The printer is equipped with USB 2.0 interface, supports printing directly from a digital camera and also comes with an LCD screen. The screen indicates the possible settings of a digicam, to enable direct printing. The S503D came one step behind the HP 6122 by posting 75 on the STTI.

Another printer that stands out from the crowd is the Epson Photo 915. Designed along the same lines as the Canon S503D, it too features direct printing from a camera, an LCD screen to program the settings and comes with a four-in-one memory stick adapter. Its performance was comparable to its nearest competitors, but it lost on the details and colour reproduction. Also, all the printers from Epson showed a high degree of paper dependency—i.e. the quality of the output was excellent on the manufacturer recommended print media, but suffered when printed on any other medium. Overall this printer could only amass 72 on the STTI scale.

HP 6122
This was the best printer as per quality, producing vibrant colours and photo-realistic printouts

Our recommendation for an ideal professional printing solution would be the HP 6122, since has an output quality that is unmatched by any other printer in the comparison, and at just Rs 11,000, you can assure yourself of a fantastic printer in hand.

What it all leads to

To conclude, we have some interesting facts to touch upon. First and foremost, the HP 3325 aptly highlighted that performance does not always come at a high price. Surprisingly this printer has just 768 KB of internal buffer memory, but it still beat the printers with higher buffer memory at printing images.

Though we calculated the STTI per application area, it would

Refill, Replace, Recycle?

Inkjet printers have a very high maintenance cost, primarily because of the cost of cartridge replacements and the expenses incurred as a result of using bad quality cartridges.

Users have an option of either using original cartridges or refilling them. Typically, users prefer the latter route as it is more cost-effective. Refill kits, that contain all the tools required for the task, are also available. The problem with them is that the ink provided along cannot be used with all the cartridges: different cartridges have their own standards (every printer model needs an ink of a certain viscosity, texture, shade, mixture) and hence a single kit cannot provide an all-encompassing solution.

One can also opt for compatible or replacement cartridges, manufactured by third parties or Original Equipment Manufacturers (OEMs). These are reliable as they are manufactured keeping in mind the model of the printer. Another variety of cartridges extensively used these days are the recycled or re-manufactured ones. These are professionally recycled to guarantee high quality and good performance.

be unfair to award any of the above mentioned recommended solutions the crown, since they are good only for their respective application area. The best performance crown was evaluated based on the overall performance of these printers, taking price into consideration.

The crown was won by none other than the Canon S503D—based simply on its package of overall performance, features and support; no other printer deserved this more.

To adjudge the best value award, it would be an injustice if the HP 3325 was left out on any grounds. No other printer can match the value for money ratio that this printer offers.

Canon S530D

Canon S530D was the most feature-rich printer in our comparison test. Its support for nearly all possible technologies, makes it a one-stop printing solution. Whether printing from a PC or a digital camera, it assures that you have total control over the final output.

The printer comes with a USB 2.0 interface for faster data transfer rate, and a Compact Flash (CF) card reader, that you can insert into any digital camera and then take direct printouts. Canon is thoughtful and generous enough to provide a CF adapter as well.

The Canon S530D was an all-rounder, performing equally well in all tests

The printer communicates via an LCD screen that offers full control on settings, such as the paper type, ink quality, etc. It also indicates the number of photographs that you have given to be printed. In case you want to print thumbnails of all the images available on the CF card, you can do so from the LCD console.

Canon has also provided cables for printing from a digital camera, this is quite interesting since up till recently, manufacturer did not even provide the necessary data cable along with their printer. Other details such as the placement of buttons and the compact flash slot—all of which are easily accessible—goes in making this printer a true winner.

Snap to Paper

For those of you who are proud owners of a digital camera and long for a solution that can transfer those wonderful moments onto a paper, there is good news. HP and Canon both offer specialised printing solutions in the form of photo printers.

Although many inkjet printers have photo printing capabilities, they require a PC as an interface between the camera and the printer. Photo printers, on the other hand, allow you to print your pictures directly from the camera. So if you wish to print photos, without a go-between PC, then a photo printer is ideal.

Canon S530D
A Compact Flash slot allows you to transfer images directly from your digital camera

Such printers can typically read different memory media which a digital camera is likely to use. To further simplifying your job, all you need to do is just insert the media into the appropriate slot and out come your pictures.

The only draw back of these photo printers is that they allow printing of 4 X 6 size prints only, for larger prints you have to look to the desktop solutions. HP Photo Smart 130 and Canon CP100 are two such photo printers available in India.

HP 3325

Initially, we had our reservations about this cute looking printer, that looked like an infant amongst the others. But, after the conclusion of the tests, we had no doubt about its credibility of performance and price. This little one can dance with the best of them!

With a native resolution of 600 X 600(units), it is ideally

With a great price and good performance, nothing comes close to the HP 3325

suited to general purpose work, and is a boon for home users. The most interesting talking point about this printer, apart from its sheer performance, is the price. Costing just Rs 3,000, there was no doubt that it should be decorated with the Best Value award in the entire comparison. Also, HP has decided upon a new strategy to counter the growing competition: they have introduced a new warranty type whereby, if your printer malfunctions within one year of purchase, they will replace the entire unit on the spot.

SANKET NAIK, AHMED SHAIKH and MUSTALI KACHWALA

Decision Maker

	Home Printing Solution	Office Printing Solution	Professional Printing Solution
You need	An inkjet printer to print resumes, letters, Web site contents and some occasional photo printouts; very low on price and can compromise on speed	An inkjet printer that allows you to print text and combination documents at good quality and high speeds	An inkjet printer that allows you to print photo-realistic vibrant photos, at high resolutions with good features
Look for	A basic A4 printer that has decent speed, prints in colour and comes with warranty and support	A printer that offers good speed, has adequate connectivity options such as USB, parallel, network IrDA, etc	A printer that sports the highest resolution support, has support for separate ink tanks and produces excellent photo printouts
Our recommendations	HP 3325, HP 3420,Canon S200SP, Lexmark Z35	Epson C61, Epson C82, HP 3820, HP 6122	HP 6122,Canon S530D,Epson 915
Price Range	Rs 3,000 to Rs 5,500	Rs 6,000 to Rs 11,500	Rs 10,000 to Rs 20,000

Printer at a Glance

Model	Canon				Epson	
	Bubble jet S200SP	Bubble jet Xnu i320	Bubble Jet BJC 55	Photo direct S530D	Stylus C41SX	Stylus C61
Features						
Printing technology	Bubble Jet	Bubble Jet	Bubble Jet	Bubble Jet	Piezo electric	Piezo electric
Resolution (dpi)	2880 x 720	2400 x 1200	720 x 360	2400 x 1200	1440 x 720	5760 x 720
Interface	USB	USB 2.0	USB/IrDA	USB 2.0	Parallel	Parallel / USB 2.0
Input buffer (KBytes)	NA	NA	25	NA	12	32
Paper capacity (pages)	100	100	100	100	100	100
Cartridges included	colour, mono	colour, mono	colour, mono	colour, mono	colour, mono	colour, mono
Dual-side printing support (y/n)	✗	✗	✗	✗	✗	✗
Accessories						
Data cable	✗	✗	✗	✗	✔	✔
Power cord	✔	✔	✔	✔	✔	✔
Adapter for Indian power outlets	✔	✔	✔	✔	✔	✔
Misc features						
Status of ink tanks through driver	✗	✗	✗	✔	✗	✔
Special features	None	None	None	Dif B250 cable for digital camera, Dif B100 cable for digital video camera, PCMCIA adapter	None	Photo paper supplied
Performance						
Speed test (in sec)						
Text print (Black and White mode, Normal)	36	28	40	14	36	15
Text printout (Black and White, Best)	203	37	450	38	441	27
Photo Printout (Full colour supported)	1144	231	592	223	624	749
Combi document (Normal)	183	94	240	53	122	48
Combi document (Best)	623	166	533	88	494	162
Image quality (combi document, Normal) (out of 5)						
Text print (Black and White)	4	4	3	4	3	3.5
Resolution of circles on concentric pattern	4	3.5	3	3.5	3.5	3.5
Uniformity of colours in lines of concentric pattern	3.5	4	3	3.5	3	4
Seven color bars - how many differentiated?	6	6	5	6	6	7
Yellow text on black background	5	3.75	2.5	5	1.25	2.5
Quality of small photo	2.5	3.75	2.5	2.5	2.5	3.75
Highlights on red berries	3.75	2.5	2.5	3.75	2.5	2.5
Details on fruit	3.75	3.75	2.5	3.75	2.5	3.75
Blue shading on the wall	3.75	2.5	3.75	2.5	2.5	3.75
Grille on the wooden plate	3.75	3.75	2.5	3.75	3.75	3.75
Minimum readable text point size	3	3	4	3	5	3
Image quality (combi document, Best) (out of 5)						
Text print (black and white mode)	4	4	3	4	3.5	3.5
Resolution of circles on concentric pattern	4	4	3	3.5	3.5	3.5
Uniformity of colors in lines of concentric pattern	3.5	4	3	3.5	3	4
Seven colour bars - how many differentiated?	6	6	5	7	6	7
Yellow text on black background	5	3.75	2.5	5	1.25	2.5
Quality of small photo	2.5	3.75	2.5	2.5	2.5	3.75
Highlights on red berries	3.75	2.5	2.5	3.75	2.5	2.5
Details on fruit	3.75	3.75	2.5	3.75	2.5	3.75
Blue shading on the wall	3.75	2.5	3.75	2.5	2.5	3.75
Grille on the wooden plate	3.75	3.75	2.5	3.75	3.75	3.75
Minimum readable text point size	3	3	4	3	3	3
Image quality (picture, Best) (out of 2)						
Clean white teeth, no dithering	2	2	1.5	2	2	2
Natural colour of skin	1.5	1.5	1	1.5	1.5	1.5
Good contrast in dark areas of plant	1.5	1.5	0.5	1.5	1	2
Clear specular effect on bracelet	1.5	1.5	1.5	1.5	1.5	1.5
Clear blanket fabric at lower right corner	1.5	1.5	1.5	2	1	1.5
Wrinkles between the eyes on forehead	1.5	1.5	1	1.5	1.5	1.5
Overall image not overly bright or dark	1.5	1.5	1	1.5	1.5	2
Overall Score						
Suitability to Home use	42.55	60.30	34.20	79.32	40.75	73.85
Suitability to Office use	44.28	64.48	37.68	89.00	42.02	84.79
Suitability to Professional use	55.52	64.76	43.51	75.54	51.65	68.16
Overall Product Rating	47.45	63.18	38.47	81.29	44.80	75.60
Overall Product Grade	C+	B	C	A	C	A-
Vendor name	Canon India Ltd	Canon India Ltd	Canon India Ltd	Canon India Ltd	Epson India Pvt Ltd	Epson India Pvt Ltd
Phone	011-26806572	011-26806573	011-26806574	011-26806575	080-5581800	080-5581800
E-mail	brijesh@canon.co.in	brijesh@canon.co.in	brijesh@canon.co.in	brijesh@canon.co.in	vasu@eid.epson.co.in	vasu@eid.epson.co.in
Number of authorised service centres	100+	100+	100+	100+	132	132
Number of cities with service centres	60+	60+	60+	60+	60	60
Period of warranty (Years)	1 year	1 year	1 year	1 year	1 year	1 year
Price (in Rupees)	3,701	6,995	18,539	21,747	3,950	7,495

Disclaimer: Prices are indicative and are subject to change

	Epson			HP				
	Stylus C82	Stylus Photo 830	Stylus Photo 915	Deskjet 3325	Deskjet 3420	Deskjet 3820	Deskjet 450 CBI	Deskjet 5550
	MicroPiezo	Piezo electric	MicroPiezo	Thermal	Thermal	Thermal	Thermal	Thermal
	5760 x 720	5760 x 720	5760 x 720	600 x 600	600 x 600	600 x 600	1200 x 1200	1200 x 1200
	Parallel / USB	Parallel / USB 2.0	USB	USB	USB	Parallel / USB	USB / Parallel / IrDA / Compact	USB / Parallel
	NA	256	32	768	768	2000	Flash card slot 16,000	8000
	150	100	100	100	100	100	45	100
	colour, mono	colour, mono	colour, mono	colour, mono	colour, mono	colour, mono	colour, mono	colour, mono
	✗	✗	✗	✗	✗	✗	✗	✗
	✔	✔	✔	✔	✗	✔	✗	✗
	✔	✔	✔	✔	✔	✔	✔	✔
	✔	✔	✔	✔	✗	✔	✔	✔
	✔	✔	✔	✔	✔	✔	✔	✔
	Photo Paper supplied	Photo Paper supplied	Photo Paper supplied, PCMCIA slot with an 4-in-1 memory adapter	None	None	None	None	Photo paper supplied
	15	35	33	18	22	23	18	43
	30	55	146	98	98	34	70	173
	422	408	240	169	298	437	440	339
	67	88	48	98	93	73	87	70
	157	160	174	128	128	179	250	193
	3.5	3.5	3.5	3.5	3.5	3.5	4	3.5
	3	3.5	4	3	3.5	4	4	3.5
	3.5	3.5	3.5	4	3.5	3.5	3.5	3.5
	7	6	7	5	5	5	6	7
	3.75	3.75	3.75	3.75	3.75	2.5	5	2.5
	2.5	2.5	3.75	3.75	3.75	3.75	2.5	3.75
	5	2.5	2.5	3.75	3.75	5	5	5
	3.75	3.75	2.5	3.75	5	3.75	5	3.75
	3.75	3.75	3.75	3.75	3.75	5	2.5	3.75
	3.75	3.75	3.75	3.75	3.75	3.75	3.75	3.75
	4	3	3	3	3	3	3	3
	3.5	3.5	4	3.5	3.5	3.5	4	3.5
	3	3.5	4	3	3.5	4	4	3.5
	3.5	3.5	3.5	4	3.5	3.5	3.5	3.5
	7	6	7	5	5	7	6	6
	3.75	3.75	3.75	3.75	3.75	2.5	5	2.5
	2.5	2.5	3.75	3.75	3.75	3.75	2.5	3.75
	5	2.5	2.5	3.75	3.75	5	5	5
	3.75	3.75	2.5	3.75	5	3.75	5	3.75
	3.75	3.75	3.75	3.75	3.75	5	2.5	3.75
	3.75	3.75	3.75	3.75	3.75	3.75	3.75	3.75
	4	3	3	3	3	3	3	3
	2	2	2	2	1.5	2	2	2
	1.5	2	1.5	1.5	1	1.5	1.5	1.5
	1	1.5	1.5	1.5	1.5	2	1	2
	1.5	1.5	2	1.5	1.5	1.5	1.5	1.5
	1	1.5	1.5	1.5	2	1.5	1	1.5
	1.5	1.5	1.5	1	1.5	1.5	1.5	1.5
	1.5	2	2	1	1.5	2	1.5	1.5
	71.57	60.93	63.03	65.79	59.10	68.95	63.80	59.99
	78.35	59.94	65.27	72.02	67.09	74.77	69.67	60.21
	68.06	66.27	72.77	65.87	63.87	68.77	65.92	69.23
	72.66	62.38	67.03	67.90	63.35	70.83	66.46	63.15
	A+	B	B+	B+	B	B+	B+	B
	Epson India Pvt Ltd	Epson India Pvt Ltd	Epson India Pvt Ltd	Hewlett Packard India Ltd	Hewlett Packard India Ltd	Hewlett Packard India Ltd	Hewlett Packard India Ltd	Hewlett Packard India Ltd
	080-5581800	080-5581800	080-5581800	011-26826000	011-26826000	011-26826000	011-26826000	011-26826000
	vasu@eid.epson.co.in	vasu@eid.epson.co.in	vasu@eid.epson.co.in	ashwini-k_aggarwal@hp.com	ashwini-k_aggarwal@hp.com	ashwini-k_aggarwal@hp.com	ashwini-k_ aggarwal@hp.com	ashwini-k_aggarwal@hp.com
	132	132	132	300	300	300	300	300
	60	60	60	79	79	79	79	79
	1 year	1 year	1 year	1 year	1 year	1 year	1 year	1 year
	11,750	9,975	17,950	2,999	3,999	6,299	15,999	9,999

digit

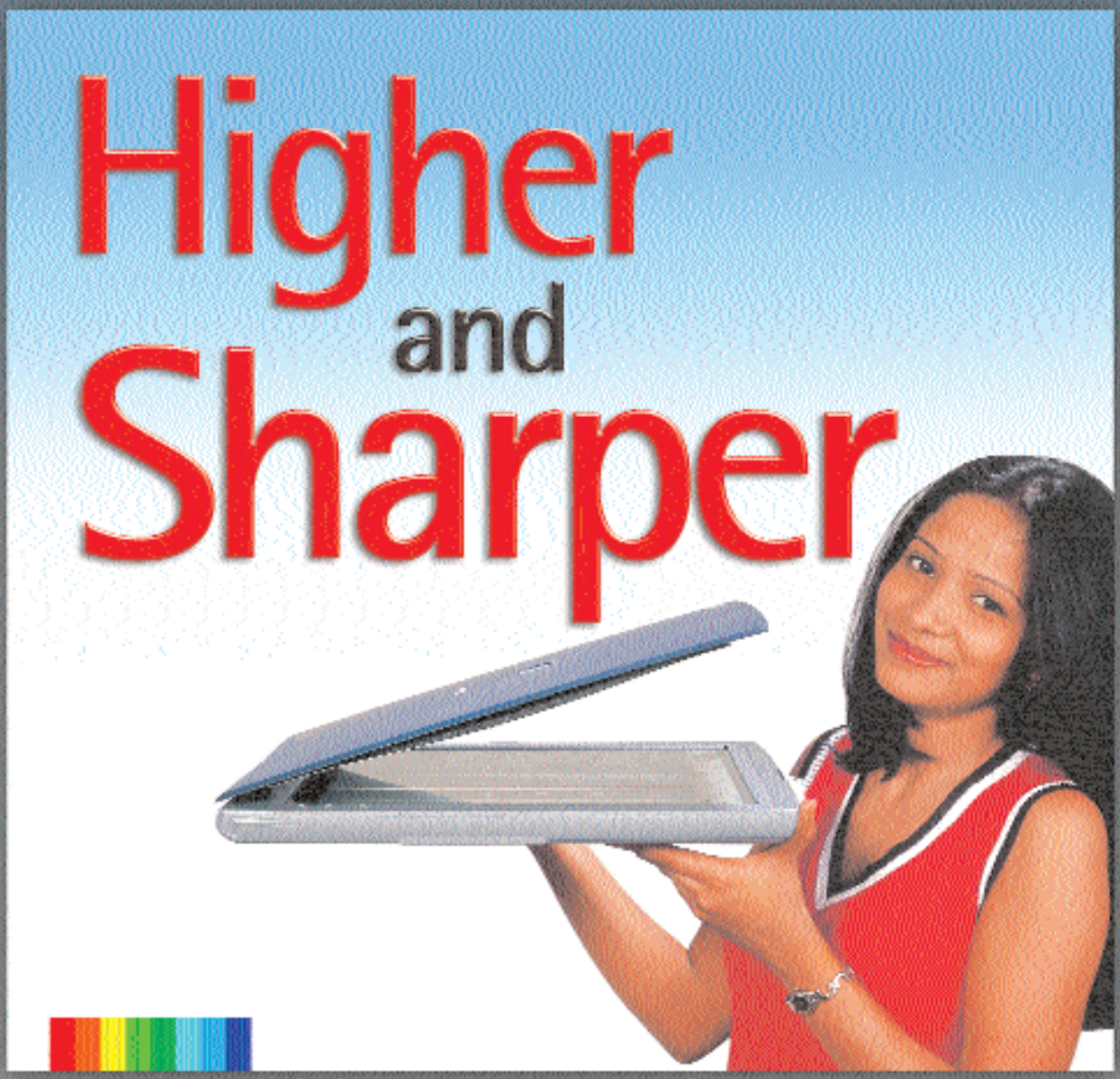
SCORE BOARD Printer at a Glance

Model	HP	Olivetti	Lexmark				
	Deskjet 6122	Artjet 22	Z25	Z35	Z45	Z55	Z65n
Features							
Printing technology	Thermal	Thermal jet	Thermal	Thermal	Thermal	Thermal	Thermal
Resolution (dpi)	600 x 600	1200 x 1200	1200 x 1200	2400 x 1200	2400 x 1200	3600 x 1200	4800 X 1200
Interface	USB / Parallel	USB / Parallel	USB	USB	USB	USB / Parallel	USB / Network
Input buffer (KBytes)	8000	NA	NA	NA	NA	NA	NA
Paper capacity (pages)	150	60	100	100	100	100	100
Cartridges included	colour, mono	colour, mono	colour, mono	colour, mono	colour, mono	colour, mono	colour, mono
Dual-side printing support (y/n)	✔	✘	✘	✘	✔	✔	✔
Accessories							
Data cable	✘	✔	✘	✘	✘	✘	✘
Power cord	✔	✔	✔	✘	✔	✔	✘
Adapter for Indian power outlets	✔	✔	✔	✔	✔	✔	✔
Misc features							
Status of ink tanks through driver	✔	✔	✔	✔	✔	✔	✔
Special features	Photo Paper supplied, dual side printing adapter	None	None	None	None	Sensational design	Dual paper input tray
Performance							
Speed test (in sec)							
Text print (Black and White mode, Normal)	17	26	20	19	18	14	14
Text printout (Black and White, Best)	71	46	175	176	177	61	66
Photo Printout (Full colour supported)	280	470	686	683	616	590	610
Combi document (Normal)	61	138	163	162	153	83	90
Combi document (Best)	159	302	569	570	389	176	208
Image quality (combi document, Normal) (out of 5)							
Text print (Black and White)	4	2.5	3.5	3.5	3	3	3.5
Resolution of circles on concentric pattern	4	4	2	2.5	2	2.5	3
Uniformity of colours in lines of concentric pattern	4	3.5	2	2	2.5	2	2.5
Seven color bars - how many differentiated?	7	6	4	6	6	7	6
Yellow text on black background	3.75	2.5	5	5	2.5	3.75	3.75
Quality of small photo	2.5	2.5	3.75	3.75	3.75	2.5	3.75
Highlights on red berries	3.75	2.5	2.5	2.5	3.75	3.75	2.5
Details on fruit	5	1.25	2.5	2.5	3.75	2.5	3.75
Blue shading on the wall	5	2.5	2.5	2.5	2.5	2.5	2.5
Grille on the wooden plate	3.75	2.5	3.75	3.75	1.25	2.5	2.5
Minimum readable text point size	3	4	3	3	4	4	3
Image quality (combi document, Best) (out of 5)							
Text print (black and white mode)	4	2.5	3.5	3.5	3.5	3	3.5
Resolution of circles on concentric pattern	4	4	2.5	2.5	1.5	2	2.5
Uniformity of colors in lines of concentric pattern	4	3.5	2.5	2	2	2	2
Seven colour bars - how many differentiated?	7	6	4	6	6	7	6
Yellow text on black background	3.75	2.5	5	5	2.5	3.75	3.75
Quality of small photo	2.5	2.5	3.75	3.75	3.75	2.5	3.75
Highlights on red berries	3.75	2.5	2.5	2.5	3.75	3.75	2.5
Details on fruit	5	1.25	2.5	2.5	3.75	2.5	3.75
Blue shading on the wall	5	2.5	2.5	2.5	2.5	2.5	2.5
Grille on the wooden plate	3.75	2.5	3.75	3.75	1.25	2.5	2.5
Minimum readable text point size	3	4	3	3	3	3	3
Image quality (picture, Best) (out of 2)							
Clean white teeth, no dithering	2	1.5	1.5	1.5	1.5	1.5	1.5
Natural colour of skin	2	1	1	1	1.5	1.5	1.5
Good contrast in dark areas of plant	2	1	1	1	1	1	1.5
Clear specular effect on bracelet	1.5	1.5	1.5	1.5	1.5	1.5	1.5
Clear blanket fabric at lower right corner	2	1.5	1	1	1	1	1.5
Wrinkles between the eyes on forehead	1.5	1	1.5	1.5	1.5	1.5	1.5
Overall image not overly bright or dark	2	1	1	1	1	1	1
Overall Score							
Suitability to Home use	75.27	52.97	43.35	45.09	49.03	60.67	62.88
Suitability to Office use	80.91	52.39	47.42	48.60	49.00	65.76	65.62
Suitability to Professional use	76.57	51.40	43.75	47.74	49.19	56.52	60.44
Overall Product Rating	77.58	52.25	44.84	47.14	49.07	60.98	62.98
Overall Product Grade	A-	C+	C	C+	C+	B	B
Vendor name	Hewlett Packard India Ltd	Spicenet Limted	Lexmark International India Pvt Ltd	Lexmark International India Pvt Ltd	Lexmark International India Pvt Ltd	Lexmark International India Pvt Ltd	Lexmark International India Pvt Ltd
Phone	011-26826000	011-26814542-44	022-26057755	022-26057755	022-26057755	022-26057755	022-26057755
E-mail	ashwini-k_aggarwal@hp.com	gunjansahni@spicenetindia.com	sandeepk@lexmark.com	sandeepk@lexmark.com	sandeepk@lexmark.com	sandeepk@lexmark.com	sandeepk@lexmark.com
Number of authorised service centres	300	69	22	22	22	22	22
Number of cities with service centres	79	39	16	16	16	16	16
Period of warranty (Years)	1 year	1 year	1 year	1 year	1 year	1 year	1 year
Price (in Rupees)	11,999	7,350	4,239	5,240	7,927	11,354	14,506

Disclaimer: Prices are indicative and are subject to change

Scan Preview Exit

Higher and Sharper



PHOTOGRAPH: Jiten Gandhi IMAGING: Atul Deshmukh

More than 20 scanners strut confidently out of the market, and into our test lab, with features and performance that will impress, and prices that will astound. Which model has the right stuff? Hang around for a clear picture

Not too long ago, scanners were bulky peripherals occupying much desk space, while the scanning resolution remained at 600 dpi. This was the time when price was the crucial deciding factor, and scanning was still a dabbling practise and not a necessary function.

Today, even entry-level scanners can spin their magic at well over 1200 dpi and are infinitely more affordable, not to mention slim, good looking and admirably good at multitasking. A scanner can, for example, acquire a document and e-mail or print it, or even burn a copy of it on a CD—all in a matter of moments. It has, thus, been elevated to the status of a smart companion from just a mono-task device. Moreover, technology such as Contact Image Sensors (CIS) provides a scanner with a space-saving design, without sacrificing on quality.

Although scanners are not on the list of hardware to see major technological changes, these devices are now capable of performing at a hardware resolution of 2400 x 4800 dpi, and at 48-bit colour depth. Subtle changes in the way sensors are built, have also helped the scanner reproduce better results in less time.

The fall in prices has made it easy for manufacturers to embellish the scanner with accessories—Transparency adapters and Automatic Document Feeders are two such add-ons. The market is flooded with different brands, competing fiercely for the attention of the end user. The battle is fought on the grounds

of price, quality and support—all to the benefit of the user. Even branded PCs are including scanners in their packages to boost sales, as increasingly more home users have begun to opt for this device. A scanner with a resolution of 1200 dpi and 48-bit colour depth can be bought for, as low as, Rs 3,500.

Our comparison test rounds up more than 20 scanners available in the market to offer you the best suited one for your varied tasks.

How we tested

Test bed used: Prior to running the tests on every scanner, a ghost image of Windows XP is loaded, after which, the necessary drivers are also loaded. The desktop resolution is kept at 1024 x 768 x 16 at a refresh rate of 75 Hz. The test machine used is P4 2.0 GHz with 256 MB RD RAM and 40 GB ATA/100 hard drive on an i850E motherboard. The monitor used is Samsung Samtron 75E. Windows XP with SP1 is loaded on the System with only Photoshop 7.0 and Office XP.

Each scanner was evaluated for speed and quality apart from noting relevant features. The tests include:

Speed test: Here we logged the time taken by the scanner to preview and scan documents, and our test image at 300 dpi and 1200 dpi resolutions (line art and colour). This test was given the greatest importance for the home user segment.

Image quality test using an IT8 card: An IT8 card is used by professionals the world over to determine the colour purity of a scanned image. This card is scanned at 300 dpi and 1200 dpi optical resolutions to check out the colour reproduction in light and dark region. This test is of importance to professionals who demand colour accuracy from the scanned document.

Image quality test using a resolution chart: In this test, a resolution chart comprising lines is scanned at 300 dpi and 1200 dpi optical resolution; then, using the magic wand feature of Photoshop, all the scanned blocks are analyzed. The scanner which can differentiate between scanned lines in all the five blocks is awarded the maximum marks. This test helps in determining which scanner is best in picking up minor details from a medium to be scanned.

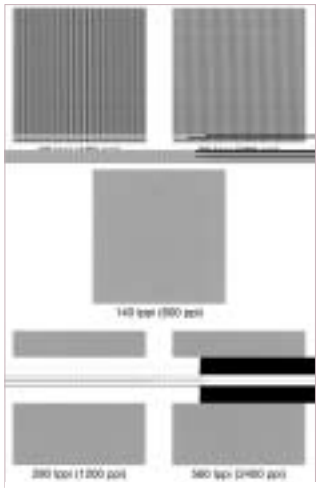
Determines the scanners capability to detect dark and light regions

The minute color deviation in neighbouring boxes really tests the scanners

Tests the scanners ability in picking tonal deviation

Image quality test using a photograph: In this test, a highly detailed image is scanned and analysed with regards to the reproduction of the details and colours. The test image was divided into different areas, which showcased different qualities of a scanner and marks were assigned accordingly.

OCR test: This test is important because it determines the ability of a scanner to scan a text document accurately such that it can be used by an OCR-software for extracting the text therein. It is vital for a scanner to scan the image precisely for the OCR software to give accurate results. The medium is scanned at the recommended resolution of 200 dpi.



Resolution chart used to determine scanners capability to pick-up finer details

We chose this image to determine overall performance of the scanners, and looked for the quality of colour reproduction and minute details

Features: This is one of the main ingredients of decision-making for scanners. We, therefore, noted down as many as 12 different features from which to draw a clear picture of a particular device. We also noted down special features such as Automatic Document Feeder and Negative Scanning attachment. An appropriate weightage was assigned to the different features, logged according to their importance in their respective segments.

After gathering the relevant scores from all the tests performed, we calculated the Suitability to Task Index (STTI). This STTI score helps us determine which scanner is best suited for a particular application area, hence making the buying decision much simpler for you. The greater the STTI score, the better the scanner. To further simplify the whole process, price is also factored in to give a single score that reflects the overall buying worth of a scanner.

How they fared

A 1200 dpi resolution has become the bare minimum for even the entry-level scanners. The entire range we tested—except a few, such as the Umax AstraSlim 600, which supported 36-bit depth only—supported this hardware resolution and a 48-bit colour depth.

Each of the top five scanner brands that participated in this comparison test had something unique to offer. Some, such as the HP 2300c, were very cheap and still managed to deliver quality. We also saw USB 2.0 finally making its way in to the scanner segment, but the performance numbers did not reflect the

better interface. Evidently, there is still some optimisation that needs to be done to bring the scan-time at higher resolutions to an acceptable level.

Price is also playing fair with hopeful buyers of these machines. We received scanners for as low as Rs 3,499 to as high as 24,999—both the cheapest and the costliest scanners were from HP. The maximum number of scanners came from UMAX—seven scanners, ranging from Rs 3,900 to Rs 15,950. Only HP came close to this with a variety of six models.

Home user

This category consists of those among us for whom price is of great importance—speed comes next, followed closely by features and after-sales support. Entry-level scanners available in the market right now are capable of scanning a document at the respectable resolutions of 600 x 1200 dpi. The resolution of 600 dpi is enough even for scanning a passport-photo size image, which can than be enlarged and printed on an A4-size paper, using a photo printer. Thus, tests with a 600 dpi resolution were awarded greater weightage within this category. The other good news is that scanners now sport the easy-to-use USB 2.0 interface which makes installation hassle-free. Keeping these factors in mind, we formed the benchmarks. They included, the speed test (awarded 40 per cent of weightage), features (awarded 15 per cent, because it is not much of a necessity) and the OCR test (awarded just 7 per cent, as it is not done by everyone actively). All scanners that scored above 60 STTI and cost between Rs 3,000 and Rs 3,900, were considered ideal candidates for this application area.

The best scanner for the home user

The reason behind establishing a home user category was the price factor. Home users, as a trend, are not willing to spend anything upwards of Rs 4,000 for a scanner because of the limited use of these devices. Users of this category would also like

When you Need to Read the Lines (Not Between Them)

OCR or Optical Character Recognition is a means of obtaining editable text from a scanned medium, such as a newspaper clipping or your friend's college assignment. What follows are a few tips and pointers to better scan a document for the further purpose of OCRing it. Read on:

1. Always opt for a scanner with a white sheet under the lid. This will give more accurate results.
2. Always keep the document flat and ensure that there are no wrinkles or folded corners, as this will produce an image with a black mark in that particular area.
3. Look out for a scanner with software driver that offers de-skew and de-speckle options. This will give more accurately scanned images and hence increase the accuracy of an OCR-software.
4. Do not scan a document with black fonts on a white background in line-art mode, this will return very poor results that will not improve, even by increasing the resolution. Use grayscale mode instead.
5. 200 dpi and 48-bit setting are more than enough for most new OCR software. Increase the resolution to 300 dpi if the document has an image and the format needs to be preserved.

1/2 pg V AD

to purchase a scanner which takes less time to preview and scan a document at the ideal resolution for this segment—600 dpi.

The preview time is of great importance because, although a user may want to scan only a part of the document, every document has to be previewed completely. To test the preview time of a scanner, we previewed the document and also noted the warm-up time of the lamp. This was done because a user of this segment is not expected to use the scanner continuously and therefore the time taken to warm up between scans will be high.

The scanner that topped our chart, by taking the least time to preview the test document, was the HP Scanjet 2300c with only 11.88 seconds taken to warm-up the lamp, and preview the document in the TWAIN interface. In comparison, the Benq S2W 4300U and Umax AstraSlim 600 took as long as 24.97 seconds and 23 seconds, respectively.

This is further concretised if we look at the time logged to scan the test document at 1200 dpi, line-art mode. Keeping in mind that 1200 dpi is very high resolution, used mostly to scan small images which can later be magnified for further touch-up in imaging software; the score of HP Scanjet 2300c, at only 50.3 seconds, is impressive. This test is indicative of how the scanner will perform when used at higher resolutions. Umax AstraSlim 600 was the only scanner which overtook the HP Scanjet 2300c in the text scan test at 300 dpi line-art mode. It logged 28.67 seconds as against the 28.99 seconds logged by HP, beating it by a very tiny margin. Considering the quality of the scanned image, the 2300c was light years ahead of the Benq and Umax. With a score of 86.23 STTI, this scanner sure makes a good buy, even for home users who scan images once in a while, but like quality scans. On the feature front, both HP and Umax lag behind the Benq S2W 4300U, which has four hot keys for various functions such as scan-to-Web, scan-to-print, as compared to the two keys on the HP scanners. It also has free bundled software such as ArcSoft PhotoImpression, Acrobat Reader and MergeMagic to touch-up the image once it is scanned. Here again HP scores over the other two competitors because of its price. The 2300c is available for only Rs 3,499, making it one of the cheapest USB scanners available today in the market. Couple this with the performance and the quality of scans it is capable of, and you have the best overall scanner for less than Rs 4,000.

Canon, comes bundled with loads of software

We recommend the HP Scanjet 2300c. With its fast warm-up time and the attractive price, it is the cheapest and best scanner available today.

Business user

Business users are a level above the home users—they need their scanner to be fast, accurate and compact. An office scanner also needs speed over quality, because not every PC will have a scanner of its own, and a solitary scanner will be shared by multiple users. For office tasks, documents are generally scanned at resolutions between 150 to 300 dpi; very few documents are scanned at higher resolutions. Thus 1200 x 2400 dpi scanners will suffice for business users. However, quality is also required because the documents that are to be scanned come on varying media. If a scanner fails to adequately perform on a bad-quality print-medium such as a newspaper—an exercise which is frequently practised in offices—it is difficult to get an OCR-software to work accurately. The bundled accessories are also very important—an Automatic Document Feeder and Transparency adapter will make great companions in office environment.

Features such as Scan to Mail, Scan to Fax, Scan to Copy and Scan to CD are also important to speed up various processes. For instance, with an appropriate hot key, it is very easy to scan the document and automatically e-mail it to a colleague. The scanner's driver is designed to automatically select the best resolution for the document, as well as initialising your e-mail client to send the scanned file—such features are real time savers, and thus ideal for an office environment.

Thus, in this segment, features and speed become important criteria to evaluate a scanner. Although an office is not as price sensitive as a home setup, it makes little sense to purchase a scanner with features, such as a transparency adapter or a SCSI interface, which will be of little value to an office, but definitely increase the cost.

Able Assistants

Automatic Document Feeder: ADF or Automatic Document Feeder is an accessory which is bundled with high-end scanners. This is primarily bought by the corporate and SoHo segment, where bulk scanning is needed to be done unattended. The scanner needs to have an interface that accepts this accessory. It can accept as many as 30 to 50 pages at a time and is capable of churning out a maximum of 15 pages per minute. All the user has to do is put the heap of papers to be scanned in the tray and the scanning process begins. The paper is automatically picked up from the tray, scanned and placed back into the tray. This ensures the safety of documents which might get lost if there is no proper return path. The ADF, when coupled with a scan-to-copy feature and a colour printer, will turn the scanner into a colour photocopier eliminating the high cost of buying one.

ADF is good add-on to scanner for batch scanning

Transparency Adapter: This is an accessory one will find with professional photographers. This is because a Transparency Adapter is used to scan positives and negatives, directly as an image, hence saving the cost of getting a paper print to check for quality. Photographers and designers can directly plug the negative/positive to this attachment, scan it and see the results on the screen. This also helps them to take decisions on whether photos are suitable for development. A compact version of such an adapter is also available. This version sits on the top of a scanner but does not occupy the full area: making it more handy and easy to carry around.

Detachable TPA is very handy tool for photographers

Tips on Scanning Different Types of Documents

Document type	Resolution Settings
Magazine Page	300 dpi, 48-bit
News Paper	200 dpi, 48-bit
Excel Sheet	150 dpi, 48-bit
Typed Document	200 dpi, 48-bit
Fax	200 dpi, 48-bit
Photo-copied Document	200 dpi, 48-bit

Following this thought-process, we formed the benchmarks that included speed (which was awarded 30 per cent), followed by quality (which was given 20 per cent). Warranty and support are also important for the business users, and therefore awarded 20 per cent, features got 20 per cent, and the price tag was given a 10 per cent weightage. The calculated STTI scores, coupled with price, offered the best scanners for business users. We determined that all scanners scoring above the 60 STTI mark, and falling within the price range of Rs 3,950 to Rs 11,000, are ideal candidates for the business user.

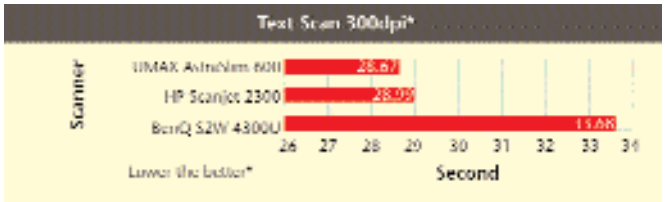
The best scanner for Business users

This category also saw the newer USB 2.0 interface scanners, which were expected to do better in the speed tests; the rest of the sub-systems being on par. We had mixed results from various scanners, with HP, Canon and Umax giving excellent results in one area but averaging in another. This made for an interesting category.

If you are looking for a scanner that can do both, preview and scan the documents with speed, then the Umax Astra 2500 is the best choice. Although it wasn't the fastest draw while previewing documents (Benq S2W 5000E took 7.54 seconds), its score of 8.47 seconds is not bad by any means. When you couple this with the low time of 16.19 seconds taken to scan a text document at 300 dpi, as is widely practised in an office, the speed achieved eliminates the need to have more than one scanner per department.

The Microtech 3800 is a decent performer for the Business area

Climbing up the dpi-ladder towards high-quality photo scanning, the Canon CanoScan LIDE 30 took less than 4 minutes to scan a full-colour photo at the respectable resolution of 1200 dpi. This USB 2.0-interface machine, slim and compact as it is, took just 211.39 seconds to complete the Herculean task, hence making it the perfect choice for high-quality scanning at a good speed. Furthermore, it just needs a USB cable for data-transfer and power supply, thereby reducing desk clutter and eliminating the need to locate it near a power jack, the same was the case with Umax AstraSlim 600, which was drawing power from the USB interface. A dark metallic-blue colour adds to its aesthetic appeal. Couple this with the three hot keys that let it



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SCORE BOARD Scanner at a Glance

	BenQ			Canon		
	S2W 4300U	**S2W 5000E**	**S2W 7400UT**	**CanoScan D646U**	**CanoScan D1250U2F**	**CanoScan LIDE 20**
Feature						
Max Optical Resolution (dpi)	600 x 1200	1200 x 2400	2400 x 4800	600 x 1200	1200 x 2400	600 x 1200
Interpolated Resolution (dpi)	19200	19200	19200	9600	9600	9600
Bit Depth (bit)	48	48	48	42	48	48
Interface	USB	USB	USB 2.0	USB	USB 2.0	USB 2.0
Transport lock for the Lamp (Y/N)	✔	✘	✘	✔	✔	✘
Build Quality (Scale of 5)	3	4	3	3	4	4
Additional on-board controls	Scan to Copy, Web, PDA, Mail	None	Scan to Web, OCR, PDA, Print and Direct scan	None	Scan to Copy, Mail, Photo and Direct scan	Scan to Copy, Mail, Direct scan
Bundled Accessories	Standard*, no OCR software	Standard*	Standard* and IOGEAR USB 2.0 PCI card, no OCR software	Standard*	Standard*	Standard*, scanner stand
Performance						
Speed Test (in seconds)						
Prescan Preview (300 dpi full colour mode)	24.97	7.54	44.84	15.26	32.17	70.68
Text Scan (Black and White Mode) 300 dpi	33.68	36.68	34.82	44.33	28.35	25.91
Text Scan (Black and White Mode) 1200 dpi	281.13	319.57	164.25	161.39	126.10	119.34
Photo Scan (Full Colour Mode) 300 dpi	113.89	66.44	90.91	60.19	28.90	42.72
Photo Scan (Full Colour Mode) 1200 dpi	648.33	736.81	778.70	579.08	176.67	516.81
Quality Test						
Gray Scale Tonal Deviation (Out of 22 bars) 300 dpi	19	19	18	20	20	20
Gray Scale Tonal Deviation (Out of 22 bars) 1200 dpi	19	19	18	20	22	20
Colour uniformity (Scale of 5) 300 dpi	2	3	5	4	5	4
Colour uniformity (Scale of 5) 1200 dpi	2	5	4	4	5	4
Colour Deviation (Scale of 5) 300 dpi (Dark area)	1	1	2	3	4	1
Colour Deviation (Scale of 5) 1200 dpi (Dark area)	1	1	1	2	2	1
Colour Deviation (Scale of 5) 300 dpi (Light area)	2	2	1	4	4	1
Colour Deviation (Scale of 5) 1200 dpi (Light area)	2	2	1	3	3	1
Photograph test (Scale of 5) 300 dpi	2	2	1	3	4	3
Resolution test (Scale of 5) 300 dpi	3	3	3	2	3	1
Resolution test (Scale of 5) 1200 dpi	3	3	3	3	3	2
OCR Test (number of errors from 108 words)	5	0	1	1	2	0
Warranty & Support						
Number of Authorised Service Centre	16	16	16	100	100	100
Number of Cities with Service Centre	16	16	16	60	60	60
Period and Type of Warranty	1	1	1	1, RTB^{+}	1, RTB^{+}	1, RTB^{+}
Overall Score						
Suitability to Home Use	46.20	55.81	35.94	57.44	53.61	56.52
Suitability to Business Use	36.91	66.02	51.96	63.95	66.51	65.58
Suitability for Professional Use	54.10	68.86	64.93	63.59	70.93	58.59
Overall Product Rating	45.74	63.56	50.94	61.66	63.68	60.23
Overall Product Grade	C	B	C+	B	B	B-
Vendors Name	BenQ India Pvt Ltd	BenQ India Pvt Ltd	BenQ India Pvt Ltd	Canon India Ltd	Canon India Ltd	Canon India Ltd
Phone	022-25705231	022-25705231	022-25705231	011-26806572	011-26806572	011-26806572
E-mail	kamleshsalunke@benq.com	kamleshsalunke@benq.com	kamleshsalunke@benq.com	brijesh@canon.co.in	brijesh@canon.co.in	brijesh@canon.co.in
Price (in Rupees)	3,750	4,995	16,250	4,495	10, 579	4,995

Disclaimer: Prices are indicative and are subject to change * *Standard package includes OCR and other software with requisite drivers*

	HP					
CanoScan LIDE 30	**Scanjet 2300c**	**Scanjet 3500c**	**Scanjet 3570c**	**Scanjet 4500c**	**Scanjet 4570c**	**Scanjet 5550c**
1200 x 2400	600 x 1200	1200 x 600	1200 x 600	1200 x 600	2400 x 1200	2400 x 2400
9600	99999	99999	99999	99999	99999	NA
48	48	48	48	48	48	48
USB 2.0	USB	USB	USB	USB	USB	USB 2.0
✔	✘	✘	✘	✘	✘	✔
4	3	4.5	4	5	4	4
Scan to Mail, Scan, Print	Scan to Copy, Direct scan	Scan to Mail, Print, Direct scan	Scan to Mail, Print, CD, Direct scan	Scan to Mail, print, Web, CD, Direct scan	Scan to Web, Mail, copy, Direct Scan	Scan to Web, Mail, Print, CD, Direct scan
Standard*	Standard*, no OCR software	Standard*, no OCR software	Standard*, transparency adapter, no OCR software	Standard*, no OCR software	Standard*, transparency adapter, automatic photo feeder, no OCR software	Standard*, no OCR software
65.00	11.88	49.18	39.88	5.45	4.50	6.46
19.98	28.99	17.21	18.35	13.90	11.12	15.41
129.28	50.30	150.43	564.20	120.75	116.37	275.48
68.95	42.80	45.88	45.73	19.67	13.97	17.33
211.39	271.64	585.93	575.76	317.49	280.90	264.55
21	22	22	22	22	22	22
22	22	22	21	22	21	22
4	4	4	4	3	3	3
4	4	3	4	4	4	4
1	4	2	5	3	2	3
1	2	5	3	3	3	3
1	2	4	5	4	4	4
1	2	5	5	5	5	4
4	3	4	4	3	3	4
2	2	3	3	3	3	3
3	3	4	3	4	4	4
0	1	0	1	23	1	0
100	300	300	300	300	300	300
60	79	79	79	79	79	79
1, RTB+	1, ULR++	1, ULR++	1, ULR++	1, ULR++	1, ULR++	1, ULR++
54.00	86.23	67.56	54.23	62.10	66.64	58.11
65.98	66.03	77.69	50.33	78.33	86.12	76.44
65.73	70.90	80.56	77.09	82.49	84.22	80.40
61.90	74.39	75.27	60.55	74.31	78.99	71.65
B	A-	A-	B-	A-	A	B+
Canon India Ltd	Hewlett Packard India Ltd	Hewlett Packard India Ltd	Hewlett Packard India Ltd	Hewlett Packard India Ltd	Hewlett Packard India Ltd	Hewlett Packard India Ltd
011-26806572	011-6826000	011-6826000	011-6826000	011-6826000	011-6826000	011-6826000
brijesh@ canon.co.in	ashwini-k_ aggarwal@hp.com	ashwini-k_ aggarwal@hp.com	ashwini-k_ aggarwal@hp.com	ashwini-k_ aggarwal@hp.com	ashwini-k_ aggarwal@hp.com	ashwini-k_ aggarwal@hp.com
8,495	3,499	7,099	9,099	15,999	17,999	24,999

+*RTB: Return to Base* ++*ULR: Unit Level Replacement*

SCORE BOARD Scanner at a Glance

	MICROTEK		UMAX			
	ScanMaker 3800	**ScanMaker X12USL**	**Astra 2500**	**Astra 4400**	**Astra 4500**	**Astra 4700**
Feature						
Max Optical Resolution (dpi)	1200 x 600	1200 x 2400	600 x 1200	1200 x 2400	1200 x 600	1200 x 2400
Interpolated Resolution (dpi)	9600	9600	9600	9600	9600	19200
Bit Depth (bit)	48	42	48	48	48	48
Interface	USB	USB, SCSI	USB	USB	USB	USB 2.0
Transport lock for the Lamp (Y/N)	✔	✘	✔	✘	✘	✔
Build Quality (Scale of 5)	4	4	4	3	4.5	3
Additional on-board controls	Scan to Copy, Mail, OCR, Web, Direct scan	None	None	Scan to Mail/Fax, Copy, custom, Direct scan	Scan to Mail, Print, Direct scan	Scan to Mail, Copy, Direct scan
Bundled Accessories	Standard*	Standard*, SCSI card	Standard*	Standard*	Standard*	Standard*, scanner stand
Performance						
Speed Test (in seconds)						
Prescan Preview (300 dpi full colour mode)	7.90	34.56	8.47	13.30	49.18	11.25
Text Scan (Black and White Mode) 300 dpi	20.63	19.80	16.19	36.30	17.21	8.61
Text Scan (Black and White Mode) 1200 dpi	63.85	177.57	108.50	85.19	150.43	130.32
Photo Scan (Full Colour Mode) 300 dpi	75.24	75.46	40.82	73.22	45.88	24.32
Photo Scan (Full Colour Mode) 1200 dpi	722.56	1239.50	132.79	2727.47	585.93	736.82
Quality Test						
Gray Scale Tonal Deviation (Out of 22 bars) 300 dpi	22	22	22	21	22	22
Gray Scale Tonal Deviation (Out of 22 bars) 1200 dpi	22	22	22	22	22	22
Colour uniformity (Scale of 5) 300 dpi	3	3	4	4	4	4
Colour uniformity (Scale of 5) 1200 dpi	2	4	4	3	3	4
Colour Deviation (Scale of 5) 300 dpi (Dark area)	5	3	4	2	5	4
Colour Deviation (Scale of 5) 1200 dpi (Dark area)	2	3	3	2	5	3
Colour Deviation (Scale of 5) 300 dpi (Light area)	3	4	4	3	4	4
Colour Deviation (Scale of 5) 1200 dpi (Light area)	3	4	4	3	5	3
Photograph test (Scale of 5) 300 dpi	3	4	3	3	3	2
Resolution test (Scale of 5) 300 dpi	2	3	3	2	3	3
Resolution test (Scale of 5) 1200 dpi	3	3	3	2	4	3
OCR Test (number of errors from 108 words)	0	2	0	1	1	2
Warranty & Support						
Number of Authorised Service Centre			21	21	21	21
Number of Cities with Service Centre			20	20	20	20
Period and Type of Warranty			1	1	1	1
Overall Score						
Suitability to Home Use	68.78	48.11	85.07	45.58	46.35	60.85
Suitability to Business Use	76.30	60.83	86.56	59.30	42.99	78.76
Suitability for Professional Use	67.19	76.08	71.28	61.55	66.75	70.15
Overall Product Rating	70.76	61.67	80.97	55.48	52.03	69.92
Overall Product Grade	B+	B	A	B+	C+	B+
Vendors Name	Rashi Peripherals	Rashi Peripherals	Neoteric	Neoteric	Neoteric	Neoteric
Phone	022-28260258	022-28260258	022-24172600	022-24172600	022-24172600	022-24172600
E-mail	ho@rptechindia.com	ho@rptechindia.com	sales@neoteric-info.com	sales@neoteric-info.com	sales@neoteric-info.com	sales@neoteric-info.com
Price (in Rupees)	5,550	15,990	3,950	8,950	9,450	11,700

Disclaimer: Prices are indicative and are subject to change ** Standard package includes OCR and other software with requisite drivers*

Astra 6700	AstraSlim 600	AstraSlim 1200
2400 x 4800	600 x 1200	1200 X 2400
19200	9600	9600
48	36	36
USB 2.0	USB	USB
✔	✘	✘
4	3	4
Scan to Mail, Copy, Direct scan	None	None
Standard*	Standard*	Standard*, no OCR software
44.60	23.00	19.28
19.28	28.67	33.10
333.79	87.79	92.62
20.98	93.49	78.07
2699.30	673.98	949.88
22	20	20
22	20	20
3	0	1
3	0	0
2	2	1
2	2	1
3	3	2
3	3	3
2	4	4
3	3	3
2	2	4
1	1	14
21	21	21
20	20	20
1	1	1
35.98	66.59	50.74
36.61	71.62	59.14
54.50	64.84	67.65
42.36	67.68	59.18
C+	B+	B+
Neoteric	Neoteric	Neoteric
022-24172600	022-24172600	022-24172600
sales@ neoteric-info.com	sales@ neoteric-info.com	sales@ neoteric-info.com
15,950	3,900	6,950

+RTB: Return to Base ++ULR: Unit Level Replacement

Buying Tips

- Select a hardware resolution depending upon the kind of document you are going to scan, e.g. 600 dpi is not enough if you are planning to scan photographs.
- Check out the packaging contents and make sure that the requisite cables and connectors are bundled along with the scanner.
- Check whether the vendor gives carry-in or on-site warranty. On-site warranty is a better option as the technician comes to your place for repairs.
- A Transparency Adapter is a must if you are going to scan negatives. Also ensure that the scanner has an interface to connect the required adapter.
- New scanners might have thermocol bits on their inner sides that may produce black dots on the media scanned. Remove such particles from the scanner by wiping it with a soft cloth and make sure there are no scratches on the glass surface.
- If you are scanning thick books or such, opt for a scanner with a removable lid or one where the lid can rise to a height of 2 inches and more.
- 36-bit scanners are on their way out, 48-bit is now considered to be the entry-level for scanners. Therefore, buy one with 48-bit colour depth.
- A good OCR and imaging software bundled along with the scanner will not only save you the additional investment, but also extend the usability of your scanner.

scan, e-mail and print directly, and it makes a perfect companion for your workstation.

In the OCR test, the scanner which blew us away with its accuracy, was the Umax Astra 2500. It scanned the test image at 200 dpi in full colour mode so impressively that ABBYY FineReader 6.0CE, the OCR software used, read each and every character precisely. The software was also able to pick up letters which were in another font. That this accuracy was achieved on a newspaper clip, makes it an even more impressive feat. The only thing that we missed in this scanner, was an Automatic Document Feeder. Available for Rs 3,950, this scanner scored a respectable 86.56 STTI.

Even the HP Scanjet 3500c performed adequately in this test—just the character 'P' was wrongly recognized as 'R' in one instance. This machine also performed well in the quality tests, and the three hot keys added to its capabilities. The 3500c has a total of three connectors: one each for a USB interface, power adapter and a Transparency Material Adapter (TMA). This makes the scanner ready for negative scanning, but you would need to shell out Rs 3,000 to Rs 4,000 extra for such a function. The 3500c is available for Rs 7,099 and easily scans documents at 1200 dpi. Its STTI is 77.69, making it a worthy buy for overall office use.

The HP Scanjet 3500c is available for Rs 7,099 but the 1200 dpi scanner with the option for TMA is more suited for photographers and imaging professionals. This scanner managed the STTI score of 77.69. However, the Umax Astra 4700 scored 78.76 STTI—even though it fell out of the price band by Rs 700—making it the best performer to cost in the vicinity of Rs 11,000. This was achieved because of it's better performance in the speed test, the OCR test and a good-enough showing in the quality test. Although the scanner is light on features, it manages to use every component to its fullest, making it a good buy for day-to-day office use.

We recommend the Umax Astra 2500. At a price of Rs 3,950, even without shortcut keys, this scanner immensly impressed us.

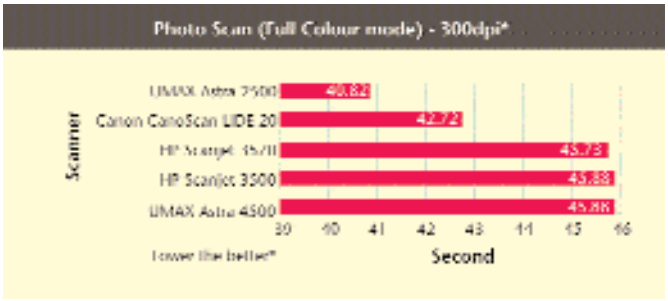
Professional user

Imaging professionals, photographers and illustrators working in the publishing and advertising industries; and those who treat photography as a serious hobby, fall within this category. Price plays second fiddle to quality here—one does not mind adding a few zeroes to the price tag, to get a scanner which can deliver outstanding quality and has a host of features. Their basic resolution requirement starts at 1200 dpi. Features such as a transparency adapter, are a must for those who deal in negatives and positives, or those who frequently dole out business presentations. A transparency adapter not only saves the money spent on a paper-print of the transparency, but also saves time. By simply scanning a transparency once, you can have the image at a desired resolution on the monitor.

Quality considerations such as the capability of a scanner to accurately reproduce colour in dark, mid and light areas, and to reproduce details play a major role in this segment. Quality was thus awarded 40 per cent, followed by speed at 30 per cent, price at 20 per cent, and warranty and support with a 10 per cent weightage.

The best scanner for professionals

The scanners which are most suited to this application area need to be loaded with accessories such as Automatic Document Feeder, Transparency Adapter and capabilities to scan at a hardware resolution of 2400 x 4800 dpi. A scanner, thus armed, has to cost more. Hence, the machines included here fell within the price range of Rs 12,000 to Rs 25,000 and scored above 65 STTI. The scanner which managed to deliver the best performance in this segment was the HP Scanjet 4570c. This scanner costs Rs 17,999, comes bundled with Transparency Material Adapter for scanning 35 mm film as the standard accessory, and is capable of scanning at 2400 dpi and 48-bit colour depth. It was astoundingly accurate in picking different colour tones from the scanned IT8 card. The scanner managed to differentiate between all 22 grey blocks, as well as colour uniformity in the light area—one of the toughest tests to pass. This makes HP the only brand that has quality products for each and every segment.



The 4570c is also one of the fastest scanners in its class. With the capability to preview the image in just 4.5 seconds, there is hardly any warm up time taken by this scanner. While performing the test image scan at 300 dpi, we found 4570c to be the fastest again—taking just 13.97 seconds. Priced at Rs 17,999 it packs a lot of features; this model has excellent build quality with an onboard LCD panel that displays the number of copies to be scanned. HP Scanjet 3570c, 4500c, 4570c and the 5550c from HP were the only scanners in the comparison test to have the 'Scan to CD' hot key. This feature lets you scan a document, and then burn it on to aCD-R or CD-RW medium. The only problem with the HP scanner is the TWAIN driver which previews a document or image every time a new scan is performed. It even previews a document which was previously previewed and scanned!

At 1200 dpi however, the 4570c lost to the Canon CanoScan D1250U2F which logged 176.67 seconds to scan a photo. The Canon wasn't far behind in the scan of the text document at 1200 dpi where it logged just 10 seconds more at 126.1 seconds, as compared to the 4570c. The strong point of the Canon is that it is more compact than the HP 44570c, and also has a Transparency Adapter built into its cover. The best feature of this machine is a hot key clearly marked as Photo, on the top of the cover to scan negatives. Apart from that it also has three hot keys for Direct Scan, E-mail and Print.

Getting in to the quality arena, which is what these scanners are made for, we found the HP Scanjet 5550c to be the best. It aced every test thrown at it. In the resolution test it managed to detect all four blocks in full colour mode, a feat which no scanner in the comparison test could match. It was 15 to 20 per cent slower in terms of speed, inspite of having a USB 2.0 interface. The 5550c comes bundled with an Automatic Document Feeder, which also acts its cover. Unlike other scanners, which have a top cover hinged at their back, the 5500c and 4500c have been clamped from their sides—the cover opens sideways. The number of buttons and their layout is the same as found on the 45xx series, but these goodies come at a cost. This scanner is priced at Rs 24,999, making it the costli-

Just Press the Right Button

Scan to Fax: This feature lets the user fax a scanned document using an inbuilt application. It needs the telephone line (not a fax machine) connected to the PC via a modem. This transmission takes place using TAPI protocol.

Scan to Print/Copy: Lets the user directly print the scanned document from a locally connected or a network printer. This saves the additional click to initialise the printer program and take the print-out. The document is also saved as an image for later use.

Scan to E-mail: Lets the user directly mail the scanned document. The moment the scan-to-mail button is pressed, the system will initialize the default email client, enter the email address of the recipient and the document will be mailed.

Scan to OCR: This is a new addition which is fast becoming common. This button, when pressed, scans the document and initializes the OCR software. The scanners which have this feature are usually bundled with older, or a 'light' version of an OCR-software.

Scan to CD: This relatively new feature scans the document and burns it directly on to a CD-R or CD-RW medium, hence saving lots of hard drive space and also imparting mobility to data.

Scan to Web: This feature scans a document, and posts it directly to a desired Web page.

est scanner we received for this comparison test. The 5550c was also best suited for the purpose of OCR. The ADF attachment of this scanner can take 35 sheets at a time and in our OCR test, ABBYY FineReader 6.0CE recognised only one character incorrectly. This makes it best suited for batch processing, where converting print information into a digital format is a very important and painstaking task.

The Microtek ScanMaker X12UL, which returned equally impressive image quality, lost to HP in the speed test. This was the only scanner in our comparison test to have both, a SCSI and a USB interface. Those who still have older SCSI scanners which need to be replaced should give this one a look. The price of the scanner is Rs 15,990 which includes the SCSI card and a cable, making it an affordable solution.

The HP 5550C, which very much deserved the crown based on the quality that it delivered, lost to its own sibling, the HP Scanjet 4570c. The 5550c scored 80.40 STTI as compared to the 84.22 scored by 4570c. This was primarily because the 5550c is priced Rs 7,000 higher. The 4570c delivers good quality scans at a faster rate and is also sturdily built. This scanner also has an option for Automatic Photo Feeder and Transparency Material Adapter, which extends its usability.

We recommend the HP Scanjet 4570. This scanner delivers astounding quality at the right price.

What it all leads to...

Benq which was also an eager participant with three models that yielded below average performances. The S2W 7400UT, in particular, gave dark scans of images, and features such as a Transparency Adapter and a compact design were absent.

Products from HP came on top in two out of the three segments. Only the business category was taken over by UMAX Astra, because of its fast speed and brilliant quality. The Astra 2500 is a very average looking scanner that is pretty low on the features but quite adept at performing the basic job.

HP Scanjet 5500c, on the other hand is one of the most feature rich scanners. In fact, at first glance, it does not look like a scanner—with an ADF for a cover, nine buttons and an LCD display, this scanner is made for the future.

Epson decided to pull out of the scanner segment, and the quality delivered by them was sorely missed.

Best performence

If quality is paramount to you, then the HP 4570c will meet your requirement. With a resolution of 2400 dpi and a 48-bit colour depth, this sleek-looking scanner brings eye-pleasing images to you monitor. It also has a connector for the Transparency Adapter, which makes it multifaceted and extends its usability to more media type. The scanner has a USB interface, which means that getting it up and running is a piece of cake. The quality delivered, and the features that it offers, is

HP Scanjet 4570c
The aerodynamic looks and impressive looks, make it a perfect companion for most scanning tasks

further backed by the results of the speed test—a testament to its efficiency. Although the Rs 17,999 price tag takes it out of the reach of most home users, the features this scanner offers—scan to CD, print and e-mail along with a dedicated key to select colour and line art mode—makes it very easy to use. The build quality and aesthetics are excellent, making it a perfect tool for those who can afford it.

Best value

The UMAX Astra 2500 has proved to be a workhorse—fast, efficient and simple—these are the keywords to describe it. The best thing about this scanner is that if used continuously, the 2500

Umax Astra 2500
This scanner is a perfect blend of price and performance

will scan each document faster than the previous one. The design is very simple, with no rounded corners, giving it an aged look. The same old beige colour further reinforces this appearance. Looks aside, this scanner costs only Rs 3,950, making it a very affordable and a no-nonsense solution for simple day-to-day scanning. This was also one of the few scanners missing hot keys, a popular feature with a majority of today's scanners.

While low on features, the Astra 2500 delivers on quality and is also good for OCR. The only bottleneck is the lack of connectivity for an ADF attachment. Its performance results and bundled goodies—which include image editing software, OCR software and so on—makes the investment more worthwhile.

ALIASGAR PARDAWALA AND AHMED SHAIKH

Decision Maker

	Home User	Business User	Professionals
You need	To scan documents including combi-documents and ocassionally images. Quality and feature are not very important	To scan documents printed on different media. Scans Images and even books at a decent resolution and needs accuracy as well as quality with some features	To scan negatives at a high resolution, and therefore needs a Transparency adapter. Scans images and also needs ADF for batch scan for OCR
Look for	Scanner with a bit-depth of more than 24-bit and resolution of 600 dpi	Scanner with at least three hot keys and resolution support of 1200 dpi at 48-bit colour depth	Scanner with built-in Transparency adapter or ADF as optional attachment with resolution of 2400 dpi at 48-bit
Our recommendations	HP Scanjet 2300c and Umax AstraSlim 600	UMAX Astra 2500, HP scanjet 3500c	HP Scanjet 5550c, 4570c
Price Range	Rs 3,400 to 4,000	Rs 4,000 to 10,000	Rs 10,000 to 25,000

Bazaar

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

Toshiba Protégé 3500

Welcome to tablet computing

Powered by Microsoft's initiatives in the area of tablet computing, the Toshiba Protégé 3500 is one of the first devices to feature the tablet edition of Windows XP Professional. At first glance, it looks exactly like a small notebook.

Tipping the scales at less than 2 kg, the Protégé 3500 measures 11.6 x 9.2 x 1.2 inches. It sports a matte black body with the touchpad and the swivel strip. The stylus is located right in the screen bezel, and the four hardware keys to be used in the tablet mode are located at the bottom right of the screen. The power switch and a small slider button needed to lock the power button are located at the other extreme end. You can use the lid latch to lock the LCD, even while in tablet mode.

The Protégé is the transition between traditional mobile Pcs and the radically new tablet computing. The 12.1-inch screen can rotate a full 180 degrees, and folded flat on top of the keyboard to activate the Tablet mode.

This baby boasts of a Pentium III 1.3 GHz mobile processor, with a 12.1-inch poly-silicon TFT colour display (supporting up to 16 million colours at a resolution of 1024 x 768).

Input options include an 84-key keyboard with 12 function keys, integrated touchpad, a tablet pen with the hovering feature and four hardware buttons. Connectivity options include 10/100 Mbps Ethernet, integrated V.92 modem, infrared, integrated 802.11b wireless LAN and optional integrated Bluetooth. Two USB 2.0 ports and an RGB port provide support for external devices.

Expansion options include a user-accessible memory expansion slot, a type II/type I PC card slot, an SD card slot and a compact flash type II slot. There is no integrated CD ROM or floppy drive, though an external CD ROM drive is bundled along.

It is strictly average in the standard notebook mode with a sturdy keyboard and well spaced keys. The touch-sensitive nature of the LCD reduces the viewing angle and the user needs to keep the screen straight to view colours and read text. The swivel ability of the screen has its advantages, but swivels only in one direction and is quite fragile.

The real fun starts when you switch to the tablet mode. The display orientation automatically changes to the portrait mode, and you can use the special features of Windows XP Tablet Edition. The input window for the handwriting and speech recognition feature is docked at the bottom of the screen.

You either use the Stylus to write text inside the input panel and control the active applications, or use the on-screen virtual keyboard.

Single or double tapping of the stylus on the screen translates to left click and double click, while a small button on the stylus can be pressed while tapping for a right-click.

The handwriting recognition is fairly accurate, but the Speech recognition leaves much to be desired—even after spending considerable time training the software. An external microphone may yield better results.

Windows Journal allows you to draw, write free-form and select handwriting to be translated into text. Other software bundled, includes Sensiva Symbol Comma stylus-based access to and navigation functi Zinio—a magazine re

The system is n tially a performance o machine, but then meant to be— it yiel fps in normal mode a in high quality for *Arena*. The PIII 1.3 C and 256 MB of RAM i for most business app

The 2 Kg weight a battery life of 3 ho short of a potenti user's requirements. the system gets quite prolonged use. At a pr about Rs 2 lakh, the 3500 may not be the alyst to make tablet co mainstream yet.

Price: Rs 1,99,999 plus taxes
Contact: HCL Infosystems Ltd
Phone: 0120-4544534
E-mail: notebook@hclinsys.com
Web site: www.tabletpc.toshiba.com

SPECIFICATIONS

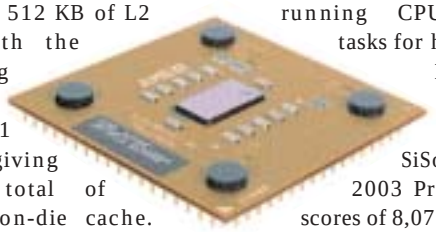
Pentium III 1.3 GHz m processor, 256 MB SD 40 GB hard drive, 12.1 Poly-Silicon TFT, Trider ALADDiN-T graphics c Ali M1535 integrated s sound, built-in speaker phone, 84-key keyboa grated touchpad, a tab 10 Base-T/100 Etherne grated V.92 modem, ir integrated 802.11b wi LAN, optional integrat tooth, two USB 2.0 po RGB port, one Type II/ card slot, one SD card one Compact Flash Ty

Toshiba Protégé 350
Performance
Build quality
Value for money
Features
OVERALL

AMD Athlon XP 3000+

Cache-happy

In response to Intel's Hyper-Threaded 3.06 GHz Pentium 4, AMD has released its new XP 3000+ processor, codenamed Barton. The newborn has one significant difference over its predecessor—the Thoroughbred—an additional 256 KB L2 cache. It combines 512 KB of L2 cache with the existing 128 KB of L1 cache, giving you a total of 640 KB on-die cache. The Barton core is currently available in three speeds—3000+, 2800+ and 2500+.



The Barton requires an FSB of 166 MHz, and the 3000+ is clocked at 2166 MHz—equivalent to the Thoroughbred 2700+. The additional 256 KB L2 cache in Barton adds 300 points to the CPU rating, bringing it to 3000.

We tested the Barton on the MSI KT4 Ultra motherboard that utilises VIA's KT400 chipset. Although the manual claimed that the 3000+ CPU was supported, it required a BIOS upgrade to make it recognise the CPU. Also, the FSB has to be specified as 166 MHz in the BIOS settings. The other components in the test setup included a 256 MB DDR 333 stick, ATi Radeon 9700 PRO accelerator, IBM Deskstar 40 GB hard disk and Samsung CD-RW\DVD combo drive.

An increase in the on-die cache usually leads to a 10 to 15 per cent increase in heat dissipation; fortunately, even though Athlon CPUs have been traditionally quite hot, the addition of the cache did not affect the 3000+ much. The thermal grease, heat sink and fan combo perform an excellent job of keeping temperatures down, even while running CPU-intensive tasks for hours.

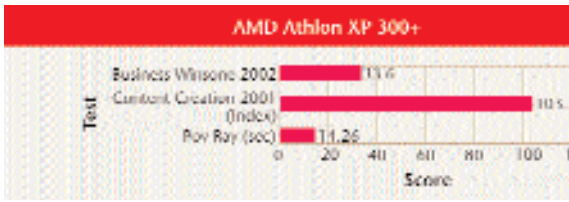
In the CPU benchmarks, SiSoft Sandra 2003 Pro reported scores of 8,071 MIPS and 3,271 FLOPS in the Arithmetic benchmarks. In the multimedia benchmarks, the scores reported were 11,923 it/sec in the Integer tests and 12,688 it/sec in the FPU SSE tests. PCMark2002 Pro meanwhile, displayed a score of 6,454 marks. Finally, in the CPU-intensive video encoding tests, the CPU performed the operation in a time of 86.58 seconds—a few seconds more than the time taken by the Intel 3.06 GHz CPU.

A P4 3.06 GHz CPU placed in an equivalent system configuration would have produced scores 8 to 10 per cent higher. Even when the 3000+ was replaced by the Thoroughbred 2800+, the scores were almost the same as those of the 3000+—in a few tests, the 3000+ actually scored lower results.

The weakness in graphical applications was reiterated by the 3DMark2001 SE and *Quake III Arena* scores. While 3DMark produced a score of 12,527 marks, the *Quake III* demo ran at 233.2 fps. It scored an impressive 103.3 Winstone units in Content Creation 2001. It also did well in POV-Ray's rendering time for a standard chessboard scene, clocking a superfast 14.26 seconds. It is here that the extra cache made its presence felt.

Sisoft Sandra 2003 Pro

CPU Dryhstone	8071 MIPS
CPU Whetstone	3271 MFLOPS
CPU Integer	11923 instructions/sec
FPU SSE	12688 instructions/sec
ALU / RAM	2301 MB/s
FPU / RAM	2149 MB/s



Currently, there is a shortage of Barton CPUs, giving vendors the opportunity to jack up their prices. AMD enthusiasts will probably have to wait a few more months for the prices to settle.

Price: US$ 580 (approximately Rs 29,000)
Contact: AMD Far East Ltd
Phone: 011-26238620
Fax: 011-2628 364
E-mail: amd@surfgold.com
Web site: www.amd.com

SPECIFICATIONS

2166 MHz clock speed
MHz FSB, 128 KB L1 ca
512 KB L2 cache, 3000
Socket A interface

AMD Athlon XP 30

Performance	
Build Quality	
Value for money	
Features	
OVERALL	

IndiaAccounts

Online accounting

The latest version of the country's only Web-based accounting software includes modules on Accounts, Inventory and Payroll—a significant improvement over its previous release and somewhat similar to popular accounting packages such as Tally.

IndiaAccounts is capable of the usual tasks of creation of groups, accounts and vouchers, which include all of the basic types such as receipts, payments, sales, purchases and journals.

The major security concerns of loss of data and hacking are taken care of by automatic backup of data on offsite backup servers and 128-bit encryption.

IndiaAccounts can import data directly from Tally. It works on the ASP Model. The software is provided cost, along with fre upgrades. However, charge a setup fee o and a montly service Rs 200 for home use 500 for small busines

All data is st IndiaAccounts server 5 MB limit and the buying additional whenever needed.

Price: Rs 750 setup charges
Rs 200 monthly maintenance for home users
Rs 500 monthly maintenance for office user
Contact: Microcell Solutions Pvt Ltd
Phone: 022-26206442
E-mail: support@indiaaccounts.com
Web site: www.indiaaccounts.com

SPECIFICATIONS

System Requirements
Windows 98/2000 or h
64 MB RAM, 500 MB f
disk space, 56 Kbps In
connectivity, and I.E 5.
higher

IndiaAccounts

Performance	
Ease of Use	
Value for money	
Features	
OVERALL	

SuSE 8.1

The chameleon adapts well

The latest version of Linux SuSE promises to be more user-friendly upon first sight. The user guide employs screenshots to assist the novice, while the installation and updating software is made simple by the YaST2 control centre that acts as a centralised interface to control all applications on your machine.

The administration guide gives in-depth information on all that a system administrator would need. SuSE is also one of the first Linux distributions to add support for ReiserFS.

Only if your hardware is supported by SuSE 8.1, will the installation and configuration be easy. We used a P4 2.2 GHz, with an Intel 850MD motherboard, 256 MB RD RAM, MSI GeForce 4 MX440 accelerator, an onboard sound codec and LAN controller and a Seagate Barracuda ATA IV HDD. The OS detected all the hardware, except the sound codec, thus, we were unable to test its multimedia capabilities.

The low-end test bed was composed of a Celeron 433 MHz with 128 MB RAM, a Riva TNT2 card and no sound card. The installation was smooth—the default option given by the partitioning utility no longer deletes the existing Windows partition.

The OS has revamped its printing sub-system completely, doing away with the earlier Berkeley-based printing system and switching to CUPS instead. This makes printing easier and flexible, since CUPS can be administered from any browser as well as from various other front-ends.

Corporate users might be a bit disappointed since StarOffice 6.0 is not included. One of its biggest problems is the huge memory requirement of the GUI. Overall though, SuSE Linux 8.1 is definitely very promising.

SPECIFICATIONS

Hardware requirements: Pentium-class CPU, 64 MB RAM, 400 MB hard disk space, for command line interface.
Package contents: One user guide, one administration guide, one quick install guide, seven CDs and one DVD

SuSE 8.1	A-
Performance	
Build quality	
Value for money	
Features	
OVERALL	

Price: Rs 3,600
Contact: G.T. Enterprises
Phone: 080-6606093
Fax: 080-6671407
E-mail: gtcdrom@vsnl.com
Web site: www.suse.com

Fuji Finepix S304

Good for stills

The latest high-resolution digicam from the Fuji S-series, the Finepix S304 has a protrusion on the right-hand side, making it look bulky, even though it is quite light in weight and compact. The rubber grip on the protruding facade adds to the comfort and reduces the chances of accidentally dropping the camera. The lens protection cap comes with a string and clips on firmly. The flash pops up like the headlights of a sports car when a button on the left-hand side is pressed.

The 1.8-inch TFT LCD screen is large enough to view images clearly and a button above it switches the display mode between the LCD and the TTL EVF (Through the Lens Electronic View Finder). The brightness can be adjusted through the user menu. However, the actual colour and brightness of the photograph is quite different from what is seen on screen. The preview of the captured images can be seen by turning the front control dial from Camera to Preview mode. You can see the thumbnails when required and erase images to free up space.

The interface is very user-friendly—the white balance, exposure compensation, aperture priority, sharpness, quality of images, flash mode and flash brightness can be adjusted for precision photography. It has a 6x optical zoom lens and another 3.2x of digital zoom that can be adjusted by the buttons placed on the right-hand side at the back of the camera. A slot on the side makes space for a 16 MB xD-Picture Card memory, which can store 12 photographs at the resolution of 2048 x 1536 pixels. Four AA batteries power the camera for more than 200 photographs. To save on power, the LCD screen automatically shuts off when it has not been used for a while. You can also record small movie clips with sound of length up to 200 seconds at the lowest resolution and the camera can also be configured to work as a web-cam by changing the USB mode to PC cam in the setup menu.

The lag time between clicking and image capture is longer than desirable—this is unsuitable for wildlife and live photography where timing is critical. It also has a rather large cycle time and is unsuitable for taking quick photographs in succession. Three aperture settings give flexibility of field of depth. The macro function can capture images as close as 10 cm from the lens. There are a number of pre-defined white balance settings that can capture optimal-quality images in yellow light, white light, or on a cloudy day. The sharpness of the images can also be adjusted.

This is a very powerful and efficient camera with good aesthetic design. It is, however, quite slow and would not be a good choice when many photos need to be shot continuously and at high speeds. While keeping in mind the performance, the price is quite high.

SPECIFICATIONS

1/2.7 inch CCD sensor, 3.24 million effective pixels, xD-picture card, 6X optical lens equivalent to 38mm-228mm, JPEG file format output
Bundled accessories: User manual, quick start guide, 16 MB xD-picture card, four AA alkaline batteries, neck strap, USB cable, lens cap, adapter ring, USB driver CD, FinePix viewer, DP Editor, Apple QuickTime 5.0 and ImageMixer VCD for FinePix

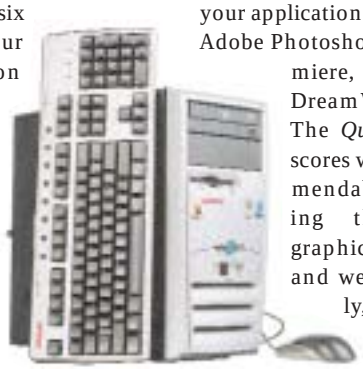
Fuji Finepix S304	B+
Performance	
Build quality	
Value for money	
Features	
OVERALL	

Price: Rs 40,000
Contact: Jindal Photo Films
Phone: 022-28504949
Fax: 022-28504044
E-mail: k_mohan@jindals.com
Web site: www.fujifilm.com

Compaq Presario 6235IN

Well! It's a Compaq

The Compaq Presario 6235IN, built on the Pentium 1.9 GHz sports a solid cabinet that combines shades of black and silver, with a DVD/CD-RW combination drive. The innards have the regular 256 MB DDR RAM, a 40 GB hard drive, standard 1.44 MB FDD, six USB ports, four PCI expansion slots, a modem, Ethernet card, onboard graphics controller and audio codec.



The hard disk was a bit of a disappointment as it runs at 5,400-rpm. Considering that the price difference between this and a 7,200 rpm drive is marginal, a faster drive should have been in order. Heat is not an issue, as Compaq has taken special care to provide sufficient and noiseless cooling.

The machine comes loaded with Windows XP, along with the necessary software for using the CD-RW. It includes two games—*Fate of the Dragon* and *Project Eden*. It also bundles Microsoft Money 2002, Microsoft Works 6.0 and the Encyclopaedia Britannica 2002 edition CD.

The keyboard has a good feel and has several hotkeys. The optical mouse too provides a happy mix of ergonomics and sensitivity. The two USB ports are placed in the front for easy access.

In the Content Creation 2001 test, the Presario logged 55.6 which is a good score if your application list consists of Adobe Photoshop, Adobe Premiere, Macromedia DreamWeaver, etc. The *Quake III Arena* scores were also commendable, considering the onboard graphics controller, and were surprisingly, at a resolution of 1024 x 768—better than the scores at a resolution of 800 x 600.

Considering the configuration and make, the PC is reasonably priced. It does take a beating by excluding an AGP slot. Since most people upgrade their computers, this is a sure limiting factor.

SPECIFICATIONS

P4 1.9 GHz, 256 MB PC2100 DDR RAM, 40 GB, 5,400-rpm hard disk drive, 32 x 10 x 12 x 40 DVD/CDRW combination drive, PS/2 optical scroll mouse, Easy Access Internet Keyboard, 1.44 MB FDD, onboard sound codec and graphics controller, Integrated 10/100 Mbps Ethernet controller

Compaq Presario 6235IN	A-
Performance	
Build quality	
Value for money	
Features	
OVERALL	

Price: Rs 50,490
Contact: AVI Electronics
Phone: 022-26465522
Fax: 022-26460347
E-mail: aviteam@vsnl.com
Web site: www.compaq.co.in

BackTrak 1.6

Protecting your data

BackTrak 1.6 is a simple backup software aimed at home and small business users. Along with copying the data, it also compresses, encrypts and password protects the data.

The backup procedure consists of three basic steps: what to copy, where to copy and when to copy. All this can be configured once and saved as profiles to be used automatically every time you take backups. BackTrak can also save a number of versions of the same file.

BackTrak does not have a host of features. Although the package is supposed to include a 12 GB USB hard drive, we didn't recieve one. This drive can be used for storing your backups and carrying them around conveniently.

SPECIFICATIONS

Package Contents: Software CD and 12 GB USB hard drive
System Requirements: 100 MHz, Windows 95/98/2000/Me/XP, 32 MB RAM, 20 MB hard disk space

BackTrak 1.6	B+
Performance	
Ease of Use	
Value for money	
Features	
OVERALL	

Price: Rs 5,798
Contact: TechnoPundits Systems Pvt Ltd
Phone: 044-2652 4326
E-mail: jothi_yegneswaran@technopundits.com
Web site: www.technopundits.com

Ulead COOL 3D Studio

3D editing for dummies

COOL 3D Studio is very compatible with other animation applications and can export files to Macromedia Flash (.SWF), Read-Text 3D (.r3t) and GIF formats. We used a low-end machine to see just how efficient and quick the program was—an Intel Celeron 466 MHz, 128 MB RAM and a 32 MB Riva TNT2.

The interface is very intuitive and easy to use. Apart from the regular samples in the EasyPalette such as text, graphics, geometric objects and lathe objects, you can insert particle objects such as fire, smoke, snow and bubbles.

One limitation is its inability to directly import the required video and image files—these have to be set as the background. However, direct importing of graphics files and 3D models are supported.

It provides accurate editing and control of frames using its timeline mode. It is a much improved version with enhancements—exporting of 3D models, timeline mode, setting of various background and camera views, support for locking, disabling and aligning objects.

SPECIFICATIONS

Requirements: Pentium II, 64 MB RAM, 120 MB hard disk space, display card with 4 MB memory, high colour display mode, Windows 98SE/Me/2000/XP, DirectX 8.1
Package contents: One user guide, license agreement, customer registration cards, one installation CD

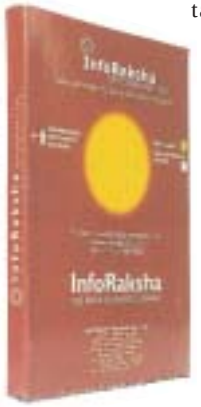
Ulead COOL 3D Studio	A-
Performance	
Ease of Use	
Value for money	
Features	
OVERALL	

Price: Rs 6,500 + taxes
Contact: MICROGRAPHICS
Phone: 011-22092423
E-mail: micrographics@vsnl.com
Web site: www.asiapac.ulead.com

On-line remote back-up data storage

Price needs to be compressed

This Web-based back-up software does not require any storage space for the data at the user level. You only need to install the software and register yourself online at ***www.inforaksha.com***. The software requires that your proxy or firewall (wherever applicable) should open ports 2773 or 2774.



Once the installation is complete, a disaster recovery disk should be prepared that stores the username, password, encryption method and encryption key. Backing up is a pretty easy process—you need to create a backup set by specifying the files to be backed up and naming the set. From then on, it automatically backs up the files on the server, depending on the frequency and time configured by the user.

Restore > Select Files for Restore will show you a list of the backup sets, and the day and time when they were taken. The files can be restored to either the original location or a new location on the hard drive. The location can be changed by going to ***Restore > Redirect Restored Files*** and then choosing the location.

Although the server storage is priced a little steep, the software does guarantee you peace of mind—provided you have a really high-speed Internet connection.

Price: Rs 5,000 for a single user with 100 MB server space
Contact: InfoRaksha Netlinks Pvt Ltd
Phone: 022-26870013
Fax: 022-26870860
E-mail: marketing@inforaksha.com
Web site: www.inforaksha.com

SPECIFICATIONS

Package Contents: Customised software CD, installation manual
System Requirements: Intel 486, Windows 98/Me/2000/NT/XP, 16 MB RAM, high-speed Internet/Network connection

On-line remote back-up data storage	B
Performance	
Ease of Use	
Value for money	
Features	
OVERALL	

Maxtor 250GB DiamondMax 16

So much to store

Storage solutions provider Maxtor has become the first company to introduce a 250 GB IDE hard disk, running at 5,400 rpm, and featuring the Ultra ATA/133 interface. The form factor is the same as any new disk drive. By jacking up theaerial density using the latest technological innovations, manufacturers are increasingly packing the standard drive with loads of storage capacity.

Maxtor has maintained the spindle speed of the hard disk at a low 5,400 rpm, as compared to other high-capacity hard disks—even the buffer is maintained at the standard 2 MB. Although the ATA/133 interface is supported, the low rpm definitely poses a bottleneck to transfer speeds. This is verified by the access time of the drive—11 ms, as compared to usual access times of 5 to 7 ms, which is the rated access time.

The hard disk is cheaper as compared to other 200 GB hard disks, primarily because it skimps on performance. Thus, it is suitable only for those who are interested in finding a permanent solution to their storage problem, with no regards to the performance.

Price: Rs 22,500
Contact: Cyberstar Infocom
Phone: 022-26438216
Fax: 022-26235460
E-mail: yogi@maxtor.com
Web site: www.maxtor.com

SPECIFICATIONS

250 GB internal hard drive, DMA/ATA-133 (Ultra) Fast interface, 3.5-inch form factor, 5,400 rpm spindle side speed, 2 MB buffer, Dimensions: 1.02 x 4.02 x 5.75 inches, Weight: 600 grams

Maxtor 250GB DiamondMax 16	B+
Performance	
Build quality	
Value for money	
Features	
OVERALL	

Neotech Keyboard

Too simple

The Neotech K-9856, a blue and silver keyboard, has a USB connector, thus cannot be used with older PCs. It features a rubber grip for stability, and the plastic pegs that are adjustable to three positions, so you can keep the board at an angle you prefer.

The keyboard has a regular layout with the hotkeys placed unobtrusively on the upper part of the board. The top row of regular keys has been made slightly smaller in order to accommodate the hotkeys. The keys do make a little noise when pressed. Besides, they don't depress much, making you doubt if the keystroke has been recognised by the system.

We also could not get the hotkeys to work on the Windows XP test bench, even though the software installation and key configuration went smoothly. Also, the software did not install correctly with Windows 98, rendering the hotkeys useless. The lack of documentation also proved to be a major stumbling block.

This is a simple keyboard with a number of hot keys for speeding up frequently-used processes—if you can get them to work. It might appeal to those who are tired of looking at the conventional black and white keyboards.

Price: Rs 999
Contact: Sunder Marketing
Phone: 022-2492 6015
Fax: 022 - 2496 3150
E-mail: neotech@vsnl.net

SPECIFICATIONS

USB connectivity, 126 keys including 19 hotkeys, Windows 98/2000/XP compatible drivers

Neotech Keyboard	B
Performance	
Build Quality	
Value for money	
Features	
OVERALL	

Creative MegaWorks THX 5.1 550

The ultimate sound of music

With the MegaWorks, you're not watching a movie—you're bang in the middle of it! The THX 5.1 are manufactured with the expertise of Cambridge Soundworks—makers of high fidelity speaker systems with a Signal to Noise ratio of 99 dB. The revolutionary BASH amplifier technology produces high power levels without sacrificing on the sound quality.

Setting up the speakers with the Audigy 2 Platinum soundcard from Creative simple because of the colour coding given for the connections to the individual channels. The acoustics are clear and loud enough for an out of the world experience. The bass is something that trance lovers will write home about. Turn down the bass and play a live orchestra track, and these same speakers produce the most soothing high-fidelity sound that transports you to a live concert. Having the coveted THX certification, it is a great system for watching a movie with intensive sound effects.

The sound intensity can be adjusted by a fully functional remote control. The 150W RMS subwoofer overpowers the higher frequencies.

On the flip side, there are only analog inputs—there is no provision for connecting a digital input to the speakers. If you've got deep pockets, a large room and love music, don't miss out on this system.

Price: Rs 27,999
Contact: Creative technology Ltd
Phone: 9820357713
Fax: 022-26870860
E-mail: rajshekhar_bhatt@ctl.creative.com
Web site: www.creative.com

SPECIFICATIONS

5.1 speakers, 150 W RMS subwoofer, 5 x 70W RMS satellites, 25 Hz to 20 KHz frequency range, 99dB SNR, 14.3 x 10.8 x 16.0 satellite speakers (with stand), 30.5 x 29 x 32.5 cm sub woofer
Bundled accessories: USB cable, desktop stands for satellite speakers, monitor stand for centre satellite speaker, quick start guide, instruction manual, wired remote control

Creative MegaWorks THX 5.1 550	A+
Performance	
Build quality	
Value for money	
Features	
OVERALL	

LG L-112 IV Optical Mouse

This is no church mouse

The first LG mouse launched in India sports a low-profile design with a two-tone colour finish. The upper shell is made of a highly polished plastic, with a complementing orange transparent undershell.

The mouse uses the standard PS/2 interface, with two buttons and a clickable scroll wheel. The buttons are large and well-placed within easy reach, but are very soft and lack good tactile feedback. This results in frequent dead clicks that makes the mouse totally useless as far as gaming is concerned. The rubberized clickable scroll wheel is smooth, but lacks that special touch that goes into great mice such as Logitech's MX500.

Priced at a Rs 1,000, plus taxes, this mouse is very expensive. Other mice offer more in terms of ergonomics, precision and button quality at nearly the same price.

Price: Rs 1,000
Contact: LG Electronics India Pvt Ltd
Phone: 0118-2560900
Fax: 0118-2560921
E-mail: arastogi@lgezbuy.com
Web site: www.lgindia.com

SPECIFICATIONS

PS/2 interface, two buttons, one clickable scroll wheel and optical sensor

LG L-112 IV Optical Mouse	B
Performance	
Build quality	
Value for money	
Features	
OVERALL	

Samsung Combo Drive 48x24x48x16x

Jack of all trades

Samsung's new CD-RW/DVD combination drive is aimed at home users—for whom money and space are top priorities. It features 48x CD read and write speeds, 16x DVD read speed and 24x write speed for CD-RWs—the fastest speeds currently available for combo drives. It also has 8 MB buffer memory, which is a definite advantage.

The Dynamic Vibration Absorber (DVA) reduces vibrations in the drive. Bundled Software includes Nero 5.5, InCD and Cyberlink PowerDVD (an excellent application for reading DVDs). A sample DVD for demonstrating the drive's performance would also have been appreciated.

The drive performed noiselessly, thanks to its efficient damping system, and sailed through all the tests. One limitation was faced during the CD-R write test—Nero could write only at a maximum speed of 32x, although the medium claimed to be 48x-compatible. Also, even though the blank CD-RW available for the test was 12x-compatible, Nero could write only at speeds of 10x. Thus, the times of the tests are equivalent to a 32 x 10 x 40 CD writer. However, it touched its claimed read speed of 48x in the Nero CD Speed test.

On paper, this drive offers the fastest speeds but, compatible media are not bundled or available in the market. The higher buffer memory and rewrite speeds don't seem worth the extra money and the only advantage is that it's future-proof—in other words, slightly ahead of its time.

Price: Rs 10,000
Contact: Samsung Electronics
Phone: 011-51511234
Fax: 022-56345859
E-mail: marketing@samsungindia.com
Web site: www.samsungelectronics.com

SPECIFICATIONS

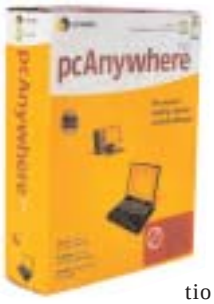
128 MB capacity, Windows 98/SE/Me/2000/XP, USB power supply (4.5 V to 5.5 V), USB 1.0/1.1 interface, data retention of over 10 years, available in capacities ranging from 32 MB to 384 MB
System Requirements: IBM PC or Notebook computer with USB port, Windows 98/Me/2000/XP

Samsung Combo Drive 48x24x48x16x	B+
Performance	
Build Quality	
Value for money	
Features	
OVERALL	

Symantec pcAnywhere 10.5

Take your PC wherever you go

Symantec pcAnywhere 10.5 is a 32-bit Windows-based application that allows users to collaborate across networks. Users can view their desktop from a remote computer or transfer files across networks. Other features include configuration of rebootless Host PC and gateways. pcAnywhere can connect to desktops using various interfaces such as dial-up ISDN, IPX, TCP/IP and infrared. We tested it using a 100 Mbps Ethernet connection on our Intranet.



The installation is quite simple—you can choose between a wide range of options such as Host Only, Remote Only and Complete. The manual gives detailed information about configuring hosts and remote clients using various connection types. The Symantec Web site has a decent collection of tutorials that are of great help.

The provided SpeedSend file transfer is extremely useful and swift. This is primarily because the utility detects and sends only that data which has changed since the previous transfer.

Data can be encrypted using public key, symmetric or pcAnywhere's encryption methods. Of these methods, pcAnywhere's encryption is the most simple and basic.

The excellent security, data encryption and logging facilities provided by Symantec pcAnywhere 10.5 make it ideal for enterprise setups.

SPECIFICATIONS

Requirements: Pentium 233 MHz, 64 MB RAM, Windows 98SE/Me/NT/2000/XP
Package contents: One installation CD, User manual

Symantec pcAnywhere 10.5	A-
Performance	
Ease of Use	
Value for money	
Features	
OVERALL	

Price: Rs 15,525
Contact: Symantec India
Phone: 022-26570658
Fax: 022-26570671
E-mail: adeshpande@symantec.com
Web site: www.symantec.com

Toon Boom Studio V2

Cartoonist at work

Toon Boom Studio V2 is 2D animation software that helps create cool animations with great ease. The program depends on QuickTime 5, so you just need to install the player provided with the CD.

A tutorial familiarises you with the features of the software. The creation of pictures for every animation is pretty easy. The user has to create a single drawing and then onwards create drawings with respect to the previous frame. The previous drawing is visible on the Drawing View for easy reference while you draw the picture for the next step.

Apart from drawing and painting, you can even insert sound elements. If the sound element is a dialogue, then you can animate the lip movements of the animation. You can make new lip states or just use the ones automatically generated by the program. You can even make multiple scenes, apply cross-dissolves between frames with colour transform elements, and create clipping mask effects.

Cartoonist and Web designers will find the Toon Boom Studio a true boon, especially with the added facility to export to Shockwave files. Taking into account the price factor, this is definitely a good investment for professionals.

Price: Rs 20,000
Contact: Rahul Commerce
Phone: 9520-6113853
Fax: 9520-6127752
E-mail: rahulsales@vsnl.com
Web site: www.toonboom.com

SPECIFICATIONS

System Requirements: 233 MHz CPU, Windows 98/2000/XP/Me, 128 MB RAM, 100 MB hard disk space, 1024 x 768, 24-bit colour display with 8 MB of video RAM

Toon Boom Studio V2	B+
Performance	
Ease of Use	
Value for money	
Features	
OVERALL	

Super Monocular Digi Cam

Souped-up magnifying device

The Super Monocular has an in-built lens that allows you to take pictures of far-away objects, and a viewfinder with a thumb-wheel focal adjustment. The user interface comprises a mode key and shutter button. The mode can be seen on the two-digit, alpha numeric, LCD screen. You have to refer to the key in the operational guide to figure out the meaning of the displayed digits.

The camera produces a barely-audible beep upon clicking and the only way to confirm is by keeping track of the photographs taken displayed on the LCD. The focal adjustment is not very flexible and allows you to take photographs of objects situated less than five metres away.

To download your photographs, connect the camera to the USB port, install the drivers and software from the CD.

The quality of the photographs leaves a lot to be desired—edges are not sharp and the detail level is quite low; there is no provision for light adjustment either. The camera can also be used to capture live images to the PC, but the limited focal adjustment does not allow much flexibility. The images are also marred with vexing red and blue dots, and a low frame rate. About the only thing it's got going for it is the large amount of memory—64 MB.

Overall, the Digi Cam is not a great buy given its low versatility, poor image and build quality.

Price: Rs 6,500
Contact: Compact International
Phone: 022-26923743
Fax: 022-26281751
E-mail: sales@compact-international.com
Web site: www.compact-international.com

SPECIFICATIONS

1.3 Megapixel picture resolution, 8x zoom, 7.8 mm angular field of view, 64 MB memory, two AAA batteries, USB interface, compatible with Windows 98SE/Me/2000/XP

Super Monocular Digi Cam	B-
Performance	
Build Quality	
Value for money	
Features	
OVERALL	

A key find

Agent 001 looks for the right buttons on a keyboard

A freak incident involving me, some spilt coffee and my keyboard left me with two options—one, to open up the keyboard and clean it dry; the other, to buy a new one. I knew it would set me back by about a thousand rupees. But considering that the keyboard was over two years old, the spilling of coffee was probably a boon in disguise, or so I like to think. The rationalisation made me feel better.

I was very clear about my requirements—smooth as silk typing; ergonomic considerations (if within my budget); and a QWERTY layout—the rest was left to my explorations and gyan from the vendors.

Now keyboards come in different layouts—typing keys are generally laid out in the same style that was common for typewriters. Critics of the QWERTY layout (taken from the letter on the first line of the said keyboard) have adopted another layout, Dvorak, that places the most-commonly used letters in a more convenient arrangement. I, for one, prefer the QWERTY layout. Simply, because it's the one I'm familiar with.

This settled, I checked out a few vendors. The popular brands spread across the market were Microsoft, Logitech, Samsung, Acer, Typhoon, Odyssey, Frontech, Gigabyte, Neotech, Vesta and Mercury. The prices begin at a humble Rs 600 and rocket up to Rs 5,000, all depending on the brand and the keyboard type. For instance, a wireless RF (Radio Frequency) keyboard could cost over Rs 4,500. A PS/2 (the standard), on the other hand, starts at just Rs 300.

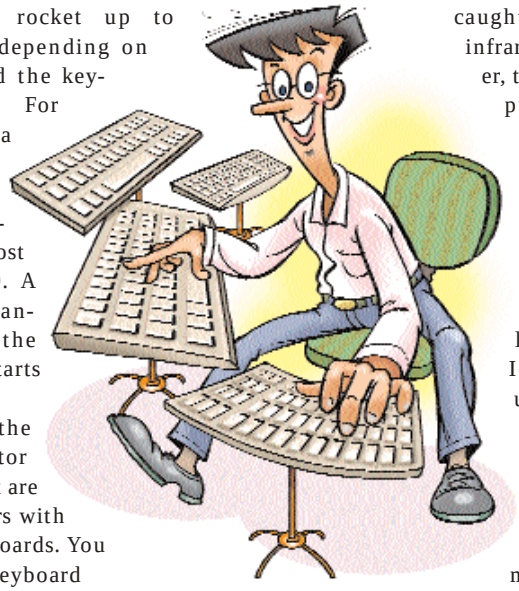


ILLUSTRATION: Mahesh Benkar

There are the AT connector keyboards that are sought by users with older motherboards. You can find this keyboard with a PS/2 converter with a few vendors. This interface, anyway, does not apply to new computers. As much as I would like it, cordless keyboards are for those with deeper pockets than mine. These keyboards also come with an incorporated touchpad (mouse). This option saves a lot of space.

Some probing done overseas via chat told me of identification keyboards with finger print verification. This allows you to lock and unlock your computer with the mere touch of your finger. A pity I couldn't find that here.

I wanted to look at some keyboards that accommodated extra function keys for increased productivity—for running the Internet, CD Audio player or opening my mailbox. However, one of the vendors informed me that these keyboards rely on software to run the different programs, and work only with certain operating systems.

My horizons were widening; I decided to look further. A friendly neighbour confided that flashy-looking keyboards not only add to your desktop appeal, but are also smooth to use. A few keyboards from the likes of Typhoon, Frontech and Neotech also have an in-built microphone, along with multimedia functional keys. But the prices were way beyond my budget.

Meanwhile, my eyes caught the attention of an infrared keyboard. However, the use of batteries is a put-off as you have to look at the type of battery the keyboard uses, as well as the average length of battery life in the keyboard. Further, there are the usual line-of-sight problems. I wasn't really charged up, so moved on.

The vendor asked me if I wanted a USB option with a free PS/2 converter. Unfortunately, my machine does not have a USB port and the possibility of shelling out a couple of thousands was a clear deterrent. I thought it best to end up with a PS/2 interface. These generally have 104- and 121-key options.

After a lot of heartburn, I stood with the Microsoft multimedia keyboard on one shoulder and the Samsung PC keyboard on the other. My thrift almost got the better of me when I was settling for the latter. It cost only Rs 300, but had no hotkeys and palm rest. But the deciding factor was the lack of the all important backslash key [\].

The Microsoft Multimedia keyboard had everything I wanted—16 hotkeys, PS/2 interface and a palm rest. The multimedia keys were located at the top, along with keys to access the e-mail, instant messenger, media player, etc. It was a cool piece, priced at Rs 1,606. The keyboard pegs are designed to take the load off your palm, and the software bundled worked hassle free. Best of all, the vendor would accept a cheque. And, now my coffee mug stands on an adjoining stool!

SHOPPING TIP

- Keyboards need to be soft and smooth
- The leg pegs should be sturdy; most tend to break with the slight jerk
- The keys should be tactile and not need too much pressure to register. Since this peripheral is in constant use, any glitch on the keyboard can be very irritating.
- An ergonomic keyboard is split in the middle, offsetting the keys where the two hands lie. This type of keyboard does take some time to get used to, especially since the arrow keys have been completely changed.
- Many vendors offer a combination of a keyboard and mouse in a cheap package deal. This is worth exploring.
- At the minimum, any Windows user should opt for a keyboard with a Windows shortcut key.
- Try to fit in a wrist pad that provides additional comfort and causes less strain on the wrists.

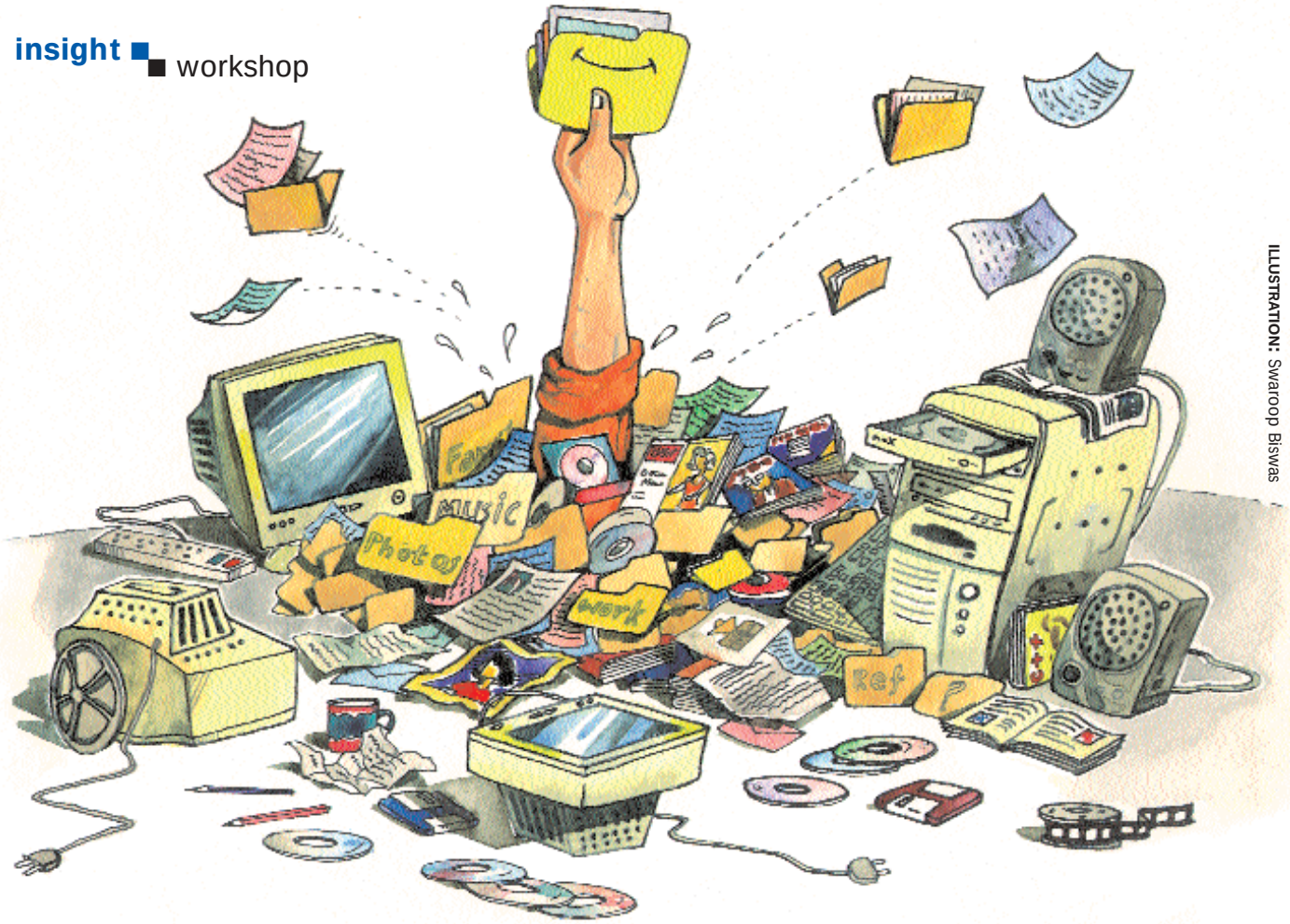


ILLUSTRATION: Swaroop Biswas

Organise your CHAOS

It's very likely that you have large volumes of documents, both at home and in the office, that are in disarray for want of a systematic process to organise and share them. Try out the document management system to see what it can do for you

"What's in a name?" asked Shakespeare once. A lot, especially if it's a vital document that your boss has asked for. Scrounging through the reams of folders on your computer will drive you crazy. We've been taught to organise electronic documents in folders, the way it's done in filing cabinets. The hierarchical file system (HFS) has long been a logical way of storing electronic documents.

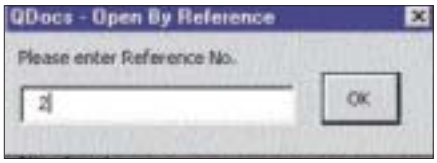
The HFS subjects the future behaviour of the user to his/her original logic on how to lay out the directory tree. Hence, even the Find feature may not be of much help when all you remember is that you do have such a document named 'something' lying 'somewhere'. You need an expert to organise your files in a meaningful manner that will help instant retrieval. What you need is a Document Management System (DMS).

A document records information. Information is more than data, so a document includes elements of contextualisation, organisation and analysis. Document Management involves managing documents through their lifecycle—from creation, review, storage and dissemination, right to their destruction.

The first thing is to document the management operation (by way of a meta document). Each document type (record series) retains a list of the creator, a brief description, method of indexing, location, retention period and reason for the retention period assigned. Records may then be placed in sub-groups to further classify the records. A DMS classifies, stores and records the progress in terms of changes made to your files in a systematic manner, making retrieval easy and efficient.

Getting your act together

While there are plenty of paid options that you can experiment with, you could start with Qdocs—a full-version single-user freeware that works with Word, Excel, PowerPoint, Visio, Publisher, Acrobat Reader, WinZip, eBook, Twain Scanners and image files. It is an add-on to MS-Office that organises your documents using a profile which generates an Automatic Reference Number, and asks for a



Just click Search to start the 'Open By Reference'

document description, a client (related to document), practise (department which the document belongs to), author, project associated with document, and date creation. The reference number, then, appears in the lower right corner of your document footer. So now, instead of searching through your folders to find a document, or an image, all you can do is type the reference number and press OK. If your document exists, it will open up instantly; otherwise you will get an error message.

Working with Word

When you save any Word document by pressing Save or using any other saving combination, a window will pop up asking you for the document profile information.

Type a detailed description of your document in the Description field. The more details, the better the chances of finding your document. In the Client box, if you don't use clients, use the default created by QDocs (My Recipient). In Practise, type the practise associated with your document. If you don't use practises, use the default created by QDocs (Default) e.g. accounting, operations, administration, etc. the Author field is filed by QDocs automatically and cannot be changed. It is mainly used in

Just click save and then fill in the description for the document—Description, Client, Project, Practise and Password—which will simplify a later search for it

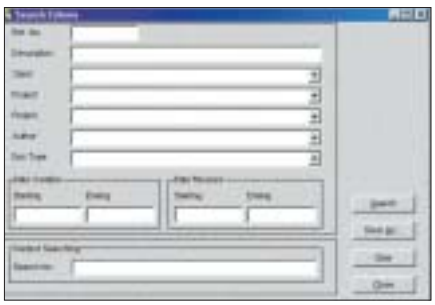
the multi-user version of QDocs.

For Project, type the project name connected with your document. If you don't use projects, use the default created by QDocs (My project). Secure your file by typing in a password.

If you aren't too particular about these fields, you can press the default button which will automatically fill these fields with pre-defined values. You can set defaults from ***QDocs > Tools > Defaults*** option. Now press OK, and QDocs will save your document and preserve a unique reference number that will be inserted in the document footer. You can enable or disable this function by going to ***Start > Programs > Qdocs > Stop (or Start) QDocs***.

In search of a document

When you want to retrieve a document, click the Search button on the QDocs toolbar. This will bring up a window asking for the reference number, description and so on of the file in question. As it often happens, we forget the name of the

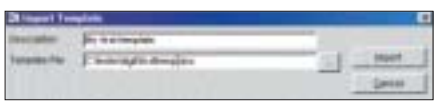


When retrieving a document, remembering a filename isn't necessary as you can search via varied criteria

file or where it was saved. QDocs helps by providing additional criteria to search for the lost documents. The more criteria you specify, the shorter will be the list to choose from. Let's assume you want to locate a document, and the only thing you remember is that it was related to a specific client and was written around January 2000. In this case, you will use the Client and Date Created criteria.

A matter of templates

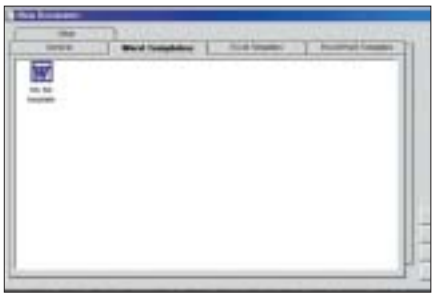
To create templates, go to ***New Document > Word templates***. You can choose the Excel,



Standard Excel, PowerPoint and other templates are easy to create

PowerPoint, General or other options too.

Clicking on Import will bring up another window wherein you will have to fill in the name of the template. Give the path and file name of the document that you want to use as a template by using Browse. When finished, click on Import to save your document as a template.



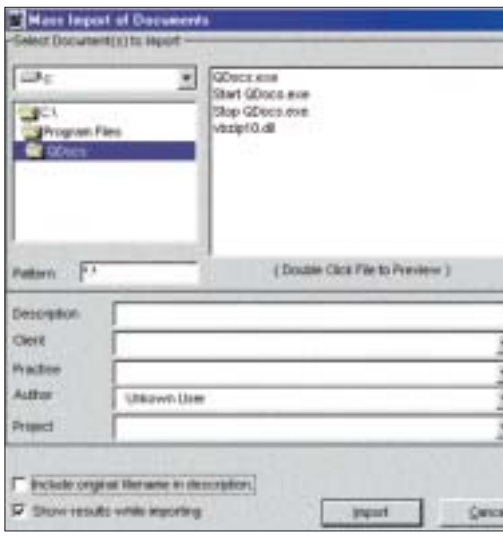
Importing templates is also easy

Double-click on the My first template icon to start a new document based on the template that you've just created.

Meant to import

The easiest way to import a document to QDocs, is to open it either from Windows Explorer or from Word. When you try to save it, the profile window will ask you for document information. After the document is saved by Qdocs, it is assumed that it belongs to the database and the profile window will not appear again.

You may want to import a host of files or a whole folder. In such cases, click ***Import > Mass Import***. In the window that pops up, search for the files that you want to import—select them like select-

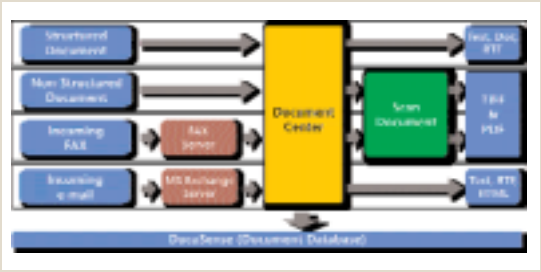


Use mass importing to import multiple files or even folders into QDocs

How Companies can Choose a DMS

Electronic Data Management Systems (EDMS), or DMS, are commercial, off-the-shelf software packages. A database management system (DBMS) is designed to store structured data—essentially data elements and data records. A Document Management System, on the other hand, can store, retrieve and manage unstructured information objects-files, text, spreadsheets, images, sound clips, multi-media and compound documents. An IT staff's involvement is to configure and install the package, train the users, provide help-desk support and keep the servers running smoothly.

The Document Management System takes care of the back-end jobs of an organisation such as the management and archiving of records. What remains is the front-end work, which includes e-mail messages, word processing documents and even voice-mail messages. For many organisations, the front-end integration is the most important consideration in product selection. Today, many vendors offer support for both proprietary clients on private networks and also Internet connectivity through Web gateways.



Companies that have implemented Document Management Systems emphasise the need to examine business-critical objectives before embarking on such projects. For businesses such as engineering, insurance and pharmaceuticals, the goal of automating the document management process is to get control of, and increase the efficiency of the flow of documents that support their business-processing insurance claims, and creating and getting approval for new drugs.

So how to choose the right product? A good Document Management System should obviously make it easy to locate documents, track the history of changes, prevent accidental loss of work and provide a basis for knowledge management. The first two fall into the document profiling area. The latter are normally part of version control. Besides this, the system should include all possible file types that a company uses-especially e-mail messages—and the filing and locating documents should be simple, both when working

ing files on the Windows explorer. Fill in all the document profile information (Description, Client, Practise, Client, Author and Project).

This information will be used for all the documents imported. All imported documents will be included in the QDocs by their unique Reference Numbers. If you want to include the filenames of the documents in the description, click the 'Include original filename' option. Start importing by clicking on Import.

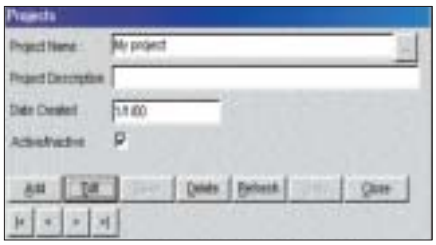
*Add clients easily by clicking **Tools > Clients > Add**—enter the information and click save*

Simple addition

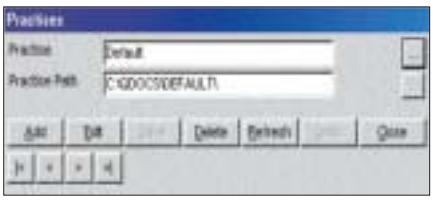
To add clients, click ***Tools > Clients > Add***. When you've finished typing the information, click Save, or else click Undo to discard changes. Use the arrows buttons to move to first, previous, next or last client in the list. You can use the Browse button to search for a client by the company name. Click Edit to edit the client details.

Projects : If you need to add new projects, click the Add button and the project name field will be shown in the workbench window. The Date created is automatically entered when adding a new project. When you're finished with a specific project, mark it as Inactive by disabling the option control and it will stop appearing in the workbench window. You can make it active again simply by enabling the option control.

Practises: Use the Practise option to categorise your documents by your business practises. Specify the location where you want the documents to be



New Projects can be added and appear in the workbench

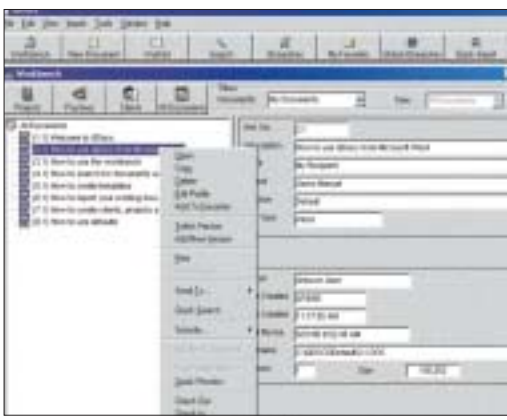


File your documents according to business practises for easy access later

saved by QDocs. Use the browse button to create a new folder.

Working the workbench

The workbench is a graphical representation of your documents. The tree view will show your documents in the following order: projects, practises and clients. You



Right-clicking on the tree view gives you the popup menu

offline and on the network.

Document profiling: All Document Management Systems allow you to save additional information so that it becomes easier to locate the documents later. When saving to the normal file system, you can specify a file name and a folder in a hierarchy. The system itself saves the date and time, file size and other attributes. A system profile extends this to allow a larger number of different attributes to be used, and does not force you to use a hierarchical system.

Generally, systems allow a single profile template for all documents. (Most systems actually allow you to create separate templates for different libraries of documents, but this normally requires you to create a very hard division in the filing system). Documents in real life do not lend themselves to such neat classification, especially if you are looking to file all documents, both client-related and internal. If you have a large profile, people will be less likely to fill it in and find it harder and slower to use. With a small profile, you lose many of the benefits of having a DMS in the first place.

Version control: Almost all systems provide for documents to be checked out, updated and returned to the system as a new version. The DMS makes sure that only one person at a time is working on a document and that the latest version is always known.

Systems would generally require customisation and additional work to meet company requirements.

can narrow down the visible documents on the tree by using the filters that are located in the upper right corner of the window.

Most operations (such as opening, copying, deleting, editing profiles, adding to favourites, listing existing versions, adding new versions, printing, searching and previewing) can be performed on the workbench. You can open a document by just double-clicking on it. When you select a document on the tree, its profile details are revealed on the right side of the window.

There are other commands that give you more freedom over the security of your data:

Save As...: Use this to save a document outside the QDocs database system. This option will prompt you for a path and file name. A document saved thus, cannot be retrieved by QDocs—you will have to retrieve it manually.

Remove Password from Document: Use this option to remove the password from the current document so that others can use it.

Set New Password to Document: Use this option to set a new password to your current document for more security.

The last words

QDocs also works in a multi-user environment and does not require an expensive server—a normal PC can act as your file server. It also does not require a big relational database such as SQL-Server or Oracle. QDocs is built specifically for the small to mid-sized companies.

You must note that QDocs is compiled for Microsoft Office 2000 and works with Office XP. However, in some computers running Office 97, it crashes when you try to open a document within QDocs, or shows the message 'compile error' while attempting to save. To amend this, ask for an Office 97 compiled version.

To disable QDocs go to ***Start > Programs > QDocs > Stop QDocs***. Note that MS-Word must be closed while you do this. Alternatively, when you are ready to save your document, keep the Shift key pressed and click on the Save Button. This will open the Word Save window instead.

1/2 page V. AD

GRAPHIC DESIGN: Solomon Lewis

Taking the WEIGHT off your LAP

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

The world of mobile computing has seldom been so exciting. Not, at least, for the last 3 years when all that the chip giants could think of was scaling down the frequency and voltage of the desktop CPUs, and labelling them as mobile processors. At CeBIT, the annual trade show for information and telecommunications technology held in Germany, Intel displayed a paradigm shift in thinking.

Intel introduced a combination of mobile technologies under the brand name Centrino (formerly Banias). Centrino includes a newly-designed microprocessor, integrated wireless capability, as well as related chipsets and software. It can be used to make thinner and lighter notebook computers with built-in wireless capability, extended battery life and improved performance. AMD too sprang a surprise with 12 mobile processors *(See box, 'AMD is a tough competitor').*

Given the longer batter life, frequent fliers can check their e-mail or read a newspaper online while waiting for a flight, and still have enough battery life left to watch a DVD on the return flight. Collegians, as done overseas, can register for next semester's classes, or seek a part-time job from the college library—all on a sleek and light system that won't stifle them.

How it works

Centrino broadly comprises three parts—a microprocessor called the Pentium-M, a companion chipset and a WiFi module. The Pentium-M comes out of Intel's labs in Israel and attempts to address one of the key problems with Pentium notebooks—the excessive power consumption.

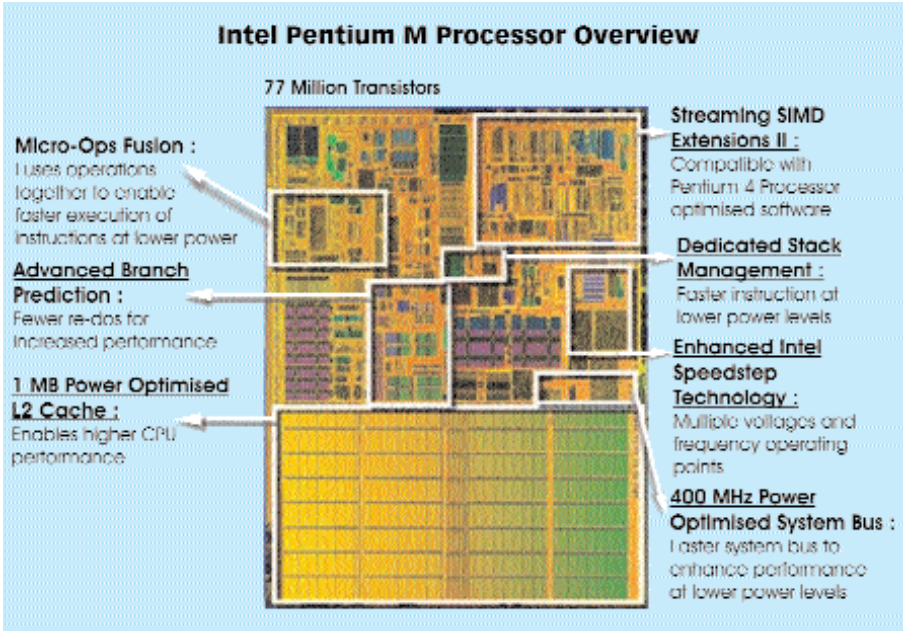
The Pentium-M is designed from the ground up to fit into notebooks, i.e., the chip is built from an architecturally different point of view. It now features the Micro Ops Fusion that combines two micro-operations, enabling it to execute tasks faster, while using less power. The first micro-operation is the Advanced Instruction Prediction, aimed at reducing

the overall latency in the system, thus contributing to higher performance with low power consumption. The second—Dedicated Stack Manager—reduces the overall number of micro-operations required to generate higher performance at a lower power.

The new chip does not compromise on performance—it completes more instructions per clock cycle (IPC). Besides, the Pentium-M has a 1 MB Level 2 cache—twice that of the P4's 512 KB L2 cache. The Israel-based design team, headed by Mooly Eden, realised that each and every processor clock cycle costs valuable battery power. Hence the Banias was designed for a high IPC rate, so that it could do a lot of work in fewer clock cycles. Banias thus has a shorter pipeline, and runs at lower clock frequencies than the clock speed racer Pentium 4.

The processor is manufactured using Intel's industry-leading 0.13-micron process technology, and consists of 77 million transistors. It also includes a 400 MHz power optimised system bus, a 1 MB low-power L2 cache (which turns off parts of the high-speed memory when it's not needed), and technology to reduce overall platform power consumption. It also provides support for Enhanced Intel SpeedStep technology (that allows it to drop to multiple lower speed settings) with multiple voltage and frequency operating points.

The Pentium-M notebooks offer four to five power steps as opposed to the two speeds (fast and slow) of the original SpeedStep notebooks. It also supports



Streaming SIMD Extensions II. This makes the Pentium-M fully compatible with P4-optimised software, although there's no Hyper-Threading support.

Slimming the laptop

To fit high-performance processors into all PC designs, including slim and ultra-slim notebooks, Intel Centrino mobile technology uses the Micro FCPGA (Flip Chip Pin Grid Array) and Micro FCBGA (Flip Chip Ball Grid Array) packaging technology. This technology has been bettered for a range of thinner, lighter notebook PC designs that can be less than an inch thick.

Thermal management is equally essential to enabling thinner, lighter form factors. Intel engineers have designed the new notebook to further minimise thermal power, the target power level at which mobile systems work best and use the least amount of energy.

Other technology features that enable computer makers to design sleeker, smaller notebooks, sub-notebooks and tablet PCs include the special Low Volt (LV) and Ultra Low Volt (ULV) options. These options set the processor to run at a lower voltage specification, which is critical to lowering thermal power in tablet designs and extra-slim notebooks that are less than one-inch thick. And that means you can have a truly

AMD Follows Suit

AMD sprang a surprise on Intel by introducing 12 new mobile processors for thin-and-light and high-performance notebooks at CeBIT on March 12. The chips, to be sold under the Athlon XP-M brand, include three based on the recently released Barton processor for performance desktops, and five energy-efficient models for so-called thin and light notebooks that use a maximum of 25 watts of energy, according to AMD officials. Energy efficiency will help PC makers add wireless networking.

The Athlon XP-M family breaks down into three segments: a high performance segment based around the Barton processor; a middle segment based around the standard Athlon XP chip; and the low-power segment which relies on a standard Athlon XP that uses less electricity. The Barton chips will be sold with model numbers of 2200+, 2400+ and 2500+. Barton chips differ from other Athlon XP and Athlon XP-M chips, primarily in that they doubled the L2 cache, an on-chip reservoir of memory for rapid data access.

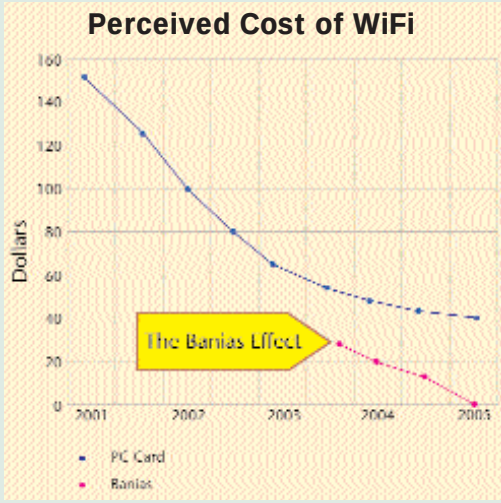
AMD Athlon XP-M processors are designed with an open architecture, helping to ensure that the 802.11 wireless solutions from leading companies can be easily integrated into AMD processor-based mobile systems. The energy-efficient chips will provide less performance (very unlike the Centrino that is a whole new architecture), but they will let notebooks run longer on a battery charge. AMD is also working on a chip that consumes even less power, relying on a maximum of 16 watts, according to a representative, but it isn't ready yet.

The mobile AMD Athlon XP-M processors are compatible with AMD's Socket A infrastructure, and support the advanced 266 MHz AMD Athlon front-side bus. The low-voltage mobile AMD Athlon XP-M processors are pin compatible with Socket A infrastructure, but are packaged in a smaller uPGA package. Mobile AMD Athlon XP-M processors are manufactured using AMD's 0.13 micron copper process technology.

What Happens to WLAN?

Centrino has a massive significance for wireless LAN (WLAN) because of its support for the 802.11a and 802.11b wireless LAN standards, requiring only the addition of an external transceiver and modem interface. The effect of this is that a laptop manufacturer who uses the Banias chipset will have a WiFi-ready motherboard. Intel has promised to provide the transceiver in the form of a mini-PCI interface using its own silicon, codenamed Calexico.

Nick Hunn, Managing Director of TDK Systems Europe that deals with mobile connectivity technology asserts that, "Although Intel is pushing the 802.11a+b combination, I do not believe that many manufacturers will jump at the chance of incorporating it. The limited availability of 802.11a products has delayed a number of fundamental questions being asked about its global acceptance. There is still a lack of worldwide approvals for 802.11a, with very limited acceptance within Europe. In addition, whereas 802.11b is becoming deemed safe by airlines, the operating frequencies of 802.11a may well cause them concern, as they lie much closer to the frequencies where several radar systems operate."



Banias, according to Hunn, presents a problem for AMD. The Am1772 WiFi chipset, which provides a soft baseband with a PCI interface, is less integrated than the Banias approach and will be more expensive than the Intel solution. This is good news for the laptop purchaser, who will see the cost of adding WiFi to a laptop falling significantly during 2003.

Hunn also opines that several silicon suppliers who make wireless LAN components will perish, following the decision of both Intel and AMD to provide the bulk of the circuitry on the motherboard. He points out that Centrino provides almost everything a PC maker needs to provide wireless support on the motherboard. It is not yet clear, though, what percentage of laptops will have the full RF solution placed on the motherboard. For those that do not, some manufacturers may provide connectors for a wireless LAN transceiver module to be added. Intel has already identified this, and suggested that it will supply mini-PCI transceivers for multimode in June 2003.

light notebook, making it a whole lot easier to work, play and connect on the go.

Chipsets that save power

Two chipsets (Northbridges) are being launched with the Pentium-M processor, as a part of the Centrino mobile architecture—the 855PM (Odem) and 855GM (Montana-GM). Both the 855 chipsets are essentially highly power-optimised versions of the 845 chipset. They both feature a 64-bit DDR266 memory interface and AGP 4X support, but they consume less than half the power of the 845 chipset.

The GM includes a power-saving version of Intel's 845G graphics core, while the 855PM has no integrated graphics. Both the 855PM and GM use ICH4-M (Southbridge). Typical of any Intel Southbridge, it is responsible for managing the various power-saving mechanisms, such as Quickstart, Deep Sleep, Deeper Sleep and the enhanced SpeedStep of the Pentium-M. The processor now recognizes further modes that lie somewhere between Performance mode and Battery Optimized mode-similar to AMD's PowerNow and Transmeta's LongRun.

Both chipsets include a 400 MHz processor system bus and support for up to 2 GB of DDR 266 memory, along with support for USB 2.0 and Intel's I/O Hub Architecture.

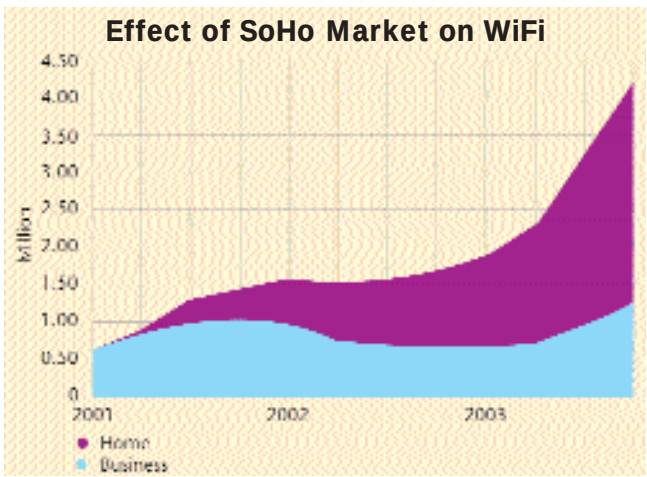
The wireless capability

The third piece of the Centrino technology is Intel's PRO/Wireless 2100 card (formerly code-named Colexico). Notebook manufacturers must use this card (along with the 855 chipset and a Pentium-M CPU) to be able to call their notebook a Centrino system. It has been designed and validated to connect easily to 802.11b WiFi certified access points.

With Centrino mobile technology, you can connect to the Internet or a corporate network without wires or an add-on adapter card, with the integrated 802.11b wireless-LAN (WLAN) capability. WLAN uses radio waves to wirelessly connect computers to each other, to the Internet or to wired networks.

Intel Centrino mobile technology supports 802.11b WLAN standards and enables wireless connectivity from WLAN networks-including hotspots worldwide. An increasingly popular way to work and play on the go, hotspots provide WLAN service (for free or for a fee) from a wide variety of public meeting areas, including coffee shops, airport lounges and convention centres. To use these hotspots, your computer must be configured with WiFi certified technology so that you can connect with other WiFi certified products. With Intel Centrino mobile technology, you've got the WiFi certification you need.

Incidentally, WiFi maxes out at 11 Mbps over the 2.4 GHz frequency. The



Transmeta Fights back with Astro

In answer to the Pentium-M, Transmeta is preparing a completely redesigned architecture and new bus technology for the TM8000-code-named the Astro. The company released its first chip, the low-power Crusoe designed for ultra-portable notebooks and Tablet PCs, in January 2000. It uses code-morphing software that both interprets x86 instructions from applications, and also translates frequently used x86 instructions into the Crusoe's VLIW (Very Long Instruction Word) instructions. This reduces the number of transistors the chip needs, moving the complexity of the processor into software, which saves power, according to Transmeta.

Transmeta also included three new bus technologies in the forthcoming Astro processor. The company will use Hypertransport, a point-to-point interconnect technology, for the processor's front-side bus. It will support DDR400 (double data rate at 400 MHz) memory, but will maintain backward compatibility with the more widely-used DDR266 and DDR333 memory standards. The chip will support AGP 4X for very high-speed graphics for Windows applications.

802.11a standard goes up to 54 Mbps but operates in the 5.0 GHz range. 802.11g matches the speed of 802.11a (54 Mbps), but uses the 802.11b (2.4 GHz) frequency. This means that a single 802.11g radio should be able to support the choice of 11 Mbps or 54 Mbps speeds.

Analysts, however, aver that if you want notebooks to connect to 802.11a or 802.11g networks (and not only to WiFi), Centrino-based systems won't play unless the built-in radio is disabled and a third-party adapter is added.

Competition beware

The Pentium-M notebooks would run for about 4-5 hours without recharging. The battery life is not drained only by the CPU, but also by the choice of other components such as displays, hard drives and memory. Hence, expecting the notebooks to run continuously for 8-10 hours may not be realistic, at least for another couple of years. But this does not rob from the achievement that is Centrino.

One would tend to agree with Avtar Saini, Director of the South Asian endeavours of Intel Asia Electronics, who says: "This breakthrough innovation, together with industry-wide investment and WiFi hotspot deployments, brings computing and communications capabilities to businesses and consumers, adding new value to mobile PCs." Intel has already been working with leading wireless network service providers, hotels, airports, and retail and restaurant chains worldwide to accelerate deployment and increase awareness of wireless public hotspots. One needs to remember that not all notebook makers favour Intel's implementation of 802.11b technology, as pointed out earlier.

Computer shoppers can identify the notebooks by the Centrino brand logo in a striking magenta colour and the 'Intel Inside' mark. If Centrino becomes a success, the competition will have to pull its pants up. They will have to do much more than merely modify their desktop processor solutions.

LESLIE D'MONTE

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GRAPHIC DESIGN: Atul Deshmukh

Off days online

Planning a vacation to your favourite getaway, is just a mouse click away—A look at the facilities available to make a detailed plan for the perfect holiday

You will soon spot the swallow. Summer is near. Time to get away from the madding crowd and hang out in a hammock, and laze on your favourite turf. But planning a vacation can be hard work. Nature has given us paradise. However, instead of packing our knapsacks, we agonise over where to go, what to do, when to book the tickets, the long lines, the waiting lists...aarrrggghhh!

A travel agent could make your job easy, but there's a charge attached. Here's a softer option. The Net has evolved to a position where it can hold our hands through every step. You can pick an ideal holiday spot from across the world, read up in detail about it, map out the best routes to take, find the best ticket deals, reserve accommodation and bag the best deals—all customised to suit your tastes and needs. But how reliable and accurate is the information we find? And how far are we willing to trust cyberspace with our money?

Recent trends show that, while more and more people are availing of the resources present on the Net for research, a very insignificant number is willing to trust the Net for money transactions. Tour conductors such as Cox and Kings and Raj Travels confirm that even with a credible online presence, travellers still prefer to hold transactions in person, using their sites only for research and choosing a particular tour.

Online Vs Offline

Advantages	Time	Convenience	Reliability	Options	Personalised attention
Online	✔	✔	✘	✔	✔
Offline	✘	✘	✔	✔	✔

info

More than 59 million travellers used the Net to make travel plans in 2000, while 25 million booked parts of their trip online

If we took a holiday

The Internet is still the best mall to shop for a perfect holiday that is determined by the money and time at hand. If you have a good two or more weeks in hand, a reasonably-priced trip can be planned for a destination abroad, or within the subcontinent—places such as Sikkim, Himachal Pradesh, Myanmar, Nepal and the Andaman-Nicobar islands hold enough to interest the tourist for a fortnight.

Almost every holiday destination in India has a tourism site that gives indepth details about the place, such as the trains and planes to take, hotel listings, the major attractions and the tourist seasons, etc. To get them all in one place, try India Tourism at ***http://india-tourism.de***. Popular destinations such as Goa use Web sites such as ***www.goacom.com*** to give indepth

details about the best flights and trains to get there, and also have a listing of the tour operators within the state.

An easier way of getting information is through Yahoo! or MSN Travel. Both the portals give customised information about all the different aspects of a holiday such as planning, hotels, maps, cruises, transportation. These sites give you planned tours, options to make your own tours, flight and train information and reservation facilities. MSN has even tied up with Cox and Kings and Expedia to give you some of the best deals.

If you are putting together a trip, sites such as ***www.indianrail.gov.in*** can be very useful. Though you cannot book the tickets online, it does help to know the availability, departure and arrival time and the fares. Indian Airlines (***http://indian-airlines.nic.in***) and Jet Airways (***www.jetairways.com***), both allow booking of tickets online. These sites can be scoured for good deals with cheaper rates for night flights and so on. The same can be done for international sites such as Air India (***www.airindia.com***), Cathay Pacific (***www.cathaypacific.com***), British Airways (***www.britishairways.com***), Kuwait Airways (***www.kuwait-airways.com***) and Gulf Air (***www.gulfairco.com***).

If you are planning a destination overseas, the sites most travellers swear by are the Lonely Planet ***www.lonelyplanet.com*** and Expedia ***www.expedia.com***. The Lonely Planet will give you a detailed description for any destination of your choice—all you have to do is click on a country, and the site reveals its places of historical interest, its main tourist attractions, the best time to visit and the political scenario.

In the event of a long vacation involving numerous destinations, try the TripPlanner. You simply have to pick out the destinations on your itinerary and you will get the estimated costs of the air tickets involved. The TripPlanner gives you three options based on the lowest cost, the most for money and the fewest stops. For example, if you plan a trip that looks something like Mumbai-Los Angeles-Bali-Bangkok-Kathmandu-Mumbai, your Lowest Cost results will show a stop over at Kuala Lampur, while the Most for your Money will show you a lot more destinations that can be accommodated on your route by stretching your budget a little. The Fewest Stops list will just stick to your destination itenary.

Info 84 per cent of online travel expenditures are for airline bookings

The approximate costs are given in dollars, and include only the air fare. The prices stated are as per current rates and booking the tickets online guarantees you 30 to 60 per cent off the published price.

Closer home, Traveljini (***www.traveljini.com***) gives you more options for travel around our subcontinent, and is more suited to an outsider visiting India. It gives details about the destinations around the nation, listing the hotels available, the flights and trains that take you there. The site has hot deals on round trips to nearby destinations that are hard to ignore.

Traveljini also lets you plan for shorter trips and weekend getaways from your city of residence. It has trips planned for getaways within the reach of your residence, and lists them out with details on price per person and the duration of the trip. It also makes provisions for you to book online. The site also has the expected facilities of giving you the best air fares for destinations in and outside of India, and letting you book your tickets online.

In case you have a fixed destination in mind, or don't have much time on your hands, opt for package tours and lay back and let someone else do the running about. Package tours assure a hassle-free ferry between destinations, waving aside the worries of hotel reservations and ticket bookings. They are especially an advantage for an unfamiliar trip overseas where the comfort of a group and the assurance of safety are key drivers. Many reputed travel houses such as Cox and Kings (***www.coxandkings.com***), and Thomas Cook (***www.thomascook.co.in***) have special offers for tourists who book for the tours online.

While booking a tour, it is advisable to identify a source with a brick and mortar presence in your town. This way, you can be assured of offline assistance if required.

Thomas Cook, again, gives you the convenience of making your trip by giving you a list of options of destinations, airlines and hotels to choose from. But it also features package tours to different destinations. A worthy mention are the cruise packages that you can go on—you can choose from family cruises, honeymoon cruise, or those meant for singles—all classified by the region.

For the Vagabond Wanderer

If you've got the back packing itch, you might want to log on to Youth Hostels Association India at ***www.yhaindia.com***. This functions on the lines of the YMCA—meaning if you avail of their membership for a nominal fee, you can stay in the hostels located all over India and abroad for as little as Rs 25 a day. You may, of course, be needed to help around the hostel a bit, but that just adds to the experience. They also organise regular short and long camps, and treks to various parts of the country. Other sites such as India Explorers (***www.explorersIndia.com***) and India Outdoors (***www.Indiaoutdoors.com***) plan regular adventure trails such as rock climbing, rafting and Himalayan camps. The Bombay Natural History Society (***www.bnhs.org***) is another gold mine for trekkers.

Before you set out, you may want to prepare your self by reading up on the experiences of other trekkers. India Mike (***www.indiamike.com)*** is a travel site relating hilarious and touching experiences of back packers around India—some foreigners, some Indians and other in search of their roots. The site also has a forum and you can put up your experiences after you're back!

Cox and Kings, the oldest travel house in the world, gives out newsletters informing you about their special offers. The site specialises in planned tours in almost all parts of the world, and special tours within the subcontinent. Details of this can be found on ***www.bharat-dekho.com***. If you like to travel at your own pace, you can contact a consultant from the firm who will plan the trip down to the last detail—down to the make of the car you would like to ferry you to your hotel. With its élan, this site is more suited to corporate tours for visiting dignitaries.

> **info** 13 per cent of the holiday searches are for travel packages

A more humble holiday assembler is Erco travels at ***www.touroperators-india.com***. This site focuses on tours in and around India, and offers up to 70 per cent discount. It has a variety of tours classified by adventure, religious, nature, cultural and Ayurveda spas. You can even customise each tour to your preference. The site also lists five and three star hotels in all of the major cities, and spas and resorts, in case you want to venture out on your own.

KVT Holidays (***www.kvtholidays.com***) and Raj Travels (***www.raj-travels.com***) is another place to look out for more options on package deals. KVT focuses exclusively on a variety of tours in India, giving one all the ingredients an exciting holiday should be made up of—leisure beaches, natural wildlife, domestic packages and healthy servings of culture. It also has the rather unusual adventure tours that include mountaineering, trekking, hiking, rafting, jeep and biking trips. It zeroes in on the places to ski, white river raft and take jeep and camel safari tours in.

Raj Travels takes you to the tried and tested holiday spots of Europe, Mauritius and the Far East. It regularly features special deals at discounted rates. So this is one site that would pay to keep track of. On the same beat is the Outlook Traveller (***www.outlooktraveller.com***), an online companion of the print magazine. The site is a dealmine with various discount offers running at almost any given point of time. It brings to your notice the best times to visit any destination with regards to the local festivals and seasons. A quick access to all the airfares to major destinations abroad makes it easy to glimpse through. Most destinations entice you with the writings and experiences of former travellers. The site also gives you current news relating to travel, such the introduction and cancellation of flights or trains.

Will we plan our trips online?

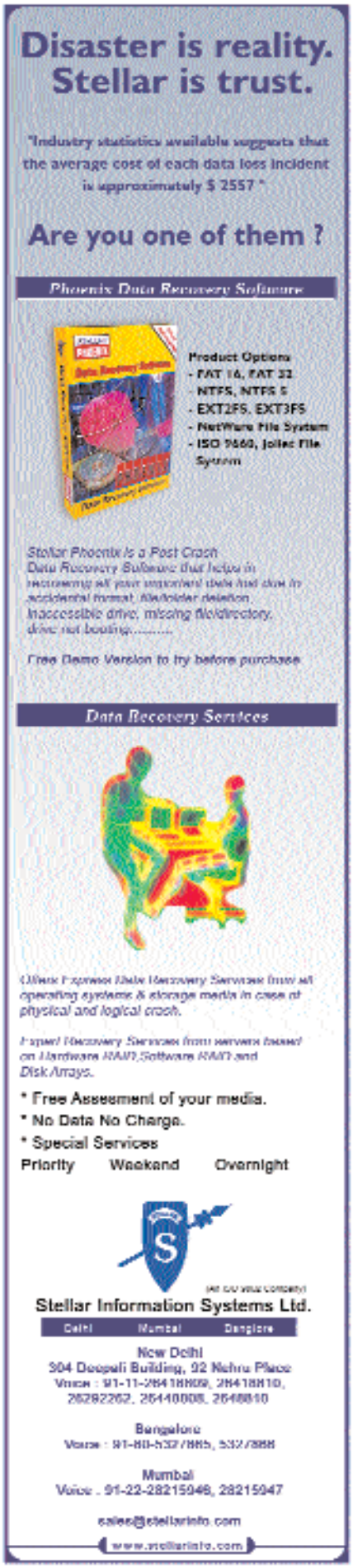
Even with this wealth of services, tales of misuse of credit card details haunt surfers. Web sites have not yet been able to generate trust. Moreover, in the Indian scenario, it is the child or the teenager who is Net savvy and more likely to venture online to plan the family holiday on behalf of his parents. This lowers the chances of online monetary transactions. Credit cards purchases are still restricted to overseas deals with most people preferring cash and cheques for domestic travel.

You would be well advised to go with a reputed or known name, or at least one that comes with recommendations from other travellers. In a country of millions of PC/Net users, the Internet still remains a medium of research rather than a medium of transactions. But with so many worlds to explore within our world, a little risk may give us the experience of a life time.

MITALI PAREKH

A Train of Thought

A more unlikely place to plan a holiday would be the Indian Railways official site at ***www.indianrail.gov.in***. Not only is the site extensively and exhaustively stocked with information to show the availability of seats and track the progress of your ticket through the waiting list, you can also avail of some unique offers. For instance, the little known tourist trains can be a short vacation by themselves. The Royal Orient train and the Palace on Wheels are two luxuriant trails that give a taste of Indian opulence. A shorter route is taken by trains such as the Shivalik Deluxe Express, Shivalik Palace Train and the Shivalik Queen Train—each giving you an uninterrupted view of the Shivalik mountain range that lies at the feet of the Himalayas.



30Minutes Expert

Copy in Seconds!

To protect against the growing threat of viruses, stupidity (read accidental deletion of data) or the always-in-the-back-of-the-head morbid fear, that our hard drives might crash without warning, backing up regularly is an exercise we can ill-afford to avoid. But doing backups can be a chore that even the most dedicated computer users procrastinate, often until it's too late.

So if a software eradicates the drudgery associated with backup and (gasp!) entices us into becoming committed 'backers', it's definitely worth a few hundred rupees. Second Copy 2000 from Centered Systems (***www.centered.com***) is one such program.

All we need to do is to add a list of the files we want to backup and Second Copy 2000 will automatically copy these files to a destination of our choice. In networked environments, we can select to back up our data to another machine. In a computer with two hard drives, we can mirror the data on the other drive. This drastically reduces the risk of data loss since it's highly unlikely that both machines (and hard drives) will fail at the same time.

It's simple, really!

Second Copy organises our backup needs into profiles. Each profile defines the set of files/folders that we want to copy, the location where we want to copy these files to and the frequency at which we need backups.

Click on the File menu and select New Profile. This will bring up the New Profile Wizard window, from where you can select either Express setup or Custom setup. Express setup, as the name suggests, is really easy to use and we need only to answer three basic questions (What, Where and When). Once configured, Second Copy monitors the source folder (What) for changes or updates, and copies new or changed files to the destination folder (Where) automatically at the scheduled time (When). Alternatively, we can even create a new profile by simply dragging the folder we want to backup into the Second Copy application window.

You can schedule the profile to run and copy files at specified time intervals

More power to the user

Advanced users can use the Custom setup option to define specific rules for including/excluding certain files from the backup operation, along with choosing from six different copy modes, including compressing the files that need to be copied, synchronising the source and destination folders, etc.

Let's suppose you want to backup certain documents, and also wish to preserve the last five versions of these documents.

Specify the files you wish to include in the profile

In order to set up a profile for this specific task, you need to select the Custom setup option from the New Profile Wizard window. Now, select the source folder that contains these documents and click Next. This should get you to the Which files? tab, from where you can manually specify the files to include or exclude from the copy operation. Click the Only selected files and folders radio button, and then click the Select button on the top right. This will open up a new window that will allow you to individually select the documents you want to copy. Alternatively, you can key in wildcards for including specific file types (E.g. *.doc will select all Word documents from the source folder, *Project* will select all files that contain the word Project, etc).

You can choose from several copy modes such as Simple Copy, Exact Copy, Compress, Synchronize, etc

Now, select the destination folder and specify the frequency of backup. In the How? tab, choose Simple Copy from the drop down list. Key in the number of document versions to preserve (five in our case) in the Keep version(s) of deleted files. Now select a folder for archiving, and finally, enter a name for this new profile. That's it. Depending on the periodicity selected, Second Copy 2000 will automatically backup the files and maintain copies of their last five iterations.

Second Copy 2000 completely automates the backup process, and with this wonderful utility installed on our computers there's no reason for us to dread taking backups anymore.

TIP

In order to create a new zip file for different dates, create a compressed profile (select Compress from the drop down list of copy modes in the How? tab) and name it Project Report $DATE$. Second Copy will now create a new zip file for each day it runs. E.g.
Project Report - 20030310.Zip
Project Report - 20030311.Zip
Project Report - 20030312.Zip

Web cam conflicts, blue screens of death, unrelenting recycle bins, burning errors—we've got solutions for all of these and more...

Run in C

Q. Recently, I bought an assembled PC comprising PIII 600 MHz, a KOB 810 DSMT Motherboard, 64 MB SD RAM and a 20 GB hard disk. It runs Windows 98 SE along with C and C++. I have installed the Turbo C++ 3.0 IDE. Whenever I try to compile or run any of my C or C++ programs, I get the error message saying "Unable to open include file 'stdio.h'". This happens with all the include files that I use.

Ajay Paul
Via e-mail

A. C/C++ programs do not run unless all the #include files (header files) and library files are present. A single missing file will throw up an error message during compilation. Thus every compiler needs to know where the library files reside.

Turbo C3

In Turbo C 3.0, the it is specified in the Options menu. Go to ***Options > Directories***. Now you will be able to check the settings for the include and library folder. If they are incorrect, you have to correct the settings to the proper folder location. The default location of Turbo C 3 is C:\tc, and that of include and library folder is C:\tc\include and C:\tc\lib, respectively. If you have not installed Turbo C in the default location then type the Directories settings as per the installation in your case. Now all your C/C++ programs will compile and execute properly.

Whats my comp's temperature?

Q. Hi, I need to know a few things. What is the normal and maximum temperature for a hard disk? Is there any software utility to measure the temperature of the processor? How do I increase the sample/refresh rate of a PS/2 based optical mouse?

Carl D'Souza
Via e-mail

A. For any hard disk, there are two temperature ranges to be taken care of—one while the hard disk is in operation, and the other when it is not. These temperatures vary from manufacturer to manufacturer. But the approximate range in operating condition is 2 to 55 degrees Celsius and non-operating is 40 to 65 degrees Celsius.

Most new motherboards have the capability of sensing the temperature of the installed hardware. In case you wish to see the temperature of the processor, you can download utilities such as the Motherboard Monitor from ***http://www.3dnews.ru/download/tweak/mb/motherboard-monitor/***, which gives you a complete snapshot of the various temperatures of the installed hardware.

To increase or decrease the refresh rate of a optical PS/2 mouse, go to ***Control Panel > Mouse > Hardware > Select your mouse device > Properties > Advanced settings***. Now change the sample rate from within the drop box. Click OK and you're all set.

Web cam conflict

Q. I have been facing a strange problem: I run Windows 98 and have only 8 GB of hard disk. Recently, I formatted my computer. It was running fine until I installed my Web camera. Now, when I restart the PC, it does not start in the Normal Mode; it always goes in the Safe Mode. If I try bringing it to the Normal Mode, it gives an error message saying "Please restart the computer". Is my hard disk about to crash?

Tushar Kapoor
Via e-mail

A. First, check if your hard disk is working correctly by running ScanDisk in the Thorough mode. If the ScanDisk finds any bad sectors on the disk, the reliable solution is to replace your hard disk since you risk losing your valuable data.

But since the problem started after you installed your Web camera, it is likely that those drivers are corrupt or do not support Windows 98. Try downloading the drivers afresh from the company Web site. Before you install the new drivers, remember to uninstall the previous drivers completely. If the problem persists, browse through the

troubleshooting guide provided by the manufacture—this will have a list of the most common problems experienced. If all else fails, reinstall Windows.

Screen of death

Q. I use an ASUS motherboard with Athlon XP 1700+ processor, 256 MB of DDR RAM and run Windows 98 SE. The problem is that while loading Windows, after POST, the system shows a blue screen with the error: "A fatal exception OE has occurred at 017F: BFF8AB97. The current application will be terminated." When I restart the system again, Windows shows a message saying, "Windows did not shut down properly." Then the ScanDisk begins, after which Windows starts in the Safe mode.

Babu K

Via e-mail

A. Whenever you install a new program, check if it is compatible with your existing OS. This problem generally occurs upon installation of a new program, which may have replaced some DLL files, resulting in the improper behaviour. Many of the programs freely distributed on the Net are not properly tested for bugs, causing your system to crash. In this case you have no choice but to uninstall the program from ***Control Panel > Add/Remove Program***.

Internet sharing

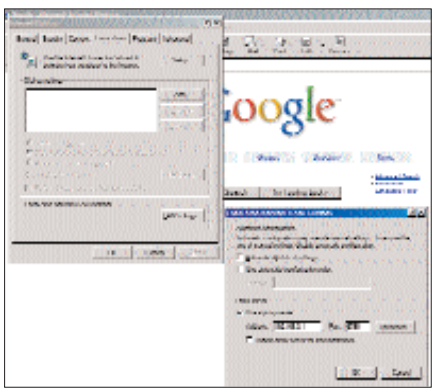
Q. My problem is that I have five computers which are connected in a LAN. The operating system on all computers is Windows 98. Out of the five computers, one is connected to the Internet. I wish to extend the same connection to all other computers. How can I do this?

Sunil

Via e-mail

A. To extend the same Net connection to all your computers in a LAN, you need to make one machine a proxy server. This can be done by installing a software called AnalogX. The program is fairly easy to use, and involves minimal configuration.

After installing AnalogX, note down the IP address of the machine on which you have the Internet connection—this will be your proxy server. Now to gain Net access from each PC, go to ***Tools > Internet Options > Connections > LAN Settings***. Click on 'Use a Proxy Server' and enter the IP address of the proxy server as the Address and 6588 as the Port. Now you can access the Internet through every machine you have configured. Just keep in mind that if you are using a dialup connection, the speed will be relatively slow as the bandwidth is shared by all your machines.



LAN Settings in Internet Options

Slow burner

Q. I recently bought a 32x CD-Writer. My system is built on a Pentium III 667 MHz with 192 MB RAM. I have dual installation of Windows 98 and Windows XP. When I write a CD, I get a data write speed of 2 MB to 2.5 MB per second, whereas a 32x write speed should give me a transfer rate of 4800 KBps. I have tried using 32x and 40x CDR media disks.

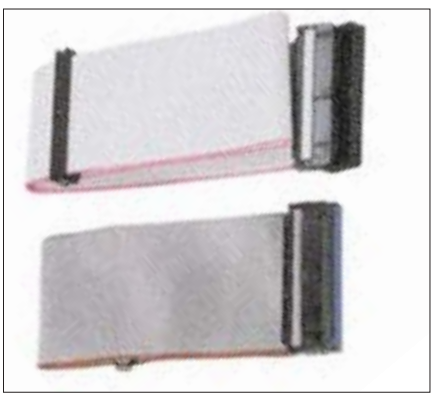
Kunal

Via e-mail

A. There are a few things you can do to increase the data transfer rate—use a 80 pin conductor cable to connect the CD Writer to your PC. Next, run Disk Cleanup to free up more space on the hard drive. This will give the burning software more space for cache the files while writing the CDs. Finally, defragment your hard disk to speed up the read and write process, thus hurrying the data transfer rate.

Can I rollback my OS

Q. I have a Compaq Presario Pentium III 933 MHz with 128 MB RAM, running Windows Me that came pre-installed. I



The 80 pin conductor cable will hasten your transfer speeds

Transfer problems

Q. I have two PCs—one at my house and the other at my office. I want to transfer a few of the Mp3s from my home PC to my office computer. I don't have a CD Writer, and want to transfer the files through the telephone line as it will be faster and cheaper than the File Transfer utility in the Instant Messenger. Please tell me the name of the software which can be used for this kind of dial-up transfer of files and the settings which will be needed.

Vikram S. Shah

Via e-mail

ILLUSTRATIONS: Mahesh Benkar

A. The only software you need is Windows 98 with the Hyper Terminal installed. To check if your system has Hyper Terminal installed go to ***Programs > Accessories > Communications***. If you don't find it here, go to ***Control Panel > Add/Remove Program > Windows Setup > Communications > Details***. Here select Hyper Terminal and click OK to install it. Do this for both your computers. Set the Hyper Terminal on your office machine to 'Wait for a call'. To do this go to ***Call > Wait for a Call***. Now call the office machine from the house machine by going to ***Call > Call***. Specify the Country Code, Area Code, Phone Number and Connect using then click OK.

Once the connection is set up, you will be able to transfer files from your house machine by clicking Send within the Transfer menu.

want to upgrade to Windows XP but my vendor raises a doubt that after I upgrade, I may not be able to roll back to Windows Me, even through the Compaq Recovery CD. I need Windows Me in case I cannot upgrade my printer drivers to be compatible with XP.

Dipesh Naigaonkar

Via e-mail

A Yes, you can roll back to your previous Operating System (OS) by removing the upgraded OS. All you have to do is go to ***Control Panel > Add/Remove Programs*** and remove the new OS.

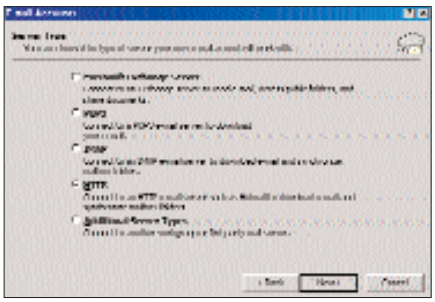
Impossible Outlook 2000

Q I have been accessing my Hotmail account through Outlook Express. But now I wish to access my Hotmail account through Microsoft Outlook 2000. How can I do that?

Ishak Patel

Via e-mail

A Microsoft Outlook Express version 5 onwards have the facility to access Hotmail accounts from the e-mail client and download e-mails. You cannot download e-mails in Microsoft Outlook 2000, but if you wish to access your hotmail account, type ***www.hotmail.com*** in the address bar



Microsoft Outlook 2002

and check your e-mails without closing Microsoft Outlook.

If you insist on downloading your e-mails in Microsoft Outlook, upgrade to Microsoft Outlook 2002 which has incorporated this feature.

Printer problems

Q I have connected two PCs that run Windows 98 SE with peer-to-peer networking without a hub. One of the computers has a HP LaserJet 1000 printer connected on the USB port. I have shared the printer and installed it as the network printer on the other machine.

The printer works fine on the computer it is connected to, but when I try to print from the other machine, it does not print and displays the message 'Printer could not print the document.' It does not even print the test page.

Naiyer Rizvi

Via e-mail

A You can very well share a USB printer just like any other printer. The problem seems to be with the printer drivers that have not been installed properly. Uninstall the drivers and install them afresh. A printer connected to either USB port or LPT port does not in any way cause a problem while printing on the LAN.

Call monitoring

Q I have a 56 KB internal fax modem. I want to monitor all the incoming and outgoing calls on the telephone line. Please tell me if this is possible and which software should I use.

Deepak

Via e-mail

A You will be able to monitor your calls only if the call are made via the computer. If calls are made from the telephone instrument, there is no way to monitor each incoming and outgoing call. Proprietary software usually bundled with the modem will let you monitor your calls. In case if you don't have software along with your modem, try using Super Voice from ***www.supervoice. com***.

No scrolling

Q I have a Pentium 4 1.7 GHz PC with 256 MB RAM, MSI 845E, 64 MB AGP and two hard drives—4 GB and 5.1 GB respectively.

Every time I try to empty my Recycled Bin, I get the message "Cannot delete BE__: Cannot find the specified file, make sure you specified the correct path and file name". I have tried to view the file by changing the settings to 'View all files' in Folder Options, but I am still unable to view the specified file. I have even done an anti-virus (AVG 6.0) check on the folder but found nothing. However, the anti-virus reports state that 'd:\recycled\dd0\my music\BE__.BM cannot open; not checked.' What should I do?

Akter ul azim parvez

Via e-mail

A The solution is to run ScanDisk in the Thorough mode. This error is caused by crosslinks, but once ScanDisk checks and removes these cross links, the error does not appear again.

Recording woes

Q I have a PCI TV Capture card (ADCOM Make). I am able to view the cable reception, but whenever I record with the bundled software, it records in .avi format. The .avi files take up huge space on my hard drive. So please tell me of some freeware that will help me record the live video in MPEG format. I have used the trial version of PowerVCR and Ulead Video Studio 6 which has certain limitations.

Also, tell me if I can record only audio from the TV Capture card. The sound recorder in Windows can record only for 60 seconds and that too in WAV format.

Anurag Gupta

Via e-mail

A First, the size of the file is directly dependent on the bit rate at which you are recording. Higher bit rate results in more hard disk space and vice versa. Also .avi files are of two types—uncompressed and compressed. So check whether the software you are using is recording in compressed or uncompressed mode by default. Change it to compress mode to save space.

To record the live video in MPEG format you have two options. The first one is to get a CODEC from the manufacturer or the Internet that supports your software. With this, you can directly convert your live video to MPEG format. But bear in mind that the performance of your machine will be severely tested when directly recording to MPEG format. The

FAQs

Memory Overload

Q. I have a Compaq 5000 with a 1 GHz processor, 128 MB RAM, running Windows Me. When I try to launch the Explorer, it does not start; even if it does, it hangs abruptly while surfing. I even get the following message, "KERNEL32 caused a general protection fault in module KRNL386.EXE at 0001:000075a8". My system hangs a lot while running other applications too. Also, the Task Manager shows many programs on its list such as Explorer, Gmt, Cmesys, etc.

Satish Dubey
Via e-mail

A. The amount of memory you possess is inadequate to run all your tasks, causing the Explorer to hang. To make most of your memory, press ***[Ctrl] + [Alt] + [Del]*** to start the Task Manager. Now end any program which you may have exited but is still running in the background. Next, go to ***Control Panel > Add/Remove Program*** and remove the unused programs from the list. Also check is if a virus is eating into your memory as well as processing powe. If all these steps do not amend your problem, try installing your OS anew.

Store your mails safely

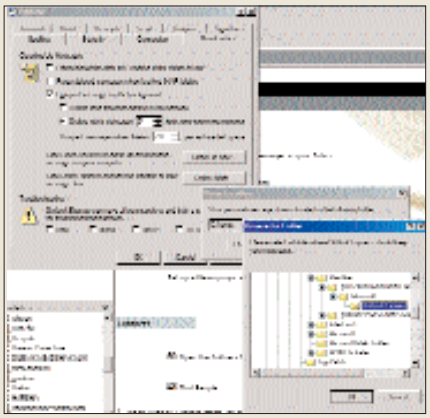
Q. I want to know how to backup and restore my Outlook Express mails in case I wish to format my PC.

Saugat Ray Chaudhury
Via e-mail

A. To back up your mails go to ***Tools > Options > Maintenance > Store Folder > Change*** and select Change from the popup window. Select the location you want to copy your mails to. If you wish to format only a particular drive, choose the location on some other partition or save it on an external storage device. Once the location is chosen, click OK and again OK to complete the process.

You will now get a window showing the message 'Your store location will not be changed until you shutdown and restart Outlook Express'. Click OK and restart Outlook Express.

After you format your PC and the installation is complete, you can restore the mails by going to ***Store Folder > Change*** and select the location were you had copied the e-mails. You will get a window saying 'There appears to be an Outlook Express message store already in the folder that you have chosen. Do you want to switch to using that store? If not, it will be deleted and replaced by your current store.' Press Yes.



Store Folder in Outlook Express

Now restart Outlook Express to see all your stored e-mails.

Computer amnesia

Q. I have a Pentium III 850 MHz with 128 MB SD RAM, a 32 MB 3D card and an Intel motherboard. After I returned from a trip of 2 months, my computer showed 96 MB RAM instead of 128 MB. I tried every way to get back the remaining 32 MB, but to no avail. Just hope you guys have some bright ideas up your sleeve!

Another question is that I have two RAM modules of 64 MB each. Can I get a third 128 MB module?

Hashim Mehmood
Via e-mail

A. Firstly, check if your VGA card has its own 32 MB of memory or is it sharing it with your RAM. If this is the case, then the 96 MB RAM is accurate. If your VGA card has its own memory, then one of your RAM modules is corrupted.

Here's how to fix it yourself-check the size of your modules. If both of them show 32 MB of RAM, then your VGA card is sharing the system memory. But if one of them shows 64 MB and other shows 32 MB, then the latter is damaged.

As for your second query—yes, you can insert a 128 MB module with your existing modules, provided your 128 MB module is working on the same frequency as your 64 MB one.

second option is to record the video in .avi format and then convert it to MPEG format using third-party software such as WinMPG 2.5 and TMPEGenc 2.5.

As for recording only audio, you can do so using third-party software such as Total Recorder and Cool Edit. These are shareware programs available on the internet in demo version for free. In most systems, the Audio Out of the TV Tuner card is connected to Line In of soundcard. Hence, you can use any audio recording software. Most recorders record in .wav format but plug-ins are available on the audio recording software's Web site if you want to record in different formats such as mp3.

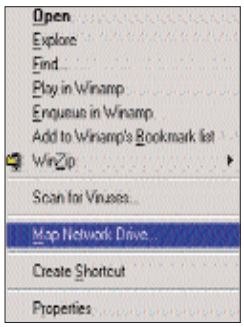
WordStar via network

Q. At my office, we have four PCs connected in a LAN. All the machines have Intel Pentium 4 1.7 GHz processor with 256 MB DDR RAM and run Windows 98.

I have WordStar 4 running on one PC. Is it possible to access it from the other terminals? If so, how?

Deepak
Via e-mail

A. To run WordStar 4 over the network, you will have to map the network drive first. To do this go to Network Neighbourhood and go to the shared folder in which WordStar 4 is stored. Right-click on it and select Map Network Drive, and Press OK. Now you can execute WordStar 4 through this network drive. Don't forget that you need to have enough number of licences to access WordStar 4 from the network.

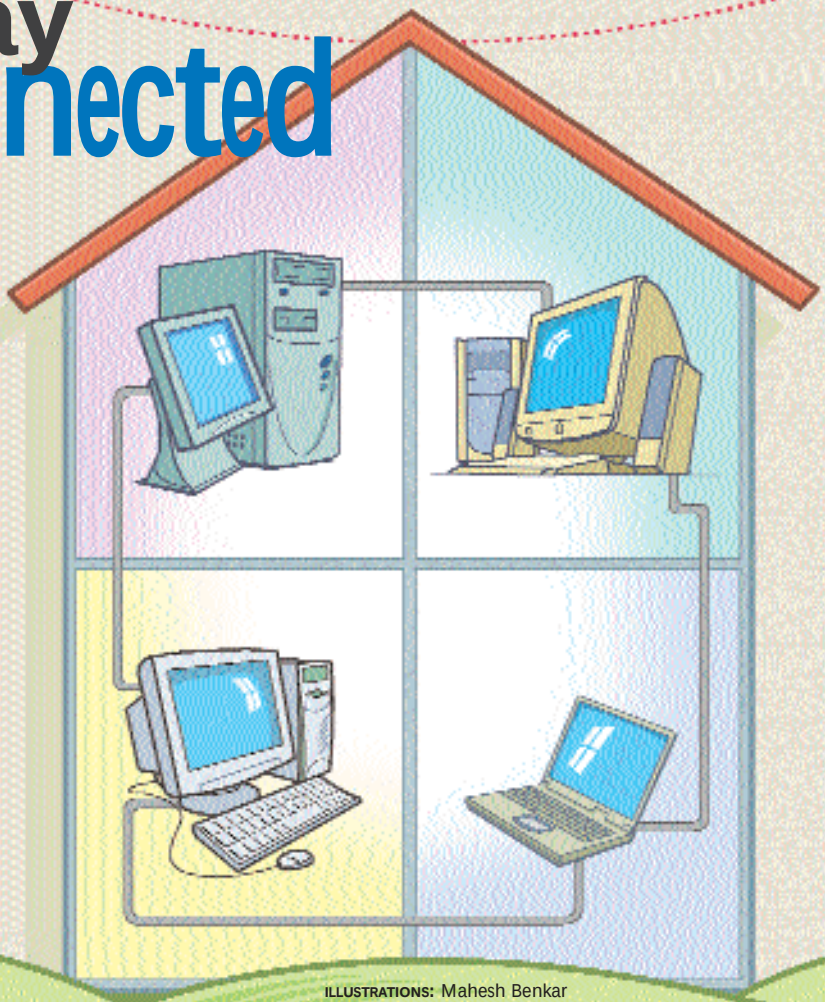


Map Network Drive

Send your computing problems to *sos@jasubhai.com* or write to Digit, D-222/2, Om Sagar, MIDC, Nerul-400 706, and we may answer it here!

tips & tricks

Stay Connected



ILLUSTRATIONS: Mahesh Benkar

If you have just put together some computers, cables and adapters, and are vying to venture into the networked world, you definitely need some help. This month we bring you easy tricks to get your network up and running, and help you make the most of your time

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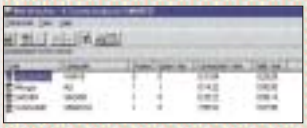
WINDOWS NETWORKING

Windows features some very useful tools to troubleshoot your network. You can use them to ensure that your network is up and running, and detect problems, as well as find out important network parameters

NetWatcher

NetWatcher is installed with the full installation of Windows 98. If it is not so in your machine, go to ***Control Panel > Add/Remove Programs*** and click on the Windows Setup tab to install it. Click on 'System Tools' and then 'Details', and then scroll down to select NetWatcher; you will be prompted to insert the Windows 98 CD.

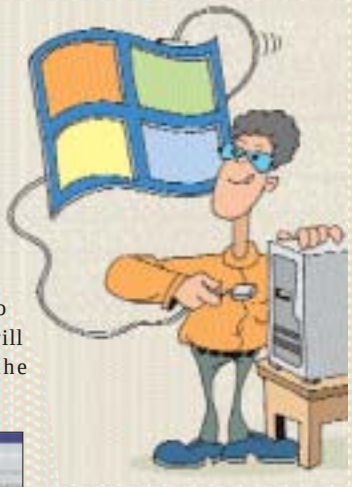


Use NetWatcher to track what resources are users accessing on your machine

NetWatcher lets you see who is using the shared resources on your computer at any given moment in time, across the network. You can use it to add shared folders, as well as disconnect users from your computer or just a specific file. Note that disconnecting the users does not prevent them from reconnecting to your machine. For that, you need to either hide or unshare the specific resources.

System monitor

System Monitor is a standard utility in Windows. If it is not already installed, you can install it from ***Control Panel > Add/Remove Programs***, here navigate to ***Windows Setup > System Tools > Details***. Scroll down and select System Monitor.



Within System Monitor, click on the Add button and choose Microsoft Network Server from the category field. Choose the parameters that you want to track. This will be added to the chart. Use this to determine if your system is slowing down on account of shared resources. You may need to disconnect a user or unshare a resource to remedy it.

System Monitor graphs your system performance

Win IP Config

Win IP Config can be accessed by going to ***Start > Run*** and typing in ***winipcfg*** in the open dialog box. Win IP Config lets you view all your current TCP/IP settings in a single menu. By clicking on More Info, additional information regarding the network can be viewed.

If the IP address was dynamically allocated by a DHCP (Dynamic Host Configuration Protocol) server, then you can use the Release and Renew buttons to release and renew the IP address.

The information displayed on Win IP Config is described below.

Adapter address

This is a hexadecimal address that is unique to every network adapter. It is hard coded into the card by the manufacturer, and consists of six 8-bit numbers. However remember that modems (both internal and external) do not have this address—this is restricted to network adapters while the number for a modem or dial up adapter is set to a meaningless default number.

IP address

This is the current IP networking address. Depending on whether DHCP is used, this may be static, fixed or dynamically allotted. The static value would be entered in the TCP/IP network configuration menu.

See your complete TCP/IP configuration on Win IP Config

Subnet Mask

This is used to mask a portion of the IP address to determine the subnet where the computer is located, that is, where the computer is located within the internal network. All computers running TCP/IP must have the subnet mask defined.

Default Gateway

This is the IP address of the computer that provides the connection to a remote network. The gateway computer is the computer that TCP/IP will use to communicate and route data destined for computers on remote networks.

On clicking on it for more information, the following settings are displayed.

DHCP Server

This entry indicates the IP address of the DHCP server. The DHCP server, when present, will dynamically

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assign an IP address to the machine upon connecting to the network. Clicking on the Release button will release the IP address, and the Renew button requests a new IP address from the DHCP server.

Primary and Secondary WINS Server

These settings specify the IP address of the Primary and Secondary WINS Server, if present. The WINS servers translate the NetBIOS names into the corresponding IP addresses.

Lease Obtained and Leased Expired

These values show when the current IP address was obtained and when it is due to expire. You can use the Release and Renew buttons to release and renew your current IP address. In any case, the DHCP client automatically attempts to renew the lease when 50 per cent of the lease time has expired.

Ping

The Ping utility will let you determine whether a specific IP address is accessible. It works by sending a data packet to the specified address and waiting for the reply. Ping is a simple, yet highly configurable tool.

Trace Route

You can troubleshoot your Internet connection with the Trace Route option. To use Trace Route, type ***tracert*** in the command line. Tracert traces every hop (router on the Internet) that a packet takes to reach its destination, giving the path and the amount of time taken between each hop. On a LAN, this can be used to diagnose problems in routing. Use it on the Internet to choose the nearest and fastest download sites.

Use tracert to troubleshoot your routing problems

Netstat

Use Netstat to display protocol based statistics, as well as all current inbound and outbound connections. Netstat can be configured to display all connections and listening ports and Ethernet statistics, as well as statistics on a protocol basis. This would include statistics for TCP, UDP, ICMP and IP. This is a very useful command line utility that lets you know who is accessing the machine.

Netstat shows you inbound and outbound connections through all the ports

IP Config

IP Config is a very useful tool that displays the entire TCP/IP configuration in your machine. The IP Config utility displays all the information in the Win IP Config utility, but on the command line. To obtain all the information, use the ***ipconfig/all*** command.

Net

The Net utility in the command line contains a host of other interlinked utilities. You can choose to do basic network configuration, diagnostics, inspect print queues, as well as connecting and disconnecting to the network from the command line. Type in ***net /?*** on the command line to access more information on the different commands within the Net utility.

For command line utilities, in order to be able to read the text output one screen at a time, type in the command through the More paging command—this would be of the form ***net /? | more***.

LAN protocol

The exchange of information takes place through established protocols. Windows 98 supports the following transport protocols:

TCP/IP: TCP/IP is installed by default in Windows 98. If your computer is located on an interconnected network with diverse hardware and operating systems, you would need to use the TCP/IP protocol. TCP/IP is the standard protocol for the Internet, and also the de-facto standard for LAN communications.

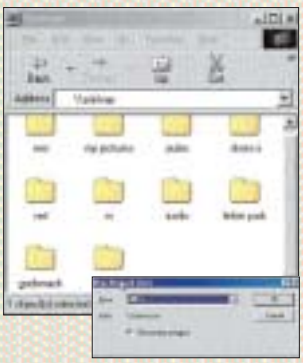
NWLink IPX/SPX Compatible Transport: This is the standard network protocol that is used to communicate with NetWare networks. It supports routing too. IPX/SPX is needed only if your computer is connected to, or communicates with a NetWare network.

NetBEUI: You need to install this protocol only if your network uses NetBEUI as a transport protocol.

Generally, for a small network, all you need to have installed is the TCP/IP protocol suite that is installed by default in Windows 98.

Driving for DOS

If you use DOS applications, you may not be able to use files and shared resources that are located across the network, since these programs need a full path to the files, starting with a drive letter. Within Windows, you can map folders that are shared across the network, to free drive letters to your computer. Use Explorer to get to the shared folder and then right-click and choose 'Map Network Drive'. Select any free drive letter in the configuration screen. Now you can



Mapping frequently used network shares

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access the shared folder as though it were located on your hard drive. If you intend work within this shared folder regularly, tick and enable the 'Reconnect at Logon' option, to make the drive mapping permanent.

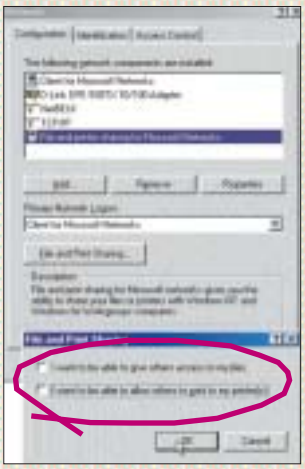
Now these drives will be fully accessible through DOS or any older Windows programs.

Searching for a server

If you are working on a large LAN, then getting into a shared network resource or folder would mean making your way through the Network Neighbourhood and the various workgroups. The entire list of computers across the network could take quite a while to build up; instead, go to the address bar and type ***\\computer_name*** to directly connect with and browse the remote computer. You can also go to the ***Start > Run*** menu and type ***\\computer_name*** to access the computer. This is the Universal Naming Convention (UNC) style network name.

File and Printer Sharing

To share resources across the network, you will need to enable the 'File and Printer sharing' option. If you do not intend to share any folders or printers from your computer, you can uninstall the same for Microsoft Networks. To do this, go to ***Start > Settings > Control Panel > Network*** and click on the File Sharing. Uncheck both the 'Give access to files' and 'Give access to printer'. You will have to restart your computer for the changes to



Removing File and Printer Sharing Services

take place.

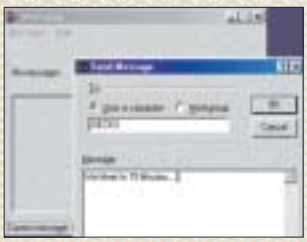
Now no one will be able to access any files on your machine, since your computer will not appear on the network. You will, however, be able to access files and folders on other computers as long as Client for Microsoft Networks is installed.

Protecting your shares

To ensure safe sharing of your network shares, you can restrict access to your shared resources. Right-click on the folder or drive you want to share, and select Sharing. Here you can set the level of access. You can mark a folder as read-only, give it full access and assign a password for each. A quick way of hiding your shared folders is to add the '$' sign as the last character in the share name. This way even though the folder appears to be hidden from public view, it can still be accessed and viewed—so if you really have to lock it down and protect it, add in a password too.

Messaging across the LAN

You can send a quick message across the LAN using a standard tool within Windows. WinPopUp is a standard and easy-to-use messaging utility within Windows. To use WinPopUp, go to ***Start > Run*** and type in winpopup in the Open field, and click OK. This will open the WinPopUp window. To send a message through WinPopUp, click on Send—



Using the WinPopUP messaging utility

this opens up the Send Message window. Type message in the Message text field, and the name of receipient (the computer's name) and click on OK. Incoming messages are also displayed in the WinPopUp window. Keep in mind that for the recepient to be able to receive your message, he or she would also need to have WinPopUp running.

Firewall

Windows XP comes with a firewall known as the Internet Connection Firewall or ICF. ICF provides only inbound protection—unlike a full-fledged firewall, it only monitors data coming into your machine from the Internet. To

Configuring the ICF

turn on ICF, go to the Control panel and select Network Connections. Open this, and right-click on the displayed connection, and click on Properties. Under the Advanced tab, you can enable ICF. While the default settings may work fine, you may want to tweak the settings. Click on the Settings button to access all the ICF features and settings. You can fine tune the network services under the Services tab, set logging details under Security Logging and details about ICMP under the ICMP (Internet Control Message Protocol) tab.

ICF - Do you need it?

Keep in mind that ICF is for use only with a direct connection to the Internet, such as a dial-up or cable modem connection. This means that computers connected to the Internet through a LAN or Internet Connection Sharing (ICS) or a hardware router don't need an ICF. Moreover, you may tend to have some trouble with networking with other computers on a

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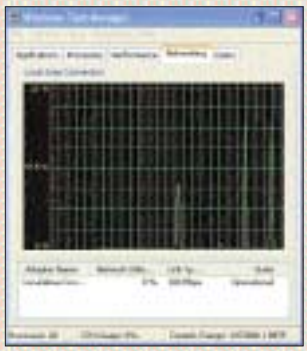
Disabling the ICF

LAN, as File and Printer Sharing services are blocked. It would make sense to disable the ICF if you intend to use File and Printer Sharing services that would be essential in a LAN environment. To disable the ICF, go to the Control Panel, and select the Network Connections. Open this and right-click on the desired connection, click on Properties and under the Advanced tab, disable ICF.

Viewing the network utilisation

You can view the current percentage of network utilisation in the Windows XP task manager. Open the Task Manager by holding down [Ctrl] + [Shift] + [Esc] and click on the Networking tab. You will then see the real-time graph of network utilisation.



View the network utilisation

IPConfig in XP

Windows XP doesn't feature the GUI Win IP Config tool, so to quickly locate all the relevant TCP/IP configuration details, you will need to use the command line IP Config tool, accessed by typing ***ipconfig***.

Faster Windows sharing

When you try to view the shared folders on a computer running Windows 98 or ME from a PC running Windows 2000, there may be a delay of up to 30 seconds. This is because Windows 2000 tries to determine if any 'Scheduled Tasks' are enabled on the other computer. You can fix this delay by deleting a Registry entry on the Windows 2000 machine—but only after backing up the Registry before making any edits.

Open up shared folders within Windows 98/ME faster

Go to ***Start > Run*** and type ***REGEDIT*** to open the Registry Editor. Navigate to ***HKEY_LOCAL_MACHINE\Software\Microsoft\Windows\CurrentVersion\Explorer\RemoteComputer\NameSpace***, and locate the subkey that reads {D6277990-4C6A-11CF-8D87-00AA0060F5BF}.

First click on Export and save the selected branch as, say, restoreshare.reg in a folder. Once you have exported a copy of the key, right-click on this subkey and click on Delete. This should fix the problem.

Network indicator

On a PC with a modem, you can see the little flashing computers in the System Tray that shows you that there is some data flowing. Now in Windows 2000, you can see the same flashing computers style indicator for your local network.

Turning on the network monitor

Right-click on My Network Places, click on the Local Area Connection. Click on the Properties button. At the bottom of the Properties window, you will see the Show Icon in taskbar when connected option. Enable this and you will see the indicator.

Routing your way

Windows 2000 has a very powerful command line tool, the Route command that can be used to view, and even change the computer's routing table. This can affect the path that the network traffic takes to get from one place to the other. Be careful while editing the routing table though—a little mistake here could play havoc with your network communications. You can find out the different options for usage by typing route***/?*** at the command line.

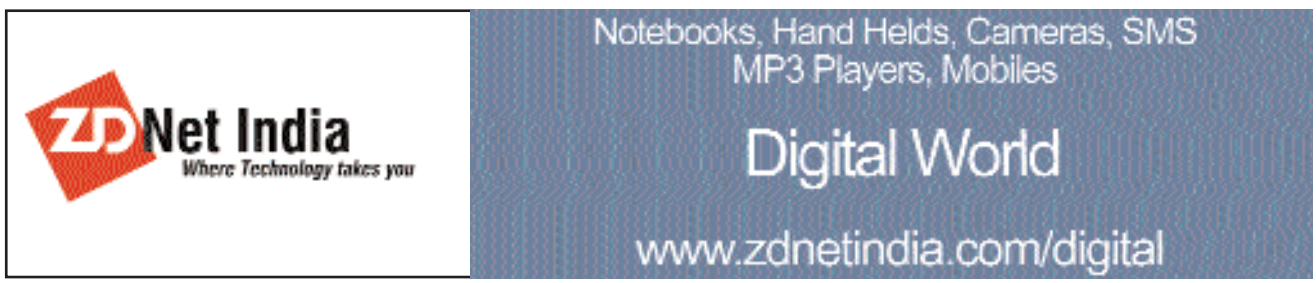
Routing data in Windows 2000

Pathping

The pathping command line utility in Windows 2000 gives you the best of ping and tracert, by sending out packets to each router on the way to a final destination over a period of time, and then computes the results based on the packets returned from each hop. Since pathping shows the degree of packet loss at any given router or link, you can use it to determine which routers or links might be causing network problems.

Use pathping to determine any weak links on the network

Type ***pathping /?*** at the command prompt to get additional information on



syntax and options.

Net Send

You can use the net send command line utility to send messages to another computer, or choose to send messages to everybody in

Sending messages through net send

the domain. Just typing in ***net send computer_name*** and typing in your message after that should do it! For more syntax and options type in ***net send /?*** at the command prompt.

Connecting two computers

For networking two computers, you need two network adapters, and a crossover network cable of adequate length with the RJ-45 connectors on each end. To get the two computers physically connected, just connect either end of the cable into the slot on the network adapter of each computer.

Connecting three or more computers

For networking three or more computers, you would need to have standard CAT5 cabling with standard connectors, one network adapter for every computer and a hub or a switch that acts as a central connection point for networking the computers

Hubs and Switches.

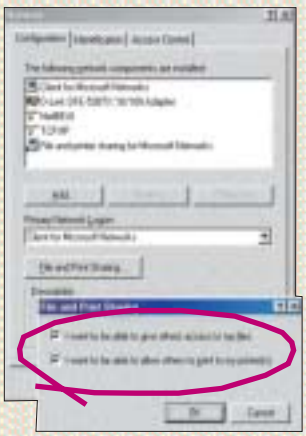
If you are setting up a SoHo network with not more than four to six computers that you will use for relatively light network traffic, consider using a hub instead of a switch to network the computers.

NETWORK PRINTERS

Sharing a printer on the network saves a lot of trouble, not to mention time and resources. We bring you some tips on sharing and accessing a Networked printer

Installing File and Print Sharing Services

To access and print files stored in your computer through other computers on the network, you will need to install File and Print Sharing Services. To do so in Windows 98, go to ***Start > Settings > Control Panel*** and click on Network. This will open up the Network

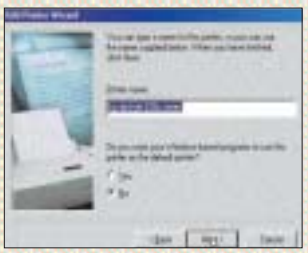


Set up File and Print Sharing services from the Control Panel

utility menu; click on File and Print Sharing. Enable the options and then click on OK.

Installing network printers

You can access a number of shared printers across the network. To do so, you need to install the printer within Windows—locate the computer that is sharing the printer on the network from Network



Installing the network printer

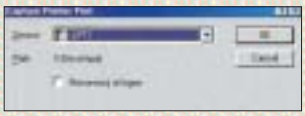
Neighbourhood. Right-click on the shared printer and choose Install—the Add Printer wizard will guide you during the install. If you are printing from within Windows, tick No for the printing from MS-DOS programs. The wizard will offer to print a test page to confirm that the printer is properly installed.

Setting a printer as a default printer

You can install the network printer as a default printer—within Windows, both local and network printers are located under Printers in the Control Panel. Simply right-click on the printer and click on Set as Default.

Mapping the printer

For some applications, you may need to assign a print job to a specific port number, such as LPT1 or LPT2. This way, within an application, you can send the print jobs to the ports instead of specifying the print-



Mapping the printer to a specific port

er by name. To do so, first locate the printer on the network from the Network Neighbourhood, right-click on it and go to Capture Printer port. Choose the appropriate port number from the drop-down list and assign a value such as LPT2. This value needs to be greater, if you already have a printer attached locally to your computer. Enable the Reconnect at logon option if you want the mapping option to be present every time you login.

Sharing a local printer

If you have a printer attached to your computer and want to share it across the network, go to the ***Control Panel > Print-***

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Sharing your local printer across the network

ers. Within the Printers folder, right-click on the printer you want to share and select Sharing. Here, select Shared as and type in the name of the printer in the Share Name field. To finish, click OK. The printer will now be shared across the network.

Restricting access

You can restrict access to the printers to specific users by typing in a password in the Share Printer menu. This way only those people with the password will be able to use the printer.

Queuing up

Before giving a print command, find out if there is another print job that is pending. You can do this by going to ***Start > Settings > Printers*** and selecting the printer. Click on the selected printer—this will open up the print queue window.

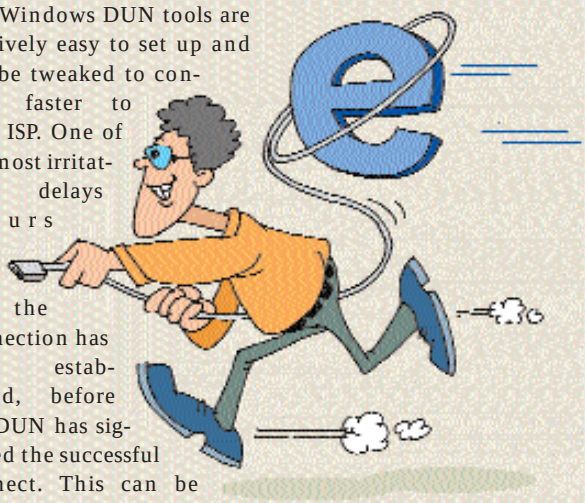
Once you have issued a print command, you can pause or cancel the same by right-clicking on the printer icon on the system tray. Locate the job, and right-click and select Cancel Printing. This will terminate the job.

INTERNET EXPLORER

Get networked on the Web

Speed up the Dial-Up Networking (DUN) initialisation

The Windows DUN tools are relatively easy to set up and can be tweaked to connect faster to your ISP. One of the most irritating delays occurs after the connection has been established, before the DUN has signalled the successful connect. This can be speeded up in a couple of steps:



Getting online faster with DUN

Click on the Dial-Up Networking folder in My Computer. Right-click on the connection that you want to change, and go to ***Properties > Server Type***. While keeping TCP/IP turned on, turn off support for NetBEUI and IPX/SPX. Note here that turning off support for IPX/SPX will disable access to NetWare. Another time saving trick would be turning off the Log on to network, which you need only if you are dialling into a Windows LAN. Finally click OK to set the changes.

Backing up the ISP settings

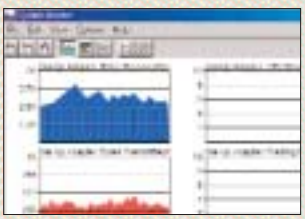
It pays to backup all the information stored in your DUN connection for easy retrieval, in case you need to reset all the values for future installs, or while transferring to another computer. All the information that you need to dial into your ISP—namely the authentication details, telephone number and IP address information for all DUN profiles—is stored in the registry.

Go to ***Start > Run*** and type ***REGEDIT***. Now, in the left pane, navigate to the ***HKEY_CURRENT_USER\Remote Access key***. To backup this branch of the Registry, go to ***Registry > Export Registry File*** command. Choose the selected branch option and assign a name, say INTERNET.REG. To import this setting to another computer, just copy the key to the second PC, run ***REGEDIT***, and import this file into the Registry.

The RemoteAccess key holds the key to your Dial-Up settings

Monitoring the modem

You can use your System Monitor to monitor the quality of your dial-up connection. To do this, start System Monitor from ***Start > Programs > Accessories > System Tools***. Go to ***Edit > Add Item*** and click on ***Dial-Up Networking Adapter > CRC Errors***. Finally click on OK. If you encounter a lot of CRC errors, then there may be problems either with your phone line or modem. If both



System Monitor can track your Internet connection

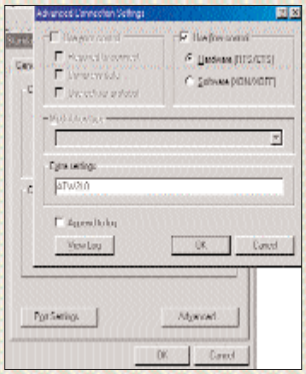
appear to be fine, try adding Framing Errors and Timeout Errors from ***Edit > Add Item > Dial-Up Networking Adapter*** to pinpoint the problems in your connection.

Automatic re-dialling

If you often need to dial more than once before you connect through your ISP, you can setup automatic re-dialling. This can be done by going to ***Start > Programs > Accessories > Communications > Dial-Up Networking > Connection Name > Settings***. Check Redial, and select the number of times that you want to re-dial (between 2 and 100). To wrap it up, click OK and close Dial-Up Networking.

Honest modems

When you open up the modem icon from the system tray, it indicates the speed at which the computer and modem communicate. But this is not the true data transfer speed—the speed at which your modem communicates with the modem on the other side is the true speed. To see this, go to ***Start > Settings > Control Panel > Modems > Properties > Connection***. Click on the advanced button and in the Extra settings, put ATW2L0. You should now get the correct speed.



Getting your modem's truthful speeds

...Speed it up

New Windows

A single page may take its own sweet time to load, so optimise your time by opening links in new windows. To open a Web page hotlink in a new window, hold down [Shift] as you click on the hotlink; this is faster than right-clicking and selecting 'Open Link in New Window'. This is particularly useful when you have a Web page that has numerous links that you want to open as you read the Web page. Note that this will not work with JavaScript pages.

Faster Searching

To search in Internet Explorer 5 or greater, instead of jumping to your favourite search engine, press [Ctrl] + [E]. The Search pane opens into MSN search. Here, choose your category, enter the search term you're looking for, and click Search.

Smart Searching

If you are one of those who trusts Google to get to a page worth your while, then you should get hold of the Google search bar ***(toolbar.google.com)***. Most popular search engines, such as Google, Yahoo!, Ask Jeeves and Toema, have free search toolbars that are tightly integrated into Internet Explorer. These toolbars make searching online quicker and easier.

Smart searching with search toolbars

Speeding up

You can speed up navigation within Explorer 5 or Explorer 6 by disabling page transitions. To make this change, in Explorer, go to ***Tools > Internet Options***. Under the Advanced tab, disable the option for 'Enable Page Transitions' and click OK. This will allow for faster browsing.

Faster loading

If a text or graphics-heavy page takes a long time to download its graphics, hitting F5 or clicking Refresh can speed up the loading the second time.

Automatic refreshing

IE cache keeps a record of the Web pages you have visited; this can be used to retrieve those pages faster. To change any cache settings, go to ***Tools > Internet Options > General > Settings***. To automatically check for updated versions of visited pages, enable the 'Automatically' option under 'Check for newer versions of stored pages:'. This will give you faster and updated versions of the Web pages you frequently visit.

Automatic refreshing: Enabling and disabling it

...Or disabling it

You may want to disable the above feature, if the pages you visit are not updated very often. To do this, set the option to Never. If you want to open the latest version of the page, click Refresh, or press F5.

Cache Sizes

If you want to store versions of the Web pages that you visit, adjust the amount of space in your cache. Go to ***Tools > Internet Options*** and select General. Move the slider to select the amount of hard disk space you would like to devote to your cache. Ideally, keep aside about 75 to 100 MB.

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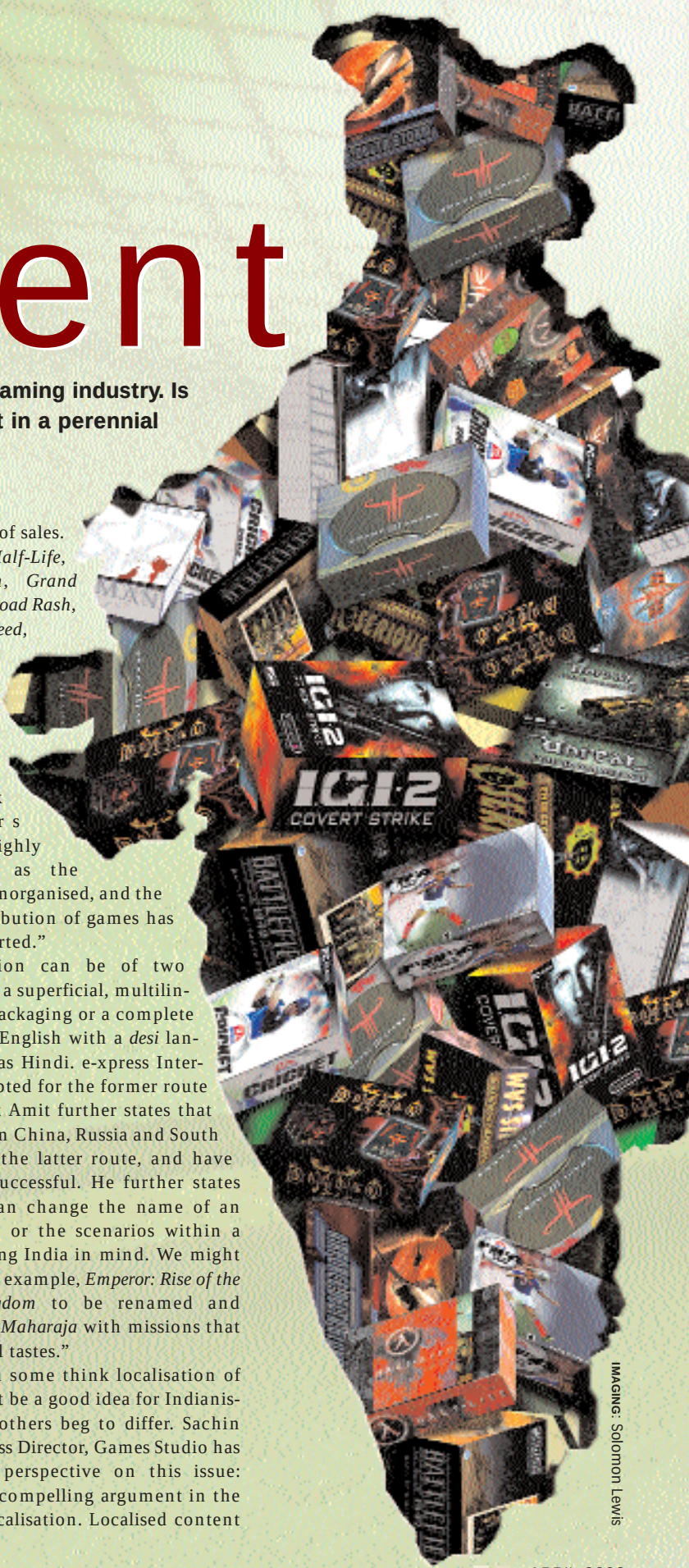
Stuck in a moment

Price and piracy play havoc with the Indian gaming industry. Is there a way out, or is it doomed to be caught in a perennial rut of indifference and lethargy?



IMAGING: Solomon Lewis

"It's disconnected, fragmented and nascent." After more than three years of living, breathing and writing about games, Sriram Sharma climbs onto his private mountain and passes judgment on his beloved pastime. Attention is to be duly paid. "Most people who play computer games, do so because they get it for free from someone else. A lot of piracy and bootlegging is going on." Now is a good time to throw numbers around. The games software industry is expected to grow to a $ 28.3 billion industry by 2004-05. Gaming budgets equal or surpass those of Hollywood movies. In terms of total revenue generated, the US gaming industry is actually bigger than Hollywood. Around 61 per cent of the total game players are above 18 years of age.

So much for the rest of the world. Come to India and notice the change in weather. Gaming here is a struggling activity: computers still cost a bundle; the latest consoles are only unofficially available; and online gaming is gasping on the shores of pathetic connectivity. To shed light on the gaming scene in this country, we spoke with gamers and game distributors. e-xpress Interactive Software and Milestone Interactive Software Ltd, are some firms that are the top players in our market that are fighting a desperate battle to increase awareness about games in general, and eliminate the demons of piracy.

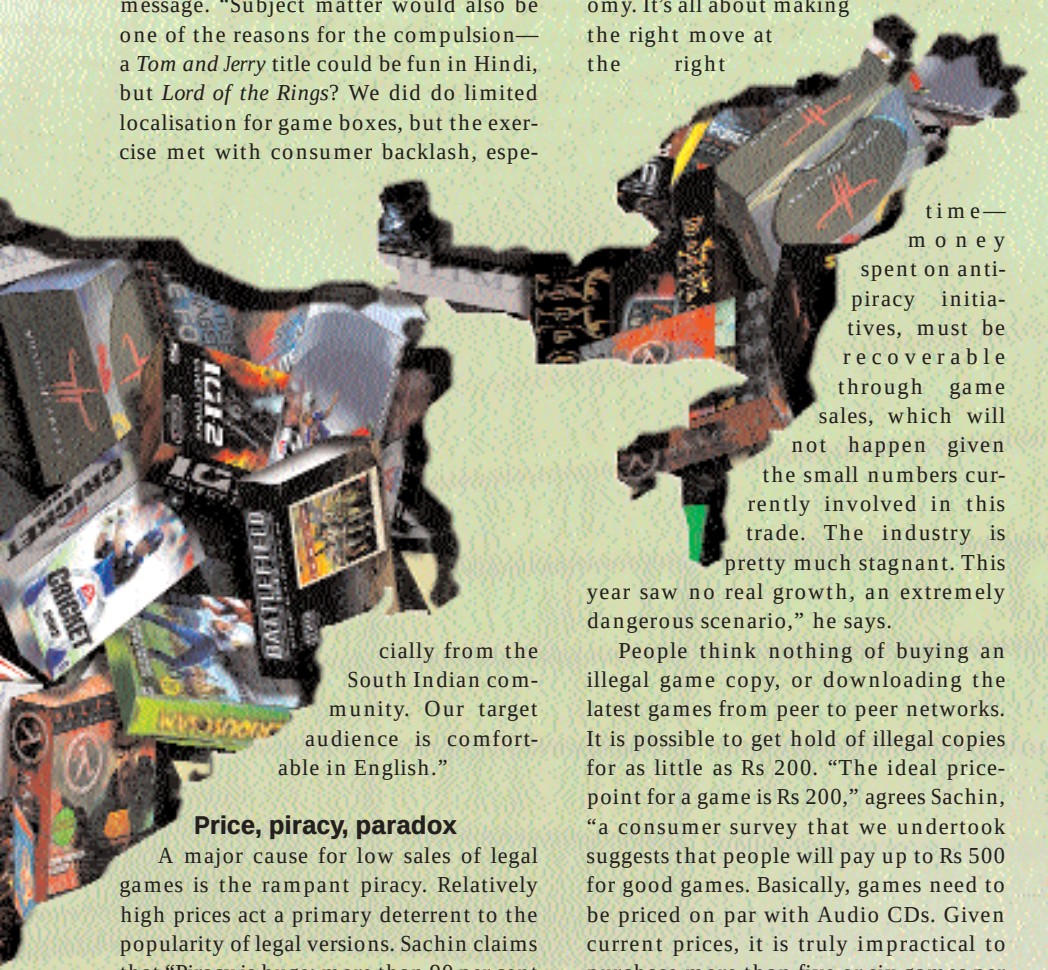
Do as the Romans do?

"The most popular game genres are action and sports", says Amit Khemani, Head, Business Development at e-xpress. "Strategy games have also started picking up in terms of sales. *Diablo*, *Half-Life*, *Serious Sam*, *Grand Theft Auto*, *Road Rash*, *Need for Speed*, *FIFA* and *Cricket* are very popular. As for quoting sales figures, I think numbers would be highly misleading, as the industry is unorganised, and the proper distribution of games has only just started."

Localisation can be of two types, either a superficial, multilingual game packaging or a complete overhaul of English with a *desi* language such as Hindi. e-xpress Interactive has opted for the former route thus far. But Amit further states that the market in China, Russia and South Korea offer the latter route, and have been very successful. He further states that, "we can change the name of an entire game or the scenarios within a game, keeping India in mind. We might consider, for example, *Emperor: Rise of the Middle Kingdom* to be renamed and launched as *Maharaja* with missions that cater to local tastes."

Although some think localisation of games might be a good idea for Indianising games, others beg to differ. Sachin Naik, Business Director, Games Studio has a different perspective on this issue: "There's no compelling argument in the favour of localisation. Localised content

makes sense, but localising an English product into Hindi will not do much. A game meant for the Indian market is where we see benefits. A game, or an add-on to a popular game, on Kargil or Kashmir, would be more compelling than translating an English title into Hindi." He adds that, currently, games are a cultural import and as such an out-and-out translation would lose the essence of the message. "Subject matter would also be one of the reasons for the compulsion—a *Tom and Jerry* title could be fun in Hindi, but *Lord of the Rings*? We did do limited localisation for game boxes, but the exercise met with consumer backlash, especially from the South Indian community. Our target audience is comfortable in English."



Price, piracy, paradox

A major cause for low sales of legal games is the rampant piracy. Relatively high prices act a primary deterrent to the popularity of legal versions. Sachin claims that "Piracy is huge; more than 90 per cent of games sold are pirated. It is fragmenting an already small market. A growing cause of this ailment is domestic piracy; wherein students burn and distribute games within a circle of friends." Amit agrees, pointing out that piracy is the reason why the market revenue is not increasing. He calls for a central body to monitor and reign in the renegade monster, that is the current illegal trade. "There is no organised body in the gaming industry to control (piracy). Another big hurdle is the lack of support from international publishers and distributors."

Approaching NASSCOM for a solution would require a flow of money that Amit feels is not practical for a single distributor to handle. "Indian distributors need to band together and approach NASSCOM. Only then can we gather the resources that will be needed to monitor, and slow down the sale of pirated games." Although necessary, such a monitoring body would be currently hard to form, according to Sachin. "Extensive measures are not being taken to curb this activity for reasons of economy. It's all about making the right move at the right time—money spent on anti-piracy initiatives, must be recoverable through game sales, which will not happen given the small numbers currently involved in this trade. The industry is pretty much stagnant. This year saw no real growth, an extremely dangerous scenario," he says.

People think nothing of buying an illegal game copy, or downloading the latest games from peer to peer networks. It is possible to get hold of illegal copies for as little as Rs 200. "The ideal price-point for a game is Rs 200," agrees Sachin, "a consumer survey that we undertook suggests that people will pay up to Rs 500 for good games. Basically, games need to be priced on par with Audio CDs. Given current prices, it is truly impractical to purchase more than five or six games per year. Thus, you have a handful of people buying these games, while the rest justify themselves by citing high prices and then exchanging, borrowing, or downloading the games."

Ravi V (name changed to protect identity), is a regular gamer, and maintains an FTP site that serves as an exchange platform for illegal games and other software. He offers his view on piracy. "I would like to reward the developers for producing such amazing games by buying an original copy of the game. You can, however, buy pirated games for a trifle. I also burn, distribute and download pirated games. I do so because games aren't easily accessible in India, they don't release soon enough, and even if they do, they are priced beyond my reach," he avers.

Unavailability of game titles in India is an oft-cited reason to pirate. There exists a sizeable demand for the latest game titles released by major publishing houses across the world. Sachin sheds some light on these issues. "The time-gap between an international release and local availability of a title has drastically reduced in the last year. The games we sell are basically decided on perceived demand of a title. Some of these titles may be pulled due to release slippages, or publishers losing the titles to failed negotiations, etc. You see, the publisher of a title chalks out the territories where the game can be distributed, according to what it feels would make good economic sense. Developers are also a part of this process, but there is a difference in their attitudes. While publishers look for maximum profitability, developers want the greatest visibility for their products. Certain titles such as *Elder Scrolls III: Morrowind* could not be published because the distributor was not interested in the South-East Asian market as a whole and in India in particular. Others, such as *Pool of Radiance*, were skipped, as the numbers sold would not have made good economic sense."

Economically-priced products can definitely help improve sales. Amit suggests that game prices can come down at the behest of the publishers. He explains that like any business', game distribution is a function of numbers. "To increase the numbers, we need to reduce the retail price, and make it affordable to the Indian pocket. For this, a product should be priced between Rs 100 to Rs 500. We cannot achieve this without the support of our international partners that are publishers."

However, there is an initial hit in terms of investment: someone has to take that risky first step and decide that a certain title should be sold at say, Rs 500 instead of Rs 1,500. This price difference has to come from someone's pocket—at least initially.

Hammering another nail in the coffin of legal game distribution, is the parallel gray-imports. Amit explains, "Consider someone who can purchase games from a close-out abroad and imports them into India. How do we fight that person?" The very fact that such a parallel market is thriving, indicates that there is indeed a sizeable demand for games. To counter

piracy, economy packs and budget games are being introduced by local distributors. Such offers compete with pirated wares on price.

Several budget titles have been released by these firms. As an example, Amit says, "e-xpress offers budget titles in the form of two ranges called the Best Seller Series from Vivendi and e-ntertainment series from e-xpress. Both are priced at Rs 499, at present. We also offer a big range of edutainment software (such as *Jumpstart*, *Barbie*, *Fisher Price*, *Playzone*) from Vivendi, at a price range of Rs 299 to Rs 699." Milestone Interactive has a similar range of affordable products—from the Rs 199 'Budget hits', to the Rs 499 'Best of Milestone'—with the reasoning that good titles at digestible prices are bound to sell well.

Send in the consoles! Online gaming too...

The high cost of purchasing a personal computer has led to a PC penetration that is miniscule in comparison to our neighbouring countries. "Publishers are keen on India as a market," says Sachin, "primarily because other markets are akin to smoothly running machines. They have the necessary presence to operate these markets, at an optimal level for maximising revenues. There is a lot of interest in the Asia-Pacific region. Publishers want to know both the nature and the destination of this market. Obviously, sheer numbers make this country look impressive, but PC penetration makes, say, China look more attractive to business. We are trying to get everything into place, so that when India comes under the spotlight we are ready. Things will happen."

"The interactive entertainment industry can be a big market in India, but we need to do a lot of work to create domestic demand and raise market awarness"

Amit Khemani
Head, Business Development, e-xpress Interactive

Veteran gamers are fleeing to greener pastures. Some like Gagan Gupta have found love in the arms of a console. "PC gaming used to rock about a few years back, it is now stale and repetitive, with no real innovation. Games such as, *Devil May Cry*, *Onimusha*, *Final Fantasy X*, *Mortal Kombat Deadly Alliance*, *Metal Gear Solid 2*, give you reason enough to go out there and get a PlayStation 2." He also cites the nature of the hardware involved: "Many gamers are switching over to consoles because the hardware is a one-time buy. You don't have to keep downloading patches to ensure that your games stay bug-free. Two words—No Troubleshooting. Just pop in the DVDROM and enjoy the ride; bye-bye hardware incompatibility issues."

"We are confident that 2003 will be the turning point for the Indian games industry, its perception within and outside India"

Sachin Naik
Business Director - Games, Milestone Interactive

Gaming consoles are not officially available in India (although an official launch of both the Sony PlayStation2 and Microsoft's Xbox is rumoured to be close at hand). The current installed base is expected to be in the range of 2,00,000 units—comprising largely of Sony PSOne and Sega Genesis. According to Amit, "At present, pirated software for consoles is available from Rs 40 to Rs 100. This is really killing the growth of software for consoles in India. Further, duty on console software is increasing its cost. Though we do hope to see some action from console manufacturers in the future." Of course, gamers such as Sriram decide to stick to the tried and tested PC: "A PC is a cheaper gaming solution, and it's also customisable, so a person can invest as much as he wants on turning his PC into a gaming machine. Knowing how Microsoft and Sony are, I have very little hope for console gaming in India. Even if Microsoft and Sony bring their consoles to India, they will have to price it very cheaply to influence the svalue-conscious Indian."

As far as online gaming is concerned, the lack of broadband access, is proving to be a major stumbling block in the growing popularity of multiplayer-games. But gamers have found a way and a few initiatives have been set up to encourage the formation of online communities. A few examples are, Kawabonka.com—an online game server—and the cyber-cafes Skirmish in Mumbai and Surf's Up! in Pune. Sriram is optimistic about the multiplayer scene, "I went to the RAIT college in Mumbai to see the engineering students playing *Quake III Arena* on Linux with a keyboard... they were really enjoying it. I have seen more than 50 gamers playing intense clan matches at Surf's Up! There's Kawabonka.com and FragShack, and dozens of other cyber-cafes where kids play *Counter-Strike* and other FPS games." Also, with the entry of players such as Reliance—which is planning to set up multiplayer gaming centres on a fibre-optic backbone—the area of multiplayer gaming is all set to receive a boost.

Public awareness and perception of games is another hurdle. This is bound to change as large players begin to enter the industry. A case in point is Times Multimedia, which uses its media-might to advertise the game titles that it sells. Large publicity campaigns make all the difference as far as sales of entertainment products, such as games are concerned. e-xpress Interactive has, "approached gaming cafes, organised college events, placed specialised merchandising units in retail outlets, and offers have been given to customers in association with national retail chains such as PlanetM and Crossword," says Amit to grant greater visibility to games. As Sachin puts it, "Visibility is paramount but the nature of it comes into question. We try to participate in some college events and such, but it isn't a priority, because the brand recall in such scenarios is not much. We, thus, focus on getting a strong market presence. Our target audience is more likely to walk into a store to make a purchase, and that is where we plan the greatest visibility. Vinyl displays, oversized boxes, and such are used to highlight our offerings."

Rampant piracy? Check. Low sales of legal games? Check. Costly hardware? Check. Non-existent broadband connections? Check. Parents? Of course. A bleak outlook? Nah! Gaming in India is like a toddler—give it the space to crawl—a few bruises and pretty soon it will grow up to be a force to reckon with.

AHMED SHAIKH AND BADRI NARAYAN

HITMAN

SILENT ASSA

Tread softly and carry a big g

Your cheating ways

You need to enable the console and che within the hitman2.ini file. Locate the fi game's directory, open it with a text ed add a 1 after EnableConsole. Then add a reads EnableCheats 1 right below it. Bri the console by pressing ***[~]***; activate th by entering them here.

IOIRULEZ	God Mode on/off
IOIGIVES	All Weapons and Ite
IOIHITLEIF	Health
IOISLO	Slow Motion On/Off
IOIER	Bomb Mode On/Off
IOIHITALI	Ali Mode On/Off
IOILEPOW	Special Attack Mode
IOIGRV	Gravity On/Off
IOINGUN	Nail Rifle On/Off
IOIPOWER	Mega Power

To unlock all of the missions, op hitman2.ini in Notepad and char DefaultScene=AllLevels/logos.gms li DefaultScene=AllLevels/levelmenu.gms. Select menu should now appear within t

.22 Silenced

Small and deadly, it combines the .22 cartridge with an integral noise suppressor

Combat knife

Stainless steel blade, serrated, silent. Cuts like one too

SP12 Shotgun

The combat shotgun; can fire 40 powerful rounds per minute. More, if you can handle it

R93 Sniper

A modular, military adaptation of a hunting rifle, this killer can find comfort within a briefcase

MI95 Sniper

Can stop a Jeep range of 1,80 Might work or too

Stronghold Crusader

A castle-building sin. Indulge

Religion is in the air and once again you are required to extend your dominion beyond grey castle walls and smite all those on the wrong side of the moat. Like its predecessor, *Crusader* demands diligence, a tactical approach to missions and a level of micromanagement that ought to have been discarded.

You will lead a host of new units against a better AI in the arid deserts of the Middle East—the Holy Crusades demand action and you are to deliver. Deliverance comes in the form of armies that are weaned on resources such as food, leather, ale, bread and weapons. Managing your economy and overseeing your military machine are the dual tasks that you will indulge in; since an army marches on its stomach, a strong economy will see you victorious through most tussles. Keep your people happy (a tavern always helps), tax wisely and you will have a well-oiled economy feeding a growing army.

The other part of the equation is simple enough: throw your guys against their guys, and with a little juggling of your medieval units you should be on top when the dust settles. Set in the desert, arable land is hard to come by within the game, throwing yet another challenge to the mix. Often you will find yourself holding desperately on to a piece of green that is irritatingly close to the borders of your foes. It is a heady mix, nevertheless, one that demands tactics; but winning a close fight is rewarding enough.

WATCH THE PIXELS BURN: *Looking down, things look pretty hot*

The game includes four campaign modes—which let you play as both sides—and a skirmish mode. Isometric views, frame the pretty game design. The music—Arabic and moody—is a perfect companion to both the lands and the battles fought on them. Stronghold Crusader is deep, rich and rewarding.

Genre: Real time strategy ■ **Developer:** FireFly Studios ■ **Distributor:** e-xpress Interactive Pvt Ltd ■ **Phone:** 022-28870017
Web site: http://stronghold.godgames.com/ ■ **Price:** Rs 699 ■ **System requirements:** 300 MHz, 64 MB RAM, 4 MB DirectX 7 compatible video Card
Rating: ★★★★☆

Trainz

Like, coolz man!

Here's your chance to go one up on the government and find out firsthand, just how easy it is to muck up a rail transport system. *Trainz* attempts to bring model railroading to digital life—you can build trains from numerous engines and cars, create your own tracks and locales, and run your monsters over countries that span the globe. Alas, India is prominent by its exclusion. Models come from America, Great Britain, South Africa, Australia and Canada. You can either ride these beauties yourself or, take the passenger seat and let the AI do all the work.

An impressive amount of detailing has gone into creating these vehicles of mass transport—the 3D models of the cars can be viewed from every angle and show satisfying detail. Real life can take a back seat as you joy-ride through mountain passes, with little likelihood of a crash. For those who demand it, the realism can be notched up, and soon-enough, the party is crashed by the burning wreckage of your creations. The graphics are a mixed-bag—while the trains are good to look at, the surroundings could have been better, and the weather should have received a better treatment. The same goes for the sound. The game, however, does not disappoint in what it offers, which is a rich and deeply involving, tinkering and building of your favourite train.

CREATE AND RIDE: *The game allows you to easily create a locale, lay your tracks and ride your favourite putt-putt through the greens*

Genre: Simulation ■ **Developer:** Auran ■ **Distributor:** e-xpress Interactive Pvt Ltd ■ **Phone:** 022-28870017 ■ **Web site:** www.auran.com/trainz/
Price: Rs 499 ■ **System requirements:** 400 MHz, 128 MB RAM, 16 MB video Card ■ **Rating:** ★★★½☆

Unreal II — The Awakening

A sight for sore eyes

Some games such as *Half-Life*, bring with them a solid plot. Others, such as the *NOLF* series, bring a twisted sense of humour, not to mention excellent gameplay. Still others, such as *Serious Sam: The Second Encounter*, are merely a demonstration of an engine's capability. *Unreal II* brings with it bags full of fun.

The Awakening, is at its very essence, a game that has been wrapped around a fabulous graphic engine. The story uses every clichéd word in the handbook, there's nothing new in the gameplay, and AI is practically non-existent. And yet, somehow they all come together and provide just that right amount of entertainment.

You are John Dalton, a space marshal relegated to a life of patrolling the back of beyond. Life just couldn't get any duller, when suddenly, you receive a distress signal from a void, plunging you headlong into a struggle for the existence of humanity. You

UHHH... Doggy want a bone?

are ably supported on your perilous journeys by the beautiful and mysterious Aida, laid-back technician Isaak and a half-wit alien pilot called Ne'Ban.

The story unfolds in bits, and your object is to collect seven alien artefacts that hold immense power. The search for these artefacts will take you across diverse alien planets, breathtakingly rendered by the game. You'll face stiff opposition from alien races and greedy corporations, that command fierce mercenary armies.

The strength of the *Unreal II* engine, is its ability to draw the great outdoors, with surreal alien environments forming its finest work. Combine this with the superb soundtrack, and you'll find that *Unreal II* is the ultimate food for your senses.

The AI is anything but intelligent, and the evil minions compensate for their stupidity, with brute force, agility and a kamikaze mentality. Most fight sequences are pretty mundane, except for those where you can use the sniper rifle, to take out the tons of bad guys, or when you team up with a squad of marines, and go head-to-head against the nasties.

Veteran players will find *Unreal II* a disappointment in terms of innovation. However, in terms of pure entertainment value, *Unreal II* delivers the goods. And how!

Genre: FPS ■ **Developer:** Legend Entertainment ■ **Publisher:** Epic Games Inc ■ **Distributor:** Miletone Interactive Software Ltd ■ **Phone:** 022-28381614
Website: www.unreal2.com ■ **Price:** Rs 1,299 ■ **System Requirements:** AMD or Intel 733 MHz CPU, 256 MB RAM, GeForce2 MX, 3 GB hard disk space ■ **Rating:** ★★★★☆

Red Hat Linux Firewalls

Freshers kindly excuse

Red Hat Linux Firewalls delivers what the name suggests—information that a Red Hat Linux administrator needs to build an effective firewall. This book is for the guys in the trenches, who actually build and implement Linux firewalls.

The first chapter explains the significance of a firewall, types and threats. Next, comes the all-important TCP/IP primer. Chapter 2 takes the quick and dirty route to defining addressing, terms and services in TCP/IP to refresh the mind of what is, most likely, an already educated reader.

The chapter goes on to explain the use of popular TCP/IP tools such as ping and traceroute, as well as tools that may be platform-dependent, such as ifconfig and route. If you're coming over to the Linux fold from another unix-like OS, some tools may have unfamiliar usages, but are still fairly easy to understand. Linux-specific TCP/IP configuration is covered, with important files, and their formats and instructions on how to modify configurations.

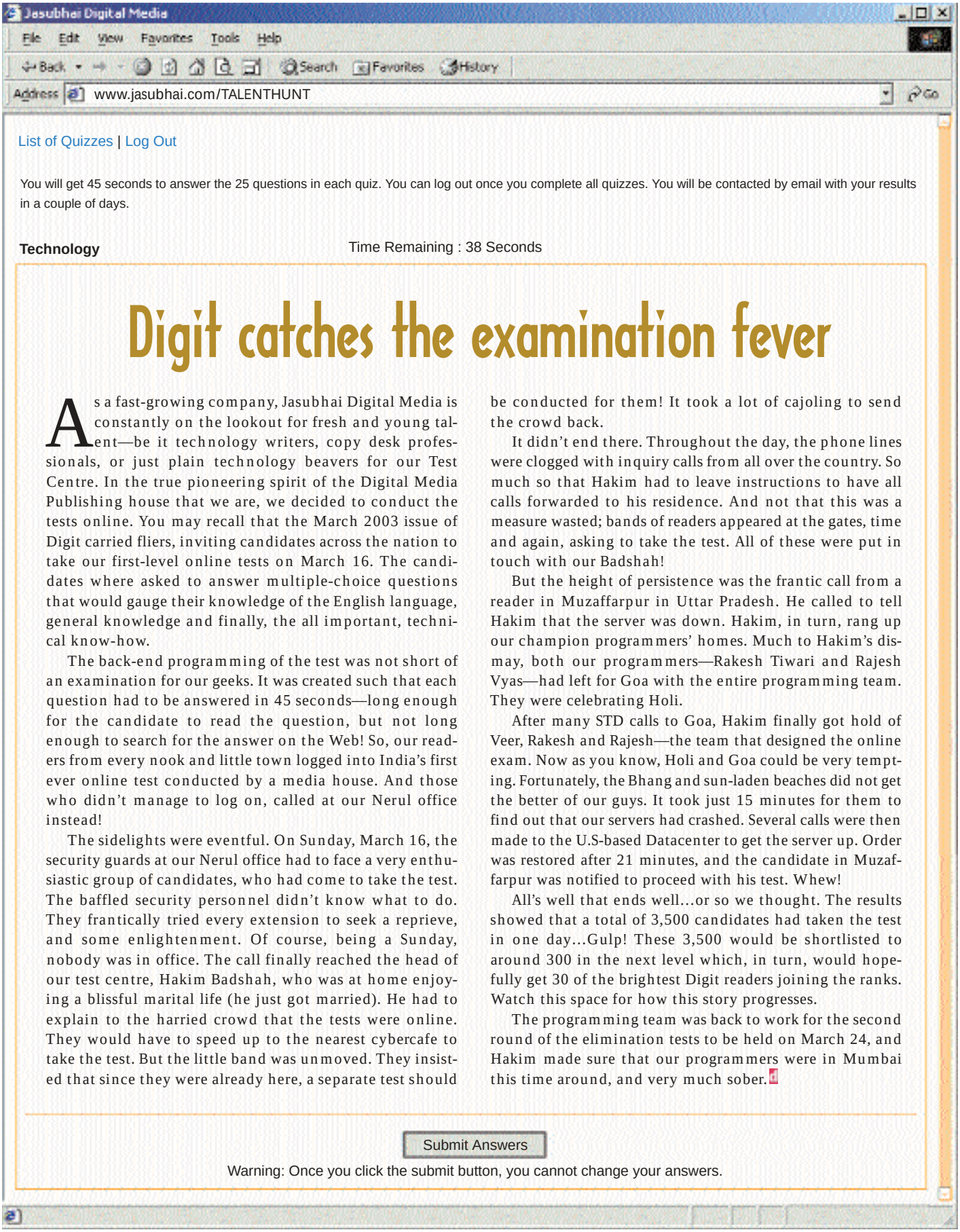
Design and implementation of a firewall is covered extensively, including popular tools, such as IPchains, IPTables, the TIS toolkit and the industry heavyweight CheckPoint, as well as hardware products. While not a full feature comparison of the tools, it makes for a good reference.

IPChains has been the mainstay of many Linux-based firewalls, simply because it was the only included choice in most Linux distributions. With kernel updates came IPTables—a stateful firewall engine. However, the reality is that lots of folk still use IPChains for simplicity and compatibility. Chapter 7 is dedicated to IPChains firewalls, but stops short at implementing a simple firewall and administering it.

The book is a lot more verbose with IPTables, with three chapters dedicated to the basics, implementation and advanced facilities. It wraps up with a few chapters on design, administration and testing, not to forget, appendices. Appendix E is worthy of note for including sample firewall scripts.

In all, the book is recommended for experienced Linux folk. Not recommended if you plan to try out the sample scripts on your server over a telnet connection.

Publisher: Red Hat Press ■ **Author:** Bill McCarty ■ **Distributor:** Wiley-dreamtech India Pvt Ltd ■ **Phone:** 011-23275895, 23270877
Fax: 011-23275895 ■ **E-mail:** wdt@vsnl.net ■ **Web site:** www.wileydreamtech.com ■ **Price:** Rs 329
Rating: ★★★☆☆



Digit catches the examination fever

As a fast-growing company, Jasubhai Digital Media is constantly on the lookout for fresh and young talent—be it technology writers, copy desk professionals, or just plain technology beavers for our Test Centre. In the true pioneering spirit of the Digital Media Publishing house that we are, we decided to conduct the tests online. You may recall that the March 2003 issue of Digit carried fliers, inviting candidates across the nation to take our first-level online tests on March 16. The candidates where asked to answer multiple-choice questions that would gauge their knowledge of the English language, general knowledge and finally, the all important, technical know-how.

The back-end programming of the test was not short of an examination for our geeks. It was created such that each question had to be answered in 45 seconds—long enough for the candidate to read the question, but not long enough to search for the answer on the Web! So, our readers from every nook and little town logged into India's first ever online test conducted by a media house. And those who didn't manage to log on, called at our Nerul office instead!

The sidelights were eventful. On Sunday, March 16, the security guards at our Nerul office had to face a very enthusiastic group of candidates, who had come to take the test. The baffled security personnel didn't know what to do. They frantically tried every extension to seek a reprieve, and some enlightenment. Of course, being a Sunday, nobody was in office. The call finally reached the head of our test centre, Hakim Badshah, who was at home enjoying a blissful marital life (he just got married). He had to explain to the harried crowd that the tests were online. They would have to speed up to the nearest cybercafe to take the test. But the little band was unmoved. They insisted that since they were already here, a separate test should be conducted for them! It took a lot of cajoling to send the crowd back.

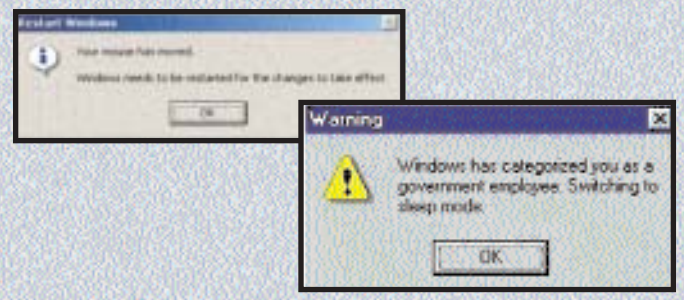
It didn't end there. Throughout the day, the phone lines were clogged with inquiry calls from all over the country. So much so that Hakim had to leave instructions to have all calls forwarded to his residence. And not that this was a measure wasted; bands of readers appeared at the gates, time and again, asking to take the test. All of these were put in touch with our Badshah!

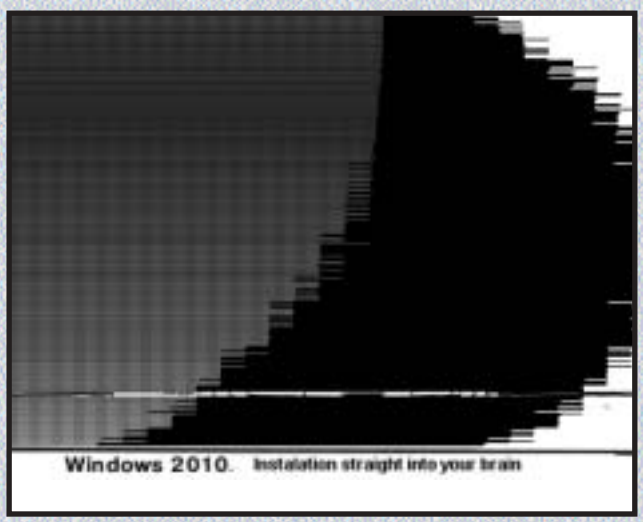
But the height of persistence was the frantic call from a reader in Muzaffarpur in Uttar Pradesh. He called to tell Hakim that the server was down. Hakim, in turn, rang up our champion programmers' homes. Much to Hakim's dismay, both our programmers—Rakesh Tiwari and Rajesh Vyas—had left for Goa with the entire programming team. They were celebrating Holi.

After many STD calls to Goa, Hakim finally got hold of Veer, Rakesh and Rajesh—the team that designed the online exam. Now as you know, Holi and Goa could be very tempting. Fortunately, the Bhang and sun-laden beaches did not get the better of our guys. It took just 15 minutes for them to find out that our servers had crashed. Several calls were then made to the U.S-based Datacenter to get the server up. Order was restored after 21 minutes, and the candidate in Muzaffarpur was notified to proceed with his test. Whew!

All's well that ends well...or so we thought. The results showed that a total of 3,500 candidates had taken the test in one day...Gulp! These 3,500 would be shortlisted to around 300 in the next level which, in turn, would hopefully get 30 of the brightest Digit readers joining the ranks. Watch this space for how this story progresses.

The programming team was back to work for the second round of the elimination tests to be held on March 24, and Hakim made sure that our programmers were in Mumbai this time around, and very much sober.





We bring you your horrorscope...

Aries

Mar 21 - Apr 19

With the DDRs and RDs taking over the world, the RAM in you is feeling outdated. Now is the time to just lay down and die. Let the big boys run the show.

The virus scan

Politically Correct Virus
Never calls itself a "virus", but instead refers to itself as an "electronic micro-organism."

Right to Life Virus
Won't allow you to delete a file, regardless of how old it is. If you attempt to erase a file, it requires you to first see a counselor about possible alternatives.

Government Economist Virus
Nothing works, but all your diagnostic software says everything is fine.

Nike Virus
Just does it.

Quantum Leap Virus
One day your PC is a laptop, the next day it is a Macintosh, then a Nintendo.

Your chance to bite back!

Highlight the lighter side of computing. Mail your contributions to: Backbyte Digit, Plot D-222/2, TTC Industrial Area, MIDC, Shirvane, Nerul, Navi Mumbai 400 706 or e-mail us at backbyte@jasubhai.com