

digit

YOUR TECHNOLOGY NAVIGATOR

STOP!

BROADBAND ACCESS DENIED

**We All Want It.
No-one's Getting It.
Why?**

- **Sound Drivers:** Which Speaker Set Is Worth Your Money?
- **Digital Bulbs:** Choose From Nine Projectors—For Boardroom Or Living Room
- **Know Your Gaming Hardware.** The Latest.
- **Before You Buy That LCD Panel...**



Bluff Your Way Through

INFLATING POPULARITY ONLINE is a new fad that seems to have caught the fancy of some social networking regulars. With sites like MySpace, friendster, Orkut, and Facebook signing up new members by the minute—and hordes of socially active (socially starved in the real world?) people signing up—a strange new competition has been initiated within that community. It is the race to be famous and project an image of being a popular and affable person: one whose roster of personal-page friends is long (and contains good-looking ones!) and with the “friends” endorsing not just their friendship but even dropping in a few positive comments. This weird “popularity contest” has spawned one of the most bizarre sites I’ve come across: fakeyourspace.com.

With some help from the site, you can actually fake your personal profile page at any of the above sites and hire good-looking (almost model-like) friends for only a dollar a month. The service doesn’t end there: apart from serving up model-esque friends, FakeYourSpace also enables you to create customised messages for the comments list on your profile pages.

This essentially means that if you’ve dreamt of having “hot” friends whom you could not befriend, here’s a chance to grab them for just 45 rupees. And for us Indians, it gets even better. We can now rent *phirang* friends (mostly American) to pump up our reputations! Obviously, the site ensures that the friends you rent are very normal in their actions and personalities, and their comments don’t sound fake—ensuring you’re never caught.

According to Brent Walker, the founder of the site based in San Diego, the purpose behind the site was “to turn cyberlosers into social-networking magnets.”

Walker’s inspiration is a consequence of an emerging trend that Bruce Schneier, a security expert and well-known tech blogger describes as “the social network reputation hack.”

Another site that feeds into this new development is popularitydialer.com. It arranges for fake phone calls that make you look popular while you’re



Deepak Ajwani Executive Editor

“There is a race to be famous and project an image of being a popular and affable person online”

at a social do or amongst people you want to impress with your “social status.”

To my simple understanding, the sole reason for the existence of all the new social networking sites was to help one acquire new and interesting friends, find a few more like-minded ones, and facilitate networking in existing relationships. However these sites also gave a chance to real-world social “losers” to build, forge, and seek new relationships if they weren’t successful at it in their childhood, workplace, or even in their own family.

With the successful launch of sites like FakeYourSpace and popularitydialer.com, the concept has been taken too far.

Shortcomings of human nature that affected real-world relationships had found an answer online. Innocent enough. Not any more.

A handwritten signature in black ink, appearing to read 'D. Ajwani'.

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Each month, Digit walks through the technology maze to bring you the most relevant, most researched stories. If you have an opinion about anything published in Digit, or about technology in general, please write in to
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Disclaimer: For every Digit contest, there will be only one winner, unless specified otherwise. In the event of a dispute, the Editor's decision shall be final

Products Reviewed This Month

HARDWARE

PC Speaker Sets ... 46

Altec Lansing 121i
Altec Lansing ATP3
Altec Lansing FX4021
Artis S-100
Artis S111/FM
Artis S111R
Artis S444
Artis S800
Creative Inspire M2600
Creative SBS-370
Intex IT-2000SB
Logitech X-230
Tech-Com SSD-803
Xfree XE222
Xfree XE233
Zebronics ZEB-SW8000
Altec Lansing ... FX5051
Altec Lansing ... V53251
Artis S5200
Artis S6600R/FM
Artis S7500R
Artis S8800
Artis X10 Mini

Creative Inspire M5300

Creative SBS 580
Intex IT-4800W
Tech-Com SSD-2001
Tech-Com SSD-3001R
Tech-Com SSD-4001R
Tech-Com SSD-5001R
Tech-Com SSD-5101R
Tech-Com SSD-6001R
Xfree XW555
Zebronics ZEB-SW13100R
Zebronics ZEB-SW6900R

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Acer PD726W
Benq MP611c
Epson EMP-1715
NEC VT590
NEC VT695G
NEC NP40
Panasonic PT-LB60EA
Sharp XG-C330X
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Laser Printers 72

Brother HL-5240
Brother HL-5250DN
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HP LaserJet P-2015D
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UPB-10
ASUS Striker
ATEN CS-62B KVM
Creative Zen V Plus
LG Super Multi GSA-E10L
Western Digital My Book
Pro Edition II
XFX 7600GT FATALITY

Software 58

Adobe Acrobat 8
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WinOrganizer 4.0

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Enter



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Steve Ballmer threatens open source vendors—again

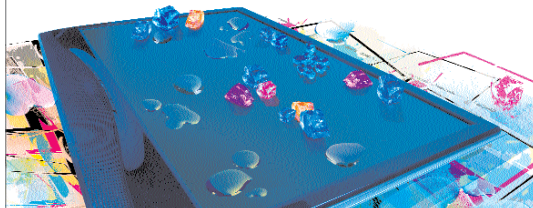
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Learn about Wizpy, a Linux-based portable media player

Digital Passion

Insight

34 Enter The Matrix!

You probably didn't know there happen to be several types of LCD panels! And no, they're not just variants on a theme



Tomorrow

40 Tube Tech

The latest buzzword in hardware research circles is "the almighty carbon nanotube."



Here's giving you an indication of the sheer range of applications of this little marvel

Cover Story

27 Are We There Yet?

Just why are our "fast" connections poor excuses for broadband? Why is broadband always "next year"? Will it be this year? Or when? We ask those in the know about all roadblocks



Speaker Test

46 Sonic Boom

A speaker set is a goodish investment—both in terms of money and pleasure.

We took as much of a good, hard look as we could at what's on offer



Contents Magazine

Digital Tools

Lead Feature

72 Laser Printers

We continue our laser printer test from last month's issue. Presenting an assortment of mid-range mono printers for your office

Enhance

63 Gather Your Thoughts

Microsoft Office OneNote is an enhanced note-taking and organisation software. Did you even know it existed? Here's about how to use it to organise yourself, whether you're a scuba diver in the North Sea or a brain surgeon in Brazil

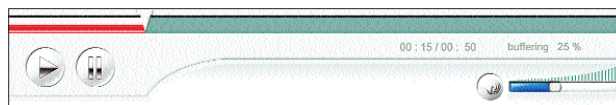


66 Bazaar

The attention-grabbers this month are a terabyte hard disk, a spanking new motherboard from Asus, and a device that lets you leech power off your laptop to charge your mobile devices

78 Know More About

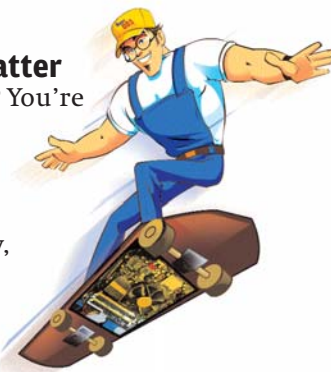
A look at streaming technologies. What's going on behind the scenes when you're streaming, for example, a video on YouTube?



Agent001

92 The Core Of The Matter

Buying a new computer? You're deciding on the motherboard-processor combination, of course. Instead of looking at the components individually, Agent 001 is being more helpful by looking at combos



Digital Business



Test Centre 104 Screening Success

This month: our annual projector test. We looked at solutions both for the boardroom as well as for the living room. As you'll see, one size does not fit all—but this comparison should help clear matters

Case Study

100 Ditch That Wallet!

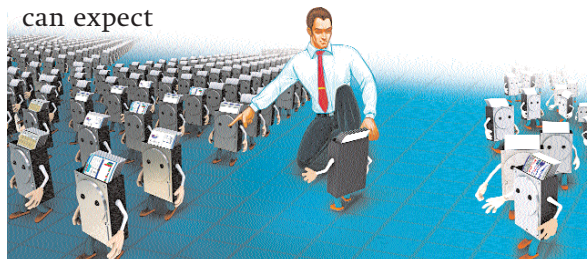
Paying using your mobile sounds a good idea. Services are limited as of now, but they're indicative of the coming of age of m-commerce in India



Tech Careers

97 Driving The Numbers

Data drives business, as they say. Careers in databases are not for the faint of heart or head. Here's a little introduction to what you can expect



Smart Business

114 Through The Ages

Version control software has been used by software developers since 205 B.C., and it's time for you to consider whether it can help you in the office to track your documents



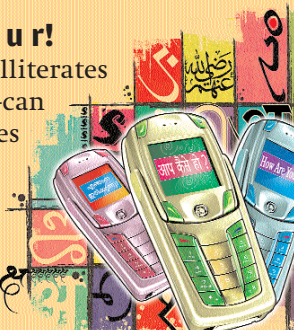
March 2007

Digital Leisure

Touched By Tech

117 Lern frm whr u r!

People—especially illiterates and semi-literates—can now learn languages using their handsets. The applications are innovative, and the potential, vast



Gaming Special

120 No Boundaries

If you're a gamer, chances are you know your hardware pretty well. But chances also are you need a refresher from time to time. Here's one!



130 Game On

The last *Star Trek* movies weren't the only lemons in the franchise—the latest game is terrible too! Also featuring RACE: The Official WTCC Game—simulation geeks rejoice!

Escape



133

What would a computer be without a hard disk? Thank Mr Johnson for the invention, please

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Mobile users want more features on their phones, and they also want fewer features!

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DIGITAL PASSION

XNA Game Studio Express 1.0



This development package enables hobbyists, academics, and small, independent game developers to easily create video games for Windows and the Xbox 360

Carbide.ui S60 Theme Edition 3.1 for Symbian OS



This is a tool that enables the creation of packages to customize the appearance of the user interface on S60 devices

Code::Blocks 1.0rc2

Code::Blocks is a free C++ IDE built to meet the most demanding needs of its users. It is designed to be very extensible and fully configurable



GAME

- Nexuiz 2.2.3
- Savage 2.00



- WarRock 1

LINUX

- Avast Home Edition 4.7
- dvdisaster
- Flash for Linux 0.2.1
- GCC 3.4.6
- gPhoto2 2.3.1



- Linux Kernel 2.6.20 RC7
- Mozilla Firefox
- Quicktime 4 Linux 2.0.0
- Rawstudio 0.5
- XnView 4.51

DEV TOOLS

- Dev-C++ 5.0 beta 9.2
- PassportODBC odbcv10
- RadRails 0.7.2
- Sony Ericsson Themes Creator 3.06
- TOAD for Oracle Freeware 8.5
- Visual C# Express Edition

DIGITAL TOOLS

TrueCrypt 4.2a



Creates a virtual encrypted disk within a file and mounts it as a real disk. Encrypts an entire hard disk partition or a storage device such as USB flash drive

MULTIMEDIA

- Audacity 1.2.6
- Audiograbber 1.83 build 1
- BearFlix 1.1.6.1
- CDex 1.7.0 beta 2
- DivX Player 6.4
- FLV Player 1.3.3
- GSpot v2.60 RC01
- JetAudio 6.2.8 Basic
- MediaMonkey 2.5.5
- QuickTime 7.1.3
- Realtek high definition audio driver
- TVUPlayer 2.2
- VCD Cutter 4.03
- Windows Media Player 11

INTERNET

- Bandwidth Speed Test
- Comodo Firewall 2.4
- EasyMTU 3
- ePromoter 2.0
- Firefly
- Foxmail 6.0 beta 4
- Gigaget V1.0.0.23
- Instant-t



Instant-t

- Miranda IM v0.6.6
- NetMeter 0.9.9.9 Beta 2
- Pegasus Mail v4.41
- Proxomitron 4.5
- Snort 2.7.0 Beta1
- SpamAware 4.4.1
- TCP Optimizer 2.0.3
- Trillian 3.1
- WebReaper 10
- Webripper 1.31
- WinHTTrack
- Yahelite 306 Full 1.0
- K-Meleon 1.02

SYSTEM

- BySoft FreeRAM 4.0.4.759
- CCleaner 1.36.430
- ClipMagic 3.2.3
- Copernic Desktop Search 2.0
- ditto 3.9
- EasyCleaner 2.0.6.369
- E-Counter
- HD Tune 2.53
- HijackThis 1.99.1
- Launchy 1.0
- Microsoft Windows XP PowerToys
- Ranish Partition Manager 2.44 Beta
- RegSeeker 1.52
- SpeedFan 4.31
- TaskSwitchXP 2.0.11
- AVG Anti-Virus 7.5.432
- TestDisk
- TweakUI PowerToySetup.exe
- Windows XP Service Pack 2
- xplorer2 1.6.0.1



DIGITAL BUSINESS

Virtual Iron 3.1



Virtualization and Management for a Single Server. Get all the capabilities, benefits and ROI of Virtual Iron Enterprise Edition available in a single Server environment. Consolidate up to 80 Linux and Windows virtual servers on a single server

BillQuick 2006 7.0.84

With this software you can generate intermediate invoices, track money outflow, and assess total payments with ease



PortableApps Suite



This is a comprehensive application suite that fits onto and runs from almost any device with at least 512 MB of space

PRODUCTIVITY TOOLS

- bcTester 4.0
- CheckbookEase
- OpenOffice.org 2.1



- PowerPoint Viewer 2007
- PPPCD 1.51

MOBILE APPS

- Backup Lite 1.7.0
- floAt's Mobile Agent



- Flurry
- Games For All Java Mobiles
- Nokia PC Suite 6.82
- Opera Mini 3.0
- Plato Video to 3GP Converter
- PSP Video Express 1.03



- RAR 3.60 for Pocket PC
- Reporo
- Sony Ericsson Image Editor 2.11.6b
- Sony Ericsson PC Suite 1.30.55
- Sony Ericsson PC Suite 3.1.1
- Sony Ericsson Update Service 2.6.11.7
- Torpark 1.5.0.7

DIGITAL LEISURE

Little Fighter 2 v1.9c



Little Fighter 2 is a popular freeware fighting game for Windows. It's simple yet addictive gameplay, its great replay ability. The game can have up to 4 human players on one computer and 8 characters in network play at one time

Neo Sonic Universe



It's Sonic all over again in this fan remake of the classical Sega arcade. This game doesn't disappoint, boasting graphics so true to the original you won't know what's going on anymore!

SMALL GAMES

- Bikez II
- Blast Doors 2.0 Beta
- Counter Strike 2D Beta 0.1.0.3
- Dink Smallwood V1.08
- Entrance Gate v1.3
- G-Sector 1.0
- Icy Tower 1.3.1
- Kingdoms of War 1.2
- LaserAge Gold
- Max Payne Kung Fu Edition v3.0 Mod
- Mini Golf Pro
- Narbacular Drop v1.4
- Nitto 1320 1.525
- OpenArena v0.6.0
- Worminator 3



MOVIES

- Star Wars Revelations
- The Second Renaissance - Part 1
- The 39 Steps (1935)



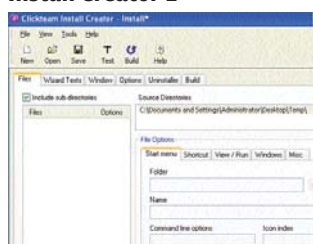
DIGITAL PASSION

CyberInstaller Suite 2006 1.01



CyberInstaller Suite is a suite of programs for the creation of installation packages to distribute applications written using any development environment

Install Creator 2



This software is very easy to use and professional tool to create software installations

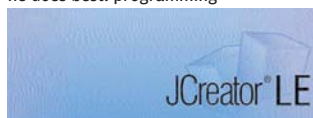
AVG anti-virus 7.1

This antivirus has improved virus detection based on better heuristics and NTFS data streams scanning, Smaller installation and update files, Improved user interface



JCreator LE

JCreator is the development tool for every programmer that likes to do what he does best: programming



DEVELOPER TOOLS

- Ruby185
- ASP.NET AJAX v1.0
- NetBeans IDE 5.5
- NoteTab Light 4.95
- PHP Designer 2007
- SharpDevelop



LINUX

- audikonverter 5.5
- DVDAuthor Wizard 1.4.3
- Distributed Checksum Clearinghouse 1.3.37
- Firestarter 1.0.3
- Google Earth 4.0.2723.0
- KWrite 4.5.5
- Linux Duracell CPU load monitor 0.0.2
- phpBB 3.0 Beta 5
- Siag Office 3.6.1



DIGITAL TOOLS

Ant Movie Catalog 3.5.0.2



This is a program made to manage your collection of movies DVD, CD (VideoCD, DivX, ...)

IcoFX 1.5.01



This is an all-in-one solution for icon creation, extraction and editing. It is designed to work with Windows XP and Windows Vista icons supporting transparency

PC INSPECTOR File Recovery 4



This software recovers files, even when a header entry is no longer available

MULTIMEDIA

- BigFix 1.7.6.0
- Flash Movie Player 1.5
- Free iPod Video Converter 1.32
- HoverMatch
- HoverSnap v0.8
- KMPlayer 2.9.3.1214
- MovieTrack 3.3
- Riva FLV Encoder 2
- Streamripper for Winamp 2 and 5
- Video DVD Maker Free 2.4.0.16
- Vista Transformation Pack 6 Final

INTERNET

- Cabos 0.7.1
- CyberDefenderFREE 2.0
- FireFox Plug-in
- Google Desktop Gadgets
- Google Earth 4
- HoverIP v1.0 beta
- HoverNews
- Internet Explorer Plug-in
- iOpus iMacros V5.22
- Maxthon 2.0.1.5462
- Skype 3.0.0.209



- Thunderbird 1.5.0.9

SYSTEM

- LocalCooling 1.0.4 LocalCooling.jpg
- AcceleRun Free 1.7
- Active Virus Shield
- Arrange Startup ver. 2.3
- Avira AntiVir PersonalEdition Classic 7
- DeleteOnClick 1.0
- dvdisaster 0.70



DIGITAL BUSINESS

AbiWord 2.4.6



This is a free word processing program similar to Microsoft Word. It is suitable for a wide variety of word processing tasks

PDFCreator 0.9.3



This is an application for converting documents into Portable Document Format (PDF) format on Microsoft Windows operating system

Pocket DivX Player 0.8



Pocket DivX Player is a multifunction video and audio player for the PocketPC platform. You can use it to play DivX, OpenDivX, MPEG-4, MPEG-1 videos and MP3 audio files

MIDP for Palm OS 1.0

Install this software to run WILDEC products and other J2ME applications



PRODUCTIVITY TOOLS

- ATnotes
- Converter v1.5.0
- Doc Converter
- KeyNote 1.6.5
- PhraseExpress 3.1.6
- PrimoPDF 3
- SpamBayes 1.0.4



- tinySpell 1.5
- WordWeb 4.5a

MOBILE APPS

- Contacts Transfer (S60 3rd Edition) 3.01
- MeetBuddies 1.0
- Mobile Office for Java 1.0.0

DIGITAL LEISURE

Stan Skates



A fun skateboarding arcade game. Guide Stan through the city by jumping obstacles using his trusty skateboard

Battleships

Can you be the savior and destroy the enemy fleet?

SMALL GAMES

- Action Cube v0.92
- Battle Pong
- Battleships
- Cube Buster
- Flashman
- Frozen Bubble version 1.0.0
- Magic Balls
- Stan Skates
- Sudoku

VIDEOS

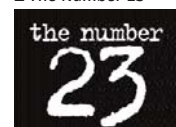
- The Last Mimzy



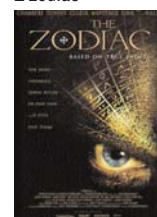
- The Lookout



- The Number 23



- Zodiac



FUN AND POINTLESS SOFTWARE

- Exertrack - Exercise Performance
- Management 1.2
- Guitar Chords Crash Course 3.4
- Orbitron 3.60
- Recipe Manager 1.2.0
- StumbleUpon
- DrWindows 1.04.01



By Demand

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



Vista Transformation Pack 6 Final

Size: 30MB

Virtual Iron 3.1

Size: 208MB



Subscribe

No more snail-mail! No need to visit post offices! All you have to do is log on to www.thinkdigit.com/subscribe and use your **Credit Card** to make sure you never miss another issue of your favourite magazine!



Digit Reader Poll

This Month's Question

How would you rate your computer knowledge?

- ☐ I use a branded computer and often call customer support
- ☐ I sometimes need help with software and/or hardware
- ☐ I repair friends' computers
- ☐ I know what the {23E6EC-3790-AEF} key is for

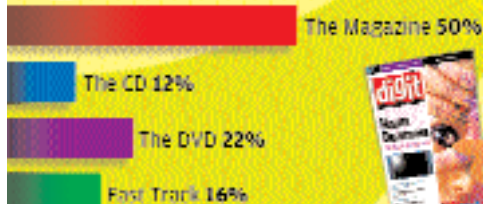


To vote Log on to www.thinkdigit.com

Last Month's Question

What do you like best about Digit?

Total: 522



taste technology at www.thinkdigit.com

FROM THE DIGIT FORUM (www.thinkdigit.com/forum)

This month, we feature the second-hand goodies being sold on our Forum by its members.

Click here to go back to

[thinkdigit.com](http://www.thinkdigit.com)

Second-hand goodies being peddled in Bazaar

What: Zalman ZM-RS6F Headphones
Who: vinyas
How Much: 1800+ shipping
Where: Bangalore
Link:
<http://www.thinkdigit.com/forum/showthread.php?t=49295>

What: Leadtek 7600GT PCIe 256MB
Who: jainshubhanyu
How Much: Rs 7,500
Link:
<http://www.thinkdigit.com/forum/showthread.php?t=48214>

What: Pentium 3 System
Who: Redshary
How Much: Rs 7,000
Where: Bangalore
Link:
<http://www.thinkdigit.com/forum/showthread.php?t=50231>



What: XBOX 360 Core System
Who: aamiracle
How Much: Rs 17,000
Where: Mumbai
Link:
<http://www.thinkdigit.com/forum/showthread.php?t=50146>

What: D link 56kbps Modem
Who: sunil.night
How Much: Rs 800
Link:
<http://www.thinkdigit.com/forum/showthread.php?t=38701>

What: HP Proliant Server
Who: nagarjun 424
Where: Bangalore
How Much: Rs 45,000
Link:
<http://www.thinkdigit.com/forum/showthread.php?t=50007>

Disclaimer: These are random picks from the forum. Digit and Jasubhai Digital Media do not endorse the products, nor do they vouch for the buyers. Please take proper precautions before any money changes hands and deal at your own risk.

Gaga Over Broadband

It's official! By the end of 2007, a little over one in two Americans will be surfing at breakneck speeds at home. With 55 per cent of US citizens and 49 per cent of Brits using broadband, one is left wondering when we Indians will read news reports like that. Read our cover story for more...



As One...

...was the name of a meeting held at San Francisco for popular YouTube stars. Publicity stunt? The Web-celebs gathered and posed for camera flashes, handycams and cell phones. Will YouTube be the next TV? Millions across the globe watching millions of videos on the site might agree...



Enter

Suman Ranganathan Actress

Duskily-good-looking-model-turned-actress Suman Ranganathan became a hot topic with the movie "Fareb", following up with movies like "Ishq Qayamat," "Aa ab laut chalen," and "Baghban." She has also starred in several Tamil films. Though she didn't tell us this, we spotted something on the Internet about her being a "deeply religious soul."

So what is technology to you?

I think it is the future. I believe that technology has positives and negatives in life and one needs to take the positive aspects. From the last 30 years, there have been rapid technological changes.

What are the gadgets you use?

I am not a gadget freak at all. However, since I enjoy photography, I will soon be buying a digital camera.

What do you mostly do when you go online?

I just browse around. Play games like Solitaire. Otherwise, nothing much.

Any instance where technology has come to your rescue?

There have been many instances where technology has come to my rescue and many a time it has been my mobile phone.

BETTER XP-ERIENCES

Vista Vs. XP For Gamers

Ever since the launch of Microsoft's latest operating system, Windows Vista, confusion has reigned on the Web. Since it's mostly gamers who are the early adopters of the latest hardware and OS upgrades, it's no surprise that Windows Vista is on every gamer's mind. "Should I switch, or should I ditch the idea?" seems to be the question. And the answers are not hard to come by. Quite the reverse, actually; there are just too many answers at this point in time, and all of them contradicting each other in some way or the other.

It's obvious that no previous operating system from the Microsoft stables has generated quite so much buzz—whether it's Apple fans crying foul for the alleged "copying" of Mac OS X's prettiness, or Windows fanatics raving about Aero, to confused PC gamers standing in the corner shaking their heads at all the commotion while console gamers happily ignore everyone and everything as they rejoice with their Xbox 360s and PS3s!

Respected geek sites—Extreme Tech, Tom's Hardware and the likes—have done every Vista review possible, including

benchmarking the performance differences between a clean Vista install vs. an upgrade from Windows XP. Incidentally, an upgrade from Windows XP seems to be better for

telling gamers *not* to upgrade to Windows Vista? Keeping up the confusion that reigns, we'll say yes and no! For some of you the answer is Yes, don't upgrade; for a smaller number it's No, upgrade immediately, and for the majority... well... we just don't know, and you'll have to make up your own minds.

Here in India, when it comes to gaming, hardware demographics are a little more of a complicated affair. The majority of computer owners have aging hardware that has no right to be running even Windows XP, leave alone Vista. It's very obvious that if those users upgrade to Vista, they'll have to deal with really slow PCs. Those with better hardware are seldom gamers.

Now we come to the PC gamers segment, which again is broken into two segments: the first and larger segment comprises of computers that have pretty decent configurations—an equivalent of an Athlon64 or Pentium D, 1 GB of DDR RAM, and a good DirectX 9 graphics card with 256 MB of RAM. The second and smallest section of the public is the hard core gamers with top-of-the-line hardware—Core 2 Duo/AM2, gigabytes of RAM, and the

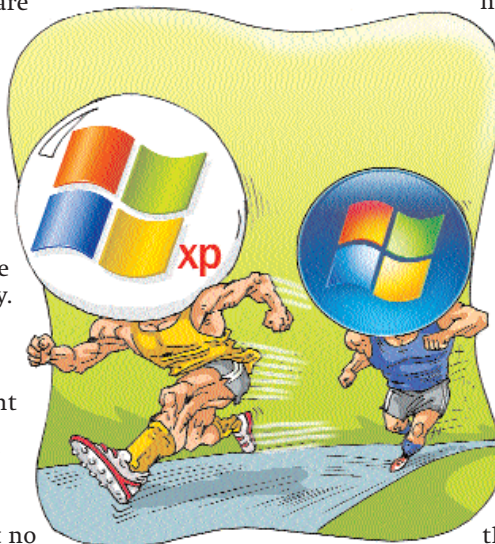


Illustration Harsho Mohan Chatteraj

gaming than a clean install of Vista, according to benchmarks.

Facts remain facts, however, and currently, Windows XP is slightly ahead in terms of performance for most games. This may be because those games were built for Windows XP, or just the fact that Windows XP has lower hardware requirements, but the message is clear; if you want the best performance you can eke out of your hardware for current generation games, stick to Windows XP!

So that's it? Are we



Security Watch

High Alert!

"Extremely critical" vulnerabilities, as rated by security firm Secunia, have been reported in Microsoft Word and in Microsoft Office. The two vulnerabilities work differently. The vulnerability in Word is being actively exploited as of the time of writing. A successful exploit means the hacker can execute arbitrary code on your system.

The Word vulnerability affects Word 2000 and Word 2002. It is caused due to an unspecified error when parsing Word documents.

There has been no patch released thus far for the Word exploit, and until one comes along, you just need to make sure not to open untrusted Office documents.

As regards the other vulnerabilities, in Office, one of them is being actively exploited via Excel.

In fact, there is a long list of software affected by these vulnerabilities, and to find if your product is affected, you should visit <http://tinyurl.com/398gkg>. Both vulnerabilities are exposed when processing "malformed records."

Patches have been released by Microsoft, and you should apply the appropriate one.

For Office 2000 SP3:
<http://tinyurl.com/yugfes>

For Office XP SP3:
<http://tinyurl.com/2fgw43>

Office 2003 SP2:
<http://tinyurl.com/2gd5x4>

Microsoft Office 2004 for Mac:
www.microsoft.com/mac/

latest DirectX 10 capable cards.

For the first gamer segment, switching to Vista right now may be a problem, and kind of pointless. The reason is simple: what Vista brings to the table is DX10 compatibility, which the next generation of games will run on. If you're going to be running DX9, it's perhaps best you do it on the operating system it was designed for.

For the top-of-the-line-or-nothing-else gamer, Vista is probably what you should be looking at for future-proofing. That said, before thinking of switching to Vista, make sure your hardware manufacturer's are making Vista drivers—this is for *all* your hardware.

The majority of Indian PC gamers will probably play it smart with the wait and watch game, which isn't such a bad idea—at least until some good DX10 games come out and all the initial teething problems for Vista are solved. For now, just watch the Vista news flashes on various sites, all the benchmarks, and chuckle contentedly.

THE RUSSIAN PERSPECTIVE

MS To Blame For Piracy?

Russia is amongst the top 10 nations responsible for using pirated software. According

Vietnam	90%
Zimbabwe	90%
Indonesia	87%
China	86%
Pakistan	86%
Kazakhstan	85%
Ukraine	85%
Cameroon	84%
Russia	83%
Bolivia	83%

to studies conducted by Business Software Alliance (www.bsa.org), 83 per cent of computers sold in Russia run on pirated software. Incidentally, the top ten pirated-software countries are as in the table above.

Russian IT Minister Dmitry Milovantsev recently said that the cause of high piracy rates in Russia was more the fault of software vendors than of the users! Now that may sound like a really tall claim, and a lot of you will be going, "Oh no, not another person moaning about how Microsoft should take into account the earnings of the average Russian!" Do Russians really want a crippled version of XP, like the one India saw a few years ago? Will the Russian public pay to have a Windows version that only allows three windows to open at a time, especially when the "free" version that's available from the local market costs almost nothing and gives you full functionality? It's an old debate, and we're not going to get into that...

Those of you who want to sit down and start shooting off an e-mail to

HOT

Vista



It's not selling as much as Windows XP did when it launched, but it is doing well. Of course, this could be because Windows XP had the advantage of moving users away from Windows 98 and Windows Me, and even pirates paid to move from those two...

Vista Upgrades

More people are buying Vista with new computers than upgrading from XP. This is because of the all new heavy hardware requirements—and don't tell us that Vista runs on lower requirements without Aero... Vista without Aero is... err... Windows XP?



Mr Milovantsev and point out that open source is always a viable alternative might want to hold off hitting "Send" on that pirated Outlook window for a while... apparently, in a bid to reduce piracy, Microsoft does not allow hardware partners to sell computers without Windows loaded. So Russians have no choice but to buy from smaller assemblers or fork out the cost of the Windows OS that's preloaded on their machine.

But the bit that really stinks is that if you buy from these PC manufacturers, still insist on using an Open Source OS, and do *not* want Windows loaded, you have to shell out an *extra* \$50 to



One Silly Question

"How many GBs is your brain?"



"Unlimited"
Sanket Shankar



"80 GB, enough for me!"
Sameer Rahate



"My OS doesn't run on GBs!"
Jinal Kamdar



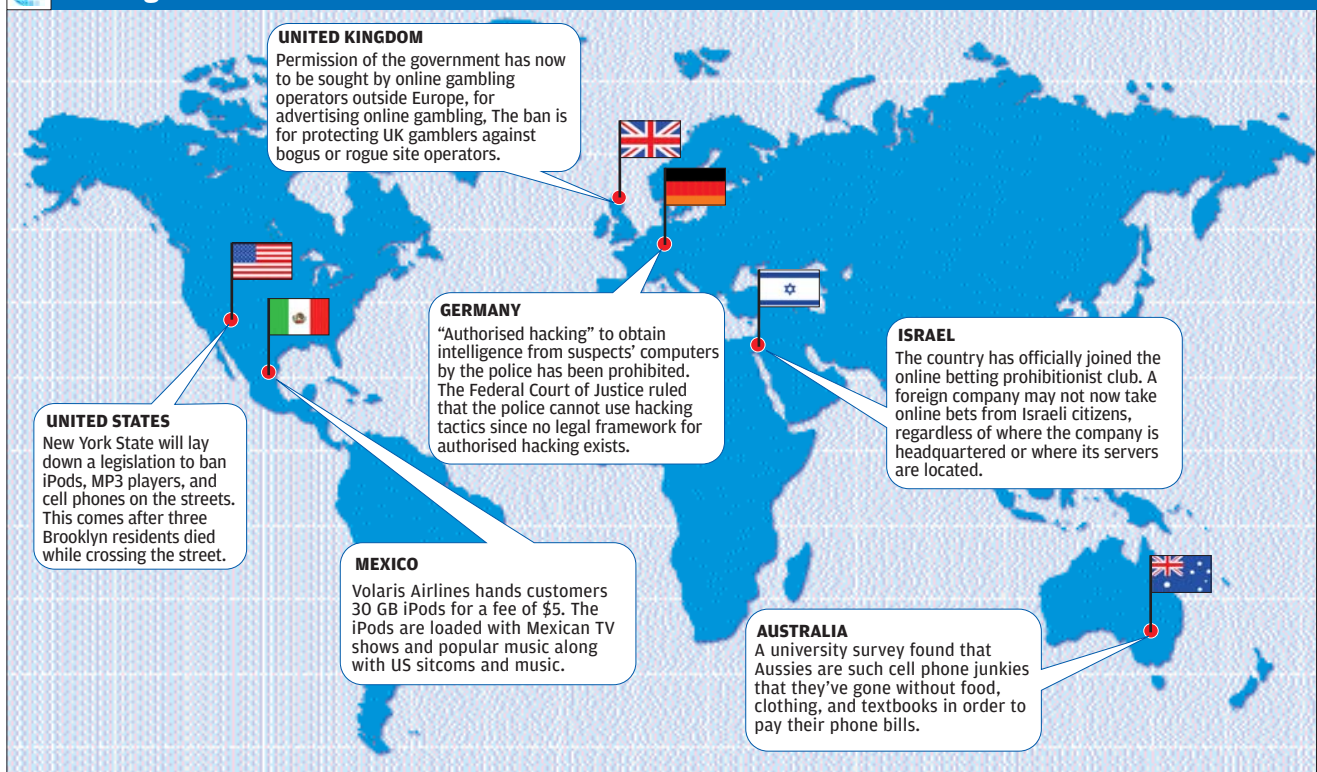
"200 GB and upgradable"
Ravi Prabhakar



"Too much for my RAM to handle!"
Ekta Modi

 The Digital World

A Round-up Of Technology News From Across The Globe



have the company remove Windows! Now that's just the cost of formatting your PC—they won't load Linux for you!

We've heard of extreme measures being adopted to combat piracy, but this one takes the cake! Hopefully, with Vista's new phone-home type security, which almost forces you to uninstall it if you haven't paid for it, will get rid of such ridiculous policies.

For those of you who are interested in knowing where India stands on the piracy list, don't worry, we aren't in the top 20. However, with 72 per cent piracy, and an ever growing number of users buying assembled PCs, we will have to spread awareness if we want to avoid being put on the list of shame!

One thing you need to remember is that this 72 per cent figure means that for every 100 Indian users who buy a computer, only 28 buy genuine software. So according to BSA, even though Vietnam tops the list of shame in terms of percentage, it is not the

country with the most PCs running on pirated software. Take China for example: studies and estimates put the number of Internet accessing users in China (not PC owners), stand at around 120 million.

Let's apply BSA's stats to this figure: $86\% \times 120 \text{ million} = 103.2 \text{ million}$ Chinese users run pirated software. Compare this figure to Vietnam's *entire* population of 84 million humans, and you should get what we're saying...

VIRTUAL BUSINESSES

Second Life Madness

It's *Second Life* time again. There was a competition in *Second Life*; the objective was to come up with business plans and ideas that were implementable in *Second Life*. The winners were announced late February, and the top honours went to Market Truths, a US-based market research and



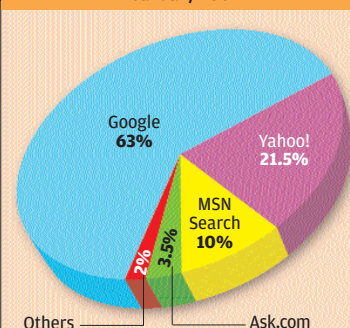
Stat Attack

It's all in the numbers

Wikipedia broke into the top 10 visited sites, ranking **9th** with 42.9 million unique visitors in January 2007. One year ago, Wikipedia was **33rd**!

About **85 million digital cameras** were sold in 2006—and **500 million camera phones**

Percentage-wise usage of search engines in January 2007



55% of online teens have a personal profile.
55% have used social networking sites.
48% of teens visit social networking sites **daily or more often**
26% visit once a day
22% visit **several times a day**

Software companies lost **\$34 billion** in potential revenue from piracy in 2005.

InPhase Technologies' 300 GB holographic disk costs \$18,000.
Price per GB: Rs 2,700. Price per GB of a **250 GB regular hard disk: Rs 13.**
 Capacity could increase to 1.6 TB in 2010

Second Life's front page states **3.1 million** residents
15,000 people are logged in to Second Life at any time



Photograph Dr P T Jadhav, Karnataka

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

Beat That!

Digit Caption

"Tombs' Hardware!"

Last Month's Winner!

Vishal Gupta.
"Playing It Safe!"



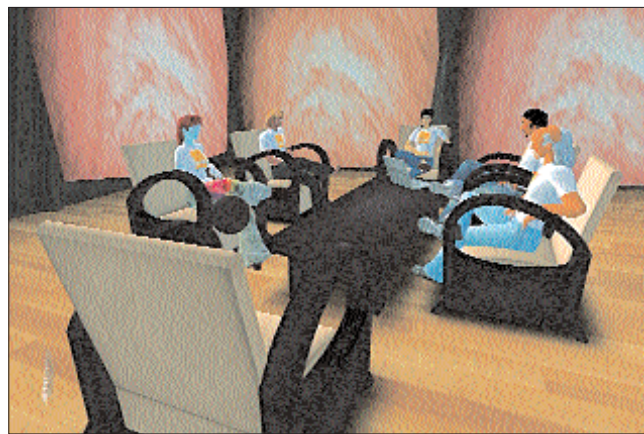
E-mail your caption with the subject "Beat That", and your postal address, to beatthat@thinkdigit.com and win

SQL Server 2005

by Brian Knight,
Ketan Pate
Wayne Snyder,
Jean-Claude Armand

Published by

WILEY-INDIA



analysis company. So what was the winning idea? They made a market research and analysis system that real-world companies can use to analyse how users in the virtual world react to virtual brands, services and products. In plain English, that's a virtual business plan that will help companies make virtual business plans for virtual products or services. OK, maybe the first explanation was better...

Market Truths won first prize of 350,000 Linden

dollars (worth about \$1,300 in the real world). Judges felt that their real-world experience qualified them better than the other competitors. With an increasing number of companies looking to set up shop in the virtual world, it's only logical that they will need to have a plan and virtual market research details. Market Truths is already conducting research about brands and products, for which users who take part in the surveys are paid—in

Linden dollars, obviously.

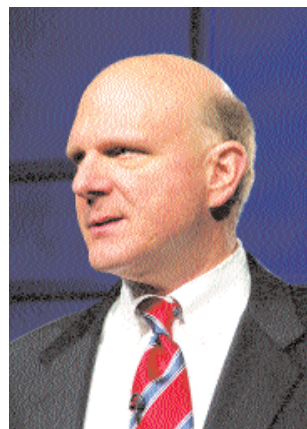
One really has to wonder when the madness will end, if ever. It was crazy enough with people spending half their lives in *Second Life*; now we have companies taking this seriously and setting up virtual branches. We were kind of hoping that people would focus on real problems and pay a little more attention to the world that doesn't go away with power cuts, or not paying your ISP bill. What's next? *Second Life* failures turning to virtual drugs and begging on pixelated streets?

A POX ON OPEN SOURCE

Ballmer On Linux And Open Source

Once again, Steve Ballmer, Microsoft CEO, has threatened open source sellers. In February, in a meeting

with investors, Ballmer again took the opportunity to remind the world that open source "is not free," and reminded the world that the Linux OS violates some of the patents that Microsoft holds. Now we've been hearing these incoherent and disapproving noises emanating from Microsoft, with even rumours of MS suing companies that sell Open Source Software (OSS), but no one seems to know exactly what Microsoft has up their sleeve.



GENDER

Kanvika Vishnoi Vs. Rajendra Rao



BENDERS

Make your own online matrimonial advertisement

Kanvika's mouse got into motion instantly when she was informed about making her own online matrimonial advertisement. She Googled up "matrimonial site" and got a long list of sites, and each result seemed to confuse

her. But soon she narrowed down her choice to shaadi.com, and hastily clicked "Join for free." When she hit the button to save her profile, she got a message: "Would you prefer a working wife?" The next moment she realised the goof-up, clicked back, and found that she'd



chosen her sex as male! The Gender Bender was officially over, and we told Kanvika she'd officially flunked!



When we told Rajendra what exactly he was supposed to do, he started off with pair of raised brows and a smirk on his face. Quite confidently, he took his browser to jeevansathi.com. Enthusiasm lit up his face, but he mistakenly chose "Yes, Not

living together" under Children. And then he got stuck at the box where had to write

about himself. It seemed he hardly knew his own traits; he fumbled, but ended up writing too much about himself. Too long an ad for anyone to really read!



In November last year, Microsoft signed an agreement with Novell (SuSE Linux) to provide a mixed OS platform to those customers who requested it. So if you want a few servers or PCs running on an open source OS, Microsoft will recommend SuSE. The agreement also incorporates a clause that prevents Novell or Microsoft from suing each other for patent infringements.

Microsoft has also issued coupons that entitle their clients to support for SuSE Linux Enterprise Server, if they've chosen a mixed OS solution. Around

70,000 such coupons have been promised per year, and Microsoft claims to have already sold 35,000. How many have been used is another question altogether.

Popular opinion online seems to think that this little Linux-users-owe-us-money ploy has gone a little too far, and OSS fanatics have gone as far as labelling Novell as "sell-outs." Everyone seems to be asking, "Enough already, will Microsoft ever shut up and just tell the world what intellectual property Linux stole from them?", but no answers are forthcoming. Linux fans

also think Microsoft is deliberately not proving the patent infringements simply because there are none, and are just tomming it as a scare tactic to deter corporations from investing in Linux. It seems Novell did the smart thing by paying Microsoft to become the only Linux distribution that Ballmer cannot tch-tch at, and thus mop up all the revenues for non-Windows enterprise sales. In terms of the OSS end-user though, both Microsoft and Novell have fallen to new levels in terms of respect, and the hate grows. Ballmer may have put a pox on non-Novell Linux distros, but you can bet there are a few OSS fanatics practising voodoo on a little Ballmer doll somewhere... perhaps in a Red Hat office building!

GET IN THE GAME

Realism In A Couple Of Years

Have you seen the latest games? No, we're not talking about the weird ones with funky looking aliens and unbelievable worlds. We're talking about the games that try and immerse you in realism; the *Never Winter Nights 2* kind. Those of you who have seen videos and screenshots of the upcoming DX10 game *Crysis* will agree to the realism of the world that you will be plunged into

when you load the game. However, there's always one thing that betrays the virtual world; no, not the AI, it's the characters. Whether it's your own character, or the others that you have to interact with in games, they all look and act so unreal. Sure, we're well past the days of polygonal-shaped people, but we're still incapable of imagining game characters to be real humans. "Give us another year or two" seems to be the prediction of the gaming industry...

David Kunkler, one of the people behind *Never Winter Nights 2* said in an interview with BBC that motion capture technologies and graphics are improving rapidly. If all goes as planned, in a couple of years we will not be able to tell the difference between an actor in a movie and a game character. He also foresees this change as the advent of "emotional content in games."

Ian Livingstone from Eidos, the makers of the *Tomb Raider* series agrees: "We will be able to play with people's emotions—we can make them laugh, we can make them cry, we can make them sad."

So will this become the Third Life? We can certainly see some adult titles being released after they perfect the production of humans in games... whether game developers will ever get game characters to act naturally is another story altogether. We're still no closer to AI, and no matter how real

I'm A Mac!

Everyone seems to be talking about Apple's new "I'm a Mac" advertisements. For those of you who don't know, Apple released advertisements that portray PC users as uncool geeks and then compare them to Mac users, who they then portray as the "cool dudes." We, the media, are not letting an opportunity by to get the reactions of Microsoft higher-ups. Microsoft execs are a little more riled than they let on, which is clear from the comments they've made.

Bill Gates: "I don't think the over 90 per cent of those who use Windows PCs think of themselves as dullards, or the kind of klutzes that somebody is trying to say they are."

Steve Ballmer: "Remember, when you're the little tiny niche guy who owns about 2 per cent of the worldwide market, you can be cute one time and it helps you grow."

February, the month of not-so-good rejoinders...

Buzzword
of the MONTH



Wizpy

What on earth is Wizpy?

Wizpy is a Linux-based portable media player that supports the OGG, WMA, MP3, AAC, DivX, and JPEG formats. You can also view text files on its 1.71-inch display. What's more, you can connect it to your USB port and boot into Linux.

Who developed it?

It is the brainchild of Turbolinux, a Japanese Linux developer.

What apps come bundled?

Wizpy comes loaded with Turbolinux' Linux OS "Fuji" with the Linux Kernel 2.6.19, which is updatable. Also bundled is Firefox, Thunderbird, Skype, Turbo Media Player, Adobe Reader, CD and DVD ripping software, OpenOffice 2.1, RealPlayer 10, and Justsystem's ATOK Japanese Input System.

How does it work?

Simply hook it up to the computer and boot into your own version of OS. Wizpy has Flash memory with a bootable Linux OS that uses at the most 1 GB of memory from the player. The host computer will detect Wizpy as a USB bootable device and boots into Fuji. Wizpy uses its own output system so users can plug in their own output peripherals for sound. Files and documents are stored either in the media folder or on the documents folder of the host PC. The media folder on the host PC will be accessible only when Wizpy is connected, and the documents folder is accessible only by using Wizpy's OS.

Where can be Wizpy used?

Wizpy is compatible with both PCs and Intel-based Macintoshes.

When will be Wizpy be available?

It debuted in February 2007 in Japan, and the rest of the world will get it after April of this year.



that soldier looks, we're still going to be bursting into peals of laughter when you shoot him in the foot and he goes down holding his face! If it's not that, then it's your own squad stupidly standing around getting shot at, or an enemy using a predefined route to get to your position.

Well, one step at a time we guess, real faces in two years, and real behaviour in 2007

INDIA MORE MOBILE

Mobile Market Growing Rapidly

Normally a common meeting ground to discuss possible strategies for China, the 3GSM World Congress (<http://3gsmworldcongress.com/>) was all abuzz about India. Vodafone's 11 billion dollar acquisition of Hutchison Essar was also part of a lot of conversations.

The reason global mobile service companies have lost a little interest in China and are focussing on India is that China has run its shift to 3G into murky waters. At the same time, India is the fastest-growing mobile segment, and with 150 million subscribers, that's a mere 13 to 15 per cent penetration. Estimates proclaim that

India will soon overtake Russia to become the third-biggest mobile subscriber base, and will reach a whopping 500 million by 2010. Even though financial experts say that Vodafone may have paid a little too much for their acquisition, it's nothing compared to the potential they've bought.

With global players coming into India, the mobile industry is set for a new boom. Pricing will be competitive, services will be ramped up, and the general competitiveness will give us end-users more choices and better service coverage. Since Vodafone plans to start penetrating rural areas immediately, expect a much better connected nation in a couple of years.

Whatever the case, we're going to enjoy ourselves, and hope that 3G finally makes it here to take over from the 2.5G services we have to make do with currently.

EXUDING COOL

Brand New Products From HP

HP recently announced a new range of digital lifestyle consumer products, featuring an industry-first touchscreen PC, a touchscreen notebook, a Desktop PC with a new design, and an iPAQ handheld.

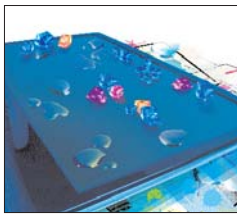
The new TouchSmart PC is a one-of-its-kind. Encased in a shiny piano-black exterior, it exudes class. HP has integrated useful applications such as SmartCalendar, HP PhotoSmart Touch, and other tools to it. The integrated 19-inch touchscreen is bright and uses optical touch recognition, as against the traditional capacitive technologies and HP claims better touchscreen performance.

The new TX-1000 Entertainment Notebook, too, features a touchscreen, and HP claims it is the first notebook optimised to take advantage of Vista's entertainment features. A key feature is its ability to transform into a Tablet PC. It also has HP's entertainment features such as the QuickPlay buttons, a remote control, and a webcam with a microphone.

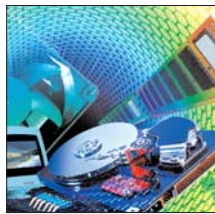
Then, packed with features is the iPAQ rw6828, the new, chic PDA-phone from the HP stables. Based on a 416 MHz Intel processor, and with 128 MB ROM, a QVA screen, and running Windows Mobile 5.0, this PDA-phone will set a new benchmark for PDA-phones. It comes equipped with Bluetooth, infrared, Wi-Fi (802.11b), tri-band GSM, and GPRS/EDGE. A 2-megapixel camera, inbuilt FM tuner, and a 1 GB mini-SD card enable entertainment.

With IDC forecasting healthy growth for PCs in countries such as India and China, it was but natural for HP to come up with a new range of PCs. The general theme is centred on Black and Slim. HP has banked to a large extent on their industrial design team to come up with new, good-looking, functional designs.

HP India assures that these products will make it to the Indian market by the April / May 2007. ■



32 Enter The Matrix!



40 Tube Tech



46 Sonic Boom

Digital

Passion

Fuelling The Pursuit Of Technology Knowledge

Cover Story

Are We There Yet?

Even with prices falling, you still pay more for your bandwidth than you should. What's going on, and will 2007 really be the "year of broadband"?

Nimish Chandiramani

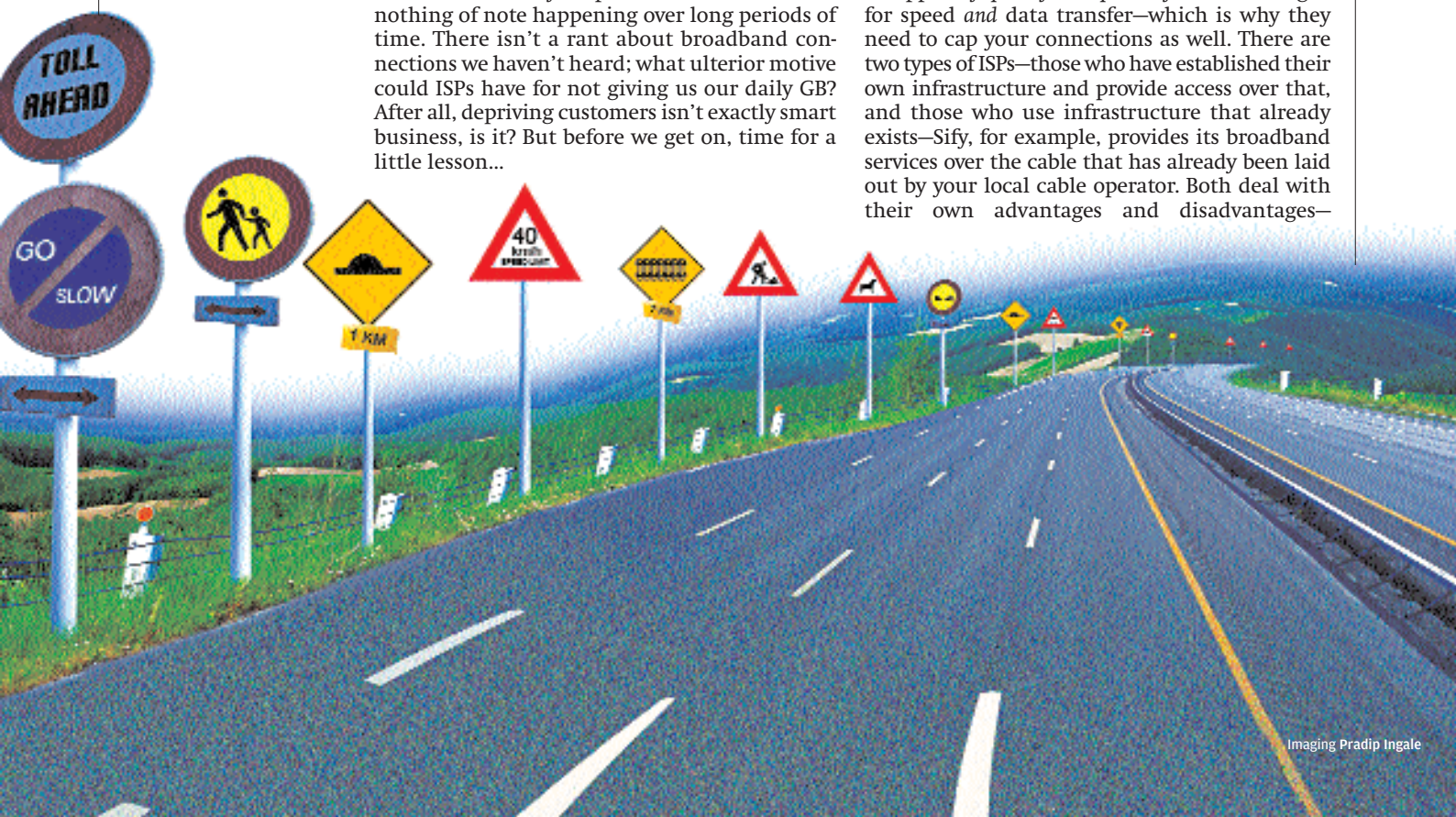
"Hey, watch this hilarious video", says the friend from the US, and you click on the YouTube link with all imaginable anticipation. "It's still loading," you say, when said friend asks you whether you watched it. Now, if your US-based friends are anything like ours, they'll instantly give in to the temptation to send you a screenshot of their 500 KBps (yes, that's kilo bytes) download and call it Awww.jpg.

The urban Indian's quest for high-speed Internet access is something that should be turned into a daily soap—lots of tears, and with nothing of note happening over long periods of time. There isn't a rant about broadband connections we haven't heard; what ulterior motive could ISPs have for not giving us our daily GB? After all, depriving customers isn't exactly smart business, is it? But before we get on, time for a little lesson...

The Bandwidth Food Chain

This whole explanation becomes simpler if you consider bandwidth to be a commodity—like apples, for example. It all starts with the Network Service Providers (NSPs), who own the backbone to the Internet. They're the ones bringing bandwidth to India, and selling it to both ISPs and you. Bharti (Airtel), Reliance, VSNL, MTNL, and BSNL, for example, are all NSPs—they're the people importing the apples.

Next are the ISPs, who buy bandwidth by the GB from the NSPs—usually more than one—and sell it to you. Just like the supermarkets that stock the imported apples. And just like you're charged for apples by quality and quantity, ISPs are charged for speed and data transfer—which is why they need to cap your connections as well. There are two types of ISPs—those who have established their own infrastructure and provide access over that, and those who use infrastructure that already exists—Sify, for example, provides its broadband services over the cable that has already been laid out by your local cable operator. Both deal with their own advantages and disadvantages—



upgrading your own infrastructure is easier than getting your franchisees to upgrade theirs, for instance. ISPs that have their own infrastructure are also able to guarantee better services, since they are in full control of quality. However, taking the plunge to network an area is an expensive proposition, and they need to think more than twice before laying out more cabling.

We aren't going to get more penetration this way, indicates Naresh Ajwani, VP Projects at Sify Broadband: "There are 120 million cable TV connections in India just waiting to be exploited." We'll get deeper to the penetration dilemma later, but there's some food for thought in that...

Finally, the people giving you your connection may be franchisees of the ISPs, though many ISPs prefer to establish their own branch offices and give you service themselves.

The Purse-strings

So *why* is bandwidth so expensive? There are a number of factors to consider here, and many of them depend on each other to a point where it's like listening to the chicken-and-egg argument.

The first, and most obvious, is the cost of the infrastructure itself. Connecting a country like India is no small matter—says A S Oberai, Director, IOL Broadband, "India is actually quite exceptional in its degree of connectivity. VSNL has around 12,000 km of optical fibre running across India—and that's *just* VSNL. A lot of countries aren't that well off. I'm told that 18 lakh *villages* are connected by fibre-optic cable—that's one of the greatest things achieved in India."

All commendable and everything, but we still didn't have a clear answer—but everyone we spoke to was quick to point out that prices *are* falling. Today, you get a 256 Kbps unlimited connection for the same price that you got a 64 Kbps connection a few years ago; if you're on an MTNL or BSNL connection, you're paying the same price for your 2 Mbps connection that you did for your 256 Kbps pre-January! And yet...

The key is the return on investment (ROI)—with penetration the way it is in the country, ISPs



It's not that bandwidth is much cheaper abroad—but the demand is such that it's easier for ISPs to make their money back."

A. S. Oberai
Director, IOL
Broadband

need to make enough money from subscriptions to offset their investments. Bandwidth is an expensive commodity—You Telecom CEO E. V. S Chakravarthy calls it perishable: "We pay for bandwidth by the day, so if any of it goes unused, we make a loss." If you're on a limited data transfer plan, you should be able to relate to this instantly—this is why you can't carry your remaining megabytes forward to the next month.

Penetration is crucial, then—when more people start adopting broadband, the economies of scale will come into play, and the cost per connection will fall. It isn't the only thing, however—while we fight the monster of penetration, there's something else that will drive prices down further...

The Local Bandwidth Funda

Consider your home or office LAN—the costs involved in maintaining it aren't particularly high. There's the one-time cost of cabling, servers, and routers, and the recurring costs of repairing the odd broken cable, the power to keep the servers running, and so on. While these aren't costs to be scoffed at, they aren't daunting in the big picture—to you, the bandwidth you use when accessing another computer on the network is free. Costs only come into play when you're accessing the Internet, and companies pay a lot of money for high-speed (usually those measured in Mbps) unlimited connections.

Take it a step higher, and the story is similar. Try to picture India as one massive LAN. Accessing sites (servers) that are on this network is cheap—you're using local bandwidth. But then, how many of the sites you visit are hosted in India? "Our dependence on international bandwidth is too much," Ajwani points out, "and prices will drop only when more datacentres are established in India."

All the data that comes to you has travelled from the US or Europe through an NSP's broadband pipe—a pipe that costs them a lot of money to own, thus costing ISPs a lot of money to buy bandwidth off; so you pay more for accessing, say, Yahoo! than someone in the US does.

And that's saying a lot—Yahoo!, Orkut and Google India are the top three sites visited by Indians—and none of them are hosted in India. Every time you access these sites (and how can you not?), it costs money. Compare this to the ideal situation where your most frequently-used sites have their own mirrors within the country. You'll be using the international pipes less often, which means that your ISP can actually get away with buying less bandwidth from the NSP than it does now—connecting to a server in India costs considerably less—which in turn means that you can actually get much higher speeds for what you're paying now, perhaps even cheaper!

Now you know why those blasted friends in the US are getting so much for so little!



Broadband Technology

Wireless broadband connections are still to make their presence felt; today, you get to choose between Internet over cable or ADSL (Asymmetric Digital Subscriber Line). You'll find the latter, most notably, with MTNL, BSNL and Airtel.

Theoretically, cable wins the speed war—it's capable of up to 30 Mbps, though this depends on how well-maintained your connection is. In contrast, ADSL connections can reach a theoretical maximum of 10 Mbps. Then again, the speed you get over your cable connection depends on shared bandwidth—if there are too many users in your area, and your cable provider hasn't allocated enough bandwidth, you'll get a poor connection. The DSL connection, however, is all yours—your bandwidth depends only on the quality of the line.

If you've got a telephone line coming to your house, you're already ADSL-ready—you'll get your connection over that telephone line. With cable, you have the inconvenience of having your house wired.

Finally, with cable connections, upload and download speeds are the same, so you'll see caps on total data transfer. ADSL, being *asymmetric*, can give you different speeds for both. For example, you can download at up to 2 Mbps on an MTNL or BSNL connection, but your upload speed is capped at 256 Kbps—reflecting your normal use. Moreover, there's only a download cap!

Still, we've only figured out the problem. Is there a solution on the way? Datacentres in India are coming up, but progress has been slow—setting up a datacentre that meets international standards is a rather large investment.

The National Internet Exchange of India, or NIXI, (www.nixi.org) is a group of ISPs dedicated to the cause of establishing more datacentres in India, and their outlook for the future is quite optimistic. Ajwani agrees, "It will take a couple of years, but the domestic bandwidth situation in India will get better."

Sify, incidentally, has datacentres in Navi Mumbai and Bangalore. VSNL has been at it for a while now, and the number is growing. News surfaced late last year that Google was planning to invest \$1 billion in a datacentre in Andhra Pradesh.

A couple of years it is, then. Meanwhile...

The Penetration Demon

The Telecom Regulatory Authority of India (TRAI), in their Broadband Policy (www.trai.gov.in/broadbandpolicy.asp), estimated three million broadband subscribers by the end of 2005. The actual number was a depressing 835,000 (*source: Tonse Telecom, Analysts*). At the end of 2006, the number was up to 2 million—still short of the previous year's target. What's wrong?

Ajwani blames, in part, the pricing model. "Mobile phones saw phenomenal growth only after prepaid connections came into the market. Indians don't like seeing hidden costs, and they don't want to get a shock at the end of every month—they'll just respond by not adopting. Prepaid broadband connections will give users transparency, and that's the direction ISPs should be thinking in."

And then there's the vicious circle—for penetration to rise, people need compelling reasons that make broadband attractive. One of those compelling reasons will be lower prices, which will come when penetration rises. Now what?

Broadband... And More

While we wait for bandwidth prices to drop, ISPs are keen on showering Value-added Services on us—for a flat subscription fee, you can now get yourself VoIP services, play multiplayer games on-demand and watch TV, with a lot more on the way.

"What broadband will do for people matters as much as broadband itself", says Panham Endlaw, Senior Manager at Airtel Broadband. "Value-added services will play an important role in increasing broadband penetration."

Today, you can buy VoIP services from as many as 30 ISPs—both local and national. For a subscription fee of around Rs 100, you can make calls to any international land line or mobile for as little as Rs 1.25 a minute! Chakravarthy believes VoIP is the future: "There is a huge desire on the part of the Government to make VoIP a reality in a big way, and in a way that will trigger a meltdown in telecom tariffs—which is fantastic. The guys stalling this are the telecom companies—if I can offer you international calls at one rupee a minute and you're willingly paying me five a minute, where is the incentive for me to cut the



“There are 120 million cable TV connections in India just waiting to be exploited.”

Naresh Ajwani
V. P. Projects,
Sify Broadband



price?" He continues, "Right now, all that's being talked about is the fact that ISPs haven't paid the big license fees the telecom companies have, so they shouldn't get to provide telephony. Once all this resistance is broken, just watch..."

Sify plans to promote broadband as an educational medium with their upcoming educational portal—students will receive classroom-like education, enabled with facilities like VoIP. "If parents see broadband in this positive light, they will be less reluctant to adopt it," says Ajwani. Airtel's got educational plans of their own—something that will be "more than just school", Endlaw tells us.

And once the homework is done...

Fun And Games

In September 2006, both Airtel and You Telecom tied up with Indiagames to offer games on demand—play all the multiplayer games you want for a flat monthly subscription fee. You Telecom also plans a service where the base game is free, but you pay a little for additional features—something like *Need for Speed: Carbon*, only you pay real money for upgrades to your car. This was due in January, but has been delayed by a few months.

"You'll notice that a lot of the games we offer are games that families can play," Endlaw points out. "This makes the service more attractive—just good, clean fun." They will be adding more genres soon, though.

Neither has any complaints about the response, but Chakravarthy admits they're still trying to figure out the mind of the gamer, and how to make the service more attractive to this mysterious creature.

Finally, there's good old TV.

Bigger Idiot Box

A lot of talk has surrounded MTNL's announcement of its IPTV services in collaboration with IOL broadband, but will it change the way you watch TV? We watched a demo of the service at IOL's offices, and we must admit that it looks promising on the face of it. Video quality is quite agreeable, and the video on demand service works better than what you get with Direct To Home (DTH) TV today. "And if it's financially feasible, we'll be giving you the latest movies as early as the Sunday after the release," says Oberai.

Others aren't as optimistic about IPTV—"It's just something to showcase," Ajwani scoffs. He also notes that IPTV hasn't had much success in Europe, and that it won't fit in in India, either. Chakravarthy points out that IPTV assumes that you're not used to watching TV on your PC—five years ago, for example, you couldn't imagine watching a movie on your PC. Today, it's practically second nature. And yet, you are made to invest money in a "PC-like" set-top box, bringing the functionality you already have on your PC, to your TV. "But the younger generation will have one window open for TV, one for browsing, one for chat, and so on." With sites like YouTube and services like Joost, why would you need IPTV?

Overall, IPTV is a better alternative to the local *cablewallah* in terms of the services it offers. There's still a chance you won't find some of your

favourite channels in the bouquet, but this will change. Meanwhile, Oberai proclaims, "IPTV is changing the Internet!"

Be it IPTV or the alternatives, we will need fatter pipes.

The 2 Mbps Revolution (?)

When Dayanidhi Maran, Union Minister of Telecommunications and IT, announced that we'll see speeds of up to 2 Mbps on our existing MTNL and BSNL connections, we took it with a pinch of salt. We Indians aren't used to prompt action, are we? And yet, amidst much fanfare, we entered the New Year with, sure enough, 2 Mbps connections.

Barely a few days after that, You Telecom announced their 2 Mbps plans; as of this writing, Airtel and You Telecom are the only ones who offer such speeds to the home user. "In his announcement, Mr Maran encouraged private providers to match MTNL's upcoming offers, so we did," says Chakravarthy simply.

Airtel announced its 2 Mbps plans nearly a month later—why the delay? "We were preparing to provide higher speeds—I believe everyone was. You Telecom did trump us, but we'll see 2 Mbps plans from everyone soon enough," says Endlaw.

But is the 2 Mbps picture all peachy? The first thing that hits you when you visit the providers' sites is that there still isn't an affordable 2 Mbps plan with unlimited data transfer. The second thing is that transfer limits haven't been changed; considering that you'll hit that limit much faster with the 2 Mbps connection, you'll need to watch your usage very carefully, or face the bill shocks that hit people when they got too carried away with their first month of a 2 Mbps connection. "2 Mbps could lose credibility this way," says Chakravarthy, "Tomorrow, if you've been burned by the bills, you'll tell your friends not to fall for it, they'll tell their friends, and so on."

Sify, on the other hand, won't be going the 2 Mbps way soon. "It's all hype," says Ajwani. "There will be a lot of complaints with the download limits. 85 per cent of Internet users go online for e-mail and Instant Messaging—do they



Just as it's our responsibility to provide our customers with the best speeds and service, it's their responsibility to keep us alive by paying a fair price"

E. V. S. Chakravarthy
CEO, You Telecom

even need 2 Mbps?"

You're probably appalled at this statement, but this is the truth in the Indian "hybrid market," as Ajwani puts it. The disparity between the geek's demands and the average user's is tremendous, and for now, the majority—meaning the average user—is going to drive the plans available in India. Did you know that a lot of people don't even hit their download limits?

So while urban users scream themselves hoarse for faster, unlimited connections, others scream themselves hoarse just for connections, period.

But we digress. It's early days yet for the 2 Mbps brigade—both MTNL and BSNL warn that it depends on the line condition. If you're closer to the telephone exchange and the lines in your area are being maintained properly, you'll see the speeds. If not, you'll find yourself at the receiving end of a broken promise. Feedback is online for all to view—you'll find it on any Indian technology forum, including our own; the disparity is mind-boggling. As is the disparity in the quality of service...

Meat, And Poison

You're quite happy with your ISP—good prices, speeds as advertised, and decent customer support. You recommend it to your friend in another area of the city. Ten days later, you get showered with abuses for your recommendation. What happened?

There are two facets to service—firstly, who's providing it, and secondly, how much bandwidth has been allocated to the area in question. When an ISP provides its service through a franchisee—usually a local cable operator—you're bound to see differences in the quality of service across areas. Sify has been dealing with this for a long time. On the other hand, Endlaw assures, "We manage our own customer service, so barring minor differences, you'll see consistent quality across the country."

The second aspect is bandwidth management—if there are 200 subscribers for 256 Kbps connections in an area that has only 30 Mbps allocated to it, there are naturally going to be problems.

Then there's the matter of the customer himself being wrong. Even something as silly as someone tripping over and dislodging the network cable becomes an irate "My Internet isn't working!" call to the service centre.

On paper, You Telecom's plan is the best we've heard so far. Unless the problem with your connection is physical—a broken wire, a faulty network switch, and so on—you'll still be able to connect to their service site, where you will be asked for a 10-digit code. Once you do so, your system is analysed (with your permission, of course) to ensure that everything is all right at your end—no viruses, proper settings, etc. If all is well, someone will come over to service the connection, and soon after the technician leaves, you'll receive a text message asking you for feedback on the quality of service you received. Your reply to that message will enable them to give you better service in the future...on paper.

Choosing A Broadband Connection

Use the Web sites as only an indication—do your groundwork before you settle on an ISP.

- ❑ Check with people in your area. Despite the official word, the quality of service *does* vary from region to region, and to different degrees. Make sure you speak to your neighbours about the ISP they're using and the quality of service.
- ❑ Be very careful when signing up with an operator who's just started offering services. All will be peachy in the beginning, but there's a good chance that the service may degrade as more subscribers come on board. Where possible, opt for someone established—you'll get consistent service, as any kinks in the infrastructure will have been ironed out.
- ❑ If you're opting for an MTNL or BSNL connection, find out when the neighbourhood infrastructure was last upgraded, especially if you're far from the telephone exchange—the quality of the wiring and the distance from the exchange will determine your speeds.

The Year Of Broadband?

We'll see cheaper, faster connections this year. We'll also see new technologies like WiMAX coming to the fore—Bharti TeleVentures, Reliance, Sify, BSNL, and VSNL have all acquired licenses to provide it, and Sify showed off their first live demonstration on February 19.

At least, this is what we've been promised.

There will also be innovation in the way broadband is provided—for example, in keeping with his idea of the “Indian pricing model,” Ajwani envisions the advent of “Broadband On Demand”—the ability to ask only for the bandwidth you need, when you need it. But that's only half of it.

The way we use broadband is changing—even ISPs in the US weren't prepared for the volume of content that's now available online. Horror stories of Comcast cutting off users' connections for exceeding their bandwidth limits (on supposedly “unlimited” connections, mind you) have already begun to surface.

At the India Digital Summit 2007, Maran pointed out, “Connectivity, of course, is not enough to ensure adoption of Internet. Content is another significant contributor to it—I have to say we do not have much content today for consumers!”

Consider this: YouTube—an English-language site—is now number 7 on the list of sites most frequented by Indians. “Now imagine a Hindi YouTube in India,” says Chakravarthy.

Though Maran has made lofty promises, but Chakravarthy has complete faith in the min-

ister: “He's a performing minister, and he's serious when he says these things. He's almost running the Indian IT sector like a CEO.” As for the “Year of Broadband” and all that it promises, “He'll get it done.”

Disconnect

You probably expected us to crucify your provider for daring to interrupt your download. Or tell you that you'll see a 2 Mbps unlimited connection for Rs 250 a month, two weeks from now. Perhaps you even expected this writer to rail about the fact that while he writes this, a 200 KB file is downloading at 2 Kbps in the background. Or that the “Hah!” in broad(hah!)band will never go. Pity.

We just need to give it time. The datacentres will come, and prices will fall. PC prices will fall, penetration will increase, and then broadband prices will fall. In the mean time, you can do your bit to help broadband and PC penetration by making them more desirable—if you know someone who's worried about what their kids will get exposed to online, tell them about the whole world of knowledge waiting out there. The television faced the same kind of resistance, but with acceptance came adoption.

We know you've got a broadband anecdote to share—how could you not? Will you content yourself with value-added services while you wait for prices to fall? Will you opt for IPTV? Is the country doomed to sub-standard speeds? Write in—our inboxes are quite large! ■

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Enter The Matrix!

Everyone and their uncles have hopped on to the LCD bandwagon, but how many of us know about the different kinds of LCDs out there?

Michael Browne

No two LCDs are created alike

That may sound dubious at first, but as you'll see, it's very true. The differences between LCD technologies are fundamental, based on the actual panel matrix that the LCD (Liquid Crystal Display) uses.

Each type of panel is designed to suit a particular usage pattern—gaming, movies, image editing, etc. This is actually intentional. As far as history is concerned, compared to CRTs, which have been around since 1897, LCDs are rather new products, and constant innovations are being made.

If you're going out to buy an LCD, just reading manufacturer specifications isn't going to clear the fog. If you want to know whether a particular LCD is suited for your needs, you're going to have to understand more about the manufacturing technologies. Almost all LCDs made today are the jack-of-all-trades kind, and the only way to discern a panel's suitability to a task is to check the type of matrix used.

There are broadly four types of LCD matrices being manufactured today:

1. TN (Twisted Nematic) also called TN+Film
2. IPS (In Plane Switching)
3. MVA (Multi-domain Vertical Alignment)
4. PVA (Patterned Vertical Alignment)

TN / TN+Film

TN panels are the adults of the LCD world. They've been on the scene since the time of Passive Matrices. The term "Twisted Nematic"

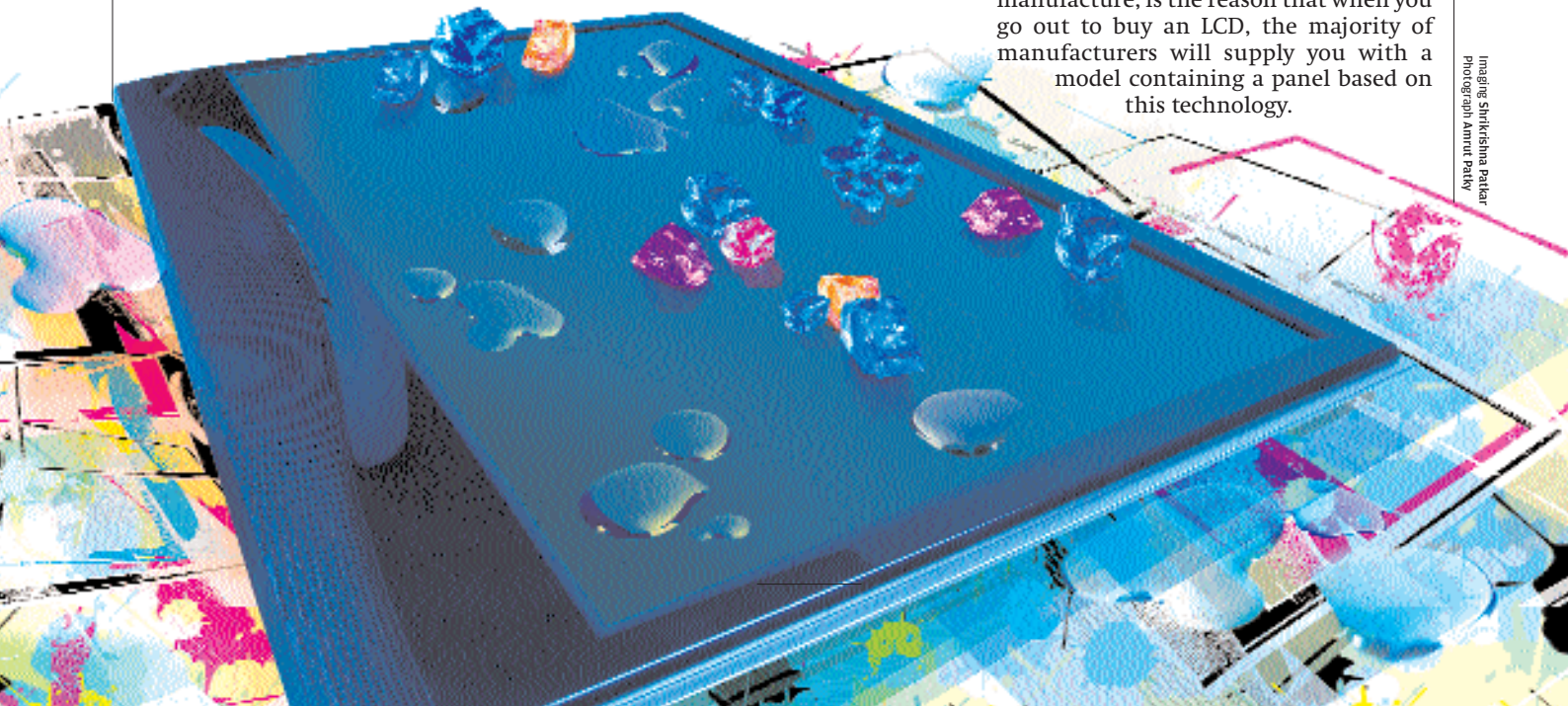
actually refers to the way the liquid crystals are organised.

How A TN Panel Works

When voltage is applied (see Figure 1) you'll notice the outer set of crystals hardly change position (mostly parallel to the panel's surface). All the while, the inner crystals orient themselves in such a way that their axis is perpendicular to the panel's surface—they twist. The problem in reality is the outer crystals aren't really parallel to the surface but *nearly* parallel. If viewed as a whole (the entire matrix), there are noticeable irregularities. These irregularities cause TN panels to have a characteristically poor Contrast Ratio, which is immediately noticeable while viewing multimedia content. Also, the viewing angles are adversely affected because of such irregularities.

Another disadvantage that TN panel-based LCDs face is the fact that they're natively capable of displaying only 262,144 colours—18-bit colour as opposed to 24-bit colour. TNs are basically 6-bit panels—the 18 bits comprise of 6 bits per colour component, red, green, and blue. However, manufacturers get to the magical figure of 16.7 million colours (24-bit) by a technique called *dithering*. Dithering is simply a technique for altering the values of adjacent dots (or pixels for that matter) on a matrix so as to create the illusion of a larger gamut of colours than what actually exists.

The advantages that TN panels have is that they're by far the fastest of all the technologies in terms of response times. This, coupled with the fact that TN panel LCDs are the cheapest to manufacture, is the reason that when you go out to buy an LCD, the majority of manufacturers will supply you with a model containing a panel based on this technology.



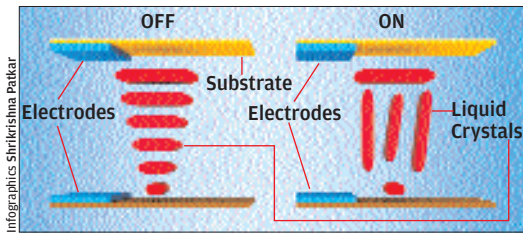


Figure 1: Orientation of liquid crystals in a TN panel. Note the unorthodox alignment in the On position

Due to the significantly higher costs involved, S-IPS technology is seen in larger LCD panels, 20-inch and above

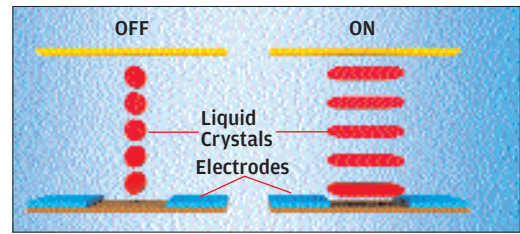


Figure 2: A view of the liquid crystals between the glass substrates in an IPS panel. Note the way the crystals stretch when electric current is applied—in-plane

IPS

The second-type of LCDs we're looking at are the much costlier IPS (In-Plane Switching) panels. Developed by Hitachi in 1996, IPS panels were intended to remedy all the problems associated with TN panels mentioned above. Incidentally, IPS panels are natively 8-bit, which means that they can display the entire range of 16.7 million colours without the need for any dithering whatsoever. This makes them a good choice for professionals working with image and graphics applications. A newer version of IPS is S-IPS (Super IPS), which addresses the inherently poor response times that plagued first-generation IPS panels.

How IPS Works

As the name suggests, the crystals in the panel do not change orientation during off and on operations, remaining parallel to the panel's plane. Notice the elongation of the liquid crystals as they switch to their active state. Also notice the position of the electrodes—they're on the same wafer. This design is more space-consuming as well, which leads to one of the major shortcomings of IPS panels—a poor contrast ratio which causes relatively lower

brightness levels. The benefits of IPS technology are the generously wide viewing angles and the brilliant colour reproduction.

Due to their original design, IPS panels suffered from very slow pixel response times, which made them unsuitable for gaming and multimedia applications because of all the ghosting.

A shot in the arm for IPS came in 1998 when Hitachi Corporation developed S-IPS or Super IPS. S-IPS significantly lowered pixel response times from 50 ms (for IPS) to about 25 ms. Later, in a joint venture, LG and Philips worked out several chinks in the S-IPS armour, further reducing response times to about 16 ms. None of this affected the brilliant image quality, wide viewing angle and colour reproduction, thus making S-IPS panels the only choice for the discerning.

Due to the significantly higher costs involved in their manufacture, S-IPS technology is reserved for larger panels, above 20-inches.

MVA

MVA (Multi-Domain Vertical Alignment) panels came into existence sometime in 1998, thanks to Fujitsu, as a compromise between TN and IPS technologies. TN panels offered superb response

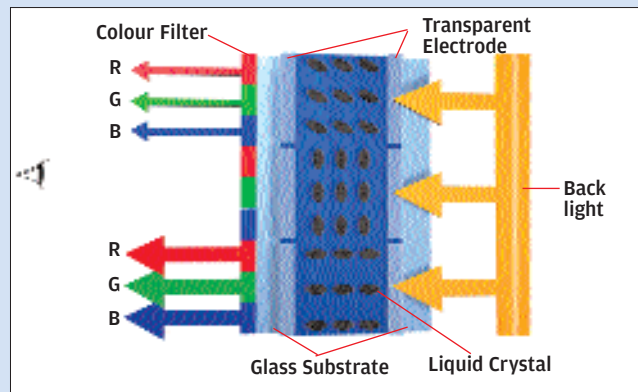
How An LCD Works

Liquid crystal display panels are named after the semi-fluid crystals present in them. Liquid crystals have a couple of peculiar properties that made flat panels possible.

Firstly, they change shape when electric current is applied to them. Different types of panels (as mentioned above) will have crystals taking on differing shapes when an electrical current is applied, but one thing stays common—a change occurs. Let's not get into the types of liquid crystals around.

Secondly, liquid crystals can transmit polarised light. An LCD basically works on the principle of alternatively blocking and allowing light to pass through. This blocking and allowing is done by the liquid crystals themselves as they change structure when an electric current is passed through them.

As you can see, the liquid crystals are sandwiched between two layers of polarised glass. The inner sides of the glass panels, the sides that aren't polarised, have microscopic grooves hewn into them. These grooves are made by a special sort of polymer which is conductive, and each groove corresponds to where a pixel's alignment would be, and the grooves are perpendicular to each other. Liquid crystal material is placed between these two layers of glass substrate, and a polarising film is put on the outer side of each glass panel. The individual rows and columns inside the substrate created by the polymer are hooked up to integrated circuits. This is how



current is supplied to a particular row or column to activate a particular pixel.

Now, suppose a current is passed through this assembly to a particular pixel; the voltage is received by the liquid crystals causing them to change shape. Now this change of shape differs according to the type of panel being used, but basically, it alters the intensity of light passing through the liquid crystals onto the pixel.

Note that the liquid crystals merely allow or disallow light being created by the polarised panels to pass through them. They do not create any light of their own.

Pixel Response Times: The Long And Short Of It

Response Time can be defined as the amount of time it takes a pixel to go from its active state to its passive state and again back to its active state. Unlike a CRT, where the pixel response time is virtually negligible, LCDs have been plagued with high response times—you end up getting ghosting on your screen because the transition time (switching from on to off) is so high.

The liquid crystals in an LCD display actually move, or re-orient themselves accordingly, when electricity is passed through them. The time taken by these viscous crystals to re-orient is a few milliseconds, and the movement could be minute or large depending on the colour the pixel is supposed to display. The Off position for a pixel is white, while the On position is black. One complete pixel operation would therefore be a shift from white to black to white. In such a case, remember that the distance the crystal has to move is maximum, since black represents the maximum amount of orientation away from white (other colours will fall in between). So technically, the

crystal would take the longest possible time for this operation, and therefore the response time would be the slowest, right?

Wrong! You have to consider that the angle or degree of turning is proportionate to the intensity of the electrical field applied. Therefore to orient the crystal just a little bit, a very weak electrical field is needed, and the slower the crystal moves. The larger the degree of orientation required, the greater the electricity applied, and the faster the crystal will turn, and vice-versa—a rather paradoxical situation. In many multimedia applications, games for example, the response time for a pixel transition from, say, black to dark grey may be more significant than the transition from black to white.

Transitions from grey to grey are the fastest, and so most manufacturers quote this figure. For a monitor having a “marketed” response time of 4 ms gtg (grey to grey), the actual response time may be closer to 8 ms or even 12 ms. The ISO standard for pixel latency is defined as the time taken for a full black to white transition.

times, but suffered from poor colour reproduction. S-IPS panels had amazing colour reproduction and acceptable response times, but suffered from poor contrast ratios. MVA panels walked the middle path to try and address all flaws in previous technologies, and offer actual contrast ratios of 600:1, which translates to blacks actually looking black, and a full spectrum of grey. So do we finally have visual perfection?

Unfortunately, no! MVA panels have been proven to have the worst pixel response times. Also, if a close comparison is done, MVA panels

do not offer the same brilliant colour reproduction that S-IPS panels do, although to be pretty honest, MVA panels leave TN based ones chewing the dust on this parameter.

MVA panels are usually natively 8-bit. However, the drive for economy has seen cheaper 6-bit MVA panels that use dithering, similar to TN panels.

Once again, MVA panels are expensive, much more so than TNs, but cheaper than IPS panels, so they’re mostly restricted to around the 19-inch-and-above category.



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network
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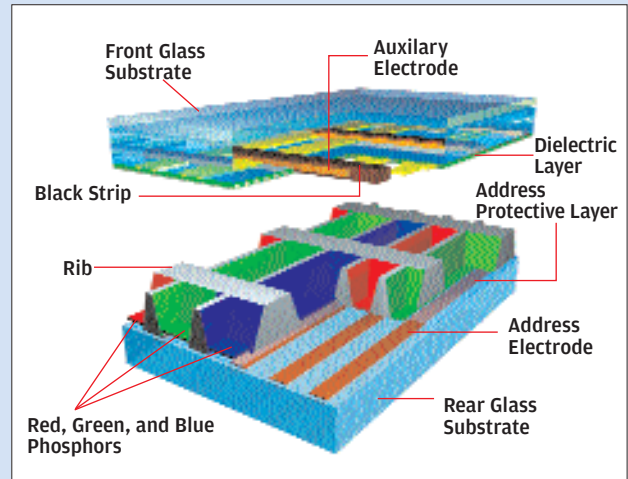


Plasma Displays—More CRT than LCD

The working of an LCD system should be clear now. But what about plasma TVs? Plasma is another flat screen display type that most people confuse with LCDs. However, the extremely flat (read compact) dimensions is all that these two technologies have in common.

A plasma TV is comprised of two sheets of glass with a series of corrugations that have coloured phosphors in between. All this is on the bottom glass layer. The top glass layer is embedded with the electrodes, and both these layers meet to form hundreds of thousands of tiny pixels, each of which is sealed with a gas inside it. Gases that have been used in plasmas are typically neon and argon, and more recently, xenon has also been used. All these pixels are naturally in the same plane, that is, parallel to each other. A single pixel is made up of three sub-pixels, one each of red, green, and blue. Note that these are the colours of the phosphor sandwiched between the two glass sheets.

Now each of the phosphors can be individually controlled as they have their own electrodes. When active, the electrodes bring the rare gases to a plasma state, where they can conduct electricity. The gases react with the phosphor to emit a burst of ultraviolet (UV) light that is invisible to the human eye. The energy from this UV light stimulates the colour phosphors, making them glow. A high voltage is supplied to activate the gases, and after that a much lower voltage supplies them with the necessary stimulation to keep the pixels in the On position.



One of the biggest acclaimed disadvantages of plasma is supposed to be the display's abysmal life. However this is *not* true. A typical plasma display lasts for around 25,000 hours, which incidentally is also the life of a regular CRT monitor. Think of it this way: even if you use your plasma display for 12 hours a day, every day, it will last you for $25,000 / 12 = 2,083$ days, or roughly 5 years and 8 months!

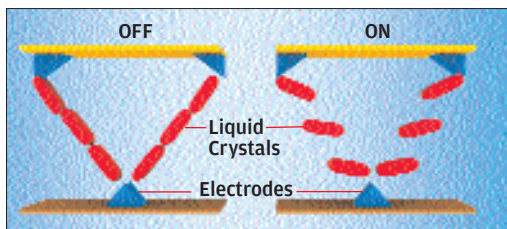


Figure 3: Liquid crystals in an MVA panel

MVA panels attempt to address the shortcomings inherent in TN and IPS panels

How MVA Works

As the name implies, MVA (Multi-Domain Vertical Alignment) panels see each pixel assigned a domain, or an area all to itself. Now these domains work in synchrony with each other. As you can see in Figure 3, the crystals form a sort of a shutter system whereby if one domain allows light to pass through (in the On position), the neighbouring domain will have its crystals aligned at a certain angle to shut out the light, or deflect it. If the monitor is to display white, you see all the crystals aligned somewhat parallel to the plane surface.

PVA

PVA (Patterned Vertical Alignment) was developed by Samsung as an offshoot of the technology used in MVA panels. Some people even criticise the technology stating there's enough in common to conclude that Samsung developed PVA to avoid paying licensing fees to Fujitsu for bulk-producing these panels.

However, a closer look at PVA as a panel technology will suggest differences that lead us to accept PVA as an independent (if not innovative) product that owes its origins to MVA.

In PVA panels, the alignment of crystals is identical to MVA panels. The domain principle is

also used. This allows PVA panels to enjoy amazing viewing angles similar to MVA panels. The disadvantage of a slow pixel response times is also present in PVA matrices. A significant advantage is the improved contrast ratios. PVA panels can actually achieve a contrast ratio of up to 1000:1 in real figures, not what manufacturers claim. This is why PVA panels are finding their way into almost all LCD TVs available in the international market today. The fact that Samsung is the only player manufacturing PVA matrices also means that quality of such panels will be more or less identical.

PVA matrices can be found in the 19-inch-and-above categories. A lot of the massive LCD TVs in the range of 65+ inches (and even the smaller 26+ inches and above) are based on PVA matrices.

The Future

LCDs aren't the future. They are very much the present. As of today, CRT is a dead technology, and manufacturers and consumers alike are focusing on the flat panel market. The binaries of breakthrough technological advances and sharply declining costs is the culprit for the ever increasing popularity of LCD monitors across the globe.

The best news for you, our readers, is the conscious move towards larger LCD panels by the bigger manufacturers. Two of the leading flat panel manufacturers, LG-Philips and Samsung, each with an OEM market share of 22 per cent, are pushing out larger panels to fuel the sudden demand for more desktop space and larger screens for home entertainment. This drives the cost of mainstream panels down, and the trend of falling prices should continue in this product segment through this year and beyond. ■

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Tube Tech

Nanotechnology is the future! We've heard this a million times before, but now it finally seems that nanotubes have a foot grounded in reality

Ram Mohan Rao

Tech buzzwords come and go, some more long-lasting than others. Like "convergence". But it isn't often that so many researchers in so many areas get hooked on a thing. That thing today is nanotubes. These miraculous structures are promising to deliver in so many areas that big companies—IBM, Intel, and the likes included—and small companies alike are rushing in to invest in nanotechnology in general, and nanotubes in particular.

If you missed out on what carbon nanotubes are, check out *Move Over Silicon*, *Digit*, May 2006. But here's a one-line recap: they are elegant-looking structures made of carbon (duh): hollow columns of carbon atoms. One of their most important properties is that they can be both semi-conducting and conducting; the conducting

ones conduct very well indeed, well surpassing copper and aluminium in that area. You'll find out more of their properties as you read ahead.

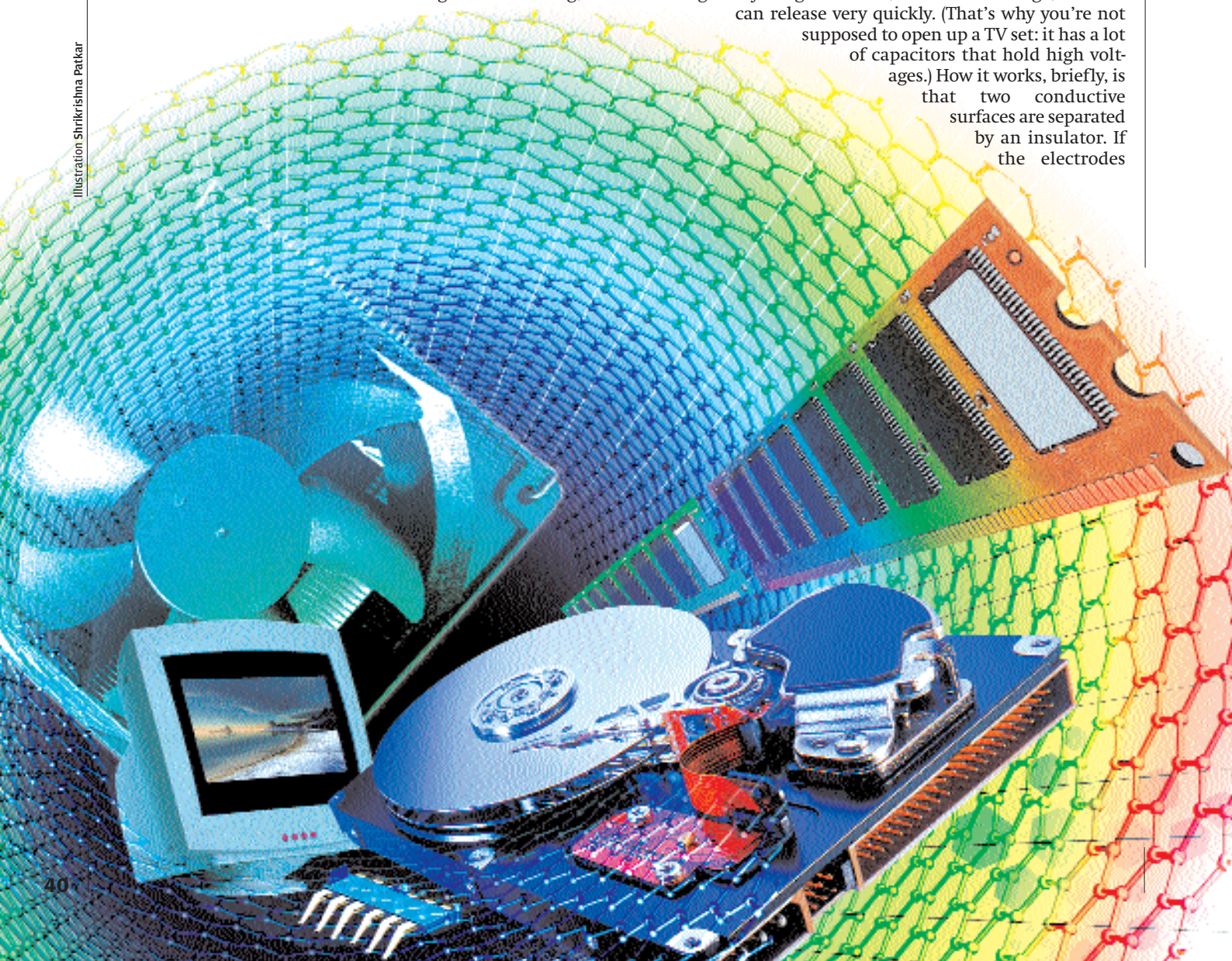
As our regular disclaimer goes, we can't cover everything that nanotubes are good at in this space, but we look at their applications in things ranging from displays to batteries to chip interconnects. And more.

And Nanotubes Come In...

...to save the battery. They're running out so often these days, people are getting tempted to give up on battery-powered devices altogether and take up farming. But would you believe that someone is planning on making batteries last longer by using nanotube-turbo-charged capacitors?

In case you never attended engineering college (whether you were enrolled or not), a capacitor is a crucial component of almost anything electronic, and it holds charge, which it can release very quickly. (That's why you're not supposed to open up a TV set: it has a lot of capacitors that hold high voltages.) How it works, briefly, is that two conductive surfaces are separated by an insulator. If the electrodes

Illustration Shrikrishna Patkar



have a voltage difference, and are then connected by a wire, current flows so as to equalise that voltage difference.

Sounds like a recipe for a battery. Why not just use capacitors? The problem is they can't hold much charge. They'd have to be *huge* to hold as much charge as a standard battery. Why? Because the surface area of the conductive surfaces (the electrodes) would have to be very large.

Enter the nanotube, to the sound of a boisterous orchestra. Joel Schindall, an engineer at MIT, thought up this one: cover the electrodes with millions of nanotubes. And how would this work, please?

We said the surface area of the electrodes would have to be much larger. Now, why does a Turkish towel—with its coating of water-absorbing threads—work better than a plain cloth towel? Because it has more surface area. Just so, the nanotubes increase the surface area of the electrodes to a very high degree, without taking up too much space themselves. The result is a capacitor that can rival a traditional battery in terms of charge.

Timeline: five years. (Schindall's estimate, not ours.)

Motorola And Their "Hybrid" Display

We begin with a disclaimer here: the use of nanotubes in displays does not promise world peace. It doesn't even promise to revolutionise displays—not too many companies have yet bought into the idea. But we must mention this one so you get an idea of the sheer range of applications nanotubes have!

There are too many new display technologies, and nanotubes have jumped in to add to the confusion. Will they, won't they deliver? Motorola's nano-emissive display design has been touted (by Motorola—who else?) to be superior to all flat-panel technologies. In what way? Well, all the usual suspects: very good brightness, very quick response times, colours almost as good as those on a CRT, longer life, and—the best part—they're cheaper to manufacture.

How does it work? If you remember engineering college lessons—or even if you don't—it's simple. CRTs sweep an electron beam across the screen, which is coated with phosphors that glow when excited by electrons. The nano-emissive display uses an array of nanotubes to fire the electrons, instead of whatever fires them in regular CRTs, and there are clusters of nanotubes behind each pixel. Think of an NED as a cross between CRT and flat-panel technologies.

Motorola's prototype is 4.7 inches diagonally, with a resolution of 128 x 96 pixels. It was designed to be one piece of a 42-inch HDTV screen with a resolution of 1280 x 720. Well, they're getting there.

There's always a catch to any nanotube application, and it always goes like this: "how to get the nanotubes to work in <some> way." Here, the problem is attaching the nanotubes to a glass substrate. Motorola says they're managing pretty well.

Nantero...

...is a small company that has big plans for NRAM (nano RAM), saying it will replace all

There's always a catch to any nanotube application, and it always goes like this: "how to get the nanotubes to work in <some> way"

kinds of memory altogether, including the hard disk, once and for all. They say we'll have a universal memory of sorts in the form of NRAM. It's again about nanotech coming to the rescue and making possible the dream of Universal Memory.

There happen to be several contenders for Universal Memory—notably MRAM ("M" for "magnetic"), FRAM ("F" for "Ferroelectric Materials"), and more. We're hoping to see something concrete soon—these terms have been bandied about for too long now! In any case, to understand how NRAM works doesn't require a PhD.

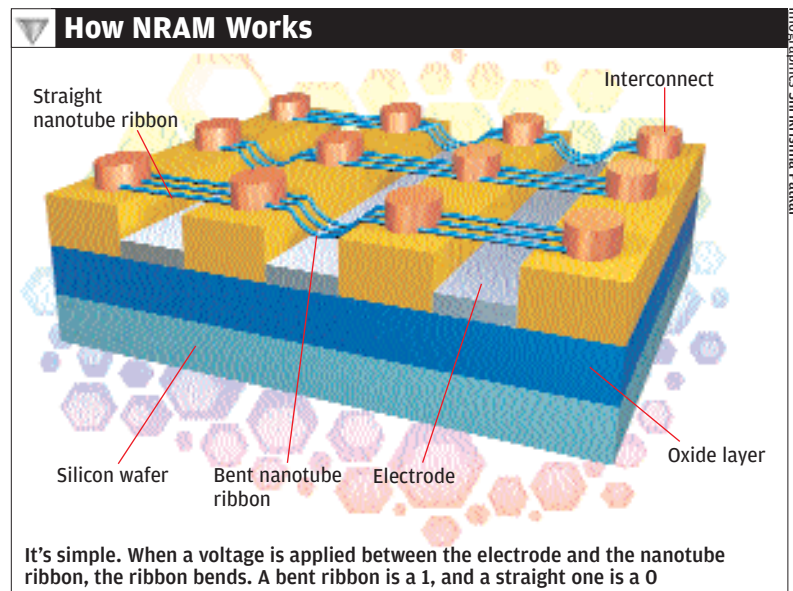
Refer the figure below, and look at each component, specially the interconnects, the ribbon-like things, and the grey electrodes. The nanotube ribbons, anchored to the interconnects, stay suspended over the electrodes. Now when a voltage is applied between the ribbon and the electrode, the ribbon *bends and touches the electrode*.

That's one key to the working. The other key is that the ribbon stays stuck to the electrode even when the voltage is turned off, due to certain molecular surface attraction forces. This makes for non-volatility, meaning that power need not be continuously supplied to the device.

And thus are obtained the ones and zeroes: when the ribbon is far from the electrode, it's a zero. When the ribbon is touching the electrode, the resistance between them is much lower, and it's a one.

How does this compare with SRAM and DRAM? It turns out that the switching can be as fast as that of SRAM, making NRAM have the "fast" characteristic of SRAM; at the same time, the density of the assembly approaches that of DRAM. And the whole thing is non-volatile, like we mentioned, so it's got the goodness of Flash.

NRAM, in sum, trounces all three—DRAM, SRAM, and Flash—except for one little thing: it isn't as fast as SRAM. So we have the best of all three worlds, give and take a little. Visit nantero.com for more on NRAM. There's a movie illustrating the principles of operation of NRAM.



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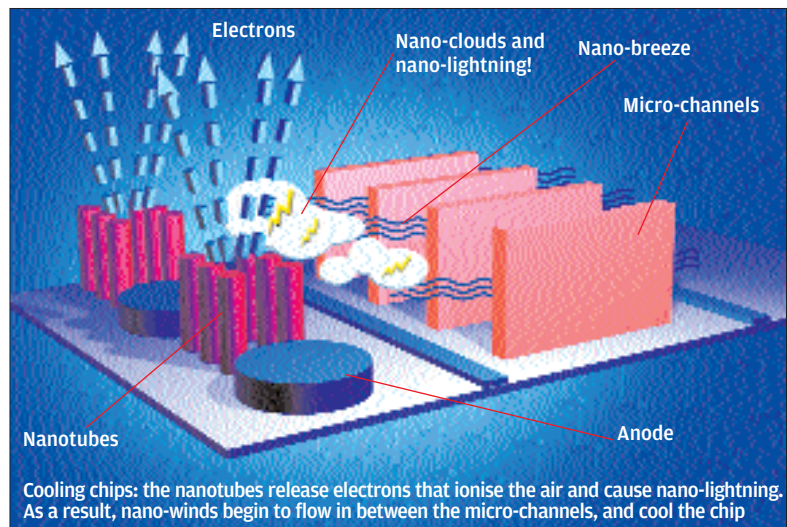
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Seagate Innovates... Again

Seagate is obsessed with hard disks. Which is quite in order, considering that's their business, but they have this habit of coming up with innovations ever so often. They're now dabbling in nanotubes, and are researching a rather complex process that can make hard disks denser.

We're saying "complex," but we can break it down into steps to see where the nanotubes come in.

First, we need denser hard disks. Because. Now, techniques such as perpendicular recording do make disks denser, but we need more density. Just because.

Now, if one just packs the bits on a hard disk platter too close together, there's a chance that a bit can flip its adjacent bit. In other words, it's demagnetisation at work, because of too high a density.

Now how does one remedy this? By using a recording material of high "anisotropy," meaning that it's harder to demagnetise, and so will reduce the chances of bits flipping each other. Problem: such material is also harder to magnetise as well.

This has an answer, too. Use a laser beam to *heat* the spot being recorded on, because when a spot is hot, it's easier to record on. This happens to be a better solution than using a stronger recording head.

Still with us? OK. When the heating is taking place, the lubricant film on top of the recording surface (yes, there is one) could evaporate or decompose. That, in turn, considerably reduces the life of the disk.

And here's where our hero—the nanotube—comes in. Spread nanotubes all over the surface of the platter—nanotubes filled with lubricant. The nanotubes slowly release the lubricant over the life of the disk, keeping the head spinning happily.

So that's how it is—they can hold lubricant as well, we've now learnt!

Aiding In Cooling...

...are the nanotubes of tomorrow. Cooling of chips, that is. Fujitsu and Intel are into this one, and it was reported more than a year ago.

What Intel is doing is simple. It just involves putting nanotubes into the thermal grease that makes up the layer between a microprocessor and its heatsink. A nanotube layer works *orders of magnitude* better than regular thermal paste, it's been claimed.

Why nanotubes? Because they conduct heat extremely well, and because they lend themselves to suspension in polymers and coatings. This second point is important: Intel will either design a polymer film containing billions of nanotubes, or try and find a way to deposit the nanotubes onto the (silicon) substrate.

Fujitsu's system is a heatsink made up of millions of nanotubes "grown" on a wafer substrate. The structure of the heatsink is such that it matches the pattern of the electrode bumps on the base of the chip to be cooled. Fujitsu is now working to improve the nanotube density around the bumps which, of course, will lead to even higher heat dissipation.

In independent research at Purdue University, "lightning" (!) produced by nanotubes could generate tiny air currents that can cool chips. This is air

cooling that the researchers say works as nicely as water cooling. The technique hinges around the fact, as usual, that nanotubes are small. Ions (electrically-charged atoms) are generated using electrodes separated by as little as 10 microns. The cathode is made of nanotubes with tips just as wide as 5 nm.

The ionisation of the air leads to an imbalance in the charges on the electrodes, which results in "lightning bolts." This nano-lightning is responsible for the tiny breezes that do the cooling.

Normally, lightning requires thousands of volts, but here it's been done with a hundred volts and less—because the nanotube tips are so narrow, and because the electrodes are so close together.

These three examples aside, there are many people doing different kinds of work on cooling using nanotubes, and nanotube cooling could be one of the first major "solutions to a real-world problem" that nanotech rolls out.

Also Good As Interconnects

Now we get into our "As chips get smaller and faster" mode of speaking. And so, as chips get smaller and faster, copper interconnects get more difficult and expensive to fabricate; their electrical properties degrade at the scales we're approaching.

Electromigration is the name for the phenomenon whereby the reliability of integrated circuits degrades—because it makes nanometre-sized copper interconnects unreliable, and can even lead to wire failure. Visit <http://en.wikipedia.org/wiki/Electromigration> for an explanation of the phenomenon.

Finally, at one million amperes per square centimetre, copper just burns out. Enter the nanotube, as usual: they can carry a *thousand* times that much. In addition, bundles of densely packed nanotubes can have significantly lower resistance than copper—and as you're aware, lower resistance is a much sought-after attribute.

In addition, with nanotubes, there is no need to create deep, narrow trenches on silicon wafers in which copper conductors are traditionally buried—further increasing the potential for miniaturisation.

With all these advantages to be had, and with all the difficulties that come in the way of nanotubes being used as interconnects, it's only natural that almost every nanotech organisation—and some non-nanotech companies as well—are in a race to bring out nanotube-interconnect-enabled chips.

Scientists at the NASA Ames Research Center (ARC) are amongst those working on the problem. One of the problems is that of the nanotubes being entangled; when they are, they don't display their fantastic current-carrying prowess. The idea at the ARC is to develop a process to untangle them.

In January of this year, it was reported that researchers at Rensselaer Polytechnic Institute had created hybrid structures that "combine the best properties of carbon nanotubes and metal nanowires." These structures could help overcome some of the main hurdles to using nanotubes in chips, displays, sensors, and such.

At one million amperes per square centimetre, copper just burns out. Enter the nanotube: they can carry a thousand times that much

Of particular interest is the fact that the researchers' approach allows "the precise attachment of nanotubes to individual metal pins, offering a practical solution to the problem of using carbon nanotubes as interconnects."

As a final word, Intel, too, is looking at nanotubes as a replacement for copper interconnects. The company has managed to create prototype interconnects out of nanotubes, and measure how well the interconnects perform.

The whole nanotube interconnect thing points, essentially, to what you'd expect: shrinkage. And we are, naturally, going to see a lot of that—just like we've been seeing the past couple of decades—so expect the nanotube to begin taking over a few years from now.

The Rise Of The Nanotube comes down to three things: innovate and think up new uses for carbon nanotubes, given all their wonderful properties; find more of those wonderful properties; and most important as of now, find how best to manufacture and interface them.

Manufacture is notoriously difficult; for example, in one process, they come out as a mixed bundle of conducting and semi-conducting, and it's hard to separate them. Another problem, for example, is how to un-bundle them.

Some of what we've talked about above could just turn out to be that much more thin air; some of it could turn out to be groundbreaking. In any case, look forward to the "nanotube computer," which, by the way, is also being talked about. ■

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February 2007

ViewSonic VX2245WM

Michael Browne

I've been saving up to buy a large (20.1 inch or above) widescreen LCD, and have been hunting around. That's why I just *had* to review the VX2245WM

Day 1

The VX2245WM sports a lovely piano black finish. It's glossy enough to remind me of Samsungs Bordeaux LCD TVs! The bezel is a little too wide for my taste, and makes the monitor look larger than it is which spoils aesthetic appeal. I got a call, had to run, so no setting it up today.

Day 2

Setting up the monitor was a breeze. It's got both D-Sub and DVI connectivity. On a negative note, the monitor cannot swivel sideways—generally, larger monitors have this capability.

Day 3

The VX2245WM excels at office applications—Word, Excel, etc. Of course, these applications are an overkill for this monitor and aren't really its intended genre of use. The joy of working with large excel sheets on this monitor has to be experienced to be believed. Hardly any horizontal scrolling required. Web browsing is a delight—absolutely no complaints with a screen this large. Who says a 17-inch monitor is enough for surfing?

Day 6

The VX2245WM comes with four USB ports, one upstream port (USB B type), and three downstream ports (USB A type). Convenient! Now I don't have to bend my back to insert a pendrive into my cabinet's USB ports. There are also inbuilt speakers, with a little subwoofer too. This monitor has another trick up its sleeve—it also features an iPod dock!

Day 9

I got an iPod 30 GB from a friend to try with the dock—it works perfectly. So iPod owners behold—

another reason to buy this monitor—you can tune into your Pod, and charge it, too!

Day 11

It was Saturday, and I planned a serious round of gaming on the new monitor. A couple of hours of F.E.A.R confirmed the speedy response time. I noticed some gray where there should have been pure black, and firefights in darkened corridors became a game of guess-position-and-shoot. The same thing happened with *Far Cry*—I had to turn off the lights to be able to see anything!

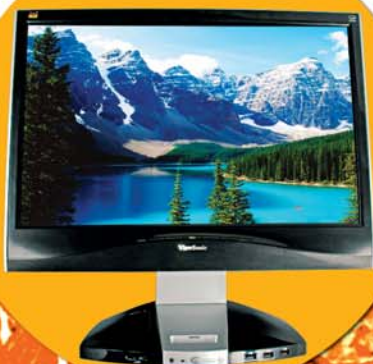
Day 12

I fired up a movie—*Torque*. One of my colleagues said, "Wow! Look at that—it's huge... I want!" Colour reproduction is impressive on this one!

Day 24

Time to say goodbye... I enjoyed having a large screen (don't we all?). Offering decent performance on all fronts the VX2245WM is a good buy at the price of Rs 24,000. Agreed, most users don't have such budgets for just a monitor (when entire systems have been purchased for less). Discerning gamers and professionals working with images will give it a wide berth, but for the home user who wants to turn his PC into an entertainment station and television substitute will have one less component to decide on.

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Sonic Boom

Multimedia speakers for PCs are more than just boxes that emit sound; they're trendy-looking, and are available from the basic two-speaker sets to hi-fi quality 5.1 and even 7.1 sets.

This time, we roped in an expert to review our results to make sure you spend your money on the right set

Jayesh Limaye

When it comes to buying a PC, speakers were traditionally bundled with mice and keyboards as the components we paid the least attention to.

But that's change a little, and is changing even more. People seem to be getting more interested in quality audio. And if you think about it, that brilliant-looking game is kind of pointless with just stereo speakers, and what's the use of buying movie DVDs if all you have is a 2.1 set?

For this, our annual speaker test, we received 35 sets from eight brands in the 2.1 and 5.1 categories. Though Logitech sent us the entire range of their products—X-230, Z-2300, Z-5300, Z-5450 and Z-5500—only the X-230 worked, and the rest were damaged in transit. Last year's 2.1 Gold Winner, the Altec Lansing MX-5021, shared the same fate. Creative's audiophile sets (the GigaWorks), unfortunately, didn't make it to the test on time.

We brought in an expert from the audio industry for this test, and he took a listen at the best speakers from each category, conducted a few tests, and gave us his verdict. Look for Sunil Karanjikar's comments and results throughout this article for a better understanding of what to expect from your speakers.



ONLY MUSIC PLEASE: 2.1 SPEAKERS

The most basic speaker sets are the 2.1 category. However, it's a mistake to think of them as speakers that have less to offer. It's more about usage patterns, and if you're more into listening to MP3s and rarely play any games or watch DVD movies on your PC, it's kind of pointless to look for anything more than a good 2.1 set. This is because most of the sound sources you will be listening to have just two channels—left and right. Only DVD movies and newer games have more channels (5.1 or 7.1), whereas all your music collection and any VCDs you might have on your PC are just stereo.

If you decide that you don't need anything more than a 2.1 speaker system, the next thing is to decide on a budget. 2.1 speaker sets range from the lowest-priced sets to some of the most expensive audiophile-grade systems. Most PC users buy the inexpensive, entry-level 2.1 sets, which consist of two satellites and a subwoofer. The subwoofer plays back the lower frequency sounds extracted from the stereo input.

Making it to this category were 16 sets—from Altec Lansing, Artis, Creative, Intex, Logitech, Tech-Com, XFree, and Zebronics.

Features Power

We attempted to take a look at many aspects of the speakers, and power rating is one of the most important. A speaker set with a higher power rating will produce sound of higher amplitude, since they amplify the sound to a larger degree. All the power ratings we'll mention in this review are in RMS, unless mentioned otherwise. In the case of the 2.1 speaker sets, the Altec Lansing FX4021 boasted of an individual satellite power rating of 11 W, while the subwoofer pumped out 46 W. The Zebronics ZEB-SW8000 was next with satellites rated at 10 W each and the subwoofer rated at 30 W. Xfree's XE222 were the lowest-powered of them all, with a 2.5 W satellite and a 4 W subwoofer.

Driver Size

The size of the driver (speaker diaphragm) is one of the determining factors in the ability of the speaker to produce sound (see box *Size Does Matter*). Because most of the 2.1 speaker systems were targeted at the budget segment, we did not expect to find anything spectacular in this regard. However, the Altec Lansing ATP3 boasted of a 6.5-inch woofer, while the FX4021 had two 5.25-inch drivers in isobaric configuration (facing each other) to provide double the amount of bass. It was natural for us to expect some rocking bass from these speaker sets. The rest of the speaker sets had woofer sizes ranging from 4 to 5.25 inches.

As far as the satellites were concerned, the Altec Lansing ATP3 had an unusual design, with two 28 mm drivers and a 3-inch down-firing mid-bass. The FX4021 from the same brand had satellites with 40 mm and 18 mm drivers to deal with a higher range of frequencies. The Logitech X-230 also sported dual 2-inch drivers to produce a uniform sound field and to eliminate uneven response.

Other Features

Clamp-type connectors are usually found only in higher-end speaker systems because of the better conductivity and contact, and we were surprised to find them in the Altec Lansing 121i and the Artis S444 and S800. The rest of the speaker sets had the more common RCA contacts, while the Creative SBS-370 was the only one with mono contacts, which are prone to problems.

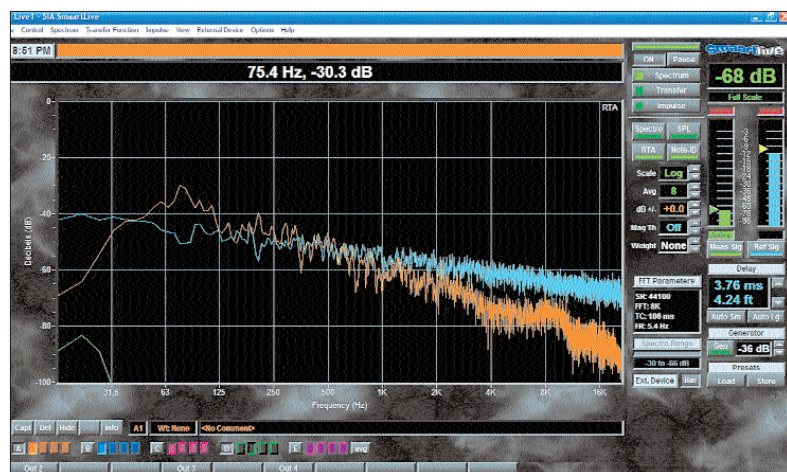
Bass as well as treble controls along with volume controls were there on most of the sets except for the Artis, Creative, Logitech and Xfree.

Accessories

As accessories go, Creative bundled large, heavy power adapters. While Creative had some nice-looking detachable stands, the Altec Lansing FX4021 came with good-looking metal stands, which added to their aesthetic appeal. Speaking of aesthetics, the Logitech X-230 was the most dashing-looking 2.1 set, with a jet-black sub-

Illustration Chaitanya Surpur
Photograph Jiten Gandhi, Amrut Patki
Model Shivam





The analysis of the Altec Lansing ATP3 shows that they are pretty bass heavy, and lose out a little in terms of highs. This can be seen in the graph between the 4 to 16 KHz mark

woofer and slim satellites with stands that can also be used as brackets for wall-mounting.

A remote control lets you control the speaker volume and other parameters without the necessity of leaving your seat. The Artis S111R, the Creative duo, as well as the Xfree duo came with wired remotes. The Altec Lansing FX4021 provided both a wired and a wireless remote. Only the Artis S111/FM sported FM radio.

Build Quality

The Altec Lansing FX4021 had a better build than the rest, but was very closely followed by its sibling, the ATP3, and the Logitech X-230. The Zebronics ZEB-SW8000 was decently put together and was the heaviest of the sets, but its knobs weren't the sturdiest. Most of the subwoofers were ported to allow for maximum displacement of air while producing bass. How much of this design translated into actual performance was verified when we tested the performance.



Altec Lansing ATP3
Crystal-clear!

Performance Music

The Logitech speaker sets were found to be the best performers with music of every genre. Not only were the highs crisp and clear, the lows were rich, and the mid-range pleasant. The Altec Lansing ATP3 and FX4021 fiercely contested for second place. While the ATP3 faltered a bit with rock, with flawed bass reproduction, it did produce better *Bhangra* beats and *Ektara* sounds than the FX4021. The performance of the Artis S444 and the S800 was excellent, yet they come at low prices. Lesser-known brands such as Xfree, Tech-Com, and Zebronics exhibited below-average performance, as did the Creatives. The Artis S-100 was the lowest-performing speaker set with low scores in almost every category.

DVD Movies

While none of the speaker sets could flawlessly render the concussion gun boom in *Minority Report*, the Logitech X-230 and the Altec Lansing

How We Tested

Our test PC comprised an AMD Athlon64 3800+ processor running at a stock speed of 2.0 GHz, a WinFast 6150K8MA motherboard, 1 GB of 400 MHz Corsair XMS DDR RAM, a Seagate Barracuda 120 GB SATA150 hard drive, and the Creative Sound Blaster X-Fi Elite Pro sound card, running Windows XP Professional with SP 2. The latest drivers and DirectX version were installed.

We put the speakers through an exhaustive set of tests, including three DVD movie tests, multiple music and sound tests, as well as a game test.

The game test was the *Half-Life 2* Demo “d3_c17.12”. We ran this demo with sound settings at “high,” while the visual quality was set to “low” to reduce CPU overhead. The sound was configured according to the number of channels available on the speaker sets. This demo blends voice commands with firing and explosions, and is good for testing the capabilities of speakers when reproducing varying sounds. A speaker set that reproduces the faintest of directional sounds with clarity, such as footsteps, is good for gaming and can save you from getting fragged.

A DTS sampler disc with a couple of DVD movie clips and a 5.1 soundtrack were used as the DVD test material. This sampler disc contains high-quality content and is bundled with high-end Creative sound cards—perfect for stressing out speakers. We noted how clearly the speaker sets managed to produce faint footsteps, the

twang sound of the soldier stepping on the trip wire, and explosion bass in *Behind Enemy Lines*. In *The Fast and The Furious*, we noted how well they reproduced the sound of breaking glass as well as the humming and roaring of the engines. Finally, we played *Minority Report* and listened to the blast of extremely low bass produced by the Concussion rifle.

We listened to Eric Clapton's *Broken* to test DVD Audio. In this song, there are certain details such as a "blow" on the microphone at the start, which only a few speaker sets managed to reproduce correctly. There is the guitar twang as well as the squeaky sound of fingers moving along the strings, which we noted. The soundtrack was rated for bass, treble and vocals.

For music playback, we divided the tests into Western and Indian. This was further sub-divided into different genres. In all the cases, we looked for clarity and for distortion.

The Western music playlist included the following.

Rock *With Or Without You* by U2. This song has some deep bass as well as clear vocals; we noted these.

Jazz We chose a couple of Dave Brubeck numbers. Faithful reproduction of the sax and piano were noted in this case. Drums should sound as they would in the background, as they were positioned that way during the recording.

ATP3 and FX4021 came closer to doing it than the rest did. The results were very similar in *Behind Enemy Lines*, but this time, the explosions were better reproduced by the Logitech X-230, while the Altec Lansing duo did not do badly at all. The engine roar and the insane treble in *The Fast and the Furious* clip was reproduced better by the aforementioned trio. Again, as in the case of music tests, the Artis S444 and S800 did a great job, but were marginally behind the Logitech X-230 and the Altec Lansing ATP3 and FX4021.

DVD Audio

The Altec Lansing ATP3 was stronger in case of DVD Audio, producing all the fine details in the treble, along with strong vocals as well as bass. The Altec Lansing FX4021, Logitech X-230, and Artis S444 and S800 were just a few steps behind.

Game Performance

The Altec Lansing ATP3 kept us engrossed in the gaming test, and by far proved to be the best gaming 2.1 set. The Logitech X-230 was the next-

best, and was beaten because of the former's superior ability to better reproduce the different sounds and voices—even amidst the loud explosions. The FX4021 had overpowering bass, and as a result, lost quite a bit of the detail.

Frequency tests

The 50 Hz hum is a very difficult sound to produce for most speaker sets, and only the Altec Lansing ATP3 and Logitech X-230 produced respectable results. Overall, the Logitech was better in this test than the other sets, but some others—such as the Altec Lansing FX4021 as well as the Zebronics ZEB-SW8000—also performed well. The ATP3, FX4021, and the Z-230 passed the *ultimate bass* and *ultimate treble* tests very well indeed, though none could clear the *ultimate bass* test at a volume above 75 per cent.

MY HOME, MY THEATRE: 5.1 SPEAKERS

For those of us who don't like to be confined by the shackles of stereo sound, 5.1-channel speaker sets are the answer. Almost all DVD movies and games today boast of surround sound and 5.1-channel audio. To meet these aural requirements, all modern motherboards come with a minimum of six-channel audio. Even HD audio is becoming the norm. 5.1-channel systems enrich the listening experience and create a more immersive audio environment.

Unlike their 2.1 counterparts, 5.1 channel speaker sets derive sound from six discrete sound channels. One channel goes to the centre speaker, which is responsible for the main functions such as dialogue delivery. Two go to the rear left and right, and two to the front left and right. These are responsible for creating a 3D map of the audio environment around the listener. The last channel goes to the subwoofer, which is responsible for delivering low frequency sounds such as explosions and deep drum beats.

Almost all DVD movies and games today boast of surround sound and 5.1-channel audio



Altec Lansing FX4021
I am a bass freak!

New Age A couple of Enigma tracks were chosen in this genre. Songs of this genre have some very good and reverberating beats with tight bass.

Acid Trance We looked for clear and faithful reproduction of the tight beats and special effects, and also noted the audibility of the various instruments in a couple of tracks from *The Vicious Spiral*. Treble was also noted here.

Western Classical In this genre, we had compositions with a myriad of instruments and covering the widest audio spectrum—a string quintet by Mozart and a symphony by Dvorak. We noted the audibility at high and low volumes, the treble, especially the piano and the violin and the quality of bass.

Our Indian playlist consisted of:

Bollywood *Tu Hi Meri Shabh* from the movie *Gangster*. The clarity, distortion of vocals during heavy drumming, and distortion in the chorus were noted.

Bhangra *Tunak Tunak Tun* by Daler Mehndi. In this song, we paid attention to the drum beats and the *Ektara*.

Ghazal *Hoshwalon Ko Khabar Kya* by Jagjit Singh. This song has reverberating vocals and instrumental sounds, and we paid attention to these aspects.

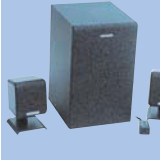
Indian Classical Vocal *Mundana* by Pt. Bhimsen Joshi. In this

song, the voice of the singer traverses from low to high in a very little space of time, and we looked for distortions when the speaker sets attempted to handle his powerful voice.

Indian Classical Instrumental This track sample had the *Santoor* and *Tabla*. We carefully evaluated whether the speaker sets could reproduce individual beats on the *Santoor* strings and the sound of fingers striking the surface of the *Tabla*. We also listened to the quality of the *Tabla* beats. We also used special test files of a constant frequency to test low-, mid- and high-frequency across the audio spectrum. These ranged from a humming 50 Hz to a shrill, ear-piercing 15 kHz. The treble and bass of all the speaker sets was tested by playing special THX-certified "Air Raid" and "Ultimate Bass Test" sound samples from Creative.

WinAMP 5.3 was used to play all the sound files, and no extras such as DSP or visualisation plug-ins were installed. The equalisers were set to Off. For the DVD, we used CyberLink PowerDVD 7.2 Ultra BD Edition. The tests were carried out at varying volume levels, and in the case of separate bass and treble controls, these were kept at 50 per cent through the first run and 100 per cent through the second run.

We also noted the different features (or lack of them) for the different speaker sets such as the various inputs, connectivity, controls, accessories, cables, and build quality.

Artis	Artis	Creative	Creative	Intex	Logitech	Tech-Com	Xfree
S444	S800	Inspire M2600	SBS-370	IT-2000SB	X-230	SSD-803	XE222
9.32	10.68	11.92	11.46	11.06	10.16	10.10	7.60
NA/NA	NA/NA	17/6	11/5	20/6	20/6	18/5	4/2.5
35 Hz–20 KHz	35 Hz–20 KHz	40 Hz–20 KHz	40 Hz–20 KHz	40 Hz–20 KHz	40 Hz–20 KHz	20 Hz–20 KHz	50 Hz–20 KHz
5	5.25	5.25	5	4	5.25	4	5
2.5	2.5	2.5	2.5	3	2x2	3	2.5
Clamp type	Clamp type	RCA	Mono	RCA	Proprietary	RCA	RCA
✓/✗/✓	✓/✗/✓	✓/✗/✓	✓/✗/✓	✓/✓/✓	✓/✗/✓	✓/✓/✓	✗/✗/✓
✗	✗	✗	✗	✗	✗	✗	✗
✗	✗	✓	✓	✗	✗	✗	✗
✗	✗	✓	✓	✗	✗	✗	✗
✗	✗	Wired	Wired	✗	✗	✗	Wired
NA	NA	NA	NA	NA	NA	NA	NA
✗	✗	✗	✗	✗	✗	✗	✗
Stereo to RCA	Stereo to RCA	Stereo to Stereo Cable with Remote	Stereo to Stereo Cable with Remote	Stereo to RCA	None	Stereo to RCA	Stereo to Stereo Cable with Remote
✓	✓	✓	✓	✓	✓	✓	✓
✓	✓	✓	✓	N	✓	N	N
7.5	6.5	7	7	7	6.5	6	6
0	6	7	6.5	7	6.5	6	6
0	7	7	6	6	7.5	0	0
7	6.5	7.5	7	6	7.5	6	6
38.32	39.72	33.05	30.19	31.53	45.37	29.77	24.54
7	7	4.5	5	6	8	5.5	5
7	7.5	7	6	5.5	8	6	5.5
6.5	6.5	7	5.5	5	8.5	5	4.5
6.5	6.5	4.5	5	5	8	5	4
6.5	6.5	6	5	5.5	8	6	4.5
6	6.5	6	5.5	6	7.5	5	4.5
6.5	7	7	6	6	7.5	5	5
6.5	7	5.5	5	5.5	7.5	6	5.5
7	7	7	5	6	7.5	5	4.5
7	7	6.5	6	5.5	7.5	6.5	5.5
6.5/6.5/6.5	7/7/7	6.5/6/5	6/5/5	5/5/5	7/7/7	5/4/5	5/4.5/4
5.5	6	4	4	5	7	5	3
6	6	6	4	5	7.5	4	3.5
6	6	5	4	5	7	3	3
5.5	5.5	3	4	4.5	6	4	4
4/3	5/3	2/3	3/3	3/3	6/6	4/3	2/2
4/4	4/5	4/4	4/5	3/4	6/6	3/3	2/2
5/4	5/4	5/3	5/4	4/3	6/3	4/5	2/1
6/7	5.5/7	5.5/5	1.5/5	3/5	7/7	4/4	1/5
7.42	5.21	5.50	8.02	12.06	3.71	13.50	10.23
2,000	2,850	2,699	1,849	1,230	3,995	1,099	1,450
55.06	55.60	50.47	49.68	54.65	59.24	53.37	42.37
							
+ Good performance - None in particular	+ Good performance - None in particular	+ Decent overall performance - Weak in bass	+ None in particular - Powerless bass	+ Decent for Indian music - Not for gaming	+ Best performance in the 2.1 category - Slightly expensive	+ Very inexpensive - Poor performance	+ None in particular - Poor performance

Scoreboard		2.1 Speaker Sets (contd.)	
BRAND	Xfree	Zebronics	
Model	XE233	ZEB-SW8000	
Features (Out of 20)	9.20	11.04	
Power (RMS Watts): Subwoofer/Satellite	10/5	30/15	
Frequency Response	45 Hz–20 KHz	18 Hz–35 KHz	
Subwoofer Driver Diameter (Inches)	5	5.25	
Satellites Driver Diameter (Inches)	2.5	4	
Connectors on Subwoofer	RCA	RCA	
Controls Provided on Speaker Set/Remote Control			
Bass / Treble/Volume (Y/N)	✓/✗/✓	✓/✓/✓	
Others (List)	✗	✗	
Bundled Accessories			
Power Adapter (Y/N)	✗	✗	
Speaker Stands (Y/N)	✗	✗	
Remote Control (Wired / Wireless)	Wired	✗	
Batteries (Y/N/NA)	NA	NA	
Built-in Radio Tuner (AM/FM/N)	✗	✗	
Cables (List)	Stereo to Stereo Cable with Remote	Stereo to RCA, RCA to RCA	
Manual & Documentation (Y/N)			
Quick Setup Guide	✓	✓	
Troubleshooting	✗	✗	
Build Quality (So10)			
Knobs	6	6	
Speaker Veils	6	7	
Speaker Stands	0	0	
Overall Build Quality	6	8	
Performance (Out of 65)	24.54	30.26	
Music Quality (So10)			
Western			
Rock	5	5	
Jazz	5.5	6.5	
New Age	4.5	6	
Acid Trance	4	5.5	
Classical	4.5	5.5	
Indian			
Bollywood	4.5	4.5	
Bhangra	5	6	
Ghazal	5.5	5	
Classical Vocal	4.5	4.5	
Classical Instrumental	5.5	5	
DVD-Audio (Eric Clapton—Broken) (So10)			
Treble / Vocals / Bass	5/4.5/4	5/5/5	
DVD Movie Test (So10)			
Minority Report	3	5	
Behind Enemy Lines	3.5	4	
The Fast And The Furious	3	4	
Game Sound: Half-Life 2 (So10)	4	4	
Special Frequency Test Files (So10)			
50 Hz / 100 Hz	2/2	3/4	
250 Hz / 500 Hz	2/2	5/5	
1000 Hz / 15 KHz	2/1	5/1	
Power Handling: Bass / Treble (So10)	1/5	3/5	
Price Index (Out of 15)	8.48	7.61	
Price (Rs)	1,750	1,950	
Final Score (Out of 100)	42.22	48.91	
			
	+ None in particular - Poor performance	+ Decent for Western music - Large and heavy	

We received a 19 speaker sets in this category—from Altec Lansing, Artis, Creative, Intex, Logitech, Tech-Com, XFree, and Zebronics.

Features Power

Power rating is the most-vaunted parameter of a speaker set. For the layman, the power rating of a speaker set determines the loudness with which you can play sound. The power rating of PC speakers is generally specified in RMS wattage, but there were three Tech-Com speakers whose power was specified in PMPO. In case of 5.1 speaker sets, the power is the sum of the individual power ratings of the subwoofer, centre speaker, and the four satellites.

The Artis X10 Mini has the highest-powered subwoofer at 100 W and satellites at 28 W each. The next-highest powered speaker set was the Artis S8800, with an 80 W subwoofer and 20 W per satellite. The speakers from Creative and XFree were the lowest-powered, and therefore had problems handling sounds at a volume higher than 40 per cent.

Driver Size

A speaker with higher power usually has larger drivers. This is especially true in the case of subwoofers. An exception was the Altec Lansing FX5051, which was not high powered, but which had subwoofers with dual 6.5-inch drivers in isobaric configuration, thus effectively delivering double the bass levels without taking up additional floor space. High-powered speaker sets such as the Artis S8800, X10 Mini, and the Zebronics ZEB-SW13100R have huge 8-inch drivers, and this raised our expectations of getting some deeply immersive bass from them.

The satellites of most speaker sets consist of a single mid-range driver. But as you may be aware, a single driver can produce a limited range of frequencies. Therefore, speakers with more than one driver of different sizes are better, because they can deliver a larger range of frequencies. Such speakers included the Altec Lansing FX5051, Artis 6600R/FM, S8800 and X10 Mini, Intex IT-4800W, Tech-Com SSD-2001, SSD-5001, SSD-5101R and SSD-6001R, as well as the Zebronics ZEB-SW13100R.

Other Features

RCA was the most common connector type. RCA has the advantage of being less prone to noise, and it is resistant to damage. Stereo connectors, on the other hand, are prone to noise and damage. The Altec Lansing speakers were the only ones that accepted audio input via triple stereo pins. Clamp-type connectors, which connect directly to bare wires, are preferred by those who are not tolerant to audio noise. These connectors were found on a few models such as the Artis S5200, S8800 and X10 Mini, Tech-Com SSD-5101R and SSD-6001R, and the Zebronics ZEB-SW13100R.

The Altec Lansing FX5051 had a connector we didn't see on any other—a USB. Using this connector, you can listen to 5.1-channel audio from any computer with Windows 98 SE or higher. In this case, the audio signal is decoded

within the speaker unit using the inbuilt sound chip, and thus is not worth it if you're using an expensive sound card. But we have to admit that it sounds a lot better than most onboard sound solutions we've heard. Apple Macs are not officially supported.

Digital connectors of any kind were non-existent in the speakers we tested. A digital connector ensures a pure audio signal, devoid of noise of any kind, to deliver the highest-quality input to the speakers. Auxillary inputs were there on all the speakers except the Altec Lansings, Creatives, XFreeds, Intexes, all the Tech-Coms (except the SSD-5101R and SSD-6001R), and the Zebronics ZEB-SW6900R. An auxillary input lets you connect a stereo sound source such as a CD player or hi-fi music system to the speakers without having to remove an already-connected 5.1 source. The Tech-Com SSD-5101R and Artis S8800 even had dual auxillary inputs, allowing you to connect a second stereo source.

Accessories

An external decoder decodes audio signals from the sound source if the source contains information complying with audio digital standards such as Dolby Digital or DTS. This is pure digital audio and is preferred by audiophiles.



Unfortunately, none of these speakers came with an external decoder.

With the exception of the Creative SBS 580, all the speakers came with either a wired or a wireless remote control. One of the most stylish remotes came with the Altec Lansing FX5051. The wired remote has a smooth control knob and blue LEDs, and the slick, angled wireless remote was the icing on the cake.

Radio functionality is usually not seen on expensive speaker sets, and is very rare in the case of 5.1 sets. Only the Artis S6600R/FM came with this functionality. We were very pleased to see that not only did it have FM radio, but also AM radio so you can play your favourite medium-wave regional channels.

5.1 speaker sets are always accompanied with a huge bundle of cables. We would like to note here that most of the Artis speakers came with colour-coded cables, which eases the effort required to connect different sound channel pairs from the sound card to the correct inputs on the speaker sets / amps. Bare-ended wires were also bundled with quite a few of the speaker sets that featured clamp type connectors. While some of these cables were of inferior quality, such as those which came with the Tech-Com SSD-5101R, the ones that accompanied the Artis sets, espe-

Expert Tests

For this speaker test, we decided to call a professional with a trained ear and some testing equipment to give us an idea of how good multimedia speakers are from the perspective of an audiophile. This was done to gauge whether professional testing equipment corroborated what our ears heard.

We asked Sunil Karanjikar from SOUND.COM (www.online-sound.com), a professional live sound provider, to come in and take a look at some of the top-performing sets in the 2.1 and 5.1 categories.

Sunil is a professional live sound engineer, with over six years of experience. Although he specialises in live sound and concerts, he is an audiophile and designs his own speakers in his spare time.

Test Equipment

SIA SmaartLive 5 FFT based RTA spectrum analyser: SIA's dual-channel FFT-based audio measurement software is the professional audio industry standard for real-time sound system measurement, optimisation, and control. It combines powerful audio frequency measurement, analysis and data logging capability with a highly intuitive, user-friendly interface and the ability to remotely control an extensive list of top name equalizers and DSP processors. This was used to compare the measured response with a reference signal. (Details: http://www.siasoft.com/products/smaart_live.html)

Presonus Firebox Audio Interface: The Firebox is a professional grade sound card that connects via Firewire to bypass a system's soundcard. It offers much better frequency response compared to consumer level audio solutions. (Details: <http://www.presonus.com/firebox.html>)

Audix TR40 Measurement Microphone: This is a flat frequency response microphone that is specially used for testing and measurement purposes. (Details: www.audixusa.com, found under Contractor Microphones)

Neutrik Minirator Test Tone Generator: This handy portable gadget generates all kinds of test tones—pink noise, white noise, sine / square waves, sweep signals (20Hz to 20 kHz).



Sunil Karanjikar at a live event

Mackie VLZ Pro 1402: A professional 14-channel mixer that was used to route the sound from the Minirator to the speakers and the Firebox. (Details: <http://www.mackie.com/products/1402vlzpro/>)
HP Pavilion dv2119TX Notebook: This laptop has Intel's Core 2 Duo CPU and 1 GB of DDR 2 RAM.

Test Procedure

The testing was done by generating "pink noise" and sending it to the speakers via the mixer. Pink noise is acoustical energy distributed uniformly by octave throughout the audio spectrum (the range of human hearing, approximately 20 Hz to 20 kHz). Most people perceive pink noise as having uniform spectral power density—the same apparent loudness at all frequencies. In pink noise, the total sound power in each octave is the same as the total sound power in the octave immediately above or below it. In all the graphs displayed, pink noise is shown in light blue.

All the speakers were set to 75 per cent of their maximum volume, so as to get their ideal output without distortion.

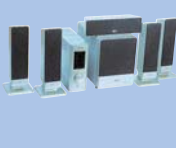
The output of the speaker sets were recorded by the Audix TR40 Measurement Microphone and then fed back to the laptop and analysed with the SmaartLive software.

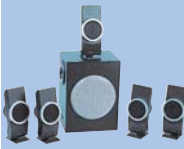
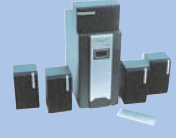
There are two waveforms displayed in the software—one of the reference signal (light blue wave) that was sent to the speakers, and the other is the measured signal that the speakers sent out. By comparing the two waveforms, it was possible to gauge how well or poorly the speaker set was able to reproduce the sound it was supposed to.

It must be noted that the acoustic signal takes time to reach the microphone and the software has to compensate for this delay. It automatically measures the time difference between the reference and measured signals and corrects it by adding the delay to the reference signal. This is displayed in both feet and milliseconds, such as 7.80 feet/6.92 ms.

Scoreboard

5.1 Speaker Sets

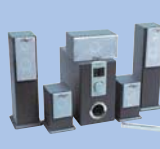
BRAND	Altec Lansing	Altec Lansing	Artis	Artis	Artis	Artis
Model	FX5051	VS3251	S5200	S6600R/FM	S7500R	S8800
Features (Out of 25)	15.56	10.70	11.34	15.34	10.28	11.41
Power Rating (RMS Watts)						
Subwoofer / Centre / Satellites	28/13/12	25/9/9	900*/300*/300*	1500*/700*/700*	1500*/500*/500*	80/20/20
Frequency Response	40 Hz–20 KHz	40 Hz–17 KHz	45 Hz–20 KHz	30 Hz–20 KHz	30 Hz–20 KHz	35 Hz–20 KHz
Decoder / Amplifier	✗	✗	✗	Amplifier	✗	✗
Speaker Diameter (Inches)						
Subwoofer	2x6.5	5	6.5	5.25	5.25	8
Satellites	1.5 + 0.7	2.5	1.5	2.5	2	2.5+1.5
Centre	1.5 + 0.7	2.5	1.5	2x2.5	2	2x2.5+1.5
Connectors on Subwoofer	RCA, Stereo, Proprietary to Remote, USB	RCA, Stereo	RCA, Clamps	RCA	RCA	RCA, Clamps
Auxilliary	✗	✗	✓	✓	✓	✓
Controls Provided on Speaker Set/Remote Control						
Bass / Treble / Volume (Y/N)	✓/✓/✗	✓/✓/✗	✓/✓/✗	✓/✓/✗	✓/✓/✗	✓/✓/✗
Others (List)	Centre, Rear	Individual channels, Input Select	Individual channels, Input Select, Reset	Individual channels, Input Select, Radio Controls	Individual channels, Input Select	Individual channels, Input Select
Bundled Accessories						
Power Adapter / Stands (Y/N)	✗/✓	✗/✓	✗/✗	✗/✓	✗/✗	✗/✗
Remote Control (Wired / Wireless)	Both	Wireless	Wireless	Wireless	Wireless	Wireless
Inbuilt Radio Tuner (AM/FM/N)	✗	✗	✗	AM/FM	✗	✗
Cables (List)	Triple Stereo to Stereo, 3xRCA to Stereo, USB	Triple Stereo to Stereo, 3xRCA to Stereo, IR Pod	Stereo to RCA, 3x RCA to RCA, Audio Cables	3xStereo to RCA, 3x RCA to RCA, Aerial	3xStereo to RCA, 3x RCA to RCA	Stereo to RCA, 3x RCA to RCA, Audio Cables
Manual and Documentation (Y/N)						
Quick Setup Guide	✓	✓	✓	✓	✓	✓
Specification Listing	✓	✓	✓	✓	✓	✓
Build Quality (So10)						
Knobs	7.5	7.5	7	7.5	5	8
Speaker Veils	7	7	6.5	7	5	7
Speaker Stands	8	6.5	0	7.5	0	0
Overall Build Quality	8	7	7	8	6	7.5
Performance (Out of 65)	41.34	33.44	39.49	46.67	36.92	42.32
Music Quality (So10)						
Western						
Rock / Jazz	7/6.5	7/6.5	4/6	7.5/7.5	5/6	6.5/7
New Age / Acid Trance	7/7	6.5/6	5.5/5	7.5/7.5	5.5/5.5	7.5/7.5
Classical	7	7	6.5	7.5	5.5	6.5
Indian						
Bollywood / Bhangra	6/6.5	6/6	6/6	7.5/7.5	6.5/6.5	7/7.5
Ghazal	6.5	5.5	7	7.5	6.5	7
Classical Vocal / Instrumental	6.5/7	5.5/6	6/6.5	6/7.5	6.5/6	6.5/7
DVD-Audio (Eric Clapton–Broken) (So10)						
Treble / Vocals / Bass	6.5/7/6.5	6/6.5/4	5.5/6/6.5	8/7.5/7.5	6.5/6.5/5.5	7/7/6.5
DVD Movie Test (So10)						
Minority Report	7	5	7	7.5	4.5	7
Behind Enemy Lines	7	4.5	7	8	6.5	7
The Fast And The Furious	6.5	5	8	8	6	7.5
Game Sound: Half-Life 2 (So10)	6.5	4.5	6.5	7.5	6	7
Special Frequency Test Files (So10)						
50 Hz / 100 Hz	5/4	6/4	5/4	6/4	5/3	6/4
250 Hz / 500 Hz	6/6	0/6	6/6	6/6	5/6	3/4
1000 Hz / 15 KHz	6/5	2/5	6/3	6/5	6/3	5/5
Power Handling: Bass / Treble (So10)	4/6	4/6	6.5/5	7/7	6/6.5	6/6
Price Index (Out of 10)	1.19	3.26	4.65	2.11	3.85	1.79
Price (Rs)	15,000	5,500	3,850	8,500	4,650	10,000
Final Score (Out of 100)	58.10	47.40	55.48	64.11	51.05	55.52
						
	+ Good performance, USB sound - Very expensive	+ Good for western music - Failed to play piano in stereo	+ Inexpensive - None in particular	+ Good performance, Radio - None in particular	+ Decent in Indian music - Weak in bass	+ Good in music and movies - A bit expensive

Artis	Creative	Creative	Intex	Tech-Com	Tech-Com	Tech-Com	Tech-Com
X10 Mini	Inspire M5300	SBS 580	IT-4800W	SSD-2001	SSD-3001R	SSD-4001R	SSD-5001
13.41	9.00	6.58	7.96	9.50	6.38	6.38	7.96
100/28/28	17/6/6	16/6/6	45/15/15	NA/NA/NA	20/5/5	20/5/5	45/15/15
25 Hz–20 KHz	40 Hz–20 KHz	40 Hz–20 KHz	20 Hz–20 KHz	40 Hz–20 KHz	40 Hz–18 KHz	40 Hz–18 KHz	20 Hz–20 KHz
✗	✗	✗	N	Amplifier	✗	N	N
8	5.25	5.25	5.25	5.25	5.25	5.25	5.25
2.5+2.5	2.5	2.5	3+1.5	2.5	3	3	3+1.5
2.5+2.5	2.5	2.5	2x3+1.5	2.5+2.5	3	3	2x3+1.5
RCA, Clamp	RCA, Proprietary for Remote	RCA, Proprietary	RCA	RCA	RCA	RCA	RCA
Y	✗	✗	✗	✗	✗	✗	✗
✓/✓/✗	✓/✓/✗	✓/✓/✗	✓/✓/✗	✓/✓/✗	✓/✓/✗	✓/✓/✗	✓/✓/✗
Individual channels, Input switch	None	Volume and Power on Right Front	Individual channels, Input switch	Individual channels, Input switch	Individual channels, Input switch	Individual channels, Input switch	Individual channels, Input switch
✗/✓	✓/✓	✓/✗	✗/✗	✗/✓	✗/✗	✗/✗	✗/✗
Wireless	Wired	✗	Wireless	✗	Wireless	Wireless	Wireless
✗	✗	✗	✗	✗	✗	✗	✗
3xStereo to RCA, 3x RCA to RCA, Audio Cables	None	None	Stereo to RCA, 3x RCA to bare wire	3xRCA to RCA, 3xShort Stereo to RCA	3xRCA to RCA, 3xShort Stereo to RCA	3xRCA to RCA, 3xShort Stereo to RCA	Stereo to RCA, 3x RCA to RCA
✓	✓	✓	✗	✓	✓	✓	✓
✓	✓	✓	✓	✓	✓	✓	✓
7.5	6	6	6	6	6	6	6
7	6.5	5.5	0	6	6	6	0
8	6.5	0	0	5	0	0	0
8	7	4.5	5.5	6	6	6	5.5
48.88	29.93	27.85	26.98	32.05	37.41	38.35	26.65
7.5/8	4.5/5.5	4.5/5.5	3/5.5	5/5.5	5.5/6	6/6	3/5.5
8/8	4.5/5.5	4.5/5	4.5/5.5	5/5	5.5/6	6/6.5	4.5/5.5
8	5.5	5.5	5.5	6	6.5	6.5	5.5
8/8	5/4.5	5.5/5	5/4.5	5.5/5.5	6/6	6/5.5	5/4.5
8	5.5	5.5	5.5	6	5.5	5.5	5.5
8/8	5/6.5	5.5/6.5	5/6.5	6/6.5	6.5/6	6.5/7	5/6.5
7.5/6.5/8.5	5/4.5/4.5	5/4.5/4.5	5/4.5/4.5	5.5/5.5/4.5	6.5/6.5/6.5	6.5/6.5/6.5	5/4.5/4.5
7.5	5	4	3	4	6	6.5	3
8	5	4	4	5	6	6	4
8	5	4	4.5	5	6.5	6.5	4.5
7	5	4	4	5.5	5.5	6	3.5
8/6	4/2	4/3	4/2	5/2	4/4	4/4	4/2
7.5/7.5	3/3	3/3	3/3	4/4	5/5	5/5	3/3
7.5/6	3/3	3/2	3/3	4/3	6/4	6/4	3/3
6/7	4/5.5	4/5	4/5.5	5/6	5/6	5/6	4/5.5
1.49	3.14	3.58	4.29	9.00	7.82	7.49	6.89
12,000	5,699	4,999	4,170	1,990	2,290	2,390	2,599
63.79	42.08	38.01	39.23	50.55	51.60	52.22	41.50
							
+ Great music reproduction - Quite expensive	+ Stylish looks - Below-average performance	+ None in particular - Poor for DVD movies, gaming	+ Rosewood finish - Poor for DVD movies, gaming	+ Very inexpensive - Not good for gaming	+ Decent overall performance - None in particular	+ Decent overall performance - None in particular	+ Inexpensive - Poor overall performance



Scoreboard

5.1 Speaker Sets (contd.)

BRAND	Tech-Com	Tech-Com	Xfree	Zebronics	Zebronics
Model	SSD-5101R	SSD-6001R	XW555	ZEB-SW13100R	ZEB-SW6900R
Features (Out of 25)	11.10	8.60	8.54	12.96	6.08
Power Rating (RMS Watts)					
Subwoofer / Center / Satellites	NA/NA/NA	30/10/10	12/8/8	80/15/15	20/5/5
Frequency Response	40 Hz–20 KHz	10 Hz–45 KHz	40 Hz–20 KHz	20 Hz–18 KHz	40 Hz–18 KHz
Decoder / Amplifier	✗	✗	✗	✗	✗
Speaker Diameter (Inches)					
Subwoofer	5.25	5.25	5.25	8	5.25
Satellites	3+1.5	3	2.5	2+4	3
Center	3+1.5	3+1.5	2.5	2+4	3
Connectors on Subwoofer	RCA, Clamp	RCA, Clamps on Satellites	RCA-Out, Stereo-in	RCA, Clamps	RCA
Auxiliary	✓	✓	✗	✓	✗
Controls Provided on Speaker Set/Remote Control					
Bass / Treble / Volume (Y/N)	✓/✓/✗	✓/✓/✗	✓/✓/✗	✓/✓/✗	✓/✓/✗
Others (List)	Individual channels, Input switch	Individual channels, Input switch	Balance	Individual channels, Input switch	Individual channels, Input switch
Bundled Accessories					
Power Adapter / Stands (Y/N)	✗/✗	✗/✗	✗/✗	✗/✗	✗/✗
Remote Control (Wired / Wireless)	Wireless	Wireless	✗	Wireless	Wireless
Built-in Radio Tuner (AM/FM/N)	✗	✗	✗	✗	✗
Cables (List)	3xStereo to RCA, 3x Stereo-In to RCA, Audio Cables	Stereo to RCA, 3xRCA to RCA, 5xRCA to bare wires	Triple Stereo to Stereo, 3xRCA to RCA	3xStereo to RCA	3xShort Stereo to RCA
Manual & Documentation (Y/N)					
Quick Setup Guide	✓	✓	✗	✗	✗
Specification Listing	✓	✓	✓	✓	✓
Build Quality (So10)					
Knobs	6.5	6	5	6	6
Speaker Veils	6	6.5	6	0	6
Speaker Stands	0	0	0	0	0
Overall Build Quality	7	6	5.5	8	5.5
Performance (Out of 65)					
	37.44	32.50	34.39	46.90	27.17
Music Quality (So10)					
Western					
Rock / Jazz	6.5/6.5	5/5.5	5.5/6	7.5/7	4/4.5
New Age / Acid Trance	6/5.5	5/5	6/6	7.5/7.5	4/4.5
Classical	6	5.5	6	8	5
Indian					
Bollywood / Bhangra	6.5/6	4.5/4.5	5.5/6	7.5/7.5	4/3.5
Ghazal	6.5	5	5.5	7	4
Classical Vocal / Instrumental	5/6	4.5/5.5	4.5/5.5	7/7.5	5/4.5
DVD-Audio (Eric Clapton—Broken) (So10)					
Treble / Vocals / Bass	6.5/5/6.5	5.5/5/4	4.5/5.5/5	7/7.5/8	4/5/5.5
DVD Movie Test (So10)					
Minority Report	6	6	5.5	8	4.5
Behind Enemy Lines	6	6	6.5	8.5	4
The Fast And The Furious	6	6.5	6	8	5
Game Sound: Half-Life 2 (So10)					
	6	6	6	8	4
Special Frequency Test Files (So10)					
50 Hz / 100 Hz	5/5	4/2	4/4	6/3	2/3
250 Hz / 500 Hz	0/6	3/3	4/4	4/4	4/4
1000 Hz / 15 KHz	6/5	3/3	4/3	6/6	6/2
Power Handling: Bass / Treble (So10)					
	6/6	5/5.5	4/4.5	7.5/7.5	3/4.5
Price Index (Out of 10)					
	6.18	4.98	3.98	1.81	7.31
Price (Rs)					
	2,899	3,599	4,500	9,900	2,450
Final Score (Out of 100)					
	54.72	46.08	46.90	61.67	40.56
 + Decent overall performance - Failed to play piano in stereo  + Good movie performance - Not good for Indian music  + Decent movie performance - Weak in bass  + Thundering cinema experience - Bulky  + None in particular - Wrong colour coding					

cially the X10 Mini, were of superior quality. An advantage of bare-ended wire audio cables is that in case the contact wire at the end gets damaged, you can always remove the insulation further to replace the damaged contact.

Build Quality

The knobs of a speaker are generally the most-handled mechanical moving parts, and these need to be durable. We didn't have too many complaints with any speaker set for badly-put-together knobs. The Altec Lansing and the Artis sets (except the S7500R) have knobs that will last long after the speaker sets are dead and buried. Notably, the Artis' had servo knobs, which do not produce static when rotated.

The veils of a speaker protect the driver from damage, but they have to be such that they do not obstruct the sound path. Most of the speakers had veils, barring the Intex IT-4800W, Tech-Com SSD-5001, and the Zebronic ZEB-SW13100R, all of which did away with the veils. Some speakers such as the Artis X10 Mini had veils with grilles behind them for extra protection. Others, such as the Tech-Com SSD-6001R, did not have grilles.

Stands help elevate the speaker to the level of the listener, and also provide stability. The Artis X10 Mini came with sturdy steel stands for the rear speakers. Most of the speakers came without any stands at all, while a few, such as the Altec Lansing FX5051, came with aesthetically designed stands—diamond shaped in this case.

Wood and plastic were the two most common materials used in the building of the

Subwoofers are seldom constructed using any material other than wood, because of the high quality of resonance wood exhibits

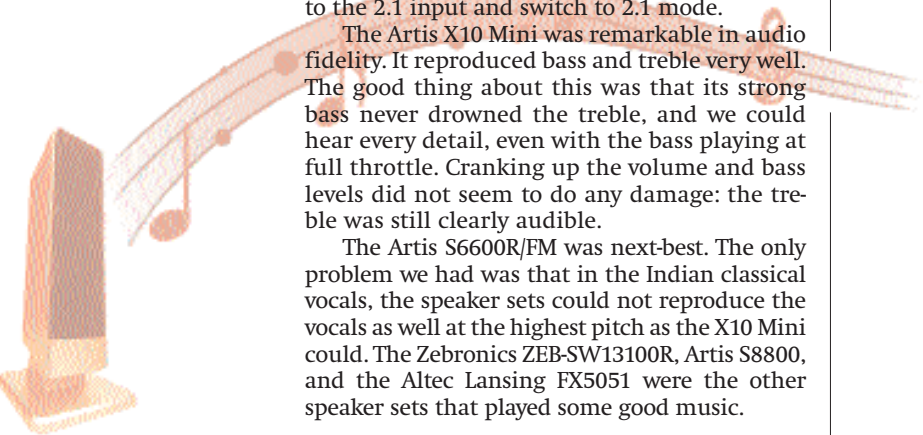
speakers. Subwoofers are seldom constructed using any material other than wood, because of the high quality of resonance wood exhibits. Of the speakers we tested, the Artis X10 Mini, Intex IT-4800W, and the Zebronic ZEB-SW13100R have subwoofers that do not attempt to hide the wood. The wood grains are clearly visible on the exterior surface and give them a classy look. The ZEB-SW13100R, in particular, has one of the most ruggedly-built speakers, but these are also the biggest, and it would be difficult to place them near a PC.

Performance Music

Our test music was stereo (two sound channels), and we had a few problems playing bass in certain speaker sets, when the source was connected to the 5.1 input. We therefore had to connect to the 2.1 input and switch to 2.1 mode.

The Artis X10 Mini was remarkable in audio fidelity. It reproduced bass and treble very well. The good thing about this was that its strong bass never drowned the treble, and we could hear every detail, even with the bass playing at full throttle. Cranking up the volume and bass levels did not seem to do any damage: the treble was still clearly audible.

The Artis S6600R/FM was next-best. The only problem we had was that in the Indian classical vocals, the speaker sets could not reproduce the vocals as well at the highest pitch as the X10 Mini could. The Zebronic ZEB-SW13100R, Artis S8800, and the Altec Lansing FX5051 were the other speaker sets that played some good music.



All About Amps

An amplifier elevates the level of the audio signal from the source to a level high enough to be able to drive speakers without changing the sonic characteristics of the audio signal. Earlier, sound cards used to have onboard amplifiers, but today it's the speakers that come with their own amplifiers. We will try and explain what you need to look for in a good amplifier.

So your speaker sets boast of 4000 W? Amazing! Right? Not always the case. Power is the most important feature of an amplifier. You should look for the number of channels that an amplifier's rating is true for. So 4000 W could be for 6 channels, and so the power output per channel is in fact much lower.

Secondly, look out for misleading specifications. Quite often, speaker manufacturers state the Max, Dynamic, PMPO, or Peak output power ratings. The point to ponder here is at what distortion and frequency they achieved these ratings, and whether it is peak or RMS power.

Now let's say you come across an amplifier rating of "500 W RMS per channel from 20 Hz to 20 KHz = 1% THD + Noise at 14.4 Vdc." What this means is that at 50 Hz and 14.4 Vdc, the amplifier produced 500 Watts RMS. This is the proper way of specifying power ratings. But what we see usually is that manufacturers simply state such speaker sets as 600 W = 1% THD + Noise, and forget to mention that it was tested at 10 kHz and 16 Vdc. Thus they derive the value of 600 W instead of the actual 500 W.

There are things other than power that you need to note before buying an amplifier or speakers. Frequency response, or the span of frequencies an amplifier can produce, should be reported with a range followed by a tolerance (such as 22 Hz to 19 KHz $\pm$ 2.5db). It goes without saying that a higher frequency response is preferable.

The damping factor, or the ability of the amplifier to control the

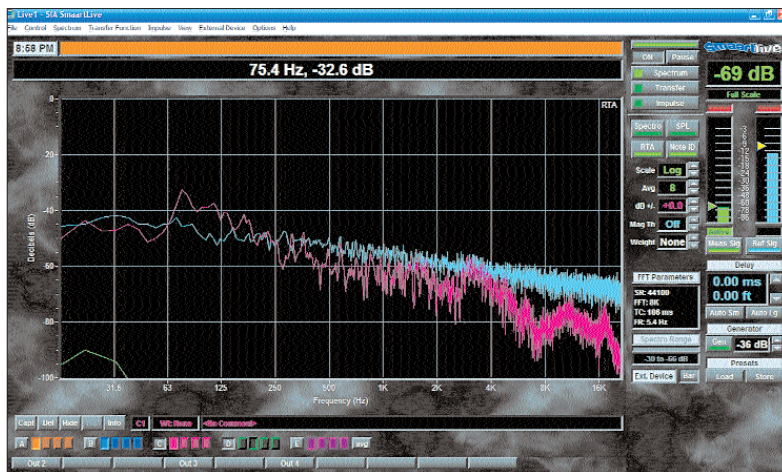
motion of the speaker, is the ratio of the internal impedance of an amplifier compared to the impedance of an amplifier with a speaker connected. These are usually referenced at a particular frequency of 200 Hz.

Signal to Noise Ratio (SNR) is a measure of the quietness of the amplifier. A higher SNR means a lower level of noise in the sound even at higher volume levels. The unit is dBA.

Finally, there is Channel Separation. This is the amount of isolation between different sound channels in a multi-channel speaker system. If Channel Separation is not good, there is a phenomenon known as Crosstalk, in which sound from one channel is audible to a certain extent in other channel. This, too, is expressed in dBA.

We almost forgot to mention that amplifiers are classified as Class A, AB, B, D and H. Class A amplifiers are the most inefficient (25 per cent) but have the best audio quality. They are therefore costlier to operate and consume a higher amount of power. Class B amplifiers are much more efficient, but have the problem of notch distortion. Class AB is the combination of good things from both the above classes to yield better efficiency (60 per cent) and decent audio quality. This is the most common type of amplifier. Class D amplifiers have an even higher efficiency (80 per cent). The problem with these is that they are not good at powering mid-range drivers and tweeters, and are therefore bandwidth-limited to the frequencies of the subwoofer. Class H is a newer version of digital amplifier with the efficiency of Class D, but they are good for powering even mid-range drivers and tweeters.

The above-mentioned things will rarely be encountered by you when you purchase a regular 2.1 or 5.1 speaker set. However, when buying a discrete amplifier unit, or when you want hi-fi-grade PC audio, you will need to keep these things in mind.



The Artis S6600R/FM fails a little at reproduction of higher pitched sounds—between the 4 and 16 KHz mark

A peculiar thing we noticed was that the Tech-Com SSD-5101R and the Altec Lansing VS3251 could not reproduce piano sounds in 2.1 mode. When we switched to 5.1 mode, only the centre speaker reproduced the piano, but the bass was lost.

DVD Movies

The Artis X10 Mini and the S6600R/FM and S8800 were very good in the DVD movie test. The bass, treble, and mid-range were all just about perfect. But once we plugged in the Zebronic ZEB-SW13100R, we found that the set possessed the power to edge past the former speaker sets,

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Artis S6600R/FM
Everything you ever needed—it's all here

and we had to raise the bar we had set for the benchmarks. The explosions seemed earth-shatteringly real—we could feel the shrapnel flying around us! The engine roar was surreal, and the concussion gun almost gave us a concussion!

Other brands such as Altec Lansing and Tech-Com were decent, but the Altec Lansing FX5051 produced overwhelmingly overpowering bass, which eclipsed some sound detail.

DVD Audio

The Eric Clapton song was rendered beautifully on the Zebronic ZEB-SW13100R and the Artis S6600R/FM and X10 Mini. The ZEB-SW13100R and X10 Mini produced richer bass, while the S6600R/FM produced crisper highs. The sets from Altec Lansing and Tech-Com also gave decent performance and are worthy mentions.

Game Performance

The Artis S6600R/FM, X10 Mini, and the S8800 were very good in the game test and could create an almost-real virtual environment around us. But the Zebronic ZEB-SW13100R was in a

Size Does Matter

The normal human ear can perceive sound from 20 Hz to 20 KHz. Ideally, a single speaker should be able to reproduce this entire range of the aural spectrum. But as is evident, in real-life scenarios, this is not possible. To maintain the output level, for every halving of a given frequency, the speaker must double its excursion. For the layman, this means that if a speaker diaphragm moves 1 mm at 20 KHz (20,000 Hz), it would have to move a distance of 1 km to be able to produce the same level of sound at 20 Hz. Unrealistic, isn't it?

To overcome this problem, we have speakers built to operate in different frequency ranges. Depending on need, this is divided into three or four frequency ranges. The commonly-used frequency ranges and their significance are as below.

2,500 Hz to 20,000 Hz: This range is covered by a class of drivers called tweeters. These are typically dome-shaped and are generally 1 inch in diameter. The wavelength of a tweeter is also very small, typically 0.7 inch for 20,000 Hz. Harsh, high-pitched and ear-piercing sounds, such as a cricket chirping, electric guitars, etc., constitute this frequency range.

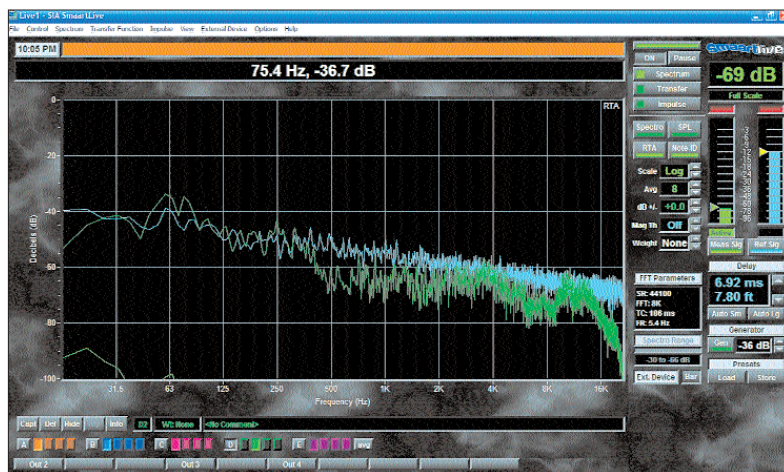
400 Hz to 2,500 Hz: This range is covered by mid-range speakers. Such speakers are cone-type, having a separate cone body and surrounding material. They are sized from 3 to 8 inches in diameter. The most common diameter is around 5.25 inches. This is a frequency range to which the human ear is better tuned and thus, more receptive. Therefore, most musical instruments create sounds that fall in this range.

100 Hz to 400 Hz: Mid-bass drivers cover this range. These are very much similar to mid-range speakers in features and construction, but the difference lies in the size, these being larger and designed for higher excursion. The typical size of these speakers ranges from 6.5 to 10 inches in diameter, while the most common size is 6.5 inches. Some systems incorporate speakers with diameters ranging from 5.25 to 6.5 inches and in such cases, a single driver can cover a frequency range of 100 Hz to 2,500 Hz. Male voices, and instruments such as the cello, bassoon, and French horn are some examples for this frequency range.

20 Hz to 100 Hz: This is the lowest audible frequency range covered by speakers. Known as bass, the speakers designed to cover this range are known as woofers. Sharing the same features and construction as mid-range and mid-bass class of speakers, woofers have the lowest of the resonant frequencies and the highest of the excursion capacities of the three. The typical size of woofers ranges from 6 inches to as large as 36 inches. The average size of woofers is 10 to 12 inches. Kick drums, organs, contrabassoon and string bass are some of the sources of sounds in this range.

A typical speaker system consists of at least two of the above types of speakers, tweeters and woofers being those types. The woofer usually operates in the 20 Hz to 150 Hz range, while tweeters operate in the range of 150 Hz to 20 KHz. The sound signals from the sound card are received by a special crossover circuit containing electronic filters that separate the different frequency ranges and feeds the adequate frequency range according to speaker type.

We would like to add that speaker systems that use a single subwoofer and a set of satellites can never provide you pure audiophile-quality sound. To cite one example, we would like to bring to your notice that in such a speaker system, only the subwoofer produces bass. So what about multi-channel, low-frequency sounds? That is entirely neglected. So in the case of a bass drum beating on one side of the listener or moving around, the bass portion of the sound will only be produced by the subwoofer (from one direction i.e. from the centre of course), while the satellites will produce the higher frequency sounds of the sticks striking the drum's surface from the correct direction. This will no doubt produce a pseudo-multichannel impression of the drum beats, but it definitely will not be anything near the real thing. A solution to this problem is to have the different types of speakers mentioned above, in each of the satellites, and to disband the subwoofer as a whole. This is the principle deployed by manufacturers of audiophile quality speaker sets, and is one of the reasons why such speakers are so expensive.



The Artis X10 Mini was by far the best sounding set, and analysis using SmartLive shows that it has only minor variations from the test signal—excellent for a multimedia set

class of its own. It could brilliantly create bullet sounds and explosion ricochets. We could go so far as to say that this set provides a better surround experience in gaming than any other.

Frequency tests

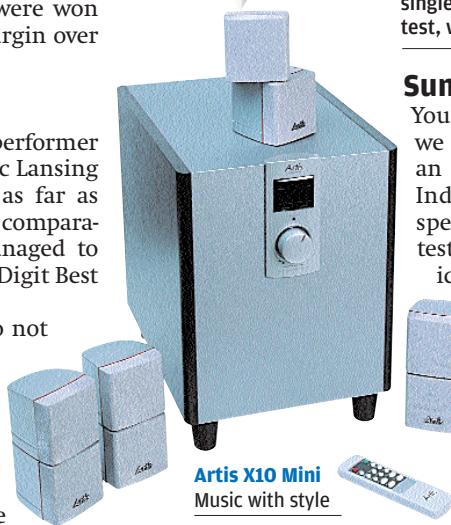
The Artis S6600R/FM ruled when it came to frequency tests. It performed exceedingly well in all the frequencies. The Zebronic ZEB-SW13100R produced harmonics in a few of the frequencies, and had to remain content with second place. While most of the brands were average performers in this test, the Creative exhibited dismal performance. The Altec Lansing VS3251 and the Tech-Com SSD-5101R missed the 250 Hz altogether. This was evident in the music test, where we found that these sets could not produce piano sounds in 2.1 mode.

The ultimate bass and treble tests were won by the ZEB-SW13100R by a narrow margin over the Artis S6600/FM.

And The Grammy Goes To...

The Logitech X-230 was the best performer amongst the 2.1 speaker sets. The Altec Lansing ATP3 was only a whisker behind it as far as sheer performance goes, but with its comparatively lower price of Rs 3,400, it managed to edge past the Logitech and secure the Digit Best Buy Gold in the 2.1 category.

The Altec Lansing FX4021 was also not far behind in the performance, in third place. But it is rich in features compared to the other sets. Not only does it sport stylish looks, it comes with wired as well as wireless remotes. It is also the only speaker set with dual woofers, and can be connected to the

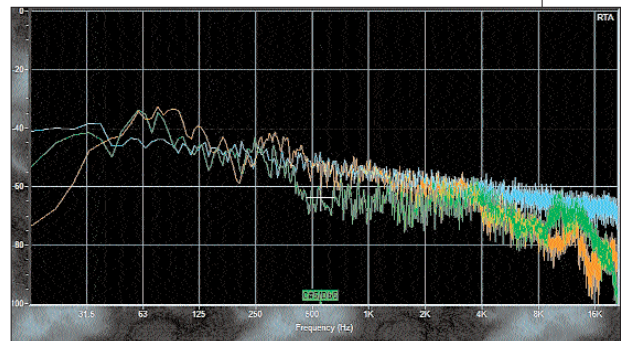


Artis X10 Mini
Music with style

USB port of a PC to listen to crystal-clear 5.1-channel audio. The Altec Lansing FX4021 is therefore the winner of the Digit Best Buy Silver in the 2.1 category.

For the 5.1 speaker sets, the performance king was the Artis X10 Mini, closely followed by the Zebronic ZEB-SW13100R. While the ZEB-SW13100R was better at recreating a movie environment, the X10 Mini was better when audio fidelity was compared. In the end, the Artis X10 Mini, with its good looks and great music performance was adjudged the winner of the Digit Best Buy Gold in the 5.1-channel category, despite being the most expensive at Rs 12,000.

The Artis S6600R/FM has almost everything that you need in a speaker set, and more. It is the only one amongst the 5.1 sets to have not only FM but also AM radio. In terms of performance, it came in third—not bad. The affordable price—Rs 8,500—leaves us with no option but to award the Artis S6600R/FM the Digit Best Buy Silver in the 5.1-channel category.



The Logitech Z5450 (green) and the Artis X10 Mini (orange) are quite similar in terms of reproducing bass, but the Artis have a slight edge when it comes to the highs. The Z5450 wasn't part of our test, but since only a single speaker and woofer is needed for the SmartLive test, we pitted it against the Winner

Summing It Up

You might have noticed that the test process we deployed was carefully devised to present an idea from the layman's point of view. Indeed, an audiophile would have tested speaker sets in a markedly different way. Such testing involves a studio and various electronic gadgets that can bring out the minutest of details in a speaker set, and over the entire audio frequency range. However, this is not the kind of environment where PC speakers are generally deployed, and therefore we chose a different path that helps us better identify with you, our readers.

That said, we decided to bring in an audiophile and have him take a look at some of the speakers that stood out in the tests. This review is peppered with his comments; this we did for those of you who want hard evidence and want to see frequency response graphs of some real audiophile tests.

Send feedback at readersletters@jasubhai.com if you want to see a more extensive audiophile test the next time we look at speakers! ■

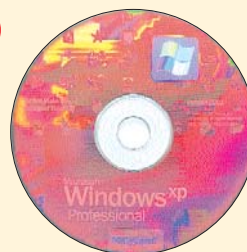
jayesh_limaye@thinkdigit.com

Contact Sheet		Speaker Sets	
Brand	Company	Phone	E-mail
Altec Lansing	Rashi Peripherals Pvt Ltd	022-67090909	navinderc@rptechindia.com
Artis	Kunhar Peripherals Pvt Ltd	022-66345758	mail@kunhar.com
Creative	Creative Technology Ltd	9821455590	irfan@ctl.creative.com
Intex	Intex Technologies (India) Ltd	011-41610224	info@intextechnologies.com
Logitech	Logitech Electronic India Pvt Ltd	022-26571160	response@logitech.com
Tech-Com	Shree Sagarmatha Dist Pvt Ltd	022-26428541	techcom@airtelbroadband.in
Xfree	Transtek Infoways Pvt Ltd	0250-3250072	amit@ttek.in
Zebronic	Topnotch Infotronics (I) Pvt Ltd	044-26616202	enquiry@zebronic.net

How would you create a Windows XP CD that can pre-install your favourite programs along with XP?

Send in your solution with the subject "Take a Crack", and your postal address, to takeacrack@thinkdigit.com

Create A Bootable XP CD That Pre-installs Additional Programs



LAST MONTH'S CHALLENGE



Take a Crack and win

DCOM Application Development

by Jonathan Pinnock

Published by

WILEY-INDIA

LAST MONTH'S WINNER

Pradeep Bishnoiwinner!
Jodhpur, Rajasthan

Rules and Regulations

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

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

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

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

Change The Default Drive Tools In XP

Last month's solution

Windows XP bundles some utilities to take care of common problems. The defragmenter brings scattered data together to boost file access speed. Scandisk checks for and fixes disk errors. Disk Cleanup sweeps unwanted files off your hard drive, and Backup backs up your files.

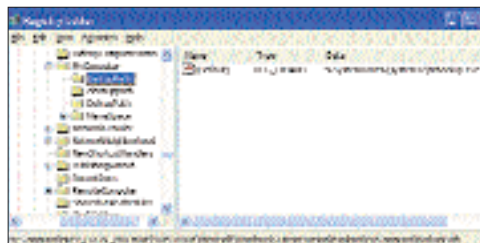
While these utilities do what they claim to do, there are many other utilities that can do the same and more. Let's see how the default tools in XP can be replaced by such third-party utilities.

You first need to download those software, of course. We suggest the following three tools.

- 1. Diskeeper from www.diskeeper.com. This is a defragmenting tool which is an excellent replacement for the standard defragmenter in Windows.
- 2. Disk Cleaner, a freeware from www.diskcleaner.nl. A drive cleaning tool that can clean your system better than can the Windows utility.
- 3. Paragon Drive Backup Personal 8.0 from www.drive-backup.com—a versatile backup utility.

Note again that the tools specified here are only our suggestions. Any other similar software can be used.

Install all these software to any location. You must remember the path to where the software is installed so that you can later retrieve the path to the .exe. Then open the Registry Editor.



Change the default backup tool using Regedit

Navigate to the Key
`HKEY_LOCAL_MACHINE\SOFTWARE\Microsoft\Windows\CurrentVersion\Explorer\MyComputer`

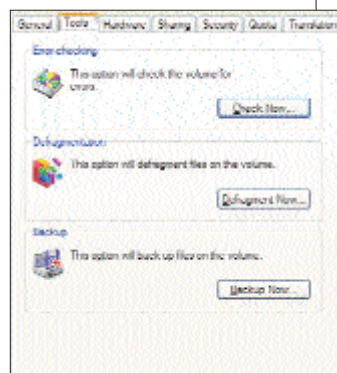
This has four keys named Backuppath, Cleanuppath, Defragpath, and Namespace. First click on the Backuppath key. You'll be able to see its "Default" Value on the right side: `"%SystemRoot%\system32\ntbackup.exe"`

Change this to new value—give the path of the backup utility executable. Now it becomes something like `"C:/Program Files/paragon/diskbackup.exe"`.

Do a similar operation for the other two. For example, for Defragpath, click the key and change its Default Value to `"C:/Program Files/diskeeper/diskeeper.exe"`. And similarly for Cleanuppath.

If you want to replace Scandisk with a third-party utility, modify or create a key called `"ChkDskPath"` at the same level as the aforementioned keys. Click the key then change its Default Value to `"C:/Program Files/DiskScanner/Diskscan.exe"`. Note that the path and the program file name in this case are dummy values—replace them with the proper values for the program you want to install.

Close the Registry Editor. Refresh the Desktop or log off and log back on. You're ready to use your own tools as the defaults in Windows XP. ■



Launch the new drive tools from the same old dialog



72 Laser Printer Test



79 Tips & Tricks—Nero 7 Premium



92 The Core Of The Matter

Digital Tools

Technology For Personal And SoHo Productivity

Enhance

Gather Your Thoughts

Microsoft Office OneNote can help you organise yourself, in your own unique way

Robert Sovereign-Smith

Now where did I save that stupid Excel file? Oh no! Here comes the boss, itching to lecture me about the importance of organisation... If you're smiling, thinking "been there, done that," you should continue reading.

Thoughts are random, hurried, and seldom recurring—that's the beauty of the creative human mind—which is fine if you're an artist or an eccentric billionaire. Chances are, you're not! So you need all the help you can get to organise your thoughts and remember those ideas—who knows, maybe your next promotion or your first million await you... Now if only you could remember what it is you thought about, and where that damn Excel file is?

A lot of people, including most of us at Digit, still carry a pen and paper to every meeting and brainstorming session. Some even have pen and paper on their night stands, just in case. A few of us use our mobiles or PDAs to jot down ideas, set reminders, take notes, etc. Then we learnt about OneNote!

For the casual user, MS OneNote is just another MS Access—something the majority of Microsoft Office users don't have a clue about, and frankly, couldn't care to learn. It's just another program in the Start Menu that we notice on our way to clicking on

Word, Excel, PowerPoint or Outlook—providing you've bought the Microsoft Office Enterprise or Ultimate edition. If not, you can get OneNote for about \$100 (Rs 4,500).

OneNote

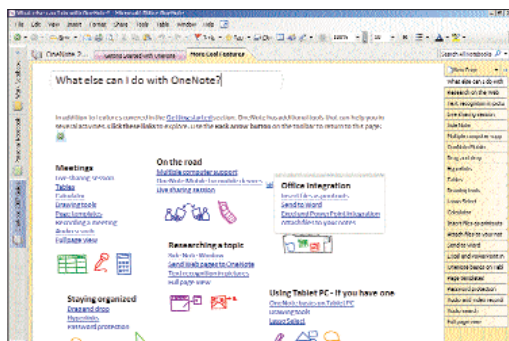
Sadly, this brilliant note-taking and collaboration tool hasn't had the same publicity as its Office counterparts. In fact, it seems Microsoft considers it more of a tool for TabletPC users, because of the ability to use Ink to jot down notes in OneNote. However, we decided to leave tablet PC functionality out, and focus on what the software has to offer to regular desktop and laptop users.

Fire up OneNote 2007, and the first thing you'll notice is the lack of the new Ribbon that seems omnipresent in Office 2007. Quite frankly, it's not needed, because OneNote needs all the desktop area you can get, and the software is not complicated enough to warrant the Ribbon.

So What Is It?

OneNote is an enhanced note-taking and organisation software. Since it's made by Microsoft, it has the added advantage of being seamlessly integrated with Windows, Microsoft Office, and Internet Explorer. You can use it to jot down your thoughts, ideas, save URLs, insert files, images, take screenshots of selected areas of a Web page, or your Desktop, and basically do anything you could using paper, pen, printers, and browsers to organise yourself.

Imaging Shrikrishna Patkar



Make sure to read the Getting Started guide the first time you use OneNote

The beauty of OneNote lies in the fact that there's no right or wrong way to use it

The beauty of OneNote lies in the fact that there's no right or wrong way to use it. Whether you're a teacher organising your yearly syllabus, a doctor keeping notes on patients, a manager monitoring his team's performance, or a group who want to collaborate and share ideas and research, there's no real template or procedure to follow.

Apart from professional use, OneNote can also help you organise yourself—manage your shopping lists, help you keep track of your many boyfriends/girlfriends... anything! Essentially, if there's something you want to do, and it involves remembering something or refers to something else, you can use OneNote to do it easily and better!

Getting Started...

By default, when you start OneNote 2007, it opens with the "Getting Started with OneNote" tab. This handy guide is something you just *have* to read through at least once, because it will answer a lot of questions you will ask later on.

That done, you should get a basic idea of how and when to use OneNote. From now on, we'll assume you've read that guide, and have no doubts about when to use this software. We'll now go on to telling you how to put it to use.

The first thing you should do, provided you have the time and inclination, is to go to **File > New > Notebook** and take a look at the templates of notebooks that OneNote has ready for you. You don't have to follow these templates, of course, but it will give you a fair idea of what this software is capable of.

After you open a notebook of your choice, it's time to understand the layout of the pages you will come across.

Apart from the Standard menu and Formatting buttons at the top, there are three areas to the interface. On the left you will see a thin vertical bar that displays all your Notebooks. Exactly as the name suggests, each Notebook is like a physical file folder—it can be filled with notes, scraps, cut-outs, pictures, and more. In this case, of course, these "scraps" of information are all digital. You can quickly skip from one Notebook to another by clicking on the tabs at the left of the interface.

On the right you will find a list of "Pages", which, again, exactly as the name suggests, are digital versions of pages in a notebook. One you've filled up a page, you can just add another one and continue with your notes. Of course, you don't have to wait for a page to be filled before you move on to another, because if you really want to be organised,

you can give your pages descriptive names and put different types of content together—like all Web links in a page called "Links" and images in a page called "Pictures"... or not!

As we said earlier, the beauty of this software lies in the fact that there are no rules to follow; as long as it makes sense to you and serves its purpose, there's nothing to stop you from putting images in a page called "1" and links in a page called "Hakunamatata"!

At the top, below the standard buttons and menus, you will see what is called the Section bar. Here, you can further organise your pages into sections. This is much like the drawers and compartments in a cupboard—like separating the whites from the colours before again segregating shirts and trousers!

Again, using this is completely your choice.

Get Those Notebooks Out

One you have created the notebook of your choice, you can start jotting your thoughts and research down. In order to add text, just type anywhere, then drag it to the spot you want to place it in. The same applies for images, audio/video clips, links, Web pages, anything.

You can change the way the Notebooks panel on the left is displayed by clicking the ">>" button at the top to give you a more detailed view of the Notebooks and their contents.

If you use Internet Explorer (6 or later), adding what you find online to OneNote is as simple as clicking a button. After you've used OneNote for the first time, you will find a taskbar icon appear, which will let you add elements to your notes. In Internet Explorer 7, under the Tools menu you will find "Send to OneNote", so you can easily add Web pages to your Notebook.

While you have the OneNote icon in the taskbar, you can use **[Windows] + [S]** to take a screen clipping. This is similar to a screenshot, but you drag the mouse and make a selection box so that you only get the required area in the image. This is then automatically added to your open Notebook, and then you can set comments for it.

Search And More Cool Things

If you're putting your thoughts down in OneNote, it's obvious that you should be able to find them when you need them. This is where the search function comes in handy: not only can you search through text, you can also do so in images (or rather the text that may be in images) as well. This works in the same way OCR does, and tries to recognise characters in images. So if you have scanned business cards, just pop them into your Notebook called Contacts (for the current project) and then just search for names when you need them.

When you add documents into your Notebook, you're asked whether you want to include a link, a copy or a "printout," which is nothing but an image of the print preview of the document.

Because OneNote integrates seamlessly with Outlook as well, if there's a mail that relates to the project that your Notebook is organising, just drag it into OneNote. You can also set Outlook tasks from within OneNote, all you have to do is click on the Tasks button or go to **Insert > Outlook Task**.

OneNote On The Move

If you own a PocketPC or Windows Mobile device, you can jot down and save notes into them and synchronise them later with your desktop/laptop. There's no additional software to buy or download either—all you have to do is go to **Tools > Options > OneNote Mobile > Install OneNote Mobile** after you've connected your device to your PC. This will install OneNote mobile to your phone, and now you can take notes wherever you go.

Apart from all these basics, which you should have no problem figuring out yourself, you should know that OneNote will also let you record audio and video notes with the help of a microphone and webcam. Just start recording by right-clicking on the OneNote icon in the task bar and choosing Start Recording Audio (or Video).

You can find such audio/video clips easily by searching for “video recording started” or “audio recording started”, which is the text that’s added by default when you record an audio/video note.

If you’re not really sure of where to put a thought, or if you haven’t yet made a Notebook for a project, but there’s something you need to record right away... all you need to do is press [Windows] + [N], and a Side Note popup called “Untitled Page...” is seen. Add your note here and then close it. It is automatically saved in the Unfiled Notes section of OneNote, which is just below your other Notebooks. You can always categorise it later.

The Coolest Ones

OneNote 2007 adds a lot of functionality for collaboration and teamwork, because no project is a one-man-show. When creating your Notebook, just select one of the Shared Notebook templates, or just choose Blank Notebook. When you click Next, you will see the options “I will use it on this computer”, “I will use it on multiple computers”, and “Multiple people will share this notebook”. Select the last option, and if you have a central file server that everyone in your team can access, choose the “On a server (SharePoint document library, network share, or other shared location)”, and specify the path to the folder on the server you wish to store this document on. If there’s no file server facility, just select “In a shared folder on this computer”. OneNote will automatically share the folder that the document resides in.

However, it is wise to make the share a dollar share if you’re going to be giving both read and write permissions, to protect your computer against viruses and the like. In both these steps, you get an option to create an e-mail to inform the rest of the team about the location of these files.

Instead of everyone working on one file, OneNote creates a local copy for all the people sharing the file and then keeps updating the changes people have made. What this means is that when out of office, team members will still have access to the Notebook, and changes will be updated when they’re back at work. VPNs and accessibility to mobile Internet means that you can hook up a laptop from virtually anywhere you are, and your Notebook can be set up to be updated online as well.

If you have multiple computers (most commonly a desktop and a laptop), you can get OneNote to synchronise your Notebooks to make sure all your computers that you work on are always up-to-date. When creating a Notebook, select “I will use it on multiple computers”, set a shared directory

Because OneNote integrates seamlessly with Outlook as well, if there’s a mail that relates to the project that your Notebook is organising, just drag it into OneNote



Take screen clippings from any application, or even of your desktop by pressing [Windows] + [S]

on one of them and then create it. When you want to synchronise, just go to File > Sync and all computers are updated.

You can build your own little Web site inside OneNote by using hyperlinks to point to other Notebooks, pages within a Notebook, Web URLs... anything! One interesting feature is that you can make text on one page into a hyperlink which points to another page, just select the text, right-click and choose the “Create Linked Page” option.

When it comes to making tables or creating shapes, easy-to-use toolbars will make your life easier. One notable upgrade to the 2003 version is the fact that the Lasso tool has been included. Though this is another feature meant for Tablet PC users, the Lasso tool is quite handy for those of us who use mice instead. Very often you will find your pages in your notebook quite cluttered with different notes (images, URLs, text, etc.). Instead of trying to select shapes or notes by clicking away to glory, you can use the Lasso tool to draw a selection around them, and then move them around as you please.

Privacy

Very often you might find yourself using OneNote alone—no team, no projects, no bosses—just you trying to get your life in order. You may want to store that joke you liked, or that ridiculous, raunchy forwarded picture that’s doing the rounds, and you can’t have your boss see these things of course, not even by mistake. All you have to do to prevent this is to password-protect your Notebook, or just a section of it. All you have to do is select the section, then go to File > Password Protect this Section.

If you were worried about storing sensitive data or valuable data such as credit card numbers, banking pins, etc., you don’t need to any more. OneNote features 3DES encryption, which is pretty much uncrackable. Just make sure your password is strong, because 3DES or not, setting your date of birth or your significant other’s pet name as the password is just plain silly!

Summing It Up

We’ve given you a very small overview of OneNote and its capabilities, and there’s tons more to learn. When it comes to organising your life, nothing we’ve seen before beats OneNote. It’s functional, simple and powerful, which is the perfect combination for success. Why keep a million sticky notes when you can store it all in OneNote! ■

robert_smith@thinkdigit.com

OneNote And Math

What’s 8752347 divided by 876235? This article is being typed in Microsoft Word, so to find the answer we have to go to Start > Run, type “calc”, enter the numbers again, and then find the answer. In OneNote, all you need to do is put an “equals” sign at the end of the phrase and press [Spacebar]. You can even do some geometry—just type $\tan(15)=$ or $\sin(60)$, find square roots, and much more.



ASUS Striker

Strike one for the boys in green

Based on NVIDIA's latest 680i chipset, the Striker is ASUS' premium offering. It is targeted at enthusiasts and hardcore gamers. The Striker impresses, with neat frills—like the embedded blue LEDs, and the illuminated On/Off, restart and CMOS reset buttons. The board is most at home inside a see-thru cabinet to be shown off at LAN parties and such.

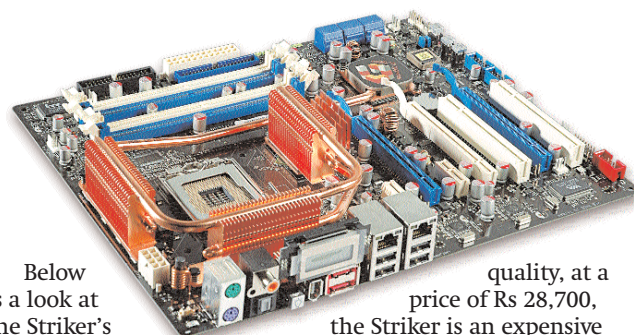
With all its six SATA ports facing outwards (as opposed to upwards), even a large graphics card won't hamper the functionality of

RATINGS

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

the ports. ASUS has gone the all-solid-capacitors way on this board, and the substantial-looking heatpipe solution (which does a good job) adds to the appeal the Striker exudes.

You could have a problem trying to install large CPU heatsinks on this board because the heatpipe actually covers the CPU region completely. All the other connectors are very well laid out. A 7.1 soundcard (PCIe x1 interface) is provided, which is necessary considering the packed-to-the-gills PCB.



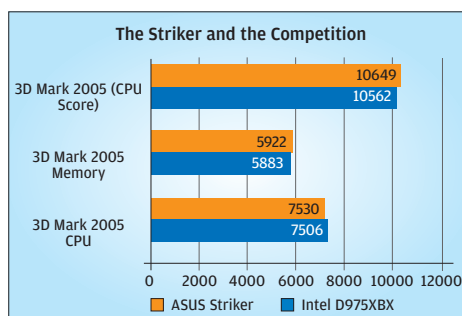
Below is a look at the Striker's performance compared to Intel's high-end 975X platform. Despite the heavy feature set and the supreme build

quality, at a price of Rs 28,700, the Striker is an expensive proposition. Although the venerable nForce 680i chipset is a proven performer now, there are much cheaper options available for the platform.

Specifications

nForce 680i chipset; LGA 775 Socket; supports Core 2 Duo and quad-core processors; six SATA 2.0 ports; rear-panel LCD POST readout

Contact: ASUSTeK Computer
Phone: 022-40058923
E-mail: media_india@asus.com
Web site: www.asus.com
Price: Rs. 28,700



Western Digital My Book Pro Edition II

The terabyte era has begun!

Western Digital sent us something we've never seen, a humongous external drive with—hold your breaths—1 TB (1,000 GB) capacity. That much space is enough to store 75 hours of DV video, 120 hours of HD content, 400 hours of DVD or 2,00,000 MP3 songs.

This sturdily constructed drive has the looks of an extra-large reference book. The drive has a push-button on one side, which lets you take a one-touch backup of your data in conjunction with the provided Retrospect backup software. The button also serves as a capacity gauge.

The My Book Pro appears larger than an average external drive because inside are two WD 5000KS 7200 rpm hard drives, 500 GB each. These drives are

configured so that you can either choose RAID mirroring for extra data protection or RAID striping for speed and performance. RAID configuration is easy with WD's intuitive RAID Wizard.

The My Book sports a triple interface: USB 2.0, FireWire 400, and also the ultra-fast FireWire 800, which has a throughput of 800 MBps. The design of the drive is such that you can stack more such drives in a daisy-chain.

Drive performance, though not the best, was very good—as we had expected. It took just about 45 seconds to transfer a 1 GB sequential file to the drive and 34 to copy it back. Copying a GB to and fro simultaneously took just over a minute and a half.

The bundled Retrospect Express 6.1 backup software can handle all common data backup tasks such as synchronising, incremental, etc. You can schedule these tasks, and it can even do a complete restore of your system if things go terribly wrong. A convection-cooling system driven by a thermostatically-controlled fan keeps the setup cool. The My Book happens to be quite bulky, weighing in at 1.93 kg.

Even though it's 1 TB, the Rs 27,450 price tag will take a toll on your bank balance.

RATINGS

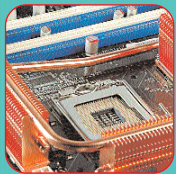
Performance	★★★★★
Features	★★★★★
Build Quality	★★★★★
Value for Money	★★★☆☆
Overall	★★★★★



Specifications

1 TB; 2xWD5000KS 7,200 rpm HDD; latency: 4.2 ms; read seek time: 8.9 ms; interfaces: USB 2.0, FireWire 400, and FireWire 800; cables: USB 2.0, IEEE 1394a/b; Dantz Retrospect Express 6.1 backup software; HxDxW: 174.6 mm x 159.3 mm x 104 mm; weight: 1.93 kg

Contact: Mediaman Infotech
Phone: 022-23823100
E-mail: santosh@mediamangroup.com
Web site: www.wdc.com
Price: Rs. 27,450



XFX 7600GT Fatal1ty Edition

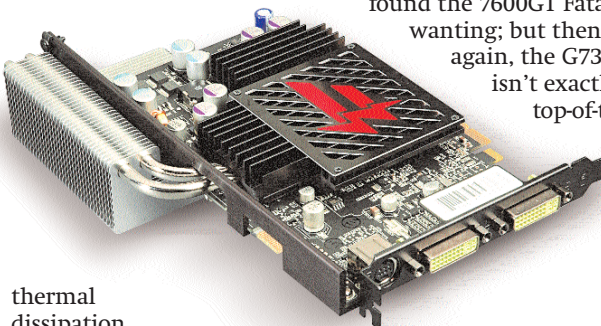
A non-fatal force!

So Jonathan "Fatal1ty" Wendell gets his nickname endorsed by yet another gaming brand. XFX joins Creative, Abit, and Zalman in this respect.

The XFX 7600GT Fatal1ty Edition is seriously more than just another G73 wannabe. It sports a completely fanless design, opting instead for a silent albeit bulkier heatpipe-heatsink design. The memory is cooled by discrete metal strips that have nothing to do with the heatpipe solution which evidently only cools the GPU.

As expected, the solution is decidedly bulky, cooling a core like the G73 (basically a stripped down version of NVIDIA's formidable 7900GTX a.k.a. the G70 chipset). Part of the radiator-looking cooling fins extend

to the reverse of the card; ditto the heatpipes. What's good is the heatpipes are not glued to the heatsink. Rather, they're soldered, which aids



thermal dissipation.

We tested the 7600GT with a more than modest Core 2 Duo X6800 with 2 GB of DDR2 800 MHz memory. The XFX 7600GT brings up 7041 3D2005 Marks, about on par with other cards based on the

same core. *FEAR* brings up 85 fps at maximum settings with a resolution of 1024 x 768. This makes the 7600GT a very decent solution for current-generation games at toned-down settings.

Once the resolution and settings were cranked up, we found the 7600GT Fatal1ty wanting; but then again, the G73 isn't exactly top-of-the-

line; nor was it intended to be even in its heyday.

At Rs 11,500, XFX's Fatal1ty Edition will provide any PC with some perky multimedia performance while not adding to system noise. Gamers will look elsewhere, as the G73 is an outdated core. For all other NVIDIA, fans the DirectX 10 replacements to the 7600GT (GeForce 8600 and 8300) are already close to seeing Indian shores. Irrespective of your needs, we suggest holding your horses, umm, wallets a bit longer and look at the way things play out.

Specifications

core: G73 core @ 560 MHz; memory: 256 MB GDDR3 @ 1400 MHz; dual DVI outs

Contact: : Rashi Peripherals Pvt Ltd
Phone: 022-67090909
E-mail: divya@rptechindia.com
Web site: www.xfxforce.com
Price: Rs. 11,500

RATINGS	
Performance	★★★★●
Features	★★★★●
Build Quality	★★★★●
Value for Money	★★★★●
Overall	★★★★●

Creative Zen V Plus

Audio: hot; Video: not

Flash-based, small and feature-rich—that's the Zen V Plus. The trendy colour combination adds to its appeal. The 1 GB Zen V Plus is available in black or white with orange highlights; the 2 GB model has green highlights, and the 4 GB version comes with blue accents—ditto the 8 GB version.

The device is well-built and feels very sturdy. The controls are easily accessible and the buttons well-placed; opinions differed about the joystick. FM radio and video playback round off the features list. The Zen V Plus interfaces with you via a bright, 1.5-inch, 128 x 128 OLED screen.

A good software bundle comes along, and the device

syncs with WMP 10 and above to transfer music and videos.



It supports MP3, WAV, and WMA audio formats. Then there's the excellent line-in recording feature that allows you to record to MP3 at 128 or 160 kbps.

Videos such as those in the DivX and AVI formats

are transcoded to the Zen's proprietary format; however, the resolution at 128 x 96 @ 12 fps doesn't really cut it. Audio quality is the Zen V Plus' forte. It delivers rich highs and decent vocals. Bass is good, but not deep enough to be classified as excellent. On the default headphones, the Zen V Plus sounds similar to the iPod nano. Actually, the right set of phones will allow you to experience the full output range the device is capable of—we attest to this!

With the feature set and user-

friendliness on offer, the Zen V Plus is one attractive package. We don't think the lack of good video playback should matter; think of it as an added feature. Creative has other products in their portfolio that handle video very well indeed. If you want a great-sounding, feature-rich MP3 player that's on par with the iPod nano but much smaller, the Creative Zen V Plus is the way to go.

Specifications

Dimensions (WxLxD): 43.5 x 67.5 x 15.9 mm; 43.5 g; screen: 1.5 inches (128x128 pixels); 1/2/4/8 GB; MP3/WMA/WAV; Line-in MP3 recording; JPEG support; transcodes video; embedded Li-Ion battery

Contact: Creative Technology Ltd
Phone: 9821455590
E-mail: irfan@ctl.creative.com
Web site: www.creative.com
Price: Rs. 7,499 (1 GB)

RATINGS	
Performance	★★★★●
Features	★★★★●
Build Quality	★★★★●
Value for Money	★★★★●
Overall	★★★★●

LG Super Multi GSA-E10L

Speedy backups!

LG's latest external DVD-Writer, the Super Multi GSA-E10L, has all the features you'd expect in its internal counterparts. The drive is housed in a ruggedly-constructed silver and black polymer casing, and seems strong enough to withstand rough usage. It looks decent, weighs just 1.26 kg, and can be carried around easily.

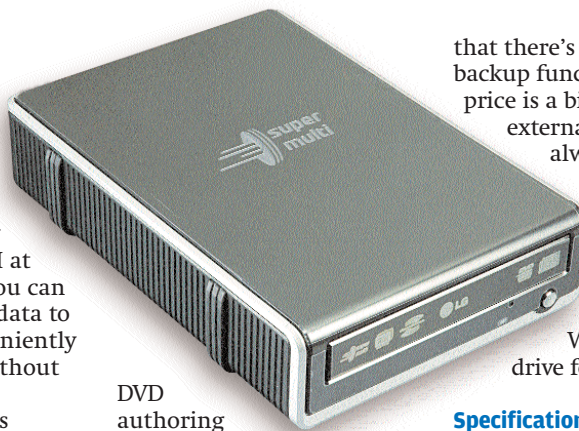
If you've got a lot of Hollywood DVDs and are worrying about how to back them up, forget lossy compression techniques! The Super Multi lets you back up uncompressed 8.5 GB dual-layer DVDs to dual-layer media at speeds as high as 10x!

With 16x speeds for DVD±R, it is one of the fastest external DVD-Writers available. Video editing

professionals and enthusiasts will love this drive because of its ability to write to DVD-RAM at a very speedy 12X. You can even drag and drop data to a DVD-RAM as conveniently as to a hard drive without the need for special software. The drive is LightScribe-enabled.

The interface is USB 2.0. The drive performed on par with its internal counterparts. It could write 4.5 GB on both the sequential as well as the assorted DVDs in less than 6 minutes, while a 700 MB assorted CD-R took around 3 minutes.

The drive comes with an impressive software bundle—Nero Burning ROM in addition to CyberLink's PowerProducer (a premium



that there's no one-touch backup functionality. The price is a bit high, but then, external drives have always been more expensive than internal ones. If you're in the market for an external DVD-Writer, this is the drive for you!

DVD authoring software) and PowerDVD for DVD playback.

You can adapt the drive to newer media by updating its write strategy via firmware upgrades from the Internet. One negative is

RATINGS

Performance	★★★★★
Features	★★★★★
Build Quality	★★★★★
Value for Money	★★★★★
Overall	★★★★★

Specifications

Writing: DVD±R: 16x, DVD+RW: 8x, DVD-RW: 6x, DVD+R DL: 10x, DVD-R DL: 6x, DVD-RAM: 12x, CD-R: 48x, CD-RW: 32x; Reading: DVD-ROM: 16x, CD-ROM: 48x; buffer: 2 MB; LightScribe; USB 2.0; dimensions: 163.2 mm (W) x 54 mm (H) x 230 mm (D); weight: 1.26 kg

Contact: LG Electronics India Pvt Ltd
Phone: 0120-2560900
E-mail: arastogi@lgindia.com
Website: www.lgezbuy.com
Price: Rs. 6,320

APC Mobile Power Pack UPB-10

Intelligent design

The APC Mobile Power Pack (MPP) acts as a battery pack for charging mobile devices that have a USB connector. When your battery's low, simply connect it to the MPP to charge it!

The only button on the pocket-sized thing is used to show the remaining charge, represented by four white LEDs that light up according to the charge left on the unit. The UPB took about three hours to charge fully—which is decent.

The UPB has two USB connectors, so you can connect one to either the AC-to-USB adapter or to a laptop to leech power from. You connect the other to a mobile device to charge it.



Coming with a price tag of Rs 3,898, we can say it's well worth it if you travel a lot and power outlets are hard to come by.

Specifications

Dimensions: 100 x 65 x 13.7 mm; weight: 105 gm; 10 Whr capacity; 8 W maximum continuous power; 10 W peak power (short duration); four white LEDs for capacity indication; factory-specified charge time: 3.5 hours

Contact: APC
Phone: 1800 4254 272
E-mail: shreya.choudhary@apc.com
Price: Rs. 3,898

RATINGS

Features	★★★★★
Ease of Use	★★★★★
Build Quality	★★★★★
Value for Money	★★★★★
Overall	★★★★★

ATEN CS-62B KVM

Switching made easy

If you're an administrator with more than one PC—say one running Linux and the other, Windows—or if you're an enthusiast with multiple PCs, a device called the KVM switch (Keyboard, Video and Mouse) helps avoid the duplication of keyboard, monitor and mouse. That's what the ATEN CS-62B brings you. The idea is to plug the existing devices into the respective ports on the CS-62B and attach the two PCs to the box via the ten 6-foot-long tentacles.

The CS-62B has two pairs of connectors, consisting of one D-sub connector, two PS/2 connectors, and two audio jacks. These



connect to the respective PCs. The audio jack connects to the audio line-out and mic-in ports on each PC.

We tried this with a Windows and a Linux machine, and we liked the instant switching between machines. The ATEN CS-62B is a cool addition to your arsenal of tools—if you need it, that is.

Specifications

Two-PC connectivity; two PS/2 connectors; two D-SUB connectors; four mini stereo audio jacks; two LED indicators; hotkey switching

Contact: : Cubix Micro Systems
Phone: 020-24251594
E-mail: sales@cubixindia.com
Price: Rs. 2,750 + Taxes

RATINGS

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

Adobe Acrobat 8 Professional

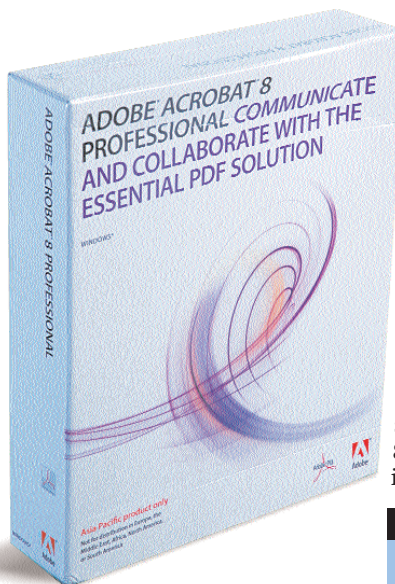
One step closer to the paperless office

Acrobat 8 Professional was recently released, and we received a copy for review. The platform-independent PDF needs no introduction: it is the most popular and versatile document format for registration forms, manuals, e-books, reports, brochures... but what do you get for the \$499 (Rs 22,500) price?

For starters (literally), the Getting Started screen makes things easy. The Start Meeting and Review & Comment button opens Adobe Connect, a replacement for Macromedia Breeze for hosting virtual meetings and collaborations. What strikes the eye is the revamped interface, something as revolutionary as what Microsoft did with

Office 2007—but not to worry; things have only gotten easier.

Acrobat 8 lets you combine different document formats such as PDFs, spreadsheets, Word documents, images, reports, etc. into a single PDF, something the older versions couldn't do. There is tighter control over redactions, giving top-secret documents enhanced security: sensitive text is permanently blacked out. This is an improvement; with previous versions, text blacked out in Microsoft Word was revealed when converted to PDF. What's more, you can even erase search keywords.



Finally, one can download and fill in PDF forms electronically and fax them. If someone mails you a PDF invitation or questionnaire and it doesn't contain standard form fields, Acrobat 8 Professional can detect and

convert flat lines into live form fields ready to accept data. This brings you one step closer to the paperless office.

Acrobat 8 integrates well with MS Office 2000 to 2003, though it did not integrate with Office 2007 on our test PC. At \$499, it's the price that's the pain. If creating PDFs is what you need, there are free programs for the purpose; it's the security and data-sharing facilities in Acrobat 8 that can prove to be of immense value for some.

RATINGS

Performance	★★★★★
Features	★★★★★
Ease of Use	★★★★★
Value for Money	★★★★★
Overall	★★★★★

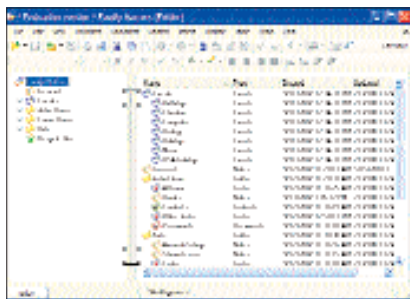
Contact: Adobe Systems Ind P Ltd
Phone: 0120-2444711
E-mail: prsingh@adobe.com
Website: www.adobe.com
Price: Rs. 25,000

WinOrganizer 4.0

All neat and tidy

Here's a personal information manager that not only manages contacts, appointments, tasks, and notes, but can also store your passwords.

The two-pane interface is easy to grasp, and the tree-like folder structure makes accessing the main modules (Contacts, Events, Notes, Passwords, and Tasks) very easy. You can achieve most tasks via a right-click. You can also add and rearrange folders and organize them as you deem fit. Documents and folders can be secured by password-protecting them,



and there is also the provision to assign user-level security.

Weaknesses: to import Outlook contacts, you first need to export them to CSV format. To sync with a Pocket PC, you need to shell out an extra \$20 (Rs 900) for the plugin, and there is no provision to sync with a Palm PDA—a big letdown! WinOrganizer 4.0 costs \$55 (Rs 2,500), a bit expensive for a PIM.

Contact: : TGS Labs
Web site: www.tgslabs.com
Price: Rs. \$55 (Rs 2,500)

RATINGS

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

TuneUp Utilities 2007

Towards a slick 'n' fast XP

After a few months of use, XP has this habit of slowing down and cluttering up your hard drive with useless files. TuneUp Utilities 2007 steps in and makes life easier for you by getting XP back on track.

The program has several powerful and well-designed utilities that can access the Windows maintenance toolset in a fast, organized, easy-to-use, modular interface.

One-click optimization makes managing temporary files and cleaning the Registry and unwanted startup programs easy. There is a variety of Internet and Windows acceleration tools.

The crash-preventing MemOptimizer, a deleted file recovery tool, a file shredder, and an uninstall utility complete the toolset. The "Styler" tool tweaks Windows'



appearance, the Scheduler automates maintenance tasks. In case of an errant program installer, use the RescueCenter to restore all changes at once or one-by-one. The system-analyzing Wizard generates thorough reports and upgrade suggestions. Highly recommended!

Contact: : TuneUp Software
Web site: www.tune-up.com
Price: Rs. \$39.99 (Rs 1,800)

RATINGS

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

Laser Printers

Continuing from last month's mono laser test, here are the ones that lie in the mid-range

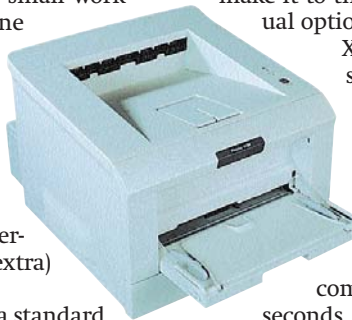
Xerox Phaser 3120

Vanilla anyone?

The Xerox Phaser 3120 is a typical, vanilla design laser printer box that better suits the back office.

Touted as a personal or small work-group laser, this machine doesn't boast of cutting edge features. There is only one button on the printer and two indicators for indicating paper jam and online/offline. The Phaser 3120 connects to a PC via either USB or parallel interface; you have to opt (pay extra) for the network interface.

The printer comes with a standard 250-sheet input paper tray and a 150-sheet output tray. An optional paper tray is available to augment the paper capacity by another 250 sheets—good enough for a small work group. The manual feeder has a capacity of 50 sheets, and that's much better than the sheet feeders most lasers have today.



Installation was a breeze; the toner cartridge slides down in position without any problems. Driver installation took five minutes; the driver interface is nothing fancy—simple to understand and functional. Auto duplexing doesn't make it to this printer, but a manual option exists.

Xerox claims a 22 PPM speed; we got around 18 PPM, which isn't that bad. The first page takes around 11 seconds to print and that's what most laser printers in this class deliver. Our combi-document took 22 seconds to print, which isn't quite up to the mark. In contrast, the photo-target image took 23 seconds to complete despite its complexity. Of course, the combi-document is 35 MB in size and any heavy file will take longer to print on this printer.

Prints lack vibrancy and look dull, and the problem seems to be a low

density of toner being deposited on the paper. Thus, some banding occurred in the greyscale test.

The toner cartridge is rated to deliver 3500 pages and costs Rs 6,400, giving us an indicative cost per page of Rs 1.83—expensive. Xerox does provide an option to upgrade to a higher yield cartridge rated to deliver 5000 pages.

The Xerox Phaser 3120 has an MRP of Rs 17,000—expensive; we suggest you skip this printer.

Specifications

22 PPM, 166 MHz processor, buffer memory 32 MB upgradeable to 144 MB, 600 dpi resolution, USB & parallel interface and 250 sheets output tray.

Price: Rs 17,000

RATINGS	
Features	★★★★
Print Speed	★★★★
Print Quality	★★★★
Value for money	★★★★
Overall	★★★★

HP LaserJet 1022n

Good for small loads

The LaserJet 1022n is a networked version of the base model LJ-1022 and is aimed at those looking for a network printer for a small workgroups. The design is refreshing, and should fit the décor of any modern office.

The LJ-1022n sports a vertical profile design that uses less desk space. This design looks great, but the paper tray juts out of the body. Also, the translucent flap sits over the input paper tray and a mere push unsettles it.

The front panel on the LJ-1022n has two buttons and three LEDs to indicate various errors. This printer comes with a 250-sheet input tray with no option to increase the paper capacity via additional trays. The 150-sheet output tray is quite flimsy. The LJ-1022n has both a USB as well as a network interface.

Installing the printer was as simple as it gets. The driver interface is neat and clean, simple to understand and feature

rich. Installing the printer over the network didn't take much effort—the driver detected the network

printer immediately. The Web administration panel is very configurable and gives greater control over the printer. Anyone with moderate technical skills can setup this printer on a network.

The LJ-1022n fell short of the claimed 18 PPM by just a page. The first page takes 8 seconds to print. The combi-document took 8 and 9 seconds respectively for normal and best settings. The photo file was printed in 9 seconds.

Quality was crisp and dark. Finer details were reproduced exactly and reversed text was completely legible. Some banding was seen in the grey scale gradation test, but text was reproduced without any spread or jaggedness.



At 2000 pages per cartridge, at Rs 2950, the cost per page is Rs 1.48.

The LaserJet 1022n is priced at Rs 15,999—good value for money considering its performance, above average quality and the network option. Overall, a good laser printer for small workgroups with light printing loads.

Specifications

18 PPM, 266 MHz processor, 8 MB memory, 250 Sheet input tray, 150 sheet output tray, USB 2.0 and HP JetDirect Printer server.

Price: Rs 15,999

RATINGS	
Features	★★★★
Print Speed	★★★★
Print Quality	★★★★
Value for money	★★★★
Overall	★★★★

Samsung ML-4551ND, ML-3051ND & ML-3561ND
World Class Samsung Network Laser Printers

ML-4551ND: 43ppm • Duplex • Network
 ML-3051ND: 28ppm • Duplex • Network
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Windows • Linux • Mac OS

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 Chennai: 9845291777 • Bangalore: 9845291772

HP LaserJet P2015D

Great quality, low memory

The LaserJet P2015D is HP's solution for high speed printing in medium-sized workgroups. We received the non-networked version of the 2015D.

The printer is designed beautifully and exudes style. It uses less desk space than older models with similar specs.

The front panel has two buttons and a line of six LED indicators—pretty useful for quick error diagnosis. The printer comes with a deep 250-sheet paper cassette and the capacity can be augmented to 500 sheets via an optional paper cassette. The output tray can hold 150 sheets, and the manual feed another 50 sheets. If you opt for the version with a duplexer unit, you can save a lot of paper by printing on both sides.

If you want networking, you have to get the P2015n version, as the one we got only featured USB. Installation was simple and the driver CD had a Flash-based tutorial which will help anyone set it up. HP also provides a suite called as the FX tool box—an application to diagnose, maintain and administer any HP printer.

HP claims a speed of 26 PPM, but we got 23 PPM—not bad at all. HP claimed a first print in 8 seconds, and they were right. The 35 MB combi-document took 14 seconds to print; because the printer has only 32 MB of memory. The photo-target disc took 17 seconds to print—slow. This printer only delivers speed when the prints are pure text or documents with low quality graphics.

The print quality is exceptionally good. Toner density was perfect, spread was minimal and text appeared sharp. Fine details were well reproduced and graininess was absent even at the base resolution of 600 dpi. Graphics are not a laser's forte and like all other laser printers, the P2015D gives acceptable image printouts.

The cartridge is rated to deliver 2000 pages and it retails for Rs 3,265—approximate cost per page of Rs 1.63, which is expensive. At a price of Rs 17,499; we felt it should have had an Ethernet connection and a duplexing unit. Still, it's a good buy for its good quality and just about acceptable cost per page.



Specifications

26 PPM, 400 MHz processor, 32 MB memory (max), 600 dpi, 250 sheet input tray, 150 sheet output bin, duplexer unit and USB interface.

Price: Rs 17,499

RATINGS	
Features	★★★★★
Print Speed	★★★★★
Print Quality	★★★★★
Value for money	★★★★★
Overall	★★★★★

Samsung ML-2571N

Affordable with good quality

Samsung's ML-2571N is an entry level S-network laser printer. Though the design is simple and dated, this milky white printer is compact. The vertical profile design requires less desk space and the paper trays fold back to save more space when the printer is not in use. The tray design is very similar to that seen on the HP LJ-1022n.

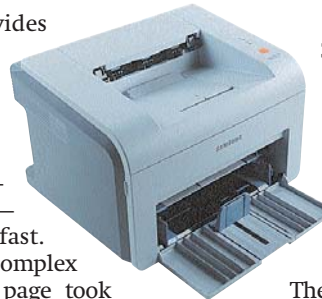
Being an entry-level printer, the Samsung ML-2571N is devoid of any front control panel; it has one button for cancel and two LED's for indicating errors. The input paper tray can hold 250 sheets; the output tray 150 sheets. A single-sheet manual feed is also present for on-the-fly printing needs. The ML-2571N isn't equipped with a duplexer unit, but manual duplexing is possible.

A high speed USB port and Ethernet connection are available on the printer. Installation via USB was quick and simple, and when installing as a network printer, it was easily detected and a proper IP was automatically assigned. The

Web server provides extensive and easy control over the device.

The Samsung ML-2571N delivered 19 PPM—claimed 22 PPM—which is quite fast. The heavy and complex combi-document page took 14 seconds to print—not the fastest. The complicated photo-target image file also took 14 seconds indicating that there is no lag in the print engine—it's the underlying electronics that are slow. Overall, the Samsung ML-2571N delivers prints at reasonably good speeds.

Print quality was as good as the HP Laserjet 1022n, with occasional differences cropping up. Toner density was perfect and text showed very little spread. There was some banding in the grey scale gradation test, but it was within acceptable limits. The Samsung ML-2571N deviates when it comes to images—contrast is a problem and in darker areas too much toner ruins the details.



The cartridge is rated to deliver 3000 pages at Rs 3,800, thus the cost per page works out to Rs 1.27—superb. The printer is attractively priced at Rs.13,000—quite affordable and definitely a good buy.

Overall, great value for money considering its reasonable price, solid feature bundle and equally good performance.

The running cost is also low, so anyone interested in a network laser for light loads should consider this one.

Specifications

600 dpi print engine, 400 MHz processor, 32 MB memory (max), 250 sheets paper input tray, 150 sheets output, USB and Ethernet interface.

Price: Rs 13,999

RATINGS	
Features	★★★★★
Print Speed	★★★★★
Print Quality	★★★★★
Value for money	★★★★★
Overall	★★★★★



Samsung CLP-300 Colour Laser Printer

The world's smallest colour laser printer that's big on the inside.

- ND-NDIST™ Technology • 16ppm B&W and 4ppm Colour Print Speed • 150 Sheet Cassette Tray
- Print upto 2400 x 600 dpi • USB 2.0 Connectivity • 32MB RAM Memory

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Brother HL-5240

Great print speeds, low memory

The HL-5240 from Brother is a mid-range laser printer oriented towards a medium sized work group. This 28 PPM laser printer looks mean thanks largely to its robust looking design.

The front panel controls consist of two buttons and many LED's for indicating common laser printer errors—out of paper, paper jam, toner empty, etc. The 250-sheet paper cassette is huge and fits flush with the body; paper capacity can be augmented to a massive 800 sheets. The output paper bin holds up to 150 sheets. The manual feeder has a capacity to hold 50 sheets at a time—quite good.

The printer also supports the legacy parallel port, apart from the now de-facto USB; Ethernet is not available as an option, which is strange considering its target audience.

Installing the printer took no time at all; a Flash animation on the CD gives all the details on how to go about installing the printer. It even shows you how to unpack the toner and prep it for usage. For Linux drivers, the CD has a link to Brother's driver repository. The driver

interface is plain but it has all the required features. If you want advanced settings, you will need to look around, though.

Brother claims a 28 PPM speed and it delivered 25 PPM—excellent. The combi-document took 16 seconds to print, since the printer has only 16 MB memory by default. When we tried printing the photo-target image file at full resolution (1200 dpi) it automatically reduced the resolution after claiming "memory not enough for full res printing."

Quality was as good as any other printer; the toner density was perfect, as was text sharpness and legibility. Reversed text was printed well and even two-point text was legible. In the grey scale gradation test, banding did occur, but was within acceptable limits. Photographs were not striking, but then that's not what this printer will be used for.



The toner cartridge is priced at Rs 4,590 and is rated to deliver 7000 pages, thus the approximate cost per page works out to just Rs 0.6—excellent. If you have a team of around eight, and don't mind the absence of the network option, the HL-5240 is a good buy, thanks to its very low cost per page.

Specifications

600 dpi print engine, 266 MHz processor, 16 MB memory upgradeable to 528 MB, 250 sheet paper cassette, 9.5 Kg weight, high speed USB and Parallel interface.

Price: 15,500

RATINGS

Features	★★★★
Print Speed	★★★★
Print Quality	★★★★
Value for money	★★★★
Overall	★★★★

Brother HL-5250DN

Low running costs; fast printing

The Brother HL-5250DN comes from the same 52XX series and fixes the shortcomings of its younger sibling the HL-5240. The HL-5250 is the same as the HL-5240, except with duplexing and a network interface.

The HL-5250DN is designed on similar lines as the HL-5240 and borrows all traits, good and bad. The printer is equipped with the standard 250 sheet paper cassette and the capacity can be augmented to 800 sheets via optional paper trays. The manual feed has a 500 sheet capacity but that will be hardly used if an optional tray is fitted. The auto duplexing unit works as expected and allows printing on both sides of the paper.

The HL-5250DN comes with USB, parallel as well as Ethernet interface. Installing the printer via USB was simple

and took very few minutes. However, when installing the printer on a network, some technical expertise of networks is needed. Furthermore, the Web server, while quite extensive and granular, isn't easy to understand for a layman and isn't polished enough. Once

we got with installing the printer on network, however, we were thrilled at the options available for managing the printer.

When it comes to performance, the HL-5250DN is up

to mark. The claimed speed is 28 PPM and the printer delivered 26 PPM—very fast. It can print first page in less than 9 seconds—that's really fast and comparable to the best printers around. The combi-document took 17 seconds; the same lower memory and complexity of the document seem to be the reasons. The photo-target image took 22 seconds—slow, but acceptable.



Quality has no issues: toner density was perfect and spread was minimal. Image printouts weren't striking, and the toner tends to saturate at darker regions in an image.

The cartridge is rated to give 7000 prints and costs Rs 4590, bringing the approximate cost per page to Rs 0.6. The printer is priced at Rs 24,900 and considering its extensive features, manageability, good performance and low running cost the Brother HL-5250 is a good buy.

Specifications

600 dpi, 266 MHz CPU, 32 MB (upgradeable to 544 MB) RAM, 250-sheet paper cassette, duplexing unit and Ethernet interface.

Price: 24,900

RATINGS

Features	★★★★
Print Speed	★★★★
Print Quality	★★★★
Value for money	★★★★
Overall	★★★★

The world's smallest Laser Multifunction Printer

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One Year Onsite Warranty

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ML-2010: 3000 Page Toner Inside • 24ppm Fast Print Speed • Inner Save Function • 64MB RAM

SCX-4200: 3000 Page Toner Inside • 18ppm Fast Print & Copy Speeds • USB 2.0 Connectivity

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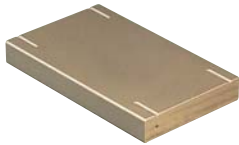
SAMSUNG

External Portable Hard Drives

Lacie Design by F.A. Porsche 40 GB

- ⊠ Inexpensive, good performance
- ⊠ Looks bland

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



Internal SATA Hard Drive Seagate ST3750840AS

- ⊠ Huge 750 GB storage capacity
- ⊠ Expensive

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

Linux SuSE Linux Enterprise Desktop 10.1

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

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

Internal DVD-Writers Lite-On LH-20A1P

- ⊠ Fast performance, 20X writing to DVD+R and DVD-R
- ⊠ None in particular

Contact Mediatech India Distribution Pvt Ltd
Phone 022-26361111
E-mail digit@mediatechindia.com
Price Rs 2,095



Digital Cameras (High-End)

Sony Cyber-shot W50

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



Digital Cameras (Mid-range)

Sony Cyber-shot DSC L1

- ⊠ Great image quality
- ⊠ Only 4 MP CCD

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

Graphics Cards (High-End)

NVIDIA GeForce 8800 GTX

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



Graphics Cards (Mid-Range)

XFx PV-T73G-UDL7 (NVIDIA 7600GT)

- ⊠ Great bundle and performance
- ⊠ None in particular

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



The A-List



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

2.1 Speaker Set

Altec Lansing ATP3

- ⊠ Great overall performance
- ⊠ None in particular

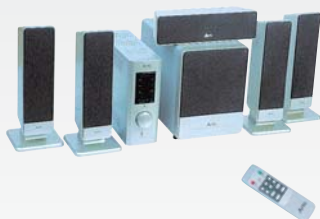
Contact Rashi Peripherals Pvt Ltd
Phone 022-67090909
E-mail navinderc@rptechindia.com
Price Rs 3,400

5.1 Speaker Set

Artis S6600R/FM

- ⊠ Good performance, Radio
- ⊠ None in particular

Contact Kunhar Peripherals Pvt Ltd
Phone 022-66345758
E-mail mail@kunhar.com
Price Rs 8,500



Hard drive-based MP3 Players

Apple iPod 80 GB



- ⊠ Large capacity; great fidelity
- ⊠ Expensive

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

LCD Monitors (17-inch)

Samsung SyncMaster 740N

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

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

Processors

Intel QX6700 Core 2 Extreme

- ⊠ Extreme performance
- ⊠ Expensive

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

Projectors

Acer PD726W

- ⊠ Great overall performance
- ⊠ No remote sensor at rear

Contact Acer India Pvt Ltd
Phone 9880544226
E-mail alankar_s@acer.co.in
Price Rs 1,50,000



Wi-Fi Access Points

Linksys WAP54G

- ⊠ Great performance
- ⊠ None in particular

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



Wi-Fi Routers

ASUS WL-530G

- ⊠ Very fast; well-priced
- ⊠ None

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

Motherboards**AMD AM2 Motherboards
ASUS Crosshair AM2**

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

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

**AMD 939 Motherboards
ASUS A8R MVP**

- ⊞ Good performance
- ⊞ Skimpy bundle

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

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

- ⊞ Inexpensive, good performer
- ⊞ None in particular

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

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

- ⊞ Good build quality and performance
- ⊞ Expensive

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

Home Inkjet MFDs**HP Officejet 4355 All-in-One**

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

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

Office Inkjet MFDs**HP Officejet 5610 All-in-One**

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

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

**Keyboard-Mouse Combos****Logitech MX-3200 Laser**

- ⊞ Extremely feature-rich
- ⊞ Slightly expensive

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

**Mono Laser Printers****HP LaserJet 1020**

- ⊞ Good combination of speed, print quality and warranty
- ⊞ A bit slow in comparison to others

Contact Hewlett-Packard India
Sales Pvt Ltd
Phone 0124-2566111
E-mail kakuni.mahto@hp.com
Price Rs 6,999

Feature-rich Cell Phones**Nokia N80**

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

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

**Budget Cell Phones****Nokia 6070**

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

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

Flash Drives**Transcend JetFlash 150 1 GB**

- ⊞ Fast
- ⊞ Poor package bundle

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

Mice**Logitech MX Revolution**

- ⊞ Has a flywheel
- ⊞ Expensive

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

**Mono Laser MFDs****Samsung SCX-4521F**

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

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

**PC Webcams****Tech-Com SSD-641-MP**

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

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

Thin And Light Laptops**Dell Inspiron 6400**

- ⊞ Amazing performance
- ⊞ Looks gaudy

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

Performance Laptops**Sony VAIO AR18GP**

- ⊞ Mind boggling performance
- ⊞ Very expensive

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



Streaming Media

What exactly happens when you play multimedia in your browser?

Samir Makwana

The streaming experience has improved over the years as our Internet connections have gotten faster. Not everyone understands that streaming actually depends on technologies and protocols different from those used for viewing Web pages or for downloading files.

What Is Streaming?

Streaming refers to the technique of continuous and steady digital data (audio, video, or graphics) transfer as “packets” in real-time from a data server through the Internet to a user’s computer. Media files can be played in a browser using an embedded plugin or in a media player. The smoothness of the media stream depends upon the speed of the connection. Multiple versions in terms of quality (high, medium, or low) can be made available for different connection speeds. For slow connections, glitches in frames and delayed or no audio will occur.

A key factor is the compression method used for the media files so they can be streamed seamlessly. Due to compression, some data quality is compromised through *perceptual encoding*, that is, the audio/video is stripped down in such a way that the changes cannot be easily perceived. Usually, perceptual encoding refers to lossy audio encoding in which psychoacoustics is used to determine what audio signals to encode and what to snip out.

Large media files are encoded using codecs to smaller sizes. Thus you have MOV, RM, etc.

RealNetworks, QuickTime, Windows Media and Macromedia Flash are the most common streaming technologies. Windows Media and RealNetworks are the most popular, and broadcasters assume that the player plugin is installed on the viewer’s browser.

QuickTime is installed on all Macs. Also, installation of Macromedia Flash is required in most cases.

Types of Streaming

Streaming technology thus encompasses media content, the streaming server, plugins, and encoding software. Streaming is of two types—progressive and real-time. During progressive streaming, the media file can be viewed or listened to while the file is being downloaded. In the case of data loss, re-transmission of lost packets is possible. Media files streamed using the progressive technique get saved on the viewer’s hard drive, which raises the problem of re-distribution. HTTP streaming is a type of progressive streaming where the media file begins to play before it is entirely downloaded. In the case of HTTP streaming, a request for data remains open even after the data is received by the client, so that the server can respond at any time.

In real-time streaming, media content gets downloaded temporarily to the user’s computer. Almost-live broadcast of content is possible. Content streamed real-time can adjust according to the user’s connection capacity; if the connection is too slow, the transmission of data would break.

Media streams can also be distinguished as “on demand” or “live.” The former are stored on servers for long periods of time, becoming available to be transmitted to the user upon request. Live streams are available only at a particular time—like the streaming of a live TV broadcast.

A streaming server software package, the Real Time Streaming Protocol (RTSP) to control the interaction, and a matching client is needed for real-time streaming.

Transmission Protocols

Internet Protocols play an important role in media file transmission. Transmission protocols such

as Transmission Control Protocol (TCP), User Datagram Protocol (UDP), RTSP, and Real-time Transport Protocol (RTP) are used.

TCP is “reliable”: data transmission happening via TCP is not blocked, and every bit is guaranteed to be transmitted. However, UDP is efficient since priority is given to continuous streaming of data rather than re-transmission of lost packets. The user can suffer streaming glitches, but by error-correction techniques, lost data can be recovered. UDP is widely used for real-time streaming of audio, video, and graphics files.

RTSP and RTP are widely used for real-time media delivery over the Internet. Through RTSP, the user can communicate with the streaming server; it is used for simple one-to-one streaming. The user also gets the preference of device control—for viewing any part of the stream. This protocol is a good performer for one-to-one viewing and larger audiences as well.

This protocol is usually used for streams via unicast (for transmission to a single client computer) or multicast (for transmission to multiple client computers) servers. Unicast is the term for when data is transferred from one point to another point, that is, one client and one server. Multicast is where data is transferred from one or more points to multiple points.

RTP is used for transmitting live streams to multiple users, but the users do not enjoy any sort of control like selective play of the media stream.

Legalities

Legal issues revolve around users being able to record the streaming of copyrighted content. It is difficult to stop such recording. Broadcasters sometimes use encryption for media content to make it difficult to record content.

Parting Words

To try your hands at streaming your own media, thus getting a feel of what is involved, refer to the *30 Minutes Expert* in our January 2007 issue. ■

samir_makwana@thinkdigit.com



Tips & Tricks

SECRETS THAT KEEP YOU AHEAD IN THE RACE

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30 MINUTES EXPERT

Become one with WinSCP
and PuTTY

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NERO 7 PREMIUM



Illustrations Harsho Mohan Chatteraj

The word “Nero” is familiar to literally anyone who has ever burnt a CD. As time passed, alternatives to Nero were being released, with more features. But Nero shot right back and expanded from just another burning software to an entire suite containing a horde of nifty utilities ranging from audio/video converters to a full-fledged desktop search engine, which gives results within two seconds.

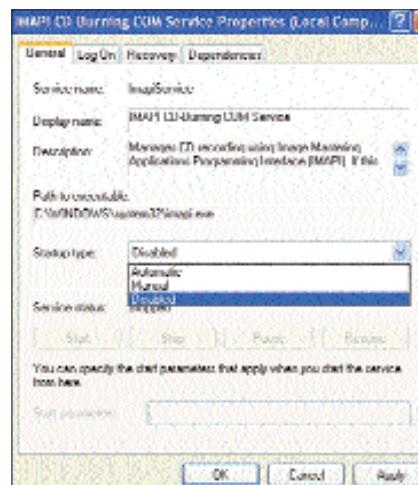
NERO BURNING ROM

Everyone’s familiar with this one; it’s become part of our lives. This program is what we associate Nero with. Nero Burning ROM, once only a CD writing tool, has now expanded with more

functionalities like copying CD/DVD images onto your hard drive to creating bootable CDs/DVDs. Working your way around this software should be simple enough with few problems, if any. Here, we provide you with tips towards stuff you probably weren’t aware existed.

Faster Start-up

If you’re using XP and have a slow computer, you will find that Nero, like other largish programs, takes a long time to start up. However, you can improve things by disabling the Windows inbuilt burner. You can do so by following these steps: type in “services.msc” at a command prompt and press [Enter]. Next look for “IMAPI CD-Burning COM Service” in the right-

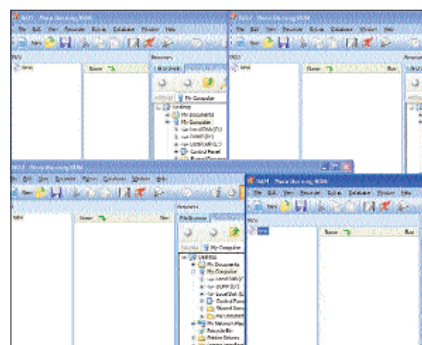


The start-up type must be set to disabled for the changes to take effect, the manual option will not help

hand pane and double-click on it. In the start-up type dropdown box, select Disabled. Remember that you have to disable it—even the “Manual” option will not help. You should now notice the difference in the start-up speed of Nero.

Record With Multiple Recorders

Did you know that if you have two recorders, you can burn two discs at a time? Or create a CD image on your hard disk while your drive is busy writing CDs? Or better yet—keep both your drives busy writing while you create a CD image? Despite this sounding complicated, the trick is actually rather simple. Logic suggests that to burn one CD, you have to open up Nero once; so to burn two CDs, you open up Nero twice. That’s the trick! Open up Nero Burning ROM, leave the window open, then open Nero Burning ROM again. This will leave you with two open windows of Nero Burning ROM, and now you can burn two compilations at a time.



Quite a clutter of windows, but if used properly, you can keep all the writers on your system busy

A word of caution—make dead sure that you choose the recorder accordingly for each window, otherwise you will end up with multiple compilations attempting to write to the same disc. And of course, your computer should be powerful enough to handle the multiple tasks.

Multiple Copies Of Your Disc

If you have two writers and want to make multiple copies of the same compilation, you can do so by going to File > Compilation Properties, clicking the Burn tab, and checking “Use multiple recorders”. Now when you set up your compilation and click Burn, you should see a list of recorders. Here you can select all the recorders you want. Selecting “Virtual CD” along with your recorder(s) in the list will make a copy of the CD image on your hard disk while your recorder is burning.



Customise Your View

Nero Burning ROM offers a lot of flexibility when it comes to customising views. You can stick your toolbars/menus literally anywhere within Nero. As a starter, you can drag the toolbar or the menu at the top by using the click and drag situated on the far right side of the toolbars and menus. To “nail” align them on a side, say, the left side, simply drag the toolbar or menu as far as you can on the left side and it will get attached there. What’s more, you can add additional toolbars with your own set of buttons. This feature is available in **View > Customize**; in the toolbars tab, click on New to create a new toolbar, then click on the Commands tab and drag the command of your choice from the right side into the toolbar. Then you can right-click on the command to rename it, give it an icon, remove the text and keep only the icon, etc.

To create a menu, click on New Menu at the top of the right-hand side, then drag the new menu control on the left hand side onto your toolbar. Again, right-clicking on the newly-created control gives you options to change it. Remember that you can get use the right-click context menu for “rename” etc. only if the Customize dialog box is open.



Last-used Volume Labels

You must have experienced those trying times when you set up your compilation neatly and accurately, but at the end, you find that the volume label is still the same from your last compilation. Actually, you can just turn off the remembering of volumes of your last burn session by going to **File > Options**, and unchecking the “Remember last used volume label” box.



Overburning your discs

This feature, should be used with care, but when used the right way, can add several minutes over the specified amount on the disk. You can find it by clicking on **File > Options**, click on the expert features tab and you should see the Overburn option. Overburning is where it’ll force the burner to continue to burn the disc even after reaching the end. Beware that your CD could contain errors, and if you try to stretch it too much over the specified size, you may even end up damaging your recorder. A tip is to also disable Finalise Burning of the disc, as finalising on an already overburnt disc will cause further problems. A safer method is to use the short-lead out feature found further down in the expert features. You may not always get the results you want, so use overburn at your own risk!



Overburning, if used properly, can add a few minutes over the specified size on your disc



Commonly-used Keyboard Shortcuts

New compilation: [F1]
Open compilation: [Ctrl] + [O]
Compilation properties: [F7]
Print compilation: [Ctrl] + [P]
Save As: [F12]
Add files to compilation: [Ctrl] + [D]
Cut: [Ctrl] + [X]
Copy: [Ctrl] + [C]
Paste: [Ctrl] + [V]
Find: [Ctrl] + [F]
Undo: [Ctrl] + [Z]
Burn compilation: [Ctrl] + [B]
Choose recorder: [Ctrl] + [R]
Disc info: [Ctrl] + [I]
Eject Disc: [Ctrl] + [E]
Encode Tracks: [F8]
“What’s this” cursor: [Shift] + [F1]

You can set your own keyboard shortcuts: click on **View > Customize** and then click on the Keyboard tab. Next click on the text box under “Press the new shortcut key”, enter the shortcut you want and click Assign.



Show Actual Write Speed

This is something that required a registry hack before Nero 7. “Show actual write speed” will show you the precise write speed in real time while you are burning your disc. Nero 7 now implements it as an included option—you can find it under **File > Options**. Click on the misc tab and check “Show real recorder write speed while burning”. You can also turn off this option to save memory.



No Nags

When working in the file browser, do you just want to remove that annoying confirmation dialog box? Or

do you want a confirmation box for rename too, so you don’t accidentally rename files? You can set these options by firing up regedit yet again, navigate to

HKEY_CURRENT_USER\Software\Ahead\Nero-Burning Rom\Browser. See those values with the prefix “confirm”? They are the ones you need to edit. For example, if you want to enable the confirmation for renaming files, double click on ConfirmRename and give it a value of 1 (in decimal); 0 will disable it.

NERO HOME

One welcome addition to Nero is Nero Home, a full-fledged Media Centre with the ability to scan certain areas of your HDD for any new media files. This search functionality depends on Nero Scout—another utility included with Nero. The general look and feel of this program is extremely user-friendly, and has Wizards to help you find your way around in the interface. The ability to include your own skins spice up this nifty media centre even further to a point where you can customise it to look any way you want. Enough of that, on to the tips.



Spice Up Nero Home With Your Own Background

Like how you change your wallpaper in Windows, you can change the background in Nero Home. Now, as you are probably aware, Nero Home already offers features such as themes and the ability to change your backgrounds; however, if you find them too drab for your liking, you can set your own background. First get an image of your choice ready in .JPG format. You don’t need to resize the picture in any way—Nero will resize your image by itself. However, for best viewing, make sure that the image fits your desktop resolution. Next copy this image and paste it into C:\Program Files\Nero\Nero Home\Skins\Spin\Graphics\Background. You can now select your chosen background in the settings of Nero Home.



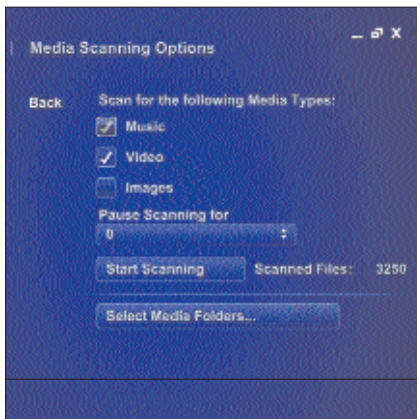
Run Nero Home In Windowed Mode

Time for starting Nero Home in windowed mode, if that full screen makes you feel trapped inside a box!

To set Nero Home to start in windowed mode, open the Registry Editor, and navigate to HKEY_CURRENT_USER\Software\Ahead\Nero Home\MediaBrowser.

Here, in the right-hand pane, double-click on the entry called “windowfullscreen” and set its value as 1 in any format, decimal or hexadecimal. The next time you open up Nero Home,

it should open in windowed mode. Set the Registry value back to 1 to revert to your original settings.



You can disable media scanning to improve performance

 Improve Performance

 If you notice your computer becoming sluggish when using Nero Home, you can turn off media scanning. Media scanning scans particular folders for any additional media files (audio/video/etc.) and indexes them for faster searching within Nero Home. To turn off media scanning, open up Nero Home and double-click on the spanner icon, which takes you to the Settings. Next, click on General, and click on Media Scanning Options. Here you can disable scanning for certain file types, select only specific folders you want Nero Home to scan, or disable media scanning altogether.

NERO SHOWTIME

Nero includes Nero Showtime, a full-fledged video player. You can use this to play any audio or video files, and it comes loaded with enough features to rival most video players out there.

Capture Your Videos

 The capture feature within Nero Showtime offers a lot of options to capture frames for your video. You can find this option by right-clicking on Nero Showtime player and clicking on Preferences. Here, click on Capture Frame, and you will be faced with a multitude of options including capturing your images to clipboard where you can paste your images in your favourite image editing software, capturing the frame and setting the image as a wallpaper upon the touch of a button, or printing the captured image to your default printer.

If you choose to capture the image to a file, you can set the location where you want to save the image. The prefix

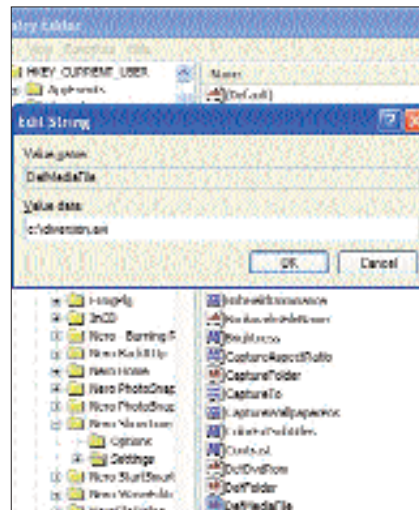
for the resultant file, unfortunately, cannot be changed.

Customising Skins Manually

Again, you can customise specific areas of your skins however you want and whatever size you want. Go to `C:\Program Files\Nero\Nero 7\Nero Showtime\Skins`. Here pick a skin, for example, red plastic. Copy all three files containing the “red plastic” prefix in their filename and rename the newly-created files to anything similar, for example, Nero.skn, Nero.bmp, and Nero_anime.bmp. Now double click on Nero.skn and you can change the buttons’ size and position. So if you have a problem aiming for that tiny control, or wish it could be replaced with something else, just change those numbers. A tip for changing positions: it’s wise if you choose to replace a button which is almost the same size as one of the others, after which you can switch their position numbers in the .skn file.

Clear Out History Of The Last Played File

In case you weren't aware, Nero Showtime, when started, by default loads the last-played media file. And if



You can direct `defmediafile` to point to any file you want

you click on Play, the last media file will automatically play. Now if you have a file which you, umm, don't want others to know exist on the system, you can clear out its trace from the history. This requires Registry tweaking. Enter the Registry Editor, and navigate your way through to

HKEY_CURRENT_USER\Software\Ahead\Nero Showtime\Settings

Here look for the String value called "defmediafile". Double-click on it and delete its contents to clear out the history of Nero Showtime. A word of

caution—do not keep Nero Showtime open in the background when editing this entry, because after you close the Registry Editor, the entry will still remain in the history of Nero Showtime, as the program saves its settings upon being closed. Also do not forget HKEY_LOCAL_MACHINE—the same change needs to be made there too!

Profile Icons For Your Settings

If you keep changing settings as you view different movies, and don't want to go through the settings every time, you can have icons containing different settings. Sounds neat? But it comes at a price—heavy Registry tweaking. Go back to the key

HKEY_CURRENT_USER\Software\Ahead\Nero Showtime\Settings

There's a large number of settings including brightness etc., functions like radio buttons will have a value of 0, 1, 2, or 3 etc. For example, the "capture to" setting has three radio buttons; setting the value to 0 will set the first radio button, a value of 1 will choose the second option, and so on.

Once you're done editing your settings, right-click on the Settings key in the left-hand pane and click Export. Give it any filename you want; a tip is to include the name of the video file which these settings are for—it's similar to naming presets. Similarly, change the Registry values for your other settings and export them. Now, by just double-clicking the files you created, you can have different settings presets before opening movies.

Balloon ToolTips

 Sick of the drab windows tooltips that come up in Nero Showtime? You can change the look to much more appealing balloon tips. In Options, click on the “tooltips” setting, and click on the “balloon tips” radio button. Now you can hover your cursor over buttons just to see how cool the new balloon tooltips can look compared to the ones Windows has to offer!

COMMONLY USED KEYBOARD SHORTCUTS

Play: [Enter]
Stop: [S]
Pause: [Spacebar]
Previous: [P]
Next: [N]
Step forward: [T]
Seek to time: [Ctrl] + [G]
Options: [Ctrl] + [C]
Full screen: [Z]
Change subtitles: [U]
Menu: [I]
Capture frame: [C]
Eject disc: [J]



Become one with WinSCP and PuTTY

If you have your own Web site, WinSCP is an indispensable for secure FTP access to your server

Mayur Bhatia

Anyone hosting an FTP server without SSH and SCP protocols isn't secure. Whether you have a complicated 76-character password, or use specialised characters, numbers, capitalised letters, etc., it can all be rendered completely useless by nothing more than a script kiddie with a sniffer.

When not using any kind of secure protocol for transferring files, passwords are transmitted in plain text, which means anyone using a sniffer on your network can see those passwords exactly as they are, and accessing your server is simply a matter of copy-pasting from the sniffer to the password box. That's where protocols like SSH (Secure Shell) and SCP (Secure Copy) step in. Instead of sending out the passwords in plain text, SSH encrypts any password you send out, thus showing a jumble of gibberish to anyone sniffing the network, while SCP encrypts the actual file transfers that take place making them unrecoverable for any sniffers.

Now if you have SSH and SCP on your server, you will need to have clients to connect to them. The two most popular are PuTTY and WinSCP. Anyone who knows what SSH is has probably already used PuTTY to remote connect to servers. It is similar to a Telnet client, but obviously more secure. WinSCP is one of the best SCP programs out there, and offers the ability to edit files in real-time directly on the server, thus saving you the time required to download, edit and upload again. We'll look at WinSCP version 3.8.2 and PuTTY version 0.59 for this article.

Integrate PuTTY With WinSCP

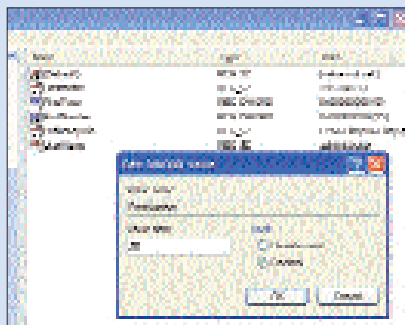
Getting straight down to business, the first thing you should do is directly integrate WinSCP with PuTTY. After you connect to a server, go to **Options > Preferences** and click on **Integration**. Here click on the text box entitled 'PuTTY Path' and enter the path to the putty.exe file. You should now be able to fire up PuTTY whenever required by using the [Ctrl] + [P] key combination. Instead of just

starting PuTTY, WinSCP will directly open the server you are on, and enter the username and password for you.

Default Session Settings

When you start WinSCP, you find that you have to input a server, username and password. If all you do is use WinSCP to access a single server, you can stop this time-wasting. You can use "Stored Sessions" to remember your username and password for a particular server, and this will save you a lot of time.

If you want to save even more time, and have WinSCP open with the server address, username and port already entered, you can change it's default settings. Open the registry editor (**Start > Run > regedit**) and navigate to **HKEY_CURRENT_USER\Software\Martin Prikryl\WinSCP 2\Sessions\Default%20Settings**. In the right pane, right-click and select **New > String Value**, name it **HostName** and give it a value of the server's IP. Create another String value called **UserName** and give it the value of the username. If your connection port is not 22, you can set the default port number here by creating a **DWORD** value called **PortNumber** and giving it a decimal value of the port you want to connect to. Be careful here because hexadecimal and decimal values differ. Passwords cannot be stored, but it's a lot easier than typing everything, and

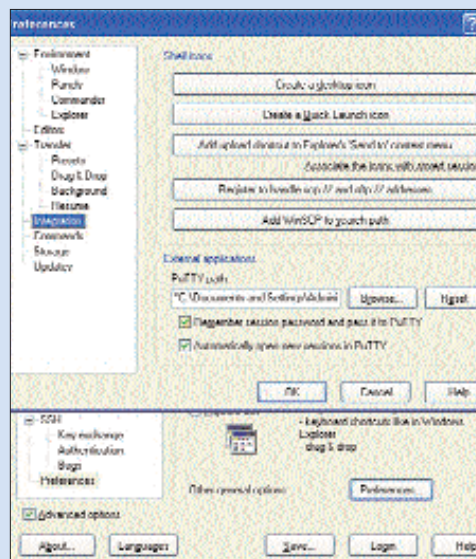


Make sure to enter the port number in the decimal format

besides, you shouldn't store passwords—for security purposes.

Sharing Between WinSCP And PuTTY

So your logon settings are saved in WinSCP, including usernames and passwords, but what about PuTTY? You can export your WinSCP setting to PuTTY by starting WinSCP and going to **Preferences** in the left hand pane. Now you will see a button called **Preferences**, click on it and then click



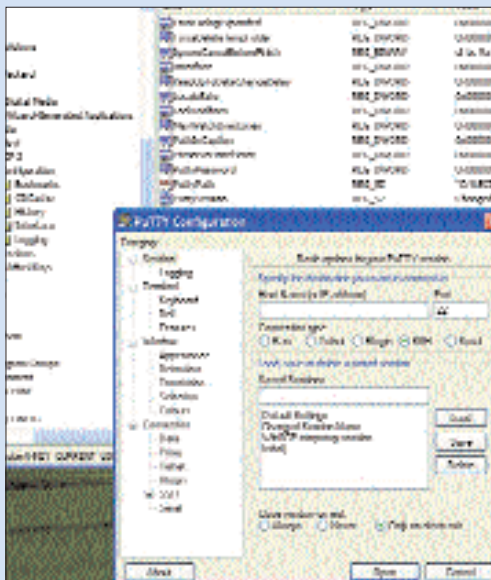
Don't forget to enter the path to your putty.exe

on **Integration** and tick the "Remember session password and pass it to PuTTY" checkbox. This will let you open PuTTY with the session name "WinSCP Temporary Session" whenever you choose to do so.

Change The Default Name

Taking the previous tip further, if you don't like the "WinSCP Temporary Session" title when you open PuTTY, change it.

Just open the registry editor, navigate to the key **HKEY_CURRENT_USER\Software\Martin Prikryl\WinSCP 2\Configuration\Interface**, find the String value called "PuttySession", double-click on it and give it any name you want. Just remember to put "%20" (without quotes) instead of spaces.



Use "%20" for spaces when entering WinSCPs session name in PuTTY

No More Passwords

If your server supports private keys, you can do away with usernames and passwords altogether! SSH and SCP allow for a private key/public key authentication model, and if both keys match, you get access to your account automatically.

To set this up, go to the folder where you installed WinSCP. Here you will find a folder called PuTTY, and a file called puttygen.exe. This utility generates two files, a public key file and a private key file. The private key file is what you will be keeping in a safe place on your PC, while the public key file will be kept on the server. In here select your

method of encryption (make sure that the server supports whatever method you choose) and then click on generate. After you generate the key, click on Save Private Key and save the file to your PC. Do the same for the public key.

Now use WinSCP and upload the public key to a location on the server where public keys are being kept. Whenever you login using WinSCP, enter your username, select your key file in the box below and zoom away!

Fast Recovery

In case you are stuck at a point where WinSCP will refuse to start, thanks to that last configuration change you did, you can reset all of its settings by deleting its

whole configuration, or better yet, a single setting if you remember what you changed. You can do this by going to the registry editor and navigating to `HKEY_CURRENT_USER\Software\Martin Prinkry\WinSCP 2\Configuration`. Delete the whole configuration key if you are not sure of what change caused the problem, or you can delete specific values anywhere within this key. The next time you start WinSCP, it'll recreate the keys with the default values.

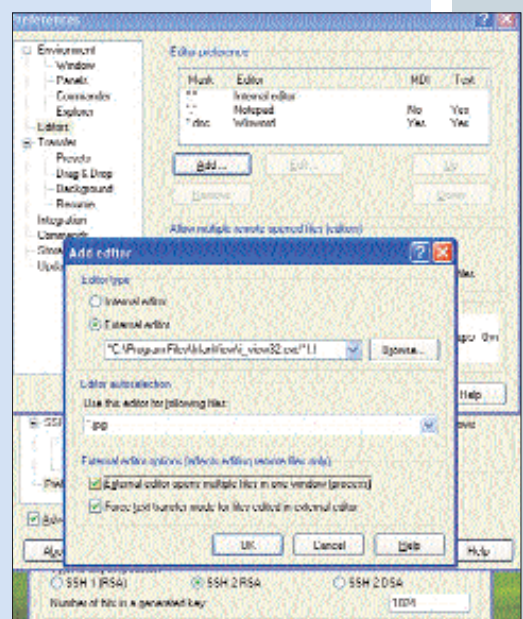
Save Settings

Tired of all those registry tweaks already? Well, you have the choice of saving your settings to the registry, or

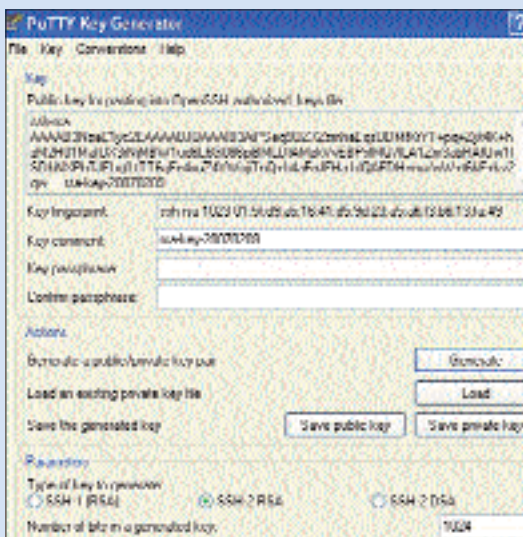
to an INI file. To set this go to **Options > Preferences** and click on **Storage** on the left hand side. Here you will see 2 radio buttons that let you choose between saving your configuration settings to the Windows Registry or to an INI file. Once you select the INI option and close WinSCP, you will then be able to make changes to this INI file by browsing to the directory where WinSCP is installed and double clicking on the WinSCP3.INI file. Again, like the last trick, you can delete the configuration file altogether if you encounter a crash because of messed up settings.

Use External Editors

Granted, if you don't use WinSCP's internal editors, you won't be able to save them in real time on the server, which is one of WinSCP's main features. However it's not like the client has its own plethora of editors either. If you wish you can open specific extensions with certain applications that you choose. To do this, go to **Options > Preferences** and click on **Editors**. Next click add, choose external editor, provide the path to the relevant EXE file. For example, if you want a document to open with Word, instead of Notepad, browse to its location and choose winword.exe and further down select the files you want to associate with this program.



Configure WinSCP to associate extensions with an application of your choice when you open them



PuTTYGen allows you to generate a pair consisting of a public and a private key, you can use load your private key to generate more public keys

WinSCP As A Plugin

WinSCP isn't short on integration options. As if integrating with PuTTY wasn't enough, it's also available in the form of a plugin for file managers like FAR manager and Servant Salamander. This functionality is extremely useful to those who are used to working with these file managers, as WinSCP's plugin functionality will allow you to work with file managers in a single package. You can download WinSCP as a plugin from WinSCP's main site—<http://www.WinSCP.net> and click on the plugins to File Managers link, here you can download the installers for your desired file manager. ■

mayur_bhatia@thinkdigit.com

NERO SCOUT

Nero Scout provides a full-fledged search engine similar to Google Desktop, offering instant searches; it also sits in the background and indexes your hard disk for new files. This is probably the most-used feature in Nero, along with Nero Burning ROM.

Save Your Searches

This feature can be handy when you searched for something long back and now want to remember what you had searched for. The search history normally shows the last 10 results of your search, but what about the last 100th result of your search? You can do exactly that: save your search string forever, you can do this by clicking on the arrow next to Nero Scout on the taskbar to bring up the advanced search, from here you can enter your search criteria and string after which you can click on the save button to save your searches. Now when you need to search for the same string again you can click on the saved searches tab in the same place—no need to remember filenames like `whatasuperduperbigfilename.dll`.

Choose The Right Places To Index

This feature can be extremely useful when used the right way. If you know where you need to search, you can choose to index files only of that particular folder. You can do so by clicking the arrow to the right of the Nero Scout search text box, click on Options, and then tweak your way through in the Indexing area. As you can see, you can set Nero Scout to exclude searching in your e-mails, other specific paths, or to index only certain files.

Disable The Scout!

Nero 7 Scout, while a very useful program for searching individual files, does tend to hog precious memory. So if you're someone who's very conscious with keeping memory free, then you can disable it altogether. To do this, double click on My Computer, right click on the Nero Scout icon and click Options. Here, uncheck both "Integrate into Taskbar" and "Integrate into Explorer" and reboot your PC. If you are still experiencing problems, open the command prompt—go to **Start > Run**, type `cmd` and hit [Enter].

In the command window, type `regsvr32 /u \"%COMMONPROGRAMFILES%\Ahead\\Lib\\MediaLibraryNSE.dll\"`. This should eliminate any bugs and disable Nero Scout for good. ■

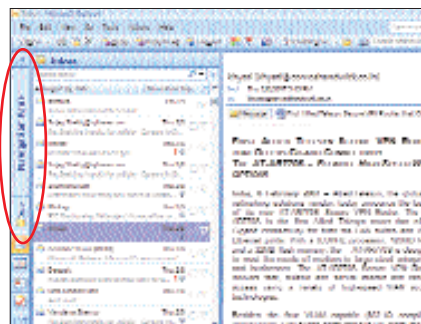
MICROSOFT OUTLOOK 2007



The ribbon may not be as pervasive here, but that doesn't mean that Outlook 2007 hasn't gone through the radical transformations we've seen in the rest of the suite...

Change The Window

In Outlook 2007, if you need more on-screen room, you can "collapse" the Navigation Pane. To do this, click the left arrows at the top of the Navigation Pane. It will get minimised to a vertical bar along the left edge of the Outlook window. Your favourite folders, as well as the icons for the Views—Calendar, Contacts, Mail, and Tasks—will still be available in the collapsed bar.



Change the window

To reset the navigation pane to what it was, click the right arrows at the top of the bar.

Adding Tasks To The Calendar

In earlier versions of Outlook, tasks and the Calendar were separate. To keep track of one event, you needed to create entries in both views. In this iteration of Outlook, you can schedule time for tasks simply by dragging them to the Calendar. And using the Daily Task List, you can modify tasks' dates simply by dragging them from one day to another.

Note that as you do this, the To-Do Bar gets updated accordingly.

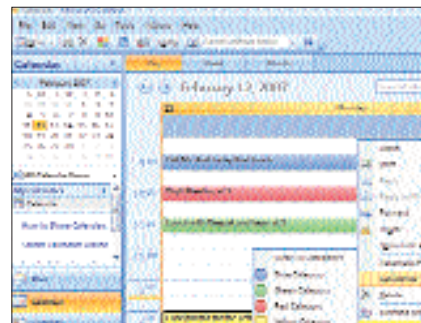
Change The Look Of The To-Do Bar

You can! Just click anywhere in the Bar's title, and choose **Customize**. You can now control how many months and appointments are displayed. You can also choose to hide them entirely.

Colourising Tasks

In Outlook 2007, you can assign a colour category to any item you've created—for example, an appointment in the Calendar. Use the **Categorize** control for this: with the Appointment window open, click **Categorize**, and from the list that appears, choose the colour you want. The Categories column will appear below the Appointment area.

Now, say you categorise all business appointments Red. If this category is often used, you can set up the Quick Click



Colourising tasks

feature. This feature enables you to make this category the default (to get activated whenever you click an item). To achieve this, right-click the item and choose **Categorize**, then select **"Set Quick Click"**. Choose the colour you want to use as the Quick Click category, then click **OK**.

Comparing Calendars

It's easy in Outlook 2007 to compare two or more Calendars so you can choose, say, when the people involved can have a meeting. The Calendars available for you to view—say those that have been e-mailed to you—are displayed in the Calendars navigation pane. By default, these appear side by side.

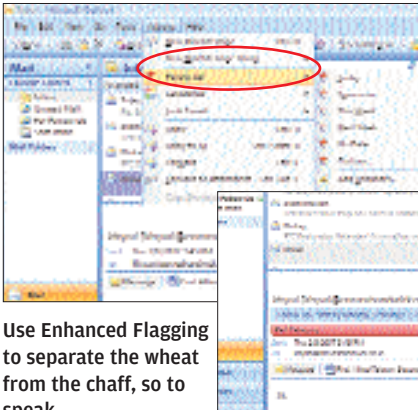
You can layer Calendars on top of each other using **Overlay Mode**, so as to be able to find free time slots easily. Select the Calendars, then click the green arrow on the Calendar at the right.

So which appointment is in which Calendar? You can tell by colouring them. The appointments from the

underlying Calendar will be, as you'll find, in the same colour as that Calendar's title bar.

Getting Some Action Into Your Mails

Some mails in your Inbox are always more important than others, and they might need to be worked on immediately. In Outlook 2007, you can use the enhanced flagging feature to distinguish an important mail from the others. The idea is that when you add a flag, the item is automatically added to the To-Do bar!



Use Enhanced Flagging to separate the wheat from the chaff, so to speak

Enhanced Flagging #2

The enhanced flagging we mentioned in the previous tip extends to messages that are sent and received. For example, a draft (say, of a company-wide proposal) can be sent as an e-mail to everyone working on the same draft, and say you need a response from everyone by a particular date. What you need to do is just flag the mail for follow-up. When this mail arrives at the others' mailboxes, the message is added to their To-Do Bars—as a task with a response date.

Fix the Quick Access Toolbar!

When you need to insert something into your mail—say a picture—you need to go to the Insert tab. And then you find you can't send the item right away—you need to click on the Message tab to see the Send button again. The Send button should have been made available on the Quick Access Toolbar!

It's easy to fix this. Right-click on the Quick Access Toolbar, and choose "Customize..." From the list of commands, choose Send and then Add. Click OK. You'll now have the Send button where you want it.

Change your IMAP mail settings

For an IMAP account in Outlook 2007, the default is to download only the headers. You can change this behaviour and make Outlook download complete items. Here's how:

- Bring up the Send/Receive Settings dialog box by pressing [Ctrl] + [Alt] + [S].
- Select "All Accounts" or, of course, the group that contains your IMAP account's settings, and click Edit.
- Under Accounts, select the IMAP account in question.
- Under "Receive mail items", select "Use the custom behavior defined below".
- Under Folder Options, select Inbox, then select "Download complete item including attachments". Then click on OK and Close.

A Helping Hand?

You might just face this situation where, when you try to select some text in mail, rather than the "select" cursor, you have the "hand" cursor that lets you "grab" the message and move it about. The toolbar does offer "Select Text" as a command, but it Selects All.

If this is happening, you just need to know that the Reading Pane has the "hand" cursor that lets you pan around the message. So just click on the hand icon above the scrollbar—along the right edge—to turn it off. You can click on it again to bring the "hand" cursor back.

Searching The Trash

Outlook 2007 doesn't search in the Deleted Items, which you certainly might want to change.

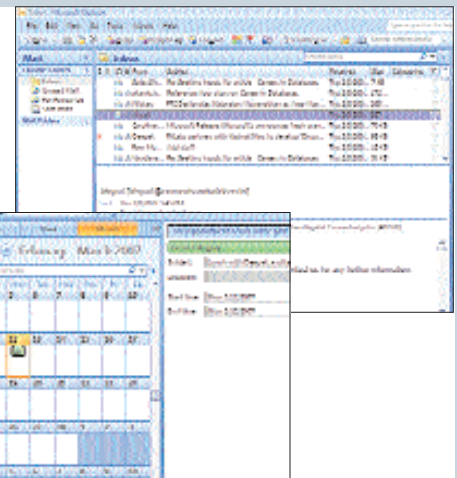
Go to Tools > Instant Search > Search Options. This will bring up the Search Options dialog box. In the Deleted Items section of the dialog box, tick the "Include messages..." checkbox. Click OK.

Multiple Outlook Windows!

Many people do a lot of switching between Outlook folders, in particular between Mail and Calendar and Tasks—by clicking the appropriate one in the Navigation Pane. There is, however, an easier and faster way: open multiple Outlook windows!

With a Mail window, a Calendar window, and a Task window all open, you can jump back and forth using [Alt] + [Tab]. Plus, you can set each window up the way you want it.

To open multiple Outlook windows at the same time: in the Navigation Pane, right-click the folder you want to open in its own window. A shortcut menu will appear. Click "Open in New Window". The new window will appear. Adjust the new window to suit your preferences. Then repeat for any other windows you want to open.



Place the Reading pane anywhere you want to, or remove it completely

Reposition Or Remove The Reading Pane

You can position the Reading pane to the right or the bottom of the Outlook window, and you can also turn it off. You can do this individually for each folder—so you can have the Reading Pane at the right in Mail, at the bottom for Contacts, and Off for the other views. It's simple. Open the Outlook folder in question. In the main menu, select View > Reading Pane. A Reading Pane menu appears. Select Right, Bottom, or Off. The Reading pane changes to match your selection. If the Reading pane is visible, resize it to suit your preference by dragging its edge.

Transform Types

You'll sometimes feel the need to create a task based on a message you receive, or turn a task into an appointment, and so on. Usually, you'd do this by manually creating a new item, copying stuff from the old into the new, then deleting the old item. A simpler way is to use Outlook's drag-and-drop capabilities.

Right-click and drag the item you want to transform. If the correct window is visible, drop the item on it. If it isn't, drop the item on the correct button in the Navigation pane. A menu will appear. In this menu, select the option you want. You can copy the item to the new location, or you can move it there. Once you select an option, a dialog box appears containing the information from the original item. Just fill in any additional information and save the item!

Mail Keyboard Shortcuts

Keyboard shortcuts from Outlook 2003 and earlier work in the 2007 version, but there are new ones you can use when working with the Ribbon. Ribbon shortcuts differ from the old ones—they all start off when you press

and release the [Alt] key. Each shortcut here means that you press and release [Alt], then enter the following keys, in the order specified.

- [H] > [A] > [C] Centre the selected paragraph
- [H] > [A] > [L] Align the selected paragraph with the left margin
- [H] > [A] > [U] Turn the paragraph into a bulleted list
- [H] > [A] > [N] Turn the paragraph into a numbered list
- [H] > [F] > [F] Select the Font list. Use [Down Arrow] to open the list, and [Enter] to switch to the selected font
- [H] > [A] > [I] Increase the indentation of the selected paragraph
- [H] > [A] > [U] Decrease the indentation of the selected paragraph
- [H] > [Y] > [S] Start the spell-checker
- [O] > [Q] Open the Zoom dialog box
- [N] > [P] Open the Insert Picture dialog box



Set A Reminder For A Message

When you need to do this for a closed message, in the Unread Mail pane or the Inbox, right-click the message. A shortcut menu will appear. Click "Follow Up". In the "Follow Up" menu that appears, click "Add Reminder". The Custom dialog box will appear. Set the Reminder checkbox. This activates the Reminder date and time boxes beneath the checkbox. Next, select a date and time for the reminder to appear. Choose what the reminder will sound like by clicking the sound button to the right of the date and time boxes. Click OK. You're done.



Search Smarter

Use these prefixes to use Outlook 2007's Instant Search more effectively:

digit

Items containing "digit", "DIGIT", "DigiT", or any other combination of uppercase and lowercase

digit magazine

Items containing both "digit" and "magazine", not necessarily in that order

digit AND magazine

Same as the above. Logical operators such as AND and NOT must be typed in uppercase

digit NOT magazine

Items containing "digit" and not "magazine"

digit OR magazine

Items containing "digit", or "magazine", or both

"digit magazine"

Items containing the exact phrase "digit magazine"

from:"john smith"

Items sent from "john smith", whatever case Mr Smith uses for his name

from:"john smith" about:"digit meeting"

Items sent from "john smith" where "digit meeting" appears in the subject line, body, or attachment contents

hasattachment:yes OR

hasattachment:true
Items that have attachments

attachments:presentation.ppt

Items that have attachments named presentation.ppt, or if the attachment contains "presentation.ppt" in its contents

subject:"digit magazine"

Items whose subject contains the exact phrase "digit magazine", case insensitive

subject:digit magazine

Items with "digit" in the subject line and with "magazine" anywhere else in the document

messagesize:<25 KB

Items whose size is less than 25 KB

messagesize:>25 MB

Items whose size is larger than 25 MB

received:=1/3/2007

Items that arrived on 1/3/2007

received:yesterday

Items that arrived the previous day. As a note here, the search feature recognises the following date values:

Relative dates: For example, "today", "tomorrow", "yesterday"

Multi-word relative dates: For example, "this week", "next month", etc.

Days: Sunday, Monday, etc.

Months: January, February, etc.

received:last week

Items that arrived the previous week

due:last week

Items that were flagged for follow up in the previous week

messagesize:tiny

Items whose size is less than 10 KB

messagesize:small

Items whose size is between 10 and 25 KB

messagesize:medium

Items whose size is between 25 and 100 KB

messagesize:large

Items whose size is between 100 and 500 KB

messagesize:verylarge

Items whose size is between 500 KB and 1 MB

messagesize:enormous

Items whose size is larger than 5 MB

followupflag:follow up OR hasflag:true

Items that have been flagged for follow-up

from:digit (received:1/3/07 OR received:2/3/07)

Items from "digit" that arrived on either 1/3/07 or 2/3/07

received:>=1/3/07 AND

received:<=5/3/07

Items that arrived between and inclusive of 1/3/07 and 5/3/07

sent:yesterday

Items that were sent the previous day

read:no OR read:false

Items that have not been read

subject:digit received:May

Items received from anyone during the month of May of any year, where the subject contains "digit"

startdate:next week subject:digit

Calendar items the following week where the subject contains "digit".

category:digit

Items categorised as "digit"

firstname:john

Contacts that contain "john" (in any case) in the First Name field
Note: Use "lastname" and "nickname" similarly

jobtitle:doctor

Contacts that contain "doctor" in the Job Title field

homephone:2762-9191

Contacts that contain "2762-9191" in the Home Phone field
Similarly, use "businessphone" and "mobilephone", as well as "homefax" and "businessfax"
Also, for searching by contact, you can use "businessaddress" and "homeaddress", with the address enclosed in brackets

birthday:1/1/1975

Contacts that contain "1/1/1975" in the Birthday field ■

Q&A

Your Questions, Our Answers

Away, Prying Eyes!

Q How can I encrypt a folder or file in Windows XP SP2? Can you suggest a free-ware for this purpose? WinZip takes a lot of time to encrypt folders.

Aakash

A You can use Windows' inbuilt encryption for encrypting / decrypting your files. The "cipher" command is used for this purpose. The syntax for encrypting files is as follows, with X as the drive letter (use this command at a command prompt):

cipher "X:\Path /E /A"

Encrypting your drive's contents will safeguard your data from the prying eyes

This will prevent all users—other than the one who encrypted the file or folder—from accessing it. The command for decrypting files encrypted this way is:

cipher "X:\Path /D /A"

If you need more flexibility in methods and speeds of encryption, we suggest FineCrypt from www.finecrypt.net. It will allow you to choose from up to 10 different algorithms, and is freeware.

Seeing Red

Q I have a Pentium 4 3.0 GHz HP 7540 branded system, 82915C/GV/910GL Express chipset family, 80 GB HDD, 256 MB DDR RAM. My display shows red vertical lines all over. This happens even when I change the monitor.

Muzafar Ahmad Ahanger

A Do the red lines appear even during POST (Power On Self Test) before Windows starts? If not, then you need to update your video card drivers to the latest available in order to eliminate any driver issues. Refer to your video card manufacturer's Web site for information on downloading the latest drivers.

If the red lines appear even during POST, it's

time to check your computer's insides. Go through the following checklist to narrow down your problem.

❑ If your video card is not onboard, then remove the card and re-insert it in the slot.

❑ It's also possible that the power supplied to your card might be fluctuating, especially if it uses a connector from your PSU to provide power. If it does, remove it and plug it in again—or use another connector if your PSU has similar connectors. You can also try your display card on another PC to see if the PSU is the cause of the problem.

❑ To eliminate any overheating issues, place a portable fan right next to your open cabinet, directly facing the video card. If the problem disappears, then you know your PC needs more efficient cooling. For tips, take a look at *Going With The Flow*, Digit, January 2007.

❑ Try another video card altogether, even if you have an onboard card. If everything seems fine, then the problem lies with the onboard video. You can then either look to using another video card or changing your motherboard.

We Don't Like No Pirates!

Q I downloaded the setup of Windows Media Player 11, but upon running it, I encounter an error message saying setup was unable to validate that my copy of Windows is genuine. Is there a way to solve this problem?

Atin Bansal

A While there are ways to get WMP11 to work in your situation, we can't assist you in this case—it would be aiding piracy. The only suggestion we can provide is for you to get a legal copy of Windows XP.

When Memory Doesn't Serve

Q I have an Intel 915GAV motherboard with an Intel Pentium 4 2.8 GHz processor, 256 MB of DDR RAM, and an 80 GB SATA HDD running Windows XP Media Center Edition. My computer is on 24/7. My problem is that after a couple of hours, it becomes very sluggish, taking more than a minute to start Firefox! I've tried using some memory clearing programs to free up memory, but nothing seems to work.

It was the same when I had XP with SP2 installed, so I tried changing the OS to Win XP Media Center. I've downloaded and installed all the new drivers for this OS. I also have ZoneAlarm, Avast!, and Microsoft AntiSpyware running in the background all the time. Will increasing the RAM work? If so, what amount would be sufficient? I'm not an avid gamer, but the system seems too slow to work with.

Arun Shanker Prasad

A Firefox taking a long time to start could be due to a large amount of cache stored; clear the cache. Keep it at 50 MB or so.

Your system turning sluggish after a couple of hours could be due to a program malfunctioning over a period of time and using up too much memory and/or CPU time. Look for this in the Task Manager. Memory usage should be in the range of 50 to 100 MB, and CPU usage should be above 50 per cent for the errant program.

More memory always helps in speeding up a computer. 256 MB is too little to work with nowadays, even if you are not an avid gamer. 512 MB will be decent, and 1 GB will help you forget your memory problems for good.

At Sixes And Sevens

Q The configuration of my system is AMD Athlon XP 2200+ with 256 MB RAM. I was running XP SP1, which I upgraded to SP2, and I installed IE Beta version 7.0 from your CD. It did not function properly, so I tried to uninstall it, but I couldn't do so. I then used System Restore and rolled back to IE6. After this I've been facing a new problem—every time I boot my system, I get a warning:

ieplora.exe—Entry Point Not Found

The procedure entry point InternetGetSecurityInfoByURL could not be located in the dynamic link library WININET.dll

Once I press OK, the system reboots. I'm not able to install IE Beta Version 7.0 again because I get a message stating that it is already installed. More importantly, I'm not able to open any .html or .htm files. Whenever I try to open these I get the above message. In addition to this, even Windows Explorer is sometimes unable to open some files. What do I do?

Saravanan K

A The problem stems from the fact that IE7 Beta is known to have these problems; the full release of IE7 should fix them all. We suggest you use an alternative browser, going to the Microsoft Web site, searching for "Internet Explorer 7" (without the quotes), and downloading the full released version of IE7. Installing this should get rid of the problems you've mentioned, and if you uninstall it at a later stage, your system will roll back to IE6

When Monitors Go Bad

Q I have a Pentium 4 1.5 GHz, 256 MB RAM with Windows 98 SE, and a Samsung SyncMaster 17-inch monitor with Intel (R) 82845 G/GL Graphics Controller running at 1024 x 768. One day, my screen suddenly blacked out and my PC stopped responding. On restarting, my screen showed two thick black strips on either side, and the actual picture shrank to the middle of the screen. I tried to get the monitor to work properly by changing resolutions and by using the OSD for functions like horizontal and vertical resize, but without success.

Nilesh

A It pretty much appears that your monitor has given up on you. We suggest you try running your PC using a different monitor to confirm if it's the monitor that's the cause of the problem.

If the problem continues even after replacing the monitor, try running on another video card. If it's the monitor, you're left with no choice but to look for a replacement. If it turns out to be the video card—of which the probability is very low—then your PC can still function with an external video card.

Op-Errant!

Q I run Windows 98 on a 2.4 GHz Athlon XP processor, 128 MB of RAM, and a 40 GB hard drive. I use Opera, and it often hangs; the following message comes up.

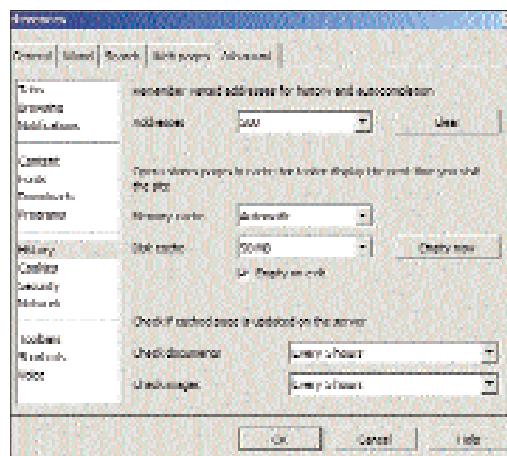
Opera executed an invalid instruction in module OPERA.DLL at 016f:67e2eae8.

Registers: EAX=0065f094 CS=016f
EIP=67e2eae8 EFLGS=00010246

What could be the problem?

Manu Nair

A First, make sure you have the latest version of Opera installed; you can find it on the Digit CDs. If that's already the case, then make sure that the drive where Opera stores its cache has enough free space (at least 200 MB). Next, clear your cache and set it to a small amount (like 50 MB). You can set this by



Set Opera's cache size to something smaller to speed it up and prevent crashes

going to Tools > Preferences, clicking on the Advanced tab, and then clicking on History in the left pane. If none of the above work, you'll have to reinstall Opera.

Resident Evil

Q The path "C:\Documents and Settings\Owner" shows a folder called "Recent", inside which resides a file called G1F89a with a size of 3.39 GB, modified on 10/31/2077! I am sure this is a malicious entry, and I cannot remove it. Help!

Subrata Ray

A Excellent detective work soldier, this is a malicious entry. You haven't mentioned which OS you use, but if you are using Win2K / XP, then restart your PC, press [F8] before Windows starts, and choose "Safe mode with networking"; stay in normal mode if you're using Win 9x.

Update your anti-virus and run a full scan on all drives. Also install Spybot Search & Destroy (it's on the Digit CD), update its libraries, run a full spyware scan, and fix any malicious entries.

If the scans are unable to detect or remove the file, use software such as Unlocker (on the Digit CD) to remove the file.



Unwanted Guest Alert!

Turn your PC into an Intrusion Detection System

Mayur Bhatia

You probably have an antivirus, and maybe a firewall to stop attacks to your box. However, have you ever considered using an Intrusion Detection System (IDS), especially if your box is part of a network? An IDS, unlike a firewall, works passively—instead of blocking traffic, they simply log attacks to a file and alert users. The advantage an IDS gives you over a firewall is that it can even detect attack signatures from within the network. You can create your own custom alerts or download them over the Internet. Systems like Snort are widely used in company networks because of their effectiveness in detecting a huge range of attacks. Snort was originally built for Linux. A Windows version is available, but it requires quite a bit of tinkering—which is what this article is for.

This assumes you have knowledge of the following:

1. Basic DOS commands, and
2. General knowledge of IP addresses and subnets

The Basics

To get started, download both the EXE installer and the rules file (make sure to get the rules file corresponding to your Snort version) from <http://www.snort.org>. The rules file contains the signatures for various attacks, similar to virus definition files. Install Snort and be sure to select the 'I do not plan to log to a database' option unless you want to use an MS SQL server or Oracle database for Snort. Extract the rules file its contents to your Snort install directory. After the install, Snort informs you that it requires the Windows Packet Capture library available at <http://www.winpcap.org/install/default.htm>, so download and install it.

The Real Thing

The first thing you will need to get your hands on is the `snort.conf` file. Assuming you installed Snort in its default location, this file can be found in `c:\snort\etc`. This is where the tweaking starts. The config file, by itself, is made for Linux, which we'll have to edit for Windows. Open the file and scroll down to "Step 2: Configure

dynamic loaded libraries". Change the following lines:

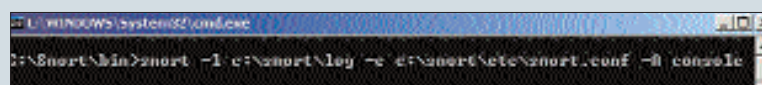
```
Dynamicpreprocessor directory
/usr/local/lib/snort_dynamicpreprocessor/
Dynamicengine
/usr/local/lib/snort_dynamicengine/libsf_engine.so
```

```
to
Dynamicpreprocessor directory
C:\snort\bin\snort_dynamicpreprocessor
Dynamicengine
C:\snort\lib\snort_dynamicengine\sf_engine.dll
```

Now that the basic setup is done to get snort compatible with Windows XP, we need to confirm if it indeed detects attacks. Snort is a command line based program—go to **Start > Run**, type "`cmd`" and hit [Enter]. CD your way through to `c:\snort\bin` and enter:

```
Snort -l c:\snort\log -c
C:\snort\etc\snort.conf -A console
```

We'll spend a few lines explaining the command. The `-l` switch points to the directory where the log files are to be stored, remember that the directory has to already exist—Snort won't create it for you. The next switch, `-c`, points to the `snort.conf` file. The `-A` switch (case sensitive) tells Snort that we want it to run in a specific mode—in this case, console mode. Leave this window open since you will be seeing your alerts over here for now.



Test snort after changing the conf file, the switches are case sensitive

Now to test if it's working properly—for this, we'll need to run a simple DOS (Denial of service) attack and confirm whether snort alerts us on it. Go to **Start > Run**, type `cmd` and enter "`ping -l 65500 -t`" without the quotes and hit [Enter]. Switch back to the Snort window. If all's working well you should see a bunch of alerts in the window. This should ensure that snort is now up and running on your box.

Configure It More

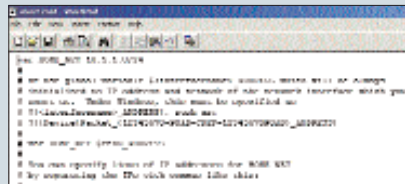
Next, we'll look into some lines in the `snort.conf` file.

Look for the following—
`var HOME_NET any`
This pertains to your home

network, the subnet being in CIDR format and monitors any attacks in the specified range, for example for IP address 192.168.1.1 with a subnet of 255.255.255.0 you would put in -

```
Var HOME_NET 192.168.1.1/24
```

Use a CIDR calculator on the Internet to find out the CIDR for your subnet mask.

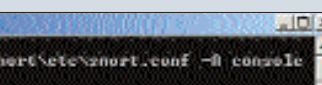


Remember to remove # from the beginning of the file

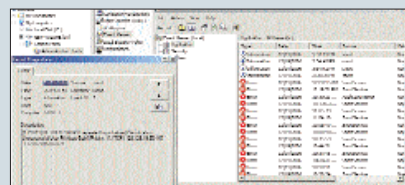
Other things you can configure are to monitor specific services like DNS or SMTP; you can find these further down the file, delete the # at the end of the line if you want the line to be executed by snort.

Finishing Up

The only thing left is to configure Snort so it can be run as a service without you having to go through the command line headache every time. We will need to start snort as a service every time windows boots so that we can see the alerts directly in the event viewer. Use the following command to do so:



Test snort after changing the conf file, the switches are case sensitive



Starting snort as a service

```
Snort /service /install -l c:\snort\log
-c c:\snort\etc\snort.conf -E
```

That's it, you should now see snort in your list of services. And all alerts should be visible in event viewer along with the log files in `c:\snort\log`. Remember, you can download more rules from <http://www.snort.org> for new vulnerabilities. ■

mayur_bhatia@thinkdigit.com

Lame Frames

Q I have an LG MyPC with a 2.4 GHz Intel 845 Processor, 256 MB RAM, and a 40 GB Disk running Windows XP SP2. I also have a Sony Hi 8 handycam. The software on the application CD captures my videos in AVI format, thus eating up loads of space, so I use Windows Movie Maker to capture, edit, and finalise movies from the cam.

When I save them they get saved in WMV format, requiring me to convert them to DAT to view the videos on a CD player. For this I use the videodisc option in Nero and add the WMV files to it.

Nero converts the files to DAT and writes them to CD, which I can view, but these DAT files come with a lower frame rate, and it seems like the movie is running in slow motion even when viewed on a computer. The WMV files

still work properly. What could be the problem? My friend tells me it's because of low RAM.

Anshul "A. J." Joshi

A The amount of RAM is not the cause of this problem—what you have is sufficient for converting WMV files to DAT. We suggest that you save your movies from WMM with a different FPS setting before sending it to Nero to convert to DAT. You can set this when saving the file in WMM; when you come to the page with the radio button "Best quality for playback on my computer", click on "Show more choices", and choose a format with a different FPS from the one you are currently using. You can see the FPS in the lower left corner of the dialog box. Be sure to stay away from the DVI format; this will save the movie in AVI format, but will end up as a very large file.

Second Things First

Q I recently downloaded *Prince of Persia 3D* patch v1.1. But ever since I installed it, *Prince of Persia 3D* gives an error message saying "Insert the 2nd CD-ROM into the drive" even when the second CD is sitting in the drive. What's up?

Nikhil Vemula

A If you have taken a backup of your original discs and are running the game using the backup discs, we suggest you use the original discs to start the game. If you still encounter the problem, go through this diagnostic checklist:

❑ If you have two or more CD drives, insert the *Prince of Persia* disc in the drive that has an earlier drive letter than the others.

❑ Again, if you are using two or more CD drives, disconnect all but one drive, insert the CD, and play.

❑ Uninstall any third-party CD-ROM emulation software like Daemon tools or Alcohol; they can sometimes cause problems with certain CD protection systems (SecuROM in this case).

If this doesn't help, you are left with no choice but to perform a reinstall of the game. And this time, don't apply the patch!

Welcome Woes

Q I use Windows XP Professional. The Welcome Screen has changed to that in older versions of Windows. How do I get rid of this and get the standard Windows XP Welcome Screen back?

N K R Vivek

A The Windows XP Welcome Screen is only available on computers that aren't members of a domain. If your computer is a standalone, then, under User Accounts in the Control Panel, click on "Change the way users log on or off". Select "Use the Welcome Screen". You should now see the Windows XP Welcome Screen at startup.

No COMfort

Q I have an HP Pavilion 6506 with an AMD K6 processor running 450 MHz, a 20 GB HDD, 256 MB of SDRAM, and Win98 SE multi-booting

with Windows XP Professional, to which I upgraded recently. I noticed that there is no COM port in the Device Manager. Checking in Add/Remove Hardware also did not show up anything, and there is no Communication Wizard. Because of this, I can't use my dial-up modem. I want to know why the COM port vanished after I installed XP. All other drivers—for display, sound, etc.—work fine.

Rajesh Sharma

A First update your motherboard and modem drivers to the latest versions available. Also, install Windows XP Service Pack 2. If this doesn't fix the problem, then in the BIOS, disable all your COM ports, boot into XP, restart, re-enable the ports, and again boot into XP. This should take care of the problem.

Out Of Control

Q After installing Windows Vista customizing pack v3 from the *Digit* CD, my system lost the Volume icon in the notification area. When I try to fix this problem using the Sounds and Audio Devices Properties and try to check "Place volume icon in the taskbar", I get the following error:

"Windows cannot display the volume control on the taskbar because the volume control program has not been installed. To install it use Add/Remove programs in the Control Panel".

Under the Audio tab, when I press the Volume button, I get this error:

"Windows cannot execute SndVol32.exe. Use Add/Remove programs in the Control Panel to install it".

Vismay Badiani

A You just need to extract the sndvol32.exe file from the Windows XP CD. At a command prompt, enter these commands without the quotes, where X is your CD drive letter:

"X:"

"CD i386"

"expand -r sndvol32.ex_

C:\windows\system32"

(The path "C:\windows" means the path to where you installed XP; change this if you installed Windows elsewhere)

You should now be able to enable the volume control. ■



Get Help Now!

E-mail us your computing problems along with your contact details and complete system configuration to sos@jasubhai.com, and we might answer them here! Since we get many more mails per day than we can handle, it may take some time for your query to be answered. Rest assured, we are listening!

The Core Of The Matter

Your trusty Agent looks at motherboard-processor combo deals this time—and while Core 2 Duo is it as performance goes, he's not dogmatic about it

I've been busy at home, tinkering with my rigs, trying my hand at overclocking and benchmarking. The performance from my current setup is abysmal enough to require loads of the former, without much luck with the latter.

I decided that I finally needed to upgrade my motherboard and CPU, since I already have two DDR2 memory sticks. DDR2 is the memory of choice for all current motherboards, and DDR-based systems should be steered away from. Incidentally, 1 GB of DDR2 533 MHz memory costs Rs 3,500.

A little research revealed that the performance of Intel's Core 2 Duo series has sent AMD on a price-slashing spree. AM2-based systems offer excellent value for money these days, and you can often get a board and the processor for the price of a Core 2 Duo. However, boys will be boys, and all things said, the C2Ds (as Core 2 Duos are called) are the best-performing options out there.

I had a budget of Rs 15,000 for both the processor and motherboard—something fast, but at a frugal budget.

With my maths done, it was time to visit Lamington Road. I popped into a shop I had visited earlier. I got the mandatory "Aaiye bhaiya." He showed me an ASUS P5B Deluxe for 13,000. This board is based around Intel's P965 chipset, and really is high-end. It features integrated Wi-Fi, six SATA ports, dual LANs, and two PCIe slots that support CrossFire. It has also been touted as an overclocker's delight. Too expensive for me, though.

I asked for something entry level, and he showed me an MSI P965 Neo V, which at Rs 6,300 offers Core 2 Duo support. This board, while a far cry from the P5B Deluxe, has all the features you'd need, and at less than half the price. It seems the Pentium D series have been phased out and this guy didn't have stock, nor could he arrange for any. The cheapest processor I could get was the E6300 clocked at 1.86 GHz—Rs 8,900. I sauntered out and walked into another shop.

Now this guy showed me two Gigabyte motherboards—a G965-DS3 and a P965-DS3. The "G" version has integrated graphics (true for all Intel board nomenclatures) while the "P" version doesn't. The DS series from Gigabyte have an all-solid-state capacitor design, meaning longer motherboard life; most motherboards use a mix of solid-state and electrolytic capacitors. The boards were priced similarly—the 965G costing Rs 9,500 and the 965P costing 9,800. The store guy also showed me a new Core 2 Duo—the E4300. This is a full-fledged Core 2 Duo (1.8 GHz) minus Virtualization Technology, and a lower-speed FSB (800 MHz)

as opposed to 1066 MHz. The price is hardly lower than that of an E6300 (just 150 bucks less), so the latter makes for a better deal.

I was also offered an E6400 for Rs 11,200; this processor clocks at 2.13 GHz. What about Intel boards, I wondered? The D965RY is available for Rs 7,500. It's based on their G965 chipset.

Vendor #3 showed me a board based on NVIDIA's latest 680i chipset. Supporting x16 SLI, the ASUS P5N32-E SLI costs around 14,800. This motherboard was way beyond my budget, but it makes a good deal for someone looking for a high-end, feature-rich and future-proof board. I was shown an E6600 to go with the board. Now this processor is really something. Priced at Rs 15,500, the E6600 runs at 2.4 GHz and offers, at 4 MB, double the L2 cache of the E6300 and E6400. It's also fantastically overclockable. A very suitable combination for the enthusiast, however, the ASUS P5B Deluxe would suit this processor as well.

I also enquired about AM2 options. I was shown an ASUS M2N-MX @ Rs 4,500. Based around a GeForce 6100 Northbridge and an nForce 430 Southbridge, this board supports all the latest AM2 940 pin processors. I was recommended a 3600+ processor costing Rs 6,200. Next up was a 3800+ priced at Rs 7,400. Both these are capable dual-cores, and offer adequate performance for all applications including gaming. The 3800+ is a Windsor core based on the 90nm process. The 3600+ dual core is available in two flavours—an older 90nm Windsor core with an L2 cache of 256 KB per core, while the newer 3600+ Brisbane is a 65nm part, sporting a total of 1 MB of L2 cache (512 KB per core). There were no combo deals available.

Decision time: sure the X2s are cheaper, and so are the platforms supporting them. But I wanted something that would last me a while. I finally decided on the MSI P965 Neo V and the E6300. I paid Rs 14,500 for both, getting a small discount.

To all of you on a similar hunt, I'd suggest a short wait if your need isn't as great as mine was. Intel has planned for a large price drop in late April, and prices here should reflect within a month of that. There is also a Q6600 processor—basically a Core 2 Quad clocked at 2.4 GHz, which promises to be priced at around the 25K mark soon. While it may seem unaffordable now, the higher processors in the Core 2 Duo line-up (like the E6600 and E6700) will surely fall to really affordable levels. Hold your horses just a bit longer. ■

Want more of Agent 001? Turn over to read his answers to your buying questions

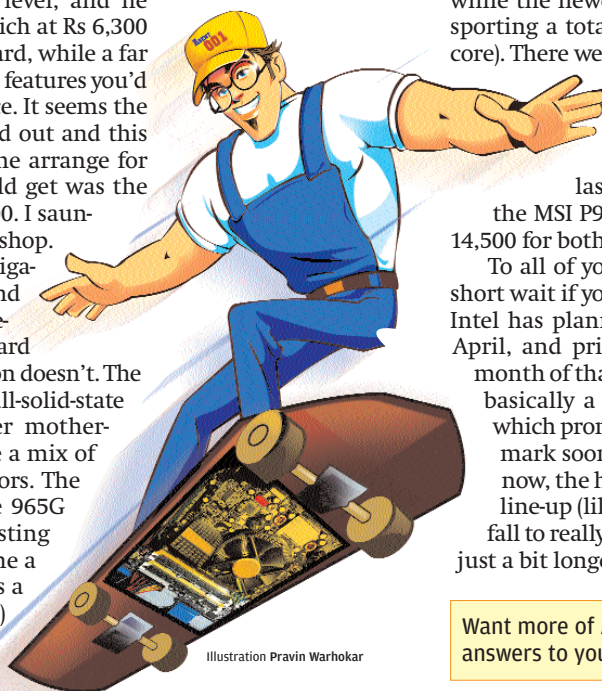


Illustration Pravin Warhokar

Swearing By Nikon

Q I want to buy a Nikon camera for professional use in the range of Rs 13,000. What will be the best configuration with a good lens and flash? Can I also opt for the COSINO camera for professional use?

Animesh Dutta



Your best bet is the Nikon P3, costing around Rs 12,500. I'm talking grey-market rates. It features an 8.1 MP lens with 3.5x optical zoom and all the other features expected from a compact camera. Besides having great build quality, the P3 also features Optical Image Stabilization, which will allow you to take blur-free shots.

Graphics Cards Revisited

Q I have an MSI RS 480-IL motherboard, an AMD Athlon 64 2800+, a 250 W SMPS, an 80 GB SATA HDD, and Windows XP Professional. Now I would like to buy a suitable graphics card at around Rs 8,000 to 10,000. Please suggest a suitable one. If I upgrade to a high-end motherboard, can I use the same card? Will my current SMPS work fine?

K Ashok Vardhan



Your motherboard has certain issues with all NVIDIA-based graphics cards. This narrows down your options to ATI-based ones. For the budget mentioned, I suggest you pick up a Sapphire X1600XT with 256 MB of memory. This card, while falling within your budget, will provide sufficient graphics horsepower. And yes, you can use this card with any high-end motherboard that has a PCI-Express slot.

I recommend upgrading your SMPS to at least 450 watts to ensure stable performance. Brands to choose from are VIP and Zebronics.

Cores Again!

Q I want to buy a dual-core-processor-based system. Besides programming, I will use the PC for DTP work, watching and burning movies, and also a lot of gaming. Please suggest a good configuration. Could you also give me approximate prices?

Aabid Hussain



Your best bet is an Intel Core 2 Duo based system. How apt that I've bought one myself and even written—on the previous page—about the components I considered before making my decision. For your needs I recommend the following:

Processor: Intel Core 2 Duo E6300 (1.86 GHz), Rs 9,200

Motherboard: MSI P965 Neo V, Rs 5,700

Memory: 1 GB DDR2 533 MHz, Rs 3,250

Hard disk: Samsung SP2504C 250 GB SATA, Rs 3,800

Graphics card: Geforce 7600GT (brands—Forsa or Palit), Rs 8,000

I'd recommend a 19-inch widescreen LCD to go with this configuration. This will cost you around Rs 13,500.

The minimum you should consider if price is a constraint is a 17-inch LCD. You'll save around 3.5K.



Ask Away!

Want a tech product, but don't know how to go about buying it? E-mail agent001@thinkdigit.com with your complete contact details, and he might answer them here! Please note that Agent001 only answers purchase-related questions in this space.

A Question Of Essentials

Q I'm interested in the following components. Please suggest the best buy for the price.

- A perfect 17-inch LCD monitor with good viewing angles and good for graphics on a budget of Rs 10,000 to 11,000
- A processor and motherboard with onboard graphics, which can help a great deal in gaming and multimedia; budget Rs 12,000 ~ 13,000 for both

Rishabh Sharma



For a very good 17-inch monitor, you can look at the Samsung 770P. It's a PVA (Patterned Vertical Alignment) panel and therefore costly—Rs 18,500. A regular 17-inch LCD within your budget would be the Samsung 740N, a TN (Twisted Nematic) costing 10K. The former will give you much better colour and contrast, whereas the latter is nearly half its price for the same screen size.

I suggest you extend that budget slightly to go Core 2 Duo. Get an Intel E6300 processor. You can expect to pay up to Rs 9,500. For the motherboard, go with an ASUS P5LD2-VM SE. This will be priced in the region of 5,000.

Modest Needs

Q I want to buy an MP3 player. 512 MB would suffice. My budget is Rs 2,700. If the player has an SD slot, so much the better.

Kunal Tyagi



I'd recommend the Transcend T.sonic 610. It offers decent music playback, a good feature set, and you can get it in 512 MB, 1 GB and 2 GB capacities. The price should be around Rs 1,850 for the 512 MB version, and the 1 GB version is just Rs 2,300—well within your budget.

C2D Mania!

Q I want to buy a laptop with at least the following specifications: Intel Core 2 Duo, 512 MB RAM, weight within 3 kg, 15.4-inch widescreen, 60 GB HDD, and it must have a DVD-Writer. My budget is rupees 40,000.

Prosenjit Mukherjee



Your budget is too low to get a Core 2 Duo processor based laptop. However you could just manage a Core Duo. I seriously suggest you consider AMD Turion options, as these my priced well within your budget. Celeron and Pentium 4 based laptops do not make sense. This is because of both performance and power issues.

Take a look at the Compaq Presario V3000 series. Costing Rs 45,000 and above, they are Core Duo based. Core Solo processors are available on the Compaq C300 notebook series. These will cost much less. HP laptops are all in the range of 50K and above. However, in the 15.4-inch category, you could look at a Dell Inspiron 6400 too. It costs just upwards of 45,000 (base model), and offers a Core Duo. Lenovo's N Series also has a Core Solo model priced at around Rs 45,000. I'd suggest a bit of market research before taking the plunge. ■

TV vs. YouTube

I hardly get time to watch TV anymore. Yes, I will fall mysteriously ill when the Cricket World Cup begins, and have to miss work; otherwise, the Idiot Box is somewhat of a faint memory... Most of my entertainment is portable, watched on the move, or at work, on a computer. YouTube is the new idiot box for most of us with decently wide Net pipes, so I decided to find out whether I was really missing anything.

Robert Sovereign-Smith (robert_smith@thinkdigit.com)



1

I've just got Tata Sky installed at home. Clarity is good, it's stereo, and I like the experience of "Active," which is Tata's version of interactive TV—DTH and CAS seems to actually be better, and worth the extra money. Unfortunately, most of the new TV series seem alien, except for classics like *Friends* and *Seinfeld*.

I love YouTube. I like spending my free time looking at other people making fools of themselves on camera, and what better place to do this than YouTube? There's also intriguing content, like sightings of UFOs or the Abominable Snowman, or music videos by budding artists from around the globe...

2

I'm officially hooked! *Lost* and *Heroes* are two of my favourite shows! Sadly, my job demands that I miss at least two episodes a month. I also found we have too many channels! I have five favourites, but I can't watch them all at once... I'm considering buying a TV-Tuner so I never miss another episode.

The best thing about sites like YouTube is that I'm really king of my PC and Net connection. I watch what I want to, when I want to. It's not going anywhere. There's no schedule. No repeat telecasts to worry about. No TV-Tuners. All that's required is a desire to be entertained, and a few mouse clicks.

3

I've re-discovered *Discovery* and *The History Channel*! I wish I had these channels to watch when I was growing up. I now need my daily dose of edutainment. To be honest, this TV experience is becoming addictive, but I wonder if that's more to do with the fact that I wasn't a regular couch potato—I am fast becoming one though!

I like the lack of censorship on the Net. I don't like being told that although I'm an adult, I'm not qualified to decide what I can or cannot watch! YouTube can be clean family fun, or wacky adult humour; I like being able to make that choice! There's a lack of educational information (the Discovery or History Channel kind), but I did learn a really cool and simple way of folding shirts neatly!

4

I now know why they call this the "idiot box." I spent the whole weekend glued to the TV, did absolutely nothing else, slept only a few hours, and am now suffering a sore thumb from channel surfing, and I feel hung over. That's it. No more TV for me! I'll just wait for the World Cup to begin and then promptly lose control again...

Resolutions and clarity aren't what we expect—not at our speeds at least. But the quality is bearable, it's completely on-demand, and for this very reason, is not addictive at all. But it's on my computer, and so its more of an individual's entertainment solution. I can't get my family to gather round and make some popcorn for a session of YouTube-ing, now, can I?

Entertainment: **3.5/5**



Entertainment: **3.5/5**



AND
THE
WINNER
IS...

I have to say, for me there's no contest: YouTube wins hands down. Interestingly, the majority of my colleagues at *Digit*, and my family and friends, feel TV is the better entertainer. They like being able to sit down with the family and watch an old Bollywood flick! Each to their own, I say.

As far as a conclusion goes, popular opinion forces me to admit that for families, nothing beats the boob-tube. For individuals, YouTube is a very real alternative to the TV when it comes to entertainment. Educational programmes? Stick to Discovery! Sorry, but this is another *Old Way, Tech Way* that ends in a boring draw!



100 Ditch That Wallet!



104 Screening Success



114 Through The Ages

Digital Business

How Technology Can Help Your Organisation

Tech Careers

Driving The Numbers

A career in the broad area of databases can be technically challenging, intellectually taxing, and financially rewarding

Samir Makwana

Any business is dependant on data to a large extent, and data is one of the most valuable assets of any organisation. IT and ITES are used extensively across various industry verticals, and in this info-centric age, data very obviously drives business.

Although databases are managed and maintained in most industry verticals, this is mostly so in Banking, Financial Services and Insurance (BFSI), Telecom, Manufacturing, and E-governance. The first three sectors are growing very fast. Databases in these sectors have become complex, and serve small, medium, and large businesses.

Businesses going online, and real-time transactions, have now increased the requirements for a robust and reliable database infrastructure. A number of different applications and packages such as ERP (Enterprise Resources Planning) and CRM (Customer Resources Management) result in complex databases.

Data has to be managed and maintained well since it plays a crucial role in decision-making. There is a need for a skilled workforce that can manage, maintain, process, and secure databases for the smooth flow of business activities.

Opportunities

Under databases, which is a very broad area, opportunities lie in areas such as software development, administration, management, and the designing of databases. One can jumpstart a career by working in any of these and more to explore broader horizons. The major sectors are banking and financial, manufacturing, telecommunication, education, and retail.

"Database professionals are hot commodities in the IT industry. The service sector needs skills. Many MNCs are outsourcing their IT infrastructure to India. Also, back-end database professionals are an integral and critical part of the IT infrastructure," says Vadiraja Bhatt, Senior Software Architect, ASE-SPEED group, Sybase India.

Scope Of Options

The major areas within databases and allied areas are explained below.

Database Software Development: The profile of the individual here remains the same as in other areas of software development. Good programming, debugging, problem-solving and analytical skills are expected.

Database Administration: The activities here include planning, testing, installing, diagnosing, and maintaining of information in the form of databases in an organisation or any other institutional body. Primary tasks here involve managing databases, developing reports, optimising the computer sys-

Illustration Pradip Ingale





Certifications are important tools to show the prowess in the field by any person who holds them and gives recognition to stand out in the crowd"

Davey Brooks
Managing Partner -
Professional Services,
for South-East
Asia/India
Teradata - A division of
NCR Corp.

tems used for storing databases, diagnosing, performance optimisation, regular backups, database optimisation over mainframes, and ensuring database efficiency.

The people one works with are the management, IT professionals, end-users, system analysts, and technical support.

In any strategic decision relating to purchase of systems or equipment, or applying solutions, advice from these professionals is needed.

Data Security: Preparing data security plans, selection of appropriate tools, deployment of security tools, regular data backups, and selection of appropriate media for data is the responsibility of those in this segment.

Database Designers: Data helps in decision-making for business activities; for that, the system needs to be efficiently designed. A lot of data is accessed online in real-time, for, say, retailing. Data structures are to be designed such that there is no flaw at any end, and the structure has to be flexible enough to incorporate expansion.

Solution Architects: Those employed in this area interact with clients and derive solutions for their businesses. For example, in the case of the banking industry, solutions for real-time banking issues, data mobilisation and safety would be provided by the solution architects. They gather the client's requirements, derive appropriate solutions, document the solutions employed, and ensure solution integrity.

Data Warehousing, Business Intelligence, and Data Mining: See box *Specialisations*.

Entry Into The Field

The industry seeks candidates with a fairly good academic record. Candidates should be from the IT or engineering backgrounds. According to industry guidelines, graduates (BCA/B.E./B.Tech.) and post graduates (MCA/M.E./M.Tech.) in the field of computer science or computer engineering remain the most sought-after. In certain cases, students of mathematics are preferred.

During the academic tenure of pursuing an IT or engineering degree, subjects relating to database management systems, data structures, and database design need to be studied. A selection of subjects that covers DBMS packages and programming languages has to be made by both IT and engineering students.

"Formal education is fairly important and essential; also, cases of non-IT people who enter and become successful are very rare. Technical education strengthens the basic fundamentals about the job," says Seema Ambastha, Director-Sales Consulting (Database Technologies), Oracle India Ltd, who offer solutions for businesses—databases, middleware, business intelligence, business applications, and collaboration.

One's institution must be recognised by the All India Council for Technical Education (AICTE). The AICTE is a statutory body that co-ordinates development of the technical education system across the country. It becomes an individual's responsibility to check for the recognition of the educational institutes with the AICTE before applying for admission. Also, the electives being offered should be confirmed beforehand.

"Certifications are positively recommended. Today, business clients appreciate people with certifications. Be it on the technical side or the business side, they get recognised for their abilities and stand out from the crowd. For those into business intelligence, business/commercial knowledge is necessary at any level of the hierarchy," says Sanjay Deshmukh, Business Development Director—India/SAARC, Business Objects, who specialise in business intelligence services.

India has a number of global DBMS software vendors who offer education and training for their software packages. The major ones are Oracle, IBM, Sybase, and Microsoft. The courses offered are from the entrant level to the specialist level, with specially-designed modules for each level. These professional certifications add value to your résumé.

For non-IT people, options are available in the allied fields of databases such as data mining and business intelligence. A post-graduate degree equivalent to Master of Business, or a commercial background with specialisation in a domain such as finance, or a Chartered Accountant degree, are required for analytical functions for positions such as Financial analyst and budgeting.

"There are exceptions in every field. Students from non-IT backgrounds can indeed enter this arena. For such profiles, good commercial or business knowledge is necessary for dealing with clients and organisations from different verticals," says Davey Brooks, managing partner—professional services, South-East Asia/India, Teradata (a division of NCR Corporation), which offers enterprise data warehousing and analytical solutions.

Skills

The basic skills required of a data professional would be expertise over any one area of database technology. The usual soft skills such as the ability to work in a team are also required. For the consultancy and business solutions functions, skills such as inter-personal and intra-personal skills are essential.

Testing Times

While hiring candidates, organisations look for three criteria—education, experience, and professional credentials. For those just starting off, fundamentals relating to database management systems and general aptitude are tested. At the time of hiring, aptitude tests that check the aspirant's fundamentals and basics relating to DBMS are conducted. Organisations consider the project(s) opted for during the academic tenure. Across industry verticals, organisations into development of DBMS software necessarily scrutinise academic records, projects undertaken, and DBMS fundamentals.

Training

Training sessions assume that freshers have hands-on experience with DBMS applications and platforms. However, software vendors and software development organisations have training modules designed according to the experience and interest of the employees.

“Training at our organisation is carried out for fresh folks for their optimum performance and upgradation of skills. We have different training modules such as class-based, Web-based, and on-the-job kind of training,” informs Brooks. The duration of the training period is usually between two and ten weeks, depending upon the nature of the training module.

“We at Oracle have special training modules designed for three levels—Fundamental, Advanced, and Specialist. All are short-term, intensively-designed modules for those who want to have in-depth knowledge and hands-on skills with DBMS products,” says Ambastha.

Designation And Remuneration

The designations awarded depend on the performance and capabilities of the employee. They differ across organisations and industries. The fields branch out into technical and business-oriented profiles at the middle level, where one can decide upon an area of expertise.

Entry Level: In programming, be it a small application or utility or a big ERP or database package, the majority of the designations remain the same throughout the industry.

For database management, software programming and development, administration, designing and solutions, consulting and business solutions of DBMS software, the growth path is similar to that of in other professions.

At this level, most tasks require core-to-field kind of activities like programming, coding, deployment of and working with database applications, end-user support, data backup, and more. Posts awarded in programming would be associate software engineer, software engineer, etc. These people will be part of a project team, but handle specific modules independently.

For database administration, the designations awarded would be technical support, technical expert/specialist, solution architect, designer, and so on. Similarly, for a consulting domain like data warehousing, business intelligence and data mining, one can be a consultant (technical or business), research assistant, assistant analyst, and such.

At this level, the average time taken to reach one position up would be a minimum of one to two years. The average monthly salary a fresher can expect is between Rs 20,000 to Rs 40,000.

Middle Level: As one moves higher, the area of expertise branches out into technical or business-related; one has to choose. Database professionals at these levels would be in charge of the testing and validation of functions such as design, solutions, data backup, security, etc. They lead a team of juniors.

The majority of individuals at the middle level lead single or multiple projects, resolve technical issues, scope out the functionality of databases, estimate resources, derive solutions to technical and business issues relating to databases, and so forth.

Designations awarded to those in software development, database administration, solutions, design, and architecture would be senior software engineer/developer, project lead, senior data architect, senior solution architect, and

Specialisations

Data Warehousing is the collection of non-volatile information of business processes such as the cost per unit, expenses incurred per employee in a particular year/month/quarter, etc., so that they can be extracted, analysed, processed, and used for further understanding of the data. It can also be seen as the technique of gathering data and maintaining it for business purposes such as purchase, payment, and other strategic decisions.

Business Intelligence (BI) is a process where programs and systems are used for gathering, storing, analysing, providing access to, and retrieving large data within an enterprise. The databases are used for

strategic planning and analysis of the available data at various levels to aid decision-making. Solution support activities such as online analytical processing (OLAP), statistical analysis, forecasting, query reports, error reporting, and decision support can be performed using BI applications.

Data Mining refers to the process of drawing useful data patterns and information from large databases using mathematical techniques. From large databases, the known relationship patterns such as consumers' common interests, their buying behaviour, etc. are extracted and then analysed for better decision-making and other strategic activities.



“The appraisal and promotions are procured by individuals as per their ability based on their assessment of work performance and contribution to a project”

Seema Ambastha
Director - Sales
Consulting (Database
Technologies)
Oracle India Pvt. Ltd.

such. For consultants in data warehousing, business intelligence, and data mining, the designations would be senior consultant, consulting head, head architect (solutions), and so on.

The time taken to advance to the next level is three to five years, and pay scales are Rs 45,000 to Rs 80,000 per month.

Senior Level: Here, the individual would be responsible for and lead all the teams below him. He/she would lead a product group—or group of solutions—to deliver cutting-edge solutions in accordance with the demands of clients from different industry verticals. These professionals take all strategic decisions relating to projects to be undertaken or those already running. Designations awarded in development, database designing, solution architecting, and administration of databases would be director of engineering, vice president (database technologies), or country head/manager (database package).

Consultants are designated the domain consultant, principal consultant, president/vice president (consulting), and so forth. The average time take to get here is more than six or eight years in a particular domain. Remuneration starts from Rs 85,000 per month, with the upper limit decided by the organisation.

Summing It Up

According to Gartner, the global DBMS market will generate \$13.2 billion (Rs 61,400 crore) by 2009, and the DBMS software market has a compound annual growth rate of 10.3 per cent, bringing the market to \$1.3 billion (Rs 6,000 crore) in new license revenue by 2009. One can sum up from the figures that there is immense scope in databases as a career option.

In India, many multinationals are bringing in their operational centres such as country offices, research labs, and such. And there will always be a dearth of qualified and skilled database professionals.

We've said the scope is immense, that the remuneration is attractive, and we've indicated the field is challenging. So what does a career in databases sound like? ■

samir_makwana@thinkdigit.com

No one likes bills. Especially when there's a lot to be shelled out, and when you have to stand in a queue to pay them. To our relief, a number of bill payment options have sprung up in recent years: one can now pay by cheque, Internet banking, telebanking, bill collection, cash cards, or even using a mobile phone.

Exploring this untapped potential are a number of companies coming up with innovative payment solutions. Payments by mobile is one of these, part of the evolution from e-commerce to m-commerce—mobile commerce.

The use of credit cards in India is nowhere as much as it is in Western countries. But even though the Internet penetration is high in urban India, people don't seem to be willing to make purchases online. This is fuelled in part by credit card fraud and the press coverage it gets; many people would never reveal their card number online. Some are even wary of handing over a card to a restaurant waiter, for example!

The Evolution Of PayMate

Every month, over four million users are added to the number of mobile phone subscribers in India. According to the Telecom Regulatory Authority of India (TRAI), more than 65 million mobile phone subscribers were added in the year 2006, and there is a total of nearly 190 million mobile users in the country. A mobile is part of almost every second home, and is now being looked at for purposes beyond communication and entertainment.

Ajay Adiseshann and Probir Roy, founders of Corusant Tec, a mobile content developer and



Illustration Chaitanya Surpur
Photograph Sandeep Patil

Ditch That Wallet!

You can now pay bills using a mobile phone in India—the wave of m-commerce is upon us!

Samir Makwana

No comprehensive statistics are available for individual credit card fraud cases, but it is more than clear that consumers want a more secure payment option.

With the boom in the telecom industry and with big players in the market, mobile commerce has passed the nascent stage. Payment via mobile phone, which has existed for a while in developed countries, is now possible here as well. Not too many merchants might be accepting mobile payments as of now, but the idea is catching on.

services provider, founded PayMate India Ltd in July 2006. PayMate is a mobile commerce solution provider. PayMate's payment solution works on the "single SMS" model, wherein a registered user can make payments to a PayMate accredited merchant via a single SMS.

"Today, the mobile phone is part of everybody's life as a device for communication and entertainment. People use VAS (Value Added Services) from the content providers and mobile operators.

"We foresaw the potential of mobile phones as a commercial tool for transactions and

founded PayMate. Our mobile payment solution is simple to use, secured, and it's an absolutely hack-free model," says Adiseshann.

As of now, this payment solution is available for Citibank bank account holders, and can be used by credit card as well as debit card holders. In the near future, PayMate services will be available to customers of other major Indian banks.

"Mobile payment is a new payment option we have adopted along with credit cards, Net banking, cash on delivery, and cheque collection. We're using mobile payment for our e-commerce platform as it is simple to use, and more important, it offers security against disclosure of credit card details. We feel that this mode of payment would be adopted everywhere for shopping and other commercial transactions as well in the near future," says Manish Agarwal, Vice President, Marketing, Rediff.com.

Initially, PayMate tied up with leading online portals—Rediff.com, Naukri.com, Jeevansaathi.com, Travelmartindia.com, India-times.com, Makemytrip.com, Cleartrip.com, and Fabmall.com. Gradually, their merchant base has expanded to over 2,500 merchants accredited with PayMate's mobile payment solution. PayMate's merchant base can be accessed at www.paymate.co.in.

The Working Model

PayMate's mobile payment solution requires just a basic mobile phone with SMS service. One can enter a transaction from anywhere. As of now, Airtel, BPL Mobile, Hutch, and Reliance customers can register with PayMate.

There's no SIM upgrade, GPRS connectivity, or installation of an application required for mobile payment using PayMate. Except for the registration process, all transactions happen via SMS. PayMate services are only available in English.

Citibank customers need to send an SMS "PAYMATE" to CITI (2484). The customer will receive a call back, and registration details would be sought.

Upon completion of registration, the customer will receive a four-digit PIN number as an SMS, which can be changed later, also via SMS. This PIN number is required for all future transactions. Merchants are registered with PayMate and the bank. For pursuing transactions, the merchants would need a mobile phone or a PC with Internet connectivity.

The merchant logs in to his account at the PayMate Web site, and feed in the phone number of the customer and the amount to be debited. Only the mobile number is required to be given to a merchant by the customer.

Within a minute or two, the person paying receives an SMS message seeking approval for the transaction with the amount to be paid to the merchant. "The initial waiting time has been set as three minutes, in order to compensate for possible delays in receipt of messages due to network congestion or any other errors," says Adiseshann. The SMS has to be replied with the command words "PAY [Alpha Code] PIN" within three minutes. The Alpha Code is a unique code that is auto-generated



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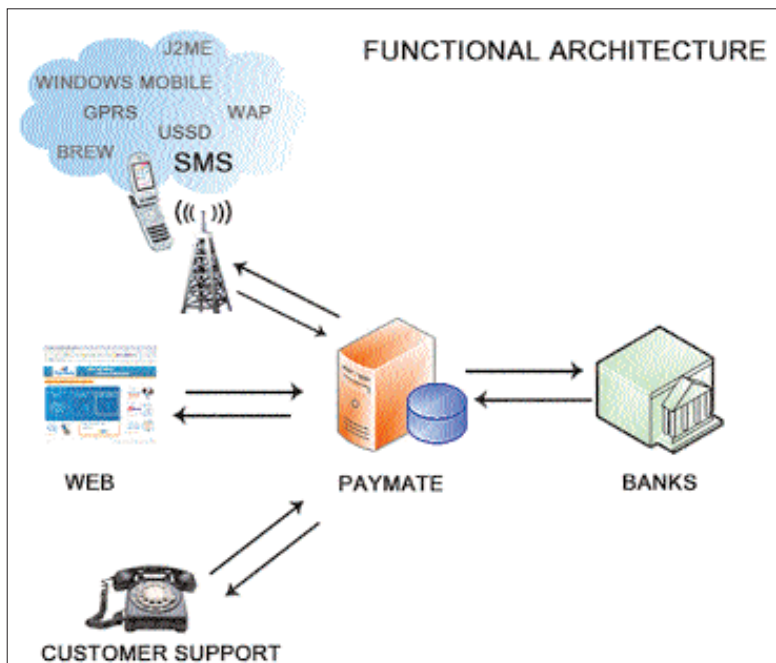


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A dumbed-down look at all that goes on in and around PayMate—from the collaboration with the banks to interacting with your cell phone

for each transaction. It is sent you with the payment request message. If the message is not replied to within three minutes, the transaction process has to be restarted.

The SMS of the payment to the PayMate-accredited merchant is received by the bank, which debits the account after the phone number is verified. For completion of the transaction, a confirmation SMS is sent to both customer and merchant.

The PayMate service is free, and no monthly or yearly charges are levied. Customers are charged only by the mobile service provider for the SMS. Currently, the ceiling for transactions has been set to Rs 5,000 per transaction and Rs 10,000 per day. A certain percentage of the transaction is paid to PayMate by the accredited merchant as a fee.

Safety And Security

The payment model of PayMate has been prepared in accordance with the security recommendations by Ernst & Young, a firm involved in accounting and professional advisory services. An individual has to reveal his or her credit card details only once—while registering with PayMate. (For all payment transactions with merchants, only the mobile number is required—no confidential information needs to be disclosed.)

If the individual's phone is lost, the bank as well as PayMate are to be informed so as to disable any transactions through that mobile

The solution is safe, since no credit card details are disclosed throughout the transaction

number. The solution is safe, since no credit card details are disclosed between either of the parties throughout the transaction. Even for a PIN number change, the details go to the bank's and PayMate's servers.

The Future Of Mobile Commerce

As per the Mobile Value Added Services report prepared by IAMAI (Internet and Mobile Association of India) and IMRB International, the Mobile Value Added Services Industry will worth about \$1 bn (Rs 4,560 crore) in 2007.

"At present, our services are at very nascent stage, and we look forward to develop this mobile commerce ecosystem. Shortly, we'll roll out more services and solutions based on our experiences and learning over time. Our next target is the retail industry, which is the next big thing. From our end, an EDC Machine will be given to the accredited merchants, where they can key in the mobile number and the amount, which prevents any disclosure of the credit card details of the customer. The device is almost ready and will be rolled out within a few weeks," informs Adiseshann.

Collaboration with merchants from different industry verticals and services from other banks to roll out PayMate's services will be possible in near future. At present PayMate wants to develop the ecosystem—expand to various sectors where a number of merchants can provide consumers with the PayMate payment model.

Other mobile payment solutions are available, too, like Itz cash card and JiGrahak. Intrex India offers the Itz cash card, by which anyone can make payments for online retail and offline merchants and even telecom service providers. The card is pre-loaded with a certain cash amount, with an account number and a PIN. JiGrahak is a service for which software has to be downloaded to the phone; one can then feed bank account or card (debit/credit) details and then select a payment option for transactions with PayMate-accredited merchants.

In Conclusion

"Mobile payment solutions are in their infancy and a lot of companies are looking at different solutions to deliver safe and secure payment solutions on the mobile. As more and more players invest in technology and innovative solutions, this could be a good payment option for consumers in the near future," says Agarwal.

Some wonder about the point of using a mobile as a wallet: why not just use credit cards—the security standpoint apart? Well, what about when you've just got pizza delivered and you don't have cash... the delivery boy isn't carrying around a card-swiping machine with him, is he?

To buy movie tickets, shop at malls, pick up CDs, book air tickets, donate to a temple, or enter into any transaction at all for that matter, mobile payment is gradually being made available—a tangible sign of the state of m-commerce in the country. ■

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Screening Success

Great Ideas are nothing but decent ideas that have been presented really well. Dim the lights ladies and gentlemen...nine projectors in test!

Michael Browne

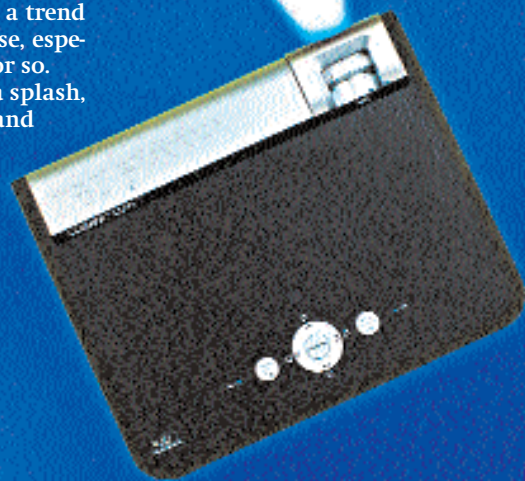
Be it a PowerPoint slide of the next big idea or a sales report, it's the presentation that matters. Because the devil really is in the details! How many times have you come across a really great idea falling short of appeal because of inefficient communication? And what else is a presentation if not an effort to psyche (for lack of a better word) others into your way of thinking?

And that's what a projector is—a communication tool for the discerning professional, which gets across the message like no words or laptops ever can. Gone are the days when boardrooms were impressed by presentations on a puny 15.4-inch screen. If you want to get your point across, you need

emphatic statements, strong convictions, and, of course, one of these test subjects!

Projectors these days aren't exclusive to the corporate realm, and their use in building a home entertainment system is a trend that is sharply on the rise, especially over the last year or so.

LCD TVs have made a splash, and so have the newer and bigger plasma screens.



These are typically viewed as entertainment projectors because of the superior resolution they provide; however, they don't cost as much as you'd think. With businesses using Flash animations and even 3D rendering software for presentations, a multimedia projector is well worth the little extra.

There will also be those users (albeit one in a thousand of our readers) who will want to, or be able to, afford to use a projector to play games. Yes, hooked up to a capable PC, most XGA projectors today are capable of very acceptable results. We tried playing a number of games on all the projectors, and a couple of our gaming freaks actually started creeping into the *Digit* Test Centre for some late-night action!

Gone are the days when a business-grade projector was just that, and totally unsuitable for multimedia purposes. Today's projectors are more suitable to a variety of tasks.

While a 103-inch screen may mean visual utopia, the prices of such screens are astronomical. Enter the projector... As you will see all throughout these tests, some of the projectors we received make for very suitable components for a full-fledged home entertainment system.

Most corporate users will feel that a costlier home-entertainment projector isn't necessary for presenting reports. With escalating costs, it isn't necessary to add one more, is it? Wrong—as with all technology, the binary of advancements and falling costs is strongly in place.

Most projectors available today are XGA (capable of a resolution of 1024x768).



Acer PD-726W

The Black Knight

Perhaps the best looking of the test candidates, Acer's large PD-726W comes in an attractive yet sober black-silver colour tone. The build quality is laudable.

One sore point—the remote will not interface with the projector if you are seated directly behind the unit. To use the remote from behind the projector you'll need to elevate the remote or come to either side (left or right) or in front of the projector. The second gripe is with the remote buttons—they are too hard; a complete lack of tactility.

The minimum throw distance of 2.85 metres is on the high side, not suitable for confined spaces.

The PD-726W offers connectivity galore with Component, S-Video, RCA, D-Sub, DVI, and even HDMI. Network connectivity is via RJ45 and Wi-Fi. Interfacing with the device is possible through RS-232 and USB (both USB A and B type connects are provided in the package).

The menu interface is good, and the PD-726W has a lot of extra networking options. It allows specifying an IP address to which a message can be automatically sent if anything goes wrong.

The PD726W was the brightest amongst all our tests subjects, while not suffering contrast deficiencies (2500:1).

During calibration the 256-shade intensity screen gave excellent results—there were no transitions visible from changes of intensity of a particular colour. The PD-726W renders reds the best from the lot that came for testing. It performed well in the presentation tests and should make a very capable boardroom partner. However, we didn't like the rendition in photographs: our test photos were missing some of

BEST BUY
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the finer details. Our business readers will be happy to note that text reproduction is sharp.

Halos that appeared around extremely light colours would disappear by tuning brightness and contrast settings, but we do not adjust anything once we finish calibrating, so the PD-726W lost out here.

The PD726W makes for a great movie projector with sharp image rendition and great contrast. Throw a couple of games at it and it'll shine even more. *F.E.A.R.* looked virtually as crisp as it looks on a desktop monitor!

With some sterling scores across the board, our Best Buy Gold Award is Acer's, as their PD-726W smokes out the other contenders, though there were some close scores. It's suitable for most users, and will handle business and multimedia applications equally well. Although its heavy with corporate features, the inclusion of hardcore multimedia features such as HDMI makes Acer's PD-726W top dog in the entertainment sphere as well.

Epson EMP-1715

Feature-rich, fancy-free!

Epson's EMP-1715 was the definitive plain-jane in our test labs. Grey and beige don't do much for style, while the boxy contours stick to the stereotype. That's not to say the EMP-1715 is any less a projector.

It's built well; the only problem with the structural design as far as we could tell was the air inlet, which is placed at the bottom. This would surely restrict or inhibit air flow, especially when the projector isn't elevated. We'd have preferred the air intake on one of the sides to remedy this. The EMP1715 did get rather hot during our tests. All projectors heat up; this one seemed a few degrees higher than the others.

Epson focuses on the business segment with the EMP-1715, and this is apparent with the limited video connectivity—D-Sub, S-Video, and RCA. The common RS-232 interface is also absent; thankfully, USB connects (A and B types) are provided.

Wi-Fi makes an appearance on the EMP-1715. The options are

very good; once again, diagnostics and IP messaging (in case of problems) is possible. RJ45 connectivity is absent, though.

The EMP-1715 has a reasonably long throw. Epson claims a maximum throw distance of 12.1 metres. This makes it more suitable for larger conference rooms. It can also be used in tighter spaces, with a minimum throw distance of 1.2 meters.

The DisplayMate Suite performed reasonably well on the EMP-1715, except for the colour tests. We had problems with streaky blacks in the black-level shift test. The EMP-1715 also has problems with rendering colour transitions. For example, when moving from lighter to darker shades of red, the gradations were clearly noticeable instead of the smooth transition one expects.

When it came to our PowerPoint slide tests, text wasn't as clear as we'd have wanted it—there was noticeable blurring



around the edges. Although the text and graphs were indeed clearly legible, we expected much more. Photograph quality was all right, though detail in darker colours was lost, which smacks of an inadequate contrast ratio.

Movie-watching was fun on the EMP-1715—good colour rendition, and none of the blurriness or tearing (a display anomaly) that usually happens in fast action movies. However, it wasn't near the NEC NP40 and the Acer PD-726W as sheer picture quality and clarity go.

Gaming isn't much fun on this projector. The lack of contrast and detail is immediately noticeable, and this is a problem for the latest crop of games.

Epson's EMP-1715 is a business oriented projector. It's not much in the way of a home entertainment device. Unfortunately, it has a few quirks with performance in its own area—the business tests.

At Rs 1,54,000, the EMP-1715 commands too hefty a price tag for the performance it places at your disposal. It's a feature-rich projector that fails to project itself past that significant "must-buy" line.

How We Tested

Test Bed

Processor	Core 2 Duo X6800
Motherboard	Intel D975XB2
Memory	1 GB DDR2 533 MHz
Graphics Card	GeForce 8800GTX
Hard Disk	Seagate SATA 2 400 GB

Test Conditions

1. Zero per cent ambient lighting (completely dark room)
2. No zoom used during testing (except when testing for zoom quality)
3. Projected image size was kept constant throughout the tests
4. Keystone correction was avoided unless absolutely necessary (because it results in loss of quality)
5. DVI connectivity was used. In case of lack of digital connectivity, D-Sub was used
6. Each projector was kept on for 15 minutes more than their rated warm-up time before the pre-test calibration began. This was done to ensure the best possible colour rendition
7. Default settings were not used. We chose to calibrate each projector to get the best visual quality possible

Features We Looked At

1. Common paper specifications like Brightness and Contrast Ratio. While disbelieving paper specs, we went on to check practically in our tests whether each of the test subjects lived up to the claims made
2. Number of preset modes, and keystone correction (and its effectiveness)
3. Connectivity options (such as DVI, D-Sub, S-Video)
4. Quality of optical zoom

5. Weight of the projector (portability is an issue, especially with business-class projectors, while home audiences will look at visual quality rather than size)
6. Control options (inbuilt mouse, remote control with laser pointers, etc.)

The Gamut Of Tests

1. DisplayMate Video Edition: A well-known video evaluation tool. DisplayMate is also used to test monitors of all sorts. We used this software to evaluate visual quality and also to check for any display anomalies. We tested various parameters like contrast, colour accuracy, brightness, moiré, resolution, focusing, streaking, and ghosting.
2. Picture Quality Tests: We used a set of high-resolution bitmap and Photoshop image files. We checked for colour rendition and also gradations in colour. The subject remained constant, but we used varying levels of colour and even greyscale.
3. Presentation Tests: We used a PowerPoint presentation that consisted of text and graphs. We checked primarily for the readability of text, and after that, the reproduction of colours and detail in the graphs.
4. Animation Tests: We used a high-quality DVD copy of *Shrek 2*. This enabled us to verify accurate colour rendition, and the ability to display intricate details. Our non-animated movie was *Alexander*, which contains sufficient matter to accurately judge the projector's ability to provide a satisfying theatre experience.
5. Game Tests: We used *F.E.A.R.* as a benchmark. The game was run at with 4x AF and 4x AA enabled and all visuals set to their maximum values. We used the projectors' native resolutions.

NEC VT590

Jack and master...

The VT590 from NEC is part of their entertainment range. It's an XGA-supporting LCD projector decked in attractive piano white. Build quality is very good, and the body feels sturdy. As opposed to some of the boxy models we received, the VT590 is also curvier, and will suit business and home environments looks-wise.

A fully-functional remote interfaces with the device, and one thing immediately noticeable was the clear demarcations near the connectors at the rear—clearly visible in dim lighting, which is helpful. We've come across a couple of projectors (the BenQ MP611c comes immediately to mind) where we could make out nothing of the legends of each connector unless we turned on our overhead lights. Such minor points add up; manufacturers should think from a consumer's perspective—like the difficulties



in setting up the projector in less-than-ambient lighting.

The VT590 adds a thoughtful on/off switch, something we missed on earlier models. It loses out on Digital Video (DVI) and PC stereo connectivity. Also absent are the USB interface and wireless connectivity.

After calibrating this beauty, we fired up the DisplayMate suite first. We immediately hit resolution problems with the horizontal bar tests. There was a noticeable lack of resolution, and even the solid bar lacked uniformity. The remainder of the test suite passed uneventfully.

Corporate users will be interested to note the lack of detail in text during our presentation tests. This projector is not for you if you plan on using a lot of text applications. These problems persisted in MS Word and even while viewing PDFs. Its not that image quality was bad overall; icons were very decently viewable—it's just the text that appeared somewhat blurry despite repeated attempts at calibration.

The NEC VT590 resurged itself somewhat in the multimedia tests with good performance throughout our test movie as well as in *F.E.A.R.* where the visuals were definitely acceptable.

Priced at Rs 84,000, the NEC VT590 doesn't showcase itself as a strong performer in any one domain. It follows the jack-of-all-trades stereotype and ends up being mediocre at a few tasks and decent at a couple. Not enough for us to recommend it to the serious-minded business or home user.

NEC VT695G

The better twin

The bigger brother of the VT590, the VT695G ups the lumen count by 500 (to 2500 lumens), and adds DVI and PC stereo connectivity. The models look identical, though, and stickers aside, you wouldn't be able to tell them apart.

The VT695G sports a much more forgiving lens that has a wider throw range than its sibling (0.7 to 10.7 meters).

It seems NEC addressed, in this model, all the problems the VT590 has, at least as far as DisplayMate goes. The VT695G breezed through all the tests with no real complaints. Good resolution and a contrast ratio



that seemed somehow better than the VT590 (despite the fact that the specifications are identical on paper).

The VT695G is an ideal corporate projector with great image rendition during the PowerPoint

tests; the text remained clear and bar-graph colours appeared as vivid as they should be on-screen.

On to the multimedia tests: movie-watching is a real treat on this projector, with all the sharpness you'd expect from a large-screen TV. There was a problem with the reds, which were oversaturated after calibration. Toning this down resolved the problem and we

verified this, but we do not fine tune the projector settings once we've calibrated them, so

this was noted as a problem, albeit a small one. The VT695G will suit gamers too: there's adequate contrast and sharpness around to ensure all the latest games like *F.E.A.R.* and *Oblivion* look their best—great level of detail.

Priced at Rs 22,400 more than its twin, the NEC VT695G offers a good mix of performance and features for all user groups. It also adds a couple of features over the VT590 which further sweetens things.

Contact Sheet—Projectors

Brand	Company	Phone	E-mail
Acer	Acer India Pvt Ltd	080-5219520	NA
Benq	Benq India Pvt Ltd	011-43531718	venkat.adiraju@benq.com
Epson	Epson India Pvt Ltd	80-3051 5032	premijith@eid.epson.co.in
NEC	Solutions India Systems Pvt Ltd	022-66924499	sandhya.m@sispl.co.in
Panasonic	Panasonic Asia Pacific Pvt Ltd	022-40032300	S.YEDERI@npi.panasonic.co.in
Sharp	Sharp Business Systems (I) Ltd	011-24631313	kray@sharp-oa.com
Zen	H T Implex	022-66587586	zenthemaster@rediffmail.com

ZEN RANGE LCD PROJECTOR



Complete Over 10000 hours



Input: TV, VIDEO, VGA, S-VIDEO, plus Channel TV, Laser Built in



Manual Keystroke connection



Dual Cooling FANS



Manual Focus Adjustment



Technical specification		ZEN RANGE LCD	
Model	PT695G	• 10000 hours lamp life	• 10000 hours lamp life
Lamp life	10000 hours	• 10000 hours lamp life	• 10000 hours lamp life
Resolution	1024 x 768	• 10000 hours lamp life	• 10000 hours lamp life
Light source	100W UHP lamp	• 10000 hours lamp life	• 10000 hours lamp life
Lamp life	10000 hours	• 10000 hours lamp life	• 10000 hours lamp life
Power	100W	• 10000 hours lamp life	• 10000 hours lamp life
Weight	1000g	• 10000 hours lamp life	• 10000 hours lamp life
Dimensions	100mm x 100mm x 100mm	• 10000 hours lamp life	• 10000 hours lamp life
Input	TV, VGA, S-VIDEO	• 10000 hours lamp life	• 10000 hours lamp life
Output	TV, VGA, S-VIDEO	• 10000 hours lamp life	• 10000 hours lamp life
Features	10000 hours lamp life	• 10000 hours lamp life	• 10000 hours lamp life
Warranty	10000 hours lamp life	• 10000 hours lamp life	• 10000 hours lamp life

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NEC NP40

A diminutive powerhouse

The smallest of the NEC trio, the NP40 is a DLP projector, sporting an excellent on-paper contrast ration of 1500:1. What we immediately liked was the tiny footprint—the NP40 was by far the smallest projector we received this year. Build quality-wise, there are no complaints, and the NP40 feels sturdy. The dull grey finish won't win many hearts, yet the overall tones aren't displeasing.

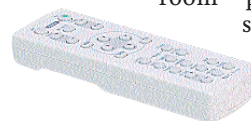
NEC has positioned the NP40 as a multimedia projector. We were therefore expecting DVI connectivity, but there was none. PC interfacing is via RS-232. The lack of USB or wireless connectivity won't impress the business audience. Audio inputs are absent too.

Setting up the NP40 is a snap mainly because there's hardly anything you can do wrong with the limited connectivity. The lens auto-focuses via an ultra-sharp and ultra-convenient optical zoom—nifty! Adjust the image size, and the lens will auto-focus; in fact, there is no manual focus control.



Our initial colour calibrations showcased the NP40's brilliant black level. The Pluge patterns in DisplayMate were clearly visible. Many projectors have a problem displaying very dark shades of grey, and black on a black background—not so with this projector!

Our sharpness and resolution tests gave the NP40 no problems whatsoever, and it exceeded the Acer PD726W here. The colour and greyscale tests were a breeze for the NP40, except for the colour purity of red: the NP40 seemed to display a shade of red that wasn't too far off from orange! Once we fiddled with the red balance a bit, the rendition of red seemed better, but it wasn't nearly as good as the performance of the Acer PD726W and the Sharp XG-C330X.



Moving on to our text and presentation tests: the NEC NP40 dominates big time here. It aced even the Acer PD726W (pun intended) and text quality was excellent, absolutely no anomalies noticeable. Our slideshow looked excellent, and any boardroom presentation will spring to life with the rich colours on display.

Movie watchers can shut their eyes and opt for the NEC NP40. It makes for an excellent home entertainment companion.

Our gaming tests did well on the NP40 too, especially the visual effects in *F.E.A.R.*, which were clear, sharp and precise—absolutely no loss of detail or pixelation even through fast action scenes.

With sterling scores throughout our tests, the NP40 slides into second position, just losing out to the feature-rich Acer PD726W and bagging the Digit Best Buy Silver Award. At Rs 1,00,800, we recommend this projector for anyone, business or home user alike, who wants uncompromised visual quality; its small footprint also makes it sufficiently portable.

Panasonic PT-LB60EA

For the presenter in you!

Panasonic's PT-LB60 is a big unit sporting a low profile and a classy looking silver-grey finish that'll assure second glances. Everything from the lens cover to the buttons on its surface breathe supreme build quality. We liked the rear-mounted buttons, namely the menu button and the five-way joystick—reminiscent of a cell phone. Menu navigation is very comfortable even without the remote unit. The menu structure is good, though NEC does their menu layout just a touch better.

The PT-LB60 offers a multitude of connectivity options—there are two D-Sub ins, the second of which functions as an out too. PC and RCA audio outputs are also present. Wireless connectivity is possible, though the USB interface has been left out. Overall, the

PT-LB60's connectivity should satisfy most corporate users.

DisplayMate's first set of tests favoured the PT-LB60, and this projector didn't have any issues with resolution or sharpness.

It performed well in the colour tests as well, with great rendition of all primary and secondary colours. However, in the greyscale portion of the tests, the PT-LB60 has issues in the black shift test, and the shades of the black bars weren't uniform as they should ideally be. There were also slight issues with flickering, which was more noticeable on this projector than on the other XGA projectors.

Business users will enjoy vibrant presentations and clear, crisp text. Both the photograph and movie quality tests were also passed very well indeed.



The Panasonic PT-LB60 makes for a decent gaming companion. Although the lack of contrast is noticeable especially in dark atmospheric games like *F.E.A.R.*, performance was acceptable overall.

At Rs 1,64,990, the PT-LB60 is feature-rich, albeit pricey and makes a good business projector. It performed commendably in all the business tests, with no serious complaints. Multimedia users will also be happy with the performance on offer, but there are better options available in the home entertainment segment.

Sharp XG-C330X

A sharp-performing short thrower!

A sturdy unit, the Sharp XG-C330X is large. The silver-beige colouring isn't much to talk about—but it's suitable for the typically sober corporate environment. Resolution is XGA, although a maximum widescreen resolution of 1400 x 1050 pixels is supported. Build quality is very good; a handle is also provided. Digital connectivity (DVI) is a definite plus, and will offer better image quality. D-Sub, RCA, and S-Video connects are also present. There's also a VGA-out (D-Sub) so you can hook up another projector in parallel, or a display. Sharp's menu layout is good—and there are a large number of predefined picture modes—six, to be exact.

The XG-C330X comes with a very capable short-throw lens. Capable of throwing a sharp image onto a screen just over half a metre away means the XG-C330X is very much at home in space-restricted environments.

In fact, this projector has the shortest throw lens of the lot. The maximum throw distance of 8.44 meters provided by the default lamp should suffice for all but the largest of boardrooms.

Setting up this projector was a snap. Keystone was absent—a good sign. After calibrating the projector, we threw the Display Mate suite at it. The XG-C330X performed very well in the sharpness and resolution tests. It especially handled the focus matrix set of tests well. Although the XG-C330X is a good performer, it loses out on clarity.

The colour tests were generous to the XG-C330X—no ghosting, and great performance in the shade tests. In fact, our 256-colour transition looked very natural with no gradations visible. It does have a slight problem with oversaturated reds, and the intensity of red has to



be toned down slightly lower than blue and green levels. This isn't a shortcoming: slight adjustments



make the problem disappear, as we discovered.

Our presentation tests breezed by the XG-C330X. Text quality is very good and sharp with no visible distortion: the projector is therefore suitable for text and graphics-heavy presentations—typical corporate usage.

The Sharp XG-C330X is equally suitable for video viewing. Our animated movie looked very good overall, though we saw an insufficient contrast ratio. This was confirmed with the movie test; blacks aren't as black as you'd expect them to be, and the variations in grey seem somehow limited. Image quality in both tests was right up there, and no ghosting or pixelation is noticeable.

The lack of a high enough

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- ✓ 5-Stage DSP Module w/ 25 algorithms including: Delays, Filters, Reverbs, Envelope Followers, Beat Triggers, Time Adaptor
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e-mail : anish5_in@yahoo.com



Scoreboard

XGA Projectors

BRAND	Acer	Epson	NEC	NEC	NEC
MODEL	PD726W	EMP-1715	VT590	VT695G	NP40
Features (Out of 32)	18.21	18.77	15.62	16.42	15.06
Projection System (DLP/LCD/LCOS/CRT)	DLP	LCD	LCD	LCD	DLP
Native Resolution (Pixels)	1024x768	1024x768	1024x768	1024x768	1024x768
Brightness (ANSI Lumens)/Contrast Ratio	3700/2500:1	2700/400:1	2000/600:1	2500/600:1	2200/1500:1
Aspect Ratio (Native/selectable)	4:3/16:9	4:3/16:9	4:3/16:9	4:3/16:9	4:3/16:9
Optical Zoom/Zoom Ratio	✗/1.2:1	✗/1.2:1	✗/1.2:1	✗/1.2:1	✓/1.2:1
Image Size (Max-Min) (inches)	60-200	30-300	101.6-762	21-300	60-300
Throw Distance (Min-Max Meters)	2.85-7.89	1.2-12.1	1.5-9.3	0.7-10.7	2.6-11.16
Lamp (Hours) (Normal/Eco Mode)	2000/3000	2000/3000	2000/3000	2000/3000	2000/3000
HDTV Compatibility (Y/N)	✓	✗	✓	✓	✓
Horizontal Frequency (KHz)	31.5-100	15-92	15-100	15-100	15-100
Vertical Scan Rate (Hz)	56-85	50-85	50-120	50-120	50-85
Video Input (S-Video/RCA/D-Sub/DVI)	✓/✓/✓/✓	✓/✓/✓/✗	✓/✓/✓/✗	✓/✓/✓/✓	✓/✓/✓/✗
Audio Inputs (PC Stereo/RCA)	✓/✗	✓/✗	✗/✓	✓/✓	✗/✗
Control Terminal (USB)	✗	✓	✗	✗	✗
Wireless Connectivity	✓	✓	✗	✗	✗
Weight (Kgs)	3.1	1.7	2.9	3	1.6
Lamp/Maximum Power Consumption (W)	300/380	170 / 244	190/255	200/285	200/265
Rated Noise (dB) (Max)	30	40	34	35	40
OSD Usability (Scale of 10)	8	8	8.5	8.5	8.5
Digital Keystone/Remote Control	✓/✓	✓/✓	✓/✓	✓/✓	✓/✓
Performance (Out of 58)	52.54	47.34	46.50	51.44	52.94
DisplayMate Video Edition (Out Of 37)					
Sharpness And Resolution (out of 14)					
Horizontal/Vertical Bar Resolution	8.25/8.25	7.75/7.5	5.5/7	7.5/8	8.25/8.5
Corner Resolution	8.00	8.25	7.25	7.75	8.25
Focus/Fine Focus Matrix	8.25/6.75	7.75/8	7/7	8/7.75	8.25/8.25
Diagonal Resolution matrix	7.75	7.75	7.00	8.00	8.50
Moire Pattern	8.50	8.50	7.25	8.25	8.50
Screen Pixel Resolution	8.25	8.00	5.75	8.50	8.75
Color and Gray Scale (Out of 16)					
Streaking and Ghosting	8.50	7.75	7.50	8.00	8.50
Color Streaking	8.50	8.00	7.75	8.25	8.75
16-Intensity Levels	8.50	6.50	8.25	8.50	8.50
White/Black Level Shift	8.5/8.5	7/5.75	7.75/8	8/8.25	8.5/8.25
Red/Green/Blue Colour Purity	8.75/8.25/8.5	7.25/8.5/8.75	8/8/8.5	7.75/8.5/8.5	6.5/8/8.5
Miscellaneous Effects (out of 4)					
Screen Uniformity/Flicker	8/8	7.75/7.75	7.5/7	8/8	8.25/8
Flicker	8.00	7.75	7.00	8.00	8.00
ANSI Brightness And Contrast	8.25	8.00	7.50	8.00	8.00
Defocusing, Blooming And Halos	7.00	7.50	8.00	8.00	8.00
Presentation And Movie Tests (Out Of 12)					
Text Quality/Reverse Text (P Mode)	8.75/8.5	7.5/6.75	6.75/6	8/7.75	9/8.25
Quality of Photographs/Animation (P Mode) *	8/8.75	7.25/7.25	8.25/7.8	8.75/8.5	8.5/8.75
Movie Quality (Movie/Pres Mode) #	8.50	7.33	8.00	8.50	8.75
Game Quality Tests (F.E.A.R.) (Out Of 9)					
Effects Quality	9.00	6.00	8.00	8.00	8.75
Contrast/Sharpness & Detail	8.75/8.75	7/6.75	7/7.75	8/8	8.5/8.5
Screen Ghosting	9.00	7.50	8.75	8.50	8.50
Price (All Inclusive) (In Rupees)	150,000	154,000	84,000	106,400	100,800
Price Of Lamp (In Rupees)	20,000	25,000	30,000	30,000	30,000
Price Index (Out Of 10)	5.00	4.87	8.93	7.05	7.44
Overall Score (Out Of 100)	75.74	70.98	71.04	74.90	75.44
Warranty (No Of Years)	2	2	2	2	2

* Animated clip Elephants Dream (1080i)

Movie Too Fast too Furious, Wake of Death, Torque Original DVD's



- + Superb all round performance
- Quirky remote, bulky



- + Small footprint, acceptable performance
- Unsuitable for multimedia



- + Aggressive pricing
- Average performance



- + Good performer
- None in particular



- + Ultra sharp, great performance, compact
- None in particular

SVGA Projectors			
Panasonic	Sharp	Benq	Zen
PT-LB60EA	XG-C330X	MP611c	PTV-01B
17.26	17.12	10.11	10.85
LCD	LCD	DLP	LCD
1024x768	1024x768	800x600	800x600
3200/400:1	3300/600:1	2100/2000:1	1200/500:1
4:3/16:9	4:3/16:9	4:3/16:9	4:3/16:9
X/1.2:1	X/1.2:1	X/1.15:1	X/NA
33-300	40-500	31-300	38-150
1.1-10.8	0.56-8.44	NA	1.2-3.8
2000/3000	2000/3000	3000/4000	4500/6000
✓	✓	X	X
15-91	15-70	31-82	NA
50-85	43-85	48-85	NA
✓/✓/✓/✓	✓/✓/✓/✓	✓/✓/✓/✓	✓/✓/✓/✓
✓/✓	✓/✓	✓/✓	X/✓
X	✓	✓	X
✓	X	X	X
2.6	4.25	2.67	5.80
220/300	275 / 375	200/285	150/225
35	36	28	40.00
7.5	8	6.5	6.50
✓/✓	✓/✓	✓/✓	X/✓
50.35	50.24	42.23	26.81
8/8	7.5/7.75	6.75/7	4.75/4.5
8.25	8.25	7.25	4.00
8/8.5	8/8.25	8/7.75	5.25
8.50	8.25	8.00	5.50
8.50	8.25	7.75	5.50
8.00	7.50	6.50	5.50
8.50	8.00	7.50	5.00
8.50	8.75	8.00	4.50
8.25	8.00	4.50	4.25
7.5/5	8.25/8	5.75/6	4.00
7.5/8/8.25	8/7.75/8.25	6.75/6.5/7.25	5/4.5/4.5
7.75/6	7.75/8	7/7.5	4.75/6
6.00	8.00	7.50	4.50
8.00	8.00	5.25	4.75
7.75	8.00	7.50	6.00
8.5/8	7.5/7.75	5.33/5	5/4.75
8.5/8.25	8/8.25	6/6.5	4.75/3.75
8.25	8.25	7.00	5.50
8.00	8.00	6.25	3.25
7.25/8	6.75/7.75	6.5/6	3.5/3
9.00	8.75	8.75	5.25
164,990	137,000	52,000	42,000
25,000	19,500	18,000	3,000
4.55	5.47	6.73	8.33
72.17	72.83	59.08	45.99
2	2	2	2



+ Strong overall performance
- Slightly bulky



+ Good text rendition
- Poor contrast ratio



+ Low price
- Poor performance



+ Very low price
- Extremely poor performance

Jargon Buster

Resolution Unlike CRT monitors and most TFT displays today, projectors are finicky about native resolutions and will not perform well at anything less (or more) than their native values. Quite simply, the higher the resolution the better the performance—smaller and more precise pixels lead to greater image quality with less aliasing. An XGA projector will, 9.9 times out of 10, outperform an SVGA projector. However, value also makes an important point here, and the price difference between the projectors sporting these resolutions is very large.

Contrast Ratio Quite simply, the higher the contrast ratio the better. Contrast ratio is defined as the ratio between the brightest and darkest areas of a screen. It represents the maximum variations in the intensity of light that a projector can render. A contrast ratio of 400:1 is sufficient for most applications. Movie buffs and gamers should look at something in the range of 600:1.

Keystone Correction Keystone occurs when the distance between the projector and the top of the image on-screen is much greater than the distance between the projector and the bottom of the screen. Keystone is also called Trapezoidal Distortion. Keystone correction, as the name suggests, consists of correcting the distortion by altering the shape of the projected image. The Keystone correction value is measured in degrees positive or negative.

Moiré Moiré is a phenomenon noticed when two screened images are superimposed on each other at certain angles. In terms of projectors and displays in general, moiré will cause one pattern to be superimposed on another, making for somewhat of a blurred effect. It is an undesirable effect and is present in most projectors. Only the degree of severity differs, based on how visible (or not) it is.

Video Interconnects This is significant especially for home entertainment users. D-Sub and DVI (Digital Visual Connectivity) are mainly useful for PC interfaces. The difference is that DVI provides a digital signal, hence offers higher quality viewing especially for multimedia content. As far as connectivity to other devices like DVD players go S-Video and Composite connects are something to look for. They offer much better colour separation than RCA. HDMI (High Definition Media Interface) is an emerging standard that carries uncompressed digital video and audio signals on a single connector.

Focus Matrix DisplayMate has a whole series of focus tests under its Sharpness and Resolution test suite to test the ability of a projector or screen to display sharp, finely-focused images. These test screens consist of fine patterns of dots in differing dot densities, and also minute, identical patterns. (There are different screens, some with finer patterns, some with coarser patterns.) An ideal projector will render these minute details with as little variation as possible on a single screen. We check for variance in patterns on a single screen.

Aliasing Definitions abound, but simply put, aliasing in terms of digital imaging refers to the occurrence of jagged edges that occur when a signal is sampled and reconstructed as an alias of another signal (the original). Its also referred to as artefacting.

contrast ratio is lamented particularly in the home entertainment sphere—movies and gaming. Corporate users should not be affected by this at all.

Our game tests proved the lower contrast ratio (the specification quoting 600:1 notwithstanding). In *F.E.A.R.*, we missed enemies in dark areas due to the fact that their uniforms

were also dark. Visuals are good, and the slow motion effects in the game look amazing. Were it not for the slight contrast ratio problem, the XG-C330X makes a great gaming projector as well.

Priced at Rs 1,37,000, the XG-C330X makes for a very capable all-round projector. It warrants special attention for those look-

ing for an extremely short-throw projector. However, it is clearly geared towards the corporate segment, which is probably why performance falls short of expectations in the multimedia environment—albeit only because of a deficient contrast ratio. Overall, though, there are better options available for both business and home audiences.

BenQ MP611c

Playing with big boys is no fun...

The BenQ MP611c was the only sub XGA projector (SVGA) resolution projector we received. It's the successor to the MP610 we received last year. This is aimed by BenQ as an entry-level projector for both the business and home entertainment segments. It's surprising to see multiple D-Sub connects on the MP611c, as well as a USB port. Some of the costlier models missing out on this seems to be unforgivable, especially considering the price of this unit—a mere Rs 52,000.

Build quality is good—very good, in fact, for the price—and the body is piano-finished in dark blue. The body is a scratch magnet, as we discovered; of course, the dark colour accentuates any minor scratches picked up.



The DisplayMate suite was fired up first. We noticed some problems with bar resolution right away, owing to the drop in resolution. Our eyes had become accustomed to 1024 x 768! Despite this, it performed well in the moiré tests, but sadly, screen pixel resolution just doesn't match up.

The problem with resolution made its presence even in the colour and greyscale tests. We found serious problems with intensity transitions in each of the shades; darker colours like

blue fared better. There were problems with shades even in the black and white shift tests—too many disparities noticeable.

We suggest that corporate users steer clear of the BenQ MP611c, at least in their offices. Text quality is poor with noticeable blurriness and pixilation. The same was noticeable in our photograph quality tests. The MP611c redeemed itself by a small degree in our movie tests, but the difference in quality between an SVGA projector and an XGA projector is very noticeable.

F.E.A.R. looked a little more scary than normal on this projector—due to the lack of visuals and visibility than anything else. Gaming on this projector is not a happy experience: despite the fact that there was no ghosting on-screen, deficient contrast and sharpness besmirch the gaming experience.

Choosing A Projector Screen

Buying the best projector for a given price doesn't guarantee great image quality. A little-known fact is that the quality of the projected image depends greatly on the screen used. In fact, a general thumb rule to be followed is that at least a fourth of the cost of the projector should be kept aside for the screen.

Besides the fact that screens are available in different sizes and qualities, there are also different types of screens available based on their gain values. Don't be confused by the term "gain." No screen can compensate for a low-lumen-rating projector and boost light. Gain therefore measures the brightness of the screen and its directional characteristics. However, screens today have specific characteristics themselves and are designed to perform optimally under certain specific conditions. Their characteristics are matched to factors like the size of the room, ambient light, audience viewing position, and the type of media displayed.

There are four types of screens available. Note that the first two are by far the most commonly-used screens.

High Gain

Such screens are characterised by highly reflective surfaces, and they're designed to produce bright images. Very suitable for multimedia content, or if the projector has lower brightness levels. A high gain screen is also suitable for relatively brightly-lit rooms.

The only disadvantage of a high gain screen is the poor viewing angles, that is, not more than 60 degrees.

Low Gain

These screens have matte finishes and are therefore less reflective. Due to this they also enjoy the advantage of wider viewing angles—up to 100 degrees. Perceived brightness is only adequate in dim lighting, so low gain screens don't perform well in anything more than dim lighting.

Silver Lenticular

These screens were in use early in the motion picture era, but are still around. They are basically vertically ridged. They are rarely used these days for regular office or home projection purposes. Their only use remains in the projection of 3D films, because the silver dust embedded in these screens is highly reflective. Hence they are suitable for keeping two light signals segregated.

Rear Projection

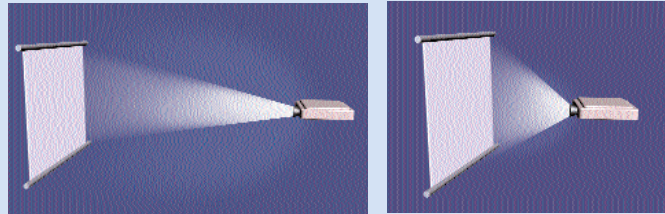
As the name suggests, the projector is placed on the opposite side of the screen to the audience, that is, behind the screen. They are much more delicate and costlier than regular screens, and are therefore used in places where a fixed setup is desirable.

The Lens Of The Matter: Long And Short Throw

There are mainly two types of lenses for projectors, based on the relationship between the size of the image projected and the distance between the projector and screen. A general rule of thumb for a standard projector lens is a foot of screen for every two feet of distance between the projector and the screen. Long-throw lenses will be able to maintain a larger distance between the screen and the projector while providing a clear image of the same size. Similarly, a short-throw lens will be able to provide the same image size while maintaining minimal distances between the projector and screen.

Most projectors ship with a default lens that is neither truly long throw nor short throw, but something in between—so that they're suitable for a larger range of situations. If you wish, you can always change the lens—for example, if you're only going to use the projector in a large hall, get yourself a long throw lens.

Comparing the two types of lens is impossible—their suitability depends on the conditions—namely the distance between the projector and screen. For large halls where the projector may be set up very far from the screen, obviously a long-throw lens would be preferred. Not only will the image size be controllable, such lens can also project a clear image even over relatively large distances.



A long throw lens at work on the left, short throw on the right. Notice the distance between the lens and the screen in each case.

A short-throw lens would project an image that would overflow the screen; moreover, the image would be unfocused.

A short-throw lens is suitable for small conference rooms or classrooms—basically any place where the distance between projector and screen is insubstantial. A long-throw lens would project too small an image if used in such a situation.

Nearly all projectors (standard, long-throw, and short throw) sport zoom lenses. This allows them to compensate somewhat for the inherent shortcomings in the lens type used.

ZEN PTV-01B

A bonsai, this...

The PTV-01B was the dark horse in our tests, a new brand in the Indian projector market. At a glance, it looks like a huge toy, with body plastic reminiscent of Leo-Mattel's toys. That's not a bad thing, and it feels sturdy to hold. If you can hold it, that is—at a shade less than 6 kg, it's heavy! It's by far the bulkiest projector we received.

This is a strictly a home-entertainment-only projector, and the PTV-01B makes no bones about this, losing out on USB and wireless connectivity. It also does without any DVI inputs. Zen assumes you have a discrete sound setup as well, so the PTV-01B does without any audio inputs. There's a cable TV input though, something we didn't see on any of the other contenders. It gives a whole new meaning to the term "large-screen TV"!

We quickly ran into problems setting this one up. The PTV-01B doesn't have any zoom capabilities—this is absolutely shocking! The focus is adjustable (though it isn't very effective). The only way to zoom in or out is to actually move the projector closer or further from the screen.

The DisplayMate tests weren't completed to our satisfaction. In fact, calibrating the PTV-01B with a setup menu devoid of too many options was difficult. The



Sharpness and Resolution tests saw severe problems with the horizontal and vertical bar resolutions. The PTV-01B just could not render this test satisfactorily. This was also the only projector where there were noticeable problems with the corner resolution test.

Moving on to the colour tests, we saw problems with nearly all the tests, with clear anomalies visible on-screen.

The Zen PTV-01B isn't suitable for presentation work; text was unreadable, and we developed headaches just straining our eyes to make out what was written on-screen. Our PowerPoint designs and photograph tests fared no better. To Zen's defence, the PTV-01B isn't aimed at such applications. Let's go on to see how it performed in its area of competence.

Although colours were rendered as crisply as we'd like, the PTV-01B tried its best to perform at least decently here. It managed to do so, but with some very mediocre scores. The BenQ MP611c makes a much better buy

at the same price point if movie-watching is your thing.

Do to its poor contrast ratio and low sharpness, the Zen PTV-01B isn't a gamer's dream—"nightmare" is more like it, as we found when playing F.E.A.R.! At Rs 42,000, the only thing it has going for it is its price. Not a big deal, since the BenQ MP611c swings into the same budget range.

What we think

The first difference noticeable from last year's comparison is the ratio of XGA to SVGA projectors we received. This year we received seven XGA projectors and just two SVGA projectors. This shows a trend that manufacturers are targeting the Indian market for higher-end products. This is partially due to the increase in the demand for projectors, and the penetration of these devices into the domestic arena.

Surprisingly, the increase in demand has nothing to do with falling prices, and price reductions, if any, will arise from further increase in demand—a most uncommon phenomenon in India, which is primarily a value-oriented market.

A growing number of corporate customers have adopted projectors for all their boardroom and sales pitch needs. A much smaller fraction of home users have also populated the projector bandwagon. We're hoping to see price reductions next year! ■

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Through The Ages

If you have documents to worry about, you should also worry about tracking changes made to them

Nimish Chandiramani

Ever opened an old, oft-edited Word document and wondered what it looked like last week? What about the time you made your own changes, only to find that someone else had overwritten the file with their own version? In the digital chaos we all live in, keeping track of your files—the changes made to them and the person making those changes—is something we all desire, but few actually achieve.

It's All About Control

To address all these needs and more, we turn to a system that software developers have been using for ages—version control. When you're working in teams where more than one person needs to edit the same code at a time, you really can't afford your work to be wiped out by a wayward team member, can you? Version control systems also track every single change made to a file, so if you want to see how the file started out and evolved, you can. The system also gives you a new layer of security—the ability to control access to your documents.

If you're worried about radical changes to the way you work, fret not. A version control system will fit in quite nicely with the way your company's files are already organised. Presumably, you have a central file server where all your official documents are stored—this is *all* the infrastructure you need.

How It Works

The best analogy for a version control system is a public library—the term we'll be using is *repos-*

itory. Library members (your employees) hunt down the book they want and go to the librarian (the version control software). The librarian then checks their library card, and makes sure that the book in question is indeed available to the member, before letting them check it out. The similarity takes a slight deviation here—when someone returns a file, it will contain changes, and the person checking it in will have to leave a little note indicating the changes made. The version control software then records what changes were made to the file (it's all binary data ultimately, so this isn't much of a problem) and stores the new version.

But what if more than one person wants the file? There are three ways that this software can handle the situation: the first is the exclusive check-out, where it denies access to anyone who tries to edit the file once it's been checked out. This is by far the easiest way to avoid any trouble, and is recommended for most scenarios. However, you might encounter situations where two people need to work on different parts of the file at the same time, and waiting for the file to be available just isn't an option. If there's a possibility of this happening often, then you'll need to opt for a setup where a file can be checked out by multiple users, and all changes made by them will then be merged into the document. If the same parts of the file have been edited by more than one person, the software asks for your intervention to determine whose change to accept or reject.

All this happens in a centralised system; for teams spread out over many cities or countries, a concept called *Distributed Version Control* comes into play. In such a case, everyone has the full repository, and changes to any document are propagated to everyone. This way, everyone



Illustration Chaitanya Surpur

always has the latest copy of the repository, without having to demand it from the server, as in the former two cases. That last bit is purely academic, unless your needs have something in common with those of the Linux kernel, whose developers use a distributed version control software called GIT.

Getting Down To It

There is an embarrassment of choices when it comes to version control software, most of them open source. You can Google for the lot, but when it comes to it, the best option is Subversion, which is now the version control software of choice for nearly all open source software developers today—the older CVS (Concurrent Versioning System) has started to show its age, and Subversion goes well beyond it in terms of the features and flexibility it offers.

Subversion is most comfortable running as an Apache module on a Linux server. It can also run as a separate Linux daemon, and if you have a Windows server, you can set it to run as a service. Once you've set up a repository, there are a lot of ways to access it. When it's running as an Apache module, you can access your Subversion repository using the WebDAV (Web Distributed Authoring and Versioning) protocol—you can set it up in just a few clicks in Windows in My Network Places. Just add a new Network Place, put in the HTTP address of the Subversion repository, and it behaves like a regular folder!

If you choose not to use the Apache module, or if your server is running Windows, you can run "svnserve"—the Subversion server—which uses its own protocol for access to the repository. Naturally, you'll need software that uses this protocol on every machine that will access the repository.

Enter The Tortoise

TortoiseSVN is another open source project by the same organisation that develops Subversion, and is the recommended Subversion client for Windows PCs. Don't expect to see a program window or the like: it's just a shell extension that brings all your repository functions—check out, check in, and so forth—right to your Windows Explorer. Files under version control have their own icon overlays—a green check-mark to indicate that it's the latest version from the repository, a red exclamation to indicate



TortoiseSVN integrates all your repository functions with Windows Explorer

that you've changed the file but haven't sent it to the repository, and so on.

It takes a while to get used to TortoiseSVN, so you'll need to invest some time in training your employees. Once that's out of the way, though, the convenience of working in good old Windows Explorer is unparalleled.

Reality Check

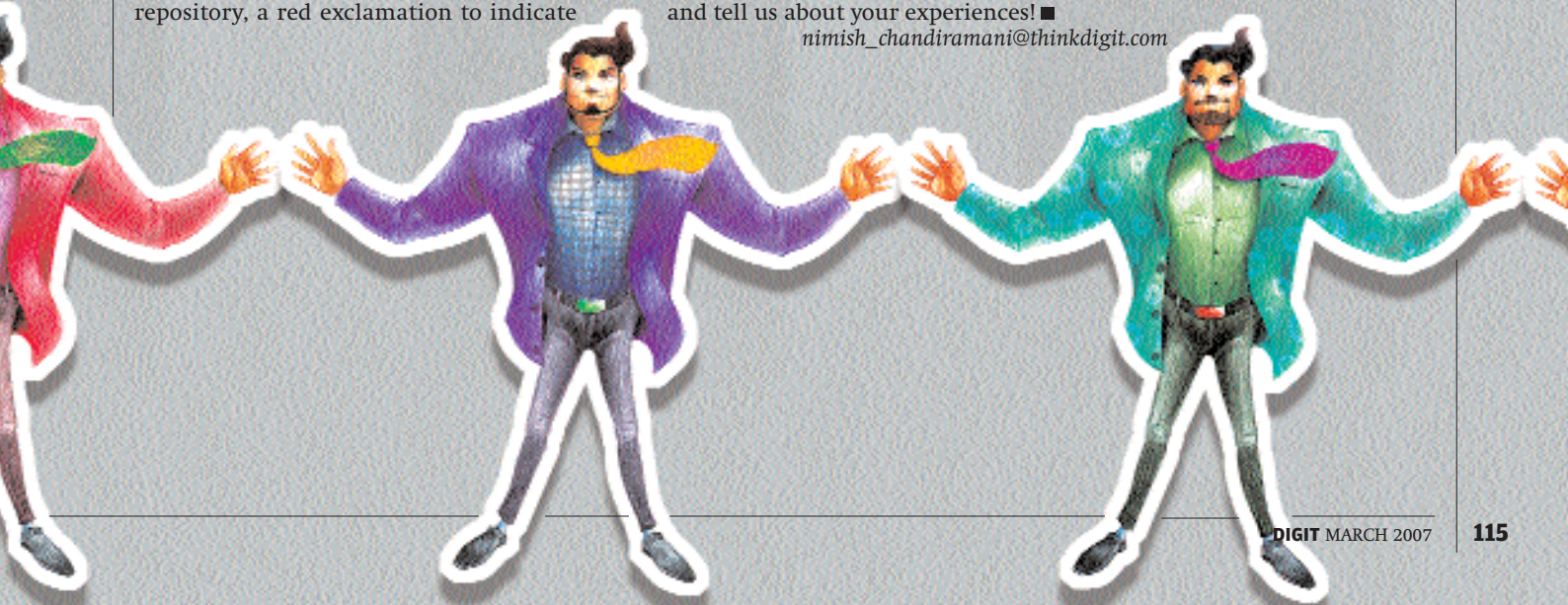
Like everything else we recommend, do take some time out to analyse your situation before you take the plunge. The most important matter you need to address is whether there are enough "incidences" in your office to warrant the time and effort you need to invest in setting up Subversion—it isn't as easy a process as one would hope. Add to that the effort of training everyone to use the system.

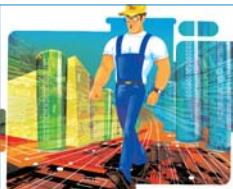
You'll also have to take a good long look at the way your data is organised. The idea is the same that we used for the user groups in *Mayhem Management* last month—make a top level folder structure that represents each of your departments. Once that's done, try to divide everything into little "projects"—April 2006 Sales can be a project for your sales department, and this will contain all the files relevant to said month's figures.

After all this, if you decide to go ahead and incorporate Subversion at your office, do write in and tell us about your experiences! ■

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Subversion is now the version control software of choice for nearly all open source software developers today





120 Gaming
Special



130 Game On



148 Everything
Paris!

Digital Leisure

Technology Beyond Work

Touched By Tech

Lern frm whr u r!

Efforts are underway to enable you to learn Indian languages on your cell phone

Samir Makwana

The mobile phone, a tool originally intended for just communication, has gone beyond the basics—it is now used for entertainment and commerce as well. It's the case of a single device enabling a lot of things. Mobile content such as screensavers, mobile games, and other applications are being offered for entertainment as well as edutainment.

Even newspapers can be read on a mobile phone: recently, Pressmart and IMI Mobile announced the availability of mPaper (mobile newspaper) for nine Indian dailies on the mobile phone. Pressmart, a subsidiary of Bodhitree Consulting Ltd, is a digital media delivery partner of leading newspapers and magazines. IMI Mobile is an end-to-end Value Added Services enabler.

Besides this, *Kalnirnay*—a calendar, almanac, recipe-book, and a source of other useful information in seven languages, is now being made available on the mobile phones by Enable M, a mobile content and services provider company. And now, mobile content aggregators are developing educational content as well.

Where It Began

At the Reliance Mobile Application Contest in February 2005-06, an application called *TeachMe Hindi* bagged the second prize in the corporate category. TeachMe Hindi was developed by Jayadev Gopalakrishnan, CEO, and Anupam Varghese, CTO, of Tinfo Mobile Pvt Ltd. This award came on the heels of their earlier award for developing an application called "All-Minder", an application for the visually impaired to hear SMSes and missed calls, at the Reliance Mobile Application Contest 2004-05.

The *TeachMe Akshara* series consists of a number of applications under the "TeachMe" head for different vernacular languages (presently, Hindi and Malayalam). TeachMe Hindi is the Hindi language module from the TeachMe Akshara series. The application helps

the user read and write letters in Hindi and Malayalam. The letters of the language come up on the screen, and one can know about how the alphabet is pronounced and written.

"TeachMe Akshara was developed to teach illiterates or semi-literates about the vernacular languages of India. Though TeachMe Akshara was meant to teach only basic letters, we consulted language teachers for formulating and verifying the content," says Gopalakrishnan. TeachMe Akshara happens to be the first vernacular language teaching application for mobile phones. An animation of the letter, along with a picture, appears on the phone's screen when a particular letter is selected.

The majority of the Indian population lives in rural areas, and the penetration of the mobile phone have been good. The application is appropriately targeted towards the rural and semi-urban population.

In January 2007, Enable M Mobile Technologies Pvt Ltd, a mobile content and services provider and mobile value



added services aggregator, formally released *LILA Hindi Prabodh* for mobile phones, in collaboration with C-DAC (Centre for Development of Advanced Computing), Pune. LILA stands for “Learning of Indian Languages through Artificial Intelligence,” being developed by C-DAC for

computers, and is now available for mobile phones. LILA Hindi Prabodh for mobile phones is from the LILA series being developed by the Applied Artificial Intelligence Group at C-DAC.

It uses MMC multimedia cards—the latest Hindi Prabodh courseware is embedded in the card, and a multimedia interface has been incorporated.

“The courseware is an adaptation of the LILA series applications available on CD and the Web. The object was to address the target group which consisted of government employees, language enthusiasts, tourists from outside India, and the common masses interested in learning Hindi,” says Amit Jhaveri, COO, Enable M.

Multimedia output for learning has been used in LILA Hindi Prabodh for Mobile, where the user can read and listen to Devanagari letters as used in Hindi. The translation of a Hindi sentence into English and sentence structure patterns can be learnt. The courseware also carries exercises and practice sets. In addition, video clips of narrative sections of lessons in Hindi and a Hindi-English Dictionary are embedded in the MMC.

How It Works

Most of the rural population can afford a basic mobile phone. “TeachMe Akshara is developed on the innovative VectorDraw engine that works even with basic level monotonic handsets with Java support. It was important for us to take this design consideration because our aim was to make this application usable by any mobile phone owner,” says Varghese. The application is 16 KB for colour phones and 32 KB for black and white phones.

The easy-to-use program focuses on enabling learning of the Hindi and Malayalam alphabets. It teaches the user to read and write the letters, and how they are pronounced.

If one wants to learn how a letter is written in Hindi, by selecting the Write option, one can view an animation of a pencil drawing the letter on a notepad playing on the screen.

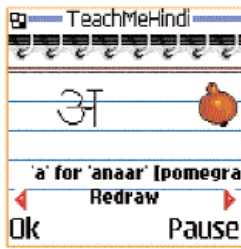
Pronunciation is learnt when the user selects a letter: on clicking it, a graphic to depict an object (such as a pomegranate) whose name begins with that letter comes up. Thus the user can relate the graphic with the letter. As the animation of the letter is played on the screen, the pronunciation of that letter is played over the phone’s speakers.

Thus, one learns a language by first learning to read the letters, then how they are written by

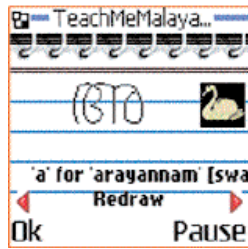
watching the animation, and finally the pronunciation of the letter.

LILA Hindi Prabodh uses artificial intelligence to educate users about the Hindi language. Unfortunately, the MMC can, of course, only be used with mobile phones supporting the card format.

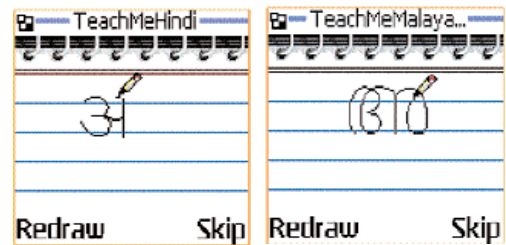
“About 30 odd lessons with ten exercises for self-assessment are included in the courseware. Animation of letters and words being written in Hindi are played on the screen along with their pronunciation. Audio elements are added to learn the pronunciation and videos of the narrative aspects of lessons are added to give the course an enjoyable learning experience,” says Jhaveri.



TeachMe Akshara relates letters to sounds using image associations



Within a few years, we can expect the mobile content market to boom, and we will see more applications that can exploit the use of mobile phones as educational tools



...and also shows you how to write the letter in question

The translation of a Hindi sentence can be seen in English: the sentence is written with English letters, and the sounds are spoken in Hindi. The user can also view video clips of lessons in the narrative sections.

The Formal Launch

TeachMe Akshara wasn’t launched formally, so not many know about it.

“Since our product was made public and was not formally launched, we have received very few commendations. The feedback from the people cannot be assessed since the product has not been able to fully reach the general public. Talks are on with a couple of big corporations to look to it as a potential Corporate Social Responsibility (CSR) tool, and we believe it will soon be available to the general public. Very soon, it would be available for Reliance customers through the R-World menu,” informs Varghese.

Concluding Notes

According to the Telecom Regulatory Authority of India, more than 149.5 million people in India owned a mobile phone, and 6.4 million subscribers were added in December 2006. With such mobile penetration, the choice of a proper path for implementation of this technology has to be made. The flexibility of personal learning via mobile phones breaks the barriers of location and time.

Within a few years, we can expect the mobile content market to boom, and we will see more applications that can exploit the use of mobile phones as educational tools. The mobile content and services market in India is in a nascent stage. For now, kudos to the efforts of Gopalakrishnan and Varghese. ■

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NO BOUNDARIES

Next-gen consoles, multi-core processing, and all that jazz...The world of gaming is changing, and hardware vendors are going over the top trying to keep up



It has been conjectured both by outsiders and by Microsoft itself that the Zune can do more than just play music

Playing games on the move was limited to *Snake* on the cell phone or to Nintendo games on a GameBoy platform. Until recently. On the console front, both the Nintendo DS and the Sony PlayStation Portable have opened up new markets and new avenues to gameplay—while the DS offers a completely new interface (driven by both touch and sound), the PSP brings console-level graphics and gameplay to a handheld device, not to mention its multimedia capabilities.

Beyond these two recent additions, players haven't had much success establishing new platforms in the mobile space. Gizmondo came and went with barely a whimper, N-Gage was met with a lukewarm reception, and niche players such as GP2X are, well, niche.

The market might see some new platforms in the future. Microsoft may or may not release a handheld version of its Xbox console, but it has certainly take a step into the mobile gaming space through its cell phone, PDA, and now Origami software. Origami is

Mobile Gaming Omnipresent

the concept of a handheld PC or as Microsoft calls it, ultra-mobile PC (UMPC). It is simply taking the Windows OS and running it in a handheld form factor. Hardware willing, any game capable of running on the PC should also be able to run on a UMPC, which should open up the possibility of playing old DOS and Windows games on the move. An interesting hardware development here would be the scaling down of the current generation of gaming GPUs—ATI, for example, has recently talked about stripping down its R500 GPU to make it suitable to a handheld form-factor. There are also rumours that NVIDIA has a chip in the works for the next version of the PSP.

Microsoft has another hardware device up its sleeve in the form of the Zune. It has always been conjectured both by outsiders and by Microsoft itself that the Zune can do more than just play music. It already syncs with an Xbox Live profile; could it not also run Xbox Live Arcade games in the future? If not in its current avatar, certainly in a newer version.

Nokia is perhaps the biggest competitor to Microsoft in this space. It already tried to establish itself as a phone-plus-gaming console with the N-Gage—while that initiative might have failed, Nokia probably won't stop trying, especially when there's a large, untapped market to be, umm, tapped. One of the ways ahead for Nokia would

be to create tools for creating and maintaining a gaming platform on Nokia devices, instead of a dedicated device such as the N-Gage. In early 2006, it took the first step to such a platform by releasing an SDK (software development kit) containing tools and a consumer interface to access and purchase games using a cell phone.

Let's not forget Apple. One can already pick up casual games from the likes of PopCap at the iTunes store, plus rumours point to at least two new products that will have gaming capabilities—one being the Apple TV set-top box which will sit in the living room, and the other, the current talk-of-the-town—the iPhone. The iPhone is a closed platform—much like a gaming console—and you won't find games and software being developed for the device by just any software house. This does not exclude big names though: recent rumours point to both PopCap and EA developing games for the device. While the iPhone's specs haven't been made public, it's not too much of a stretch to imagine the hardware capable of running some decent games: it can play videos, it runs a stripped-down version of OS X, and has multiple ARM processors.

Gaming on the move is an exciting prospect; imagine playing a game of *Halo* while paying superficial attention to a boring meeting—which you must never do. No sir.

Logo



We would generally recommend that you go in for a slightly slower quad-core solution than a faster dual-core one

In only a matter of months, the processor industry changed its tune from clock speed to multi-cores—so quickly did this happen that it left tech-heads swooning. Intel was quick to drop speed from its DNA, since it was virtually humiliated over the humbling performance of its Netburst architecture against the mighty AMD K8.

The order of the day is dual-core processors—AMD's Athlon 64 X2 series with its integrated Southbridge and HyperTransport vs. Intel's Core Duo, and more importantly, its Core 2 Duo line. Intel is winning this particular performance battle with the Core 2 Duos. AMD has yet to refresh its aging K8 architecture, but is instead offering a redesign of its Opteron line in a quad-core configuration code-named "Barcelona," a few months from now. AMD has made it clear that we should expect the Barcelona processors to be 40 per cent faster than Intel's quad-core Xeons across "a wide variety of workloads." With Dell currently offering quad-core Opterons, AMD's offerings could become popular with the introduction of Barcelona. Indeed, AMD expects Barcelona to capture 30 per cent of the quad-core market, up from its current zero per cent share.

Processors

Hard Core!

As of now, though, AMD has a dual-core, dual-socket option for the enthusiast market with a tweakable BIOS and SLI support, called the Quad FX platform (a.k.a. 4x4). AMD should also drop its processor prices across the board by the time you read this. Mostly, the drop will be to make way for the Athlon 64 X2 6000+ processor, which is expected any time soon as of this writing. Price drops are rumoured to be significant across the board: the Athlon 64 X2 3800+ is said to drop from \$138 to \$113, the Athlon 64 X2 4600+ from \$215 to \$195, and the Athlon 64 X2 5200+ to just \$222 from its current price of \$295. Note that these are suggested distributor prices. With these cuts, AMD will still remain the best processor you can buy, offering the best value in terms of both price and performance. Factor in pure speed, though, and Intel is still champion.

Quad-core processors from Intel already offer a significant advantage over their dual-core siblings, and we would generally recommend that you go in for a slightly slower quad-core solution than a faster dual-core one, especially if you are a gamer or a graphics/3D designer. Intel is also looking to introduce faster FSB to its processor range, this will tie in closely with the introduction of new chipsets, of course: Intel will introduce Core 2 models ending in "50" (Core 2 Duo E6850 and E6650) which will take advantage of the 1333 MHz FSB. The newer cores will only officially be supported on Intel's upcoming x35 series of chipsets. Meanwhile, the low-end 6000 series will also receive a cache boost—a 4 MB L2 cache will give a nice performance boost like it does their more expensive brethren. Prices will remain the same.

Meanwhile, the K10 core from AMD should burrow out of its secret underground bunker—competition is good, and we can't imagine AMD letting Intel get away with the performance crown. Intel, though, is already drumming up plans for 80-core processors against the silence of its arch-rival: these multi-core units are not expected for another five years, but it is heartening to see their game plan so early in the cycle.

One of the biggest problems for multi-core in the future would be that of memory bandwidth. Interestingly, graphics cards faced much the same problem and solved them by throwing extremely fast and expensive memory chips at the GPU, along with a wide and speedy bus—scaling such a solution to say 16, 32 or more cores for a CPU becomes prohibitively expensive and impractical.

AMD will likely base a solution to this problem around its HyperTransport bus, while Intel has revealed its future direction through its "Terascale" project: instead of transistors arranged flat on a die, this chip's design consists of 80 tiles laid out in an 8 x 10-block array. Each tile carries a small core that can run a simple instruction set for processing floating-point data. The tile also includes a router connecting the core to an on-chip network that links all the cores to each other and gives them access to memory.

What is tremendously exciting is to imagine a multi-core processor integrate itself with a graphics processor. Both AMD with its Fusion project and Intel with Larrabee are headed in that direction—a massively multi-core processor connected to a large amount of on-die memory and surrounded by specialist vector units—probably the ultimate CGPU!

Logo



There are plans to take the GPU outside the cabinet, tethered to the PC via a PCIe x16 connector

If you've been reading *Digit* religiously (is there any other way to read it?), you would be well aware of the changes that graphics cards are going through (for some background on where GPUs are headed, read *A New DirectXion*, *Digit*, October 2006). In a nutshell, GPUs are becoming CPU-like; so much so that a day when you see a GPU performing CPU tasks and vice-versa is not very far away. What's more, you might very well see the two integrate—imagine a central processor with bits of GPU connected to it, much like the design of the PlayStation 3 console.

Graphic cards are perhaps the most exciting frontier in the coming years: even as NVIDIA and ATI release DirectX 10 products with as much as 1 GB onboard memory (yikes!), Intel is rumoured to be working secretly on its own GPU design, taking a more traditional x86 route—rumours talk about a CPU-GPU hybrid (a CGPU?) code-named Larrabee, consisting of sixteen cores. The cores are small, in-order x86 mini-processors with a short pipeline and lots of vector hardware to implement some GPU-oriented extension of the x86 instruction set. AMD, too, has talked of its x86-GPU plans, aka Fusion, which plans to marry AMD processors with tech acquired from ATI GPUs. Integrating a processor and a graphics unit like this has many advantages, the biggest

Graphics cards

Big, hot, and crazy

being that of the flexibility possible: tasks pertaining to shaders, vector math, CPU-intensive physics, sound, and procedural art and animation could all be balanced on the same chip, making for an extremely efficient piece of silicon. Moreover, a GPU based on the x86 instruction set can leverage years of programming experience, tools and techniques allowing for lowered software development costs.

As things stand, graphics cards are expensive. DirectX 10 cards are currently only available from NVIDIA, and as of this writing, only in two variants—"will financially ruin you" and "will financially ruin your entire family." With competition, prices will fall, and ATI's DX10 monster has just been spotted in the wild.

Prices aren't the only means of putting the hurt on you, though: that ATI card, for example is a nine-inch behemoth with its memory running at slightly more than 1 GHz and a core speed of about 800 MHz. These DirectX 10 cards pull in more than 200 watts, and it wouldn't be a stretch to see vapour- or water-cooling units becoming the norm rather than the exception when the ATI parts appear. And this is just when the cards are running in single mode—throw in SLI and step back, way back: the power requirements would be astronomical (just today we spotted a Chinese PSU on the Net rated at 1000 W!).

There are also plans to take the GPU outside the cabinet, tethered to the PC via a PCIe x16 connector. This will not only prevent total meltdown of your system but would also offer fast graphics to, say, a laptop, or allow for a scenario in which banks of external graphic processors

are shared over a network by several computers.

As for what's currently on tap for future buyers—NVIDIA mostly, with ATI to release its line of DX10 cards between March and May '07. NVIDIA's GeForce 8 series looks like this: the 8800 GTX and GTS variants, which vary slightly in clock speeds, and the GTS coming in a leaner 320 MB version, which is also much more affordable than its 640 MB sibling. Also planned is an 8900 GTX core with 25 per cent more shader power (clocked at 700 MHz GPU and 2200 MHz memory). An SLI-on-a-card variant of this is also planned: the GeForce 8950 GX2 will be a dual-chip card based on a new 80-nm G80 chip, clocked at 550 MHz with 2x512MB of 256-bit GDDR4 (memory at 2000 MHz).

ATI's DX10 cards are rumoured to be 65-nm parts, meaning they'll run cooler. The DX10 R600 and RV600 series from ATI will come in various guises—high-end, low-end, dual-cores on a card, and even the external cards mentioned above (code-named Lasso). The R600XTX is the top-of-the-line card, recently spotted with a massive four-heatpipe-powered cooler. It comes with 1024 MB of GDDR4 memory running at over 2000 MHz; 12 inches long, the card is said to consume more than 240 W.

Apart from pushing pixels, these new cards are also HD-ready: ready to decode the highly CPU-taxing codecs of generation next—MPEG-2, H.264, and Microsoft's VC1 format. They also offer full HDCP support—over either DVI-D or HDMI. To be future-proof in the coming months, ensure that any monitors you purchase offer either HDCP over DVI-D, or come with an HDMI port.

Logo



Two of Vista's key features will make for a "sexy time for motherboards": ReadyBoost and SideShow

Stop us if you've heard this one—"talking about my computer makes my mother bored" (snigger). Ahem—no, not funny. Motherboards are getting a bit dull, though. We remember the good old days when we would break out into fist-fights in our *Digit* cantina over the relative merits of an Intel chipset versus an NVIDIA, ATI, or VIA offering; on certain moonless nights, even SiS products were whispered into the darkness. Ah yes, those were the days—today, though, market consolidations and standardisations have taken their toll on our most beloved of simple pleasures. Almost anyone would agree that a good chipset must either be an Intel or an NVIDIA—where's the fun? All you have left to differentiate one motherboard from another is the colour of its PCB ("Look, a RED one!"). Very boring!

Respite might come from an unlikely source, though: Windows Vista! Vista might not be the consumer's best friend, but it is certainly a great window of opportunity for hardware vendors. As Vista goes, two of its key features will make for a much needed "sexy time for motherboards": ReadyBoost and SideShow.

ReadyBoost can use storage space on some removable media devices, such as USB Flash drives, to speed up your computer. Thanks to unprecedented demand and even greater supply, Flash memory is cheap and probably sold by

Motherboards

Need more sex appeal!

the kilo in some backstreets in China. You should soon see motherboards with embedded Flash storage to leverage this Vista feature.

What the Flash would help with would be caching of frequently-used programs. Vista has a nifty feature called SuperFetch, through which it monitors stuff you run often and caches them to memory, so that future instances of your favourite programs start quicker. Another neat trick that a motherboard with embedded Flash memory might pull off would be to act as an overgrown floppy drive: imagine booting into your favourite Linux distribution, or even a DOS variant upon startup.

SideShow is another neat feature that Vista supports—a SideShow device is like a mini-monitor that displays key information from your Vista system. It could either be a small LCD window on the lid of a laptop which shows you unread mails, battery life and so on when the unit is off, or it might be a clock that shows you your IM buddies, your currently-playing track list or the weather even when your monitor is switched off. For a PC, SideShow would make a great addition if it is wireless—imagine IM and mail notifications while lounging in your living room.

So much for new features—what about chipsets? NVIDIA chipsets are the way to go for AMD processors (perhaps until the time AMD truly assimilates ATI offerings into its product lines). For Intel processors, the roadmap calls for at least one SiS-based motherboard; time will be judge of that product's performance. Today, however, Intel's P965 chipset is the one to watch—it offers product support across the entire Intel line from Pentium D to dual- and even quad-core processors. Barring some performance hiccups (in some

instances, the 975X still performs better), and some bad decisions (such as no native support for IDE drives), the P965 would make a great platform for any future Intel purchase. As for choice, the NVIDIA 600i family is perhaps the best route for Intel gamers to take. While the top-end 680i range came with its baggage of problems—from audio issues to data corruption—the problems are largely fixed now, and it is the best non-Intel solution for the high-end. More interesting in the 600 family is the lower-priced 650i chipset, which is meant as a direct competitor to Intel's P965.

The last few months have seen muted support in terms of chipsets for AMD processors. The reason for this could be two-fold: one, AMD bought ATI, so other chipset makers are unsure of how to react; and two, Intel is once again the performance leader with its Core 2 Duo range of processors. There is less noise in the marketing circles for AMD chipsets.

While on AMD, it would be remiss not to mention the new DTX standard the company has proposed for motherboards. DTX will essentially be an extension of the ATX standard for small-form-factor systems. The hardware spec defines two types of motherboards: a standard DTX board, 9.6-inch x 8-inch, and also a smaller mini-DTX unit at 6.7-inch x 8-inch. DTX systems, though small, would be able to accommodate a processor with a thermal envelope of up to 65 W, as well as two expansion cards which could be either PCI or PCI-Express. The form factor also calls for a notebook-style ExpressCard PC card. AMD has already released a review copy of the new standard, and is encouraging contribution from the market to design and evolve the form factor.

Logo



You can bet your last rupee that the multi-touchscreen will be copied by just about every hardware vendor out there

You've seen the movie, or have picked up the scene via osmosis; it's the geek interface zeitgeist—Tom Cruise flicking through files in *Minority Report*, his fingers are glowing, as part of the interface he is wearing gloves, and he is directly interacting with a hologram image of computer data: flick, flick, “these are not the files I want!”, flick, flick... This nature of interactivity might not be for the weak of arms, or the lazy, but as the Wii gaming console has recently shown, any interface that directly translates user input to screen activity is a good interface. So will we see a *Minority Report* “monitor + glove” combo anytime soon? Surprise: interfaces such as these have already been made and tested in labs around the world. In fact, the interface showcased in the movie was inspired by a project incubated in Microsoft's UI Labs!

Microsoft in particular has been trying unsuccessfully to push two types of interfaces at us. One of them is the Tablet PC way of interaction—pen inputs and handwriting recognition. We think this one hasn't been widely accepted due to the clumsy nature of Tablet PC hardware. Once Tablet PCs become small enough

Input Devices

Where is the ANY key?

and thin enough—in other words less like laptops and more notebooks—the interface may do better. “May,” because there will always be people who hate writing on screen as an input method. The other interface is that of voice and being able to dictate and communicate directly with a computer. Here too, the problem is two-fold: the software is not yet there, and not a lot of people are too keen on dictating to a PC.

So what could be a universal solution to the problem? A direct data dump from the brain to a computer? I hope not, unless the output is supposed to be an incoherent ramble. We can't imagine a unique solution to our input problem of today, but the question then becomes—is there anything wrong with the way we input data today?

While you can't imagine life without keyboard and mouse, you also can't imagine any other input device taking their place—or even complementing them. Well, maybe a joypad if you are a gamer, or a steering wheel if you are *really* into racing games. What else? Gesture-based computing? Multi-touch interfaces? Mouse and keyboard? Oh yes!

Gaming peripherals will hugely benefit now that Microsoft has decided that Xbox 360 peripherals may play nicely with the PC. You can thus buy a small adapter and a receiving station that will allow you to play games on your PC using the Xbox 360 controller. Also possible is the use of steering wheels on the PC which would have otherwise have been relegated to single duty on the Xbox 360. This blurring between the platforms will certainly help reduce costs for us consumers.

Microsoft is also keen on voice communication with

the PC. So much so that Vista comes with voice recognition built in—you can therefore dictate to your word processor or talk dirty to your Web browser, right out of the Vista box. Vista also extends the mouse functions to a digital tablet—if you are an artist and use the Wacom tablet or something similar, chances are that Vista natively supports the pen as an input device; the Ultimate variant of Vista comes with Tablet PC software, which allows handwriting recognition and pen-based gesture navigation.

The coolest aspect of the iPhone is its use of a multi-touch interface. A multi-touchscreen allows multiple inputs. What this means is that the screen can simultaneously listen for, and understand, more than one input point, as opposed to a single point of interaction, as is generally the norm with PDAs and their ilk. This opens up avenues for some funky gesture-based user-device interaction. One iPhone demo showcased the user being able to “pinch” the screen in order to zoom out of a photo. You can bet your last rupee that this interface will be copied by just about every hardware vendor on the face of Earth—brace yourself as multi-touch hits everything from cell phones to microwave ovens!

Finally, there is always the keyboard and the mouse. We hope to see rechargeable batteries marrying wireless keyboards, and please lose those ridiculous multimedia and system keys! We also wouldn't mind seeing some software widgets on our keyboards—so get SideShow to the keyboard, please.

We can't imagine an evolution of the mouse, though... perhaps it could sing to us? Or glow hypnotically? All devices could use some glow—make it happen!

Logo

Star Trek: Legacy

Only for Star Trek buffs...

After we got a taste of *Star Trek: Bridge Commander*, *Star Trek: Legacy* comes in to take a place in the list of the few space combat games. You play the role of a starship commander controlling your ship in third person; however, you can give orders or switch to any ship in your fleet. *Star Trek* freaks will ogle over the game's main features, one of them being the original voice cast for all the five captains of *Star Trek*. That's nice and all, but the game itself turns out to be something else...

The story starts off with the search for a missing Vulcan scientist, which, of course leads to the usual bad guys you have to fight off. As the story progresses, you will find yourself exchanging bullets with Klingons, Romulans, and Borg ships. Apart from "annihilate all enemies," there's the occasional mission to tow or baby-sit friendly ships/planets to keep things interesting.

The graphics are decent for a DX9 game; you won't be complaining on this front at any point. The ships have a good amount of detail, too. However, the physics is where the game comes out wrong. The collision detection is amateurish at best; you will often see pieces of debris pass right through each other or through ships—and that's only the start of the overall quirks of the game.

Moving from materialistic things to the core of any game—raw fun—*Star Trek: Legacy* turns out

quite disappointing. It starts right when you look at the Readme; you know they messed it up the moment you look at the section titled "Control Updates," which corrects the controls printed in the manual. Just when you think the Readme fixed things, you are welcomed with no option to remap your keys. This is a pain in the behind, considering the game has a huge number of controls. Add to that the absolutely horrid controls for your ship, plus there's no way to get the camera to lock behind your ship. Trying to get used to the controls itself will take off a decent chunk of your time. You're forced to control both the camera and the ship's movement in addition to targeting and firing.

The adrenaline level in dogfights is extremely low, with most ships turning around at a snail's pace. You could place a weight on the [A] key and go take a shower while your ship makes a 180 turn. Granted, these are battleships you are controlling and not fighters, but it's a game—and we don't really need to know that battleships take an eternity to turn around. This seriously affects the fights you encounter, even the epic large battles.

Star Trek: Legacy has a lot of potential, but it looks like the devs hurried the game to make the release date.

mayur_bhatia@thinkdigit.com

Rating: 3/10
Developer: Bethesda Softworks
Publisher: Ubisoft
Distributor: E-Xpress Interactive
Contact: sales@e-xpressindia.com
Price: Rs 1,299

RACE

THE WTCC GAME



True to the simulation mantra

Race, a simulation game based on the FIA WTCC championships lets you experience the WTCC 2006 championship seasons. Everything a simulation fanatic could possibly ask for is crammed into this game—in addition to the rules, the tracks and the cars, the drivers will also appear familiar to anyone following the WTCC craze. Yes, that also includes 2005 WTCC champion Andy Priaulx. Race goes to great lengths to ensure that players experience as much realism as possible; this includes the penalty weight system in championship mode and a realistic damage system where your cars crumble, break and bend. Even debris hitting your car can damage it, so don't go full speed ahead in glee, and watch out when you see the cars ahead of you encounter a nasty accident.

You can play *Race* mainly in the Quick Race, Championship and Race Weekend modes. The two additional modes—Driver Duel and Time Attack—add a bit of spice to the game, despite being a bit similar. And of course, there's multiplayer where up to 26 players can race with each other.

Moving to the core of the game—simulation—*Race* does it extremely well; no two cars feel the same when driving, and the amount of flexibility to customise your cars is simply huge. Even expert tuners will be impressed at the large amount of tuning in *Race*; you can even customise

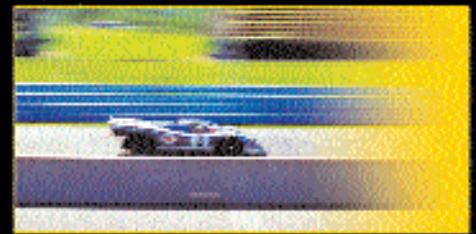
each tire and its height individually! Even in-game, small factors matter—your windshield could get smudged by the weather or dirt, and stones could smash it.

The graphics aren't overly detailed, but they feel smooth to look at and won't hamper your playing experience. As already implied before, the physics are awesome; any realistic game should pay attention to physics, and *Race* has pinpointed its every aspect.

The amount of difficulty options in *Race* brings even the toughest of the skilled players down to their knees, however novice gamers will have some difficulty getting used to the game. SimBin has taken this into account and even included mouse steering for players finding controlling with the keyboard too difficult.

Race is a great game with few quirks, one of them that you can't see where your steering wheel is pointed when controlling your car with a mouse in chase cam. Also be warned that the game comes with Steam, which means you will need an internet connection at least once to be able to play even in single player mode. Anyone who has ever used Steam can testify to its ability to cause severe hair loss! At the end though, it's all worth it if you are a simulation fanatic.

mayur_bhatia@thinkdigit.com



Rating: 7/10
Developer: SimBin
Publisher: Eidos
Distributor: E-Xpress Interactive
Contact: sales@e-xpressindia.com
Price: Rs 699



Teching Their Breath Away

Japanese transport firms are using mobile technology to prevent drunk drivers from starting shifts. An alcohol breath analyser sends data to a service centre, a video call is made and a software confirms the driver's identity before the test



Sony Pumps Up The Blu-ray Volume

Sony Computer Entertainment Europe will send out half a million copies of *Casino Royale* on Blu-ray Disc to the first half-million registered PS3 users. Probably to promote the PlayStation Network, or to the format. Strike twelve (or fourteen) for Blu-ray



Escape

NEWS YOU CAN USE

Game On!

Assuming University of Rochester researchers can't be bribed by game publishers, it's official. You can tell your parents about it. You can tell them to buy you an Alienware rig and lots of original copies of games—for the sake of your vision, which, it's been proved, gaming improves. And no, it doesn't work with Tetris-like games (hence the Alienware rig): it only works with complex, action-packed games like *Unreal Tournament*.

You can quote the good researchers at the University of Rochester. They proved that students who played action video games a few hours a day for a month improved their performance by 20 per cent at a "clutter test"—something like a standard eye-test. (It should work for non-students too, we're assuming.)

Chosen for the research were students at the

University who hardly played games. It was a tough job, but they found some. Then those students were given the clutter test. This consists of the following: one needs to identify the orientation of a "T" thrown somewhere in a "clutter" of other symbols. Then, the students were divided into two groups—one group played *Tetris* for about an hour a day, and the other played *Unreal Tournament*. The official difference? The latter is more visually complex.

After a month, the Tetris-players hadn't improved and the UT players *had* improved at the clutter test.

So here's the head researcher's verdict: Daphne Bavelier says, "When people play action games, they're changing the brain's pathway responsible for visual processing. These games push the human visual system to the limits and the brain adapts to it."

And if that weren't enough, Bavelier goes on: "That learning carries over into other activities and possibly everyday life." Meaning—and it doesn't get any better—that gaming actually makes you smarter, too!

What next? Bavelier's team plans to use a 360-degree virtual reality lab being developed at the University. Now if they find something useful from that, we're not sure you'll be able to convince your folks to buy you a head-mounted display, but for now, you can show them this.

ROMANIA'S IT INDUSTRY

Thanks, Bill!

This is the first documented evidence of something like this having happened. Basescu told Bill Gates, "Thanks for all the Windows and Office installations!"

No, sorry. That doesn't quite make sense. We're

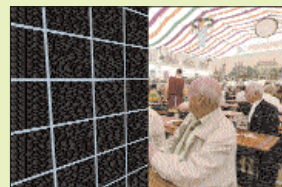
Whatever Happened To...

QTVR

QuickTime Virtual Reality (QTVR) was an interesting concept by Apple that allowed users to interact with images instead of just sitting there looking at them. It aimed to do away with the two dimensional viewing of images and instead, show everything in 3D. The technology is not dead, by any means, and you can still get the necessary tools from Apple to make QTVR MOV files, it's just that it never took off and became popular.

How it works is pretty simple: You shoot panoramic views of your surroundings—left, right, behind, top and bottom—then the software puts them together and makes a spherical 3D image that it displays as a movie. Now viewers (who have to have Apple's QuickTime Player) can just keep the left mouse button pressed and move the mouse left to see what's on the left, or right to see what's on the right, as well as up or down.

When seen in a browser (streaming) the images are loaded into the player one at a time, and you can clearly see the 3D grid that is being used. QTVR also offered companies the chance to show-off their products in 3D, letting the users rotate the product and view it from the desired angle. However, we suspect the capabilities of Flash killed all hope QTVR had on this front.



Win! My Desktop

February's Winner

Tarun Brari from Mandi, Himachal Pradesh

Is it Windows, Mac OS X or Linux? Turns out it's Windows, and here's how he did it:

1. FinderBar 1.3 for the Mac-Style taskbar
 2. Objectdock 1.3 for the Dock
 3. A SuSE wallpaper
 4. Hide the desktop icons—right click on the Desktop > Arrange Desktop Icons and Uncheck show desktop icons
- Almost had us confused, this did.

Participate in this contest

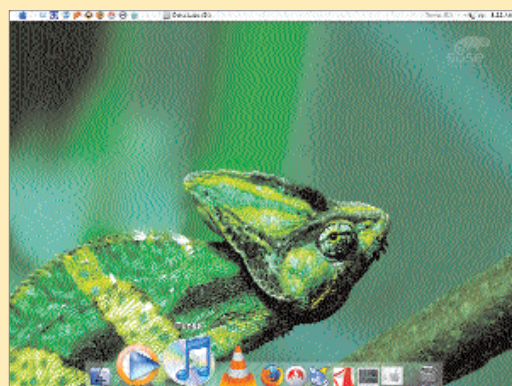
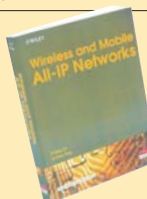
and win next month

Wireless and Mobile All-IP Networks

by Yi-Bing Lin & Ai-Chun Pang

Published by

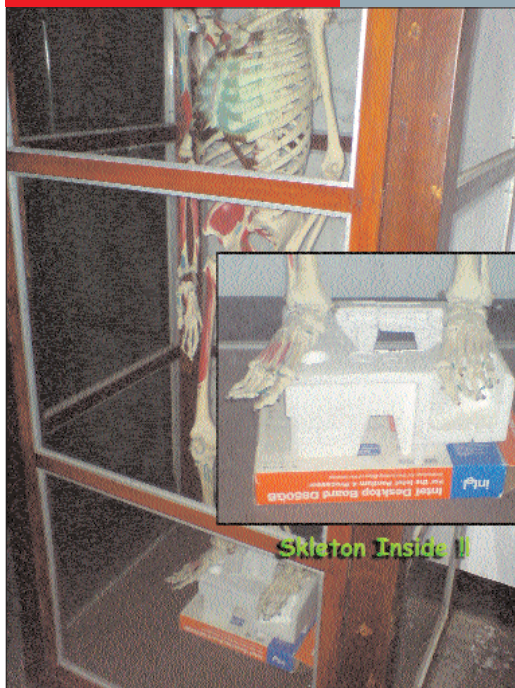
WILEY-INDIA



Send in your Desktop with a description of how you made it to mydesktop@thinkdigit.com with the subject "My Desktop", and tell us your postal address, too.

DigiPick of the month

"Bare-bones Hardware"



Last month's winner is

Abhra Bagchi

(abhra_life@yahoo.co.uk)

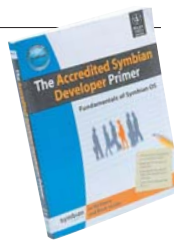
Participate and win
next month

**The Accredited Symbian
Developer Primer**

by Jo Stichbury & Mark Jacobs

Published by

WILEY-INDIA



Corrigendum: January's winner was
Nadeem Shaikh, Pune.

WIN!

Send in your entry and you could win an exciting gift just by sharing an amusing picture with a tech angle to it. The picture should have been shot by you, and should not have been published anywhere earlier. E-mail your picture with the subject "**DigiPick**" and your postal address **on or before the 20th of this month** to digipick@thinkdigit.com. One prize-winning picture will be published each month.

looking for words to describe the probable look on the face of William Henry Gates—and the extent of his speechlessness—when he was told, at the opening of a global technical centre in Bucharest, by Romanian president Traian Basescu, that that country's IT industry would have been nowhere if it weren't for pirated Windows. (And pirated Office, we're presuming.)

Now what, really, do you say in such a situation? "It's my pleasure"? "Don't mention it, it was nothing"? The comment by Basescu was almost certainly a compliment, we think. But communicated as it was to Bill Gates, we're wondering if Basescu was a tad sloshed when he said it. People don't say things!

To give you an idea of the gravity of the situation (the situation in Gates' head, that is), Basescu said during a *joint news conference with Gates* that piracy had helped the younger generation discover computers, that it set off the development of the IT industry in Romania. And Basescu goes on. Piracy also

helped Romanians improve their "creative capacity in the IT industry," which he says is now world-renowned. He said all this piracy "ten years ago" was an investment in Romania's "friendship" with Microsoft and Gates.

The one inaccuracy there is the "ten years ago." Basescu failed to mention that the pirates are still doing their act—and very well indeed. It's not like Romania is suddenly going to go buy genuine Windows—software pirates abound like flies in the country, we're told, and will call up offices peddling their wares.

So what *did* Gates say to the genial Romanian head of state? Nothing, as the reports go. "No comment."

It seems a conspiracy (no pun intended, we promise!)—everyone seems to be telling Gates to loosen up and just take piracy in his stride. There's a Russian teacher who was prosecuted by Microsoft for using pirated MS software, and he faced imprisonment in Siberia if proved guilty. Guess who intervened on the teacher's behalf? Mikhail Gorbachev. He made a plea to end the

prosecution. And Vladimir Putin advocated going after the distributors rather than the users. (The teacher was acquitted.)

So come on, Bill, lighten up! A country thanks you! The ultimate form of flattery is imitation—literally!

TOM AND HARRY AVAILABLE

Dick Taken

As if having a name like Pecker weren't bad enough, publishing executive David Pecker lost the right to own davidpecker.com. This is because according to the World Intellectual Property Center (WIPO), only famous people who *trade* on their name have their right to that domain name.

The WIPO Arbitration and Mediation Center declared that Pecker failed to demonstrate that he had rights to davidpecker.com other than "broad assertions."

Now who else would want davidpecker.com? Well, it's a parking service with ads on it, and it happens to

People Who Changed Computing

50 Years On

Certainly one of the biggest things ever to have happened to computing was the



Reynold Johnson

invention of the hard disk by Reynold Johnson, back in 1956. Reynold's interest in electromechanical devices started in 1933. His first invention was a device for automatically grading multiple choice tests.

Johnson joined IBM in the 1950s, specialising in electromechanical devices. IBM, during the time, wanted to develop a random access memory that could store and retrieve data in seconds—and not in minutes like with magnetic tapes and card files. Johnson and team devised the first working magnetic disk storage in late 1955. The device, named RAMAC (Random Access Method of Accounting Control), was very large and weighed a ton, but it was capable of accessing a file in less than a second.

The first commercial hard drive in 1956 produced by IBM called the RAMAC 305 had fifty 24-inch magnetic disks rotating at 1200 rpm. The disk could store 5 MB, which at the time was high.

Johnson is said to have been a gentle man who never wanted to be in the limelight. He received many awards for his contribution to storage devices, including the Medal of Science in 1986, and the IEEE Award for Advancement of Information Storage Technology in 1992. At the end of his life, Johnson was working on codifying Chinese characters.

Bluff

YOUR WAY THROUGH

Open Source

We've all heard about the Open Source Software (OSS) movement, but how much do we really know about it? In case your friends know more than you, here are a few terms that should see you through that uncomfortable conversation.

GPL: The GNU General Public License is too complicated to explain in such a small space. However, to give you an idea, the GPL is the most popular license for free and OSS. It allows users to copy, modify and distribute software that is under GPL for free, or even for money. However, source code of such modified software *has* to be included.

Repository: OSS is developed by hundreds and thousands of people from across the globe. In order for them to all be able to work together, all the source code needs to be stored in one globally accessible server. This server is called a repository, and contains all the different versions of the software being developed.

CVS: The Concurrent Versioning System was until recently the most popular version control system in place. It's now being replaced by SVN.

SVN: Short for Subversion, this is the revision control (or version control) system that is becoming popular. This version control software offers more advanced features than CVS, which are needed when thousands of developers are working on the same source code.

FSF: The Free Software Foundation is the group that is spearheading the OSS and Freeware movement. They support the GNU and help with legal issues in the OSS domain.

Usage: "I wish Microsoft would release Windows 98 under GPL. I'd like to see the CVS/SVN repositories for the blue-screen, and watch as the FSF tries to convince them to take it back!"

Wild Wild Web

The Love Bug

February is the month of love, and Google loves us, too, even if we don't click on the ads. And as you know, Google changes their homepage logo on various occasions, and on St. Valentine's Day they tried something lovely: a cherry dipped in chocolate, making up a letter "g". For whatever reason, they forgot the "l". Which is sad because "L" could stand for "Love," and it might have indicated that they've stopped loving us.

Someone wrote to Google's Corporate Communication Co-

ordinator about the missing "L". He also helpfully asked the C.C.C. whether the green stalk on the strawberry was for "L".

The Corp. Comm. Coordinator simply agreed with the reader, and replied that it was Google's new "edgy" design. She ended her reply with an "L". Standing for "Love," of course—so we're happy again.

Virtual Swedish Embassy

Sweden's Pirate Heaven, so lots of people want to move there. Many people don't know the processes involved. So, the Government launched its



officially-sanctioned embassy in the virtual space of Second Life, known as the Swedish Institute. We're making much of this up, mind you, but not the part about the Institute. The Institute will tell would-be movers to Sweden how to get passports and visas in this, the real world. It is now looking towards buying an island to create a home for Swedish companies in Second Life. Reminiscent of Sealand, that...

display porn ads—because of the "pecker" in the name, of course. Now wait; johnpecker.com is a placeholder site, but there's no tompecker.com or harrypecker.com or even a dickpecker.com! So, funnily enough, there's this bloke called Ferris who registered davidpecker.com some time ago. Pecker and Ferris attempted to negotiate; it climbed to \$1,600, and finally Ferris demanded \$15,000 to stop registering other domain names with "pecker" in them.

We're wondering why Ferris chose *david* as part of the domain name to register—and why he hasn't registered more common peckers like, as we said, dickpecker. And, in the first place, who would head to a site that simply had "pecker" in the name somewhere, assuming it would be a good porn site? Ferris' motives remain a mystery, but that's the way it works. He held control of his rights simply by linking "pecker" to porn—which leads to interesting observations:

willy.com is the "WILLY ITALIANA" website." They manufacture garment labels. wiener.com is "Wiener Reviews," and they go, "Wiener revies (sic) is dedicated to the gay community!"

Although whang.com and dong.com and schlong.com are parked, the usual suspects, which we won't mention here, are all porn sites.

The possibilities are many in this domain (pun not intended), but the point is, if you've got a porn-related name like that of John Gay the poet, your chances of getting "your" domain are slim!

I'M BEAUTIFUL Profiles Lie

You've probably heard a story that goes like this—it might have happened to a friend or colleague or even you: an online friend of the opposite sex is tall and handsome (or beautiful), but he or she hasn't posted a photo yet. (That digicam is always waiting to be bought, and he or she doesn't have a scanner!) Then comes personal meeting day. And one goes, "He (or she) was better online." Research now points out that more than 90 per cent of online daters lie about at least one thing in their profiles.

The biggest—and the most frequent—lies are about height and weight, just what you'd expect. This comes

from Michigan State University research. (Yes, a lot of such time-pass research is state-funded in America.)

There are very precise figures: in the MSU research, it turned out that men say they're an inch taller than they are, women in their twenties say they're five pounds less weighty, and women in their thirties say they're 17 pounds less weighty.

People even lie about being married, though we think that isn't too common in India.

Interestingly, there are "spikes" in ages on online profiles—for example, the spike at "29", which you could figure for yourself. There also happens to be a spike at "36"—the figure for that age is much higher than that for "between 37 and 41." Hence, we figure, 37 is "old."

So why do people lie? The researchers found pretty much what we knew: that the Internet disinhibits you, that you feel free to say what you want; also, that you want to attract a more appealing partner. For men, lying about income is practical: people listing higher incomes just get more responses! It's quite pardonable, really: get hitched to someone online, and confess on meeting day.

Which is something like judgment day: don't lie to the extent that "tall, fair and slim" becomes "short, dark and fat."

With the privacy the Internet gives you, it's hard to resist, though. We'd all like to be beautiful people.

"FUNCTION FATIGUE"

Too Many Features

Remember those simple mobile phones that just let you speak? Like the Nokia 1100? That's what people want, it seems, according to a survey by FAME. Well, that's human nature for you.

FAME is the Forum to Advance the Mobile Experience, and the survey was sponsored in part by Palm. Now, if FAME wants to Advance the Mobile Experience, it turns out they don't have to do much—just tell people to revert to the phones of a decade ago!

They're calling it "Function Fatigue": it was the #1 complaint of those surveyed, and it means, "I

Pinch Me, I Must Be....Whoops!

If you've ever glanced at Brother Zivalal's midsection, you can see that life has been good to him—well, except for all the work we give him. Overall though, the sight conjures up the image of a ripe pumpkin. And then came the day that The Browne (who has now insisted on the moniker Vandal) decided to see how ripe it really was...

'Twas the night before closing, and the Vandalising Forefinger was on the prowl. As Zivalal browsed the file server, said forefinger sprung out of seemingly nowhere and struck him right in the pumpkin belly. Startled by the arrival of this unknown appendage, he mistakenly dragged the folder containing the magazine's Quark files into an undisclosed

location—files, mind you, crucial to this magazine ever getting printed.

"I don't know where it went! He did it! It's not my fault! I'm mailing Deepak! [miscellaneous expletives]!" And as Pillaiji and FatBeing suffered the fallout of the explosion, Vandal struggled to see through his tears of laughter.

After some careful forensic analysis at the scene of the crime (viz. Asking Sivalal to point out what exactly he was doing at the precise moment), the errant folder was tracked down, peace was restored, and eyes were rolled at Vandal's indiscretions. "All I did was *this*", he defends himself to anyone who'll listen (and many who won't)—unleashing the forefinger upon them. So if you ever get poked in the near future....

DIGIT DIARY

don't know how to use my phone." Dave Murray, director of FAME, puts it a little more eloquently and correctly: "There are too many product features that consumers don't use, or don't know how to use, and it frustrates them."

"There is a high percentage of consumers who are only looking for limited functionality," Murray says. "At the same time, there are many who

want more functionality. But they want to be able to actually use it."

In other words, some people want to use advanced features without knowing how to use them. That's human nature for you again. If you're going to cram a digital SLR into a cell phone, there's precious little you can do to simplify things. What are manufacturers to make of these findings, and what are they to do?

An interactive voice system would be welcome. "What do you want to do?" "Take a photo." "Is it bright or dark in here?" "Dark."

Seriously, we've seen too many reports of people complaining their devices are too hard to use, and we all know at the same time that people want to be able to do more. Perhaps someday everyone will actually get down to RTFM. ■

Blog WATCH

Apple's mess-up on DRM-free music was the hottest topic of the month—did Steve Jobs make a dumb move or will he become a worldwide hero? Also, it seems that JavaScript "things" do more harm than good

Mark Cuban

www.blogmaverick.com/2007/02/07/what-should-the-music-biz-do-next

What should the music biz do next?

...Does anyone question the interdependency of value among all outlets of music? Does the popularity of downloads of a song, its ring tone, its video, its CD sales, even ticket sales, licensing, sponsorships and merch sales affect the other elements? The total revenue available from the artist? Of course it does. Leverage Google, Yahoo, maybe even Microsoft or Amazon or others to create a system that takes input from all revenue sources and prices (with constraints as defined by the owner of the content, ie min/max price for a product, and/or break even point in net margin dollars for an artist or the entire label) to optimize whatever the goals of the company are, whether its overall sales/profitability, or possibly, maximizing the number of downloads and visibility for an artist...

Ed Felton

www.freedom-to-tinker.com/?p=1117

Apple Offers to Sell DRM-Free Music

...Much as I would like to see Apple renounce DRM entirely, that's not quite what Jobs is saying. The letter describes three possible futures for Apple's music technology: (1) continue the current path with a closed Apple-only DRM

system; (2) license Apple's DRM technology to other companies to build compatible systems; and (3) sell DRM-free music.

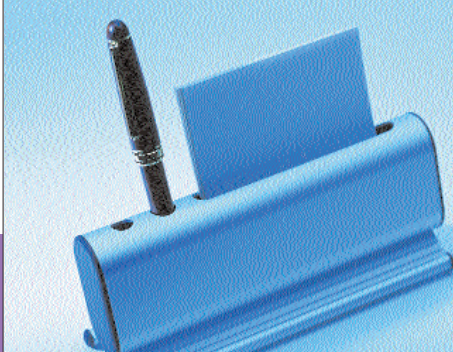
Apple's preferred outcome, Jobs says, is outcome (3). This is notable, and somewhat surprising, as the consensus has been that Apple strategy has been to seek outcome (1). If Apple really prefers to eliminate DRM, that is news...

Jerem Zowdany

<http://jeremy.zawodny.com/blog/archives/008547.html>
JavaScript Badges and Widgets Considered Harmful

... the seemingly ubiquitous JavaScript Badges/Widgets/Thingies that you see on blogs and web sites everywhere. Heck, I even have one on my site right now (over there--on the right)...

...Why? They're a hack. With all the talk of how the web has "become writable" with advent of blogs and self-publishing tools, you'd think that we'd have a better way of getting third party content on to our sites. Given that an overwhelming number of sites that are likely running PHP or some other "dynamic" hosting setup, these least common denominator solutions just feel wrong. (This could easily be followed by a rant on problems with the spread of web services and RSS.)...



February 2007

Digit Goes Clairvoyant

I am an avid reader of *Digit*, and it has helped me a lot. Especially the *Fast Track* series. For the past five years, I've wanted to build something for myself as a Web Presence but could not muster the courage to do so. But, thanks to your intuitiveness, at last I was able to publish my first blog—because of your *Fast Tracks* on Google and blogging!

Anindya Chatterjee
New Delhi

Linux Woes

I've been a *Digit* reader for the past two years. I've never seen any book with so information and content where you learn from. It is a book which makes you popular and stand out from the crowd. But all the advice from *Digit* is not gainful; some can be a pain in the neck.

After all the two years of blah, blah, blah on using pirated XP, well, I finally thought of reverting from XP to Linux.

Day 1: After all the lectures in every issue, I finally decided to go legal after searching my pouch of OSes. I have a collection of OSes from Sun Solaris to FreeBSD. I thought of installing Fedora Core 4. Two years of *Digit* always pays, and installing Fedora Core was a piece of cake.

Day 2: I liked the graphic interface and everything was cool. I went through all the options, and created user accounts.

Day 3: I am a gamer, so I checked for games. Well I played all the boring ones. Man, I'm staring to miss all my *FIFA 07*, *GTA San Andreas*, *Crime Time Gang Wars*—man, I feel like crying.

Day 4: Feel like playing some soft music to relieve the grief and the hell. There's no player that can play MP3 or video files, there is some or the other file missing. (Why did I listen to *Digit*?)

Day 5: Thought of browsing the Net to download Mplayer, Linux games, and

check mails. Please help, I'm not able to do it! Now every time I log in to the PC a dialog box appears saying "localhost. localdoamin not logged in to DNS host—please check /etc/hosts".

Please, please, please! I've had enough. Please distribute tissues next month. And please, please include big and small games for Linux in your next issue!

Mohammed Isham

Dear Mohammed,
Fedora Core 4 is certainly somewhat advanced in terms of required user knowledge. Install Ubuntu instead, and we're sure you'll have a pleasant experience—it's more user-friendly. You'll be able to access the Internet, and once you do that, you'll be able to download codecs for watching your movies.

As for games, we do give out Linux games now and then—look forward to more!

— Executive Editor

Teen Sensation

I am a 13-year-boy in the sixth grade from Kashmir, and I love your monthly magazine. I don't miss even one edition of *Digit*. The *Fast Track* is superb, especially the Web designing and Photoshop were very helpful. Even the *Digital Tools* and *Tips & Tricks* are great. And I can never forget the free CDs and DVDs. "Agar Firdoose Computer Magazine Ast, Hami Digit-w-Hami Digit-w-Hami Digit..."

H M Abbas
Kashmir

Clairvoyance, Part II

I would like to congratulate your team for the selection of beautiful backgrounds for the opening of the *Digit* CDs and DVDs, especially from the December issue. Will it be possible for you to incorporate these in future issues so they can be set as Desktop backgrounds?

Jayant Dhamne

Dear Jayant,

Take a look at this month's CD and DVD—you'll be pleasantly surprised!

— Executive Editor

Navigator No More?

I've been a regular reader for the last four years, and now I really got fed up and bored. *Digit*, instead of its narration "Your Technology Navigator," is now just becoming "Your Digital Product Guide." Giving just a look from the cover page till last page, it is full of new

products, ratings, and advertisements for them. Almost 50 per cent of the content is loaded with all this, and doesn't give insights about their basics and technologies.

In terms of software, it's just a stroll around Windows XP and Windows environment-based software and Office. There is no updated article about programming, new era of 2D and 3D animations and special effects, graphics and designing, Linux and networking, which are essential in today's scenario. I think including Hollywood movies trailers instead of Bollywood movies is also a very bad idea indeed.

But your *Fast Track* series is marvellous and more readable, and more admirable than your magazine. This is the only reason for buying your magazine. The complaint is that you publish it in black and white. The paper quality is not also as good as your magazine's. And the pictures you publish are very small, and of no use as the fonts cannot be seen without a lens and are totally blurred. Please publish this in colour, and you can increase the price to Rs 150. I also want to suggest to please publish a *Fast Track* on the best Web sites, and list some of their features—like sites on news, general knowledge, shopping, music, Bollywood, Hollywood, nature, free wallpapers, Web hosts, games, video, MP3, magazines, blogs, e-mail services, and so on, as every time I surf the Internet I get fed up with the same Google every time.

I think you will not publish this letter, but I will not stop buying your mag. I love it whether it changes or not.

Ved Prakash
Shimla

Dear Ved,

We'll definitely think about your suggestion regarding Bollywood trailers, though we don't think we'll drop the Hollywood ones. In addition, we must say that we'd lose a lot of our readership if we increased the price to Rs 150, so you'll have to bear with us as regards the paper quality of the *Fast Track* series.

With respect to your other points, we have only one thing to say—we publish, in our magazine, what we perceive as most wanted by our overall readership. You, apparently, are not a typical reader, so your needs are different.

— Executive Editor

Befuddled

Digit is just wonderful, and is like a way and clear-cut path to computer heaven.

Write to the Editor

E-mail: editor@thinkdigit.com

Snail Mail: The Editor, Digit, D-222/2, Om Sagar Building, MIDC, TTC Industrial Estate, Nerul Navi Mumbai 400 706

Digit will publish the best letters on these pages. Letters may be edited for clarity. Please include your complete address in all communication.

For subscription queries, call the help desk at 022-27629191/9200, fax 022-27629224, or send an e-mail to help@jasubhai.com

Inbox

But there are problems in understanding many of the details of your articles by many of us young readers. If you could work somehow to include a query section in which readers post their questions on various topics or new tech terms, it would be of great help.

Siddhant Kumar Yadav

Dear Siddhant—

Excellent suggestion! We'll certainly think about an "Ask Digit" section or something along those lines. Keep the letters and suggestions coming!

— Executive Editor

Blogging Boo Boo

I've been an avid reader of *Digit* ever since it was born after breaking up with *Chip*. I'm very happy to see the way *Digit* has become one of the leading Computer/Technical magazine in India, but also am disappointed at the pace at which the *Fast Track* is progressing.

This month's *Fast Track* was on blogging, and many facts stated in it are totally wrong. For example, Wordpress has been stated as both free and paid versions; Wordpress is a script which has been released under the GPL, which means it's totally free, and further, you've stated that there are only 53 templates available for Wordpress. If you visit <http://themes.wordpress.net>, you'll find that count is way less than what's really available. Apart from that, Blogger has been stated as a blog which can be hosted on an external server, which again is wrong; you can't host a Blogger blog anywhere apart from the blogspot.com server. And Wordpress being a blog which can be hosted on an external server has been mentioned otherwise.

You've missed important blog scripts like TypePad. The efforts of the *Digit* team are worth appreciating, but please don't dish out false information. Giving false information is worse than giving no information at all. I've been a blogger for about five years now, and also an active member on popular sites like sitpoint.com. Also, I really appreciate the efforts the team takes in bringing out the latest info about the hardware hitting Indian shores. But the *Fast Track* needs to be more up to date.

Anirban Mandal
New Delhi

Dear Anirban,

True: Wordpress is released under the GPL, but it was the blog hosting service we were talking

about, not the script, when we mentioned "paid." You can buy "upgrades" for your WordPress blog for credits—basically, dollars.

In your Blogger blog, go to **Settings > Publishing** and you can choose the FTP option to publish your blog to your own server. Hope this clarifies things.

We must also add, however, that our in-house team doesn't consist of experts on all tech fronts, so our readers will have to bear with the occasional error. Thank you for your letter: it has reassured our belief that *Digit* readers are sensitive to *everything* we publish.

— Executive Editor

Pilot's Chair

This is in reference to the fantastic article *The More The Merrier*, in the January 2007 issue. The doubt I have is: can a dual- or triple-monitor setup be utilised for gaming, for example, *Microsoft Flight Simulator*? Being a pilot myself, I feel the loss of visual cues from side windows is a major deterrent, and using the buttons to get momentary glimpses simply does not suffice. If, instead, I had a three-monitor setup, it would be a really immersive environment coming much closer to flight simulation than what is available so far. Taking the concept a step further, it would be an inexpensive and effective solution to simulating many environments, for example, a driving sim. But how does one go about doing that? Does *MS Flight Simulator*, for example, provide the ability to use three monitors for left, front, and right views?

Atul Bhatia
New Delhi

Dear Atul,

Multi-monitor support is very game-dependant. Thankfully, in your case, *Microsoft's Flight Simulator 2004* does support up to four monitors. Not a lot of other games do this, unfortunately. For other games, if you're willing to use software rendering and run the game in windowed mode, you can either undock the additional views and drag them to another monitor, or just choose a really wide-screen resolution that will stretch the display across more than one monitor. Since most people do not like software rendering, it's best to stick to games like *MS Flight Simulator*, which will use normal hardware acceleration, and natively support multiple monitors.

— Executive Editor

Must...Resist...

Recently, the topics in your mag related to piracy have been really touchy. In short, they have motivated me to look for free software. I recently had a nice experience that I thought I might share with you all: I got a CD teaching the basics of computers. It was really a nice CD for first timers. So I thought to copy it (strictly not for any commercial use, just for fun, as I didn't really need it). But soon I realised that something has been written on the CD: "Warning: copying this CD might corrupt your CD writer." It looked really awkward to me that such a thing can happen! I was confused and decided that this would not be possible. But that too didn't make me try to copy the CD; I left it alone! The moral is that little things too can stop piracy (though not on large scale); it still can bring some doubts in the minds of novice users!

I have a request: please include an article related to installing/uninstalling software on Linux! In the past three years or so, you haven't yet included this in your magazine!

I would also like to add that although your new interface for the CD/DVD are really rocking, I think you may have forgotten to think about some of your readers might want the CD/DVD to run on Linux too; even though it may be only 1% of readers who need it—they are your readers too! Please do something!!

Nitin Kumar
Danapur Cantt.

Dear Nitin,

Thanks for your mail. And what a moral victory you have cited there! Congratulations for keeping true to your conscience and letting honesty play a role in your acts.

I know it is really tough to take the correct decision in such cases, and the lure to copy illegal material is too high. Your action is commendable.

As for your complaint regarding Linux installation and our discs—we've received a lot of such complaints. As of now, we cannot do anything about it that doesn't involve us stretching ourselves thin, but your mail has certainly left us thinking. Let me see what we can come up with—even if it is, as you rightly pointed out, preferred by 1 per cent of our readers.

—Executive Editor

LETTER
OF THE
MONTH

Apple SANS DRM?

1 Apple has made proposals to the world's biggest music labels to sell their music catalogues DRM-free. Apple's DRM technology is called...

- a) PlugNPlay c) MediaMax
b) FairPlay d) VitalSource



2 Yahoo recently launched a feed aggregation and manipulation service, whose name resembles a plumbing utility....

- a) Pipes
b) Shower
c) Taps
d) WashBasin

3 The percentage of Africans with access to broadband is...

- a) 5 per cent
b) 22 per cent
c) Less than 1 per cent
d) 15 per cent

4 According to a recent study, the near-constant rate of hacker attacks on computers with non-secure usernames and passwords is:

- a) Every second
b) Every 2 minutes
c) Every 39 seconds
d) Every hour

5 IPv6 addresses are 128 bits long. How long are current-generation IPv4 addresses?

- a) 16 bits
b) 32 bits
c) 64 bits
d) 256 bits

6 What does DIMM—as in “RAM DIMMs”—stand for?

- a) Duo In-Line Memory Manager
b) Dual In-Line Memory Module
c) Differential Inlay Motion Monitor
d) Double In-Line Monitoring Memory

7 How many bytes make one Yottabyte?

- a) 10^{24}
b) 10^{48}
c) 10^{18}
d) 10^{56}

8 According to the SANS (SysAdmin, Audit, Network, Security) Institute's list of Top 20 Internet Security Attack Targets, the top Internet (in)security target is...

- a) The root DNS servers
b) Mac OS X
c) Microsoft Office
d) Internet Explorer

9 There are a lot of rumours, but it seems the Apple

iPhone is likely to use one of this company's processors:

- a) IBM
b) Intel
c) AMD
d) ARM

10 What is the name for the physical address of a network device?

- a) TCP Address
b) Ethernet Address
c) MAC Address
d) Subnet Mask

Frequently-used information is stored in a computer as “cache” for quick access. When IBM first developed a cache in the 1960s, they thought up the term “muffer”—for Memory Buffer. Good thing they didn't stick with it!

Did You Know?

Answers

1. b) FairPlay
2. a) Pipes
3. c) Less than 1 per cent
4. c) Every 39 seconds
5. b) 32 bits
6. b) Dual In-Line Memory Module
7. a) 10^{24}
8. d) Internet Explorer
9. c) Microsoft Office
10. c) Mac Address

Got an interesting question? Send it in with the answer to **TQ@thinkdigit.com** Mark “TQ” in the subject area.

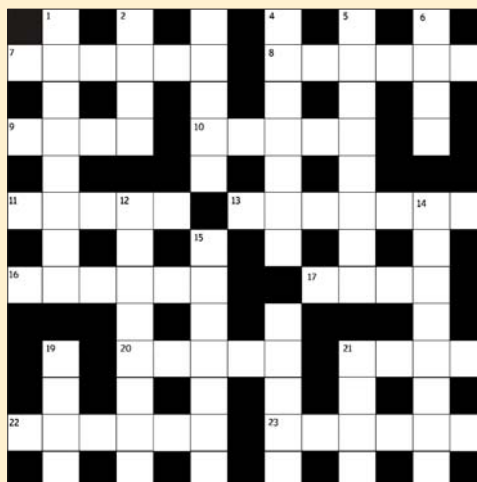
Crossword

ACROSS

7. Specification Of a Sequence Of Flow Objects(abbr) (6)
8. OWD or ____ Day—celebration of Internet holiday (3,3)
9. Asterisk symbol (4)
10. ____ nail—used by graphic designers for a smaller image of a larger one(5)
11. Open Source suite that provides seamless file and print services to SMB/CIFS Clients (5)
12. Multimedia encyclopedia from Microsoft on CD ROM (7)
16. ____ per second—unit of angular(rotational) speed (6)
17. ____ Cellular Limited—GSM operator of the Aditya Birla Group (4)
20. Famous company known for its ‘Macintosh’ series of personal computers (5)
21. Any computer that has two-way access to other computers on the net having it's own IP address (4)
22. ____ ID-telephone service enabling the subscriber to identify the opposite party's phone number (6)
23. Zoom tool function to ____ or enlarge sizes (6)

DOWN

1. Programs that make computer systems work(8)
2. IPv ____ data-oriented protocol to be used on a packet switched internet work (4)
3. Type and style of text letters and characters seen in documents (5)
4. Rows and ____ in ‘Excel’ (7)
5. Primary text input device (8)
6. PC manufacturer in Austin, Texas known for ‘PCs Limited’ brand (4)



12. Unwanted programming such as adware or spyware (8)
14. “T” in T-SQL (8)
15. Pagets (7)
18. ____ Yang-Taiwanese American co-founder of Yahoo! Inc (5)
19. Unwanted e-mail (4)
21. Menu selection in graphical user interface instructing computer not to show certain things on screen (4)

Crossword by Nitta Jaggi

February's Winner:
Chetan Ghauran
Jaipur, Rajasthan

Send in your entries to **TQ@thinkdigit.com** on or by 20th of this month. One lucky participant will win **OCA - Study Guide** By Bob Bryla & April Wells

Published by

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Last Month's Solution



Tabloid TECH

People And Events That Grabbed The Headlines—For Better Or For Worse

Everything Paris!



Earlier in February, songstress and pop culture phenomenon Paris Hilton won a case to take down a Web site—ParisExposed.com—which was selling videos, pictures and personal data she'd left in some dark, dingy place! The site was shut down by an injunction, but the owner of the site, Bardia Persa, who had paid a pretty \$10 million for the booty, said he would contest the injunction!

Hilton said she was "mortified" that someone would try to "profit by exploiting personal details" about her, "especially when it comes to my sexuality." (!) We don't see what's to be mortified about! If someone bought something legally, we don't see why he *wouldn't* peddle it on the Net for profit!

Hilton's spokesman Elliott Mintz told Associated Press, "I know what this has done personally and emotionally to

Paris." We're supposed to feel sorry for her! And we bet you aren't!

So, well, the story continues: Persa duly appeared in court February 16, and the spoilsport judge again barred the site from peddling Hilton's racy photos, videos, diary entries, and other personal items.

There are lots more legalities! Which we can't understand! Actually, we don't even know what "injunction" means!

ParisExposed.com had promised subscribers glimpses of Hilton's personal records! It claimed to have footage of Hilton in a "sexy bubble bath," and shots of her in "racy situations"!

We bet you didn't figure why we're overdoing the exclamation marks! Well, it's just to get some oomph into this pointless story! The site's been blocked anyway, so who cares!

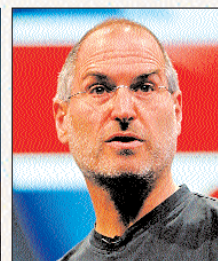
It's Cool Vs. Nerdy

There's a juicy Jobs/Gates feud doing the rounds, and it's based on a set of TV ads. You might have seen print ads of this sort—a geeky-looking man in a business suit, and beneath him, "I'm a PC"; and a "cool"-looking teenager on the right clad in jeans, and beneath him, "I'm a Mac." Similar to that are the new TV ads, but these actually use characters that look like Gates and Jobs. The nerdy guy, of course, looks like Gates.

Tech news Web site theregister.co.uk has called the long-standing feud between the two men a "tedious psychodrama between two megalomaniacs," and it all hinges around the idea that Jobs takes Gates' success personally.

In fact, Jobs once said, "The only problem with Microsoft is they just have no taste, they have absolutely no taste, and what that means is—I don't mean that in a small way I mean that in a big way."

Asked about the ads, Gates said he hadn't seen it. Then he said he had.



And then—fireworks! For no reason we can see... "I don't think the over 90 per cent of those who use Windows PCs think of themselves as dullards, or the kind of klutzes that somebody is trying to say they are," was the first thing Gates had to say. Why the insecurity? "And I don't know why (Apple is) acting like it's superior." Actually, that one's pretty obvious—because they have "cooler" products, isn't it?

"I don't even get it. What are they trying to say? Does honesty matter in these things, or if you're really cool, that means you get to be a lying person whenever you feel like it? There's not even the slightest shred of truth to it."

Not to worry, Bill. Even if we don't love you personally, we love our Windows. The Romanian president loves you too, by the way.

Ballmer Sinks MS Shares

Steve Ballmer recently said Wall Street's current expectations for revenue from Vista may be too "optimistic." Everyone around got that sinking feeling: Microsoft shares dropped more than 2 per cent shortly after.

"I'm really excited about how enthusiastic people are about Vista, but I think some of the revenue forecasts for Vista in 2008 are overly aggressive," Ballmer continued in the meeting for financial analysts.

We're not sure of the financial aspects of all this, but we get the general idea that Ballmer shouldn't (or needn't) have said what he did.

People also asked Ballmer about the Jobs vs. Gates TV ads. "I'll give Apple credit for what it's done," Ballmer said. It's not like they've really grown a lot of market share (through the commercials).



"Remember, when you're the little tiny niche guy who owns about 2 per cent of the worldwide market, you can be cute one time and it helps you grow."

Now that sounds more like the Ballmer we know. "Little tiny niche guy"?