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First Look: Intel's Core 2 Quad!

November 2006

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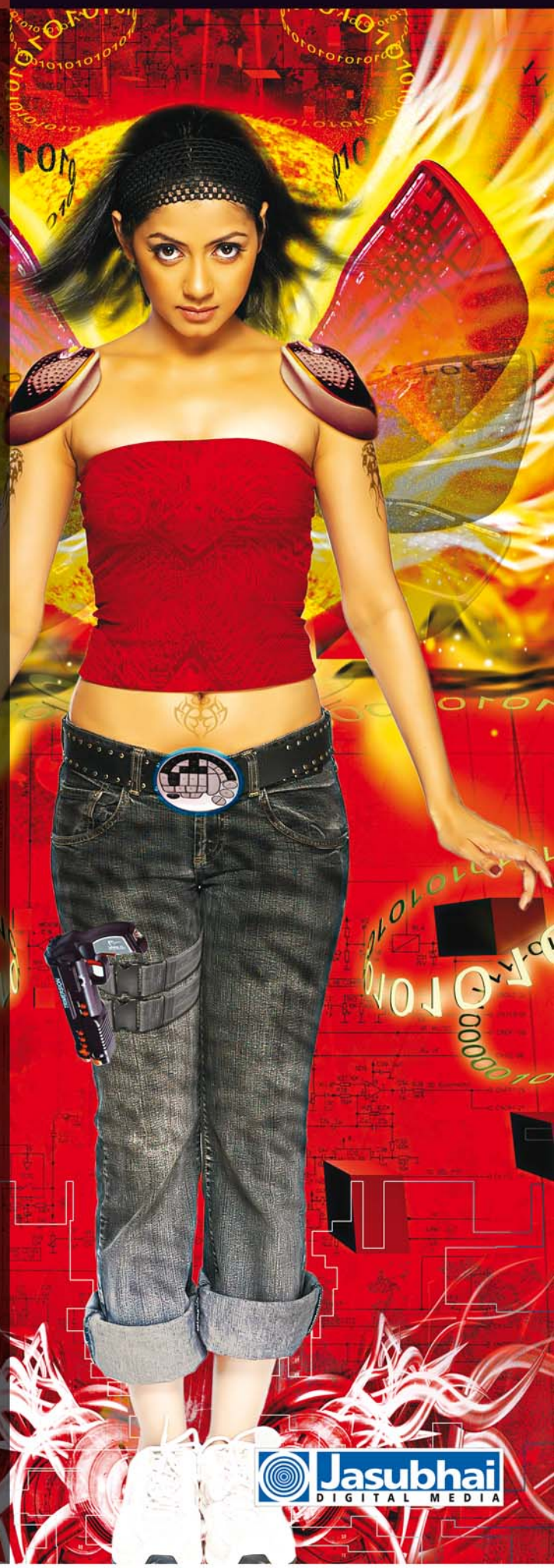


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Jasubhai
DIGITAL MEDIA

Battered on the battery front

FOLLOWING THE recall of nearly 10 million laptop batteries from around the world due to the risk of self-inflammation, senior executives from the Japanese electronic giant Sony apologised recently with a superficial, seated bow. Surprisingly, the corporate heads did not feel it necessary to stand up and explain the reasons behind the manufacturing flaw and the corrective measures they plan to take to eliminate a recurrence of such a big mishap. Sony has admitted to a quarterly loss due to the astounding cost of recalling these batteries. They will spend approximately \$250 million replacing them for their customers. This incident has once again raised questions on the improvements that have been made in battery technology and the focus or funds consumer technology companies dedicate to research and development in this area.

What really caused the Sony Li-ion batteries to heat and go up in flames is called 'thermal runaway'. It happens when elements inside a Li-ion battery heat up to the point where the internal reaction accelerates, creating even more heat, finally resulting in a flameout. Flammability and heat intolerance are long-standing problems that have been the bane of Li-ion batteries since their invention almost 30 years ago. And now, as devices turn smaller in size and richer in features, the situation only worsens. If obligated to produce more energy in less space, Li-ion batteries tend to die faster. This was discovered in the first shipment of iPods wherein the batteries wore out faster than the players themselves.

Li-ion, with its high power, fast recharge times, and steady voltage, is the best battery the consumer electronics industry has today. It powered the 50 million laptops, 800 million cell phones, and 80 million digital cameras sold in 2005. If this technology stagnates without a viable replacement, so will every kind of portable device, from iPods to cell phones. *And* this technology is fast approaching its limits. In the last 150 years, battery performance has improved only about eight-fold. If we are indeed seeing the peak of Li-ion performance, then gadget makers (and users alike) are in trouble.



Deepak Ajwani Executive Editor

“If we are indeed seeing the peak of Li-ion performance, then gadget makers (and users alike) are in trouble”

Yes, the hunt for a new technology is on, but nothing concrete has been achieved so far. Possible successors like fuel cells have been touted as “options”, but design, implementation, and cost issues have prevented them from mass adoption. It seems we’ll need more than just better batteries; we’ll need to rethink the way all portable electronics are designed and made.

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 editor@thinkdigit.com



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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

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ASRock ConRoe 945G-DVI	MSI 945GZM3	AMD Sempron 3500+	BLM 3000A Bluetooth Mouse
ASUS A8R MVP	MSI 975X Platinum PowerUp Edition	AMD Athlon64 3000+	Creative WebCam Live Motion
ASUS A8R MVP32 Deluxe	MSI K8NGM2	AMD Athlon64 3600+	Mitashi MP-16 MP3 Player
ASUS Crosshair	MSI K9N Diamond	AMD Athlon64 3800+	NEC 4610-BK 46-inch LCD Monitor
ASUS P5B Deluxe WiFi-AP	MSI K9N Platinum	AMD Athlon64 5000+	Nokia 6131
Axper XP-M8ARS482-XP	MSI K9NU Neo V	AMD Athlon64 FX62	Palit 7600GT
BiostarTforce 590SLI	MSI P4N Diamond	Intel Processors	Razer gaming setup
ECS 945G-M3 V 1.0B	MSI P4N SLI	Intel Core2 Duo E6300	Western Digital My Book
Gigabyte GA-8I945GZME-RH	MSI P965 Neo - F	Intel Core2 Duo E6400	500GB Premium Edition
Gigabyte GA-945GM-S2	MSI P965 Platinum	Intel Core2 Duo E6600	
Gigabyte GA-965G-DS3	Sapphire Pure Element PE-A9RS482M	Intel Core2 Duo E6700	
Gigabyte GA-965GM-S2	Processors 98	Intel Core2 Extreme EX6800	SOFTWARE
Gigabyte GA-965P-DQ6	AMD Socket 939	Intel Core2 Extreme QX6700	Corel Paint Shop Pro 52
Gigabyte GA-965P-DS3	AMD Athlon64 3500+	Intel Pentium D 930	Photo XI
Gigabyte M57SLI-S4		Intel Pentium D 945	Ashampoo
Gigabyte M59SLI-S5 F3		Intel Pentium D 950	WinOptimizer 2007

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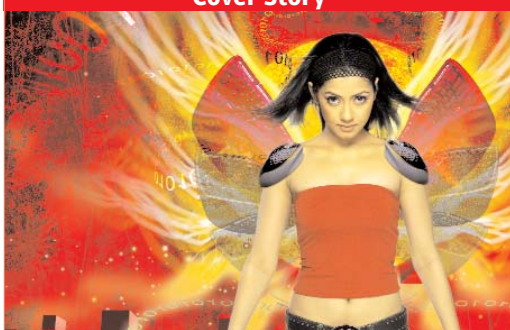
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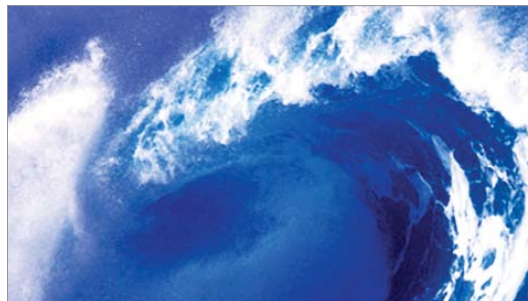
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Take a Crack

34 Turn Your USB Drive Into A Key To Boot Into XP

Like the idea? Probably do. Do your best—turn any ordinary pen drive into a secure key for your PC. Get those binary brains going and figure this one out!



Insight

36 Big Blue Is Coming!

Simply nine cores do not a great processor make. We give the Cell Broadband Engine—better known as the Cell processor—the dissection it deserves

Tomorrow

42 The Quest For Quantumland

How long have we been hearing about the promise of quantum computing? Ten years? Twenty? Impatient children that we are, we ask, "Are we there yet?"



Contents Magazine

Digital Tools

Enhance

47 Your Own Porta-PC

With a handy tool called MojoPac, you can not only carry your data around on *any* USB storage device, but also use it as your own virtual PC the second you connect it to someone else's computer!



Test Centre

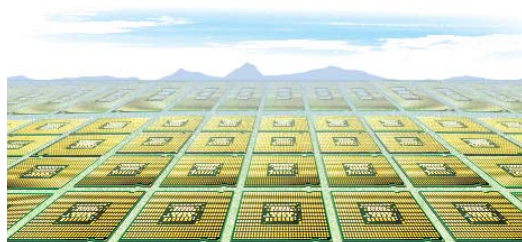
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If you're building your PC from scratch, you'll need to think long and hard about the motherboard you're buying. Then again, you could just read this test and choose!

Agent 001

89 Power+Houses

Most people don't spare a second thought when buying a cabinet and power-supply combo. The Agent tells you why you should care



Test Centre

98 Greener Cores, Meaner Scores

Intel's and AMD's prize horses battle it out in our labs this month.

Plus! An exclusive first look at Intel's new Core 2 Quad!

Digital Business

Tech Careers

109 Connections for Neophytes

With more computers can only come more of a demand for networking professionals. And as in so many other lines, demand exceeds supply here, too. If you have the aptitude, we have the low-down on what it takes, and what you'll be doing at each level in this field



Smart SoHo

120 <https://secure.storage>

Shocked at the increasing volumes of data accumulating in your organisation? Presenting some solutions to store all that excess baggage—online!



Lead Feature

112 Fun @ Work

Corporate offices don't have to be boring, but they often are. This could actually be hurting productivity! Let your employees loosen up and wind down right at work—they'll be happier, and as you know, a happy employee is a...

November 2006

Digital Leisure

Touched by Tech

123 We Want You!

Welcome to the best of both worlds—helping the world without getting off your behind. Turn to see how you can contribute!



148 Tabloid Tech

The Governor wants an RFID chip on every Californian, and Britney Spears tops another list (sigh...)—this time as the most “typo-ed” search on Yahoo!

128 Game On The City's There; Where's The Civ?

Supposedly a marriage between the *Civilization* and *Caesar* games, *CivCity: Rome* is an excellent game. Only, this marriage seems a little one-sided



Escape



131

Ivan Sutherland wrote a program that kicked off the field of computer graphics

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Apple Corp. labours under the delusion that you can't do cool stuff with your PC—and that it's so ugly you hide it

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DIGITAL PASSION

F.E.A.R. Extraction Point SP



The F.E.A.R. - Extraction Point expansion pack takes you to the next chapter – now Alma is looking for retribution

Age of Empires III: The WarChiefs



The WarChiefs will engage gamers of all ages and types in epic warfare in the Americas where they will lead the proud, playable native civilizations to expand their empire and fight for control of the Americas



Microsoft Robotics Studio

Software platform for the robotics community that can be used across a wide variety of hardware and development of a variety of applications

GAMES

- Big Thinkers Kindergarten
- Hype: The Time Quest Demo
- CheatBook-DataBase 2006
- Classic Doom 3 for Windows (1.1 Final)
- The Adventures Of Fatman

LINUX

- Epiware Document Management
- FreeWERM
- GeeXbox



- Geomview
- Ground Station Software Suite
- Jmol 10.2.0
- LuaCalc
- OoLilyPond
- Stellarium 0.8.1
- Wired

DEV TOOLS

- DataObjects.NET Express 3.8.8
- EnterpriseTenFold SOA Personal Edition
- G3D - 3D Engine
- Microsoft Robotics Studio
- Microsoft XNA Game Studio Express
- Natural Language Toolkit
- OGRE (O-O Graphics Rendering Engine)
- HydraSDO for Databases Java Edition 1
- KeepTool Hora 7.0.3
- ShellBrowser Components for Delphi /C++ Builder Win32 5.14
- VS.Php Standalone Edition

DIGITAL TOOLS

Corel Paint Shop Pro XI



Filled with one-of-a-kind photo tools sure to please even the most discerning photographer, Corel Paint Shop Pro Photo XI is the ideal choice for people who want extraordinary photos

Fruity Loops Studio 6.0.8

FL Studio is a fun product but still helps you to create great sounding music. You can add a wide range of effects, then automate them for dynamic sweeps, rolling bass lines and texture changes and make your music stand out from the crowd



Norton Internet Security 2007

Norton Internet Security 2007 includes AntiVirus, Antispyware, Two-way Firewall, Rootkit Detection, Intrusion Prevention, & Anti-Phishing



MULTIMEDIA



- Xilisoft DVD Ripper Platinum
- Cam In Style 1.0.1
- MP3 Torpedo 5.3.2
- Alive Video Converter 2.6.8.0
- Alteros 3D 2.7.2700
- MemoriesOnTV Pro 3.13
- PDF to DXF JPG TIFF Converter 1
- Pixarra TwistedBrush 10.5
- Qimage 2007.133

INTERNET

- Firefly 2.0.1
- Maxthon Combo
- Microsoft Windows Live Mail Desktop
- Torpark
- Trillian 3.1 (build 121)
- Anti Trojan Elite 3.7.8
- Anti-Porn 8.1.9.22
- Helix Proxy 11.1.0.719
- Radiotracker Platinum Edition

SYSTEM

- JavaExe 3
- Microsoft .NET Framework 3
- Asm PC Optimizer Pro 7.7.264
- AutoRun Pro Enterprise 10.0.0.105
- Registry Clean Expert 4.31
- Tag&Rename 3.2/3.3 Beta 1
- Vision Backup Enterprise 10.9.54
- X-Setup Pro 8.1

DIGITAL BUSINESS

InterVideo iVideoToGo Platinum



InterVideo iVideoToGo Platinum is the easiest way to copy movies for your iPod and PSP. iVideoToGo Platinum is fast and simple software with cutting-edge video compression to take your movies on the road today

Pinnacle Mobile Media Converter



It's a fast and easy way to convert and move PC-based video files or non copy protected DVD movies to mobile players such as the Sony PSP and video-capable Apple iPod

Symantec Mobile Security 4.0 for Symbian Series 60



Symantec Mobile Security 4.0 for Symbian Series 60 is for Nokia 6600, Nokia 6620, Nokia 6260, Nokia 7610, Nokia 6670, and Nokia 6630, Panasonic x700, Panasonic x800

PRODUCTIVITY TOOLS

- BibWorm
- ODF Add-in for Microsoft Word Retailer.org
- Topic Map Tools
- Wampum Personal Finance
- Aptus On Hold 1
- Bible Pro 4.90
- EZ-Pivot for Excel 2.1
- Pure Invoice 1.1
- TimeCurve Scheduler 3.5.01

MOBILE APPS

- Acala DVD 3GP Ripper 2.4.1
- JToDoMe
- Vsbenchmark 2006 1.1



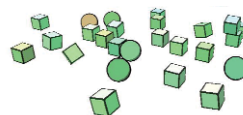
- AutoKeeper 3



- GridMagic - Truly BlackBerry Spreadsheet 3.0.0.78
- iTalkie 0.13
- MobileDriveSync 2.06.92

DIGITAL LEISURE

Rumble Box



Basically you're a man stuck in a cube; you're also made of cubes. So are the enemies. When you punch or kick them, they fall apart

SMALL GAMES

- Neko
- Jig Art Quest



- Perfect Cherry Blossom
- Roomwar
- Turbo Cars
- Sweetopia
- Treasures of the Deep
- Wik & The Fable of Souls



MOVIE of the MONTH

MOVIES

Gulliver's Travels

Gulliver washes ashore on Lilliput and attempts to prevent war between that tiny kingdom and its equally-miniscule rival

VIDEOS

- Go Open Vol.1 Episode 1
- Modern Day Gamer 1
- Flushed Away
- Man of the Year
- The Marine (2006)



DIGITAL PASSION

GeeXboX ISO



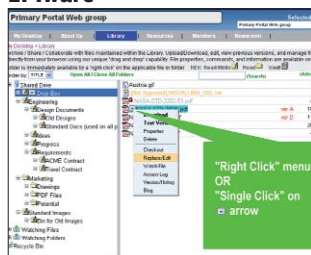
GeeXboX ISOs are ready-to-burn disc images containing the bootable GeeXboX Operating System for multimedia entertainment

jGRASP 1.8.4



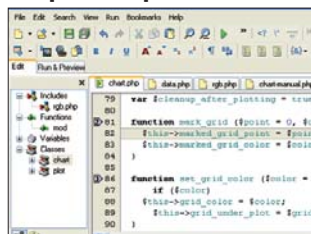
jGRASP is a lightweight development environment, created specifically to provide automatic generation of software visualizations to improve the comprehensibility of software

EPIware



EPIware provides tools for document storage, retrieval, and collaboration; project scheduling; task tracking and communications

NuSphere PhpED



PhpED is a robust tool featuring full-cycle functionality for developing web-sites and web-applications

DEVELOPER TOOLS

- Cavaj Java Decompiler V1.11
- Dev-C++ 5
- jGRASP 1.8.4
- MySQL 5.0
- Xenoage Java Exe Starter 2.0
- Magic C++
- NuSphere PhpED

LINUX

- AutoScan 0.99 RC
- EPIware
- GeeXboX ISO Generator
- KArchiver
- Linphone 1.4.1
- MailMan 2.1.9
- Sylpheed-Claws - Email client
- VisualRoute 10.0

DIGITAL TOOLS

Ashampoo Burning Studio 2007



FREE
Full Version
Software
worth Rs. 900

Burn discs quickly, easily, with maximum quality and minimum hassle

Ashampoo WinOptimizer 2007



FREE
Full Version
Software
worth Rs. 1800

Ashampoo's WinOptimizer series delivers professional-class Windows maintenance that anyone can use

MULTIMEDIA

- Real Alternative 1.50
- Aone MOV to AVI MPEG WMV Converter
- EXIF Viewer
- Photo DVD Creator 3.35
- Powware Print Screen v2.2
- ROCKIT PRO DJ
- The Helix Server
- Total Audio Converter
- Total Movie Converter
- Xara Xtreme

INTERNET

- Firefox 2.0 RC 1



- Primedius Firewall Lite
- Rediff Bol 8.0
- AbsoluteShield Internet Eraser Pro
- CA Anti-Spam 2007
- NeT Firewall
- Portable Offline Browser
- Privacy Shield 3.0.37

SYSTEM

- Advanced System Optimizer v2
- Disk Checker 3.1
- Drive Backup 8.0
- Folder Crypto Password
- Hide Folder 3.1
- Quick Screen Recorder v1.5.0
- SecureWallet

ESSENTIALS

- Avast Home Edition 4.7
- Avast Update
- Digit Software Archive 2006 Beta
- Spybot Search and Destroy 1.4
- Foxit Reader 2.0
- Irfan View 3.98
- K-Lite Mega Codec Pack
- Opera 9.02
- VLC Media Player 0.8.5
- Winamp 5.3
- WinRAR 3.61
- ZoneAlarm



DIGITAL BUSINESS

Mundu Radio



Mundu Radio works with Symbian, Windows Mobile, and Palm phones to bring streaming internet radio stations to your mobile. All you need is a data connection (GPRS/CDMA)

Mundu Speak



Make unlimited calls from mobile to mobile using VoIP. Send and receive instant text messages along with unlimited talk time

MojoPac



MojoPac is a technology that transforms your iPod or other USB storage device into a portable and private PC

PRODUCTIVITY TOOLS

- Allway Sync 4.6.10
- Eudora 7.0.1



- Ideabox
- Journyx Time Tracking 7.0
- versaSRS HelpDesk 3.2.3
- Softros LAN Messenger 3.7.3
- Sync for Outlook v1.61
- Task Plus PIM 3.9.9.1
- WinPIM Data Server v2.71
- WinPIM XP v8.22

MOBILE APPS

- Handy Finance Lite 2.4
- eWallet (Professional Edition) for Smartphones
- Photo Contacts 3.0



- RepliGo for Symbian UIQ
- Spot for Treo
- Remote 560 Professional



DIGITAL LEISURE

Warsow



Warsow is a standalone game that uses a 3D Engine based on Quake 2 GPL engine. It is an eSport oriented FPS with fast-paced gameplay focused on trix (trick jumps) and the art of moving

Trapshoot

Prove that you're the sharpest shooter



Gyrobail



Navigate your gyrobail to the glowing goal of each level without falling off the platforms

SMALL GAMES

- Atulios Online
- Rocket Man
- Tennis Ace

VIDEOS



E-BOOKS

- Dracula
- The Tin Woodman of Oz by L. Frank Baum
- The Wonderful Wizard of Oz by L. Frank Baum
- Wuthering Heights by Emily Bronte



By Demand

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

Corel Paint Shop Pro XI

Size: 198 MB

Total Movie Converter

Size: 4.48 MB



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Question Poll
How much of a gamer are you?
a) Computer games aren't for me
b) I game 1 - 10 hours a week
c) More like 10 - 20 hours a week
d) More than 20 hours a week
e) Hey, I don't count!
f) I'm gaming all the time!

Submit

Power PLAY
OPEN SOURCE SOFTWARE

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It really does pay to be loyal! Find out more on www.thinkdigit.com

Digit Reader Poll

This Month's Question

Will you adopt online office services like Zoho and Google Docs?

- ☐ Yes, and I'll drop my current office suite ☐ No
- ☐ Yes, but I'll keep my current office suite ☐ Haven't heard of them

To vote Log on to www.thinkdigit.com



Last Month's Question

Total: **6549**

Are you going to invest in a graphics card now?

Nah! I'll wait for DirectX 10

Of course! I need a graphics card yesterday!

I just bought a graphics card - I'll wait for a long, long time

I don't care. I play Minesweeper

taste technology at www.thinkdigit.com

FEATURED TUTORIAL FROM DIGIT FORUM (www.thinkdigit.com/forum)

Every month, we will feature a member tutorial from the forum here.

[Click here to go back to](#)

thinkdigit.com

Install Fedora Core 5/Suse 10 without burning CDs

13-10-2006,
08:37 PM

blackpearl
In The Zone

Join Date:
Feb 2006
Location:
0x02AE88C6
FF
Posts: 203

Burning 4-5 CDs to install any modern distro like Fedora Core 5 or Suse 10 is a big pain in the neck. This tutorial will teach you how to install FC5 or Suse or any other distro without burning a single CD!!! This method, however, will only work if you already have Windows installed on your system and want to dual boot with Linux.

1. The first thing you will have to do is copy all the ISO files to your hard disk. Make sure that you copy all the files to the root of the partition and the partition must be formatted in FAT32. If you do not copy the ISO to the root of the partition (i.e. keep inside a folder) the setup will not be able to detect the files.

2. Now use winrar to open the first ISO file (disc1). Go inside the folder "isolinux" and copy the files initrd.img and vmlinuz to your c:\boot. You will need to enable viewing of hidden and system files in order to locate c:\boot.

3. Now download the file called grub4dos from here. Extract the folder "boot" and the file "grldr" from the downloaded zip file. Inside the folder "boot" is another folder called "grub"; copy this folder to c:\boot. Copy the file "grldr" to c:\

4. Then open c:\boot\grub\menu.lst and add these following lines:

Code:
title Fedora Core 5 Install
kernel (hd0,0)/boot/vmlinuz
initrd (hd0,0)/boot/initrd.img

5. Now you have to add grub to your c:\boot.ini file. Open boot.ini and add this line in the end:

Code:
C:\grldr="Start GRUB"

6. You are now ready to install FC5. Restart your PC and from the boot screen select "Start GRUB". This will load GRUB.

7. From the grub screen select "Fedora Core 5 Install". The setup will now start and you can now select the hard drive partition where you copied the ISO files.

For the full tutorial (and many more) visit:
<http://www.thinkdigit.com/forum/showthread.php?t=38585>

IE7 Releases

After nearly a year in Beta, Microsoft has finally announced the release of IE7 Final for Windows XP SP2 and 2003. Now, will it match up to the competition? Or will this just turn into another race for hackers to find new bugs and security holes? Let's wait and watch!



Windows Virus On iPods

A small number of iPods have shipped with the RavMonE virus, triggering an "It's your fault" battle between Apple and Microsoft. Windows is not secure enough, it seems, and Apple doesn't check its products properly... Oh well, just another day in technology!



Enter

Krishna Mehta

Fashion Designer

Krishna Mehta is a noted fashion designer, having taken the Indian fashion industry by storm in 1991 with her menswear. Her designs are known for their understated elegance, relaxed, yet bold.

Technology is...

Like a lifeline. I can compare it with

oxygen—one can't survive without it. Every day I feel I'm getting more dependant on tech. I like new technologies, and am fascinated by the changes they bring about in our lives.

What gadgets do you use?

A Nokia Communicator, a laptop with a data card, a desktop PC at home that runs my CAD. I like to change my mobile with every new model that comes into the market.

What's your dream gadget?

A robot! I want one that will do everything I tell it to.

What do you do online?

I do zillions of things when I go online. I go online if I want to find information about a product. When I travel, I look up weather forecasts. I check for dates of fashion fairs happening around the world, and even to check out colour palettes.

Has technology ever come to your rescue?

Like I said earlier, technology is like a lifeline for me. There has not been a particular instance when it has come to my rescue; it has always been with me whenever I need it. I cannot live without tech!

QUAD WARS

Intel Launches, AMD Fumes

While the world still comes to terms with the humongous performance of the Core 2 Duo, the processor giant waits to strike yet another blow to rival AMD—by mid-November, we'll be seeing

programmers, multimedia content creators and generally anyone who needs the powerhouse backing them. How tall are these claims? Find out in our CPU test later in this issue!

Meanwhile, AMD has revealed their architecture

jumping the gun, and we'll be reserving our judgement till we've had a chance to pit them against each other. AMD targets a 2007 release for the Barcelona—risky, considering that Intel will have led the performance segment for more than three months.

The bigger question still lurks, though—do you really need so much power? Sure, it'll be manna for hungry gamers and multimedia users, but does Average Joe, who has all he needs in a single-core processor, benefit from any of this?

SCOUT'S HONOUR

"We Won't Sue You"

As it turns out, the Firefox team didn't meet with an "unfortunate accident" during their visit to Redmond earlier this year, so we're going to put our pessimistic selves aside and take it at face value—Microsoft has indeed found a place its heart for the Open Source Movement. This time, it's their Open Specification Promise (OSP) that has earned them a pat on the back from the industry. The said document states that Microsoft will not sue anyone who chooses to create software based on their Web services



Illustration Harsho Mohan Chatteraj

the first desktop PCs to be powered by Intel's new quad-core processors. Intel has announced its tie-up with HP for the launch, and they will both host "Quad Fest" on November 13, 2006, to promote the PCs.

Intel claims that the processors will increase application performance by 70 per cent, making the chip ideal for gamers,

for the "Barcelona" quad-core processor, claiming it to be better than Intel's. The main difference between the two is that AMD sports a true-blue quad-core design—with all four cores on the same die—while Intel's version is little more than two Core 2 dies squashed together. Still, comparing the two at this early hour would be

Security Watch

An Opera Vulnerability

The problem

A vulnerability has been reported in the Opera Web browser, which can be exploited by malicious people to compromise a user's system. Successful exploitation allows execution of arbitrary code when a user visits a malicious Web site—basically meaning that someone could take over your computer.

The vulnerability is caused due to a “boundary error” when processing very long URLs. It has been reported in versions 9.0 and 9.01 on Windows and Linux. Version 8.x is reportedly not affected.

Security firm Secunia has given this vulnerability a “Highly Critical” rating, which is just one notch below its highest security warning.

What to do about it

Simply update to version 9.02. You can download this, the latest version, from www.opera.com.

A Virus With An Anti-virus!

In an unprecedented move for any malware, the SpamThru trojan comes with its own virus scanner—to prevent any other malware from stealing control of the infected machine. The spamming trojan has been touted by security researchers at SecureWorks as the most sophisticated piece of malicious software yet—at par with commercial software, even. It uses P2P to spread itself rather than a mail server, and the virus scanner in question is a pirated copy of Kaspersky AntiVirus.

technology. The surprise announcement even got them appreciation from their rivals.

The Web services protocols are XML standards that are designed to enable better interaction between software from different developers, and with the OSP, Microsoft aims to encourage their use by anyone interested.

It seems like just yesterday we were lobbing acid in their general direction for comments that include (but are not limited to) calling Linux a cancer (Steve Ballmer) and the GPL a Pac-man like confusion (Bill Gates). It is heartening, finally, to note their softening stand towards, and growing support for the open source movement. Be it helping a college student develop the free and open source DotNetNuke or introducing support for administering Linux servers using Windows machines, they've undoubtedly earned considerable brownie points from the community.

Or is this just a devious scheme to destroy the enemy from the inside? Paranoia abounds.

SET TO CATCH UP

An Indian Microsoft?

It's no secret that India is regarded as a major force in the world of IT today. While Indian-written

code powers the backbones of many important organisations and services, you rarely (if ever) see an Indian-developed program being used regularly on the desktop. Strange, isn't it?

Apparently, all that will change in the next decade or two, and analysts expect to see product-oriented companies like Google and Microsoft originate from our shores soon. At the NASSCOM Emerging Companies Forum, Dr Ajay Kela—president of Symphony Services India—said, “The next thing we will see is software product companies emerging out of India. We have been seeing that but the ecosystem for product development has been missing in India, but it is growing now.” This “ecosystem”, he says, owes its existence to the growing entrepreneurial activity in the country. Dr Kela also warns that we don't have the expertise it takes for such a move; this will need to be learnt from companies that have been in the business.

It's not going to happen automatically, though. One of the gripes with the Indian software industry is that it isn't focused around creativity and innovation like it should be, and if we're ever going to rise beyond being just an outsourcing hub, this issue needs to be tackled head-on before anything else. Beyond that, things are sure to look up for Indian software products, or so it seems.

HOT Small Companies With Big Ideas

Some of the most brilliant ideas we've seen—be it hardware, software or Internet services—have come from small, smart start-ups with a radical idea, loved by millions over the world, and catching the eyes of...

Corporate Big Brothers

With their typical “I-see-I-want-I-buy” attitude, the world's biggest technology companies absorb these start-ups, stripping away the boldness and leaving in their stead a conformist, “propah” organisation. Boo!

“BOOM” BOX DEPT.

Laptop Makers Want Damages From Sony

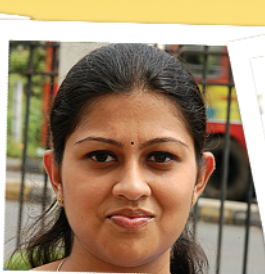
You might remember the many cases of exploding laptops in these past few months—it resulted in Dell having to recall in excess of 4 million laptop batteries, closely followed by Apple, Toshiba, Hitachi, Fujitsu, Lenovo and now Sony. The Lithium ion time-bombs batteries are all manufactured by Sony, and while only Apple and Dell

One Silly Question

“Where will your computer go after it's dead?”



“How about a graveyard?”
Kaushik Patne



“Computer Heaven!”
Pooja Prabhaka



“Real-World Matrix”
Anjana Krishnan



“The Cyber World, of course!”
Anup Deshmukh



“Ekta Kapoor for rebirth”
Vishali Dhimant



notebooks posed the risk of actually going up in smoke, the rest of the vendors claim to have recalled batteries to placate their concerned customers.

Now, it seems that three of these companies—Toshiba, Hitachi and Fujitsu—are concerned about the damage the recall might have done to their brand image, and might consider claiming damages from Sony to tide over the cost of the recall and the sales they might have lost due to said brand damage. As of this writing, there is no news to indicate that the rest of the companies have any such intentions. It is estimated that Sony will have to shell out between \$340 million and \$510 million in just replacement costs—an uncomfortable expense given their current financial situation. Add to that the possible costs of lawsuit settlements, and we might see that discomfort turn quite painful. Sony hasn't been contacted to foot the costs yet, and we still don't know how they intend to respond if they are.

However, there is hope for the company. The only "spectacular" examples of the batteries' flaws have been seen in Dell and Apple—none of the above companies' products were in the news for even a puff, let alone fires. Moreover, all news reports have clearly fingered Sony as the root cause, noting that there was nothing really wrong with any of the laptops otherwise. If the matter does go to court then, they're going to have a tough time convincing judge and jury that their image was truly sullied by the recall.

TRANSMETA WAKES UP

Intel Sued For Billions

Transmeta, the company famous for creating the Crusoe (for latecomers, that's their low-power consuming processor for laptops and palmtops),

Three Incredibly Useful Sites

Quotes, jargon and varied articles

QuoteDB



www.quotedb.com

Here is a database quote lovers would love to check out. The quotes are listed vertically according to authors, poets, athletes, comedians, the Founding Fathers, Hollywood celebs, scientists, philosophers, Presidents and entrepreneurs, and horizontally by age. The site also provides a quote generator in the form of JavaScript and RSS for your site or blog.

Webopedia



www.webopedia.com

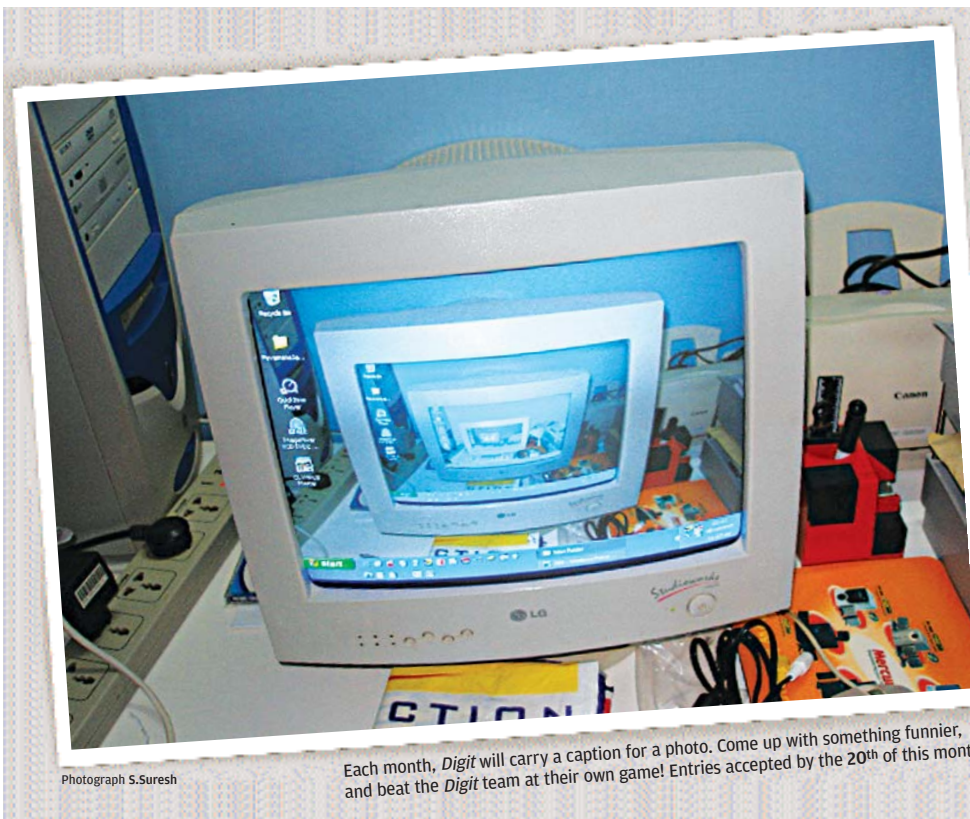
Stop asking people about simple (or complex!) stuff—look up tech terms for yourself at Webopedia. This is an online dictionary specialising in the alphabet soup of technology jargon. The terms can be searched for or browsed category-wise. At the "Did You Know" section, there's a large collection of tips and articles for computer users of all skill levels.

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Photograph S.Suresh

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

"To Infinity, and beyond!"

Last Month's Winner!

Pratik Dey
Arya Palli
Bhubaneshwar

"Defragment your Future (FREE Scan on demand)"



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

Beginning ActionScript 2.0

by Nathan Derksen & Jeff Berg
Published by

WILEY-INDIA



has decided to take on Intel, citing intellectual property infringement. The claim is that all of Intel's x86-based processor technology, right from *ye olde* days of the Pentium Pro, violates one or more out of ten Transmeta patents. They say that Intel has made over \$100 billion thanks to them, and that they should duly cough up, and foot the legal fees, too.

Among the offending technologies is the power-saving SpeedStep, which is claimed to be a rip-off of Transmeta's "adaptive power control". Other infringements include the famous MMX technology and other hardware design features.

Something, we think, is fishy. The Pentium Pro is but a childhood memory, and it takes Transmeta all these years to realise that it was their technology in the first place? Permit us to scoff. It's interesting to note that Transmeta hasn't been doing all that well for a long time, especially

since they retired from the CPU business around a year ago, choosing instead to go the R&D way. It's still a loss-making enterprise, and no doubt some "financial assistance" from Intel will help things get better.

The devilish plan doesn't end there—even if this ridiculous claim puts Intel in a spot, it'll be cheaper for them to buy Transmeta than pay them off. And what ailing company won't be willing to sell itself to one of the largest corporations in the world? Naughty, naughty!

COUNTING DOWN TO VISTA

Microsoft Relents To Security Vendors

In the run-up to the release of Windows Vista, both Symantec and McAfee haven't hidden

their consternation at the fact that Microsoft had blocked access to the Vista kernel in an attempt to lock out malicious software. The trouble was, they also locked out security software, so any hackers that broke into the kernel would have total control over the OS.

Thankfully, Microsoft has realised the error of its ways and has announced that they will give kernel access to these firms through a set of Application Programming Interfaces (APIs), but only for the 64-bit version of Vista. However, they haven't announced when these APIs will be available, and there have been suggestions that they won't be seen in the January release, causing Symantec to retain its stand.

Says communications director Chris Paden, "If the APIs exist, then Microsoft should make them available to the security industry immediately."

In addition, Microsoft also said that it will modify the Vista Security Center to enable third-party firewalls and anti-spyware tools to send Windows Defender-like alerts to the user.

This comes as a compromise to the security companies' original demands—to let users choose whether they want to replace Security Center completely with third-party software—a demand that Microsoft has expressed no intention to comply with. Whether these new changes will help Vista be more or less secure, remains to be seen.

In the face of the antitrust issues that Microsoft is facing in the EU, we might see more such occurrences in the future. Third party vendors with strong enough arguments will no doubt put intense pressure on the software giant to alter the Windows feature set, and we hope that the ultimate beneficiary of this tug-of-war turns out to be the Vista user.

GENDER

Prajakta Joshi Vs. Aksh Sorate



BENDERS



Get Cell Phone Accessories

This time round, we wanted to see how the buying habits of the genders differed when it came to the buying of accessories for a cell phone.

Prajakta was hesitant at first to tell us what she wanted, as though she were holding a closely-guarded secret. Then out it came: she said she wanted to buy a memory card, and justified this saying she needed it for her MP3s. She went on to outright reject our generous offer of a 128 MB MMC card, and said she wanted the highest capacity available in the market! And as if that weren't enough, she wanted a pair of headphones, and a mobile pouch of the hang-round-the-neck variety!

We initially thought we'd give our participants whatever they asked for, but after this onslaught, we decided not to...

The instant we told Aksh we'd be giving him any phone accessory he wanted, he outdid Prajakta by saying he wanted an iPod. "iPod"?!! We were befuddled, wondering whether we'd asked our question wrong or whether he hadn't got it right, and decided to repeat our offer. Aksh then said he wanted a 1 GB MMC card with a data cable, and that was the end of that. Quite a decisive person, we should say. When asked if he wanted an accessory to make his phone look jazzier, he didn't seem to like the idea—and went on to say, "Boys want stuff for the utility value and not to flaunt it." We don't quite think that's true, but anyway, we decided to stay out of that argument!



HERE COMES THE SUN

Google Goes Solar

If you haven't heard yet, Google founders Larry Page and Sergey Brin are very environment-conscious and huge fans of alternative energy sources—they were among the first people to adopt hybrid cars when they came out. No surprises, then, that they've decided to take on the biggest solar energy project in the US, hoping that more players from corporate America will follow suit.

Google's 1 million square foot campus at

Mountain View, south of San Francisco, will soon get thirty percent of its power from the Sun, they say, pending the installation of around 9,200 solar panels at said campus. The installation will be ready next spring, and once up, the array will generate enough juice to power 1,000 homes. No word on the cost of this whole affair, but we hardly think that it's going to pinch a company with \$10 billion in cash. What we do know is that the energy costs that they expect to save will recover the project's cost in five to ten years. Google's concern for these energy costs comes due to their immense power requirements to keep their

server farms running and serving the world.

In a world that has been reluctant to adopt solar energy, it is indeed refreshing to note this development.

CUT THE CORD

USB Goes Wireless

Finally! A solution to the mess of cabling that plagues the average desktop. With the growing number of devices that you can connect to your PC via USB, frustrations are reaching alarming highs. Wireless technologies like Bluetooth can't offer the speeds that USB 2.0 does (480 Mbps), so there's been no alternative for the good old cable thus far.

To the relief of the general masses, we should be seeing devices enabled with the wireless version of USB 2.0 later this year. The idea involves replacing the USB cable with tiny radios on both the device and the PC.

The technology will be based on the WiMedia Alliance's Ultra Wide Band (UWB) standard, and promises to deliver the same speeds as USB 2.0 up to a range of three metres, possibly dropping beyond a range of ten metres.

In the real-world usage scenario, it'll probably be difficult to see the 480 Mbps, but the performance will still be much faster and use less power than Wi-Fi.

High-bandwidth wireless technologies have been in development for quite some time now, but standardisation has been delayed by battles between the WiMedia Alliance led by Intel, and the UWB Forum led by Freescale Semiconductor, who showed off a wireless USB hub at the Consumer Electronics Show (CES) earlier this year. Freescale pulled out of the UWB Forum to develop its own wireless USB standard, though, leaving the WiMedia Alliance room to power through.

That this is going to be immensely useful is a no-brainer, but with everyone trying to get their own technology ready first, we wonder if all these "good intentions" are going to be buried under the trash of "Standard Wars". And the precedent is there—we saw it with DVD +R and DVD -R and we'll be seeing it with BluRay and HD-DVD—the last thing the poor consumer needs now is more confusion.

SYMBIAN GOES CLAIRVOYANT

The PC Is Dead

According to the top dogs at Symbian, the PC's days are numbered—we should be seeing the beginning of their end around five years from now. At the Symbian Smartphone Show in London, CEO Nigel Clifford said, "Desktop PCs are a

Wibree

Wibree is a new communication technology developed by Nokia Research Center. It works on radio frequency—2.4 GHz—and is slated for implementation in localised communications. It will support a data transfer rate of 1 Mbps, and it has a range of 5 to 10 metres.

This new technology consumes much less power when compared to other radio technologies such as

Bluetooth. It can be used in devices with small form factors, making it ideal for wireless headsets and the like. It's also an ultra-low-cost technology, and can also be used in existing Bluetooth circuitry as an add-on feature, thus drastically reducing implementation costs.

Wibree is an open industry initiative, so one doesn't need to obtain permission to use the technology, and it can be fine-tuned to one's needs.

Buzzword
of the MONTH



Niagara II Processor

What is it?

'Niagara' is the code name for the UltraSPARC T1 processor. It is a multi-core, multi-threaded CPU. The next generation, UltraSPARC T2 processor is sometimes called Niagara II.

Who is behind it?

Sun Microsystems. Niagara was their third multi-core processor, but the first multi-core, multi-threaded processor. It came in three versions: four, six or eight CPU core.

Why is it important?

Each of the cores can process eight threads simultaneously. So with eight cores, that's 64 threads that can be processed concurrently!

Where will it be used?

Servers. Sun is targeting the \$100 billion a year server market, in which Sun and IBM are the largest players. The beauty of multi-threading is that you get a lot more throughput with a much lower clock speed. Also, Sun is advertising them as eco-friendly processors.

When is it releasing?

Reports indicate that it will be released in the second half of 2007. The processor will be manufactured using a 65 nanometer process.

How much better will Niagara II be?

Niagara II will improve mathematical abilities by adding more floating-point calculation units. Currently, a single FPC unit is shared by all eight cores. Networking will also be beefed up, thanks to the built in 10 Gbps Ethernet. If that's not enough, Sun plans to ship the UltraSPARC T2 (Niagara II) as dual-processors, so that's 16 cores, and 128 simultaneous threads being computed!

flatlining community", and that laptops were generating a little more excitement.

The basis for these claims is the adoption of technology in developing countries, who are bypassing the efforts of setting up elaborate wired infrastructures in favour of going wireless, leading to a world where everyone owns a smartphone. A classic example, they say, is India, where while PC adoption increases by 5 million a year, mobile phone adoption increases by that much a *month*. The smartphone will set people free from laptops, says head of propositions John Forsyth—poor battery performance will inevitably give way. With mobile phone screens getting better with every new generation, productivity and readability on the mobile will supposedly reach new heights, leaving people wondering why they need a PC at all.

This is, of course, the millionth time that the death of the PC has been touted—PDAs have been "threatening" the PC since the mid-nineties, as have Java-based thin-client-like terminals. While we don't see anything replacing the PC per se, one must accept that shifting your work to your handheld device is a lot easier today than it's ever been. With the huge number of Internet-based applications, all you need to get your work done is a connection. So it's quite possible that the Symbian execs aren't too far from the truth—at least about possible growth of the smartphone.

In other unrelated news, research and analysis firm Gartner has published a report saying that PDAs and smartphones aren't growing at the rate that they were expected to, forcing them to revise their year-end forecasts. The report states that

smartphone adoption seems to have more to do with flaunt value than functionality, and that phones with less features, but better aesthetics will do better in the market.

So will the supposedly flagging smartphone really kick the desktop into oblivion? You decide!

A SECOND REUTER'S

Newsdesk In A Parallel Universe

Media giant Reuter's has announced that they have opened a news bureau within Second Life (www.secondlife.com), the massive simulation game that has become something of an alternative universe on the Internet. The news bureau will bring news from the virtual world to readers in

world, complete with cities, localities, and characters, where users can build characters and homes, and earn and trade in the virtual currency—the Linden Dollar.

Think of it as a large-scale version of SimCity and The Sims rolled into one. There's even an online marketplace where users can turn their Linden Dollars into real US dollars. In the 24 hours preceding our writing this, \$447,446 (that's in *real* US dollars) had been spent by users of the game.

With this alarming popularity, it's no surprise that companies have started to invade this space as well.

Sun recently set up its own Second Life space to promote its Project Darkstar—which will simplify the development of multiplayer and massively multiplayer games. Media giant CNET too has their own Second Life presence.



the real one and vice versa, and can be found at secondlife.reuters.com.

Second Life, created by Linden Labs, has become an online phenomenon in a way that few things ever have. As of this writing, it has seen over a million registrations, with over four hundred thousand active within the last two months. The concept isn't really new—an online

If you thought MMORPGs were even remotely addictive, the mind boggles at the potential of a simulation at this scale—we haven't encountered any reports of people dropping dead at their desks while Second Life-ing, so that's a good sign, for now!

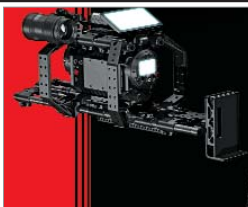
An aside: would you like a Second Digit? Write in and let us know! ■



32 The Quest For Quantumland



36 Big Blue Is Coming!



42 Red One

Digital Passion

Fuelling the pursuit of technology knowledge

Lead Feature

Power Play

Extended gaming with standard equipment can't be good—not for your health, not for your ego. Here's how you can...er...save your health

Robert Sovereign Smith

Gaming is serious business—and no, we don't mean only for game developers and hardware vendors: we mean for the gamers as well. As with any sport (yes, gaming is now a sport!), talent doesn't always get you everywhere.

Serious gaming has some very basic requirements: talent, a good rig, precision instruments of control, and a certain *je ne sais quoi*—shall we leave it at oomph, or “coolth”? Let's face facts: most of the top gamers around the world aren't really Mr Universe material. What makes them icons are their skills at their games and the aura of technological wizardry that surrounds them. They all have the latest rigs, with bleeding edge technology at their fingertips, and quite vexingly, some of them don't pay a dime for it—it's all sponsored!

We aren't going to talk about the people who rule the roost—we'll save that for another time. What we *are* going to talk about is how you can get that something extra... that something else... that no one else has.

If you're a serious gamer, you probably have gamer friends. We're guessing here, but we're supposing all of you have pretty much similar gaming rigs. If you're not into PC gaming, you probably own an Xbox 360 already, and are eagerly awaiting the PS3—but then again, so are your friends...and a million others around the globe.

Wheat Or Chaff

It's your decision; choose wisely! Though it sounds like a line from a B grade action flick, you can do this the easy way or the hard way, and trust us, use the force, resist the dark side (umm... we meant the easy way).

Apart from owning consoles and SLI-ed or CrossFire-d graphics rigs, there are a few other things you might be interested in.

Take, for example, your mouse... it's boring, to say the least. Everyone has a mouse that, well, looks like



a mouse. If you're an FPS fanatic, you need something that says “I shoot people and demons in a virtual world...and I'm good at it!”

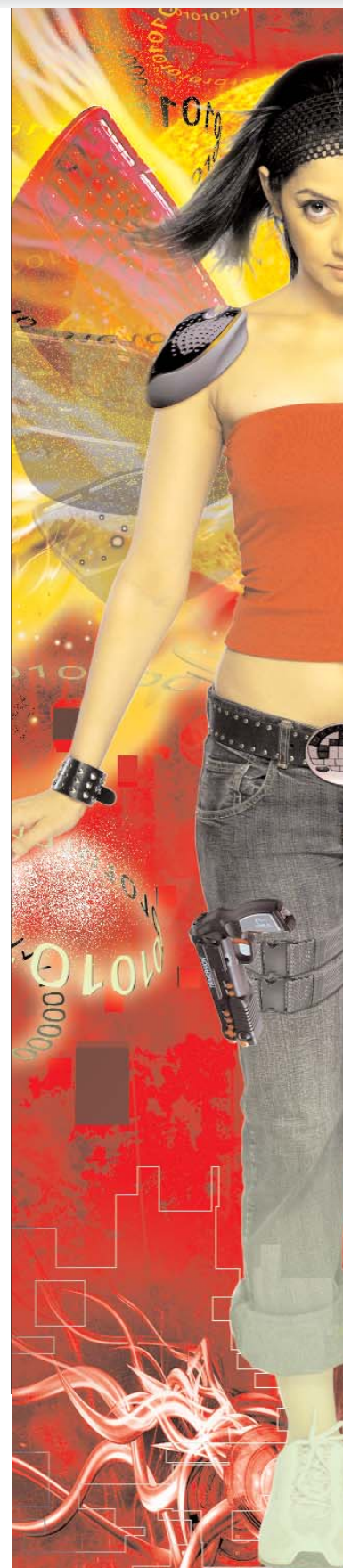
Let's start with a simple concept: You like shoot-em-ups; you're always using some gun in a game, but you're controlling it with a mouse that has a click button instead of a trigger. So why not use a gun-shaped control object instead? That's what the people at MonsterGecko (www.monstergecko.com)

have created for you: the PistolMouse FPS. This is a 900+ dpi mouse that's shaped like a pistol. It's ergonomically designed to keep your hand in a comfortable position, and has all three mouse buttons conveniently placed. But even if it didn't, we'd still want one, right? Here's the clincher though: this cool gadget costs a mere \$20 (Rs 950), so get online and e-mail that uncle/aunt/cousin/distant relative/complete stranger who's coming down from the US, and order one. Seriously, go right now—this magazine isn't going anywhere!

Back? OK! Another cool product is the Wolf Claw Type II keyboard. With a nice ergonomic controller on the left, to help you move better when playing FPS titles, this keyboard is a good buy at just \$50 (Rs 2,400).

Razer is another name that's well known in gaming circles, and their Copperhead mouse is a 2000 dpi precision instrument of destruction (if that's the type of games you play). At \$80 (Rs 3,800), it may seem expensive, but once you've used it, you'll realise why it's priced that way.

These products, however, are the usual suspects, and many a gamer will be sporting them. What will set you apart? There are a myriad products out there that cater to gaming. Some are affordable, some ridiculously not so. We've sifted through all the madness out there to come up with cool products that we think every gamer should want, if not already owned! Get out that tissue paper and be prepared to wipe away some drool/tears, after you turn the page...





Alienware Area-51 ALX

Forget words, just look at the specs:

- Intel Core 2 Extreme 2.93 GHz, 1066 MHz FSB
- NVIDIA nForce 4 SLI
- 4 GB dual-channel DDR2 SDRAM @ 800MHz
- 2 x 1 GB NVIDIA GeForce 7950 GX2L, quad-SLI Enabled
- Ageia PhysX Processing Unit with 128 MB GDDR3
- 2.5 TB hard disk space (Max: SATA II, 2 x 750 GB and 2 x 500 GB @ 7,200 rpm—RAID 0)
- Dual Gigabit Ethernet ports
- Sound Blaster X-Fi High Definition Surround Sound audio card
- Dual-zone liquid cooling for CPU and GPUs
- 1000 watt power supply with Active PFC
- Dell 30" 2560 x 1600 UltraSharp Widescreen Flat Panel

Price? A mere \$10,500, or about Rs 5 lakh! We warned you to bring tissues...

Web site: www.alienware.com

Fanatec head\$hot Controller

Unlike the Razer Copperhead we mentioned earlier, this is a strictly right-handed mouse—sorry southpaws!

It's based on laser technology with a resolution of 2000 dpi. In terms of optics, it's pretty much the same as the Razer. However, that's where the similarities end!

This mouse has one reason for its existence—the human desire to look good! It might be a little too flashy for some of you, but the show-offs among us will not give a hoot. It has an arch over the mousepad, which holds your mouse in place. When you open up the box and realise that the *mousepad* needs you to connect the bundled AC adapter to run, you know the experience will be special! The best feature, however, is the ability of the mouse to be "perfect" for every size hand. You get extenders to make the mouse fatter for those with large paws! A hundred Dollars (Rs 4,500) is what this beauty will set you back by.

Web site: www.fanatec.com





Ergodex DX1

With all the keyboards out there that try so hard to figure out what's ergonomic for you—and fail—it's no surprise that someone finally had a brainwave and decided to let *you* decide what's comfortable for you. Presenting the Ergodex DX1, a keyboard that comes with 25 keys that can be placed anywhere, at any angle you like, in any sequence you like. If you find that you want to move a particular key just a tad to the left...*move it*. The keys, numbered 1 to 25, have no wires, or any type of batteries.

You can record pre-defined macros per key, on the fly, and make your own macros. There are four basic types of macros to choose from: single key, multi-key, text blocks and a file launcher. All this management is made easier by the Ergodex Manager software that's bundled. If you want to, you *can* replace your keyboard with this masterpiece, but we'd recommend you use it for special tasks only! You will get the basic DX1 package for about \$150, but you're better off buying an additional set of 25 keys to bring the key-count up to 50 total. That's \$200 (Rs 9,000) for the total package, which is worth every paisa, for the looks of envy your friends will give you!

Web site: www.ergodex.com

Mad Catz MC2 Racing Wheel / Fanatec Speedster

We couldn't make a choice between the two, so we'll leave that task to you. We suppose it all depends on whether you own an Xbox 360 or a PS2.

The Mad Catz MC2 racing wheel for the Xbox 360 has a rubber-grip, retractable leg supports, force feedback, 10 analogue control buttons, and pedals that don't slip around on the floor. It's got great reviews from professional gamers, and is officially recommended for the Xbox 360. Overall, it's a must have for racing fans. It costs \$70 (Rs 3,300).

The Fanatec Speedster, on the other hand, is for all you PS2 owners out there who love racing. There is an Xbox model of the Speedster 3 ForceShock also available, so the choice is pretty much yours. This wheel sits perfectly in your lap, or it can be mounted on a table. The pedals are anti-skid in design, and the gears are F1-styled buttons.

Overall, both are great wheels for all you Schumachers out there.

Web sites: www.madcatz.com / www.fanatec.com





Creative Sound Blaster X-Fi Elite Pro

If you're thinking of buying good speakers (like the Klipsch Ultra mentioned later), you better get yourself a good sound card as well. Your onboard sound will just not live up to the capabilities of the speakers.

The first name in sound cards is Creative's Sound Blaster, and the X-Fi Elite Pro is the king of their castle for now. This one boasts of sampling rates of 96 KHz for 7.1 and 192 KHz for stereo audio. The card has 64 MB of X-RAM (sound memory). Think it like graphics card memory, but for sound, so that your system memory is left alone when processing audio!

Output power is 116 dB, and frequency response is <10 Hz to 46 KHz. Apart from the tech-specs, this beauty comes with three preset modes—Audio Creation, Gaming and Entertainment—just pop it into gaming mode and enjoy yourself!

The card is THX-certified, with DTS-ES and Dolby Digital EX decoding, so every movie you watch will be exactly as the director meant it to be—aurally, at least! The best part is that Creative has a very strong presence in India, so getting your hands on this baby will be easy—it costs Rs 15,000 (approx)

Web site: <http://in.creative.com>



Trimersion Head Mounted Display

OK, we'll admit it—this one is just a fun addition, but it will either have your friends in splits or really jealous—it's a 50-50 shot, and is totally your call.

You get a stereo display of 640 x 480, which kind of sucks, but then again, only you'll realise that, because you will be wearing them! The headset features tracking, so you can move your head to turn in the game. The gun will give you controls for both hands, for movement and weapons, while the triggers take care of mouse-work.

Overall, if you have \$395 (Rs 19,000) to throw away, throw it in this direction. Who knows—you might even start to like this unique way of playing shoot-em-ups. Also, if you take this to a LAN party, you're guaranteed to win, because everyone else will be too busy laughing to frag anything!

Web site: www.trimersion.com



The Ultimate Game Chair

Yes, this is a chair, but no ordinary one! This pure leather beauty has 12 feedback motors to enrich your gaming experience, so the chair will shudder when there's an explosion nearby. It's got rear speaker stands that are attached to the chair itself, and controllers attached to the arm rests. These controllers will let you connect to a PC, both Xboxes and both PlayStation models. Get this chair, a small fridge, some one to stock it for you, a bed-pan and a bundle of games, and see how long you can go without getting off this dream chair. Just keep blowing things up to make the force feedback kick in to give you some exercise!

Website: www.ultimategamechair.com

Samsung HL-S6187W 61-inch DLP HDTV

Now *this* is a monitor! Samsung is known for their display technology and the crazy things they do with mobile phone cameras, but that's another story!

This display weighs 40 kilos, and boasts of a 1920 x 1080p resolution. It has a contrast ratio of 10000:1, and hidden surround sound speakers.

It's a 61-inch HDTV—do we really need to say any more? Well, yeah, it costs about \$2,400 (Rs 1,15,000).

Web site: www.samsung.com



Klipsch ProMedia Ultra 5.1

Klipsch is a well known professional home audio manufacturer based in the US; they've been in the business since 1946! The ProMedia series is their line-up of PC speakers, and the Ultra is a 5.1-channel solution.

These speakers look good! But how do they sound? Even if you're an audiophile, the following specifications should tell you a lot:

Freq Response: 25 Hz–20 kHz +/- 5dB

Power:

Satellites: 60 W per channel @ = 1% THD, 100Hz–1KHz

Subwoofer: 170 W @ = 3% THD, 40–100Hz

Output: 115dB at listening position (near field) Crossover: High Freq–3000Hz; Low Freq–120Hz Impressive! The speakers weigh about 25 kg, and feature a 500 W BASH (www.bashaudio.com) amp. The sound quality will make your gaming and movie experience a delight, as it should be. Check at the site for dealers in India. The price? About Rs 30,000—a steal, really, for a high-quality 5.1 set!

Website: www.klipsch.com



If you can get your hands on some or all of these, you can consider yourself crazy enough to be a professional gamer! Until then, join the group and dream on!

robert_smith@thinkdigit.com

October 2006

MacBook Pro

SANKET NAIK

Macintosh, Is a word that epitomises the best in personal computing hardware as well as software! Fondly referred to as Mac, the products are designed with consumer usability at the core. Apple sent us their MacBook Pro, and I was more than delighted to test it. Here's what I learnt about the MacBook Pro over the past month

Day 1

Compared to earlier versions, the new MacBooks come in a nice, sleek box. Open the box and the immaculate packaging grabs your attention; every component fits snugly in the box. In my opinion this very attitude of paying attention to minute details is what makes Apple different from other manufacturers. Within minutes the notebook was up and ready!

Day 2

The Mac OSX interface is sleek, but with eight years of Windows usage under the belt, my fingers seem hard-wired for Windows shortcuts. Mac OSX prefers the 'Command' key over [Ctrl]. I still make a few errors, but the interface is intuitive enough to get the hang of.

Day 5

Though Apple is generally known for great design, when it comes to the MacBook Pro, Apple really needs to re-look at heating issues. This is one laptop you don't want to keep on your lap—sure, the complete alloy body provides the MacBook with killer looks, but it also causes massive heat retention.

Day 7

The MacBook Pro that we got had some serious hardware: a 2 GHz Core Duo processor, 1 GB of RAM, 100 GB hard drive, X1600 graphics card, etc. Somehow, the current Intel processor-based machines feel more responsive as compared to the older Power PC-based ones. I opened every possible application simultaneously, and the MacBook Pro never dragged its feet. It's nice to have a laptop that boots up in 30 seconds flat.

Day 10

The OS is a gem. Eye candy apart, the interface consists of a single menu bar called the 'Finder', a ribbon of icons at the bottom called the 'dock' and the super cool 'Desktop'—everything can be controlled from here. Being UNIX-based,

command line fans do get to use a 'Terminal', a pretty-looking one of course!

Day 15

I just realised the sheer amount of applications bundled with the OS. Compared to Windows XP, out of the box, Mac OSX sure is very user ready. iLife '06—a suite of digital applications for photos, movies, music, Web content, etc.—is a good software bundle to start off with. 'Front Row' provides media centric capabilities via the bundled remote, and the new MacBook Pro comes with an inbuilt Web camera that just rocks! The inbuilt speakers, however, are just too tinny.

Day 25

To test the wireless capability, I connected to my Netgear router. The network was instantly recognized, and I was surfing the Internet within minutes. The network connection speeds are decent, as is the range. I also had no trouble getting the MacBook Pro to communicate with my Nokia E61, via Bluetooth. I have to say that the Bluetooth browser on the Mac made browsing my phone effortless.

Day 27

I've found that apart from heating up, the notebook also suffers in terms of battery life. I was lucky to get two hours of juice, and that too with Wi-Fi turned off! With Wi-Fi on, the battery life is just pathetic.

Day 30

I found myself asking whether I would convert to Apple's religion? Maybe! If I do it, it will not be for the eye candy, which is what Vista will offer me anyway. What I love most about Apple products is the attention to detail, with regards to hardware and the OS, and also the out of the box usability.

sanket_naik@thinkdigit.com

Make your computer boot from a USB Flash drive, such that it cannot boot into Windows XP otherwise!

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

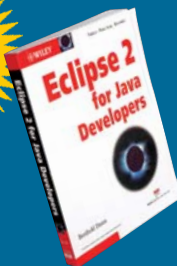
THIS MONTH'S CHALLENGE

Turn A USB drive Into A Key To Boot Into XP



LAST MONTH'S CHALLENGE

Win!



Take a Crack and win

Eclipse 2 for Java Developers

by Berthold Daum

Published by

WILEY-INDIA

LAST MONTH'S WINNER

Sahil Thorpe

G T Road,
Moga, Punjab

Rules and Regulations

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

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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.

Display the drive letter before the drive name in Explorer and change the colour of compressed files and folders

Task 1

Windows uses a special colour to identify compressed files in Explorer. By default, this is blue. You can set this to any colour of your choice:

Go to **My Computer > Tools > Folder Options > View**. Scroll down to "Show encrypted or compressed NTFS Files in Color"; check the box and click OK.

Then, open the Registry Editor. Navigate to **HKEY_CURRENT_USER\Software\Microsoft\Windows\CurrentVersion\Explorer**.

Create a new binary value, or modify the existing value, called **AltColor**, and set it to equal the hexadecimal RGB colour value for files and folders:

Value Name: **AltColor**
Data Type: **REG_BINARY** (Binary Value)
Value Data: **00 00 FF** (default)

Since we need to set the colour to red, we need to use a Value Data of **FF0000**. For other colours, the values are as follows.

Green: **00FF00**
Blue: **0000FF**
Yellow: **FFFF00**
White colour: **FFFFFF**
Black colour: **000000**
Brown colour: **A52A2A**

Task 2

By default, Windows Explorer will show drive labels in the form "<Volume Name> (DRIVE:)", for example, "Data (D:)". If you

are using shared drives from other computers, it will also append the server name—"my-shared-data on CORP-SERVER-1 (F:)"—so the drive letter is nearly invisible.

With the following setting, you can make the drive letter appear first, or make it behave differently for local drives and network drives. This change applies to all users on the computer.

Open the Registry Editor and navigate to **HKEY_LOCAL_MACHINE\SOFTWARE\Microsoft\Windows\CurrentVersion\Explorer**

Find the value called **ShowDriveLettersFirst**.

The possible values are:

0 = Default display; drive letters after description
1 = Network drive letters first, local drive letters after
2 = Descriptions only, no drive letters displayed
4 = Drive letters before description

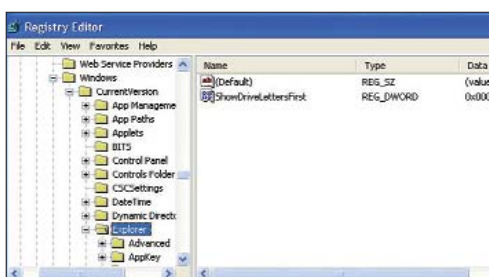
You could also use TweakUI if you don't want to use the Registry Editor. In TweakUI, the four options displayed are not associated with their correct values. The first option shows up correctly in TweakUI, but for "Show all drive letters before", TweakUI sets the value to 2 rather than 4; for

"Network before/Local after", the value is set to 2 rather than 1; and for "Never show", the value is set to 4 rather than 2.

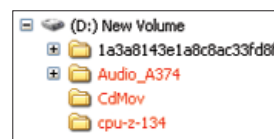
To summarise (assuming the


options are numbered 1 through 4):

Option#	Select
1	1
2	4
3	2
4	3



Set the Registry value to display the drive letter before its label





BIG Blue Is Coming!

IBM strikes back with Cell—hailed by some to be the most important processor since the Pentium. How does it kick competing hindquarters?

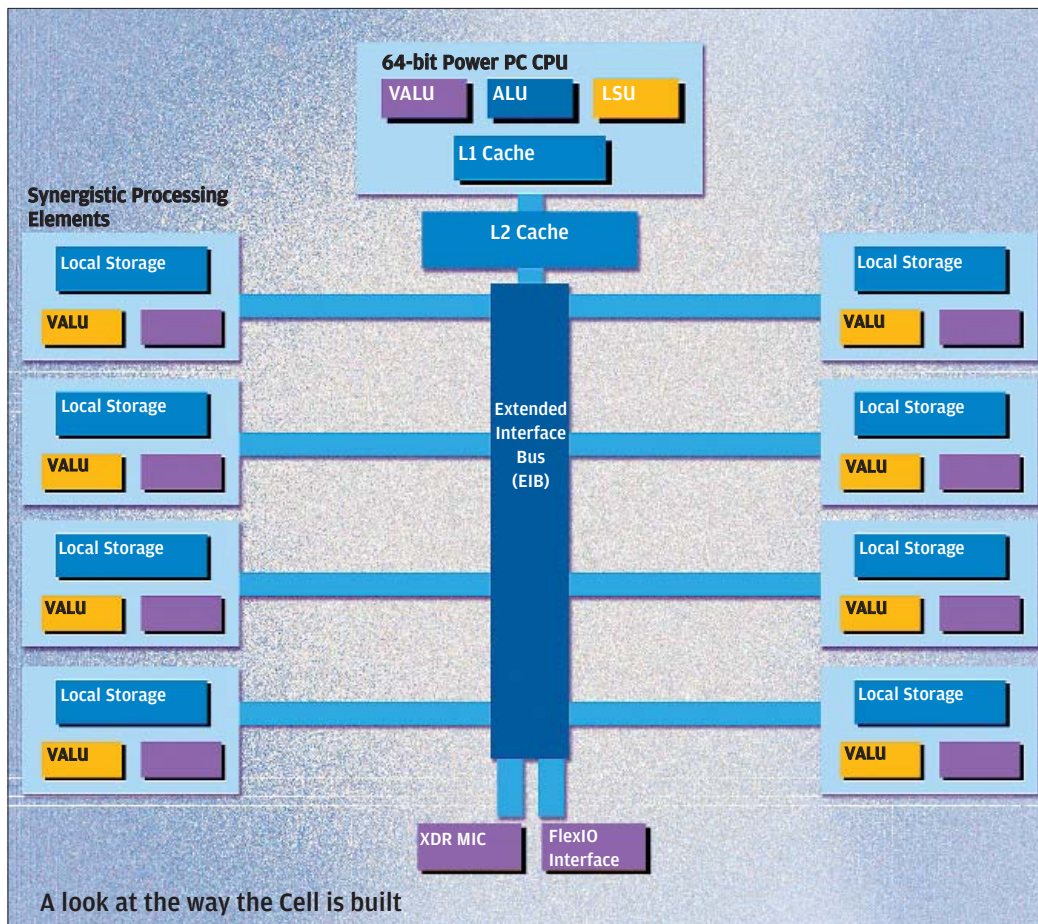
Nimish Chandiramani

With all the hype that's surrounding Sony's upcoming PlayStation 3 (PS3), you've no doubt heard that its heart and soul will be the Sony-Toshiba-IBM Cell processor (the Cell Broadband Engine, to be precise)—a nine-core monstrosity that will ensure buttery-smooth frame rates even in the most crowded scenarios, and generally ensure a wholesome gaming experience for all. So what is it that makes the Cell such a formidable force? Naturally, it's the nine processor cores on the chip. But if it were as simple as that, this article would be a waste of space, wouldn't it? Before we go into its innards, however, we need to take a look at why the Cell exists in the first place.

Please Sir, I Want Some More

In the Old Days, it was office applications that drove processor speeds—after all, what other use did we have for PCs anyway? However, as processors got faster, it wasn't just for the thrill of faster word processing that we bought them—a vicious cycle had begun. The more powerful processors got, the more we wanted them to do for us. Games and multimedia became more demanding, and soon it was these applications that would have manufacturers sweating to take out the next ultra-fast processor.

To get these applications performing at their best, it all boiled down to just one thing—CPUs needed to execute more instructions per second. The easiest way of doing this, of course, was to kick up the CPU's clock frequency, which triggered the "MegaHertz (and later, the GigaHertz)



The Package

The Cell consists of a single PowerPC Processing Element (PPE) and eight identical Synergistic Processing Elements (SPE). The PPE is a simpler version of IBM's previous PowerPC processors (more on this in a bit), and basically functions as the general-purpose core in this collection. The eight SPEs are specialised SIMD (Single Instruction, Multiple Data; see box *SIMD*) processors, designed specifically to make quick work of complex mathematical problems. With the SPEs, IBM has removed the cache, substituting it instead with 256 KB of local storage—the name has changed, but the purpose remains the same; but read on to find out why it's not really cache.

The Cell has been optimised to work with parallel workloads—and few things can be broken into as many

Wars." This was all very well for a while, but there was also the matter of executing more instructions in each cycle of that clock signal. Naturally, the way to do this is have instructions run simultaneously—the concept is called Instruction Level Parallelism (ILP), and goes on in your CPU right now. The processor collects instructions, sees which it can run in parallel, and then does so.

Now, your average computer program is a single-threaded application—put simply, churning out a single stream of instructions, oblivious to the fact that there is a processor under the hood that's trying to figure out which of those instructions it can run simultaneously to increase performance. The result? Every new generation of processors delivered only a 10 to 20 per cent boost in performance: quite distressing.

But things are changing. The GigaHertz wars are over, and everyone has realised that the only way to squeeze more performance is to have multiple program threads running at the same time—Thread Level Parallelism (TLP). The way to do this is to increase the number of processors doing the work—first with the powerful dual-processor workstations, and now today's dual-core, tomorrow's quad-core, and in five years, eighty-core processors (at least, that's what Intel tells us).

While Intel and AMD have chosen to have identical cores on their chips, IBM, as usual, decided to do things a little differently.

parallel processes as games. Rendering frames requires processing millions of pixels, and this task can be broken into as many parallel tasks as one wants. Ditto physics and AI calculations. The Cell's obvious leaning towards better physics and AI means game scenarios can get more crowded (the more objects you place in a scene, the more complex physics calculations become) without any loss in performance. In fact, the Cell is even capable of taking up the job of the GPU, though industry experts suggest that it won't be replacing the dedicated GPU just yet.

The Cell's main purpose in the PS3 is to ensure that there are no bottlenecks whatsoever, so obscene amounts of memory bandwidth are the order of the day. You no doubt remember Rambus—the people who came up with RDRAM—a technology that was undoubtedly superior to DDR-SDRAM, but never really took off. Cell sports Rambus' new XDR memory controller, which gives each processor core a memory bandwidth of 25.6 GBps—more than twice that of any PC processor. This also comes very close to the 32 GBps that GPUs get from their memory controllers, so the Cell won't bottleneck the GPU the way PC processors do.

But what's so special about these processors that make them so fast? The secret to Cell's performance is a...

...Return To Innocence

The Cell's cores are all *in-order* cores—a design that hasn't been around since the days of the old

Pentium processors. Processors since that time have been *out-of-order* processors (no, not in the “doesn’t work” sense), and in the world of general-purpose processing (office applications and so on), it’s these out-of-order processors that deliver a better performance. So why did IBM take Cell back into the Dark Ages? Let’s understand the difference between in-order and out-of-order execution first. Consider these instructions:

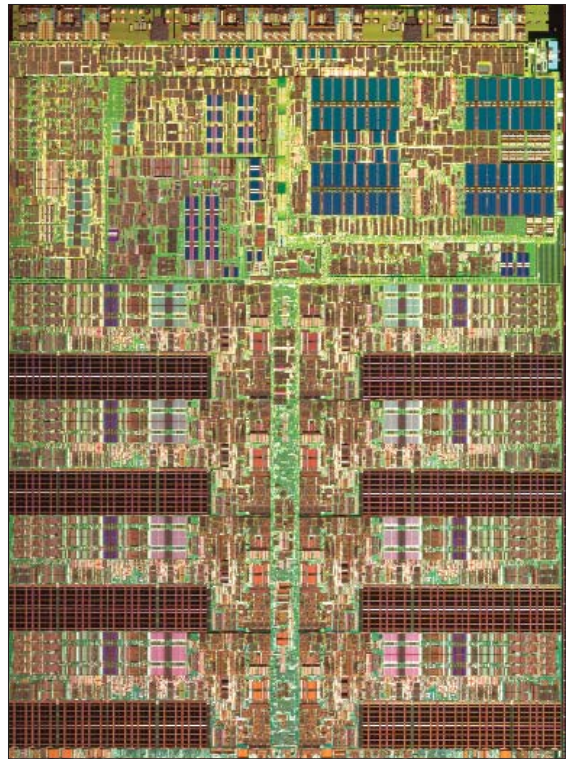
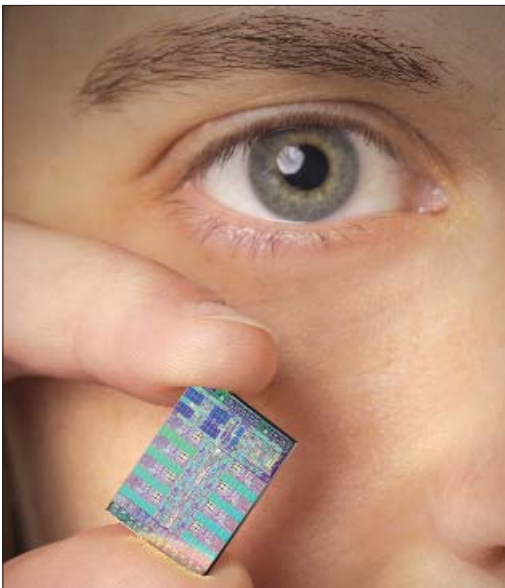
1. $A = B + C$
2. $D = A + E$
3. $X = Y + Z$

You’ll notice that instruction 2 has to be executed after 1, because it depends on the resulting value of A. Instruction 3, however, is independent of the other two. An in-order processor, as the name suggests, will execute these instructions in the order that it receives them. If all the data it needs is readily available in the processor’s cache, then the instructions proceed swiftly, and all is well.

Suppose, now, that the value of B isn’t in the cache, but C is. It’s only a matter of four or five CPU clock cycles for it to fetch C, but to get to B, it has to first search the cache and encounter a “cache miss,” following which it has to access the system’s main memory to get its data, resulting in a delay of a couple of hundred CPU cycles.

All this time, instruction 3 has to wait its turn, even though the idle CPU cycles which were wasted hunting down B could have been used to process it and get the job over with. This is where out-of-order processors came in. Out-of-order processors use an “Instruction Window” (something like a buffer where incoming instructions are stored), within which it looks for instructions that can be run independently, and processes them in parallel, so a cache miss isn’t such a disaster.

Put simply, the difference is the same as between shopping for items in the order that they’re written on your list, or by picking up whatever items on the list that you can see,



A microscopic view of the Cell—the black “bands” you see on either side are the SPEs; the PPE occupies the top left

irrespective of order. Out-of-order processors have been immensely successful in multi-tasking environments (which is the most common scenario for PC use) because they receive instructions from multiple programs, all independent of each other.

Coming back to our original question: why does the Cell forego such obvious advantages to go with the in-order approach?

Firstly, apart from the dire consequences of a cache miss, in-order cores perform quite well. Secondly, and more importantly, in-order processors are simple—without the added circuitry that enables out-of-order execution, the transistor count of the in-order core is low, which is how they’re able to fit nine cores on that little chip. To get around this cache-miss hassle, IBM has resorted to a neat trick.

We mentioned before that each SPE has its own local storage rather than a cache—this is because unlike cache memory, which has its caching logic hard-wired into it, this local store is accessible to the programmer. What this means is that the onus is now on the programmer (rather, the compiler) to ensure that any data that the SPE needs is available in this local store exactly when it needs it, minimising delays, or at the very least, making them predictable. Note that this applies only to the SPEs—the PPE still has a traditional L1 cache, and gets its performance from the speeds that the Cell will run at—between 3.2 and 4 GHz.

Raw speed isn’t the only thing behind the Cell, though. It does pack another really nifty feature:

SIMD

The reason the Cell's SPEs are able to demolish mathematical calculations the way they do is a concept called SIMD—Single Instruction, Multiple Data. The name is suggestive enough, but here's an easy way to understand how this works. If your average, everyday processor was to add a set of ten numbers to another set of ten this is how the instructions flow:

Take the first number from here, take the first number from there, add them.

Take the second number from here, take the second number from there, add them.

... and so on.

Such processors are called *scalar* processors, and are generally suited for everyday applications. However, to perform complex calculations, scientists found this approach painfully slow, which led to the development of the *vector* processor. Instead of operating on only one number at a time, vector processors operate on sets of numbers at a time—one single instruction, but multiple data. So for the Cell's SPE, the above task becomes as simple as:

Take all these numbers, take all those numbers, add them.

This technique lends itself perfectly for processing pixel data for rendering a scene, and more importantly, the physics and AI processing that will be the Cell's responsibility.

Maximum Security Cell

With Sony—known for its fervent efforts to protect its intellectual property—being one of the driving forces behind Cell, it's no surprise that the anti-piracy angle has been well thought up. The Cell will feature application security at the hardware level. Cracking software involves reading what it puts into the system memory, and thus far, it's been the operating system that prevented hackers from doing this. Compromise the OS kernel, however, and all falls to naught. The Cell, however, doesn't let even the OS kernel see what's inside the SPEs' local memory, so the question of hackers peeking into application memory doesn't come up. Voila! Automatic anti-piracy!

Big Picture

Cell isn't just a processor—'tis but a mere piece in the game for World Domination (TM). Cell's software is compiled into little "apulets," which will distribute themselves to all available Cell processors—be it on the same board, the same LAN, even over the Internet. The result is a massive grid computer, where every idle Cell you're connected to becomes a possible candidate to offload computing on. Imagine gaming on your PS3, while your Cell-enabled HDTV and PDA crunch numbers for a research lab in one corner of the Earth trying to find a cure for cancer!

So will we ever see the Cell in our desktops? Quite possibly, but there are a few things about this whole thing that might throw a spanner or two into the machinery. Firstly, there's the PPE. While it's way ahead of the competition for gaming, it will still lose out to current processors when it comes to general-purpose applications. However, throwing in more PPEs on the chip could well turn that around. Secondly, the Cell absolves itself of a lot of the responsibilities of regular processors, instead, offloading them on to the developers who will be writing the compilers for them. The insane task of writing a compiler that can intelligently exploit the Cell and all its features might just put programmers off, and that would be the end of the Cell's PC prospects.

The only people willing to code to that level are game developers, so game consoles, at least, will see a lot more of the Cell. For now, Sony and Toshiba plan to release Cell-based HDTVs and PDAs in the near future, and the Cell will probably conquer the living room before it does the desktop. ■

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You'd be forgiven for mistaking this for a weapon out of an FPS!

RED ONE—from RED Digital Cinema—is here to take you beyond the high-definition realm. It redefines video recording, going into ultra-high resolution territory.

Naturally, it's the 12-megapixel sensor—called Mysterium by the company—that makes this camera special. You can record video at up to 4520 x 2540 @ 30 fps—that's unheard of! Compare this to 1440 x 1080 offered by top-end HD cameras today!

HD video requires impressive storage, and the RED ONE can be fitted with a proprietary 40 to 160 GB hard disk. You can also order 32 GB of proprietary Flash memory as of now, though the cam supports a massive 128 GB!

An attachment called RED-CAGE allows you to mount the camera on cranes and use accessories such as a zoom microphone, an

external display screen, and other third-party accessories. Using a mounting rail, you can accommodate all such equipment on the RED ONE, and configure it so that it's physically balanced and gives the best recording possible. For handheld comfort, you have the RED-GRIP mounting system: RED Digital Cinema seems to have thought of everything.

With its magnesium alloy case, it weighs just a little more than 3 kg! No points for guessing though—the price runs into the lakhs: eight, to be precise (\$17,500)!



RED DIGITAL CINEMA



The Quest For QUANTUMLAND



It's been a few more years now; so are we any closer to the age of quantum computing?

Ram Mohan Rao

"He who tries to understand quantum theory vanishes into a black hole, never to be seen again."
—Richard Feynman
Celebrity Physicist

Language is poor indeed when it comes to certain things. How does one describe the state of mind of someone reading up on quantum theory? Baffled. Boggled. Stupefied. Dumbstruck. Confused. On the list goes—without capturing the essence of the feeling one gets when trying to grasp that ultimate theory of physics, which describes all of existence.

After all, what theory tells you that something can be a wave and a particle at the same time? That a cat in a chamber can be dead and alive at the same time—until the chamber is opened? That there is *only one electron*, which manifests itself as many electrons in the dance that is the cosmos?

As if that were not enough, we have the multiverse. You guessed it, "multiverse" is short for "multiple universes": not a new concept, but one that is shoved in our faces with renewed vigour when we talk of *quantum computing*. You see, several scientists believe there are a multitude of universes, each identical to the other until a bifurcation point happens. Such a point comes about

when a decision is made. To illustrate, say you're in a restaurant, and the waiter asks you "Tea or coffee sir?" Now, you have a choice, and decide on either tea or coffee—this is a bifurcation point, where the universe splits in two. In one of them, you're sipping tea, and in the other, coffee. These universes are only slightly different from each other—until more bifurcation points come along, and so on. That means infinities upon infinities of universes, and more interestingly, you are actually a billionaire with a harem in *some* universe!

"Shadow Photons"

But what's the point of considering other universes when we can't interact with them? Ah, but we can. Let's look at a simple enough experiment: light passing through two slits in an opaque barrier and forming a pattern on a screen beyond that. (*Figure 1 on the next page.*) We'll leave out the technicalities; when there are four slits, the pattern changes to what's seen in Figure 2! The light, as you know, consists of photons. So *what* is blocking the photons such that the dark regions appear in Figure 2? It's photons from the other universes, and this is what is usually called *interference*. These "other" photons are absolutely undetectable in "this" universe, and show themselves as existing only when they interfere with "real" photons. To repeat, that's the only way we know they exist, and that's the only way we can tell the existence of the other universes!

That is justification enough for the existence of other universes, for two reasons: one, this is a great way of explaining how photons interfere, and two, lack of space here doesn't permit further discussion!

Illustration Pradip Ingale

So What?

We're getting there. We're trying to explain how "a quantum computer" is gazillions of times faster than a silicon computer. The concept of the multi-verse comes in here, according to David Deutsch, who laid the theoretical foundations of quantum computing.

An aside: we must mention that not everyone believes there are gazillions of universes out there. But we're subscribing to that view for two reasons—one, Deutsch insists upon it, and we must respect that insistence; and two, there really does seem no other way *Shor's Algorithm* (up soon) would work.

Now, think of the problem of factorising large numbers. When you have two numbers such as 58359597 and 44845355, their product is 2617156845121935—easy enough to calculate. But when you have the latter number, how do you calculate what numbers it came from? In fact, factorising a 250-digit number could take longer than the known age of the universe on a regular computer! But Shor's algorithm—which is, well, an algorithm, devised by a man called, well, Peter Shor—actually does it in a reasonable amount of time. This, as it turns out, uses 10^{500} times the number of computational resources that seem to be present.

Deutsch asks, how can this have been achieved, when there are only 10^{80} atoms in the known universe?

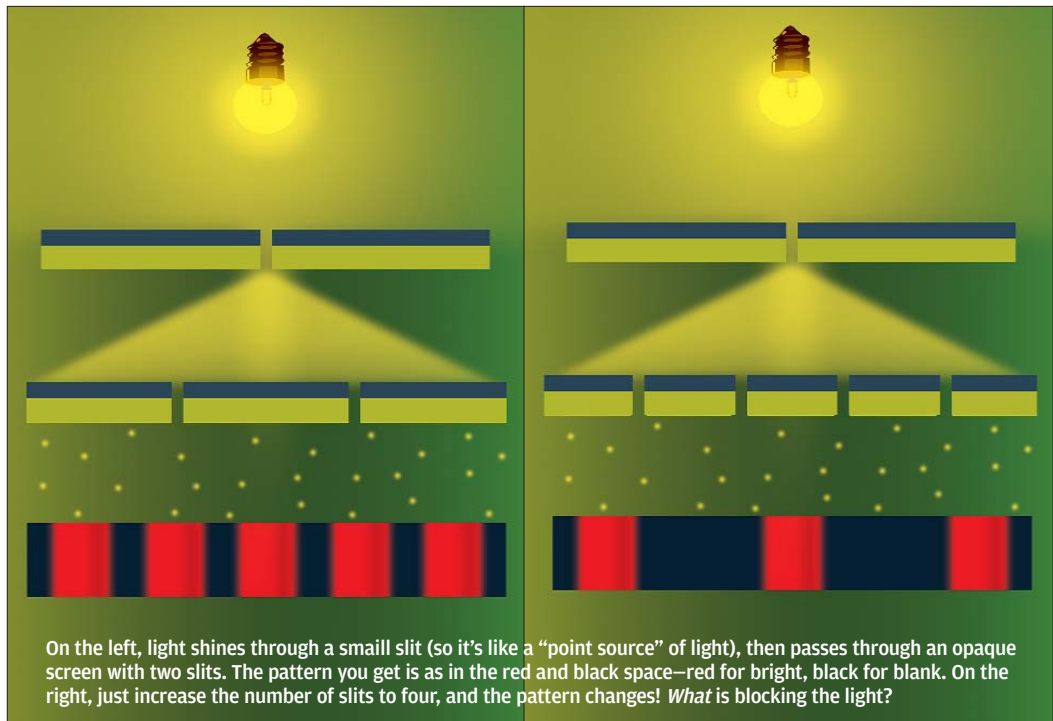
The answer lies in "interfering universes." 10^{500} universes collaborate in the production of the answer, each of them doing a small part of the job. It's not like the problem is broken up into parts and given to each universe—there's no God out there to do that—it's just that this process is like the interference of light we talked about earlier. There, photons from other universes interfered with "our" photons, undetectable except for the fact that they interfered. Here, it's a mish-mash of answers from various universes that are interfering, leaving only one.

Now this might sound like rambling, and this writer might seem to be off his rocker, but that's common when dealing with quantum computing.

At this point you're probably screaming, "What is quantum computing?" Or "Just give me a description of a Quantel Inside processor!"

Sorry. We can't. That's just the way it is!

OK, we *can* shed some light on what's going on in the labs. For example, researchers have demonstrated cryptography working on quantum principles. Let's go through some real-world stuff.



Quantum Vagueness

Now we're getting into what a quantum computing environment looks like, what goes on, and how we get the answers.

The building blocks of a quantum computer are qubits instead of bits. A qubit can be not just one or zero, but can be both one *and* zero at the same time. So, if you have 10 bits, you can have only one of 2^{10} values; if you have 10 qubits, you can have all 2^{10} values at the same time. The qubit is based on the central ambiguity inherent in quantum mechanics: a property (such as spin) of a particle (such as an electron) is ambiguous until a process of disambiguation—such as an observation—causes the particle to "decide" upon what properties it has. Electron spin is too complex to go into here; just think of it as a property!

What does a qubit look like? Well, what does a bit look like? It's a voltage in a transistor, in most cases! And if that isn't hard to visualise, neither should a qubit be hard to visualise—qubits are represented by a quantum mechanical property of a particle such as an electron. They need to be set up such that they are in both states of spin at the same time. When one observes the state of the electron, the ambiguity vanishes, and this is called quantum decoherence.

An aside: we referred to a cat being both dead and alive until observed. That is one of the most popular paradoxes in quantum mechanics—what is the cat like until it is observed, and why should our observation make a difference? This is called the Schrödinger's Cat paradox, and if you've been reading keenly thus far, you should straightaway get yourselves a copy of *In Search Of Schrödinger's Cat*, by eminent physicist John Gribbin.

Now comes the meat of the matter: feeding in the input and getting the results! We need to present a series of qubits with a problem, and also a way to test the answer. This is done by setting up the quantum decoherence of the qubits such that

only an answer that passes the test “survives” the decoherence. The failing answers cancel each other out “in a quantum way.” Vague enough?

The series of qubits represents all possible solutions. This is simple enough to understand: a single qubit represents two possible solutions, and a hundred linked qubits mean 2^{100} possible solutions. The problem itself is formulated as a test to be applied to the potential answers. It is presented to the string of qubits so that they decohere, that is, “collapse” from their ambiguous states into real 1s and 0s that pass the test.

Now that’s tough to digest, we know. We need an analogy. Ray Kurzweil, inventor, author, futurist, and strong-AI proponent, provides exactly what we need: when light strikes a mirror at an angle, it bounces off in the opposite direction at the same angle to the surface. But according to quantum theory, each photon actually bounces off *every possible point* on the mirror, thus trying out every possible path. The vast majority of these paths cancel each other out (in a quantum-interference way—now don’t ask us how!), leaving only the “correct” path.

Now, in an abstract way, think of the mirror itself as the problem to be solved: “*what is it that makes the light bounce off at this angle?*” Only the correct solution—the light bounced off at the expected angle—survives all the quantum-interference cancellations. This is what we were talking about above—the *test of the correctness of the answer* is set up in such a way that most of the answers cancel out, and we’re left with the one correct solution.

All At Once

You’ve probably gathered that quantum computing is all about massive parallelism—and we mean *massive*. We don’t mean massive as in supercomputer-massive—we mean it as in *giga-massive*. A quantum computer doesn’t just work “much faster” than a regular computer—it ropes in billions of our friendly neighbourhood universes to do in a matter of minutes what your rig would *literally* take aeons to do.

But then, that’s not all good. It means we’ll probably never have a general-purpose quantum computer—it’ll only be good for tasks that *require* massive parallelism.

Decoherence Revisited

We’ve spoken about how decoherence is the process of removing the state ambiguity of a particle. But there is a more sinister face to the phenomenon: it prevents easy construction of a large-scale quantum computer.

So OK, how do we build one? We start with simple quantum logic gates, and integrate them into quantum circuits, of course! Easier said than done: gates and circuits are familiar enough at our level of size, but they’re much more complex at the sizes where quantum effects come in. Still, we do already have quantum logic gates, simple devices that perform one elementary quantum operation, usually on two qubits. In fact, the first quantum logic gate was built using light in 2003. They differ from regular logic gates in that they perform operations on quantum superpositions (the ambiguous states of particles).



“The quantum theory of parallel universes... is not some optional interpretation emerging from arcane theoretical considerations. It is the only tenable explanation of a remarkable and counter-intuitive reality”

David Deutsch
Physicist
Oxford University

Now here are the practical problems: as we increase the size and complexity of the circuits we’re merrily imagining, the number of interacting qubits increases, and this makes it harder to design the interactions that would exhibit quantum interference! (If you’ve been following, interference is *essential*.) One of the biggest impediments to progress is that *the surrounding environment* should not be affected by the interactions that give rise to quantum superpositions.

It’s something like a process going on in a closed room; think of it as secrets being discussed inside. When the circuits get more complex, the “secrets” will spill to outside the room. Formally, this “spilling” of information to the outside is *also* referred to as decoherence. Now this is a totally different way of looking at the phenomenon. Don’t ask us how the same thing can be thought of in two such different ways—that’s the way it is!

To clear the fog for some readers, there is disagreement within the community—and different beliefs—about how to define decoherence. Different writers will tell you different things, and let’s just leave it at this: if a particle can be in two states at once, why not a concept?

Breaking News

In October 2004, a quantum memory register using caesium atoms was built at the University of Bonn. Researchers were able to “write” to the register using microwave radiation, which puts the electrons into a position between their two natural orbits around the nucleus.

In July 2006, US NIST researchers brought quantum computers closer to mass production. The development reported was that of the construction of a two-dimensional ion trap; ion traps have proved to be the best way to make qubits, allowing up to eight to be connected together. (Kurzweil estimates that at 40 qubits, quantum computers will outdo today’s PCs.)

In August 2006, a team of researchers at the Delft University of Technology in The Netherlands created a device that could manipulate a *single electron* using *conventional* chip fabrication technology. A major benefit of making a qubit this way is that the qubits will be easier to scale up.

So, then, we’ve got the memory, we’ve got the processors, we’ve got scalability. At this rate, we have good reason to believe we’ll see a working quantum computer in our lifetimes!

Concluding Remarks

Quantum computing is the future. Repeat that a hundred times. But why? Well, for the simple reason that it’s quantum mechanics that really governs the universe (or multiverse, if you will).

Our relatively feeble attempts at computing thus far have been limited to the application of rather elementary laws of physics. Even such things as DNA computing don’t really exploit truly fundamental laws. After all, biology and chemistry *are* physics.

With quantum computing, we’ve reached the final frontier—the exploitation of the most successful theory of reality. We’re admitting and harnessing the existence of parallel universes: we’re taking hold of the very fabric of reality. ■

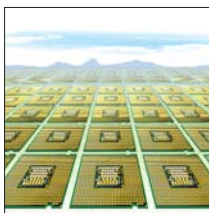
ram_mohan@thinkdigit.com



58 Know More Compression



68 Motherboard Test



98 Processor Test

Digital Tools

Technology For Personal And SoHo Productivity

Enhance

Your Own Porta-PC

No, we're not talking about laptops here—you can carry your PC around on a USB device, thanks to a neat tool called MojoPac

Nimish Chandiramani

Not too long ago, we gave you the low-down on some essential applications for your USB drive (*Life in a USB Nutshell*, *Digit* April 2006), but what if you didn't want the associated paranoia of mistakenly changing someone else's settings? Why shouldn't you be able to enjoy working on any PC in the same carefree manner that you would work on your own?

You might have heard about U3, the platform that lets you install any application directly to a Flash drive and use them anywhere. The great thing about this is that you don't need to wonder whether the application you're installing is portable or not—just install away. The downside? You'll need to buy a whole new drive that comes with U3, and if you ever tire of it or need the extra space for data, you can't get rid of it! Moreover, some applications now need re-writing for the U3 platform, and few vendors are inclined to do so.

So what if you want all the good things about U3, and not have to buy a new disk? Enter MojoPac!

What It Does

When you install MojoPac on your USB drive, it gives you your own virtual Windows XP environment, where you can install and use your applications. You'll find a 30-day trial of MojoPac on this month's CD, and it costs only \$29.95 (Rs 1350)—well worth it once you realise how much use it can be to you. The first of this feature list is its ability to turn any USB storage device into a MojoPC—Flash drive, hard drive, cell phone, and even your iPod!

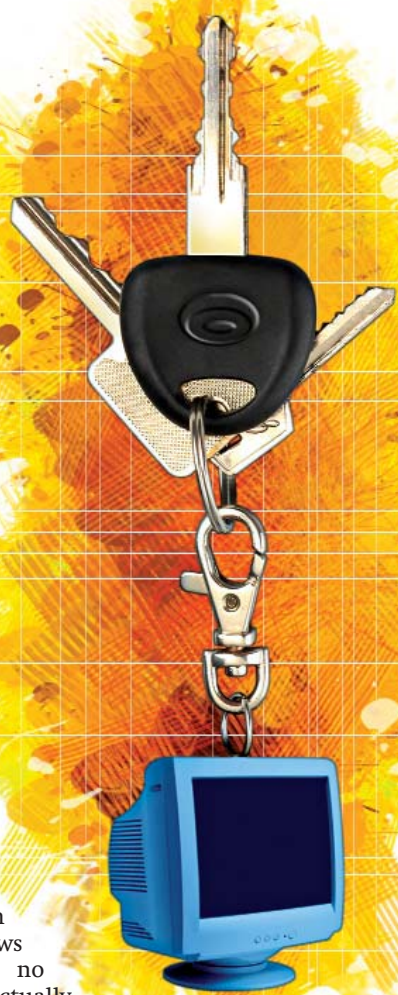
Installation is a matter of a few minutes—just make sure your USB device is connected to your

PC, and choose it when the installer asks you to. It copies essential items from your Documents and Settings, Windows and Program Files folders, and also gives you the option of copying any other files that you want.

Running MojoPac for the first time is like running a fresh install of Windows XP—it shows you no installed programs, no matter how many are actually installed on the PC you've connected your drive to. Just like a Windows XP install, though, you can run the default applications that come with it. To start installing your applications, just pop in the installation CD or run the setup file.

How It Works

With the few essential files that it copies from your Windows installation, plus its own functionality, MojoPac successfully emulates a Windows XP installation, so any software you install on it thinks it's installing on to a full XP install. Technically, then, you don't even need to worry about violating the license agreements of the expensive software you invested in. If you need to use, say, Adobe Photoshop wherever you go, you can't go around installing it on every PC you work on—this would violate the single-user license and make you guilty of piracy. But install Photoshop on your MojoPac device, and you can use it on any Windows XP machine—and you don't have to worry about being a pirate any more!



Imaging Chaitanya Surpur
Photograph Amrut Patki

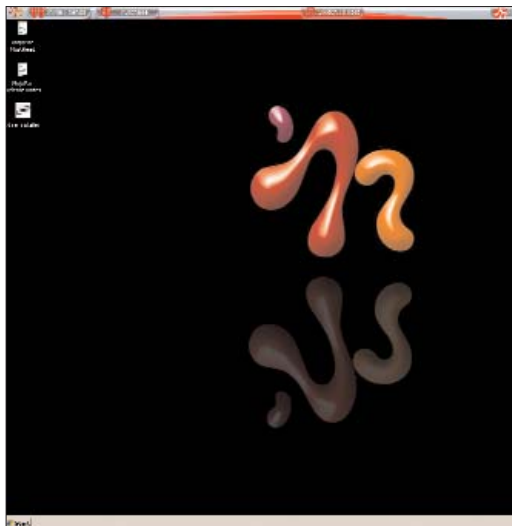
When you open My Computer from within your MojoPC, you'll notice that your USB disk shows up as the C: drive. This protects the host PC from any drastic changes that you could make, and also ensures that even the most badly-written installers won't accidentally write to the *real* C: drive—we've encountered numerous installers that automatically start installing to "C:\Program Files" without so much as asking you.

MojoPac not only protects the host PC, it also protects itself—it only gives you access to Windows' default programs, and is intelligent enough to distinguish between these and the rest of the programs installed on the host. So even if programs on the host PC are infected with viruses,

your MojoPC stays safe because it just can't run those processes.

The Experience

Working with MojoPac requires little or no grey matter at all—your USB device will autorun when you insert it (this feature only works with Service Pack 2), you log in to your MojoPC, and start working! There's a toolbar at the top that lets you switch to your host PC's desktop just in case. Another cool feature is that when a window pops up in the host PC—as happens when someone sends you an IM—you get a friendly notification in



MojoPac gives you your own virtual desktop to play around in

the tray informing you of the event.

We tried MojoPac on a Transcend 512 MB Flash drive, and we did notice that applications took a little longer to load than we'd hoped—this shouldn't have happened considering the test PC had 1 GB of RAM for it to exploit. Of course, that's when we realised that we hadn't optimised it—here's how you can...

Speed Up Your Mojo

1. In My Computer (on your Host PC), right-click on the USB drive and select Properties.
2. Under the Hardware Tab, select the drive and click on the Properties button.
3. In the dialog that pops up, you'll see that "Optimize for quick removal" is selected; change this to "Optimize for Performance."

You will now see a noticeable improvement in your Mojo performance.

You And Your Mojo

Thus far, the experience of using portable programs from your USB stick lacked the feeling of seamlessness—every PC you work on is different, so it takes time to adjust to each of them. With MojoPac, your interaction with the MojoPC is the same every time, so you're always comfortable.

If you keep carrying your work between office and home, MojoPac has obvious advantages: all your data and programs travel with you, complete



You're never out of touch with the host PC

with their settings. You can carry all your favourite applications on your MojoPac and use them at work—everything you do within your MojoPC stays confidential, and still doesn't violate any company policies: as far as the IT infrastructure is concerned, all you did was start a program.

If you're one of those unfortunate souls whose friends keep popping over to use your PC, wantonly changing your settings and running programs you don't want them to run, force them to use MojoPac! Get them to buy USB drives and install MojoPac on them. This way, they can come and use your PC's resources, but leave your programs and settings intact.

We mentioned that MojoPac lets you switch between the MojoPC and the host PC's desktop; in addition, it needs administrative access to allow the user to install applications to his MojoPC. While this is quite frustrating (letting your annoying friend switch out of Mojo into an Administrator Desktop? The horror!), there's a simple way to work around this. First, create a Guest account on your PC—cripple its privileges as much as you can. Use this account when a friend wants to log on. MojoPac will ask for an Administrator password before it starts—enter it. Now, when your friend switches out of his MojoPC, all he sees is a limited guest account—he's better off in the MojoPC!

MojoPac has also been tested with a large number of games—head over to www.mojopac.com to see which ones—so you can exploit any high-end rig you can get your hands on. Even the rigorous DRM features are going to work fine, so no worries there.

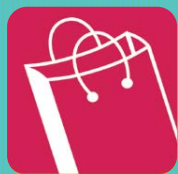
Our Recommendations

At the very least, MojoPac requires you to have a 128 MB USB 2.0 flash drive, but you're going to need more storage depending on how you want to use it. If you want to install Microsoft Office, for example, 1 GB of storage is essential—500-odd MB for the installation itself, and the rest for storage and other applications. You also need to look at how often you're going to be reading from and writing to this drive—Flash drives start to fail after a large number of read/write cycles.

Though the developers claim that MojoPac has been optimised to perform no more writes than absolutely essential, excessive use *will* have you sifting through corrupt data faster than you'd like. If you're going to turn this into a way of life, an external hard disk would be a better option, giving you the advantages of both storage space and reliability. For gaming, you should invest in a faster (and probably more expensive) drive than the rest to ensure smooth performance.

So what are you waiting for? Get installing and write to us about your Mojo experience! ■

nimish_chandiramani@thinkdigit.com



Apple MacBook

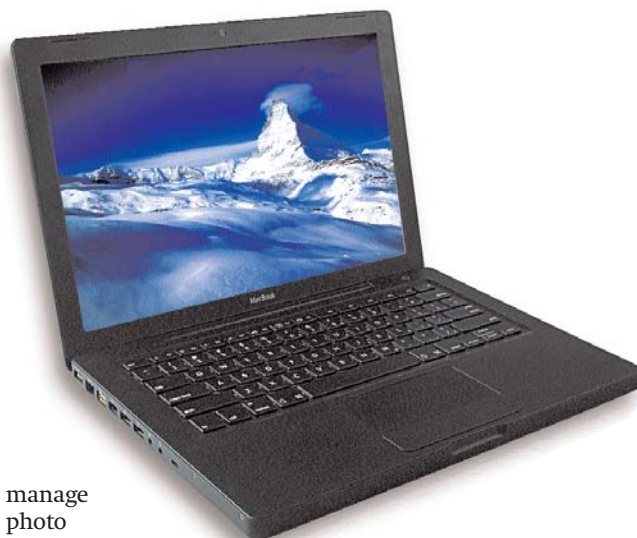
Apple, anyone?

With the Intel Core Duo CPU at 2 GHz instead of the PowerPC G4 and a matte black finish, the ultra-portable MacBook is a far cry from its predecessor, the iBook. The RAM is 512 MB DDR2, and the hard disk, 80 GB. A glossy screen enriches the viewing experience, but also makes it very reflective. The 13.3-inch display with a maximum resolution of 1280 x 800 is powered by Intel's GMA 950 integrated graphics. The optical drive is a slot-loading Super Drive

DVD±RW. All ports are located on the left.

Connectivity options include USB 2.0, FireWire, audio in/out ports, and RJ-45. Wireless connectivity provided by the AirPort Extreme supports 802.11g. There is a mini-DVI port to connect a large-format display or a TV. There is, however, no expansion slot for PCMCIA or Express cards. A card reader, another standard on all PC laptops, is missing.

Featured here is the integrated iSight camera for videoconferencing; the cam delivers very good video quality. The MacBook comes with a great software bundle. All the usual utilities are there, plus the iLife 06 application suite, which lets you create and edit movies,



manage photo albums, create your own music, and create Web pages.

The MacBook played our test video for 154 minutes—at par with other laptops.

For all you Mac fans out there, this is a great buy. As for Windows die-hards—give the MacBook a shot, and you just might not feel like going back!

Specifications

Core Duo 2 GHz, 512 MB DDR2 RAM, 80 GB HDD, Super Drive DVD±RW, 13.3-inch wide-screen, iSight camera

Contact: Apple International

Phone: 080-25550575

E-mail: indiainfo@asia.apple.com

Web site: www.apple.co.in

Price: Rs 87,600

RATINGS

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

Palit 7600GT

Just a decent graphics card

Palit's 7600GT is based on a stock G73 core. 3D Mark 2006 gave us a score of 3220—not bad. The 7600GT coughed up 6290 3D Marks in 3D Mark 2005. F.E.A.R. gave 28 fps at 1280 x 960 with 4x AF and AA off.



Soft Shadows were enabled here; with SS off, we got 41 fps. In comparison, we got 27, 6284 and 3422 in F.E.A.R., 3D Mark 2005, and 3D Mark 2006 respectively on an Asus GeForce 7600GT.

This is a fairly decent product that manages to do what other cards based on this core do, without any really outstanding features.

Specifications

Core: GeForce 7600 GT (G73), 560 MHz core speed, 1400 MHz memory speed, 12 pixel pipelines, 5 vertex pipelines, Shader Model 3.0 / OpenGL 2.0 compliant, 256 MB GDDR3

Contact: Shree Sagarmatha

Distributors Pvt Ltd

Phone: 011-26428541

E-mail: techcom@airtelbroadband.in

Web site: www.palit.com.tw

Price: Rs 8,990

RATINGS

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

Western Digital My Book 500 GB Premium Edition

The Big Daddy of the externals!

This external drive has a unique design that resembles a medium-sized reference book. The design is quite sturdy. The drive has a dual interface—USB 2.0 as well as FireWire.

There's a round button that lets you take backups from the drive; this works in conjunction with the bundled Retrospect backup software. This button also indicates free space.

Writing a 1 GB file to the drive took just 44 seconds; reading took 35, which is quite fast.



Specifications

500 GB, interfaces: USB 2.0 and FireWire, dimensions: 17.2 cm (H) x 14.3 cm (D) x 5.7 cm (W), weight: 1.32 kg, Retrospect backup software

Contact: Western Digital

Phone: 9321029204

E-mail: amarjit.singh@wdc.com

Web site: www.wdc.com

Price: Rs 17,500

RATINGS

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



NEC 4610-BK

Too expensive!

Here's a 46-inch widescreen LCD with a maximum resolution of 1366 x 768 and a contrast ratio of 800:1. You get multiple PC hook-up options with one each of D-Sub, analogue RGB and DVI-D ports. NEC also provides one each of RCA and BNC (Bayonet Nut Coupling) connects.

We hooked up the thing to our Xbox 360 at 720p (1280 x 720, progressive scanned) and fired up our game. At a distance of 12 feet and less, you will notice pixelation, but this is very normal for a large-screen LCD TV. In the DVD movie test, the NEC performed well, with great colour tones and sharp detailing. A slight



niggle is the below-par contrast ratio, but the overall picture quality was great.

The 4610-BK costs a small fortune, at Rs 3,60,000! A great product, certainly, but there are much cheaper alternatives available.

Specifications

Diagonal Size: 46 inches, weight: 32 kg (with stand), contrast Ratio: 800:1, brightness: 450 nits, maximum resolution: 1366 x 768, HD-compatible

Contact: Shiba Comp. Pvt Ltd
Phone: 011-30822106
E-mail: sales@shibacomp.com
Web site: www.nec.com
Price: Rs 3,60,000

RATINGS

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

Creative Live! Motion

Go live on the Web!

The Creative Live! Motion is an elegant and neat-looking webcam, and is one of the few ones with a motorised drive. The smooth and silent motor can swivel the camera 200 degrees horizontally and 105 degrees vertically. It has a claw at the bottom that acts as a stand and can also be used to secure it to your monitor.

The cam supports video capture at 640 x 480 at 30 fps, and it can shoot still photos at 1.3 MP. The image quality isn't extraordinary, though. There's even 4x digital zoom, which actually produces decent image quality at moderate zoom levels. Using the 76-degree ultra-wide-angle lens, you can take panoramic photographs!

Face tracking is a useful feature, and this



camera offers two modes: continuous, in which it constantly tracks your face, and smart, in which it moves only after you stop moving.

RATINGS

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

A mono headset completes the voice-chat setup. The software bundle consists of Photo Manager—a photo managing tool, ArcSoft Video Impression—a video editing tool, and SightSpeed—Creative's online video-conferencing utility which allows you to remote-control the camera.

Specifications

Specifications: CCD sensor, 76-degree ultra-wide-angle lens, 200-degree pan and 105-degree tilt, still image: 1280 x 960 (software-enhanced), video: 640 x 480 @ 30 fps, auto-focus, 4x digital zoom, USB 2.0

Contact: Compuage Infocom Ltd
Phone: 022-23842200
E-mail: vaishali.shinde@compuageindia.com
Web site: www.creative.com
Price: Rs 3,800

Nokia 6131

Not your regular clamshell

the primary display at 240 x 320 with 16 million colours.

Rubberised plastic gives the phone body a matte-black finish. The keypad has raised keys, and is large enough to prevent multiple key presses.

The 1.3 MP camera disappoints, with average photo quality, and the long time it takes to capture an image. You can print photos via PictBridge, however.

The internal 10 MB of memory can be boosted to 2 GB using a hot-swappable microSD card. Connectivity options are IrDA, Bluetooth, GPRS, and EDGE.

While the audio quality of the internal speakers is average, the bundled hands-free provides really good sound quality.

Rs 13,739 is rather steep for the package offered.

We'd suggest you opt for a better model in the same price range from other manufacturers.

Specifications

1.3 MP camera with 8x digital zoom, 240 x 320 pixel display, PictBridge support, quad-band support, FM radio, up to 2 GB microSD memory supported

RATINGS

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

Contact: Nokia India Pvt Ltd
Phone: 022-30303838
Web site: www.nokia.co.in
Price: Rs 13,739



The 6131 is a clamshell phone with refreshing new looks. A smartphone-sized external display—128 x 160 with 262K colours—is integrated, in addition to

BLM-3000A Bluetooth mouse

Atrociously priced

This laptop mouse is sleek; it has a narrow profile, reminiscent of a comet. Ergonomics is spot on; however, those with thick fingers will find the buttons a little uncomfortable. Due to the narrow "comet tail," gripping the mouse is a serious challenge.

The BLM-3000A is powered by 2 AAA batteries—which will work out expensive, unless you buy rechargeables. However, an



On/Off switch is provided.

The buttons relay good tactile feedback, and the scroll wheel is nice. But at Rs 5,959, we think the BLM-3000A is atrociously priced. An RF-based keyboard-mouse combo with a laser sensor from Microsoft or Logitech costs much less.

RATINGS

Performance	★★★★★
Features	★★★★★
Bundle	★★★★★
Value for money	★★★☆☆
Overall	★★★★★

Contact: MINDS (India) Pvt Ltd
Phone: 9818299663
E-mail: ravians.kumar@level1.co.in;
jerry.albert@level1.co.in
Web site: www.level1.co.in
Price: Rs 5,959

Mitashi MP-1G

A mini all-rounder!

The MP-1G is a digital music player with a difference—not only can you play your music and record from FM stations, you can also use it as a USB drive and as a voice recorder.

The bundled earphones aren't very comfortable.

The MP3, WAV, and WMA formats are supported. Voice recording is in WAV. As a USB drive, 1 GB should be good enough. An extraordinary feature is the bundled car cassette adapter that allows you to play songs from the device on any cassette player!



The player provides very good audio quality, both in terms of playback and recording. The inbuilt microphone is very sensitive; the only cause for concern is battery life—an AAA battery lasts only three hours.

Specifications

1 GB; MP3, WMA, WAV supported; voice recorder, car cassette adapter, USB 2.0

RATINGS

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

Contact: Mitashi Edutainment
Phone: 022-25006661
E-mail: vishal@mitashi.com
Web site: www.mitashi.com
Price: Rs 4,390

Corel Paint Shop Pro Photo XI

High on features, low on price



lets you preview photos and videos in full-screen mode, it also lets you apply quick fixes and edits. The Image Information panel gives you quick access to image info.

By appending the moniker "Photo", Corel has signalled it will now focus more on digital photography rather than image creation, its traditional forte. Photo XI consists of a complete set of editing tools for speedily creating professional-looking photos.

Paint Shop Pro Photo XI retains all the features of its predecessors. The "Learning Center" shows you how to get things done in an easy manner. The "Quick Review" feature not only

You have the option to work with both vector as well as raster graphics. Photographers will be delighted to know that now you can open RAW images from virtually any digital camera. Some effects are meant specifically for digital photos: the Digital Camera Noise Removal feature deserves special mention because it does an amazing job at removing the tiny specks of unnatural colour or noise, and can save days of hard work for designers. Using

the Skin Smoothing feature, you can even out the skin tone of people in a photo. Similarly, there is the Time Machine, which lets you see what your photos would look if they had been taken some years ago. There is the Depth of Field effect, which allows you to draw attention to a specific area of an image. One Step Photo Fix automatically adjusts the colour balance, contrast, clarity, and saturation to optimal levels.

One of the great features in this version is an image management tool called the Organizer: You can assign ratings, captions and descriptive tags—for easier and faster image searching—to images, and arrange them in thematic groups without physically moving them from the folder they are stored in.

Snapfire Plus SE is a nifty little digital camera software that comes

bundled. It simplifies image download from digital imaging devices in addition to organising images, executing quick fixes such as red eye, cropping and applying small photo effects, as also some image editing. It has inbuilt project templates for print layouts such as Calendar, Greeting Card, and Collage.

Corel Paint Shop Pro Photo XI comes close to some of the bigger and obscenely expensive photo editing applications, while still managing to be commendably affordable. It's definitely a good value-for-money proposition.

RATINGS

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

Contact: Corel Corp.
Web site: www.corel.com
Price: \$129 (Rs 6,000)

Ashampoo WinOptimizer 2007

Tweak your Windows



This software takes up the challenge of keeping Windows supercharged. "Cleaning Tools" has sub-options to clean the hard drive, Registry, and all traces of Internet activity. "Tuning Tools" give you full control of auto-start programs and more. "File Tools" is a set of security and privacy tools such as "File Wiper" to irrecoverably delete files. "Tweaking Tools" contains a defragmenter

among others.

For those not comfortable with using the various optimising features separately, there is One-Click Optimization, which safely cleans up stuff at the click of a button. The trial version is available on this

month's CD, and as a bonus, you can register it online to convert it to the full version!

Contact: Ashampoo GmbH & Co. KG
Web site: www.ashampoo.com
Price: Free

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

Razer Gaming Setup

Only for Razer fans

This gaming kit contains the Copperhead mouse, the Mantis Speed mousepad, and the cable management system a.k.a. Armadillo.

The Mantis is one of the largest mousepads we've ever seen. It is made of Fibertek (a superior cloth weave). The ambidextrous Copperhead has lightning-sharp precision thanks to the 2000 dpi laser engine, the 1 ms response time, the 32 KB of onboard memory that is used to store personal game settings like sensitivity and button mapping (there are five profiles available), and a 16-bit data path (compared to the 8 and 12 bits used by other mice). With sensitivity settings adjustable on the fly by way of two buttons, from 400 to 2000 dpi, the Copperhead quickly adapts to a variety of games from twitch-reaction ones such as

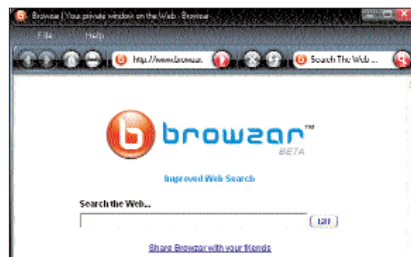
Quake III to RTS games such as Warcraft III.

The mouse feels extremely light—the Logitech G5 feels much more substantial. The Copperhead will require you to curl your fingers constantly to use the buttons. Also, the Copperhead has an "illuminated anti-slip ridge" on each side—these can be uncomfortable for people with larger hands, and tend to dig into your palm after a while. The G5 in comparison fits the contours of the hand perfectly. We used the Copperhead and the G5 on the same surface, and found both the mice equal in terms of performance. It comes down to comfort levels, and there are no doubts as to who's ahead.

The Armadillo is a heavy, metal assembly that can accommodate your

Browzar 2007

A browser for the privacy-conscious



be excruciatingly slow on dial-up connections due to the lack of a cache: when you hit the forward or back buttons, pages need to be reloaded. It doesn't support right-click, so you can't save images from Web pages.

Browzar is a free browser that uses the IE shell. A highlight is that it lets you surf with privacy: no cache, history, cookies, or auto-complete!

Browzar is very small—just 264 KB; it comes as an executable that runs solo! You can carry it around on a thumb drive and just start surfing sans privacy concerns. It is very light on system resources, and can therefore be run on even very low-end systems.

Now for the disadvantages: Browzar can

Browzar isn't, of course, meant to be a replacement for the standard browsers; its winning points are its portability and privacy.

Web site: www.browzar.com
Price: Free

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



keyboard and mouse cables to prevent them doing a jig around your table. For the Razer cultists, if you need a good gaming mouse for those frag sessions, the Copperhead will do wonders for your aim and accuracy. Non-gamers who haven't been addressed so far... avoid being bitten by the Copperhead bug!

Specifications

Razer Copperhead: 2000 dpi laser sensor, 1000 Hz / 1 ms response time, 32 KB onboard memory, 4 extra programmable buttons

RATINGS	
Performance	★★★★★
Comfort	★★★★★
Build Quality	★★★★★
Value for money	★★★★★
Overall	★★★★★

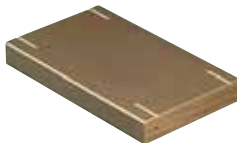
Contact: Razer (Asia-Pacific)
Pte Ltd
Phone: 00-65-6224335
E-mail: terence@razerzone.com
Web site: www.razerzone.com
Price: Copperhead: \$69.99;
Armadillo: \$19.99, Mantis-Speed: \$21.99

External Portable Hard Drives

Lacie Design by F.A. Porsche 40 GB

- ⊕ Inexpensive, good performance
- ⊖ None

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



Internal PATA Hard Drive Hitachi Deskstar HDS725050KLT80

- ⊕ Speedy performance
- ⊖ Expensive

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

Linux SuSE Linux 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 Super AllWrite SHM-165P6S

- ⊕ Good performance, supports all DVD formats
- ⊖ None in particular

Contact Mediatech India Distribution Pvt Ltd
Phone 022-26361111
E-mail digit@mediattechindia.com
Price Rs 3,085



Digital Cameras (High-End)

Sony Cybershot W50

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



Digital Cameras (Mid-range)

Sony Cybershot DSC L1

- ⊕ Great image quality
 - ⊖ Only 4 MP CCD
- Contact Macro Photo
Phone 022-22618639
E-mail macro.photo@gmail.com
Price Rs 9,000

Graphics Cards (High-End)

XFX PV-T71U-ZDD9 (NVIDIA 7950GX2)

- ⊕ Superb performer
 - ⊖ Runs slightly hot
- Contact Rashi Peripherals Pvt Ltd
Phone 022-67090810
E-mail navinderc@rpotechindia.com
Price Rs 38,500



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@rpotechindia.com
Price Rs 10,500



The A-List



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

Internal SATA Hard Drive Seagate ST3750840AS

- ⊕ Huge 750 GB storage capacity
- ⊖ Expensive

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

Hard drive-based MP3 Players Apple iPod Video



- ⊕ Amazing sound quality, easy interface, plays video
- ⊖ No FM, no protection for screen

Contact Apple Computer International Pvt Ltd
Phone 1800-425-4683
E-mail indiainfo@asia.apple.com
Price Rs 19,800

Processors

Intel Core 2 Extreme QX6800

- ⊕ Extreme performance
- ⊖ Expensive

Contact Intel Corporation
Phone 080-25075000
E-mail saranya.rustagi@intel.com
Price To be announced

LCD Monitors (17-inch)

NU QL-711V

- ⊕ Inexpensive
- ⊖ Below average build quality

Contact Shiba Comp Pvt Ltd
Phone 011-26413437
E-mail shiba@del2.vsnl.net.in
Price Rs 11,970

2.1 Speakers

Altec Lansing MX-5021

- ⊕ Great sound and build quality
- ⊖ Slightly expensive

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



5.1 Speakers

Philips MMS 5.500 i/c

- ⊕ Good for Music
- ⊖ Not suitable for gaming

Contact Philips India Ltd
Phone 022-56912332
E-mail pcp.india.info@philips.com
Price Rs 4,990

Projectors

Sharp XR-10S

- ⊕ Brilliant quality and performance
- ⊖ Bulky

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



LCD Monitors (19-inch)

NU L921G

- ⊕ Low price, good viewing angles
- ⊖ Below-average build quality

Contact Shiba Comp Pvt Ltd
Phone 011-26413437
E-mail shiba@del2.vanl.net.in
Price Rs 18,000



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
- ☐ Skippy bundle

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

**Intel High-end Motherboards
Intel 975XBX**

- ⊞ Solid performance
- ☐ Ageing chipset

Contact Intel Corporation
Phone 080-25075000
E-mail saranya.rustagi@intel.com
Price Rs 15,000

**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****Gigabyte GKM-10**

- ⊞ Good ergonomics
- ☐ Can do with more features

Contact Gigabyte Technology (I) Ltd
Phone 022-26526696
E-mail sales@gigabyte.in
Price Rs 790

**Mono Laser Printers****Brother HL-5170DN**

- ⊞ Good build quality, network support
- ☐ Expensive

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

**Feature-rich Cell Phones
Sony Ericsson K750i**

- ⊞ Very good camera & audio quality, good display crispness
- ☐ Screen could have been bigger

Contact Sony Ericsson
Phone 0124-2560808
E-mail dhiraj.soni@sonyericsson.com
Price Rs 14,995

**Budget Cell Phones
Nokia 2600**

- ⊞ Value for Money, Easy Navigation
- ☐ 4k colour screen

Contact Nokia India
Phone 30303838
Website www.nokia.co.in
Price Rs 2869

**Keyboards
iBall Power Key Designer**

- ⊞ Feature-rich
- ☐ Looks gaudy

Contact Best IT World (India) Pvt Ltd
Phone 022-30815100
E-mail sales@iball.co.in
Price Rs 990

**Mice
Logitech G7 laser mouse**

- ⊞ Feature-rich, offers fantastic performance
- ☐ Expensive

Contact Logitech Electronic India Pvt Ltd
Phone 022-26571160
E-mail kavita.nath@ap.logitech.com
Price Rs 6,495

**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





Know More About

Do you know how lots of data is crammed into a much smaller zipped file?

Samir Makwana

Compression is widely used to save storage space and for faster data transmission over networks and the Internet. A large file (or a number of files) is shrunk into a compact file that can be “expanded” later to get back the original files. In the case of lossy compression (we’ll come to that in a minute), you get a much smaller MP3 file from a huge WAV file (for example). So the question is: how does data compression work?

Lossless Compression

Let’s talk about lossless compression first, basically what happens when a number of files are zipped. Here, you get back all the original data when you unzip it. The simple fact is that data files have redundancy—the same information is represented repetitively. For example, in a text file, pronouns, prepositions, punctuations, and such are repeated throughout the document. The redundancy can be removed through compression by listing the bits of repeated information or common elements (for example, patterns or shapes in the case of image files) *once*, instead of listing them again and again.

One of the simplest ways to understand the working of compression is by considering a text file. In the phrase “A penny saved is a penny earned,” each letter, space and punctuation mark occupies one unit of space in the storage media. This file would occupy 32 units of space—comprising 25 letters, 6 spaces, and 1 full stop.

If we look for redundancies, the words “a” and “penny”, which are repeated twice each, can be replaced with the numbers 1 and

2 using a coding scheme. So this scheme is: A=1, Penny=2.

The coding scheme thus consists of 8 characters (6 letters and 2 numbers). This scheme itself has to be saved in the resulting compressed file so the compression program knows how to unzip the data.

The phrase, after applying the coding scheme, would read “1 2 saved is 1 2 earned,” which would occupy 23 units of space. This is saved by the compression program along with the coding scheme to



An aggressively-compressed JPEG—notice the ugly blocks

form a compressed file. The size of this file would be 31 units, which consist of 23 characters (with spaces) of the new coded phrase and 8 characters (numbers and letters) of the coding scheme.

So, as compared to the original file size, that is, 32 units, the compressed file size now requires 31 units of space. Here, the dictionary takes up comparatively more space since the original phrase is small. But in the case of a much larger text file, the overhead will reduce: the dictionary will be comparatively smaller, and there will be more repeated patterns in the data. For instance, in the above example, if the next sentence were “So don’t waste a penny!”, we add only 3 items to the dictionary instead of 5.

Lossless Compression uses a number of algorithms such as run length coding, the Burrows-Wheeler transform, dictionary coders, prediction by partial matching, context mixing, and entropy coding. Of these, Lempel and Ziv’s (LZ) dictionary-based algorithm for data compression is the most popular and widely-used.

Lossy Compression

When you’re talking to someone on the phone, what matters more—the clarity with which you can hear their words, or whether the phone line reproduces the deep baritone of his voice? It’s this same premise that gave people the idea of *lossy compression*—compressing files in a way that eliminates some of the “frills” from the file, but keeping its heart intact. A good example is JPEG compression—try saving a JPEG at maximum compression through a program like IrfanView—it looks awful, but you can still tell that it’s a dog or a pig or whatever.

The advantage of lossy compression over lossless is the fact that with the freedom of destroying some information from the file itself, you can achieve smaller file sizes. Such stunts aren’t tried with things like text compression, of course—all the data is essential! Lossy compression finds itself used most with images, audio and video—all one needs to do is provide a threshold beyond which all information will be destroyed. Once compressed, you can’t regain the quality of the original file, and if you compress an already compressed file, you lose even more quality, no matter how generous you are with the threshold.

We wish we could talk here about how an MP3 file is created from a WAV file, but space just doesn’t permit it! ■

samir_makwana@thinkdigit.com

Tips & Tricks

SECRETS THAT KEEP YOU AHEAD IN THE RACE

TIPS

Microsoft Office 2007
Windows XP

59
61

30 MINUTES EXPERT

Blender 3D Modeler

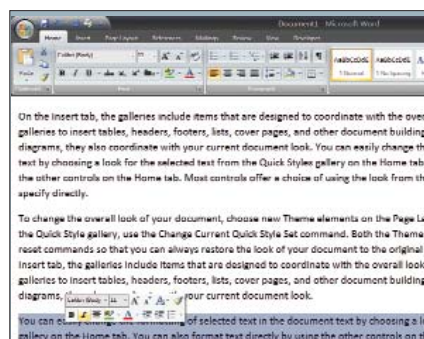
62

MS OFFICE 2007



Illustrations Harsho Mohan Chatteraj

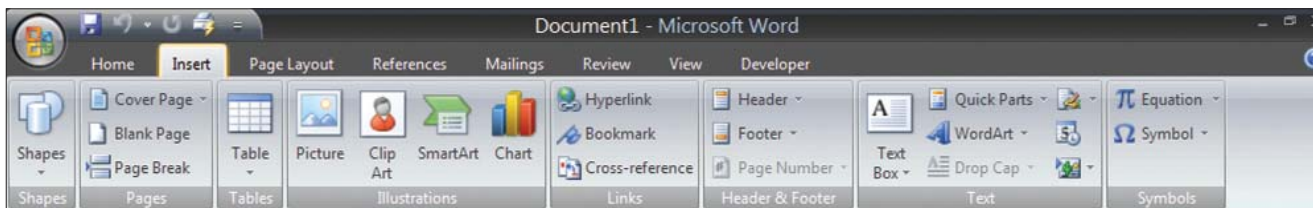
The next version of Microsoft's popular Office suite, Office 2007, is currently in Beta 2 stage. However, it's never too early to get started. Most of you might already have installed the Beta 1 version that we provided on our August 2006 DVD, so here are some tips that will help you master Office 2007.



A new look and feel for Microsoft Office

The Ribbon

The very first thing users will notice is the enhanced toolbar, called "The Ribbon." Microsoft has provided this Ribbon so as to reduce the number of mouse clicks needed to accomplish tasks and get to the option you want. This also increases the visibility of various features and options, which a lot of regular users might not have seen earlier. Another good thing is that this is quite consistent across the applications, so Excel, Word, and PowerPoint all have the same look. Take a look at the screenshots to better understand the new look. You can click on the different tabs to get different options.



A closer look at the Ribbon: You can see that features and options that were previously hidden in menus are now available at a mouse-click

Keyboard-Friendly

With the introduction of "The Ribbon," Microsoft Office 2007 looks very different from previous versions. This Ribbon appears to be more mouse-friendly, and a lot of keyboard warriors may feel left out.

This is especially true because quite a few advanced keyboard shortcuts have been changed.

However, a quick way to check for the keyboard shortcut that you need is to press and release [Alt]. When you do this, you will see all the keyboard shortcuts possible.

Live Previews

The best addition to Office 2007 is the live previews it offers. For example, when you want to change the font for headlines, instead of selecting the headline and then applying each font one by one, to try and figure out which the best option is, all you need to do is click on the Font dropdown, and move your mouse over the name of the font you want to try.

The selected text is automatically changed to the font highlighted by the cursor. This way, you can scroll through your entire font set and see how each one of them looks, without ever needing to apply any changes to the document.

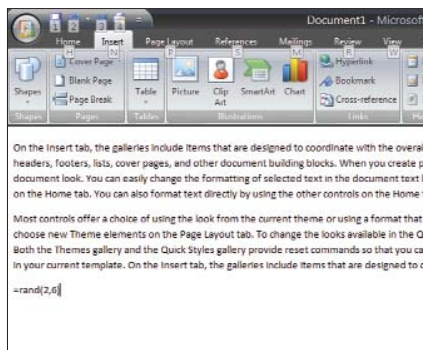
The same holds true for most other options, such as selecting a page theme, changing font sizes, colours, highlighting, etc. So, for an increase in productivity, make sure you use this cool feature.

The Only Pop-Up We Like!

When you highlight text or fields in Office 2007 documents and right-click, you will see a little pop-up on the top right of the selection that allows you to accomplish many common tasks—a mini toolbar.

You can even make this toolbar appear semi-transparent when you hover over your highlighted text. You can change the font, font colour, highlighting colour, alignment, indents, insert images, format paint, etc.

Once you get used to this, you will find you can save a lot of time and effort—no need to go to the top-left of the screen and change the font; just do it anywhere in the document.



The new random text generator is a lot better



Random Text

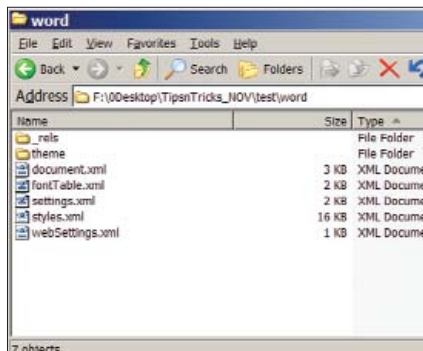
In order to create a design, you often need to add text. However, sometimes you may find that you don't have the text ready, or that you haven't yet got down to writing it all out. In such cases you can use Office's random text generator. This feature was always available in previous versions of office as well, but only in Office 2007 have Microsoft made it properly functional. Basically, in older Office versions, the line "The quick brown fox jumps over the lazy dog" would be repeated as many times as you decided. However, in Office 2007, when you generate random lines, you actually get readable text.

In order to do this, just type in `"=rand(X,Y)"` without the quotes and press [Enter]. Here, "X" is the number of paragraphs you want and "Y" is the number of lines each paragraph will have. You can also use the command `"=rand()"` and press [Enter] to generate about three paragraphs of lines.



The X Factor

Those of you who have already started using the Office 2007 Beta we provided in our DVD, or have downloaded it, will have already noticed that the default file format has an extra "X" extension. So MS Word 2007 files will have the ".docx" format, MS Excel 2007 has ".xlsx", etc. A lot of us have heard or read about this format being XML (eXtensible Markup Language)-enabled. Apart from the advantages of



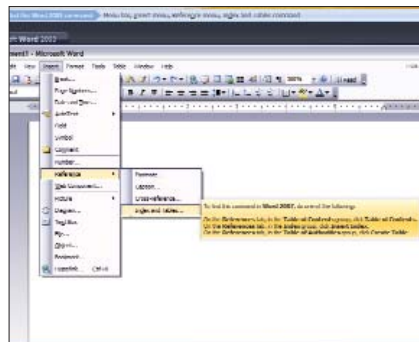
The new X file type is just zipped XML files

using XML tags to classify and sort data, the "X" format also results in much smaller files. This is because Office 2007 also Zips its documents in the process. For those of you who do not have Office 2007, opening .docx or .xlsx files shows just junk characters.

After providing our readers with Office 2007, we got quite a few queries from people who hadn't installed it. The problem was that a lot of people *did* start using Office 2007, leaving the rest scratching their heads about what to do with all these new .docx and .xlsx files that they were receiving from friends.

The solution is quite simple, really: since Office 2007 documents are nothing more than a lot of XML documents Zipped into one file, you can actually rename the file to .zip and then extract the contents. You will end up with a whole load of .xml files, which will contain your data.

Now, depending on the filetype (.docx, .xlsx, etc.), you will find either a "Word" folder or an "XL" folder that will contain your data. If the file contained any images, you will also find them here. If you want the data, open the



Using the online tutorial to understand new Office 2007 commands

XML file in an XML Editor, and you should be able to extract it.



I'm Still Lost

For those of you who just cannot get the hang of the new interface, there's still hope. In true Microsoft style, there's a guide available for everything, and comprehensive help. If you're used to the older Office 2003 interface, and want to know how to go about translating your actions into Office 2007 commands, things couldn't have been easier.

If you have an Internet connection, you can get a Web-based tutorial for Word, Excel and PowerPoint 2007 here:

MS Word:

<http://officebeta.iponet.net/en-us/word/HA100744321033.aspx>

MS Excel:

<http://officebeta.iponet.net/en-us/excel/HA101491511033.aspx>

MS PowerPoint:

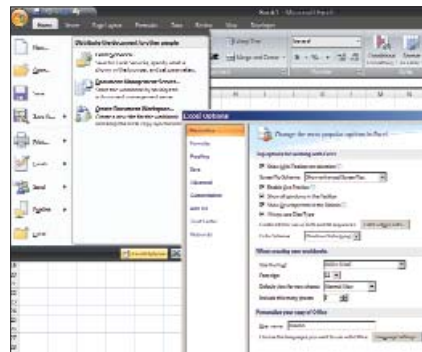
<http://officebeta.iponet.net/en-us/powerpoint/HA101490761033.aspx>

Just start the tutorial you want and go about using the commands you're used to. Then watch the screen carefully, because you will be shown the placements of the same commands in the Ribbon.



The Logo

The new Office 2007 logo on the top left of your screen is more than just a pretty sight. It also functions as the old File menu. Of course, there are many

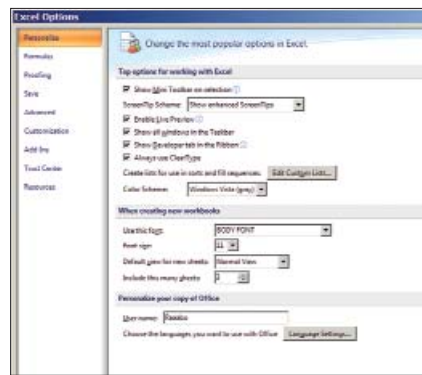


The new file menu, and MS Office options

more options here than in older versions of MS Office. As in the screenshot above, you will see the following new options:


Finish: This is where you will go once you're done with your document. The Properties option under here will let you set the document properties, such as Author, Title, Category, and even add comments. The Inspect Document option will let you check your document for comments, revisions, metadata, extra XML code, personal information, headers, footers, watermarks, hidden text, and more. You can also add digital signatures, mark the document as finalised, and check for compatibility issues with older versions of Office.

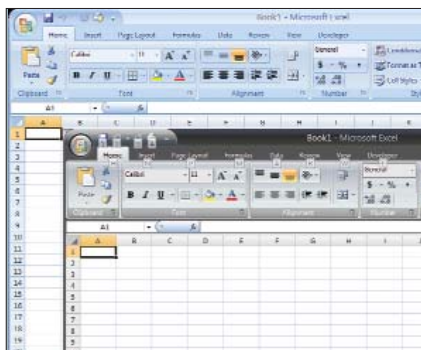
Publish: You can use the Publish option to post the document on a blog or a document management server, or even make a new document workspace where people with permissions can access it, both locally and over the Net.



A closer look at the options dialog box

 The Vista Look


 Depending on the Office 2007 tool you're using, you will also see the Options button when you click on the Office 2007 logo at the top left of the interface. Here, you can choose to change a lot of options.



Changing from the Windows XP blue look to the Windows Vista look

By default, Office 2007 installs using a bluish interface. We're rather smitten by the Vista look so far, and since a lot of other people seem to have the same opinion, chances are you will like it too. In order to give your Office 2007 installation the Vista feel, open Word or Excel 2007, click on the Office Logo, select Word Options (or Excel Options), and a new window will pop up. Here you will see topics on the left, such as Personalize, Display, Proofing, and more. With "Personalize" selected in the left pane, look for an option called "Color Scheme." In the drop-down box next to it, you will see "Windows XP (blue)" selected. Change this selection to "Windows Vista (gray)." This will make your Office 2007 match with Vista and Windows Media Player 11.

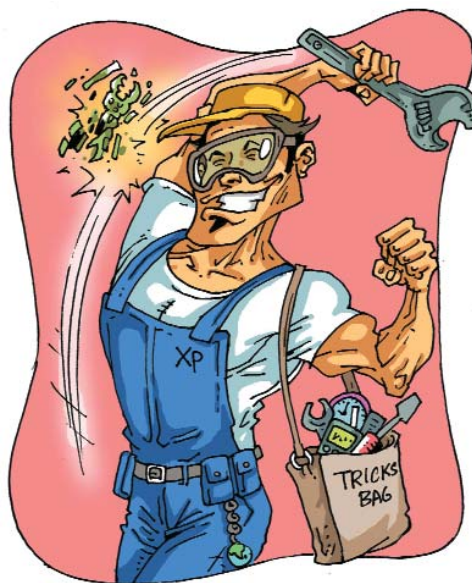
Where Did VB Go?

 Nowhere! Visual Basic is just hidden. In order to add the “Developer” toolbar to the Ribbon, go to Options, check the “Show Developer tab in the Ribbon” option and press OK. Now you should see the Developer tab appear on your Ribbon. This contains the VB launcher, Macros, and structural information of your document. Expert Office users will never be able to live without using this, the Developer tab and Macro recording. ■




Add the Developer toolbar to get access to VB

WINDOWS XP



Network

 Faster Network Browsing

 If you're on a network and are tired of waiting for ages for all the network shares to load, this is a tip you'll love. There are four basic things you need to do in order to speed up network access:

1. Remove all shortcuts in My Network Places. These are automatically generated, and if a few of them aren't shared anymore, Windows will keep searching for them anyway. So just select them all and delete them.
2. Stop Windows from automatically adding these shortcuts to shared folders, otherwise you'll just end up having to delete the shortcuts everytime you open My Network Places. This is a registry hack, so make sure you backup your registry. First, go to **Start > Run**, type in "regedit" and press [Enter]. Navigate to **HKEY_Current_User\Software\Microsoft\Windows\CurrentVersion\Policies\Explorer**. Here, create two new DWORD values (if they don't already exist) called "NoRecentDocsNetHood" and "UseDesktopIniCache", and set them to "1".
3. Have everyone on your network increase the send buffer for network data. Tell everyone who shares files or folder to go to **HKEY_LOCAL_MACHINE\SYSTEM\CurrentControlSet\Services\LanmanServer\Parameters**. Create a DWORD value called "SizReqBuf", and assign its Hex value to "FFFF".
4. Just stop using My Network Places for folders you access on a

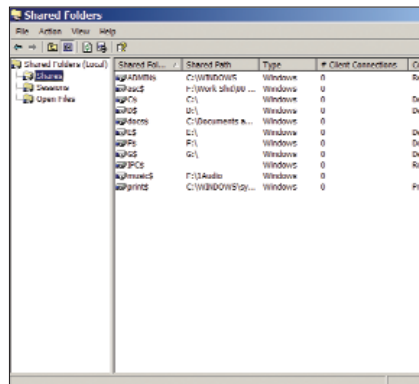
regular basis, and instead, map the drive by going to **Tools > Map Network Drive** in Windows Explorer.

A Shortcut To Shares

 Sometimes we get a little too click-happy sharing folders, and soon we realise that we have shared too many. The most common thing is to share folders, within shared folders, within other shared folders. For example, we've very often come across people sharing `D:\XYZ\123\`, `D:\XYZ\`, and the root `D:` drive as well. You need to monitor your shared folders on a regular basis, and for this, the easiest thing to do is create a shortcut on your Desktop to the Shared Folders tool. You can either just go to **Start > Run** and run "`fsmgmt.msc`", or create a shortcut that points to "`fsmgmt.msc`". Now you can quickly check what's shared and what's not.

 Guest Access

 Quite often, in offices, you will try



Checking which folders are shared



Blending Well

Get to grips with Blender's unique user interface

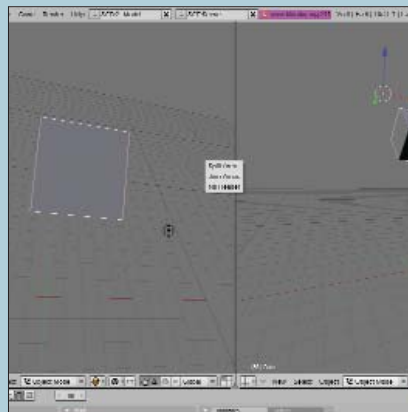
Nimish Chandiramani

Blender is a very powerful open source tool for creating, modelling, and rendering 3D scenes. If, however, you're used to a different tool, or if you're just starting out, you might find yourself a little taken aback by the interface. However daunting it may seem, Blender's interface is actually quite easy to get used to—you just need to clear your head of all those “traditional” interfaces.

The Interface

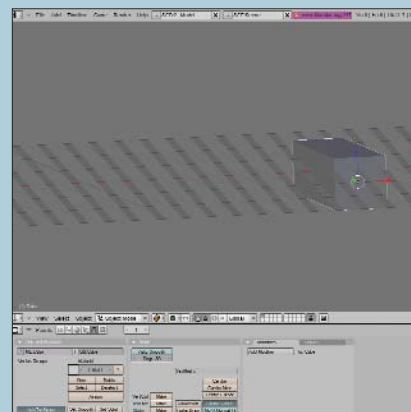
When you start up Blender, you'll be faced with its default interface (or screen, as it's called). At the top, you'll see the familiar menu bar that lets you open and save files, render your scene, or get help. Next to your main menu is a drop-down that lets you select the screens you want to work with. The default is Model (where you model your 3D objects), and you can choose from Animation, Material (where you apply materials to your objects), Sequence (advanced animation), and Scripting. You don't really *need* these screens—they're just organised differently to speed up your work.

Below this menu bar is the 3D window, where you'll be setting up



Split the 3D window to see your work from different angles

your scene. At the bottom of this window is the window header that lets you specify what type of window this is (like a script editor or file browser), or in the 3D view, which angle you're viewing your scene from. To work better, you'll need more than one of these windows—3dsmax's extremely useful four-pane layout comes to mind—and you can do this by moving the mouse to the edge of the window, right-clicking and selecting Split Area. Doing this at the top or bottom edge splits the window vertically, and at the sides splits the window horizontally.



The difference between an engineering drawing and reality lies in the perspective

Finally, the bottom of your screen is occupied by the buttons window, which is further divided into panel groups, which in turn contain panels where you can edit a whole host of parameters for your objects (whew!).

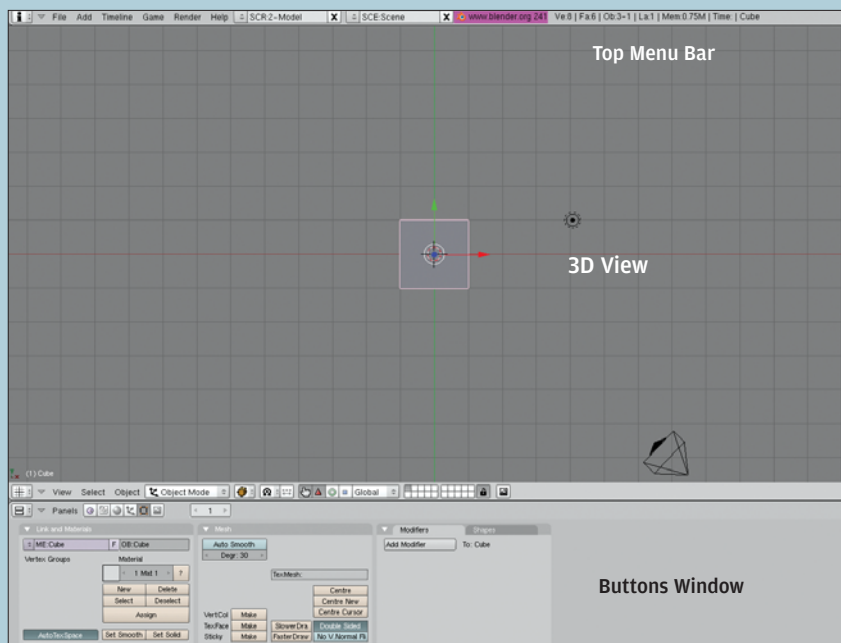
Now that we've taken a quick tour of the interface, let's see what can be done about...

Getting Around

Before moving any further, we should mention that using Blender will require extensive use of the mouse as well as the keyboard, so if you're not seated gamer-style, you should be.

By default, you're viewing the scene from the top. To fly around the scene (the term is *orbit*), hold down the middle mouse button and drag. You'll find your viewing angle changing, and this looks a little weird. This is because the view is *orthographic*—the way you would see it in an engineering drawing. To get a more realistic view, hit [5] on the numeric keypad. This switches the view to *perspective*—the way we see things in real life.

To pan around the scene, hold down [Shift] and the middle mouse button, and drag. To zoom, you can either use the scroll wheel, or for more precision, hold down [Ctrl] and middle-click, then drag. You can do all this from the numeric pad on the keyboard as well—[2], [4], [6] and [8] to control orbiting (hold down [Ctrl] to pan instead), [7] for a top view, and [1] and [3] for side views. The plus and minus keys zoom in and out respectively, the star key takes you back to the default view, and [Enter] resets



This is what you get when you first start up Blender

the zoom level. [0] changes your view to what the camera sees, and [Ctrl] + [Alt] + [0] converts your current viewing angle to that of the camera. Considering that you'll be rendering your scene the way the camera sees it, this is tremendously useful.

A more entertaining way to position the camera right is the Camera Fly Mode, accessed when you're in the camera view by pressing [Shift] + [F]. Initially, you'll be free to look around the scene; click in the middle of your view and you'll find that the camera has begun to fly like an aircraft. Repeated clicking makes you fly faster, and hit the Spacebar when you've flown to an angle you like.

That's enough of that, let's start...

Doing Things

When Blender first starts up, you're faced with a cube, a light, and a camera. To select any of these objects, right-click on them. When you've done that, you'll see the red, green, and blue axes at the centre—click on any of these axes and drag the mouse to move the object along that axis. If you don't want to confine yourself to one axis, "grab" the object by pressing [G], and move it around with the mouse. When you're done, left-click to commit your changes.

To rotate the object, hit [R], and if you want to confine this rotation to a particular axis, press [X], [Y], or [Z] while you're in the rotation mode. Scaling objects—[S]—also works this way, simple and logical.

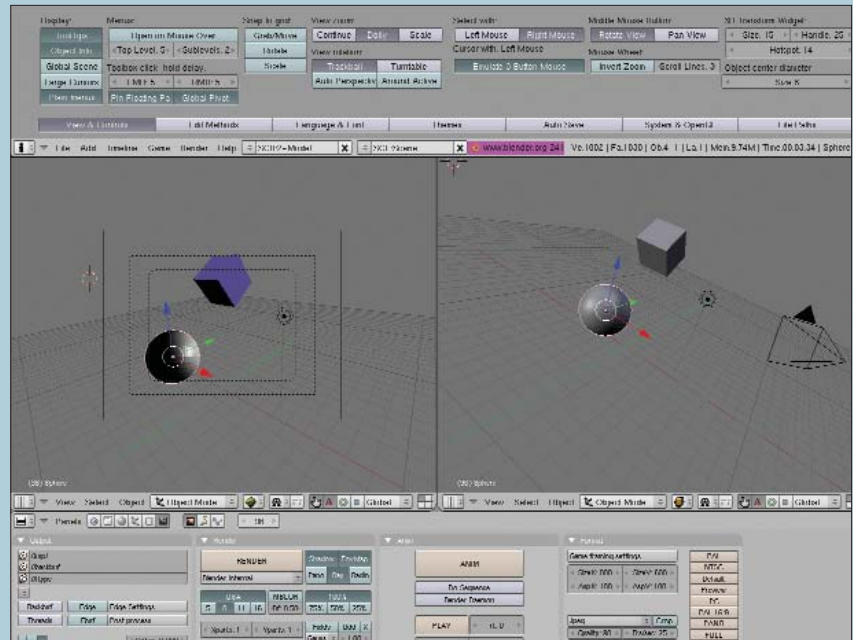
And then, there are the mouse gestures—using the left-click, draw a straight line to grab the selected object, draw a straight line and track back (left-right-left, for example) to scale the object, and draw a curved line to start rotating the object.

Now, on to creating new objects: you can either hold down the left mouse button and wait for the Add menu to pop up, or simply hit the spacebar and select the object you want to add to the scene. When you add a new object, you're automatically

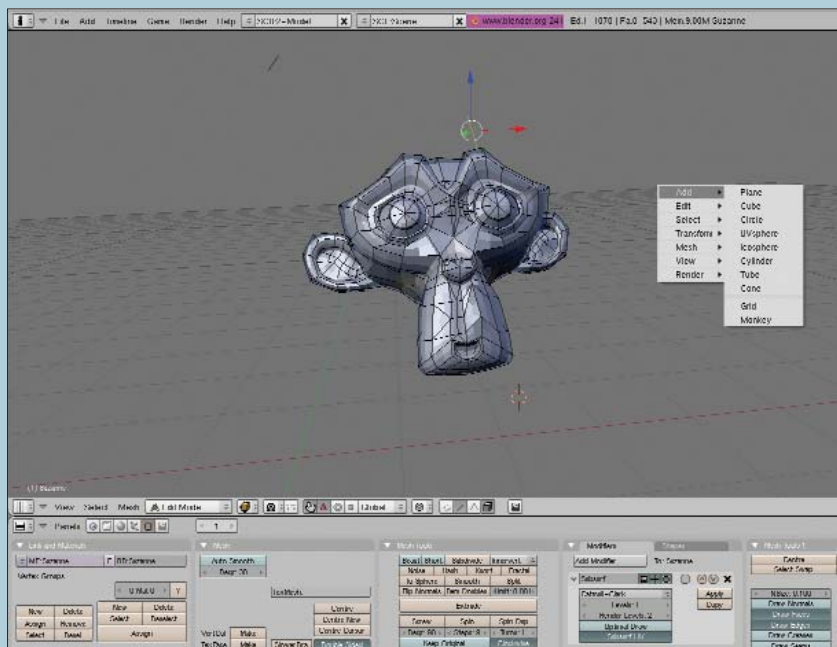
taken to Edit Mode, where you can fine-tune your object by moving its vertices around. You can choose your editing mode—whether you want to edit vertices, edges or faces—from the last set of buttons on the window's header. To enter or leave Edit mode, use [Tab].

Out Of The Blue

Finally, here's a hidden feature few know about—if you drag the top menu bar as if you were resizing it, you'll find yourself presented with the information window just above.



Drag down the top menu bar for a surprise!



Use the spacebar to bring up the Add menu

Of all the panels in this information window, the most useful is "View & Controls". Here's where you can decide whether you want to swap the functions of the left and right mouse buttons (some find this more comfortable), change the orbit mode between trackball and turntable (the latter feels a lot more controlled), and a whole bundle of other options.

Help Yourself!

Guiding you through the innards of Blender is going to take a lot more pages than these two, but hopefully, you've shed your inhibitions about its interface. To get the low-down on the program, head over to <http://mediawiki.blender.org> for the manual. Blender's inbuilt help system is quite useful as well, and make sure you go through the shortcut reference—it's refreshing how logically everything is placed.

Enjoy! ■

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and access a shared folder on the network, only to be greeted by a Login/Password prompt. The login is usually <Name>/Guest. This is very frustrating for people trying to access your shares for work. You can get rid of this by going to **Control Panel > Administrative Tools > Local Security Policy > Local Policy > Security Options**. Here, double-click on "Network access: Sharing and security model for local accounts," and select the option "Classic - local users authenticate as themselves" from the drop-down box. Apply the settings and you're done.

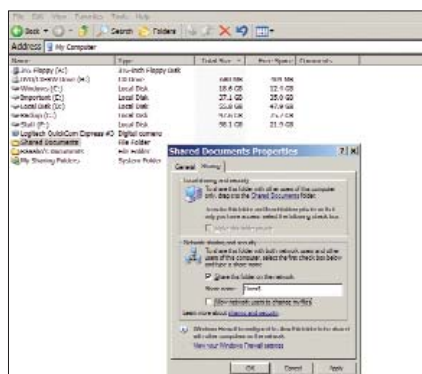
Hiding From Network Neighborhood

If you want to share folders on your computer but do not want them to be visible to others when they go to Network Neighbourhood, just go to **Start > Run**, type in "net config server /hidden:yes", and press [Enter].

So Long, Shared Documents

By default, your Shared Documents folder is shared over the network. This is irritating because if one computer in the network gets a virus or worm, it usually ends up in everyone's Shared Documents folder. There are two ways to go about avoiding this. Find this folder in Documents and Settings, right-click on it and select "Sharing and Security...". Share the folder over the network as docs\$, or something with a "\$" sign at the end. This will make it invisible to the rest of the network. You can also set it to share as read only by unchecking the "Allow Network Users to Change my Files" box.

The second way is to open the Registry Editor, navigate to **HKEY_CURRENT_USER\Software\Microsoft\Windows\CurrentVersion\Policies\Explorer**, create a new DWORD Value (if it doesn't already exist) called "NoSharedDocuments", set its value to "1", and then reboot the computer.



Dollar-share the Shared Documents folder

Troubleshooting

Tools

There are a few interesting troubleshooting tools that are not installed in the default installation of Windows XP. If you have the installation CD, you will find them in the \Support\Tools\ directory. Just run SETUP.EXE in this directory to install them. Here are a few examples:

diruse: This utility shows you the disk usage of your drives

dupfinder: Identify duplicate files, so you can free up disk space

getmac: A simply utility that will tell you the MAC address of your NIC (network card)

netdiag: Tests and diagnoses your network components

pvviewer: Shows you a list of processes, and allows you to see how much memory each process uses, and to kill processes individually

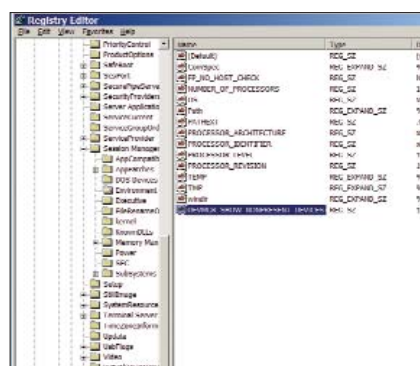
Driver List

You can troubleshoot driver issues by using the "driverquery" utility. The easiest way to do this is to use the utility to output its data to a CSV (comma separated value) file, so that you can import it into MS Excel, and get a nice, clean results table. The command to do this is "driverquery /v /fo > drivers.csv". Here, you can substitute "drivers.csv" with any filename you like.

Hidden Devices

There is a list of hidden devices that do not normally show up in the Device Manager. You can get XP to reveal these by either changing a Registry entry, or by creating a batch file to launch the Device Manager with the correct options.

If you're comfortable with the Registry, open the Registry Editor and navigate to **HKEY_LOCAL_MACHINE\SYSTEM\ControlSet001\Control\Session Manager\Environment**. Here, create a String Value called **DEVMGR_SHOW_NONPRESENT_DEVICES**, and give it a



Show hidden devices in Device Manager

value of 1. If you'd rather create a batch file, open Notepad, and type in the following:

```
@Echo Off
Prompt $p$g
set
DEVMGR_SHOW_NONPRESENT_DEVICES=1
start devmgmt.msc
exit
```

Then save it as "devmgmt.bat". You can use any descriptive filename you like with the .bat extension.

Shortcuts

Quick Access To Control Panel Applets

If you're a keyboard warrior and don't really like going to **Control Panel > Add/Remove Programs**, or the likes, you will love these shortcuts. Just press [Windows] + [R], type in one of the following, and press [Enter].

appwiz.cpl will open the Add/Remove Programs dialog

desk.cpl will open the Display Properties dialog

firewall.cpl opens your Windows Firewall settings

inetcpl.cpl will take you straight to Internet Options

mmsys.cpl will open the Sound and Audio Devices controller

ncpa.cpl will open Network Connections

nusrmgr.cpl opens the User Accounts window

powercfg.cpl will take you to the Power Options Properties dialog

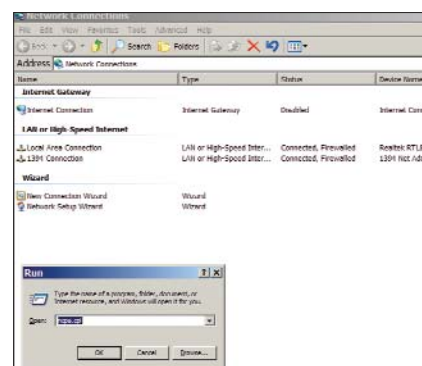
sysdm.cpl will open System Properties. You can also just use [Windows] + [Pause/Break]!

wscui.cpl opens up the Security Center

wuaucl.cpl opens up the Automatic Updates Configuration window

Suspend Shortcut

If you like to use Windows XP's Suspend feature so that you can quickly get back to what you were



Use Run shortcuts to get to common tasks

doing, instead of shutting down and then rebooting every time, you can create a shortcut on your desktop for this task in one easy step:

Right-click on your desktop, select **New > Shortcut**, and in the item location field, type in “rundll32.exe PowrProf.dll, SetSuspendState” (without the quotes), give the shortcut a descriptive name—generally “Suspend”—and click **Finish**. Now, when you want to suspend the system, just double-click this shortcut.

Irritants

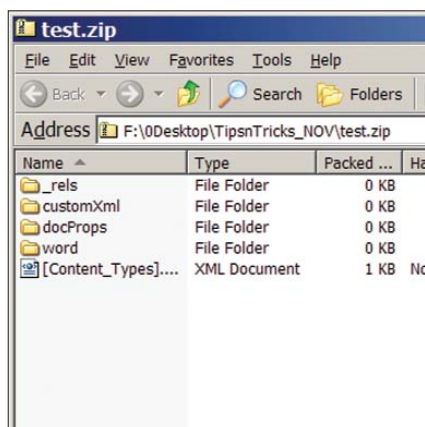
Disable Thumbnails

Windows Explorer has a feature called thumbnail view, which shows you thumbnails of all pictures in the current folder. Some people love it, others hate it. If you have pictures that you'd rather everyone around you not see, even by accident, you probably hate the thumbnail view. If so, instead of cursing at it under your breath, just get rid of it for good!

Start the Registry Editor, navigate to **HKEY_CURRENT_USER\Software\Microsoft\Windows\CurrentVersion\Explorer\Advanced**, and change the value of the **ClassicViewState** key to “1”.

No More Zip Files As Folders?

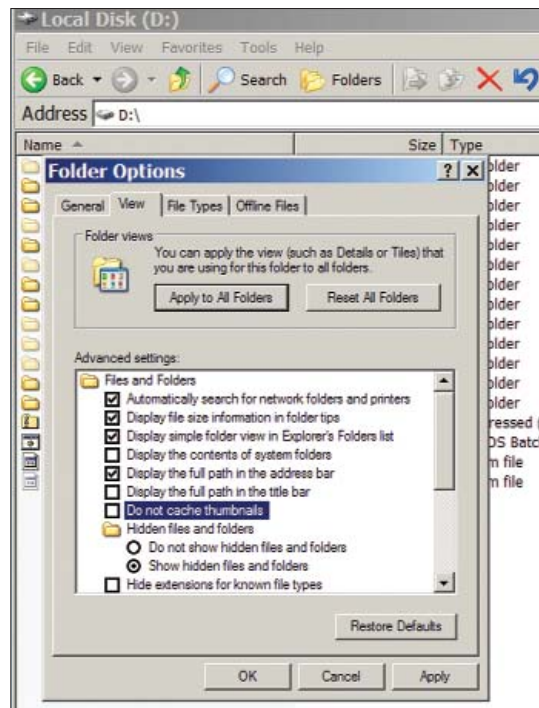
Windows XP natively supports extracting from or compressing into ZIP files. However, it treats ZIP files as folders, and if you double-click on a ZIP file, you get to see the contents, instead of unzipping it. You can prevent this from happening by running the appropriate command. Go to **Start > Run**, type in “**regsvr32 /u zipfldr.dll**” (without the quotes) and press [Enter].



In Windows XP, Explorer natively opens ZIP files like folders

Thumbs.db Irritants

It's probably happened to all of us at some point or another, especially those of us who work with a lot of



Stop XP from caching thumbnails

images: When Windows XP forgets to update a folder's Thumbs.db file after you have overwritten some image files, you end up with some wrong thumbnails associated with the wrong images.

This is because the Thumbs.db file has outdated data, and you have to delete it for Windows to get it right again. If you'd rather Windows got it right always instead of just doing it fast, you can stop the generation of Thumbs.db files altogether, forcing Windows to read every image in the folder you access, every single time.

We warn you, this is slower as Windows generates the thumbnails afresh every time.

In Windows Explorer, go to **Tools > Folder Options > View**. Look for the option called “Do not cache thumbnails” and check the box associated with it. Click **OK** and then search your entire computer for “thumbs.db”. delete all the search results once it's done searching, and you will never find another thumbs.db file on your system ever again!

Delay Desktop Cleanup

Ever so often you get this little irritating pop-up that tells you that you have unused items on your desktop, and asks whether you want to delete them. This is the Windows Desktop Cleanup Wizard, and it is set to run every 60 days by default. It's irritating to most, and feels a lot less than 60 days because of this. You can get rid of it forever by

right-clicking on the desktop, selecting **Properties**, going to the **Desktop** tab and clicking on “Customize Desktop...”. Here you will see a little checkbox that says “Run Desktop Cleanup Wizard every 60 days”; uncheck it and click **OK**.

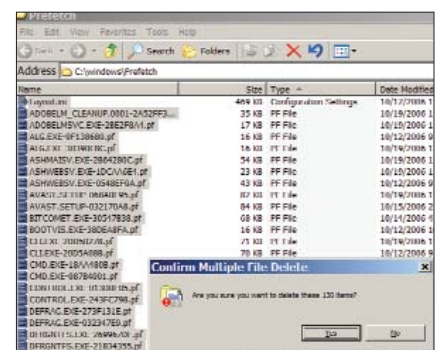
Tricks

Cleaning the Prefetch Directory

Windows XP keeps shortcuts to recently launched programs in the **\Windows\Prefetch** directory, which can take up some space, but helps find and launch applications faster. After a while, however, some really old programs which you may not even be using anymore can still be found in the Prefetch directory. Also, you may experience system slowdowns when booting or

when launching applications, because Windows is sifting through a large bunch of Prefetch files. So, as you can see, a large Prefetch can do more harm than good. It's best that you delete all the files in here about once a month, or once in two months. The first time you boot, or start applications after you delete all Prefetch files, it may be even slower than before, but this is normal: Windows is adding shortcuts and data into the Prefetch again. After the third or fourth time you boot up, things should be back to normal speeds, because Windows will have finished rebuilding the Prefetch cache.

To delete your Prefetch files, just go to **\Windows\Prefetch**, do a [Ctrl] + [A], and press [Shift] + [Delete].



Cleaning out the Prefetch clutter

Print The Directory

If you want to make a list of all the contents of a directory, you're going to have to find a much easier way

than typing it all out. If it's a multi-GB music directory, you'll end up with aching fingers before you're even halfway through. Thankfully, we've got an easier way. You can create a small batch file, and then add it to the right-click context menu, so that all you will have to do is right-click and select "Print Directory Contents" (or something like that). First, open Notepad, and type in the following:

@echo off

```
dir %1 /o:g > c:\directory.txt
start /w notepad /p c:\directory.txt
del c:\directory.txt
exit
```

Save this in the root of the C drive as "print_directory.bat". Now, in order to add this option to the right-click context menu, you will need to edit the default folder properties. In Windows Explorer, go to **Tools > Folder Options > File Types**. Click on the "File Folder" file type and then click on the **Advanced** button at the bottom right. Now, click on the "New..." button. In the **Action** field, enter the name of the action, such as "Print Directory" or "Print Contents", and in the "Application to be used to perform this action" field, fill in "C:\print_directory.bat". Click OK thrice and then close to exit.

Before you do anything, check to see that if you double-click a folder it actually opens normally, because sometimes the Search function gets set as default. You really don't want to have to right-click every folder and select **Open**. So let's fix this first:

Open the Registry Editor and navigate to **HKEY_CLASSES_ROOT\Directory\shell**. Edit the default value (which might have changed to "Open" or "Find") and change it to "Explorer".

Now make sure you can double-click and open folders again, and then you're

ready to test the **Print Contents / Directory** command you just made.

Right-click on a directory and select "Print Directory" (or whatever you called it). You will get a pop-up that will ask you where to save "directory.mdi". This is the Microsoft Document Imaging format, which makes a nice, neat, and readable file that will list out the contents of the directory. Rename it to the name of the directory, and then save it. It will open with Microsoft Office Document Imaging.



No To All

When you're copying files into a folder that have the same name, you get a dialog box that asks for confirmation about whether you want to overwrite the existing files. The options that you are given are Yes, No, and Yes To All. But what happens when you want to say "No To All"? Well, there's a simple solution actually; just hold down [Shift] and press No. This is as good as saying "No To All".



Speedier Boot

If you feel your computer takes too long to boot, you can use a tool that Microsoft provides to monitor your bootup. The tool is called BootVis, and is available from www.onecomputerguy.com/software/bootvis.exe.

Uncompress the self-extracting archive and run it. Go to **Trace > Next Boot + Driver Delays**. Next, reboot your computer and wait for BootVis to provide you with the results. You will see some graphs of your system startup, and then go to **Trace > Optimize System**. The system will reboot again. Re-run the **Next Boot + Driver Delays** and see how much time has been saved.



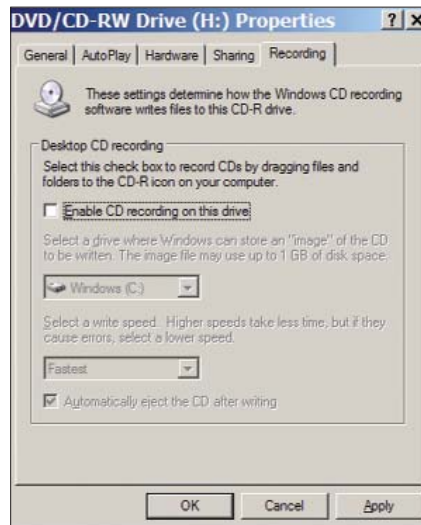
End-Task Automatically

Windows waits too long before killing a non-responsive task. To remedy this, in the Registry Editor, go to **HKEY_CURRENT_USER\Control Panel\Desktop**, change the value of the "AutoEndTasks" key to "1". Here, also change the "WaitToKillApp Timeout" key's value to the number you want. The default is 20000 milliseconds.



Stop Burning

You might certainly want to stop Windows from trying to act as a CD burner, trying to write to CDs and popping up "Write



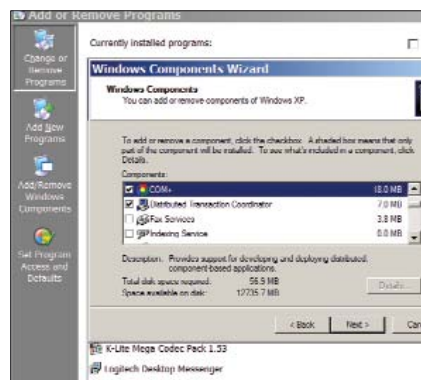
Stop Windows from burning CDs

CD" dialogs every time you insert a blank CD—this is just plain irritating. To disable that functionality, open Windows Explorer, right-click on your CD drive, select **Properties**, click on the **Recording** tab, and uncheck the "Enable CD recording on this drive" box.



Additional Programs?

You don't see all the programs in the **Add/Remove Programs** list because Windows hides a lot of Windows components. If you want to see everything, open the **\Windows\inf\sysoc.inf** file, press [Ctrl] + [H] (find and replace), search for "hide", and leave



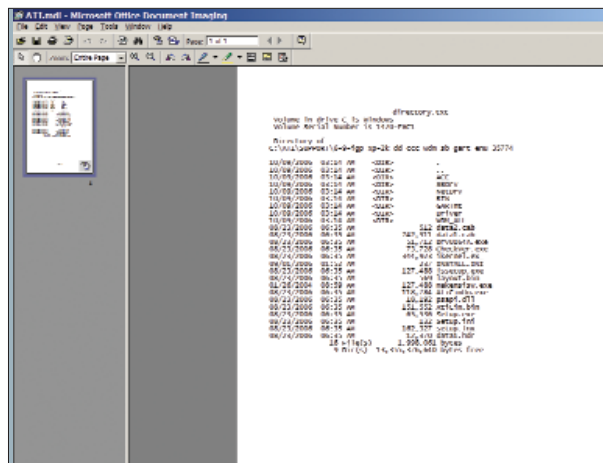
Find hidden Windows components

the "replace" field blank. Choose to replace all, and then save the file.

The file lists Components in the following order:

```
[Components]
NtComponents=ntoc.dll,NtOcsSetupProc,4
WBEM=ocgen.dll,OcEntry,wbemoc.inf,hid
e,7
```

Whatever was previously hidden in the **Windows Components** section will all now be visible in the same section in the **Add/Remove Programs** list. ■



Printing out a directory's contents



Firm Foundations

The motherboard... an oft-neglected component, it nevertheless fields all your hardware and dictates the extent of your next upgrade. Spend the most time choosing the right one, because chances are it'll be residing inside that cabinet longer than most!

**Michael Browne
Vishal Kansagra**

Motherboards do not bask in the limelight the way CPUs and graphics cards do, despite their obvious importance. Simply put, your motherboard is a meeting ground for all your hardware. Thankfully, perceptions have evolved, and a motherboard is no longer just a large PCB that you plonk your CPU on to. A quick look at some of the boards in the following test will reinforce this point.

The sheer number of features that are crammed into high-end boards is amazing, and the good news is, motherboards are offering great value for money, thanks to falling prices. Manufacturers have also understood their markets better, and boards based on the latest chipsets no longer no longer command the premium they once did! Manufacturers have realised the need to target segments, and make sure the latest technologies

are available to all price segments—so you can get affordable high-performance chipsets, albeit with lower feature counts!

That said, motherboards still aren't first priority, and your purchase decision is based solely on the CPU you choose. For example, an AMD AM2 processor obviously needs an AM2-based motherboard, and so on. The good news is there's a plethora of options out there even after fixing on a particular class of processor—not only manufacturer options, but chipset options as well. Finding motherboards that suit your needs is easy; choosing the right one, however, will be a royal pain! That's where we come in...

The first distinction you have to make is choosing between an Intel and AMD processor. Now the plot thickens. You have five options when it comes to chipsets—Intel, ATI, NVIDIA, SiS and VIA, the first three names being the bigger manufacturers.

So as not to confuse you, we've decided to serve you the motherboards we received in two different courses, and since "A" comes before "I", we'll take a look at all the AMD-based motherboards first.

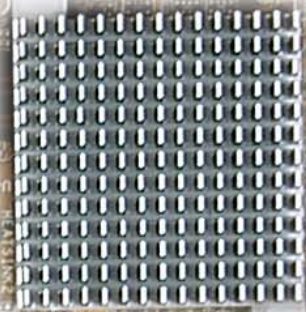
MOTHERBOARDS FOR THE AMD PLATFORM

Socket AM2 (940-pin)

As mentioned, all newer AMD processors come on a 940-pin, AM2 socket configuration. Don't confuse these 940-pin processors from AMD's earlier server range of processors—the Opterons—which supported DDR memory and also had 940 pins. They're incompatible with socket AM2.

AM2 motherboards support the entire Athlon AM2 processor line, from the humble 3600+ to the fiery FX-62; no need of any BIOS updates at all! NVIDIA is once again at the forefront for the AMD platform, and their nForce 5 series of motherboards are to the AM2 processors what nForce 4 was to the Socket 939 processors.

The nForce 5 series is headed by the dual-x16 lane SLI-ready 590SLI chipset with dual x16 PCI express slots—very suitable for games, or those interested in high-end processors. The nForce 570SLI is positioned as a lower-end



chipset for the gamer on a budget, and supports all the high-end features that the 590SLI does, with the exception that its PCI-Express lanes operate at half the bandwidth (x8 mode) while in SLI (multi-GPU) mode. Then there are the 570Ultra (the non-SLI 570 chipset), and the lower-end 550 and 510 chipsets.

Regular features such as the presence of additional Serial ATA ports and USB headers, expansions, etc., is never going to be a problem with motherboards based around these chipsets, simply because they're primarily high-end offerings, and so come fully loaded with almost every conceivable feature. Some manufacturers will, of course, include more features than others, which basically means a price tradeoff; others provide a stripped-down version of the same chipset, but for a much lower price. Whatever the strategy adopted, the chipset remains the same, along with all its abilities or lack of them.

nForce 5 chipsets are feature-laden just as the nForce 4s were a generation earlier, and NVIDIA's been busy adding up the goodie count on these chipsets. We received boards based on the high-end 590SLI and 570SLI chipsets.

The mid- and lower-range AM2 chipsets and motherboards based around them are scarce, and we received a solitary board based on NVIDIA's M1697, which is a mid-range solution.

Features

We received four motherboards based on nForce 590SLI chipsets—one each from ASUS, MSI, Gigabyte, and Biostar.

The ASUS Crosshair (their Premium 590SLI offering) immediately comes across as something an enthusiast would want. The board comes with an LCD display on the rear panel that gives you a POST display, helping debug any compatibility issues. Then there are the CMOS Reset, Power On/Off and Restart buttons hardwired on the board, with attractive LEDs that light them up. Great for a windowed cabinet, and a boon for enthusiasts who've spent a lot of time shorting pins and using jumpers. So heavily adorned is the PCB that ASUS couldn't provide onboard sound with the board, but it provides an 8-channel soundcard that fits into

the PCI-E (x1) slot. The only gripe with all ASUS boards is their graphics card retention mechanism, which looks tacky and doesn't hold the card firmly.

The Crosshair is built around an eight-phase power design—well-endowed to stand the rigours of overclocking, and ASUS has used solid-state capacitors around the CPU area—which they call “EL-Capless” design. And overclock you can, with the option to increase the CPU multiplier ratio to 25x. You'll need an FX series processor to be able to tinker around here, as the other Athlon processors come multiplier-locked. Even the communication speed between the Northbridge and Southbridge can be tweaked all the way up to 400 MHz (200 MHz is default). The CPU bus speed can also be set to 400 MHz (default is 200 MHz). Hypothetically, a multiplier ratio of 15x with a default speed of 200 MHz will have that processor churning at 3000 MHz. Storing and loading multiple BIOS settings is also possible, and this saves you the time spent tweaking the BIOS every time you have a freeze-up. Choosing profiles is hassle free, and you can overclock whenever you startup, by simply selecting an overclocked profile.

The Biostar Tforce 590SLI has the most innovative-looking bundle we've seen in a while. All the connectors came in a black nylon casing, while the mic and headphone (single earbud type, Bluetooth-style) came in a small black box. Also present were a number of adapters with which you can charge your cell phone using any one of this board's USB ports. While not a new concept, it's commendable, and we rather liked the little extra effort Biostar put in here.

Although the board itself looks good, with flashy colours, we found that the CPU's heatsink kept interfering with the memory installed in the first DIMM. We actually had to remove the heatsink, install the memory, and then install the heatsink again! On a more technical note, we were pleased to see high-quality solid-state capacitors used liberally around the CPU socket area, instead of the electrolyte capacitors normally used on most boards.

There are dynamic overclocking profiles (V6, V8 and V12) that allow up to 30 per cent dynamic overclocking. Manual overclocking is possible as well. The Tforce had one peculiarity—memory voltage cannot be increased past 2.2 volts, unless you use a jumper on the board; and then your memory voltage will be stuck at 2.3 volts. A very peculiar trait for what is positioned as an enthusiast/overclocker board.

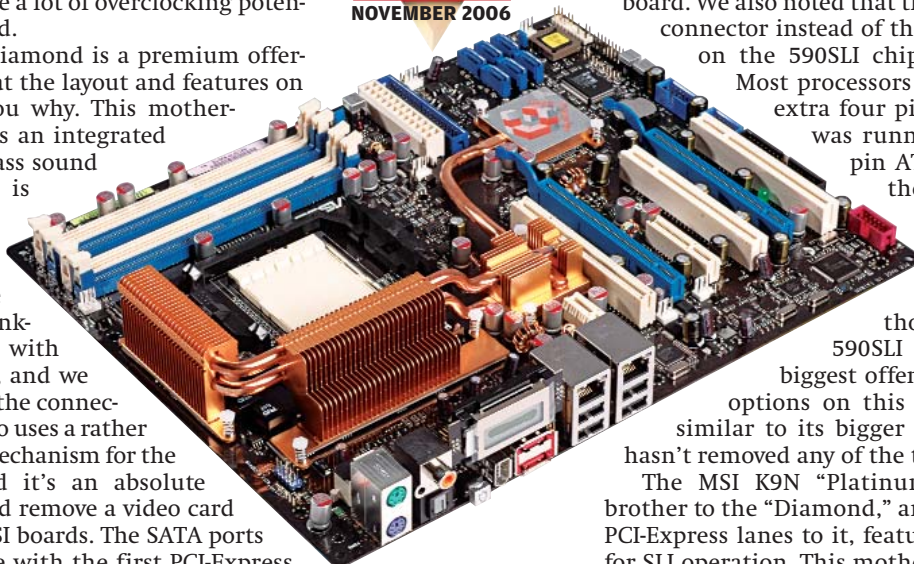
Gigabyte's GA-M59SLI-S5 was a pretty solid looking board, well built and reasonably laid out (not as good as the ASUS Crosshair, though). No complaints, except that larger coolers (compared to the stock AMD cooler) may interfere with the installation of memory in the first DIMM. We prefer all the connectors (24-pin, ATA and floppy) to be bunched together at one end of the board, mainly to reduce clutter from around the middle of the PCB—Gigabyte doesn't disappoint here!

This Gigabyte board also sports an attractive-looking heatpipe solution. You'll find

three PCI-Express slots, which look like x16 slots at first glance, but the one in the middle is an x4 slot. Due to the proximity, installing a graphics card in one slot renders the adjacent slot unusable, though this is a problem you'll see with most boards today. Gigabyte provides decent automatic overclocking support via the MB Intelligent Tweaker. The board frequency can be adjusted from 100 MHz all the way up to 500 MHz. Add to that the voltage tweaking available, and the control over multiplier ratios, and you have a lot of overclocking potential with this board.

The MSI K9N Diamond is a premium offering, and one look at the layout and features on offer will show you why. This motherboard also features an integrated Creative Audigy class sound solution, which is something you'll love if you're an audio enthusiast. We didn't have any of the heatsink-memory problems with the K9N Diamond, and we liked the layout of the connectors as well. MSI also uses a rather simple retention mechanism for the graphics slot, and it's an absolute breeze to insert and remove a video card from any of the MSI boards. The SATA ports are also not in-line with the first PCI-Express slot, which shows thoughtful design, because we've seen some longer cards like the GeForce 7900s, 7950s and Radeon X1800 and X1900 series actually interfere with the SATA ports. Though we noticed that MSI uses mostly electrolytic capacitors around the CPU region—not good for longevity—we found that it had the best layout amongst the high-end offerings.

The K9N Diamond features MSI's Dual "Core Cell," which equates to good automatic overclocking. The BIOS is by American Megatrends Inc. (AMI), and has enough options for decent



ASUS Crosshair
A combination of looks, features, and performance

manual overclocking. However, it's just not in the same league as the 590SLI boards from ASUS and Biostar as far as overclocking goes.

There were two AM2 motherboards based around NVIDIA's nForce 570SLI chipset, the Gigabyte GA-M57SLI-S4 and MSI's K9N Platinum.

The layout of the Gigabyte 570SLI is similar to that of its bigger brother. It doesn't sport a heatpipe solution but uses a smaller heatsink to cool the chipset. Gigabyte uses a lot of electrolyte capacitors around the CPU region of this board. We also noted that the CPU gets a 4-pin connector instead of the 8-pin connectors on the 590SLI chipset-based boards.

Most processors don't require the extra four pins, and our FX-62 was running happily on 4-pin ATX power even on the 8-pin boards.

Once again, the memory-CPU heatsink battle ensued,

though the Tforce 590SLI was by far the

biggest offender. Overclocking

options on this board was pretty similar to its bigger brother; Gigabyte

hasn't removed any of the tweaking options.

The MSI K9N "Platinum" plays smaller brother to the "Diamond," and also gives up 16 PCI-Express lanes to it, featuring two x8 lanes for SLI operation. This motherboard has a very clean and no-nonsense layout, no extra glitter, just an attractive aluminium heatsink with "MSI" etched on the centre in silver. There's a simple chrome-plated heatsink covering the mofsets around the I/O panel. The SATA and other ATA ports are thoughtfully placed, and adequate spacing between the memory banks means your RAM will get adequate cooling even while running gruelling applications. There is adequate space around the CPU socket, and you'll be surprised how much difference even a few millimetres here and there makes. MSI

How We Tested

We had a mammoth four test beds running for this month's motherboard shootout—two AMD-based test beds and two Intel-based. Note that for motherboards with onboard video, we didn't use a graphics card, and used the onboard solution instead.

The test beds are as listed below.

Windows XP with Service Pack 2 was our OS of choice. As always, the benchmarks are broadly divided into real-world and synthetic. Synthetic benchmarks represent applications that simulate conditions that stress test certain PC subsystems, and finally display a "score" that is usually numeric, and can be used

to quantifiably compare performance.

Real-world benchmarks are individual applications that, by their very nature, stress out certain components of the computer's subsystem. For example, games will severely stress the graphics, memory and CPU subsystems (in that order), while video encoding is processor-dependant.

The synthetic benchmarks were:

PC Mark 2005: A very standard benchmark today, PC Mark has a complete suite of tests designed to stress out individual components in turn. We used the latest version available.

SiSoft Sandra 2007 Engineer: Another industry-wide standard

THE TEST BEDS

	AMD 939 platform	AMD AM2 platform	Intel Core 2 Duo	Intel Pentium 4 / Pentium D platform
Processor	AMD 64 X2 4800+ @ 2.4 GHz	AMD 64 FX-62 @ 2.8 GHz	Core 2 Extreme @ 2.93 GHz	Pentium 4 EE @ 3.2 GHz
Memory	512 x 2 DDR400 @ 2-2-2-5	512 x 2 DDR2 800 @ 4-4-4-12	512 x 2 DDR2 800 @ 4-4-4-12	512 x 2 DDR2 800 @ 4-4-4-12
Graphics Card	XFX 7900GTX XXX Edition	XFX 7900GTX XXX Edition	XFX 7900GTX XXX Edition	XFX 7900GTX XXX Edition
HDD	Hitachi Deskstar T7K 250 SATA 2	Hitachi Deskstar T7K 250 SATA 2	Hitachi Deskstar T7K 250 SATA 2	Hitachi Deskstar T7K 250 SATA 2

provides three PCI slots, and the best part is that all of them are very useable even after installing a display card.

MSI provides a healthy CPU overclock from 200 MHz default to 425 MHz, in 0.5 MHz increments. All the usual HT, memory and PCI-Express tweaks are present in full force, and we can safely recommend this board to all but the most hardcore of overclockers.

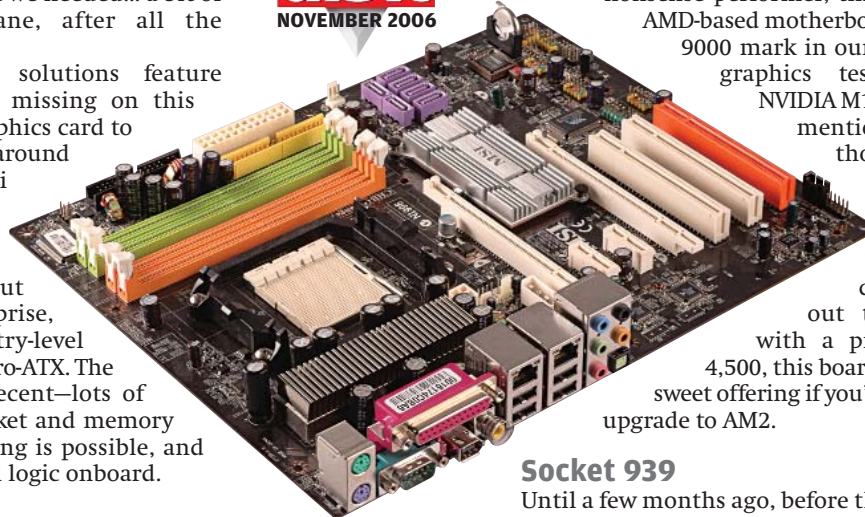
Comparing the layout of these two boards, we decided the K9N SLI Platinum zooms ahead.

There was another motherboard from MSI—the MSI K9NU Neo V, which, due to its price, falls in a slot below the other MSIs available. It's also based around a non-SLI/CrossFire chipset, and was just what we needed... a bit of the sedate, the mundane, after all the scorched before it!

Typically, entry-level solutions feature onboard video, which is missing on this board, so you'll need a graphics card to set it up. The Neo V is built around NVIDIA's M1697 chipset (ALI 1697, as it was known before NVIDIA's takeover). The Neo V is no larger than any of the other boards, but is still somewhat of a surprise, because we're used to entry-level solutions being mostly Micro-ATX. The layout of the Neo V is decent—lots of space around the CPU socket and memory region. A bit of overclocking is possible, and this board has the core cell logic onboard.

Performance

We found pretty even scores among the AM2 boards, and even more surprising was the fact that the nForce 570SLI boards were at times neck and neck with the higher-end 590SLI based boards. This goes to show that the 590SLI is only better for those who just have to have a top-end board, or are planning on SLI-ing two high-end cards (say two 7900GTs and above). With a single



MSI K9N SLI Platinum
Great Performance and
SLI support on a budget

graphics card under the hood, things remain interesting, and it's impossible to discern which chipset is which by looking at the scores. We also noted that both the Gigabyte boards lag behind the contenders from MSI and ASUS.

If you'll take a peek at our table, you'll see one board that's pretty consistent across all tests, and emerges with quite a few top scores—the feature loaded and attractive Crosshair from ASUS. With great performance, immense overclocking potential, reasonable future proofing and looks to die for, the Crosshair emerges a winner, we're giving it Gold—our *Digit Best Buy Gold* award. The *Best Buy Silver* goes to the MSI K9N Platinum (an nForce 570SLI based board). A well laid out, no-nonsense performer, this was the only

AMD-based motherboard to cross the 9000 mark in our PC Mark 2005 graphics test suite. The

NVIDIA M1697 also merits

mention here—

though not amongst the

award

winners, it

kept pretty

close through-

out the tests, and

with a price tag of Rs

4,500, this board makes quite a

sweet offering if you're planning the

upgrade to AM2.

Socket 939

Until a few months ago, before the Core 2 Duos, AMD was sitting pretty with their Athlon 64 processors, and had torn Intel's offerings to bits. However, Socket 939 is no longer a high-end or really sought-after platform.

The main reason for Socket 939's demise is the industry-wide shift to DDR2 memory. While the reasons for the shift and the causes for AMD's adoption of the same aren't in this article's purview, it's worth noting that DDR memory is no longer a manufacturing priority, and stocks should dry up over the next year.

At the very outset, Socket 939 doesn't make a very future-proof buy, simply because both processors and memory for the platform will not be available after a while (we give Socket 939 another eight months tops!)

The only scenario that would garner votes for a socket 939-based system in our opinion is if you are on an unshakeable low budget, or simply want a cheap PC which you do not plan to upgrade—a new user making his first foray into the world of personal computing. Socket 939 makes a decent buy for extremely value conscious users, as they get decent performance on a shoestring budget, sacrificing, of course, on the other fronts we mentioned.

Features

The Xpress 3200 chipset was a latecomer for socket 939, and was intended as ATI's counter to the nForce 4 SLI32 chipset that NVIDIA had released at the time. The Xpress 1600 differs only in the number of PCI-Express lanes it offers, that is, 16 as opposed to 32 for the Xpress

benchmark, SiSoft runs individual, modular tests for each subsystem, that is, memory, processing, storage, etc., and the results are obtained from each benchmark.

3D Mark 2005: The gamers' benchmark from Future Mark Corp., the people behind the PC Mark series. We used 3D Mark 2005 instead of 3D Mark 2006 because the latter is more graphics-heavy and less dependant on other subsystems, and we wanted to notice some disparity in the tests, since the subjects were motherboards and not graphics cards.

Our real-world tests included a video encoding test. We used a test file (100 MB VOB), and encoded it to DivX using the default settings. We used version 6.2 of DivX Encoder. This is primarily a CPU subsystem test.

Our next benchmark saw us loading the first level—"Training"—of *Far Cry*, and noting down the time taken to load the game. We used a fresh installed copy each time, and used version 1.32 of the game. This test stresses the hard drive, that is, the storage subsystem.

Finally, we used Doom 3's inbuilt time demo and recorded the frames per second that each card gave us. The first scores were disregarded, and an average of the next three scores was taken as our final figure. This gives us a good idea of what the video subsystem is capable of.



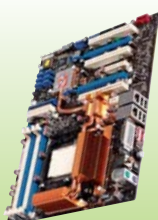
Scoreboard - Motherboards

Socket AM2 Motherboards

BRAND	ASUS	Biostar	Gigabyte	Gigabyte	MSI
MODEL	Crosshair	Tforce 590SLI	M59SLI-S5 F3	M57SLI-S4	K9N Diamond
Chipset	nForce 590SLI	nForce 590SLI	nForce 590SLI	nForce 570SLI	nForce 590 SLI
Socket	AM2	AM2	AM2	AM2	AM2
Features					
Memory Type/Max. Memory Speed Supported (MHz) / No. Of DIMMs	DDR2/800/4	DDR2/800/4	DDR2/800/4	DDR2/800/4	DDR2/800/4
Max Memory Supported (GB) / Dual-Channel Support (Y/N)	8/✓	16/✓	16/✓	16/✓	16/✓
Integrated Graphics (Y/N) / PCI-Express Slot (Y/N)	✗/✓	✗/✓	✗/✓	✗/✓	✗/✓
No Of PCI / PCI x1 / PCI x4 Slots	3/1/1	2/1/1	2/1/1	2/2/✗	2/2/✗
Multi-GPU Support (SLI/CrossFire/N) / No. Of Total PCI-E Lanes	SLI/x32	SLI/x32	SLI/x32	SLI/x16	SLI/x32
Integrated Audio Controller Chipset / No. Of Channels	ADI 1988B/8	Realtek 883/8	Realtek 888/8	Realtek 883/8	SB Live SE/8
S/PDIF Port (Y/N) / Optical Audio Port (Y/N)	✓/✓	✗/✗	✓/✓	✓/✓	✓/✗
LAN (10/100/Gigabit/Dual Gigabit)	Dual Gigabit	Dual Gigabit	Dual Gigabit	Dual Gigabit	Dual Gigabit
Integrated Wi-Fi (Y/N)	✓	✗	✗	✗	✗
No. Of USB 2.0 Ports / Max USB Connects / FireWire	4/10/✓	6/10/✓	4/10/✓	4/10/✓	4/10/✓
E-SATA (Y/N) / No. Of IDE/SATA Ports	✓/1/6	✓/1/5 +1	✓/1/8	✗/1/6	✗/1/6
SATA RAID / Types Supported	✓/0,1,0+1,5,JBOD	✓/0,1,0+1,5,JBOD	✓/0,1,0+1,5,JBOD	✓/0,1,0+1,5,JBOD	✓/0,1,0+1,5,JBOD
Main Power Connector (Type)	24	24	24	24	24
Bundled Contents	4 SATA / 1 PATA cables, floppy connector, mic, add-on sound card, SLI connector, 2 SATA power converters, 1 DVD (drivers and software)	4 SATA/1 PATA cables, 3 SATA to 4 pin power connectors, RCA/SPDIF bracket, SLI retention & connector, USB charger set, headphone and mic combo, 1 driver CD	4 SATA/1 PATA cables, floppy connector, SLI connector and retention bracket, E-SATA bracket and power cables, 1 driver CD	4 SATA/1 PATA cables, floppy connector, SLI retention bracket, , 1 driver CD	6 SATA/1 PATA cables, floppy connector, USB and FireWire brackets, 4 pin to SATA converters, 2 driver CDs (board and Creative Audigy)
Component Layout On The Motherboard (So5)					
Capacitors Near The CPU Socket	4.5	4.25	3.25	3	3.75
Placement Of IDE And SATA Connectors	3.75	3.5	3.25	3	3.25
Memory Slots Placement	4.25	2	2.5	2.5	3.5
Graphics Card Retention Lock	2.25	2.5	4	4	3.5
Overclocking: Voltage/FSB/CPU Multiplier/PCI-E Bus	✓/✓/✓/✓	✓/✓/✓/✓	✓/✓/✓/✓	✓/✓/✓/✓	✓/✓/✓/✓
Performance					
Synthetic Tests					
PC Mark 2005					
PC Marks	6688	6636	6450	6433	7094
CPU Score	5718	5721	5367	5338	5703
Memory Score	5013	5042	4978	4867	5126
Graphics Score	8872	8914	8854	8883	8879
SiSoft Sandra 2007					
Memory Bandwidth Score (Integer/Floating)	7693/7704	7493/7494	7324/7448	7356/7456	7874/7794
CPU Arithmetic (Dhrystone/Whetstone)	20411/17326	20403/17229	20203/17110	20213/17067	20303/17152
CPU Multimedia (Integer/Floating)	52922/57624	52921/57627	50834/54995	51234/55218	52692/57374
HDD Score (Drive Index/Access Time ¹)	56/6	55/6	56/6	56/6	57/6
3D Mark 2005					
3D Marks/CPU Score	11419/7392	11355/7221	11210/7150	11320/7131	11380/6590
Real-World Tests					
DivX 6.2 Video Encoding 100 MB File (Sec) ¹	95.3	94	98.1	97.5	97.1
Far Cry Training Level Load Time (Sec) ¹	19.3	19.6	20.1	19.9	20.4
Doom 3 (1024x768, High) (fps)	128.5	130.1	121.5	122.1	128.1
Final Scores					
Features (Out Of 30)	22.95	20.12	21.42	19.56	19.47
Performance (Out Of 60) ²	51.68	51.45	50.13	50.23	51.30
Price Index (Out Of 10) ²	1.60	3.20	3.64	3.67	2.96
Total (Out of 100)	76.23	74.77	75.18	73.46	73.73
Price (Rs)	15,400	12,500	11,000	10,900	13,500

¹ Lower Is Better

² For Socket 939 boards:
Performance out of 55
Price Index out of 15



+ Great Performance
- None in particular



+ Very good performer
- CPU region cramped



+ Well-priced
- Scores not on par



+ Neat layout
- Pricey



+ Good performance
- None in particular

Socket 939 Motherboards

MSI	MSI	ASUS	ASUS	Axper	Sapphire PureElement	MSI
K9N Platinum	K9NU Neo V	A8R32-MVP Deluxe	A8R MVP	XP-M8ARS482-XP	PE-A9RS482M	K8NGM2
nForce 570SLI	NVIDIA M1697	ATI Xpress 3200	ATI Xpress 1600	ATI RS482	ATI RS482	NVIDIA GeForce 6150
AM2	AM2	939	939	939	939	939
DDR2/800/4	DDR2/800/4	DDR/500/4	DDR/500/4	DDR/400/2	DDR/400/2	DDR/400/4
16/✓	8/✓	4/✓	4/✓	4/✓	4/✓	4/✓
✗/✓	✗/✓	✗/✓	✗/✓	✓/✓	✓/✓	✓/✓
3/2/✗	3/1/✗	3/1/✗	3/1/✗	3/✗/✗	2/✗/✗	2/1/✗
SLI/x16	✗	CrossFire/x32	Crossfire/x16	✗	✗	✗
ADI 1988/8	ALC 883/8	Realtek 882/8	ADI 1986A/6	ALC 880/8	ALC 650/6	ALC 880/8
✓/✓	✗/✗	✓/✓	✓/✗	✗/✓	✗	✗
Dual Gigabit	Gigabit	Dual Gigabit	Gigabit	10/100	Gigabit	10/100
✗	✗	✗	✗	✗	✗	✗
4/10/✓	4/8/N	4/8/✗	4/8/✗	4/8/✓	4/8/✓	4/8/✓
✗/1/6	✗/2/4	✓/2/4+1	✗/2/4	✗/2/4	✗/2/2	✗/2/4
✓/0,1,0+1,5,JBOD	✓/0,1,0+1,5,JBOD	✓/0,1,0+1,5,JBOD	✓/0,1,0+1,5,JBOD	✓/0,1, JBOD	Y/0,1,JBOD	✓/0,1,0+1,5, JBOD
24	24	24	24	24	20	24
2 SATA/1 PATA cables, floppy connector, USB and FireWire brackets, 4 pin to SATA converters, 1 driver CD	1 SATA/1 PATA cable, floppy connector, SATA power adapter, 1 driver CD	3 SATA/1 PATA cables, floppy connector, game port and USB, FireWire bracket, 1 driver CD	2 SATA/1 PATA cables, floppy connector, I/O bracket, 1 driver CD	1 SATA/1 PATA cable, floppy connector, I/O bracket, 1 driver CD	1 SATA/1 PATA cable, floppy connector, I/O bracket, S-Video header, 3 CDs (drivers, back-up software, and game demos)	1 SATA/1 PATA cable, floppy connector, I/O bracket, 1 driver CD
2.75	2.75	3.25	3	2.25	2.5	3
3.25	2.75	3.25	3.5	3	2.75	3
3	3.25	4.25	4.25	2	3.75	3.25
3.5	✓/✓/✓/✓	2.25	2.25	3.5	3.25	3.5
✓/✓/✓/✓		✓/✓/✓/✓	✓/✓/✓/✓	✓/✓/✗/✓	✓/✓/✓/✓	✓/✗/✓/✗
6320	6320	3810	3900	3887	3921	3959
6882	5280	4175	4090	4045	4120	4910
5675	4659	3978	4234	4281	4309	4081
4931	8797	6706	6653	6624	6589	1481
9250	7320/7335	4384/4392	5407/5391	5328/5317	5283/5211	5212/5209
7482/7746	20186/16856	17550/14800	17462/14742	17432/14340	17387/14674	17484/14747
20315/17155	51567/54948	46300/49581	45282/49304	45056/48890	45106/49107	45328/49355
52680/57362	57/6	56/6	57/6	57/6	55/6	56/7
57/6	11280/7122	10911/6342	10850/6233	578/6241	601/6333	711/4881
11309/6896	99.1	101.8	106.6	107.1	103.3	106.9
95.2	19.8	20.3	21.2	20.9	22.1	21.1
19.8	121.5	113.1	112.2	11.2	11.3	16.4
126.6	16.34	19.40	17.04	14.87	13.43	15.44
19.91	49.89	42.13	44.02	35.86	35.80	34.27
51.29	8.89	4.09	5.63	12.86	11.54	13.24
4.35	75.11	65.62	66.68	63.58	60.77	62.94
75.54	4,500	11,900	8,700	3,150	3,900	3,400
9,200						



+ Very well-priced
- None in particular



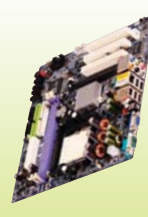
+ Extremely well-priced
- Relatively lower scores



+ Good layout, features
- Some low scores



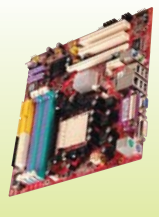
+ Good performance
- Skippy bundle



+ Well-priced
- Performance not on par



+ Well-priced
- Two memory DIMMs



+ Decent performer
- Skippy bundle

3200. These chipsets support CrossFire (ATI's multi-graphics counter to NVIDIA's SLI). With the gaining popularity of AM2, even high-end Socket 939 motherboards such as these have had price slashes; making even these ageing DDR-based solutions seem a tad more attractive.

The ASUS A8R32-MVP Deluxe is based

on the A8R32-MVP Deluxe bears a Northbridge and Southbridge chip.

The A8R32-MVP Deluxe is an overclocker's delight, and ASUS advertises this right on the box. The BIOS options are numerous, and the HT (HyperTransport) speed can be bumped up to insane levels—we tried overclocking our board and were able to get a very respectable 600 MHz boost to a 1.8 GHz AMD 64 3000+ processor. The board supports aggressive CPU and memory voltage increases, which is necessary to overcome the limitations of overclocking on stock voltages.

The ASUS A8R-MVP is the smaller brother of the Deluxe version above, and just a peek at both the boards will tell you why. The layout is decent for a single graphics solution, but using this board for a CrossFire setup could pose a problem due to insufficient spacing between the graphics slots. The build quality of the components on the A8R-MVP is good, but again, the departure from the Deluxe version is apparent.

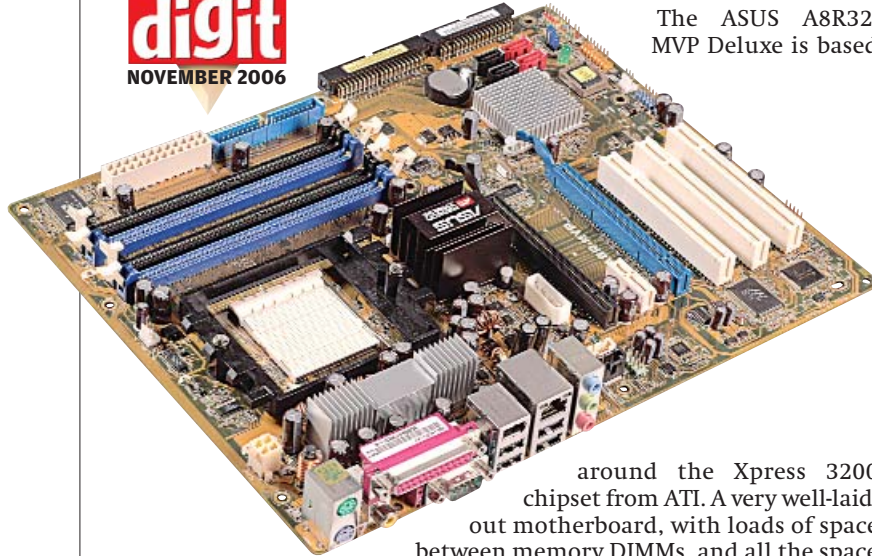
We received two motherboards based on ATI's RS 482 chipset, one each from Sapphire and Axper. Sapphire, best known for their Radeon-based graphics cards, are somewhat new to the Indian market, while Axper is a new entrant into the motherboard arena, and this is the first time we've received motherboards from them. The RS 482 chipset features a decent onboard graphics solution—ATI's X300, which is a Direct X 9.0 compliant solution. The onboard graphics solution will share memory (up to 256 megabytes of it), and is not really recommended for gaming.

Both these boards support dual-channel memory; however, you just get two DIMMs, unlike the other boards which sport four. Both sport rudimentary overclocking in their respective BIOSes, although we found the Sapphire board a bit more responsive to tweaks. In terms

around the Xpress 3200 chipset from ATI. A very well-laid-out motherboard, with loads of space between memory DIMMs, and all the space you require to install a large heatsink-fan. It's feature rich as well—the two PCI-Express slots are capable of simultaneous x16 operation. There is sufficient spacing between the two PCI-E slots to accommodate even the largest of double-slot graphics cards.

The board makes quite a strong point for itself as a quality performance product, but isn't future-proof due to the processors and memory for this platform becoming extinct. There's no nifty chipset heatsink on this one, and unlike the nForce 4 chipset, which was a single chip solution, the Xpress 3200 solution

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ASUS A8R-MVP
ASUS' Budget CrossFire offering

The Memory Question

While deciding on a motherboard, there is the perennial headache of choosing matching memory. Of course, much of your memory decision rests on choice of socket, and DDR will work fine with Socket 939 AMD processors, while AM2 processors and all Intel's 775 LGA CPUs demand DDR2. However even in the two classes—DDR and DDR2—you've got a lot of choosing to do!

Intel processors (Pentium 4 / D / Core 2 Duo) are basically memory bandwidth sensitive (read: MHz) due to their architectures. Look for memory with higher speeds rather than paying more for low latencies.

So what would be good memory for a Core 2 Duo? Practically, a processor cannot demand more data from memory than what its FSB bandwidth allows. This holds true for Intel processors only (AMD 64s and their ilk have the memory controller integrated on the CPU die, so the concept of FSB is absent). Figuratively, for an FSB of 1066 MHz, the bandwidth would be $(1066 \times 32 \text{ bits})/8 = 4264 \text{ MBps}$. If we consider that memory should be twice as fast (due to latencies involved), DDR2 667 would offer a bandwidth of $(667 \times 64)/8 = 5336 \text{ MBps}$. In case of dual-channel, this would be $5336 \times 2 = 10672 \text{ MBps}$, or roughly two and a half times higher than the FSB bandwidth. Faster memory is available (DDR2 800 and DDR2 1000 MHz), but it seems all that additional bandwidth isn't doing much more except costing more. We recommend you stick with DDR2 667

for now for any Intel-based rig, go for more memory, but not faster memory, if you need more performance. Opt for higher speeds only if you plan to do a lot of aggressive overclocking—say 3.2 GHz and above for a Core 2 Duo processor.

With AMD processors, their integrated memory controller means that not only do they scale better with speed (MHz) increments than their Intel counterparts, they show steeper performance increments with lower-latency memory. Kind of a double-edged sword considering prices, and the fact that performance-wise, speed and latency are inversely proportional. But bear in mind that AMD processors are much more sensitive to both latency and bandwidth, so you'll need faster memory here.

Socket 939 performs optimally with DDR 400 MHz memory; try and get as low a latency as your budget allows. For AM2-based processors, a general rule of thumb is to balance out the speed and latency of the RAM you're buying, else your bill will skyrocket. Opt for DDR2 667 MHz memory in the latency range of 4-4-4-10. While lower latencies are possible, as are higher clocked parts, the performance increment doesn't justify the extra you'll shell out. For example, 2 GB of low-latency DDR2 800 MHz memory will cost you in excess of Rs 16,000. DDR2 800 MHz only makes sense if you are pairing it with a fast processor, say a 2.4 GHz dual-core AMD 64 at the very least.



of layout, there's nothing much to complain about, and the Micro-ATX form factor means there's that much less room to play around with placements anyway.

We also received an MSI motherboard based on the GeForce 6150 chipset, which integrates a GeForce 6150 graphics controller onboard. For those who don't know, this chipset is a slightly stripped down GeForce 6200 core, which was the entry level chipset of NVIDIA's GeForce 6 series of graphics cards. With decent graphics performance for everyday applications, and the option to house the most powerful graphics cards via its PCI-Express slot, all audiences can be satisfied.

Performance

Our performance leaders were the duo from ASUS, their A8R32-MVP deluxe and the A8R-MVP. One of the reasons for this victory is the fact that the other 939 boards were onboard graphics solutions, which makes it mandatory for us to test them as such. These two boards were tested on a 7900GTX graphics card, which is at least 20 times more powerful than any onboard solution that has ever been around.

Nonetheless, the *Digit Best Buy Gold* award goes to the ASUS A8R-MVP, which manages to skim ahead of its bigger brother—the ASUS A8R32-MVP Deluxe—the winner of our *Digit Best Buy Silver* award.

MOTHERBOARDS FOR THE INTEL PLATFORM

We received for review a total of 17 boards that support Intel CPUs. Seven were from MSI, six from Gigabyte, and there were one each from ASUS, ASRock, ECS, and Intel.

In terms of chipsets, most support the older Pentium 4s and the latest Core 2 Duos as well. ATI, Intel, NVIDIA, VIA and SiS are some of the major chipset providers. However, all but two of the boards we tested were based on Intel chipsets (P965 Express, G965 Express, 975X Express, 945G Express and 945GZ Express)—the exception was the NVIDIA nForce 4 SLI chipset.

The older 945 chipset is almost at the end of

its life cycle, but since the Indian market is driven by value for money, you will still find a lot of cheaper boards using this chipset. Vendors are even providing BIOS revisions to enable the 945 series of motherboards to support Core 2 Duo. Even though nForce 4 SLI-based motherboards don't support the latest Core 2 Duo family, their prices are still very high compared to other motherboards. The 965s—designed for the Core 2 Duo CPU—are gradually trickling into the market, and it will take a while before they replace the 945s. With vendors already declaring support for Intel's upcoming quad-core CPUs, the 965s are your best bet for a future-proof solution. The 975X chipset, though designed for Pentium D CPUs, still support Core 2 Duos—thanks to BIOS revisions—and despite their age, are good performers.

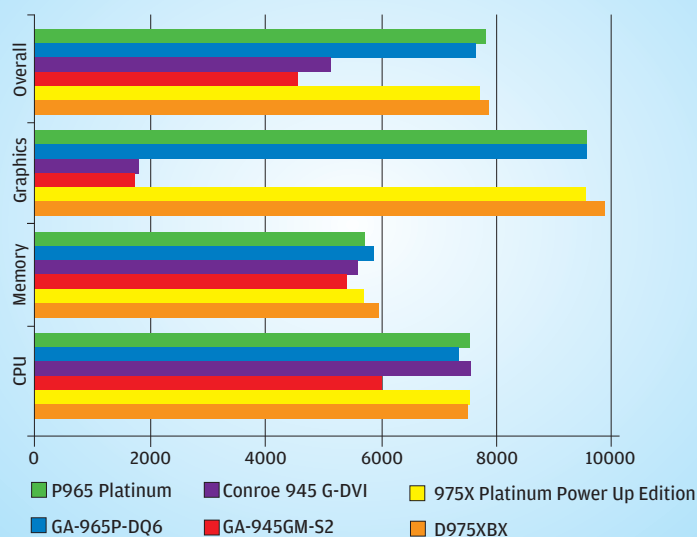
All the chipsets featured RAID solutions, integrated by the chipset manufacturer. While Intel chipsets have their Matrix Storage solution, NVIDIA chipsets feature NV RAID, which will let you span your RAID set up across SATA and IDE drives.

In order to give you a clearer picture, we came up with three groups for all these motherboards: all boards based on the 975X and nForce 4 SLI chipset were grouped together because they have multi-GPU support. The 945G/GZ-based boards were grouped together, as they support Pentium D CPUs (with a few exceptions). The P965/G965-based motherboards were classified in the same group.

Intel P965 and G965 Features

We tested seven motherboards that were powered by the 965 chipset, from ASUS, Gigabyte, and MSI. Both the P965 Express and G965 Express chipsets made appearances. Both these support up to 1066 MHz FSB for Core 2 Duos. The major difference between them is that the G965 features onboard Intel Graphics Media

PC Mark 2005 Performance (Intel)



Accelerator 3000, while the P965 Express needs you to add your own PCI-Express card.

Another design difference is that G965 Express can support 4 DIMMs per channel, so vendors can provide up to eight memory slots. In contrast, the P965 offers only two DIMMs per channel. Of course, this doesn't really say much, because most mainstream boards come with a maximum of four memory slots, and both chipsets support a maximum of 8 GB DDR2 RAM running at 800 MHz.

All the motherboards in this category have enough ports to take care of all your hard drive and optical drive requirements (SATA and IDE connectors). The Gigabyte GA-965P-DQ6 offers eight SATA ports—the highest in the category. Since both the chipsets have support for Intel's Matrix storage, all the boards have RAID support.

All the Gigabyte motherboards in this category—except for the GA-965GM-S2 had all solid capacitor designs, which translates to longer-lasting boards.

HD Audio was common across all the boards, with support for up to eight channels. Except for the MSI P965 Neo-F and Gigabyte GA-965GM-S2, all the boards feature optical out and S/PDIF out.

While all the boards offer Gigabit LAN, the ASUS P5B Deluxe WiFi-AP was the only board to feature an integrated Wi-Fi (802.11g) solution. Moreover, it doubles up as an access point, allowing you to create your own wireless network without having to buy a wireless router!

Both the GA-965P-DQ6 and the P5B Deluxe WiFi-AP use heatpipes. Gigabyte's heatpipe covers the Northbridge, Southbridge, and the CPU power MOSFET.

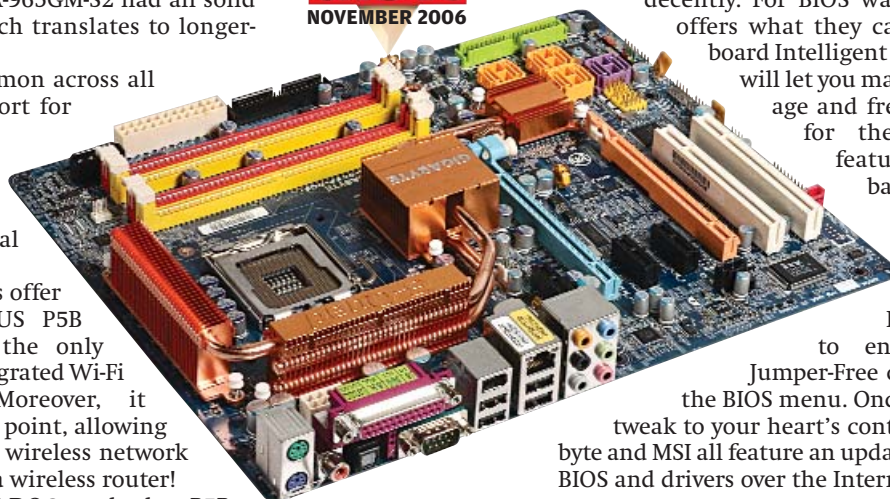
The layout of the Gigabyte GA-965P-DQ6 is very congested. If you own a 7900 GTX, you will

need to remove it to add or remove RAM. Another sore point is the lack of space between the CPU fan's heatsink and the heatpipe, making it a tricky affair when you remove the heatsink.

The ASUS P5B Deluxe WiFi-AP has identical problems. It adds one by placing the clear CMOS jumper too close to the graphics slot. The MSI P965 Neo-F has some layout issues as well: its 24-pin power connector arcs over the RAM, so you'll have to disconnect it to remove the RAM. As if that weren't bad enough, a big graphics card blocks the IDE connector! The Gigabyte GA-965G-DS3 is the best laid-out board here—all components are very easy to access.

Both Gigabyte and ASUS have incorporated some nifty overclocking features into their boards. If you prefer to soft-overclock (from within Windows), Gigabyte provides a utility called Easy Tune 5 that does the job decently. For BIOS warriors, Gigabyte offers what they call MIB (Motherboard Intelligent Tweaker), which will let you manipulate all voltage and frequency options for the board. ASUS features a Windows-based overclocking utility called AI Boost. To overclock using the BIOS, you need to enter the ASUS Jumper-Free configuration in the BIOS menu. Once there, you can tweak to your heart's content. ASUS, Gigabyte and MSI all feature an update service for the BIOS and drivers over the Internet.

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Gigabyte GA-965P-DQ6
Rock-solid performance

Performance Gaming

In the *Far Cry* test we ran, all P965 chipset motherboards gave us almost identical scores. The top two contenders—Gigabyte's GA-965P-DQ6 and ASUS' P5B Deluxe WiFi-AP—had almost same scores at a resolution of 1024x768. *Doom 3* is where the gap started to widen. While the Gigabyte GA-965P-DQ6 scored 165.1 fps, ASUS P5B Deluxe WiFi-AP managed 146.2 fps. This goes to indicate that the GA-965P-DQ6 has a better graphics subsystem.

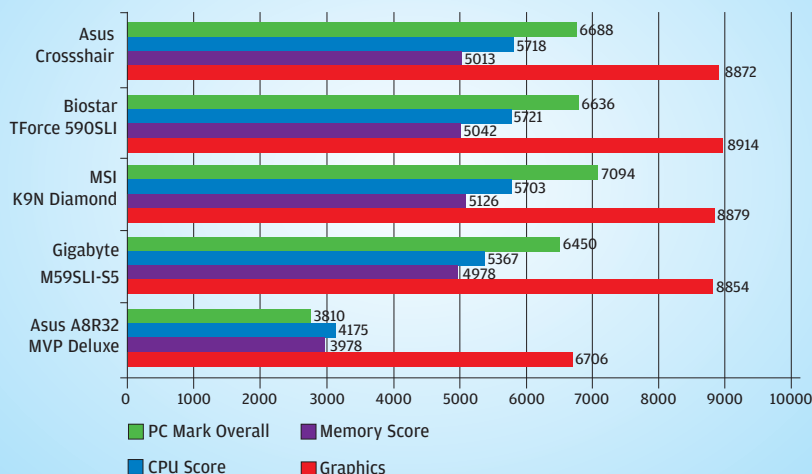
Synthetic Benchmarks

Again, the P965 were quite close together. The Gigabyte GA-965P-DQ6 gave us a score of 11801, while the MSI P965 Neo-F managed 11770. Again, these scores indicate that the Gigabyte GA-965P-DQ6 is a better option for gamers.

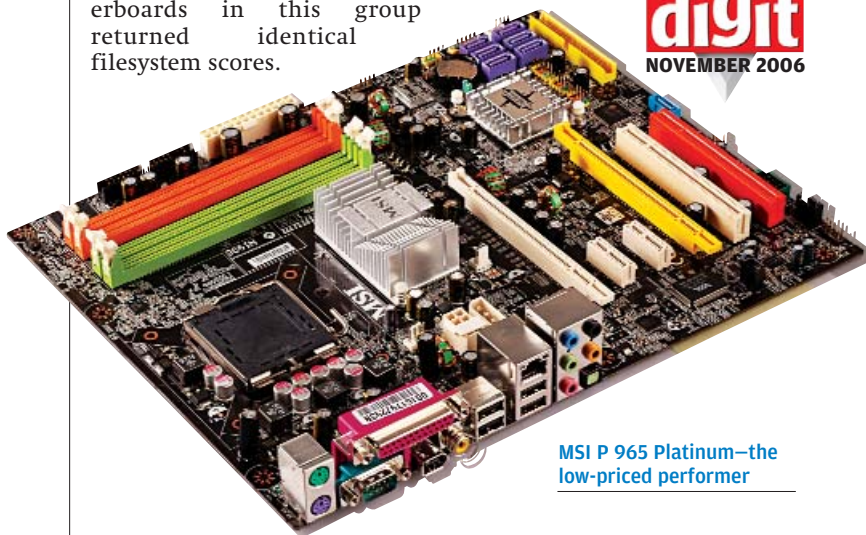
In PCMark 2005, the MSI P965 Platinum raced ahead of the competition with an overall score of 7684. Its closest competitor was the MSI P965 Neo-F with 7544 points. The P5B Deluxe and GA-965P-DQ6 disappointed with scores of 7259 and 7499 respectively.

Gigabyte's GA-965P-DQ6 and GA-965P-DS3 returned almost identical memory scores in the SiSoft Sandra tests, leaving the competition far behind. In terms of CPU scores, all P965 chipset-based motherboards showed us that they were

PC Mark 2005 Performance (AMD)



not bottlenecks—by coming up with almost identical scores. The exception—and it seems that there always has to be one—was the Gigabyte GA-965P-DS3, with lower scores than we anticipated. The G965 chipset-based motherboards, the GA-965GM-S2 and GA-965G-DS3, scored badly compared to the competition (about 25 per cent lower scores in the CPU tests), proving that these boards are not good Core 2 Duo solutions. All the motherboards in this group returned identical filesystem scores.



MSI P 965 Platinum—the low-priced performer

Real-World Benchmarks

Our video encoding test, designed to push the boards, brought up hardly any difference in scores. The time taken for P965-based motherboards varied from 70 seconds (GA-965P-DQ6) to 80 seconds (GA-965P-DS3), while the GA-965GM-S2 and GA-965G-DS3 both took 91 seconds. The consistent performance of the P965 chipset here confirms that Intel's optimisation for Core 2

Duos is working well. If it's audio or video editing that you're looking for, look no further than a P965-based board and a Core 2 Duo.

Our Conclusion

Gigabyte's GA-965P-DQ6, the ASUS P5B Deluxe WiFi-AP and the MSI P965 Platinum were the top performers in different benchmarks. All three are built sturdily with good subsystems.

With integrated Wi-Fi and dual-Gigabit LAN, the ASUS P5B Deluxe WiFi-AP just blows the rest away in terms of features. It also has a great software bundle, including InterVideo Media Launcher.

The MSI P965 Neo-F offers the best value for money, at Rs 6,400. This is much cheaper than the others in the segment, with some G965 chipset-based motherboards costing at least double that. Instead of spending around Rs 12,000 for G965 motherboards, it's better to opt for P965 boards. While the Gigabyte GA-965P-DQ6 and the ASUS P5B Deluxe WiFi-AP carry the same price tag, the P5B Deluxe WiFi-AP has lot more features than the GA-965P-DQ6. So if you want a feature-rich board with good performance, the ASUS P5B Deluxe WiFi-AP is the way to go.

Deciding the winner for this category was difficult. After careful consideration, we awarded the Digit Best Buy Gold to the Gigabyte GA-965P-DQ6. The Digit Best Buy Silver goes to the MSI P965 Neo-F, because of decent performance at almost half the price of the others.

945G And 945GZ Features

This category is the hottest-selling in the market, and is mainly targeted at home and office users where performance is not the only criterion that counts. This category saw six motherboards from ASRock, Gigabyte, and MSI

The Features Myth

A motherboard is one of the most feature-packed amongst all PC components (and we're talking mainly marketable features), so your friendly neighborhood PC vendor being the salesman that he is, will surely try to score here.

Marketable features are not to be mistaken for useful features, which is what we'd like you to be aware of. For example, the classic opening statement "this motherboard has eight USB ports." Sure it does, we agree—but are all those USB ports really needed? How many of them do you plan to use simultaneously? Not more than three, we'd bet! And don't all other boards also come with at least six to eight USB ports? Some ship with 10! The simple fact is that such components are chipset-specific, and motherboard manufacturers can include as many USB ports as the chipset maker allows, so he isn't doing you any favours.

Another such oft-recited feature is 'onboard 7.1 audio'. What good is this going to do for someone planning on 2.1 speakers, or even headphones? A person investing some 10,000 plus rupees on a decent set of 5.1 speakers would be quite able to shell out Rs 4,000 or so for a much higher quality 24-bit sound card (compared to the regular onboard sound solution). On top of all that, there are no 7.1 audio sources to actually utilise all those eight channels of sound.

A lot of motherboards come with a number of PCI-Express x1

slots, too. These aren't a great addition simply because as of now, very few add-on cards sport this interface. A couple of well-laid-out PCI slots and a single PCI express slot (x16) should be enough for most users. Although they do add a certain amount of future-proofing, we think a single x1 slot should be sufficient. What we really want to get across is that this isn't by any means a plus point (having more of such slots), and you shouldn't be paying extra for them!

We intend these examples as eye-openers. A good motherboard is very hard to define, as needs differ greatly across users, but to purchase one on the sole basis of features you'd hardly ever use is pointless. We're not telling you to disregard features, of course—quite the contrary. But you do need to define needs, keeping a little headway for inevitable upgrades that are as natural to PC components as an oil change is to a car!

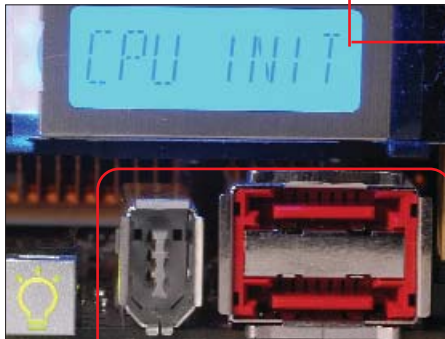
A much better plan is to check out what future processor upgrades the board's chipset will support, how many drives (whether HD or optical) you can add, number of expansion slots (PCI, PCI-Express, etc.), memory upgradeability, 24-bit onboard sound, presence of FireWire and E-SATA ports, etc.

The point here is to make an informed decision defining your own worth-paying-for features, rather than having a vendor practising a bit of deal-closing on you!

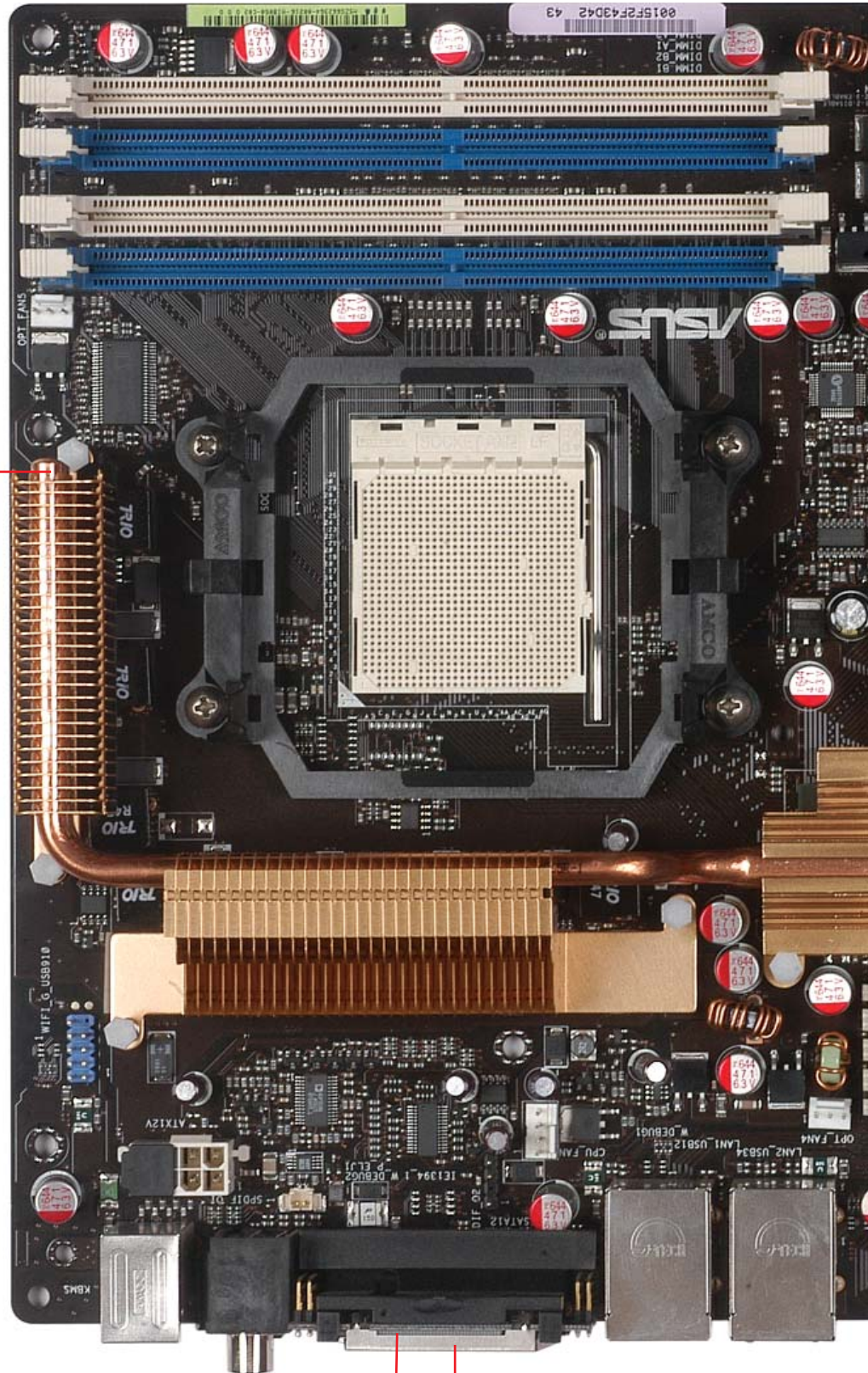
The Enthusiast's Motherboard

Heatpipe Cooling: Though not really a feature, nor as effective as an air-cooling solution, heatpipe cooling is nonetheless very desirable because it does away with fan noise. Heat dissipated by chipsets are absorbed by the heatsink fins, and whisked away by the heatpipes (through thermal convection) to eventually be dissipated by the CPU fan. Essential for a quiet computing experience, and also helps minimise dust buildup. Another plus point is no worrying about fan failure.

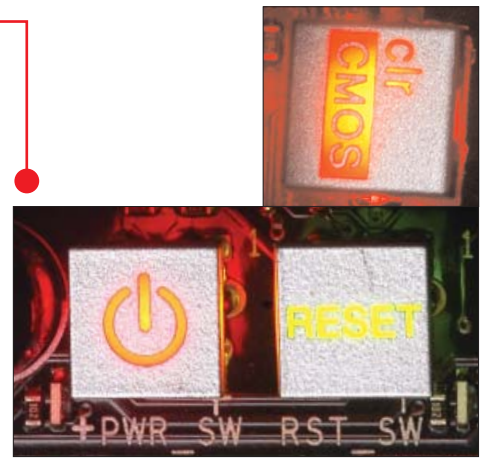
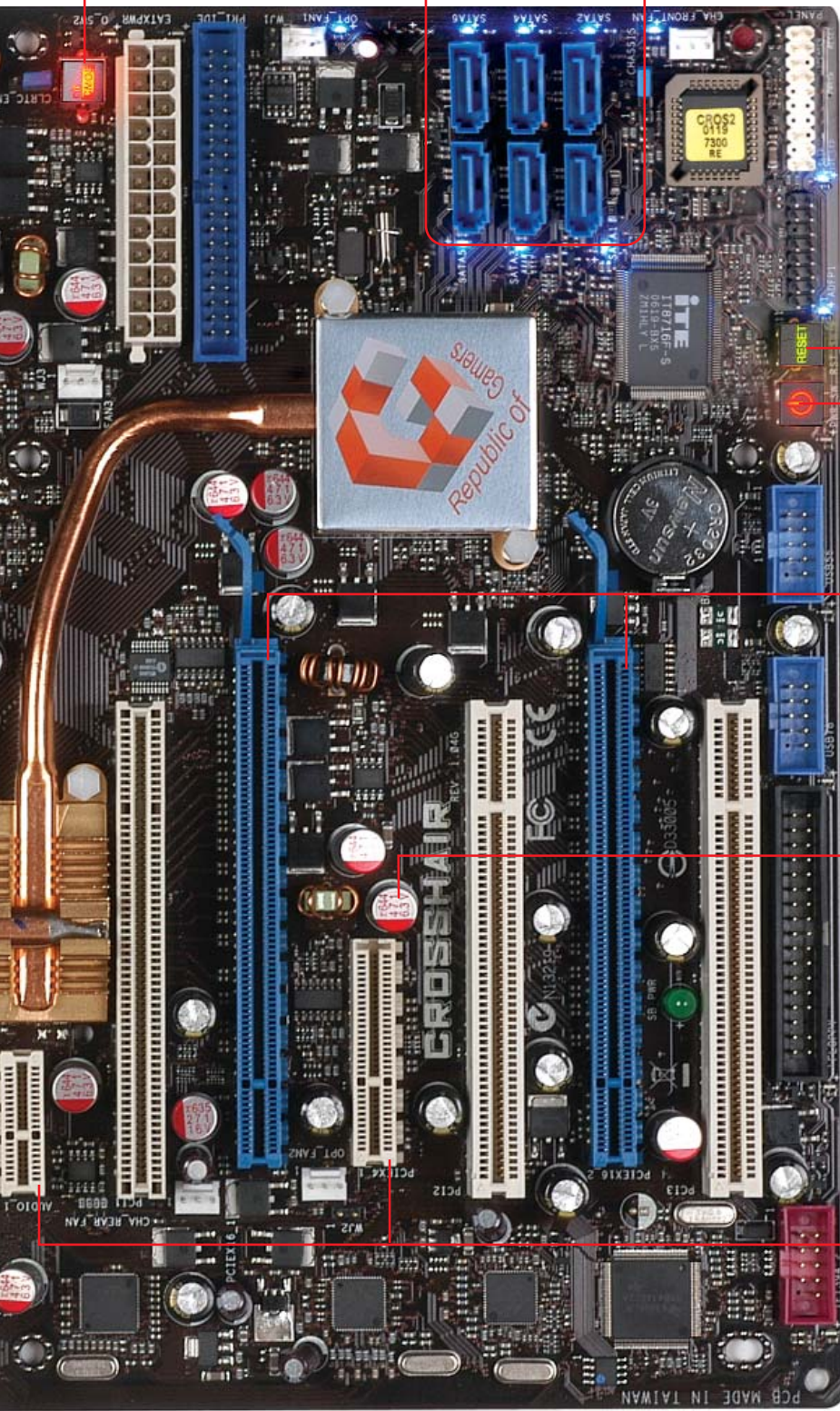
POST LCD: Enthusiast boards have some form of diagnostic on the motherboard itself—either a hex code display, or something like this, which gives you a clear view of where exactly the problem lies in case of a failed boot. A very nifty addition, especially if you're not paying extra for it!



E-SATA and FireWire Ports: One of the in things for a motherboard to have these days, external SATA allows you to hook up your serial ATA drive just like a USB drive, except for the blazing speeds that the Serial ATA interface allows. FireWire connects aren't uncommon for a motherboard these days, and are not one of the “pay extra for” features anymore. You have every right to demand a motherboard with these connects!



Multiple SATA Ports: A good motherboard today offers at least four SATA ports for expandability (remember, optical drives will also eventually go SATA). Some boards offer as many as six or even eight of these ports.



CMOS Reset, Reset and Power Buttons: Reset your BIOS, restart the system, power on with a press of a switch—no messy jumpers; very useful for tweekers and overclockers who are always tinkering around with settings.

Dual Graphics Slots: With SLI and CrossFire making high-resolution, ultra-high-setting gaming a reality, multi-GPU-supporting motherboards are now surprisingly affordable. Based around high-end chipsets (typically), such boards also have great build quality.

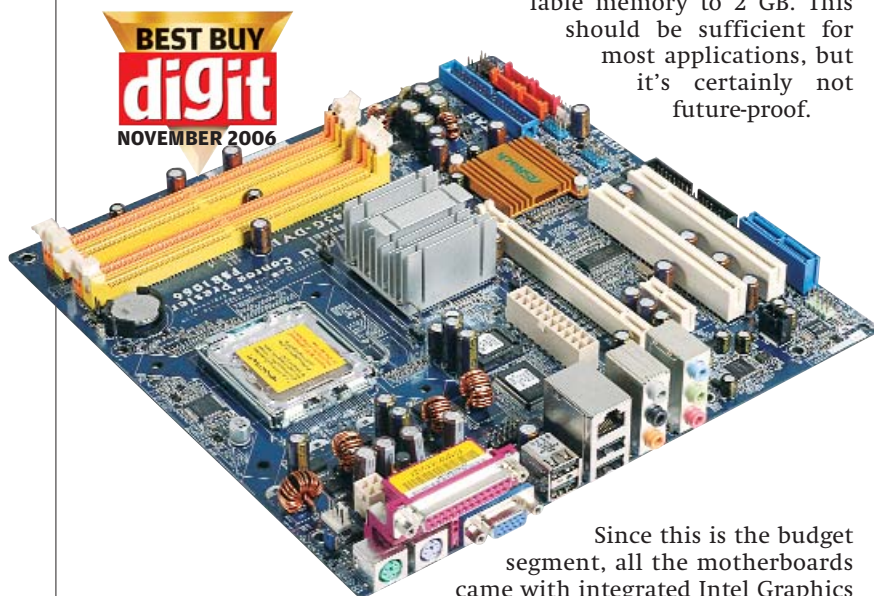
Solid State Capacitors: These are making their way into enthusiast boards on a more regular basis. Though costlier than electrolyte capacitors. The benefits include increased component life, fewer glitches, better support for overclocking, and improved reliability.

PCI Express x1 and x4 Slots: Strictly for future compatibility, this interface will see heavy use in the years to come, and PCI will eventually get replaced by PCI-E.

fight it out for top spot.

Designed to support Pentium 4 EE/HT and Pentium D CPUs, this chipset is mainly targeted at budget consumers. With later revisions providing Core 2 Duo support, this category can be considered the poor man's tool to fulfil the Core 2 Duo dream. The ASRock ConRoe 945G-DVI, Gigabyte GA-8I945GZME-RH, and the Gigabyte GA-945GM-S2 are some of the motherboards which, despite their older chipsets, support Core 2 Duos.

All the 945GZ based chipsets have only two memory slots, limiting the maximum installable memory to 2 GB. This should be sufficient for most applications, but it's certainly not future-proof.



ASRock ConRoe 945G-DVI
A David to the G965 Goliaths

Since this is the budget segment, all the motherboards came with integrated Intel Graphics Media Accelerator 950. While the 945G chipset-based motherboards allow for an upgrade via a PCI-Express slot, the 945GZ limits you to the integrated graphics.

All the motherboards have a maximum of four SATA ports. While most of these boards have only one IDE port, the MSI 945G Platinum offers three. It was also the only board with RAID support.

The MSI 945GZM3 has placed the North-bridge heatsink very close to the processor heatsink. Gigabyte's GA-945GM-S2 is another board with a bad layout—the CPU fan power socket is located bang in the middle of the RAM slots. This can be very inconvenient while removing the RAM or the CPU fan power cable.

Since these motherboards fall in the budget segment, it doesn't necessarily mean that they don't come with a good bundle. MSI 945GZM3 comes bundled with Norton Internet Security 2005; ASRock has packed its ConRoe 945G-DVI with McAfee virus scan.

Performance Gaming

These motherboards are not supposed to be used for high-end gaming, so they have very minimal gaming performance compared to their cousins in the other two categories. Since all motherboards featured integrated video, you may not be able to play all the latest games, but classics like *Quake III* will still rock using onboard graphics.

Synthetic Benchmarks

ASRock's ConRoe 945G-DVI, topped the test with a score of 771 units in 3DMark 05. It had a clear advantage due to the Core 2 Duo X6800 it was running. The advantage due to the more powerful CPU was clearly evident as the Pentium 4 powered ECS 945G-M3 returned a score of only 636 units.

The PCMark 2005 test also shows the disparity a CPU can create among similar motherboards. While the 945G-based ECS 945G-M3 could only manage an overall score of 3019, the ASRock ConRoe 945G-DVI gave around 60 per cent higher scores, with an overall score of 4929 units. Comparing these scores to those of a G965-based board like the Gigabyte GA-965G-DS3 really shocked us. The 945G chipset-based ASRock ConRoe 945G-DVI did better than GA-965G-DS3's score of 4073 units. This clearly shows that ASRock has done a good job with the ConRoe 945G-DVI, optimising it for the Core 2 Duos.

SiSoft Sandra 2007 Engineer's edition CPU scores were fluctuating due to the difference between the type of CPU used. The difference between Pentium 4 and Core 2 Duo was huge—especially the CPU multimedia scores.

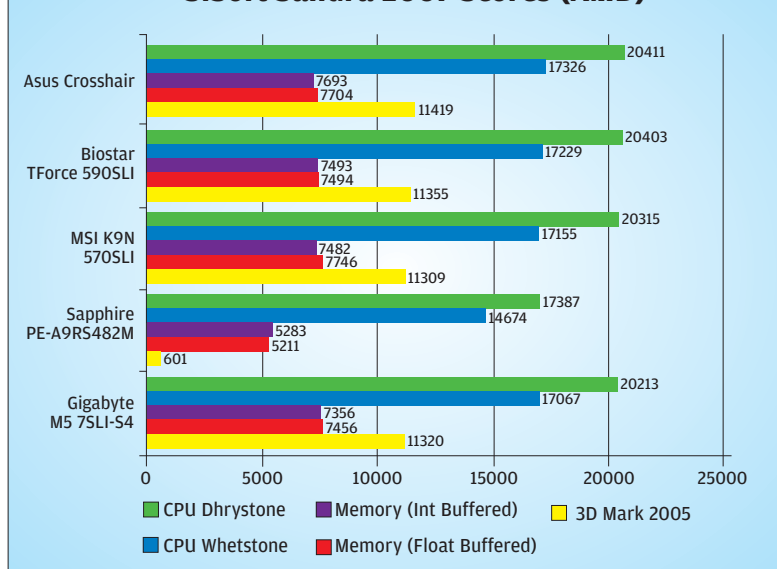
Real-World Benchmarks

The Gigabyte GA-945GM-S2 and ASRock ConRoe 945G-DVI took practically the same time to finish our video encoding test. With 84 seconds, the Gigabyte GA-945GM-S2 was definitely slower than the P965-based motherboards, but faster than the expensive G965 motherboards. The MSI 945GZM3 was the slowest, taking 148 seconds.

Our Conclusion

The ASRock ConRoe 945G-DVI led the way in most of the tests due to its support for the more powerful Core 2 Duo CPU, its older chipset notwithstanding. It also did better than some G965 chipset-based motherboards. So if you're looking for a Core 2 Duo board on a budget,

SiSoft Sandra 2007 Scores (AMD)



Intel P965 Express And G965 Express

Features (Out Of 35) ¹	23.77	23.66	22.44	17.85	19.15	19.39
Performance (Out Of 55) ²	46.04	43.78	43.60	43.12	41.54	27.03
Price Index (Out Of 10) ³	3.75	3.64	5.56	9.38	5.45	5.22
Total Score (Out Of 100)	73.56	71.08	71.59	70.34	66.14	51.63
Price (Rs)	16,000	16,500	10,800	6,400	11,000	11,500

³ (For 945G/GZ, Out of 15)

- + Onboard graphics
- Expensive

Intel 945G Express And 945GZ Express

Gigabyte	MSI	MSI	Gigabyte	ASRock	Gigabyte	ECS
GA-965G-DS3	945G Platinum	945GZM3	GA-945GM-S2	Conroe 945G-DVI	GA-81945GZME-RH	945G-M3 V 1.0B
G965 Express	945G Express	945GZ Express	945G Express	945G Express	945GZ Express	945G Express
LGA775	LGA775	LGA775	LGA775	LGA775	LGA775	LGA775
1066	1066	800	1066	1066	800	1066
DDR2/800/4	DDR2/667/4	DDR2/533/2	DDR2/667/4	DDR2/667/4	DDR2/533/2	DDR2/667/2
8/✓	4/✓	2/✓	4/✓	4/✓	2/✓	2/✓
✓/1	✓/1	✓/1	✓/1	✓/1	✓/1	✓/1
3/3/✗	3/2/✗	3/✗/✗	2/1/✗	2/1/✗	3/✗/✗	2/1/✗
✗	✗	✗	✗	✗	✗	✗
Realtek ALC883/8	Realtek ALC882/8	Realtek ALC850/8	Realtek ALC883/8	Realtek ALC888/8	Realtek ALC883/8	Realtek ALC880/8
✓/✓	✓/✓	✓/✗	✗/✗	✗/✗	✗/✗	✗/✗
Gigabit	Gigabit	Gigabit	Gigabit	Gigabit	Gigabit	Gigabit
✗	✗	✗	✗	✗	✗	✗
1/6/✗	3/4/✗	1/4/✗	1/4/✗	1/4/✗	1/4/✗	1/4/✗
✓/0,1,J,BOD	✓/0,1,5,10	✗	✗	✗	✗	✗
10/0	8/2	8/0	8/0	8/0	8/0	8/0
24-pin	24-pin	24-pin	24-pin	20-pin	20-pin	24-pin
2 SATA cables, IDE cable, FDD cable, 2 SATA power connectors, 1 driver CD	2 SATA cables, CPU clip, IDE cable, FDD cable, SATA power connector, USB bracket, FireWire bracket, 1 driver CD	SATA cable, FDD cable, IDE cable, SATA power connector, 1 driver CD	SATA cable, FDD cable, IDE cable, SATA power connector, 1 driver CD	SATA cable, FDD cable, IDE cable, SATA power connector, 1 driver CD	SATA cable, FDD cable, IDE cable, SATA power connector, 1 driver CD	SATA cable, FDD cable, IDE cable, SATA power connector, 1 driver CD
4	4	3.5	3.5	4	4	4
4	4	4	3.5	4	4	4
3.5	3.5	3.5	3	3.5	3.5	3.5
3.5	3.5	3.5	3.5	3.5	3.5	3.5
5477	4065	3990	6031	7545	5444	4186
4917	4086	3985	5485	5646	4432	4183
1583	1137	1668	1579	1608	1472	1245
4073	2853	2911	4349	4929	4048	3019
5297/5298	4877/4859	4717/4712	4956/4955	4979/4999	4048/4061	4995/4989
19917/13669	7843/10145	7616/9849	22986/16835	27328/18879	20425/14039	8102/10368
117250/63666	23576/30635	22916/29638	137101/74937	162045/87684	120107/65403	24164/31198
58/7	59/7	58/7	58/7	58/7	58/7	58/7
654/6039	591/3666	560/3471	704/5713	771/5905	659/5210	636/3854
91	112	148	84	85	94	140
19.9	20.2	21.3	22.1	21.8	21.4	22
8.4	10.3	8.2	10.5	10.6	10.3	7.4
20.02	18.30	12.42	13.62	13.74	13.23	13.23
26.93	26.56	25.63	36.15	38.62	32.76	25.95
4.65	7.06	10.34	8.63	13.33	11.76	13.65
51.60	51.92	48.39	58.40	65.69	57.75	52.83
12,900	8,500	5,800	6,950	4,500	5,100	4,395
						
+ Onboard graphics - Expensive	+ Good bundle - Expensive	+ None in particular - Only two DIMMs	+ Core 2 Duo support - Poor layout	+ Good performance - Older chipset	+ Good layout - Only two DIMMs	+ Value for money - Only two DIMMs

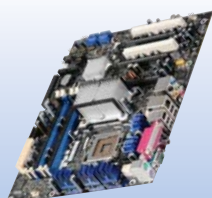


Scoreboard

Intel 975X Express And nForce4 SLI

BRAND	Intel	MSI	MSI P4N	MSI
MODEL	D 975XBX	975X Platinum	Diamond	P4N SLI
Chipset	975X Express	975X Express	NVIDIA nForce4 SLI Intel Edition	NVIDIA nForce4 SLI Intel Edition
Socket	LGA775	LGA775	LGA775	LGA775
Features				
Front Side Bus Speed (MHz)	1066	1066	1066	1066
Memory Type/Max Memory Speed Supported (MHz)/No. Of DIMMs	DDR2/800/4	DDR2/800/4	DDR2/667/4	DDR2/667/4
Max Memory Supported (GB)/Dual-Channel Support (Y/N)	8/✓	8/✓	16/✓	16/✓
Integrated Graphics (Y/N)/PCI-Express Slot	✗/2	✗/2	✗/2	✗/2
No. Of PCI / PCI x1 (Y/N) / PCI x4 slots (Y/N)	2/✗/✗	2/2/✗	2/1/✗	2/2/✗
Multi GPU Support (SLI/CrossFire/N)	CrossFire	CrossFire	SLI	SLI
Integrated Audio Controller/No. Of Audio Channels	Sigmatel STAC9221D/8	Realtek ALC882M/8	Creative Sound Blaster Live! 24-bit/8	Realtek ALC850/8
SPDIF Port (Y/N) / Optical Audio Port (Y/N)	✓/✓	✓/✗	✓/✓	✓/✓
LAN (10/100/Gigabit/Dual Gigabit)	Gigabit	Gigabit	Dual Gigabit	Gigabit
Integrated Wi-Fi (Y/N)	✗	✗	✗	✗
No. Of IDE / SATA Ports/ E-SATA Support (Y/N)	1/8/✗	2/5/✗	2/6/✗	2/6/✗
SATA RAID Support / Types Of RAID Supported	✓/0,1,0+1,5,JBOD	✓/0,1,0+1,5,JBOD	✓/0,1,0+1,5,JBOD	✓/0,1,0+1,5,JBOD
No. Of USB 2.0/FireWire Ports	8/3	8/2	10/3	10/3
Main Power Connector (Type)	24-pin	24-pin	24-pin	24 pin
Package Contents	2 SATA cables, FDD cable, IDE cable, 2 SATA power connectors, 1 driver CD	4 SATA cables, 2 SATA power connectors, IDE cable, FDD cable, CPU clip, FireWire bracket, USB bracket, 1 driver CD	4 SATA cables, IDE cable, FDD cable, 2 SATA power connectors, CPU clip, USB bracket, FireWire bracket, SLI bridge, 2 CDs (board and Creative Sound Blaster drivers)	2 SATA cables, IDE cable, FDD cable, 2 SATA power connectors, CPU clip, SLI bridge, 1 driver CD
Component Layout On The Motherboard (So5)				
Capacitors Near The CPU Socket	4	3.5	4	4
Placement Of IDE And SATA Connectors	4	4	4	4
Memory Card Slot Placement	3.5	3.5	3.5	3.5
Graphics Card Retention Lock	3.5	3.5	3.5	3.5
Overclocking: Voltage/FSB/CPU Multiplier/PCIe Bus	✓/✓/✓/✓	✓/✓/✓/✓	✓/✓/✓/✓	✓/✓/✓/✓
Performance				
Synthetic Tests				
PC Mark 2005				
CPU	7506	7518	4021	4029
Memory	5883	5821	4127	4150
Graphics	9927	9363	7926	7941
Overall	7753	7671	4648	4737
SiSoft Sandra 2007				
Memory Bandwidth Score (Integer/Floating)	5136/5185	5331/5348	4812/4808	4831/4818
CPU Arithmetic (Dhrystone/Whetstone)	27065/18770	27111/18789	7730/9946	7688/9911
CPU Multimedia (Integer/Floating)	161113/87171	161226/87541	23040/29887	23045/29958
HDD Score (Drive Index/Access Time)*	58/7	58/7	58/7	58/7
3D Mark 2005				
3D Marks/CPU Score	11717/10562	11728/10684	7686/4540	7730/4500
Real World Tests				
Video Encoding (DivX 6.2) Time (sec)*	70	72	115	113
Far Cry Training Level Load Time (sec)*	19	18.9	22.3	23
Doom 3 (1024x768, High) (fps)	150.8	155.4	73.3	73.7
Final Scores				
Features (Out Of 30)	17.82	16.86	17.67	16.68
Performance (Out Of 60)	48.01	47.39	29.15	29.26
Price Index (Out Of 10)	5.00	5.56	5.56	9.38
Total Score (Out Of 100)	70.83	69.80	52.37	55.32
Price (Rs)	15,000	13,500	13,500	8,000

* Lower Is Better



+ Solid performance
- Relatively older chipset



+ CrossFire support
- None in particular

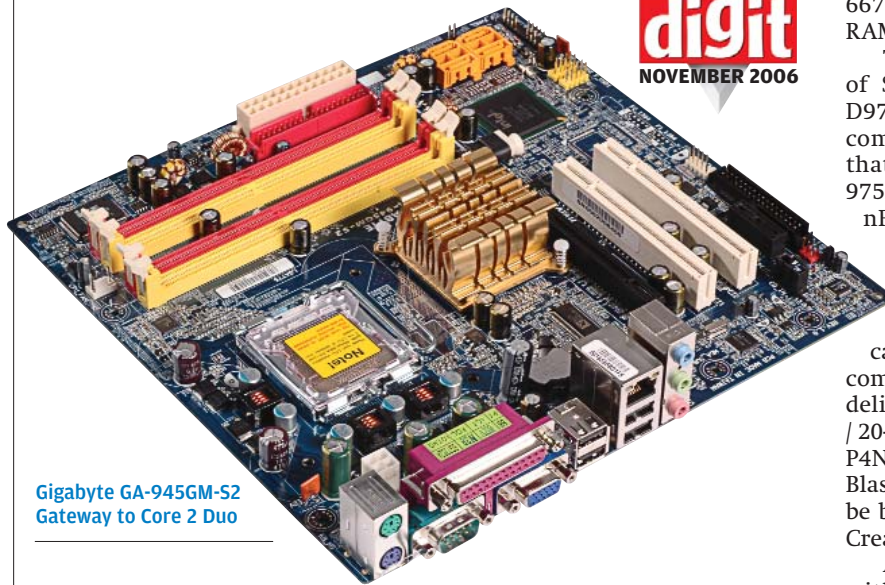


+ Creative SoundBlaster Live!
- Expensive for an older chipset



+ Good value for money
- Relatively older chipset

BEST BUY
digit
NOVEMBER 2006



Gigabyte GA-945GM-S2
Gateway to Core 2 Duo

instead of spending around Rs 12,000 on a G965-based board, it might make sense to invest in the ASRock Conroe 945G-DVI.

As this segment is defined by value for money, the ECS 945G-M3 was the favourite, with a price tag of just Rs 4,395. But given its support for Core 2 Duos, the ASRock 945G-DVI takes the cake with a price tag of just Rs 4,500. On the other hand, MSI's 945G Platinum is really highly priced at Rs 8,000.

Keeping our focus on value for money and trying to squeeze in as much performance as we could, we decided that the ASRock Conroe 945G-DVI should be the Digit Best Buy Gold winner. Gigabyte's GA-945GM-S2 took the Digit Best Buy Silver. Both these boards are priced competitively and support the Core 2 Duos.

975X and nForce 4 SLI

This category is targeted at those who need just one thing—performance! Boards in this segment are targeted at gamers, enthusiasts, and audio/video editing professionals.

Features

We received four boards for this category from Intel and MSI, two each based on each chipset as well.

As we've already said, revisions to the 975X allow it to be used with Core 2 Duos. nForce 4 SLI-based motherboards are beaten here because they only support Pentium 4 EE/HT and Pentium D processors.

Both are older chipsets, and were designed for Pentium 4 and Pentium D processors. Also, both offer multi-GPU support. That's where the similarities end.

While the 975X series supports ATI's CrossFire solution, the nForce 4 SLI is built for NVIDIA's SLI multi-GPU solution. On paper, both chipsets can support DDR2 @ 667 MHz. However, we discovered that the 975X can also support DDR2 @ 800 MHz. So although the nForce 4 SLI can support up to 16 GB of RAM at

667 MHz, the 975X can support up to 8 GB of RAM at higher frequencies.

These boards can support a large number of SATA II drives, the top being the Intel D975XBX with support for up to eight. A common feature across all these boards is that all of them have support for RAID. While 975X chipsets use Intel's Matrix storage, nForce4 SLI boards utilise NVIDIA's NV RAID technology that spans across SATA and IDE hard drives.

All these motherboards supported HD audio for eight channels—called Azalia—at 192 KHz / 32-bit quality, compared to the earlier AC'97 standard that delivered a maximum of six channels at 48 KHz / 20-bit. The best audio solution was on the MSI P4N Diamond in the form of Creative SoundBlaster Live! 24-bit audio. This solution can only be beaten by an external audio solution like a Creative Audigy or X-Fi.

All the boards feature Gigabit LAN support, with P4N SLI and P4N Diamond supporting dual LAN. To keep the system fully updated, MSI boards feature "Live Update 3": this tool checks online for BIOS / drivers / utility updates. You can decide whether to proceed with the update(s) or not.

These boards have tremendous power but they're not really future-proof, especially with quad-core processors on the horizon.

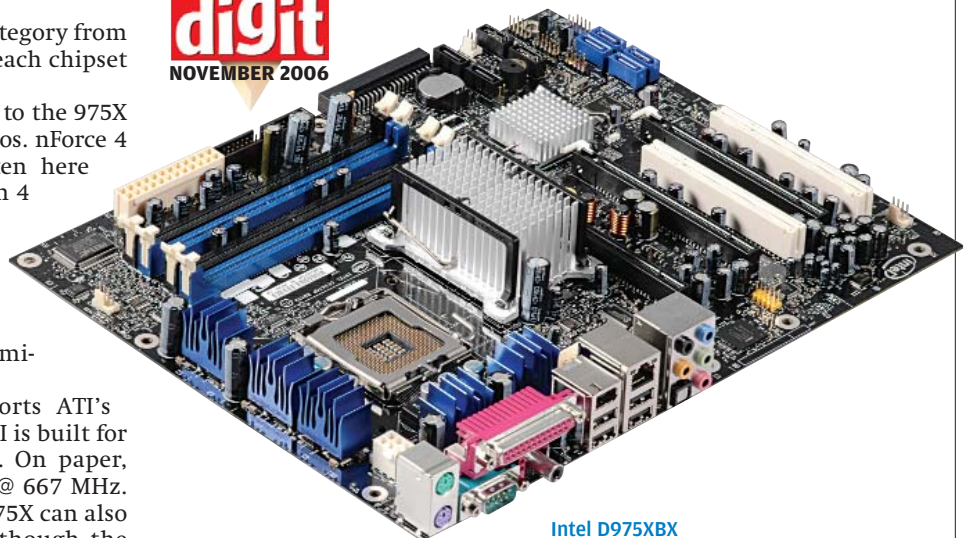
Performance

Gaming

The Intel D975XBX was the clear winner in this segment. It left its closest competitor, the MSI 975X Platinum Power Up Edition, lagging behind in *Far Cry*, though the difference in *Doom 3* was just around 5 fps. The MSI P4N SLI and the P4N Diamond were nowhere near the 975X boards.

The Intel D975XBX is definitely the board you should be looking at if you are an avid gamer, given that the price difference between the Intel D975XBX and the MSI 975X Platinum Power Up Edition is hardly anything.

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NOVEMBER 2006



Intel D975XBX
A stable performer

Synthetic Benchmarks

For those who plan to use their machines for high-end games or 3D modelling, 3DMark scores affect buying decisions. The Intel D975XBX and MSI 975X Platinum Power Up Edition were neck to neck in 3DMark 05, but the MSI 975X Platinum Power Up Edition won by a hairsbreadth.

PCMark 2005 saw the Intel D975XBX beat the MSI 975X Platinum Power Up Edition. These results suggest that the D975XBX is a very good board even for day-to-day applications. In SiSoft Sandra 2007 Engineer's edition, the CPU scores for 975X-based motherboards were nearly the same. The 975X board scores were more than triple what the nForce 4 SLI-based could manage. This is because of the power of Core 2 Duo CPUs and support for higher RAM frequencies. While memory bandwidth scores for nForce 4 SLI boards were similar, the MSI 975X Platinum Power Up Edition scored considerably over the Intel D975XBX. Filesystem scores were almost identical across the board.

Real-World Benchmarks

Our video encoding test saw the Intel D975XBX beating everything, with a total time of just 70 seconds. The MSI 975X Platinum Power Up Edition came close, with 72 seconds. The P4N brothers took nearly 60 per cent more time to finish the same task.

Our Conclusion

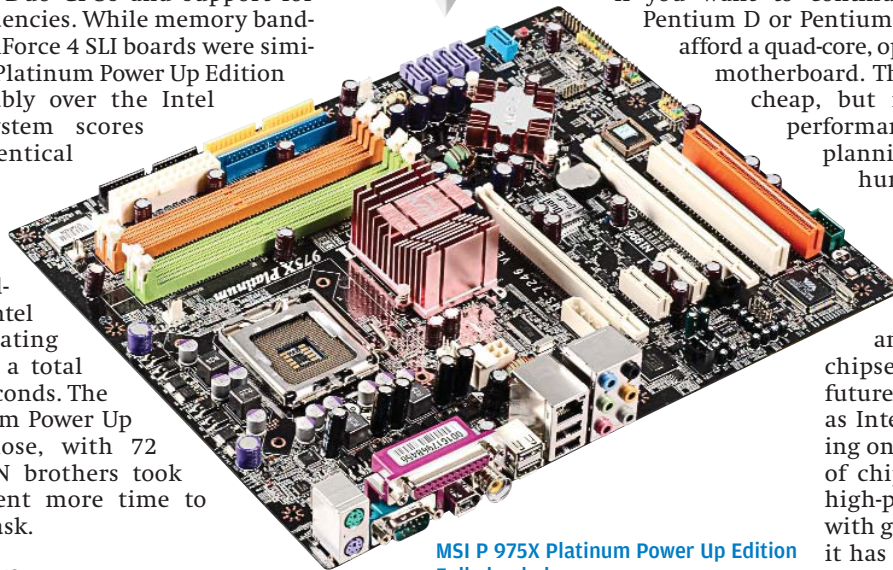
The Intel 975XBX was the top performer with the highest scores in most benchmarks, followed closely by the MSI 975X Platinum Power Up Edition. These boards had a clear advantage thanks to the 975X chipset.

With its Creative SoundBlaster Live! 24-bit audio and Dual Gigabit LAN, the MSI P4N Diamond was clearly the most feature rich board in this category. It also had a good number of accessories bundled.

When it comes to price, the MSI 975X Platinum Power Up Edition and MSI P4N Diamond cost the same. This was really surprising—the MSI P4N is an older board, and its performance is nowhere close to that of the MSI 975X Platinum Power Up Edition!

Decision Maker

Segment	Usage Pattern	Solution
Home/office use	Surfing, word processing, presentations, and casual gaming	ASRock Conroe 945G-DVI, ECS 945G-M3, MSI K9NU Neo V
Professional use	3D designing, desktop publishing, audio/video editing, and occasional gaming	Gigabyte GA-965P-DS3, Gigabyte M59SLI-S5 F3, ASUS A8R MVP
Enthusiast	The latest games, overclocking, and upgradability	Gigabyte GA-965P-DQ6, Intel D 975XBX, Biostar Tforce 590 SLI, ASUS Crosshair



MSI P 975X Platinum Power Up Edition Fully loaded

The *Digit Best Buy Gold* award goes to the Intel D975XBX, and Silver goes to the MSI 975X Platinum Power Up Edition, due to its decent performance and value for money.

Our Conclusion

If you want to continue using your older Pentium D or Pentium 4 CPU until you can afford a quad-core, opt for a 945G/GZ-based motherboard. These boards are quite cheap, but not very strong on performance. If you are not planning to upgrade in a hurry, steer clear of 945G/GZ chipsets. The same goes for the nForce 4 SLI chipset.

For a performance freak, 975X chipsets are good. Their future is doubtful, however, as Intel seems to be focusing on the newer 965 series of chipsets. If you want a high-performance system with good upgrade options, it has to be a P965 chipset-based board. You get good performance, and the promise of quad-core support to boot!

Final Thoughts

For the duration of these extensive tests, we took the opportunity to spend some quality time with a few of these boards, and spent a number of late nights gaming away to glory. A motherboard seems an unlikely candidate to get up close to: after all, it's not a personal device like a cell phone or MP3 player. However, motherboards do have certain inherent characteristics that tend to become noticeable once you actually get into the finer nuances of tuning them and using them for extended periods.

Judging by the motherboards we received this time, manufacturers are attempting to make strong inroads into personalising motherboards: it's part of product strategy, we feel—trying to get us to view the impersonal motherboard as a lifestyle product.

What really matters is that manufacturers have also put thought into the pricing—expensive isn't necessarily stylish now. Even the top-end boards offer serious value for the features they bring, and there's never been a better time to buy a motherboard. ☑

michael_browne@thinkdigit.com
vishal_kansagra@thinkdigit.com

Contact Sheet Motherboards

Brand	Company	Phone	Web Site
Axper	Priya Limited	022-66663100	www.priyagroup.com
Asus	ASUSTeK Computer Inc.	022-40058888	http://in.asus.com
MSI	Micro Star International (MSI)	011-41758808 / 09	www.msi-india.com
Gigabyte	GIGABYTE Technology India Ltd	022-26526696 / 30616666	www.giga-byte.co.in
Biostar	Top Notch Infotronics (I) Pvt Ltd	044-26616202	www.zebronics.com
ECS	Mediatech India Distribution Pvt Ltd	022-26361111	www.mediatechindia.com
ASRock	Abacus Peripherals Pvt Ltd	022-66923941 / 44 / 45	www.abacusperipherals.com
Intel	Intel	080-25075000	www.intel.com/in
Sapphire	Aditya Infotech Ltd.	011-26223810 / 26223811	www.adityagroup.com

Power+Houses

Got a New PC needy of a fully furnished apartment? Let's go cabinet and power supply shopping!

Lately I've had a lot of friends asking me about upgrading their cabinets and/or power supplies... seems like the latest breed of processors and graphics cards are ushering in a whole new need.

I was pleased to see quite a few people actually writing in with queries like "What cabinet should I use with my configuration," and "Which SMPS should I buy." The choice of cabinet is very important, and a good cabinet can enhance overall system stability by ensuring proper ventilation. A power supply is just as important, perhaps even more so, because it's responsible for supplying enough juice to allow that processor, RAM, graphics card, disk and optical drives, and motherboard to operate. Insufficient power could mean a damaged CPU or graphics card at worst, and a frequently-unstable computer at best.

As cabinets go, there are no fixed specs, no hard and fast rule. It's just that it should be able to house all your components, and should be well ventilated. A decent cabinet will have a minimum of two fans, one that sucks cool air inside (mostly at the front), and the other throwing out hot air (typically at the rear). The larger the fans the better: two reasons—first, greater CFM (cubic feet per minute), and second, lower decibels.

As for the power supply, it's better to have more power. Contrary to popular belief, a 500W power supply doesn't mean larger power bills, because the PC will only consume as much power as what the sum total of its components demands. There's another thing to watch out for—many power supplies that come labelled as "400 watts" may actually only deliver 250! Certain brands like Antec and Cooler Master do command a premium, but they stick to being honest with their specifications, and this does pay

off in the long run as far as the life of your PC components go. VIP is one Indian brand that has a good range. Zebronic is another; look for their Diamond series.

I recently went on a trip to Lamington Road with a

friend who had just blown his 350 W PSU. The first guy we went to promptly coughed up an Intex ZEDX priced at Rs 1,200, and a couple of VIP models—the VIP755 and their Compact 333B for Rs 1,450 and 1,550 respectively. Nothing very inspiring; we moved on.

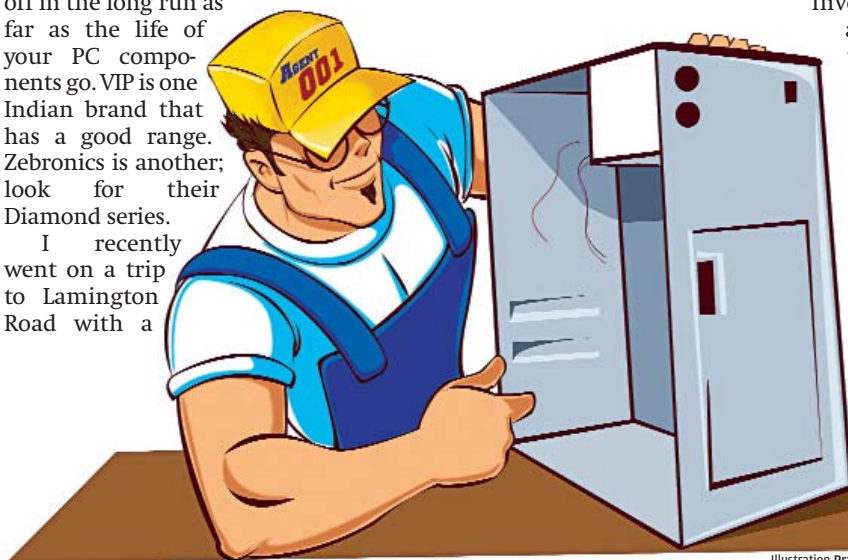
Dealer #2 had a couple of Zebronic models—Azalea (Rs 1,650) and Amazon (Rs 2,449), the former in quite an attractive case, while the latter had this huge fan that I personally felt was more of a fancy add-on. We came across a few power supplies worth a mention—VIP's 500 W model that costs a mere Rs 950, and a Zebronic 500 W for Rs 825. Both these weren't the true ratings, so we decided to give them a pass.

Moving on to the next guy, who seemed to have more stuff, we saw two beautiful Antec cabinets—an all-black SLK 3000B that costs Rs 3,200, and an all-aluminium Super Lanboy costing Rs 6,500. My friend shook his head: "Waaaaay out of my budget!" This dealer also had an Intex Nova cabinet, pretty cool-looking, for just 1,400 bucks. Also on display was another VIP offering, the TU150, which costs Rs 2,550. My friend liked one of the Zebronic models on display, called "Dragon" (he's somewhat of a Kung-fu fan!). This one was rather good-looking, and had two side fans, with the option of fitting even more fans inside. So that was done—one down, one to go!

We also saw an assortment of power supplies on offer, including a Vantec 460 W at Rs 4,000, and a few Antec models—the 350 W True Power (Rs 3000), the 400 W True Power (Rs 4,500) and a new 550 W Trio at Rs 7,900. All these are rated at their actual power values, so a 350 W Antec should be as good as a 450 W or even a 500 W regular PSU. Despite my rattling on about this, my friend just couldn't afford to invest in one of these power supplies (he'd already overshot his intended budget with the cabinet). So we settled for something decent—a 500 W VIP PSU for Rs 950.

That was that, a stable computing experience, with a little glitz courtesy the flashy cabinet at a bargain price of Rs 2,675—five minutes of haggling got me 75 bucks shaved off the price, so Rs 2,600 is what we finally paid.

The look of pride on my friend's face as he made home with his acquisitions was worth the weekend spent deal-hunting. Though, personally, I would rather he had bought a better power supply instead of a cool-looking cabinet. ■




Want more of Agent 001? Turn over to read his answers to your buying questions

Illustration Pradip Ingale

A Burning Question

Q I have lot of movies ripped to my hard disk; I want to take backups, and need a DVD-Writer. Please suggest a good one in the Rs 3,000 to 3,500 price range. I want a drive with the least compatibility issues, and it should be able to burn DVDs at reasonable speeds.

Santosh

 Sony's DRU-820A is widely available. It retails at Rs 2,750, and is a good buy. You will also come across a loose Sony DVD-Writer which retails at Rs 2,350—the difference is that the loose one is an OEM product, whereas the DRU-820A is a Sony boxed product. If you can't find the Sony drives, the Lite-On 1693S costs Rs 2,300.

I Need My Music

Q I have a budget of Rs 4,000 and want to buy a good MP3 player. What is the maximum capacity I can get within my budget, and what brand should I opt for?


Jackson Ouseph

 There are lots of MP3 players around, and recommending one is a bit difficult. First, don't opt for any of the cheap Chinese unbranded things that have flooded the market. If you are an Apple fan, you can get the new 1 GB Shuffle for Rs 5,000. If you want more features, look at Creative, especially their MuVo series. Transcend Tsonic MP3 players offer the best capacity for the price, and are a lot more dependable than the Chinese players. You should get a 1 or 2 GB Transcend player within your budget.

All(Most) Worked Out

Q I have a budget of Rs 18,000, and I want to buy a PCI-E graphics card. I have short-listed cards based on two chipsets—the NVIDIA GeForce 7600GT with 128-bit 256 MB memory and the GeForce 6800XT with 256-bit 512 MB memory. Is there a better option available?

Sanwal Chandra


 For the amount you've specified, I think you can easily get a 7900GT, which will outperform both the 7600GT and 6800XT chipset-based cards. XFX has a 7900GT that retails at Rs 18,500; contact Rashi peripherals on 28221013 / 1024, or drop in a mail to navinder@rptechindia.com for any queries regarding XFX graphic cards. We have also done an extensive graphics card shootout in our October issue.

Too Much For Too Less!

Q I have an AMD Athlon64 3000+ on an ASUS A8V-VX motherboard with 512 MB of memory. I want to buy a temporary graphics card till DirectX10 makes it to the market. I am also planning to increase my memory to 1 GB—is this recommended?

I also want to buy a racing wheel—the cheapest; I don't need it to be branded! And finally, an MP3 player with loads of space—an iPod would be great! I have just Rs 15,000 allocated for all these put together.

Ranjodh Dhaliwal


 Rs 15,000 is just too low a budget for your extensive upgrade plan. If you are inter-

ested in an iPod, the 30 GB model itself will set you back by Rs 13,000. As far as the graphics card is concerned, you can opt for a 7300GS card from XFX, Palit, or Zebtronics, which will cost about Rs 5,000. If you plan to upgrade again post-Vista, I don't recommend upgrading your memory now. Any upgrade now will require DDR2 memory, and your current DDR will be wasted. Racing wheels from Genius, Typhoon or Frontech are easily available; they are cheap and should suit your needs.

Nokia Or SE?

Q I want to buy a mobile phone, and I have narrowed down two choices—the SE W800i and the Nokia 6233, both retailing at around Rs 14,000. The 6233 has 3G and Edge, and it also records video at 640 x 480, whereas the SE W800i has great sound capability and can take good photos. So—which one?

Mansoor Khan


 First you need put down your needs. Will you spend more time listening to MP3s, or will you use your phone more for video shooting and as a digital camera? Apply the 60:40 or 80:20 rule, that is, 60 or 80 per cent of the time will be spent listening to music, and 40 or 20 per cent will be spent in imaging. In both cases, the SE W800i is what I recommend. It has better-quality headphones; with the Nokia 6233, you will need to buy a new headset. In the absence of 3G networks, support doesn't really matter; similarly, EDGE matters when you plan to use the phone for surfing the Internet using the phone as a modem—quite rare.

In sum, if you are looking for an all-rounder, opt for the Nokia 6233. For anything related to music, the SE phone beats its competitors.

Swearing By Sound

Q I have purchased a Nokia N91, but am not happy with the bundled earphones. Please suggest a good pair; I have a budget of Rs 3,000.


Surendra Patel

 We totally agree—the Nokia N91 needs a good headset! Give the Sony Fontopia MDR-EX71SL earphones a try; they sound really good. Also look for the Sennheiser MX-500 or PX100. The former is a earbud type, and the latter is an over-the-ear set. I recommend the PX100, which should be available for around Rs 3,000.

Bed Time

Q I wanted to know if you could tell me if there is any software which could automatically make my computer, using Windows XP SP2, hibernate or shut-down—that is, I configure it to make my system shut down after, say, a couple of hours. Is this possible? If yes, please recommend a good software.

Shashvat

 While there are lot of utilities out there which will help you with this, I recommend using a freeware utility from Beyondlogic. Download it from <http://www.beyondlogic.org/solutions/remoteprocess/beyondexecv205.zip> and follow the instructions to set the automatic shutdown procedure. ■

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.

Q&A

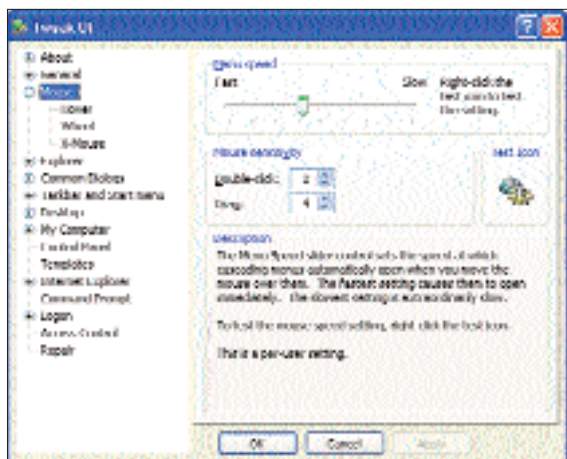
Your Questions, Our Answers

Quick-Start

Q Whenever I click on a folder in the Start menu, it seems to take ages to open. Is there any way I can speed things up a bit?

Madhav Kumar

A Yes, you can easily alter the speed at which these menus appear, and there are a couple of ways to go about it. Go to **Start > Run**, type in “regedit” in the dialog box and click OK. Navigate to **HKEY_CURRENT_USER\Control_Panel\Desktop**. In the right-hand pane, you should see a key called **MenuShowDelay** with a (default)



Adjust menu speed in TweakUI

value of 400. This is the number of milliseconds that elapse before Windows shows you a menu. Double-click on this entry and enter a lower value to speed things up. Alternatively, download TweakUI from www.microsoft.com/windowsxp/downloads/powertoys/xppowertoys.msp. This is a great tool that allows you to safely perform a number of tweaks without opening the Registry Editor. In the Mouse section of the program, you can adjust the “Menu speed” slider as required.

A Larger Clipboard?

Q I am using Windows 98, and I frequently copy and paste text and images from one document to other. The clipboard that's built into Windows is limited to holding one piece of text or one image at a time. So I have to constantly flick back and forth between files if I have to copy a number of items. Is there any way to increase the amount of information the clipboard can hold?

Senthil Venkataraman

A Windows 98 comes with a host of secret tools hidden on the installation CD—one of these tools is a handy little program called ClipTray, which greatly extends the capabilities of the clipboard. Install the Windows 98 Resource Kit from the **\Tools\reskit** folder of the Windows CD. Once this is installed, go to **Start > Programs > Windows 98 Resource Kit > Tools Management Console**. From here, you can launch ClipTray in the Desktop Tools section. Double-click on the new System Tray icon to add entries to the ClipTray list. Enter a title for your clipboard item and paste in the text you want and click in Add. When you have added a few entries, right-click on the System Tray icon and select which clipboard item you would like to paste.

Function-Key Frustration

Q I often need to boot my Windows XP computer into Safe Mode to fix problems—most of them created by me. The problem is only a minor niggle, that is, I find getting into the Safe Mode by pressing [F8] a bit frustrating, especially when I do not press the key at the right time and miss the train. Is there any way I can create a Desktop shortcut that shuts down my computer and restarts it in Safe Mode?

Vinit Prabhu

A There is no way to create a Desktop shortcut that restarts Windows in Safe Mode. But there is an alternative, which we think is worth mentioning and which you may find useful. If you have more than one operating system installed, you're presented with a boot menu that asks you which version of Windows you'd like to load. You can set up this feature to be able to choose whether you want to boot into Normal Mode or Safe Mode.

Right-click on My Computer and select Properties. Click the Advanced tab and then the Settings button under “Startup and Recovery”. Click the Edit button towards the top of the dialog box, and Notepad should open a file called boot.ini. Under the “[operating system]” line, you will see a line “multi(0)disk(0)...”. Copy this line and paste it on to the line below. Go to the end of this newly-added line and add a space, then `/safeboot:minimal /sos /booting`. Change the words inside the quotes to “Windows XP Safe Mode”. Close Notepad and save the file. When you restart Windows, you will see a menu asking you if you want to start Windows normally or if you want to use Safe Mode. The menu will automatically select normal Windows in 30 seconds.

Pop-Up Begone!

Q I have two 250 GB hard drives installed. Recently, I moved my Windows XP swap file to the second drive. I configured it to use all available free space thinking that I may never have to worry about running short of memory again. Everything is running smoothly, as I'd expected, apart from the nagging pop-up warning me that I am running out of free space on this drive. Since I have intentionally set this, I wish to get rid of this pop-up.

Ganesh Menon

A Windows XP balloon messages are generally a useful way to keep track of hard drive usage and this works well with most people. But there is always the odd occasion when they are an unwanted distraction. You can disable this warning completely by editing the Registry. Navigate to `HKEY_CURRENT_USER\SOFTWARE\Microsoft\Windows\CurrentVersion\Policies\Explorer`. Right-click in the right pane and then select **New > DWORD value**. Type in “NoLowDiskSpaceCheck” and press [Enter]. Double-click on this newly created value and set its Value data to 1. Click OK and close the Registry Editor, and restart Windows. You will no longer be bothered by the low disk space warning again.

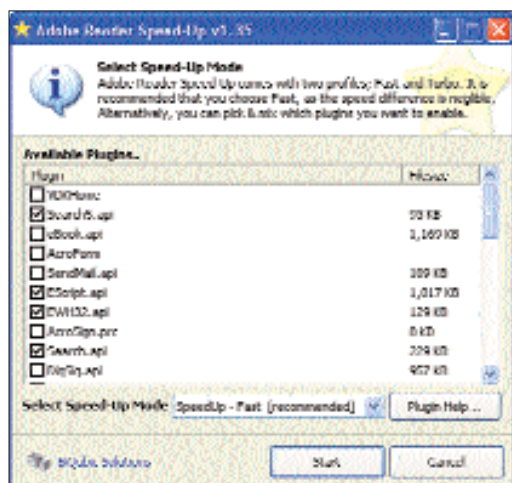
Your mail implies a very large swap file—this is overkill. Your PC isn’t going to need such a large swap file, and in its efforts to seek through it, you might actually experience performance lags. Our recommendation: set your swap file to be system-managed, and use the remaining disk space for something else—like ripping your CD collection to uncompressed audio formats.

Plugin Pain

Q My problem is that Adobe Reader takes a very long time to start up. Is there a way to speed it up?

Ali Asgar

A Adobe Reader can be a snail when it comes to starting up, because, in addition to loading the main program, it is also busy loading a ton of plugins that you may or may not need. And just for this, there is a program that lets you decide which plugins to load. This freeware program is Acrobat Reader Speed-Up, and can be downloaded from <http://tinyurl.com/symjd>. Simply download and run the program and select only those plugins you deem necessary. Leave the selection of plugins to default and click OK. The next time you load Reader, you’ll notice it starts up much faster.



Adobe Reader Speed-Up

Alternatively, you could try Foxit PDF reader—it’s fast and light on system resources, looks quite similar to Reader, and loads PDFs fast. You can find it on all *Digit* CDs.

Beyond Word

Q We are a group of college students. We want to start a small newsletter type of publication for our college. I feel MS Word is inadequate as a page layout software. Could you recommend a better software that is also easy to use? I don’t mind paying.

Niranjan Joshi

A If you are still looking for a dedicated program with which to create your newsletter, PagePlus is a good program available from www.serif.com. You can also visit www.freerisef-software.com where you can find and download several older versions of Serif programs free of charge. One of these free programs is PagePlus 5, which should definitely meet your requirements. You can design your page layouts from scratch or use one of the inbuilt templates to get started quickly. You can even try Microsoft Publisher, which will meet your needs if you don’t have large volumes of content.

Himem Harassment

Q I use Windows 98, and have been getting the following error message:
“The following file is missing or corrupted:
C:\WINDOWS\HIMEM.SYS
HIMEM.SYS is missing
Make sure that the file is in your Windows directory.
Windows has stopped. Press CTRL+ALT+DELETE to restart your computer.”

I am now unable to boot into Windows.

Pravin Dabhade

A To correct this problem, you’ll have to extract a new copy of Himem.sys from your Windows 98 CD. Boot from the Windows 98 CD or from the Windows 98 startup disk: insert the Windows 98 CD into the CD/DVD drive. Type in the following commands:

F: (assuming F is the letter of your CD/DVD drive)
CD\WIN98

```
extract /a /y /e /l c:\windows base4.cab himem.sys
```

Here, we’ve assumed that C:\Windows is the location where Windows 98 is installed. After the file has been extracted, restart your computer.

A Vanishing Act

Q I like to keep shortcuts on my Desktop to the Web sites I visit frequently. Some sites have their own logos, such as MSN’s butterfly, which makes it easy to identify them. But these icons periodically disappear, and are replaced with a standard Internet Explorer icon. How do I keep this from happening?

Sharad Mathur

A Web site designers can add a site-specific icon in two ways. One way is simple: They just include a file named favicon.ico in the root folder of the site. The other involves using a script and is less common. When you add a Favorite or create a URL shortcut, the special icon gets copied into your Temporary Internet Files folder (the browser cache). If you clear the cache, the icon will be lost. Even if you don’t,



...Create A Multi-Boot DVD

Wouldn't you like to be able to install Windows XP, Windows 98 and what-have-you from the same DVD?

Jayesh Limaye

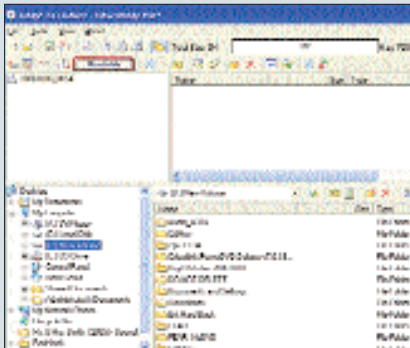
Here's how you can make your own multi-OS installer DVD—completely legal, and no piracy involved (as long as you don't go distributing these DVDs, of course!)

What you need:

1. Magic ISO Maker, a powerful CD/DVD image file creating, editing and extracting tool. It handles both CD and DVD image files, converts BIN to ISO and back, makes an ISO file from a DVD/CD-ROM or hard disk, and handles boot information. MagicISO can also make multiple boot CD/DVD image files. It is available from www.magiciso.com, is a 2.6 MB download, and costs \$29.95 (Rs 1,400).

2. A DVD writer and a few blank DVDs.
3. Your original operating system CDs.

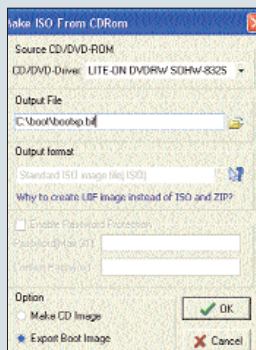
We shall take, as an example, a multi-boot DVD with your copies of Windows XP Professional and Windows 98.



The MagicISO interface

1 STEP Collect the bootable images from installation CD

Create a folder "boot" on the C drive. Insert one of the operating system's installation CD into the DVD drive. Click the "Make CD/DVD image file from CD/DVD-



Make an ISO from a CD-ROM

ROM" button to open the "Make ISO from CD-ROM" dialog. Choose CD-ROM, and select an appropriate output file name like bootxp.bif with the path to save set to C:\Boot, and choose "Export Boot Image". Repeat this for Windows 98 and call its boot image boot98.bif.

2 STEP Make the multiple OS DVD compilation

In MagicISO, click the "Create new image file" button on the toolbar. Click the folder-shaped button to create the "WinXP" folder in the root directory. Insert the Windows XP Professional CD and copy all its contents into this folder. Click the Save button to save the compilation as C:\multiboot.iso. Eject the CD and insert the CD of the next operating system into the drive. Create a folder with an appropriate name and repeat the above procedure.

Open C:\multiboot.iso with MagicISO. Hold down [Ctrl], and use the mouse to drag the "WinXP\i386" folder to the root directory. Right-click on "i386" to rename it to "iWXP". Repeat the steps for Windows 98, calling it iW98, for instance.

Copy the files "WinXP\WIN51", "WinXP\WIN51IP" and "WinXP\WIN51IP.SP2" to the root directory. Now create a folder called "iWXP" in "c:\boot". Extract the "iWXP\SETUPLDR.BIN" file to "c:\boot\iWXP":

1. Select the \iWXP\SETUPLDR.BIN file.
2. Click the button to extract the file to "c:\boot\iWXP".

Open "c:\boot\iWXP\SETUPLDR.BIN" with a Hex Editor—UltraEdit is a good example.

Replace all instances of "I386" with "IWXP" (Use upper-case letters). Copy c:\boot\iWXP\SETUPLDR.BIN back to "iWXP\SETUPLDR.BIN" in the multiboot.iso that you have open.

From the open multiboot.iso, extract "iWXP\TXTSETUP.SIF" file to "c:\boot\iWXP":

1. Select the "iWXP\TXTSETUP.SIF" file.
2. Click on the Extract button to extract the file to "c:\boot\iWXP".

Open "c:\boot\iWXP\TXTSETUP.SIF" with Notepad. Replace all instances of "[SourceDisksNames.x86]" with "IWXP"

c:\multiboot.iso.

Now insert the Windows 98 CD and drag the Win98 folder to the root.

3 STEP Make the multi-boot DVD image file

Click on the "Make multi-boot CD/DVD image file" button to open the Multi-Boot Image Editor. Click "Add..." to add an item to multi-boot image file. The Bootable Wizard will open and guide you. Choose "Boot from bootable image file" and click Next to go to the next step. Choose the "From Local Computer" option, input "C:\boot\bootxp.bif", and click Next to go to the next step. Input the menu description of Window XP, and set "Hot Key" to "1". Click Finish to complete the Windows XP bootable item.

Now click again on "Add..." to add one more boot item. Repeat this for the Windows 98 bootable image file.

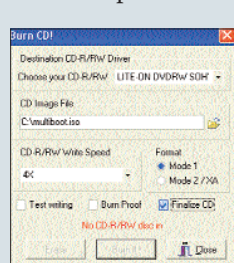


The bootable Wizard for the first OS

Now, in the Multi-Boot Image Editor, select an item that you wish to make the default boot option and click on "Set Default". Click on the Save button to save the multi-boot image file to c:\boot\multiboot_boot.mbi.

4 STEP Finalising and burning the DVD

Open C:\multiboot.iso again.



Burn the multi-boot DVD

Click on "Load boot image ..." to open the "Bootable Option" dialog. Choose "From multi-bootable image file" and select "c:\boot\multiboot_boot.mbi". Save the ISO.

Now go ahead and burn the DVD! ■
jayesh_limaye@thinkdigit.com

On The Right Side Of The Law

Q I am building a PC for myself for the first time and have a copy of Windows XP that came with a laptop that I bought last year. Is it legal to install this version on my new PC with the same CD key as my laptop? Also, can I make a recovery CD for my home-built computer like the CDs you get when you buy certain branded computer systems?

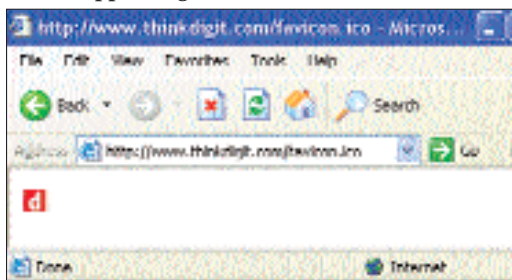
Nikhil Vaidya

A The copy of Windows XP that came with your laptop is only for use with that laptop. According to the EULA, you are legally entitled to install Windows XP if you completely remove it from the laptop and then install it on

another computer, but using it on two machines is a strict no-no. The only solution for you is to purchase a second copy of XP.

A recovery CD restores a PC to its factory-fresh state. This won't take into account any programs you have installed in addition to Windows. A better solution is to use a program such as Acronis TrueImage from www.acronis.com, or PowerQuest Drive Image from www.powerquest.com. These programs make a complete copy or image of your hard drive, which you can store on one or more CDs. You can re-apply this image to your PC to restore it to a fully-working state following a crash. What's more, the image can even be updated to take account of any new programs you have installed.

sooner or later it will be pushed out of the cache by newer content. As long as the site uses the simple favicon.ico technique, you can prevent this disappearing act.



Save the icon of your favourite Web site

Open Internet Explorer, click the Address bar, and type the site's domain name followed by a slash and favicon.ico—for example, www.thinkdigit.com/favicon.ico. Your browser should now display the desired icon. Right-click the icon and choose Save Picture As to save a copy of the icon on your own computer. Next, right-click the URL shortcut or Favorite and choose Properties. Click the Change Icon button, click the Browse button, and select your saved icon. This one won't disappear on you!

Friendly Transfer Please

Q I have Windows XP and a broadband connection. I have a registered Web site where I wish to upload files so my friends can access them. I have tried various FTP programs, but have found them really confusing. Is there any easy way to upload to Web sites?

Malkit Singh

A Windows XP supports FTP, so you can connect to your Webspaces as you would any to folder on your hard drive.

Make sure you have your FTP address at hand along with your username and password before clicking on Start > My Network Places. When the window opens, click "Add A Network Place", then click Next. You can work your way through the Wizard, entering your FTP address and username. When you double-click the new icon that gets created, you will be connected to your Webspaces and be

prompted for your password.

You can cut out many of the steps of the Wizard by entering the following information when asked to enter the Internet or Network Address: `ftp://username:password@ftpaddress`. Here, replace "username", "password", and "ftpaddress" with your actual login information, and a new shortcut will be created for you in one step.

CoffeeCup Free FTP (<http://www.coffeecup.com/free-ftp/>), Free FTP (<http://www.brandyware.com/free.htm>), and Core FTP Lite (<http://www.coreftp.com/>) are some free FTP tools you may wish to try.

SP2: Service Pack Or Space Pincher?

Q After I installed XP's Service Pack 2, I found that I've lost a substantial amount of disk space. I don't think SP2 requires that much disk space. How can I reclaim at least some of it?

Mohit Sharma

A You're right—Windows XP SP2 does not require all that much space on its own, but it does leave behind a lot of files that you really don't need.

The first, usual culprit is a very large Restore Point in case the System Restore feature is active on your installation of Windows XP. You can remove all but the most recent Restore Point quite easily. Go to Start > All Programs > Accessories > System Tools > Disk Cleanup. Select Drive C and click OK. Then click on the More Options tab. Next, click on the Clean Up button at the bottom and click Yes when asked if you want to delete all but the most recent Restore Point.

You can also remove the uninstallation information for SP2. This, too, is quite simple. All you need to do is delete the NTServicePackUninstall folder, which you will find in C:\Windows. If you can't find the folder, select Folder Options from the Windows Tools menu, and when the dialog box appears, click on the View tab. Select the option to "Show hidden files and folders", and the folder should become visible.

You could also find that you have a large folder called C:\Windows\Software Distribution\Download, which, too, can be deleted. ■



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!

Sanket Naik

More than a year has passed since we did our last processor shootout, and the decision to schedule it close to the end of the year has paid rich dividends—we have a special first look at the Intel's new Quad Core Extreme QX6700.

Before we get into the core of the matter (pun intended), let's do a small recap of the things that have happened in the last year or so. To begin with, Intel's Pentium 4 processors were thrashed like never before by AMD's Athlon64 series. Marketing was still focused around the GigaHertz craze, with Intel promising to break the 4 GHz barrier, but their plans took a beating.

AMD, on the other hand, moved away from the traditional GigaHertz performance metric and proved that the key was in the architecture of the processor. Intel, not to be outdone, fired another salvo at AMD by launching the first Dual

core processor—two separate processors slapped on to one die—after all, the GigaHertz race held no significance now and there was need for a new buzzword. AMD shattered Intel's hope of dominance by launching their dual core Athlon64 X2 processors, which outstripped the Intel line by a mile.

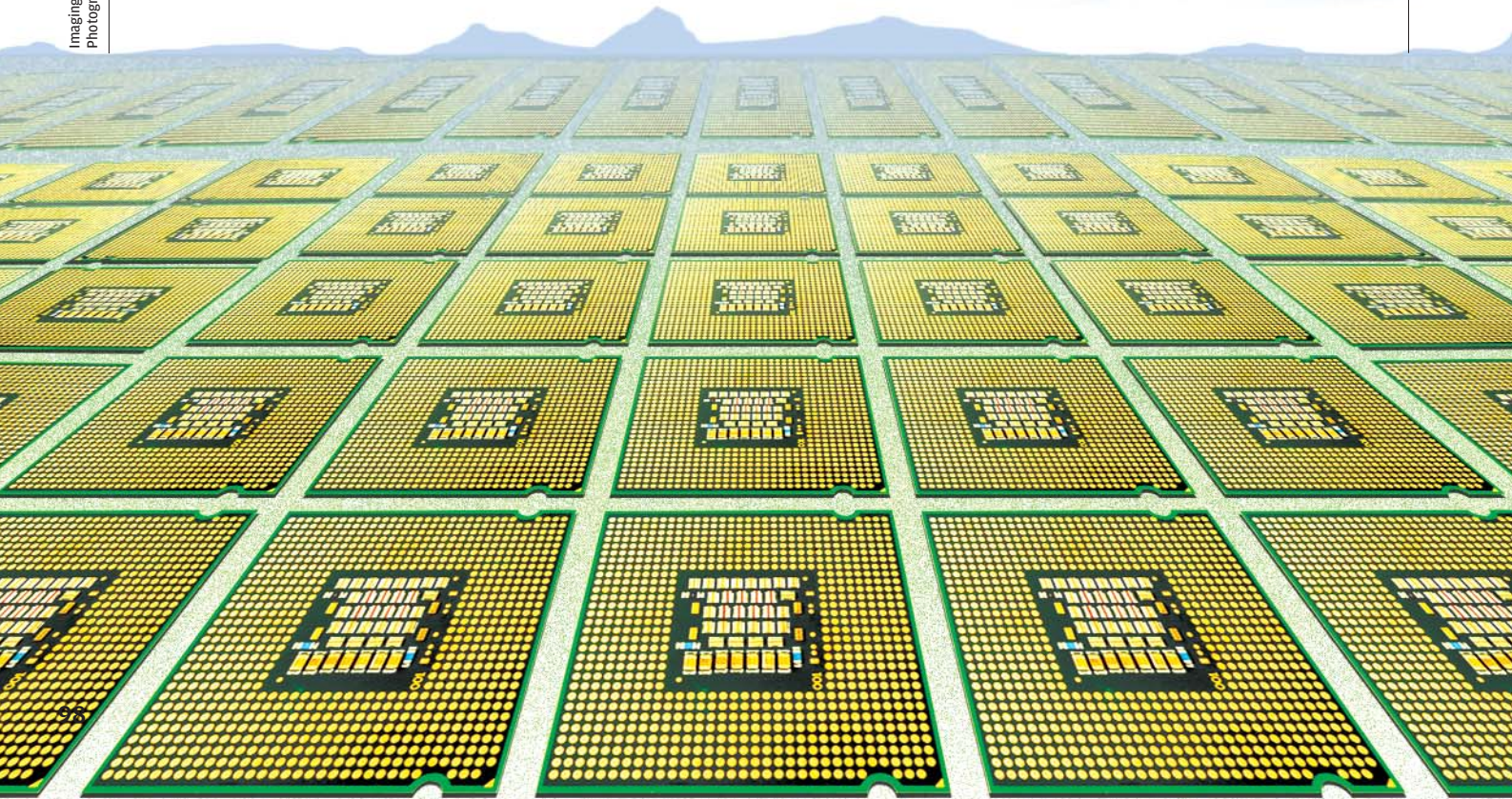
Finally, now, Intel sets the scores right. The new desktop processors were redesigned from scratch and introduced as the 'Core' architecture. As we will see further in this article, no processor can stand up to the might of these new Core processors—they butcher the competition.

This isn't the last of AMD though; it's just the beginning of another battle. If the Hammer and Sickle changed the course of the Second World War, the Hammer and Core are sure to change the course of desktop computing. What we have experienced during the test is an unprecedented level of processing power made available on your little old desktop!

Let's begin the analysis with real world applications such as gaming and multimedia—the most taxing of the processors' tasks. Gaming and multimedia applications stress almost every part of the processor—the ALU, FPU and the Cache.

Greener Cores, Meaner Scores

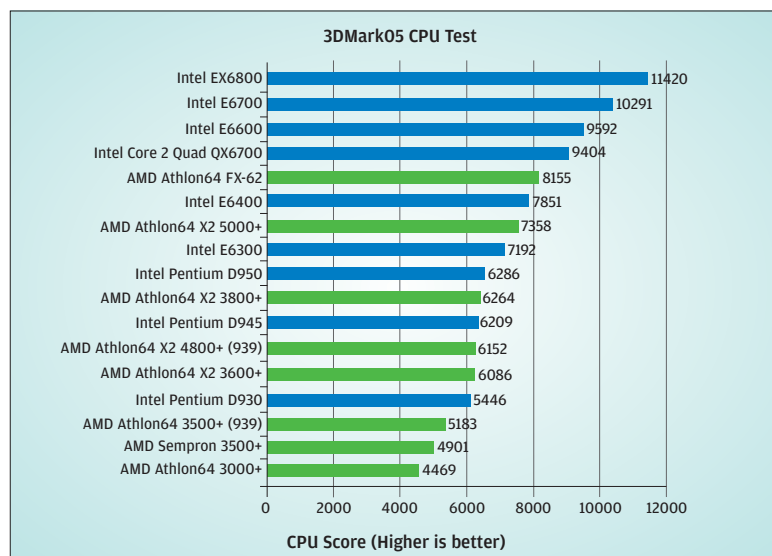
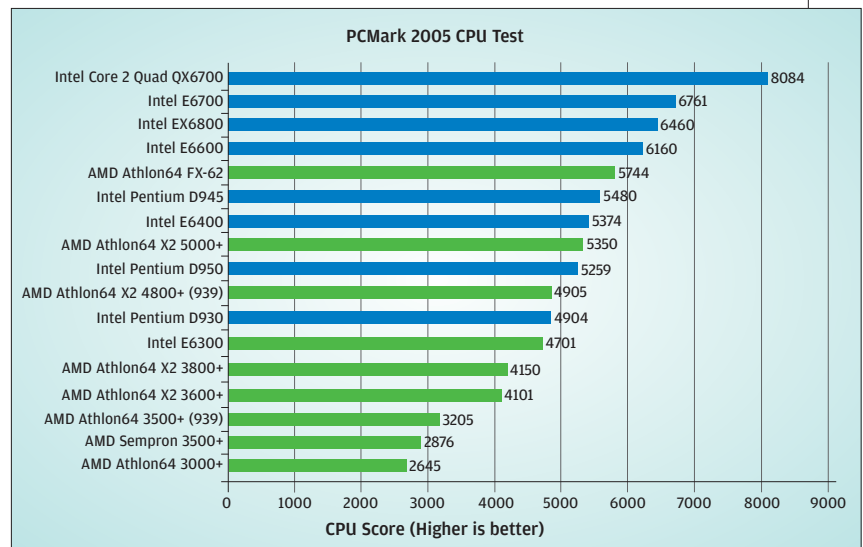
We pitted the latest and fastest processors to grace the planet from AMD and Intel. To spice up the test, we also managed to get our hands on the yet to be launched Intel Quad Core processor—let the games begin!!



Gaming and Multimedia

PCMark05

The latest Quad Core QX6700 from Intel makes an impact by delivering unbelievable scores. In this test, it outperforms the Core 2 EX6800 by a delightful 25 per cent and the AMD FX-62 by 40 per cent—superb! Except for the lower-end Core 2 E6300, all other Intel Core 2 processors were ahead of their respective AMD counterparts. The AMD FX-62 was the only processor that could compare with the new Intel processors. The older Pentium D processors can hardly match the performance of the new Intel Core 2 Duos—it's about time to bid them adieu. What's interesting to note is the performance gap between the best performer and the worst is around 300 per cent; we have never come across such figures.

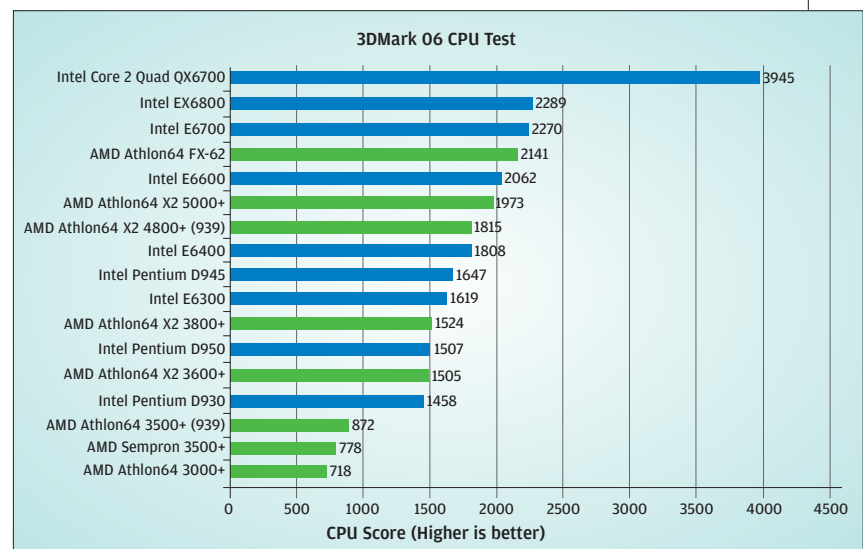


3DMark05

Here the Core 2 EX6800 takes the mantle by posting a brilliant score of 11K, which is nearly 40 per cent better than the AMD FX-62. The E6700 which retails for nearly half of the EX6800; delivers just 10 per cent less, making it an excellent performer for the price. Interestingly, the QX6700 (Quad Core) is behind both the Core 2 Duo processors, though this is more a limitation of the benchmark than the processor itself. Writing applications for the Quad Core will require proper optimisation if we are to see it delivering the best performance possible. Apart from the FX-62 and the 5000+, none of the AMD processors deliver respectable performance. The Core-based processors completely outshone the older Pentium Ds.

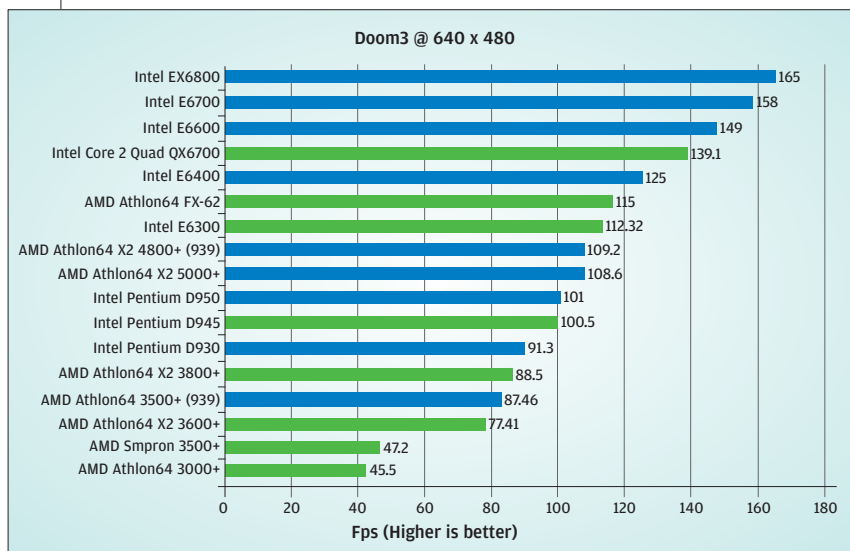
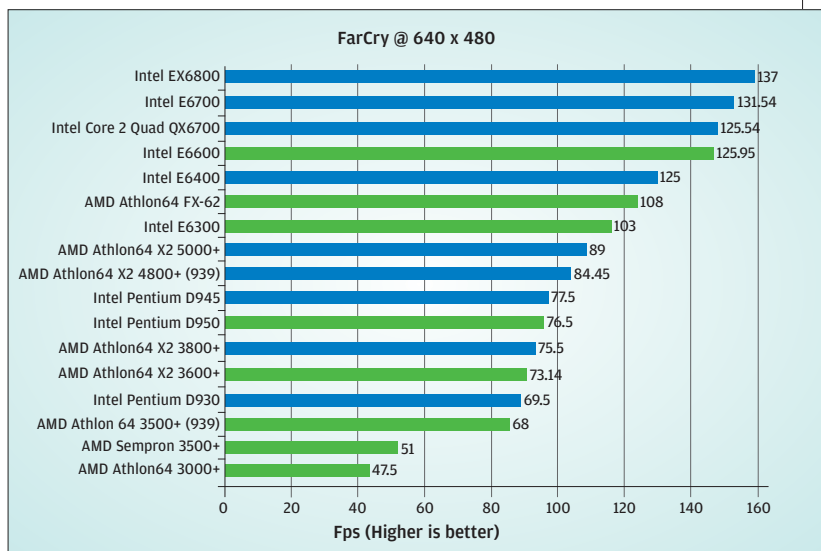
3DMark 06

3DMark06 is a relatively new benchmark and hence makes the most out of newer hardware—this is evident from the scores we see. The QX6700 came out tops, posting the best score—nearly 72 per cent higher than the EX6800 and 84 per cent over the AMD FX-62. The rest of the graph is nearly identical to the ones we have seen before. The AMD AM2 processors hardly match the Core 2 Duo and the older Pentium D series is completely overshadowed by its successor.



Far Cry

Intel's new Core 2 Duo processors beat the AMD and the older Pentium D processors by obscene margins. This is exactly the reverse of what happened when AMD launched their FX range of processors a year ago. The Intel EX6800 gives a 33 per cent better performance than the AMD FX-62 processor—a huge difference when it comes to gaming. However, the QX6700 (Quad Core) is marginally behind the EX6800, but that's expected—we will see better performance numbers only when games are optimised to take advantage of the extra cores.

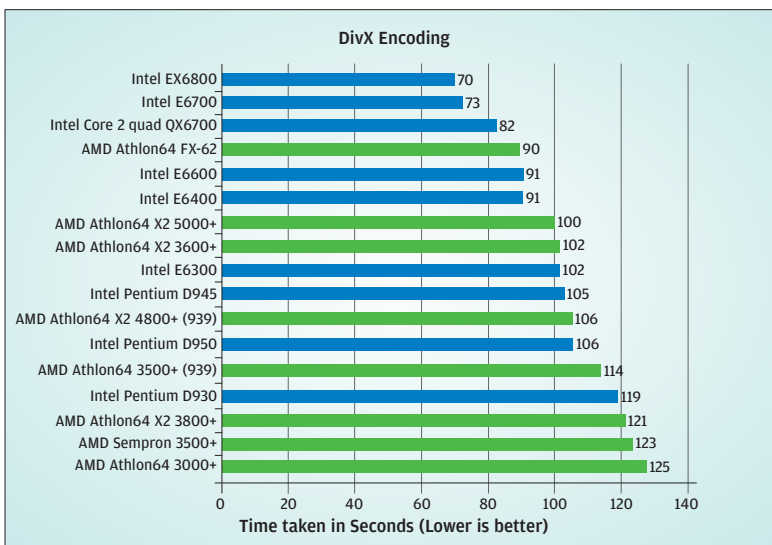


Doom 3

The story repeats here—the Core 2 EX6800 posts the best scores, followed by the E6700 and the E6600. The QX6700 expectedly lags behind. The AMD FX-62 gets beaten by even the lowly E6400—and it's priced at a third of the FX-62's tag. Moreover, the E6300—the lowest in the Core 2 Duo—performs better than the Athlon64 X2 5000+ AM2 processor.

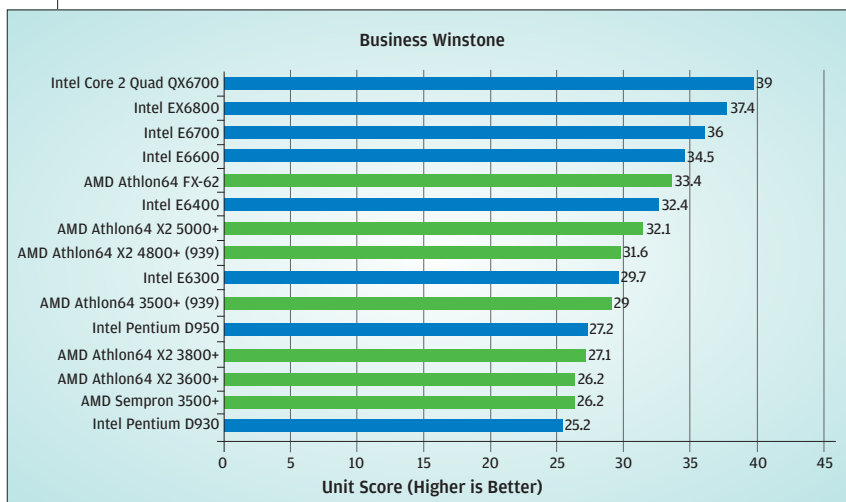
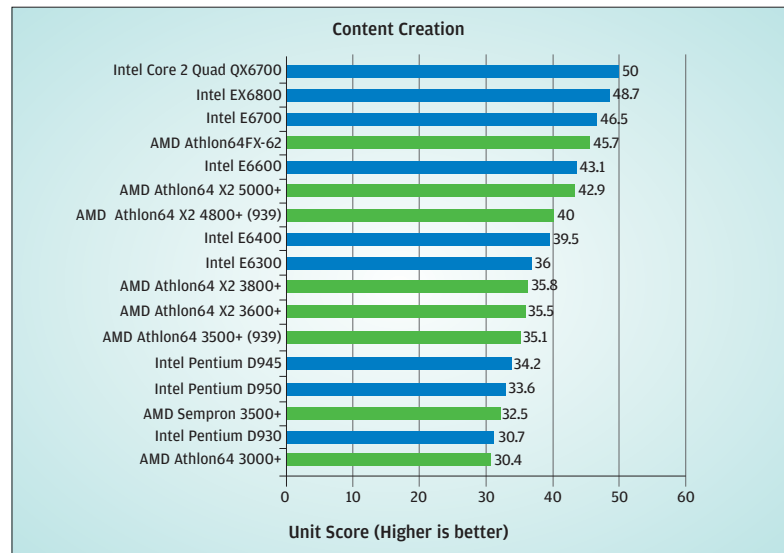
DivX Encoding

While DivX encoding has been the traditional playground for Intel processors largely due to the optimisation done in their favour, it's worthwhile to see how much of a difference it makes in real life applications. Here too, the Core 2 EX6800 tops the charts by completing the encoding in just 70 seconds. It's followed closely by the E6700 and the QX6700. AMD's FX-62 takes another 20 seconds more to complete the task. The lower-end E6600 and E6400 still offer better performance than the respective AMD processors. Strangely enough, the AMD X2 3600+ took less time than the AMD X2 3800+.



ZD Content Creation 2004

In this content-driven benchmark, the QX6700 takes the lead over the EX6800. The performance gap isn't significant, but the increment is proportional to the performance on offer. AMD's FX-62 is right among the big boys, as expected in real-world scenarios. The E6600 and AMD Athlon64 X2 5000+, for the first time, are on an even playing field. The E6300, despite running at a measly 1.86 GHz, stays ahead of AMD Athlon64 X2 3800+. The Pentium D series is starting to show its age and are left behind in the company of the Sempron and Athlon64 3000+.



ZD Business Winstone 2004

The graph is nearly identical to what we saw in the content creation benchmark, save some minor changes. The Intel processors were on top, displacing the AMD FX-62 to fifth position. Sadly enough, the AM2 processors from AMD hardly live up to the competition and are thrashed even by the E6300.

Conclusion

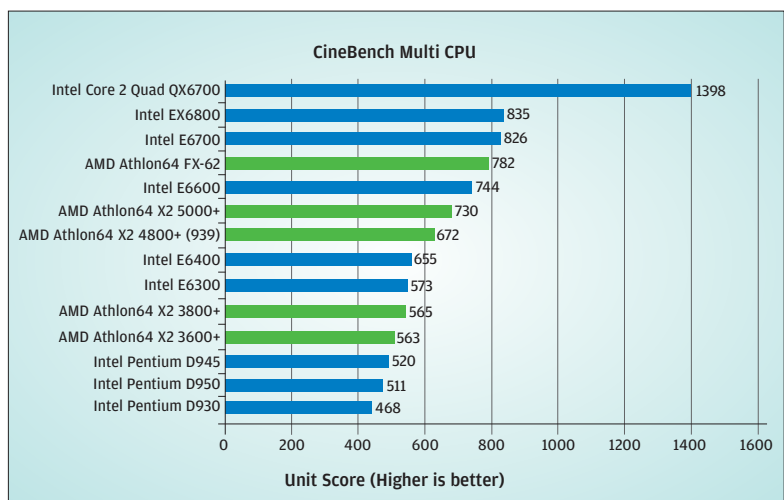
As opposed to last year, when AMD ruled the gaming and multimedia arena, the tide has now turned to Intel's favour. Processors based on the Core architecture are running riot and are brutally beating the processors from AMD. The addition of DDR2 support doesn't seem to have worked in AMD's favour. If you are interested in building a gaming or multimedia machine, the Core 2 Duo-based processors are your best bet. While the EX6800 is way too expensive, the E6600 and E6700 are the processors to grab.

3D Rendering Benchmarks

Cinebench 9.2

3D rendering is the most demanding of applications and puts a heavy load on the processor. In fact, while rendering, the PC becomes useless for any other work. Cinebench 9.2 takes full advantage of multi-processor environments.

The Quad Core QX6700 simply outstripped all other processors in this test. While the near-double score speaks for the performance of the four cores, it also offers a glimpse of what multi-core processors can actually deliver in the right ecosystem. While this multi-CPU test takes around 40 seconds to complete on any other processor, the quad core finished it in just 12 seconds by dividing the work load into four equal parts. The rest of the processors scale proportionally to the performance on offer as seen in the graph.

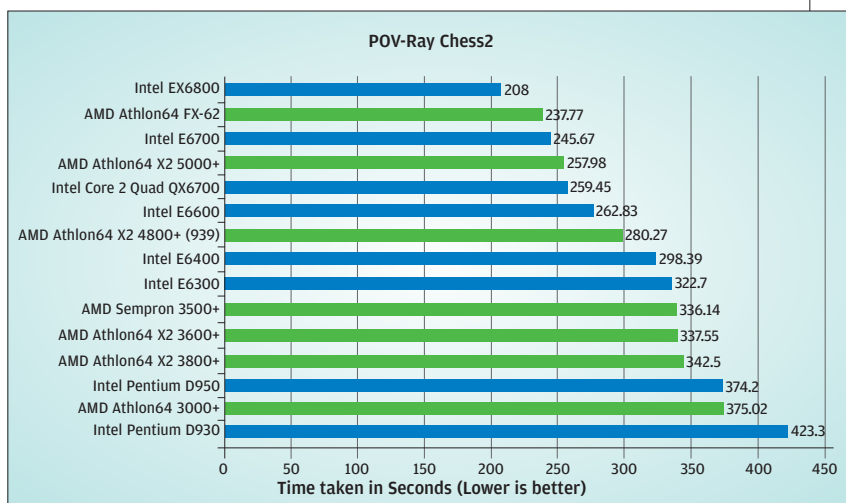


POV-Ray 3.6

Raytracing is one of the most mathematically intensive operations a processor can perform—the process involves casting rays of light from a virtual “camera” on to the 3D scene and calculating their paths. As seen from the graph, the EX6800 renders the image in the shortest possible time. The AMD FX-62 breaks into second place—no surprises; AMD processors have been known for great ALU performance, which really counts in raytracing. The Athlon64 X2 5000+ comes in at third place ahead of the Quad Core—proving again that the QX6700 requires optimisation to perform.

Conclusion

Intel is right at the top with its Core architecture based CPUs. Most of the professional 3D tools have already migrated to multi-threaded environments, and that's good news because the Quad Core shines here. Though we have just tested the Quad Core with CineBench this time, we will definitely be putting it through

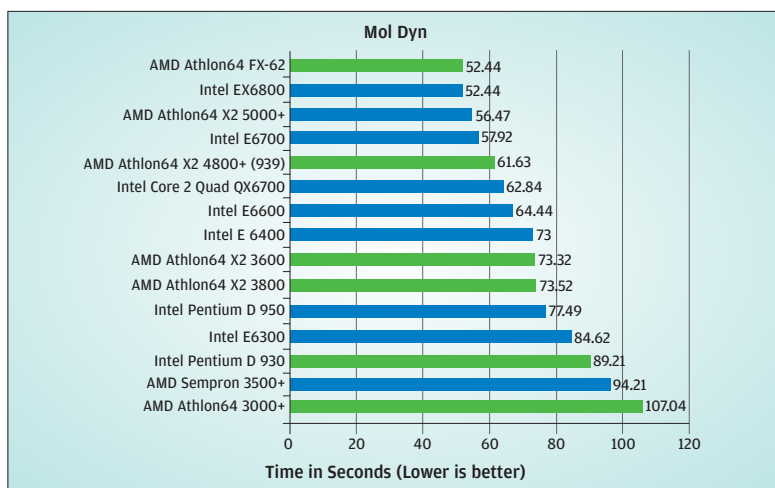
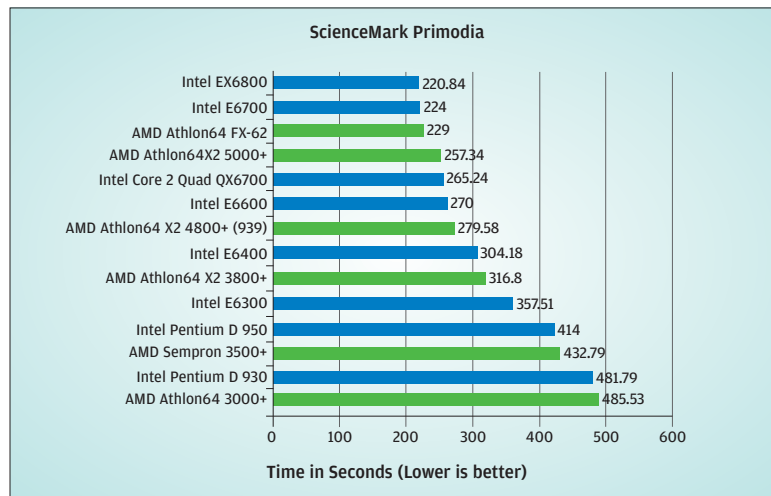


rigorous 3D rendering tests in the coming months. Right now, Quad Core just relishes multi-threaded applications, boosting their performance to levels never before seen on desktops.

Number-crunching Tests

ScienceMark 2.0 Primordia

Here the EX6800 was on the top of the chart followed by its lower-clocked sibling, the E6700. AMD's FX-62 managed to get in the third spot followed by the Athlon64 X2 5000+. These figures are quite similar to what we saw in the last test too. AMD processors generally do better in scientific tests—scientific calculations generally involve iterations, and the shorter pipeline and highly optimised cache offer a better performance when running loops.

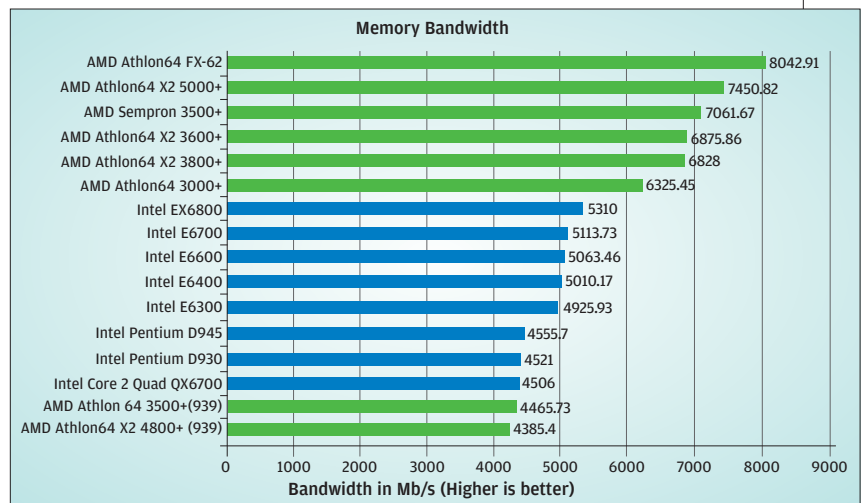


ScienceMark 2.0 Mol Dyn:

Again, the AMD FX-62 shows its dominance in this test, matching the Core 2 EX6800. The Athlon64 X2 5000+ comes in at third spot. The Quad Core is completely left out—this might have to do with its thirst for multi-threaded applications. The other AMD Athlon64 X2 processors are on par with the respective Core 2 Duo performances.

ScienceMark 2.0 Memory Bandwidth

Surprised? Don't be! The onboard memory controller design in AMD's K8 range of processors is very efficient and offers huge bandwidth. In fact, even the Athlon64 AM2 3000+ offers a higher bandwidth than the EX6800. What we are talking about here is the available bandwidth and how effectively it is utilised. The Quad Core is way down on the list, and that might be due to the overheads introduced by the interface between processors. The Quad Core is actually two dual cores slapped on to become one, which isn't really an ideal design.



How we Tested

We chose benchmarks that would stress the processor to the hilt. We also made sure that the benchmarks had a low level of sub-system involvement to obtain true processor performance.

All Intel LGA 775-based processors were plugged into Intel's D975XBX motherboard with 2 GB of Corsair 800 MHz memory with 4-4-4-12 timing figures. For the AMD AM2 platform, we used ASUS' Crosshair motherboard with 2 GB of Corsair 800 MHz memory. For the 939-pin processor, we used ASUS' A8R32-MPV deluxe with 2 GB of Corsair DDR 400 MHz memory.

Windows XP with SP2 was freshly loaded on a Seagate 7200 RPM SATA drive. XFX 7900GTX card was the standard graphics card used with both platforms.

Gaming and Multimedia

PCMark 05, 3DMark05 and 3DMark 06

These benchmarks from FutureMark are widely used to gauge the performance of a system, on a system as well as sub-system level. Though mostly related to graphics performance, each of these benchmarks has a well-developed CPU test that taxes the processor to its maximum. We used the default setting and chose only the CPU test. Each test was run three times before noting down the scores.

Far Cry and Doom 3

Both these games boast of high graphical details and are quite taxing on the processor making them ideal processor benchmarks. We ran both at 640x 480, 800 x600 and 1024 x 768 resolutions to put the maximum possible stress on CPU and not the GPU—at lower resolutions, games offload more tasks on to the GPU.

Ziff Davis Multimedia Content Creation and Business Winstone

Multimedia Content Creation and Business Winstone run applications such as Adobe Photoshop, Adobe Premiere, WaveLab, anti-virus, compression, word-processing, etc. The result is a unified score that reflects the performance of the system as a whole.

DivX Encoding

We encoded a 100 MB VOB file to DivX using the DivX converter tool. The time taken to encode the file was noted down with each processor. The benchmark was run thrice for each processor.

3D rendering benchmarks

Cinebench 9.2

Cinebench 2003 is the free benchmarking tool for Windows and Mac OS based on the 3D software Cinema 4D engine. Cinebench

2003 delivers accurate results by testing the processors' raw processing speed with OpenGL, multithreading and multiprocessing. This benchmark was used to indicate the performance gain due to multi-processing.

POV-Ray 3.6

The Persistence Of Vision Raytracer, a tool that allows creating an image by mathematical calculations. The number-crunching involved is purely processor-intensive, which is why it works as a great processor benchmark. In the default installation we used the 'Chess2' and 'landscape' to be rendered at 1024 x768 resolution without AA.

Kirbi Bench 1.1

Another rendering benchmark, based on the Kirbi engine developed by Adept software. This tool also consists of many models with multiple light sources, and the rendering is done real time. The score is given in terms of frames the processor is able to churn out.

Number-crunching Tests

ScienceMark 2.0

ScienceMark 2.0, as the name suggests, is a benchmark based on scientific calculations. It consists of multiple benchmarks that test the various aspects of a processor. We used the MolDyn, Primordia and Cipher test.

WinRAR 3.6

WinRAR 3.6 offers an inbuilt benchmark, operating on some random data which is processed in the memory. Since the data is operated on in the memory, the results are free from any influences that the hard disk's performance may have on it.

SiSoft Sandra 2007

This is the good old benchmarking tool with new features and tests added to it. We logged scores particularly related to the CPU—Dhrystone, Whetstone, Multimedia Index (Integer and Float) and Cache performance with a 4 MB data block.

Super Pi

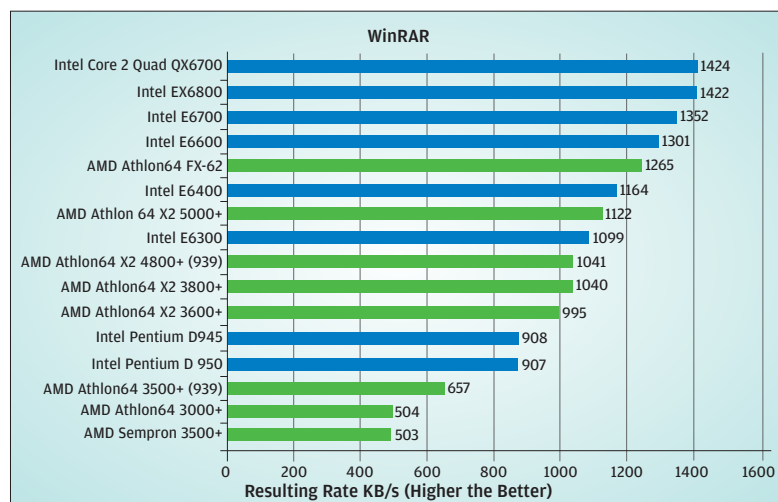
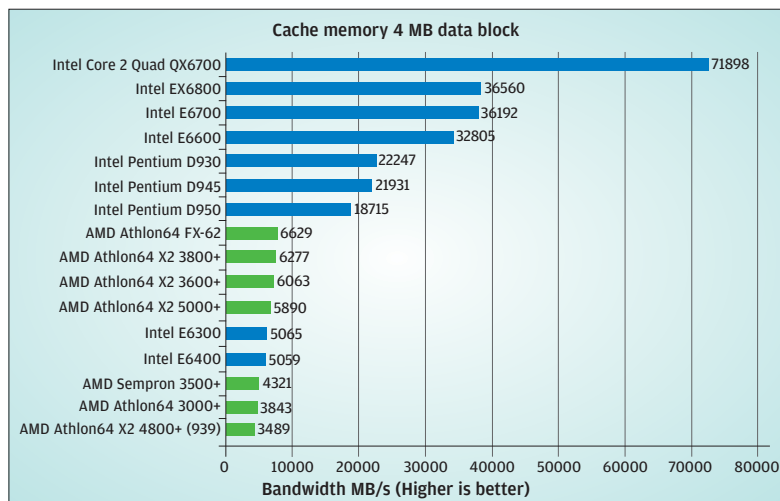
A small utility that calculates the value of pi up to 32 million places. We used the utility to calculate the value of pi, starting from 120,000 places right up to 8 million. The time taken to complete the calculation was noted down in each case.

Scoreboard								
Processor Intel								
BRAND	Intel	Intel	Intel	Intel	Intel	Intel Core 2 Quad	Intel	Intel
MODEL	Core 2 Duo E6300	Core 2 Duo E6400	Core 2 Duo E6600	Core 2 Duo E6700	Core 2 DuoEX6800	QX6700	PentiumD 930	PentiumD 945
Features								
Number of Cores	2	2	2	2	2	4	2	2
Platform	LGA 775	LGA 776	LGA 777	LGA 778	LGA 779	LGA 780	LGA 783	LGA 782
CPU frequency (GHz)	1.86	2.13	2.4	2.66	2.96	2.66	3	3.4
L2 Cache (MB)	2	2	4	4	4	8	4	4
Performance								
Number Cruching Tests								
ScienceMark 2.0								
Primordia (Sec)	357.51	304.18	270	224	220.84	265.24	481.79	416
Mol Dyn (Sec)	84.62	73	64.44	57.92	52.44	62.84	89.21	76.18
Cipher Bench (Sec)	15.71	13.34	11.84	10.69	10.18	11.79	15.91	13.64
Membench								
L1 / L2 Cache	49961/15647	57323/17865	63014.1/20142.4	71464/22385	74457/24568	73542/22353	NA	NA
Memory (MB/s)	4925.93	5010.17	5063.46	5113.73	5310	4506	4521	4555.7
SiSoft Sandra 2007								
Arithmetic Benchmark								
Dhrystone/Whetstone	16901 / 11666	19389/13355	21874/15049	24325/16751	23548/18310	46224/31361	13091/10705	14804/12157
Multimedia Benchmark								
Integer/Float	100077/54346	114635/62239	129249/70197	143964/78177	147248/83316	268955/146038	33111/37847	37582/43070
Cache Memory (4MB score)	5065	5059	32805	36192	36560	71898	22247	21931
Super Pi								
1 M/4 M/8 M (seconds)	30/156/340	26/141/309	21/117/272	19/110/246	17/99/223	19/117/262	44/222/490	39/211/434
WinRar 3.3								
Resulting Rate (KB/s)	1099	1164	1301	1352	1422	1424	853	908
3D rendering benchmarks								
Cinebench 9.2								
CPU Benchmark								
Rendering 1 CPU/CPU	311/573	355/655	397/744	438/826	488/835	437/1398	249/468	286/520
POV-Ray 3.16								
Chess2/Landscape (1024x768)	322.7/1885.2	298.39/167.02	262.83/149.56	245.67/132.67	208/120	259.45/139.86	423.3/227	397.67/202.63
Kirbi Bench								
Kirbi bench Score (out of 6)	2.33	2.61	2.99	3.28	3.83	4.91	1.61	1.39
Media Encoding Tests								
Content Creation tests								
Content Creation 2004	36	39.5	43.1	46.5	48.7	50	30.7	34.2
Business Winstone 2004	29.7	32.4	34.5	36	37.4	39	25.2	27.1
DVD to DIVX (Dr.DivX)								
Time taken to rip (Sec)	102	91	91	73	70	82	119	105
Graphics and Gaming Tests								
PCMark 2005								
CPU Score	4701	5374	6160	6761	6460	8084	4904	5480
3DMark2005								
CPU Test	7192	7851	9592	10291	11420	9404	5446	6209
3DMark2006								
CPU Test	1619	1808	2062	2270	2289	3945	1458	1647
Far Cry								
640x480/1280x1024/1600x1200	95.13/94.04/96.85	108/105/105	125/125/124	131.54/131.5/133.5	137/138/132	125.95/117.49/126.49	69.5/71.9/70	77.5/78.2/78.6
Doom 3								
640x480/1280x1024/1600x1200	112.32/112/112	125/124.5/125	149/148.2/148.2	158/157/157	165/167/167	139.1/138.1/138.5	91.3/90.8/90.9	100.5/99.1/100.4
Final Score								
Performance (out of 80)	42.11	46.87	53.68	58.76	62.19	64.84	33.73	37.29
Price Index (out of 20)	7.27	6.03	4.32	2.55	1.40	1.35	7.78	7.00
Grand Total (out of 100)	49.39	52.90	58.00	61.30	63.59	66.19	41.51	44.29
Price Rs.	9,625	11,600	16,200	27,500	50,000	52,000	9,000	10,000
Contact Details	+ Good performance for the price - Slightly expensive for its category	+ Good processor for a gaming machine - Only 2MB of cache	+ The ideal gaming processor - Currently overpriced, would be an ideal buy in the coming months	+ Superb performer, 10 per cent less than the Extreme version - A little overpriced	+ The best dual core processor on the market - Expensive	+ 8 MB cache and the best processor available for desktop - Requires multi-threaded application support	+ 4 MB cache - Too expensive for the performance on offer	+ 4 MB cache - Too expensive for the performance on offer
Intel: Saranya Rustagi saranya.rustagi@intel.com Ph: 080 25075000								
AMD: Rohit Verma rohit.verma@amd.com Ph: 080 41372400								

	Processor AMD							
Intel	AMD Sempron	AMD Athlon64	AMD Athlon64 X2	AMD Athlon64	AMD Athlon64 X2	AMD Athlon64 X2	AMD Athlon64 X2	AMD
PentiumD 950	3500+ AM2	3500+ (939)	4800+	3000+ (AM2)	3600+ (AM2)	3800+ (AM2)	5000+ (AM2)	Athlon64 FX-62
2	1	1	2	1	2	2	2	2
LGA 781	Socket AM2	Socket 939	Socket 939	Socket AM2	Socket AM2	Socket AM2	Socket AM2	Socket AM2
3.4	2	2.2	2.4	1.8	2	2	2.6	2.8
4	128 KB	512 KB	2	1	512 KB	1	1	2
414	432.79	403	279.58	485.53	322.07	316.8	257.34	229
77.49	94.21	83.43	61.63	107.04	73.32	73.52	56.47	52.44
13.88	13.22	12.37	11	14.07	13.15	13.12	10.11	9.63
NA	23030.87/3116.93	25256.14/8048.56	27464/8678.14	20778.23/6578.1	23078.45/7305.61	23100/7310	30062.57/9501.4	32436.24/10235.06
4549	7061.67	4465.73	4385.4	6325.45	6875.86	6828	7450.82	8042.91
12800/11816	7272/6142	7977/6738	17462/14750	6537/5526	14569/12306	14549/12310	18949/16003	20405/17240
37676/43080	18883/20493	20723/22486	45291/49315	16992/18440	37782/41141	37806/41163	49143/53509	52929/57632
18715	4321	3341	3489	3843	6063	6277	5890	6629
39/195/432	42/210/463	39/198/433	35/182/398	45/199/499	41/207/452	41/207/450	33/166/362	29/151/330
907	503	657	1041	504	995	1040	1122	1265
288/511	299/NA	359/NA	357/672	272/NA	299/563	300/565	387/730	420/782
374.2/200.27	336.14/349.63	308.94/215.52	280.27/160	375.02/250.98	337.55/349.39	342.5/221.02	257.98/176.2	237.77/136.94
1.40	0.99	1.16	1.50	0.97	1.87	1.93	2.42	2.65
33.6	32.5	35.1	40	30.4	35.5	35.8	42.9	45.7
27.2	26.2	29	31.6	26.1	26.2	27.1	32.1	33.4
106	123	114	106	125	102	121	100	90
5259	2876	3205	4905	2645	4101	4150	5350	5744
6286	4901	5183	6152	4469	6086	6264	7358	8155
1507	778	872	1815	718	1505	1524	1973	2141
76.5/76.5/77	51/50.5/50	68/68.5/68.5	84.45/86.24/87.6	47.5/47.5/47.87	73.14/73.5/70.5	75.5/76/76	89/88/91	103/103/102
101/99.7/100	47.2/47.5/47.1	87.46/87.1/87	109.2/108.1/108.5	45.5/45.5/45.5	77.41/77.1/77.6	88.5/94/87.5	108.6/100.8/100.8	115/115/115
36.86	27.92	32.26	41.72	26.66	36.64	37.39	45.68	50.25
5.83	13.08	12.50	4.00	17.95	9.86	7.87	4.14	1.35
42.70	41.00	44.76	45.72	44.61	46.50	45.26	49.82	51.60
12,000	5,350	5,600	17,500	3,900	7,100	8,900	16,900	52,000
+ 4 MB cache - Too expensive for the performance on offer	+ Supports DDR2 memory - Single core, 128 KB Cache	+ Decent performance for the price - Near obsolete, no DDR2 support	+ Relatively good performance - Atrocious pricing, near obsolete	+ Cheapest processor that should get along well - Clumsy performance under demanding applications	+ Supports DDR2 memory - Mediocre performance	+ Reasonable performance - Too expensive for what it offers	+ Good performance - Expensive, considering better performance is available at the same price point	+ Good performance - Atrocious pricing for the performance on offer

Si Soft Sandra 2007: Cache Memory 4 MB

This graph shows cache performance when a 4 MB data block is used. The results are as expected—larger caches result in better performances. Since the QX6700 has 8 MB of cache, the score is skewed in its favour.



WinRAR 3.6

The Quad Core has the potential to compress more files than the rest in a given time frame, but doesn't leave the EX6800 far enough behind. Processors based on the Core architecture perform commendably better than the rival AMD processors and the older Pentium D series.

Conclusion

In the theoretical benchmarks the AMD processors showed commendable performance in scientific benchmarks, implying good performance under such circumstances. When it comes to pure processing power the Quad Core has lot of horses in reserves and coupled with proper application it can unleash performance of unprecedented levels. The processors based on Core 2 Duo offer the best bang for the buck and have proved themselves across all the benchmarks.



Notes From The Lab

During the test, we came across a few things that we would like to share. Firstly, the blistering performance of the Core processors was a sight to behold—reminiscent of the AMD Athlon's heydays when it zipped through every test we threw at it.

Even today, we get mails about AMD's heating issues; we take this opportunity clear the misconception—there are none! The processors stay cool even at full load. During this test, the Pentium D processors spewed heat like furnaces, causing the cooling fan to run at full speed. The whine from said fan was enough to keep the reviewer very far away from the rig while the tests completed. The Core processors, however, do run cool and the Quad gets a little over normal when fully loaded—that's expected, though.

Intel's cooling solutions used to be a simple task—the fan-heatsink combo provided with older Pentium 4s was quite easy to install and remove. Not anymore! We still have

numb fingers after going through the complex and clumsy installation and removal—a countless number of times during the motherboard and processor test. On the other hand, AMD has made the whole affair simple and painless.

Though we ran the Quad Core through the common test process, it was more an indication of how it fared in today's application scenario when compared to the rest, than of its full performance. Even the standard battery of benchmarks will need revamping for the Quad—explained by the unexpected numbers we saw in some of the tests. We'll be putting it through more punishment in the following months; even now, though, it leaves the competition in the dust. And considering that the Quad might actually launch *cheaper* than the FX-62, we wonder what's going on in the AMD camp as we write this.

It will no doubt be interesting to see how AMD's upcoming Barcelona matches up to this early next year—the architecture, at least, promises to beat the Core.

Which One Should You Buy?

Since processors are generally bought depending on one's needs, we have divided our conclusions accordingly. The above graph gives a clear indication of the processing power available at particular price point—Price/Performance.

The Budget PC

For a typical budget PC, processor priced below Rs 6000/- is an ideal buy. From the above graph the AMD Athlon64 3000+ (AM2) is the cheapest one can get for a budget PC. Since it is based on the newer AM2 platform, DDR2 will be the de-facto memory required, so you don't have to buy new memory when you upgrade. The processor is capable of delivering a decent performance in day-to-day applications, but don't expect too much on the multimedia and gaming fronts.

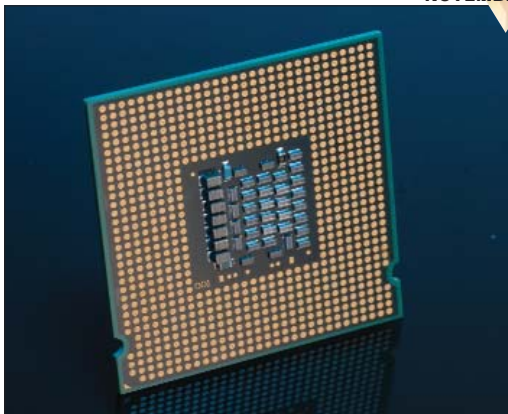
The Typical Home PC

A typical home PC can be made using a budget processor, but when running applications such as anti-virus applications and media encoding, having some reserve processing power helps a great deal when multi-tasking.

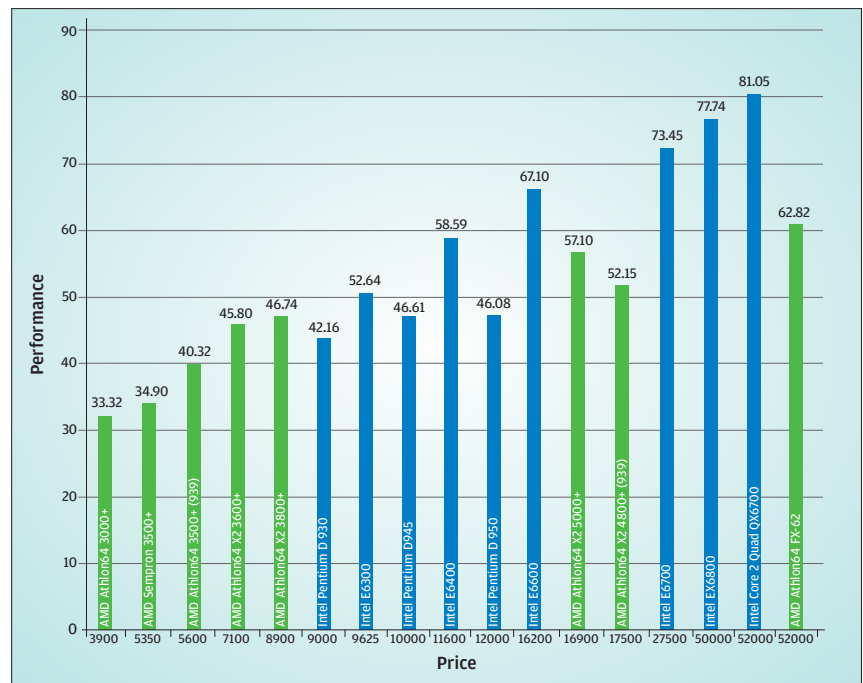
A processor priced in the Rs 7000 to Rs 10,000 range makes as an ideal buy for a good home PC. There are five processors in this range, consisting of two AMDs and three Intels. Both the AMD processors are based on Socket AM2, they make for a decent buy. On the Intel side, two processors are from the older Pentium D series—not worth it, really. The Intel E6300 priced at Rs 9,625 is a good buy, looking at the performance on offer, and also the low amount of heat it generates. In fact, at around Rs 1,000 more than the AMD Athlon64 X2 3800+, the E6300 offers a much better performance across the board.

The Mid-range Gaming Machine

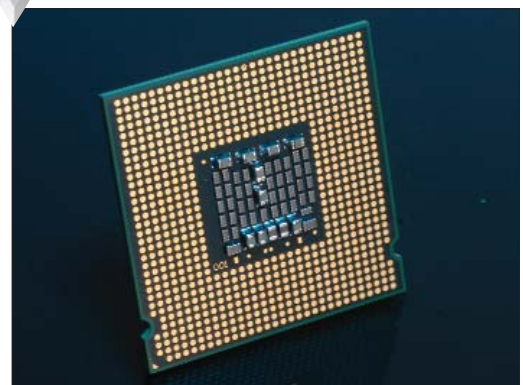
If you are into serious gaming but are on a limited budget (around Rs 50,000-60,000 for the entire rig) then a processor priced between Rs 10,000 and Rs 16,000 is what you should be looking for.



The Intel Core 2 Extreme QX 6700—the Quad beats the competition hollow



The Intel Core 2 Duo E6400 priced at a palatable Rs 11,600 is a real gem. With an impressive performance, it is one of the better processors available for a gaming machine—great value for money. If you can shell out the extra Rs 5500, then the Core 2 Duo E6600 is what we recommend for a true gaming machine.



The Intel Core 2 Extreme EX 6800 is the best for gamers

The High-end Gaming Machine

No point blowing money on an extremely high-end processor! The Core 2 Duo E6700 offers a performance that is just 10 per cent less than the top-end Core 2 Duo Extreme EX6800 and Core 2 Extreme QX6700—at half the price! The rest of your money is better spent getting on 2 GB of memory or an NVIDIA 7900GTX. If you have enough money stashed away, however, go for the Quad Core QX6700. It has enough fire power for now, and is the most future-proof of the lot. ☐

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WebMD.com

Everything you wanted to know about your mind and body

Nimish Chandiramani

Do you know what to do when someone has a seizure in your vicinity? Or what on earth an Angiogram of the Lung is, and why it's performed? Would you like to take a test to see if you're going nuts? WebMD is probably your ultimate resource for all things health—physical or mental.

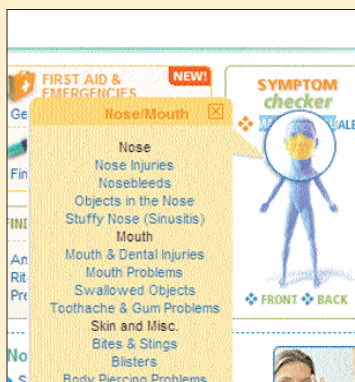


WebMD is one of the most useful medical portals you'll find today

The sheer abundance of knowledge on this site is so mind-boggling that we didn't know where to start. The site has all the regular things that you'd expect from a medical Web site—the latest news, a Body Mass Index (BMI) calculator and a list of the top 12 topics that people are reading about on the site. There's also all the information you need to perform a self-diagnosis, but as anyone would tell you, there's still no substitute for your real doctor.

Check-Up Time

One of the most useful features we found here was the Symptom Checker—just click on any part of the body, and you'll be presented with a list of symptoms that affect that area. It covers both the male and female bodies, and you can choose between viewing the front and the back. We did run into a couple of issues switching between front and back in Opera, though it worked just fine in Firefox and IE. Another handy feature the site offers is the Interactive Check-up, plus a host of other interactive tests you can take depending



With the symptom checker, you can click on various parts of the body to link to its symptoms

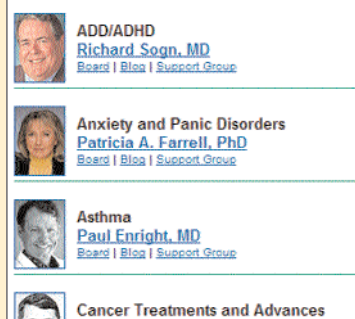
on what you're going through—including psychological tests to gauge your mental condition. All these tests are certified by experts, so they should at least get you started on what to do.

If you're in doubt about the site's automated tools, you can interact with a huge panel of experts—each with their own area of specialization—via a public bulletin-board system or through their blogs. This is quite nice, considering that a lot of features—find a doctor, healthcare services, etc.—are US-centric. Here, however, you can get your advice no matter where you are. To be able to post on these bulletin boards, you'll need to register yourself on the site. Registering also gives you access to live events, where you can share your concerns with the experts or the site's celebrity guests in real time.

Ask the WebMD Medical Experts

Click on your area of interest to see more experts

Medical | Food and Nutrition | Lifestyle | Pregnancy and Men



Choose from a prolific panel of experts to talk to

Knowledge Time

For all the information you need on leading a healthy life—diets, exercise or emotional wellness—head over to the site's Healthy Living page. There's also a daily informative video you can watch—this ranges from the “know more about” type to the latest trends in medical sciences.

One of our favourite areas, and a must-see for even a casual visitor, is the A-Z Guides section. Suggestive enough, it's got all the information on the site—be it symptoms, drug names, whatever—sorted by category and alphabetically. If you're the kind who wants to know more about the tests your doctor just inflicted you with, then the Tests A-Z section is where you should head. The details of each test are very well-written and comprehensive, right from giving you an overview of the test and its purpose, down to how it feels when you're under the microscope.



The A-Z Guides are comprehensive and an excellent source of information

Finally, there's the WebMD University, which runs periodic courses on all aspects of health—while we write this, it's running a four-week course on child obesity. The university runs lessons, live events, expert interactions and also gives you an action plan to put each lesson into practise. You'll need to register (or “enroll”) to be able to use this, too.

Whether you're a health freak or just an enthusiast for knowledge, this is one site you shouldn't miss. ■

nimish_chandiramani@thinkdigit.com



112 Fun @ Work



118 Telecommuting:
Here To Stay?



120 Secure
Storage

Digital Business

How Technology Can Help Your Organisation

Tech Careers

Connections For Neophytes

**Chisel a career
that makes and
uses the
connections
that count!**

Samir Makwana

India is rapidly developing into a tech-hungry country. Sales of Desktops and laptops combined crossed 5.43 million units in the fiscal year 2005-06. The number of Internet subscribers rose from 3.12 million in March 2005 to 4.12 million in March 2006. This is the connected age, and these figures, from the Annual Review report by MAIT-IMRB (Manufacturers' Association for Information Technology-Indian Market Research Bureau); give us a comprehensive picture of how much connectivity is now required!

Connectivity is provided by networks. The requirement for those who will connect computers through networks will soon increase. These people are identified as networking professionals.

"Networking professionals are individuals capable of planning a wired and wireless infrastructure to support network connectivity by installing, configuring, and troubleshooting network devices for Internet and server connectivity," says Ranajoy Punja, Vice President, Business Development - Advance Technologies, Cisco Systems, India and SAARC.

Stepping Stones

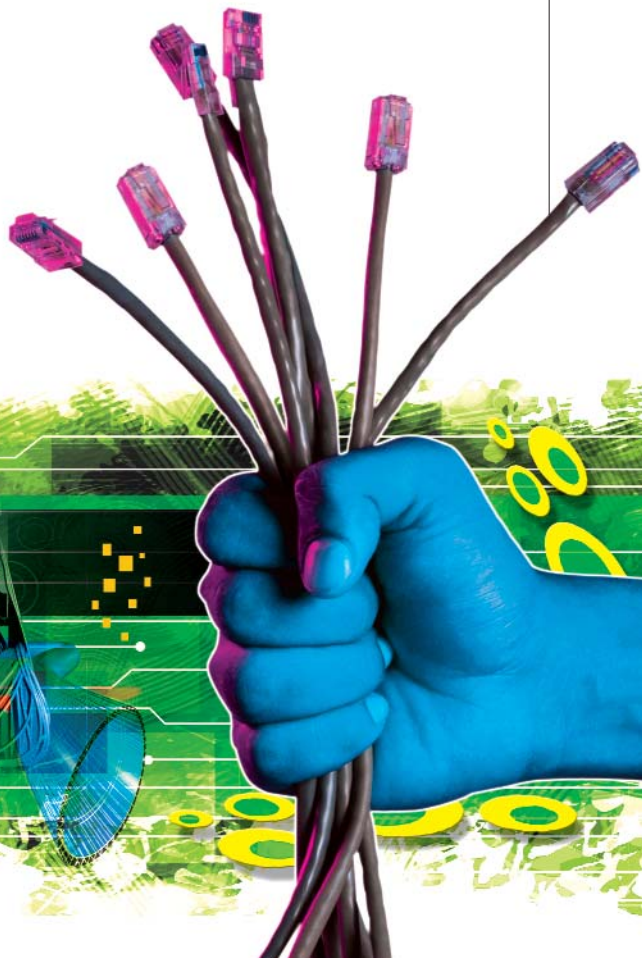
A keen interest in, and knowledge of, computer hardware are the foundations for procuring entry into the networking field. "Clarity in the basics of computers, and a good understand-

ing of the hardware and software of computer systems are the primary requirements to begin with," says J Sheshadri, CTO, Emerson Network Power India Ltd.

Along with the sharing of data over the network, arises the issue of security—security of data over the network is a serious concern. The field of networks and security are dynamic: with rapid developments happening in various areas of networking, existing technologies are challenged. By the time one gets well-versed with a particular network technology, along comes another.

Those willing to make the best of their drive can complete formal education and earn a college degree. The precise names of the degree programs vary from institute to institute, and most colleges do not offer a special degree program focusing solely on networking. A suitable graduate or master's degree program for networking

Illustration Chaitanya Surpur
Photograph Jiten Gandhi



would be any of the following: computer science, information technology, computer engineering, electronics and telecommunications, electrical engineering, information technology and telecommunications.

These degrees can be procured from leading engineering colleges across India. The degree programs cover topics such as basics of computer networks, network management and security, working with various network protocols, operating systems, and other networking-related topics.

There are also short-term courses that focus on networking topics offered by some institutions as an alternative to a four-year degree program.

Continuous Learning

Learning in this field is unlimited. With rapidly-changing network technologies, networking professionals have to keep themselves constantly updated. "Networks today have become very complex, and learning is a continuous process. The challenging part of this field is to maintain a balance between individual learning interests and keeping track with technological advancements," says Tarun Hukku, Head - Resource Management Group of Microland, an IT infrastructure management and technical support services outsourcing company.

Short-term courses may help in quick acquisition of basic networking knowledge by more focused programs on networking topics. Degree programs, on the other hand, lay in-depth foundations and reflect a level of dedication to prospective employers.

Today, international-level certifications are available from various vendors such as Cisco, Microsoft, Red Hat, Juniper, and IBM. Also, the international-level certification of the CompTIA (Computing Technology Industry Association) is now possible to acquire by an examination: for more details, visit www.comptia.org/trainingandeducation. Pursuing training from the authorised training centres of the vendor companies and taking examinations, help in gaining knowledge, to be at par with the requirements of the industry. For further details on certification courses and the authorised training centres of international vendors, see box A *List Of Popular Certifications*.

Many branches of private institutes such as CMS Institute, Jetking, Aptech, Accel, and more, are spread all over India, which provide coaching and training on hardware and networking topics irrespective of the vendor platform.

At the time of recruiting freshers, employers look at what projects the applicant has under-



Global
certifications keep one above par, and those with one have a definite edge over the others"

Muthu Logan
Founder and CEO
BroVis Wireless
Networks Ltd

taken, and whether there is any relevant working experience. While recruiting network professionals through basic-level technical written tests, organisations check for the clarity of the fundamentals of the applicant.

Besides qualifications and certifications, soft skills such as good communication, presentation skills, self-confidence, application of logic, and leadership qualities are also examined by employers at the time of recruitment.

Certifications

Which certification is the best? The answer depends upon the individual's interest in a particular area of networking, and also the preferences of the hiring companies. Certification courses are designed for three levels—Beginner, Intermediate, and Expert or Advanced, and are awarded to accredit anyone who has proved eligible after passing the examinations. A few ambitious students acquire multiple certifications—sometimes more than four!

"Certification is a must nowadays. It provides in-depth knowledge of the technology along with practical exposure. Certifications really help when they are done along with the job in the same field, and you can link the knowledge to your day-to-day work," says Manish Macwan, now an Assistant IT Specialist (messaging and groupware), CMS Computers Ltd.

Passing the tests and getting a global certification naturally keeps you a notch above those who do not possess one. Along with the certification, some working experience in industry gives a complete picture of what organisations want, and how can one fulfil that by acquiring qualifications and certifications which the organisation basically look for in.

Also, pursuing certification in specialised areas such as network security, servers, systems, etc. depends upon an individual's personal interest. Besides this, the benefits one gets from global certifications are global acceptance, better monetary returns, greater confidence, and better growth opportunities.

The Career Growth Path

The networking segment is one of the fastest growing in the IT industry. Services such as broadband, VoIP, videoconferencing, and VPNs have spurred the need for networking professionals who can set up, manage, and provide solutions in these areas.

Getting hired successfully in a company doesn't mean an end to learning; it is an ongoing process. Companies organise or sponsor internal training and education of their employees in order to enhance their knowledge and bring out better solutions with their knowledge for the organisation. After entering the networking segment as a fresher, they can reach to the top designation passing the following positions.

Beginner level (approx. salary per annum: Rs 1.8 lakh to Rs 4 lakh)

End-User Support Specialist
Information Technology Technician
Help Desk / Customer Support

A List Of Popular Certifications

To know more about the entry level, professional, specialist, and expert-level certifications, courses, and their authorised training centres, visit the following sites.

Cisco: www.cisco.com/web/learning/
IBM: www-03.ibm.com/certify/

Juniper: www.juniper.com/training
Microsoft: www.microsoft.com/learning/default.msp
Novell: www.novell.com/training/
Nortel: www.nortel.com/training
Red Hat: www.redhat.com/training
Sun Microsystems: www.sun.com/training

**Middle level (approx. salary per annum:
Rs 5 lakh to Rs 7 lakh)**

Network / System Administrator
Network Design Engineer
Network Systems Technician/Specialist
Network Engineer

**Top level (approx. salary per annum:
Rs 8.5 lakh to Rs 10+ lakh)**

Chief Technology Officer
VP - IT / Systems

Diploma holders can expect a start from as low as Rs 85,000 per annum.

After entering at the beginner level in technical support, it takes about two to three years for one to advance to the next level. At a middle level position such as a Network Engineer or Network / System Administrator, the variety of tasks and the work profile are as complex as the network itself! One acquires knowledge and experience of managing, maintaining, and providing solutions for the networks primarily at this level. Advancing from the middle level to the next level—as in from Network Engineer to Network Administrator—takes around five to seven years, and sometimes more than that. Finally, to get to a top-level position such as VP—IT or Systems, eight to 12 years or more of experience could be needed.

All these time periods are just indicative: it's the inner drive and interest in constant learning in an individual that takes him to the top.

The Roles At Each Level

After joining the networking department of an organisation, the roles as an individual advances from one level to another are different. Certain activities may overlap at the beginner and middle levels. Here is a snapshot of what kind of role is played at each level.

Service Technician / Technical Support

The first step and the entry-level position in networking. One is sent to customers' sites to perform field upgrades and support functions. One acts as a support to the Network Technician by physical installation of hardware and software, setting up switches, routers, cables, etc. The true test of one's basics and the training acquired is observed here.

Network Technicians

Network Technicians tend to focus on the setup, troubleshooting, and attending to the problems and repair of hardware and software products. They take care of the entire network within a company, and attend to the problems in the networks with the help of Service Technicians. This is the stage where one gets in touch with the practical aspects for application of their knowledge and basics of networking.

Network Engineer

The Network Engineer focuses on functions such as cabling of networks, installation of routers, switches, day-to-day operations, etc. Also, he takes care of system upgrades, evaluation of vendor products on networks, security tests of the network, and so forth.



“Boot camps and other training programs should teach one how to perform in the real world rather than how to pass tests and make them paper-tigers”

Arun Eapen
Technical Consultant
and Networking
Specialist
Red Hat India

Network Programmers And Analysts

Network Programmers write programs or scripts that help evaluate third-party network products and help in network analysis. They try to integrate new software technologies into an existing or new network environment. Analysts analyse and monitor traffic, the use of bandwidth, and data transfer over the network.

Network / System Administrators

They perform the tasks of configuring and managing LANs, WANs, and VPNs for an organisation. Providing access to the network from the remotest locations of the organisation is their responsibility. They have to provide security by configuring firewalls; good knowledge of security implementations, routing, TCP/IP, virus protection applications and spam filters is required of them. Their daily routine involves monitoring network performance, maintaining network security, and troubleshooting.

Network Information / Design Managers

They supervise the work of administrators, engineers, technicians and programmers. They also work on the long-term planning and strategy of an organisation's network. At the entry level, one would focus on tasks such as troubleshooting, monitoring, evaluation of LAN performance, adding and deleting users, adding new servers, and such.

The Opportunities

Network professionals will always be in demand—for as long as IT fuels the economy. Today, a shortage of network professionals is faced in sectors such as ITES / BPO, telecom, banking and financial services, manufacturing, and even government. Retail is an upcoming part of the Indian economy which will fuel the need for even more network professionals.

The demand for more than two lakh network professionals will go up within the next one year; only about 1.4 lakh Indian networking professionals are in existence today—the demand for network professionals is higher than supply. The BPO/ITES sector will witness the highest growth in demand for network professionals; also will other sectors such as Banking and Financial Services, Telecom and Retail.

Summing It Up

Job seekers are ever haunted by the word “experience”; “organisations only hire people with relevant experience” whenever they apply for jobs! One needs to take the initiative—by taking up full-time programming projects or help-desk internships in networking.

A good way to stand out is to demonstrate prior working experience by selecting projects or getting work experience in the area of your interest. This prior experience could serve as a launchpad, advancing you to the next level. Networking technology changes every few years, so organisations look for individuals who can adapt to upcoming technologies: this happens when there is a constant hunger for learning—in which case, the sky is the limit! ■

samir_makwana@thinkdigit.com

Fun @ Work

All work and no play could actually be affecting your bottom-line as a business, or your productivity as an employee!

Agent 001

Studies have shown that dull, boring corporate environments may not be the best enabler of quality work. A little humour goes a long way in livening up the atmosphere, and it builds friendships—an essential ingredient in the building of a good team. A lot of corporate studies have shown that a cheery work atmosphere results in better teamwork, more productivity, lower attrition rates, and an overall enhancement in output quality.

A survey conducted by the Gallup Organization (www.gallup.com) of millions of office workers around the globe has shown that having close friends at work improves a worker's job satisfaction by almost 50 per cent! The same study, in sharp contrast, showed that one third of the 80,000 bosses polled thought "office friendships" should be frowned upon—talk about not knowing what your employees want, or need! Especially considering that the study also showed that the majority of employees would rather have a friend at work than even a 10 per cent pay hike, and employees with three or more close friends at work were actually 96 per cent happier with their lives and their salaries!

There are more studies that say offices should be designed in a fun way, or that management should hold non-work-related gather-

ings for friends and families of employees to encourage friendships and bonding, but let's leave that for now. What's more important is that employees learn to open up a bit, let their hair down and have a little laugh every now and then, so long as it doesn't affect their work.

We will digress from formal business articles here in order to give you some hints as to what you can do to liven up the atmosphere.

Tech Pranks

One of the easiest ways to break the ice amidst a group of employees is a harmless prank—with emphasis on *harmless*! Nothing makes opening up to one another easier than laughter, and you're guaranteed to get some if you pull some of the pranks we're listing here. Remember, these are just a few ideas, or pranks that people have actually pulled, and you're limited only by your own creativity! What's important is that you choose your victims wisely—not everyone will find humour in having a prank pulled on him or her, so make sure you choose a person with a sporting attitude...

Switch

One of the oldest yet best pranks involving computers is to switch people's keyboards or mice. You could even switch monitors! This works best when you have two people sharing a desk or cubicle, facing each other, with cabinets on the



Photograph Amrut Patki, Jiten Gandhi
Imaging Pravin Warhokar

floor. Let two or three people in on the joke (except the victims of course), and watch as they are bewildered about the strange things happening on their monitors, as the other moves the mouse or types something. This can also be done if you're one of the two, where you control the other's mouse or keyboard.

Sounds

Windows XP's sounds reside in the C:\Windows\Media folder. These include the Startup and Shutdown sounds, and all the other short sounds you hear when running Windows. You can also do this with instant messengers, especially for the people who love to IM at work!

Replace a particular sound with something loud! Popular choices in the past have been explosions, machine guns and even adult movie soundtracks! If it's the Startup sound you're modifying, make sure you turn up the volume on your victim's speakers. Just rename the original sound, place your sound in the \Windows\Media directory and rename your sound file to the same name as the original. You can also do this by going to Control Panel > Sounds and Audio Devices, and clicking on the Sounds tab. Select an action, and in the Sounds dropdown below, you can select the sound you want, play it, or click "Browse..." to add your own sound. You can get some funny WAV files from http://www.thefreesite.com/Free_Sounds/Free_WAVs/.

Sit back and watch as your chosen sound scares or embarrasses your victim.

Word Fun

You have to love Microsoft Word's AutoCorrect! This can help you place a nice prank on a co-worker. If you're not the subtle type, you can set Word to replace a common word like "the" with something else. It can be as different as "virus," "you idiot," "_INSERT_ARTICLE_", "help, this guy can't spell," or as subtle as "teh" or "them." If the victim is not too computer-savvy, he/she may never even figure it out.

You can find Microsoft Word's AutoCorrect feature by going to Tools > AutoCorrect Options... In the Replace box type the word you want to replace, and in the With box, type in your prank word, and then Click Add, then OK.

Note: If you're using Office 2007 Beta, use [Alt] + [T] + [A] to get to AutoCorrect Options, or click on the Office 2007 logo > Word Options > Proofing, and you will see an AutoCorrect Options button on the right.

Mouse Grouse

There are a couple of things that involve a mouse that you can do to people. If you're an extremist, you could use the "real-mouse-on-a-string" joke as depicted on the previous page, but your bosses might not take kindly to you bringing rodents into work! If you just have to, use a realistic-looking stuffed toy.

Apart from this, if your colleague uses an older ball mouse, you can open it up and stick the ball to the body using tape. This will cause the mouse to stop responding, or, at least, slow it down like mad.

You could also play with the mouse sensitivity settings in Windows XP, and make it either too fast or too slow to manage, which will frustrate your colleague even more.

Last but not least, you can just switch the mouse configuration over from right-handed to left-handed, and watch with glee as your colleague desperately tries to left click on something and ends up getting the right-click menu!

You can get access to all the mouse software tweaks by going to Control Panel > Mouse. Again, this only works if your colleague is not too well-versed with PCs and the way they work.

The Hung Desktop Trick

This one is old, and will only fool absolute novices, so make sure your victim has just started using computers, or else it's just a waste of time.

Basically, it involves taking a snapshot of your victim's desktop environment, then using it as the desktop wallpaper, and hiding all other icons. This makes it seem like they're on their desktop, but nothing is clickable, and thus the confusion.

Press [Print Screen], open MS Paint, and press [Ctrl] + [V] to paste the copied image. Then save it as a BMP file somewhere on your computer. Now right-click on the desktop and go to Properties > Desktop, click on Browse..., and then choose the picture you just saved. Then right-click on the Desktop, go to Arrange Icons By > Show Desktop Icons (un-check it). This

If you're an extremist, you could use the "real-mouse-on-a-string" joke

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How To Get Fired

Consider this a “Do not do” list if you like your job, or a “How to get fired” list if you don’t!

1. For a week, set a mouse (the rodent) free in the office everyday. Wait till just before they call the exterminator, then send in snakes to get the mice.
2. Every time your boss gets up from his desk to go to the loo, dial his extension number. Just before he reaches the phone, hang up. Repeat until he ignores the calls and runs screaming to the loo, or until he loses bladder control.
3. After a particularly spicy lunch in the cafeteria, when a lot of people visit the loo, set off the fire alarm.
4. Hang “out of order” signs on all the lifts when everyone is at lunch. After everyone has huffed and puffed their way up to the 16th floor, take a ride up in one. Note: works best in buildings with over 10 storeys.
5. Write a post-it note that says “I need those confidential files we spoke about the other day by tonight. I hope they’re ready.” Stick it on your boss’ monitor. Watch him/her break out into a sweat. Again, works best in large offices where your boss has many more bosses.
6. Buy three tubes of superglue. Glue everything on your bosses’ desk. If you can get your hands on a rivet gun and a drill machine, transfer his desk and chair from the floor to the roof as well.
7. Get access to your company’s EPABX system. Change the hold music to someone burp-singing a popular song.
8. Go to a lot of questionable sites. Sign up for their “free” content using your boss’ e-mail address.
9. Buy three kilos of sugar. Wait for someone to either be fired or quit. Get out the sugar, pour it all around the cap of every boss’ car’s petrol tank. Make sure to drop enough to make it obvious. You have a good chance that most of the bosses will not realise that you need a key to get into gas tanks, and will call for mechanics and a tow truck to send their cars off for servicing. Investigations will point to the employee who recently quit or was fired.
10. Open out the bolts that hold the toilet seats in place. Stand outside and listen to people walk in, “crash,” and then fumble with it trying to figure out how to fix them all back.

Remember, the office is still the place you go to work, so don’t get carried away

will hide your desktop icons. Next, right click on the Taskbar, select Properties, and check the “Auto-hide the taskbar” box. Click OK to exit. The taskbar and the Desktop icons will be hidden, but it looks like the Desktop is active because of the background. When the victim tries to use the computer, he/she will not be able to click anything or do anything, thinking that the computer is hung.

For ethical reasons, if you do this, make sure that there are no important work files open, and if there are, please save and close them, because even a novice user will instantly press “reboot”!

Change It Up

Most people, including touch-typists and advanced users, can be easily fooled by this one. All it takes is a screwdriver and some care: remove the M and N keys from the keyboard, and interchange their positions. Most people will never figure out that they’re actually correctly typing M, and keep thinking that they’re making typos. To illustrate how confusing this can be, especially for those who haven’t had formal typing training, here’s an anecdote. One colleague was trying to play this trick on another, and popped out the M and N keys all right, but then he confused himself, and put them back into their right positions—he thought he had swapped them, but actually he hadn’t. Then he waited for the screams of anguish, and the cursing of the keyboard—they never came! It was only after about three hours that he came back and had a look at the keys and realised he had “out-pranked” himself!

To befuddle your colleagues even more, you can change the keyboard’s layout altogether! In Windows XP, go to **Control Panel > Regional and Language Options**. Under the Language tab, click Details. You will see a list of keyboard layouts. Click Add, and select United States - Dvorak (the Dvorak keyboard layout is a whole different way of organising keys on the keyboard). Now, change the Default Input Lan-

guage to English (United States) - United States-Dvorak. Apply and watch as your victim screams in frustration as “R” becomes “P”, “J” becomes “H”, and other such traumatising transformations occur.

Not-So-Tech Pranks

Here are some innovative suggestions for non-technology-based humour from friends and colleagues:

If your office has a coffee maker, change the coffee to decaf. Wait a month for their bodies to adjust. Change the coffee to espresso. Sit back and watch people go crazy!

Put tape over the microphone of a desk phone (by opening it up). Watch Mr X have to scream into it to be heard. After a week, remove the microphone tape and put it over the ear-piece instead. He’ll still scream and irritate his clients, but now he won’t be able to hear them complain. Just before he’s about to ask for a new phone, remove the tape!

If everyone in your office has desks with drawers, pull out the drawer. Place a cardboard on top of it, turn it upside down and carefully push the drawer back in. Just before you close it completely, pull the cardboard out carefully. Watch as your co-worker drops all the contents of the drawer on his/her feet!

Stay Focused

Remember, the office is still the place you go to work, so don’t get carried away—or you may end up getting fired, and we wouldn’t want that to happen. Keep it down to one a month, or one every three months, and you should be fine.

There are a million things you can do, and if you stick to non-destructive pranks, you ought to make quite a few friends (or enemies) quite quickly. We’d love to hear about some real things that have happened at your workplace. Write in to readersletters@thinkdigit.com and tell us about them! ■

agent001@thinkdigit.com



Sanjay Sakat
Human Resources Manager
Compulink Systems

The basic requirement for telecommuting is connectivity. We provide a laptop and an Internet-enabled cell phone to our employees who telecommute, and who are often travelling all around the country. Despite our physical absence in the office, we are always connected to each other, as well as to office staff, clients, customers, and others. Employees in our organisation have to travel a lot and they stay connected with each other, have important meetings and discussions, and even strategic decisions are taken over conference calls.

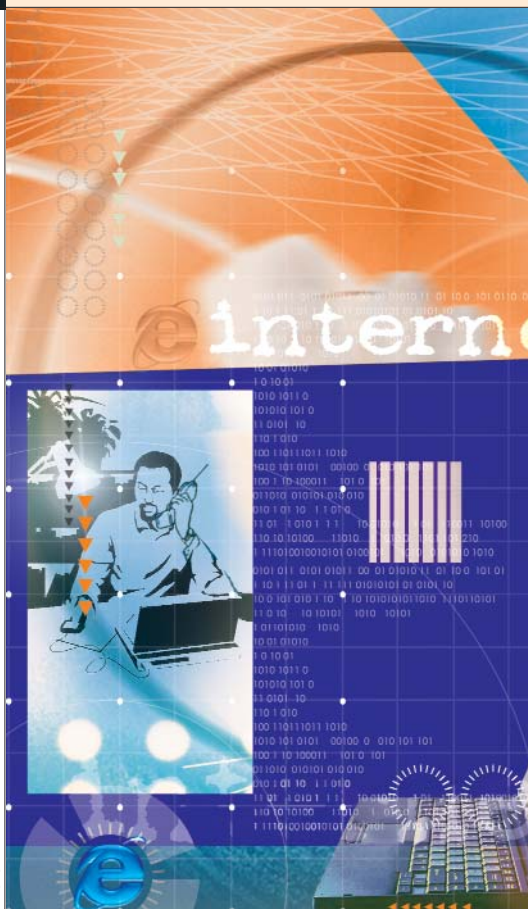
Employees who avail of the telecommuting option are trained through orientation and induction programmes through which they get familiar with computers. At times, we show online demos of our products to our clients and customers. Even our guest house is connected to the Internet so that employees can relax and work there, have meetings, discussions, and conferences.

Telecommuting helps: there is business demand for mobility, and also, many geographical locations are to be covered.



TELECOMMUTING:

How can telecommuting benefit both the organisation and its employees? And how willing are organisations to let employees telecommute? Find out what employers have to say...



Satish Parchure
Managing Director
U.S. Interactive, India

First, all thanks to our government for improving broadband facilities and providing us with a better infrastructure. Through improved Internet facilities and better and cost-effective cellular services, tasks assigned to employees can be executed simultaneously. Although our 256 Kbps connections are hardly at par with the T1 connections in other countries, we can still provide satisfactory solutions to our clients and customers.

We've reaped the benefits of this practice—in the past, one of our projects was successfully completed by a team of five members; out of five, two were working in India and the others were in different countries. I believe today is the right time to try out the telecommuting model. However, the model is applicable only to those business verticals that involve "batch processing" tasks and projects such as content writing and development.



Sreeram Iyer
Chief Executive Officer
Scope International

As far as my organisation goes, telecommuting is clearly one of the desired strategic models of operating as a Shared Service Centre. For us, the benefits are three-fold: it leads to a better work / life balance for our staff, it enhances robust disaster recovery capabilities, and brings in a talent pool for the industry.

Security-related concerns had delayed the coming of age of the telecommuting model. However, security risks can now be better managed. As part of a large multinational bank, we adopt international standards in our security solutions, and going forward, we do see an improvement in our ability to adopt telecommuting for our operations.

HERE TO STAY?



Dadi Bhote
Executive Director
Hypersoft Technologies

Telecommuting is helping us enjoy cost benefits—office overheads, real-estate costs and infrastructure, retaining key employees, reducing operation costs, and more. This has resulted in raising productivity—to an extent. Also, employees benefit by a reduction in commuting time, efforts, and costs. Flexibility in work timings provides them full freedom to work at their own, convenient timings, and also meet assigned task deadlines.

One important reason for bringing in telecommuting was the ability to hire persons who would normally not be available to work out of an office, in cities where commute times are very long. The practice of such a strategy is possible today because the necessary infrastructure is available. Taking a break from our business operations for a moment, we are working on a new strategy for the expansion of our operations in the near future, with a capacity of about a hundred employees.



Chandrashekhar Nene
Vice President, IT
Kingfisher Airlines

This western concept is at a nascent stage in India, and is one of the models that benefits both the company and employees. Needless to say, along with telephony, the Internet, too, helps in the area of telecommuting. In populated metros such as Mumbai, Delhi, and Bangalore, a lot of people commute for more than two hours every day. Telecommuting can help not only in converting those man-hours to productive use, it also helps reduce traffic jams, pollution, accidents, and so on.

At the individual level, employees can maintain a balance between professional and personal obligations. This also affects work efficiency. If a person works more efficiently at home than in the office, the telecommuting option should be provided.

As told to Samir Makwana (samir_makwana@thinkdigit.com)

https://secure.storage

Keeping your data online is an attractive and viable storage alternative for individuals as well as businesses

Anand Batra

When online storage services were in a nascent stage, they only offered basic services such as uploading via a Web interface, and often, the services were slow and cumbersome. The services have evolved fast, though, and a lot of recently-launched services offer new-age features such as data encryption, file tagging, public sharing, RSS feed support, and most importantly, many of them are free!

As a small business or a SoHo setup, you'll be interested in online storage for primarily three reasons—first, the fact that even backups on DVD do not entirely guarantee data safety. With online storage, you can pretty much be 100 per cent sure your data will be safe. Second, if you need to exchange data with national and international clients, having the data available on the Web is very convenient indeed. Besides, some of your employees could be working from home, and having their data available online is again convenient.

Here, we'll be looking at Box.net, Apple's .Mac, Jungle Disk, Omnidrive, Streamload, and Openomy. This is not an exhaustive list: there are other services such as Xdrive and GoDaddy that can be considered.

Box.net

Box.net (www.box.net) offers a clean though somewhat flashy interface. You can sign up for a free 1 GB account, or buy a 5 GB account for \$4.99 (approx Rs 225) a month with a bandwidth cap of 20 GB per month. If your requirements exceed this, there is also a 15 GB account for \$9.99 (Rs 450) a month, with a bandwidth cap of 50 GB per month.

With the free account, there is also a 10 MB cap on the size of the files you can upload.

The service only allows for uploading via a Web interface, but they're launching a desktop client soon. It supports most browsers including IE, Firefox, Safari, and Opera. We created an account and did a trial run, and we didn't encounter any problems with these browsers.

The "Box Desktop", soon to be launched, will enable you to save and sync files to your Box.net account from your desktop. Box.net offers their API to developers so they can integrate and utilise Box.net's storage service in their applications.

With an account at Box.net, you get a slew of features including drag and drop support, file tagging, and RSS feeds so you can receive updates on the files you upload. You can also post, on your blog or Web site, pictures, movies and other files hosted on Box.net. The service lets you share files with others. If you make any file or folder public, you will get a URL for that file or folder so that others can access it anywhere. However, this is a premium feature. Users with a free account can only share files with other Box.net users.

Also provided is optional shell access for data transfer. Shell or SSH is a network protocol that allows for sharing of files between a local and a remote computer. It means more security, since the transmitted data is encrypted.

Features such as tagging help you organise your files better so you can retrieve the files at a later date without hassles. Being an ad-free service is an added plus for Box.net.

The actual cost comes to around \$0.001/MB per month for the 5 GB account and \$0.0006/MB per month for the 15 GB account—very impressive. Help and support is offered via e-mail and a set of FAQs.

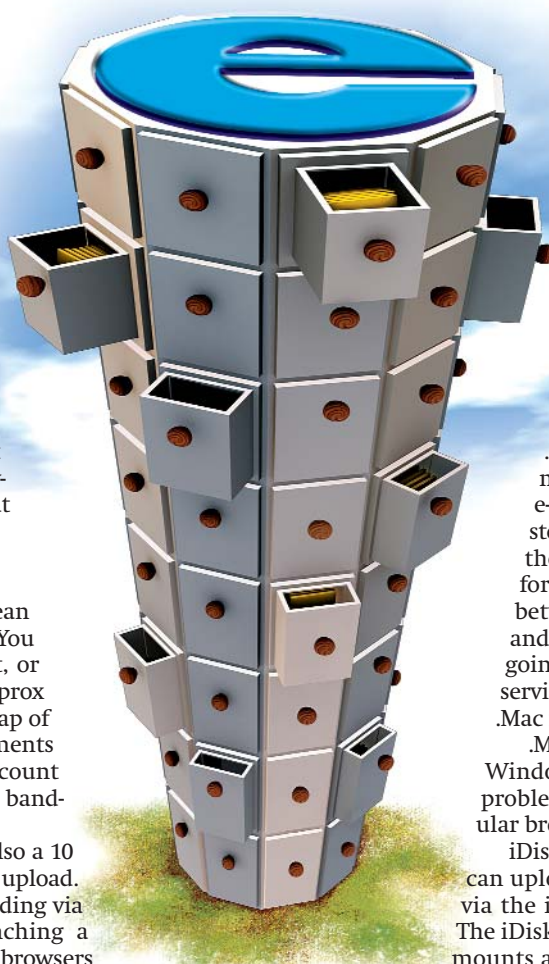
Apple .Mac

.Mac (www.mac.com) is about much more than just online storage—it is an e-mail plus hosting plus syncing plus storage service. All this comes at a price though—you pay \$99 (Rs 5,600) per year for 1 GB of space. This space is divided between e-mail and iDisk (the hosting and online storage). If you aren't sure of going ahead and spending so much on a service you haven't used, you can try out .Mac for 60 days for free.

.Mac offers cross-platform support with Windows and OS X. We did not face any problems accessing the service using popular browsers, on Windows as well as Mac.

iDisk is a feature-rich storage service. You can upload files via a Web browser, and also via the iDisk utility for Windows and OS X. The iDisk utility is unique in the sense that it mounts as a drive on your computer. You can save items to your local iDisk drive even when your Net connection is down; then, whenever your computer connects to the Internet, the local drive synchronises with the server, and your files are uploaded.

.Mac's features list is impressive: Web site hosting, iCards—a service that offers online cards for various occasions, discussion groups, bookmarks and system synchronisation (you can syn-



Imaging Shrikrishna Patkar



The Box.net interface is clean and simple

.Mac is the only service in this review that supports site hosting



The .Mac interface

chronise Safari bookmarks and other system settings with .Mac and other machines), public and private sharing, backup tools such as Backup 3 (Mac OS only), integration with iLife applications, an e-mail service, third-party application support, a free VersionTracker subscription, and more.

.Mac is the only service in this review that supports site hosting. A good feature for OS X users is iLife integration: you can update your blog, podcast, photocast and much more with a single click! Photocasting is a term coined for the service that allows people to share photos (using iPhoto- Mac OS X only) with others. For creating a basic Web site, .Mac offers quite a few ready-made templates.

The cost for .Mac comes to \$0.1/MB per month—somewhat expensive, but decent enough when you consider the features it offers. There's a comprehensive set of FAQs at the site, along with a support forum for users who need help with the services. .Mac is one of the best storage services out there, and if Apple considers revising the rates a bit, their offering will get even more attractive.

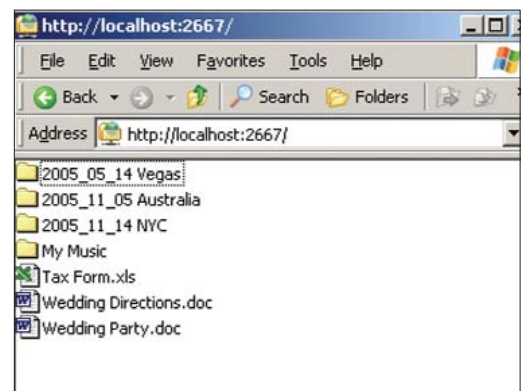
Jungle Disk

Jungle Disk (www.jungledisk.com) is a unique storage service in the sense that it uses Amazon's S3 storage service to store your files

and folders. The pricing model is also different from that of the other services we've reviewed. You'll need to sign up for Amazon's AWS service, which uses the *pay as you use* model—this means you'll pay for *only* the space and bandwidth you use. Dave Wright, Jungle Disk's founder and lead developer, says that Jungle Disk is at an advantage over other services, since Amazon provides the storage. He mentions that since Jungle Disk is based on S3, it is an open system and not closed and proprietary like the other online backup solutions. Since it is open source, you can download the source code and write your own Jungle Disk application!

Jungle Disk offers cross-platform compatibility with Windows, Mac, and Linux. The desktop client they offer integrates with Windows Explorer, and you can copy files to it just like you do to a local hard drive. It is the only service here that does not offer a Web interface—though they're considering putting up one.

Because of its integration with Amazon's S3, Jungle Disk is the most secure online storage solution we've reviewed. You can encrypt your uploaded data using Amazon's AWS (Amazon Web Service) key or your own key. The client will prompt you to enter the key the first time you run the Jungle Disk client. The AWS secret key will be known only to Amazon and to you. However, if you are paranoid, you can provide your own custom key. The advantage of using the AWS secret key is that you can retrieve the key by logging into your account; if you use your own custom key and forget it, you will not be able to access your data.



Access your Jungle Disk like any old folder

You are charged \$0.20 for every GB transferred and \$0.15 per GB per month for storage. Jungle Disk provides a list of FAQs and a support forum. You can also use e-mail for support. Essentially, Jungle Disk stands out because of its pay-as-you-use model and the data encryption.

Openomy

Compared to the other services, Openomy's (www.openomy.com) interface stands out as simple. This is reflected in their registration form and the file manager as well! Currently, they offer 1 GB of space for free. They do plan to increase this. The site mentions that they have plans to offer premium accounts and extra goodies. The official blog (<http://blog.openomy.com>) is where

Omnidrive

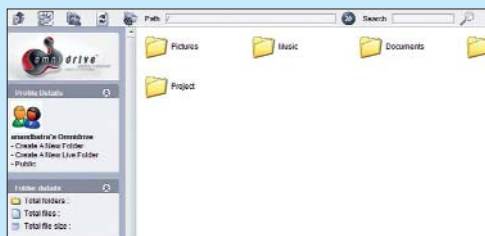
Currently in private beta, Omnidrive (www.omnidrive.com) is not offering accounts to the public. However, as of this writing, you can request an invite if you want to try out their service. Understandably, there is no information at the site about price plans—yet.

This is another service that provides cross-platform support with desktop clients for both Windows and Mac. Also, we encountered no significant issues while accessing their service from browsers on both platforms—quite surprising for a product currently in private beta.

The desktop client integrates with My Computer under Windows. You can copy files over to this folder, and your files will automatically be uploaded. It also synchronises with the remote server, updating files and folders as required. You can also access your account from a Web interface. Here you can upload files, share your files with other users, create new folders, edit your account settings, and customise the interface. The Web interface of Omnidrive is clean and resembles Windows Explorer.

Omnidrive offers more features than any other free solution does. Key features include drag and drop support, RSS feeds for users to keep track of the files you upload, file tagging, public and private sharing, developer integration through APIs and permanent URLs for files. With permanent URLs, others can access your files anytime, anywhere. You get encrypted storage and secure communication over SSL.

The Omnidrive Blog is where you get to read about the latest news and details about the service. They offer a set of FAQs and e-mail support for users. The site mentions that user forums and a re-vamped support centre is coming soon.



The Omnidrive Interface

you'll get more information about what's going on with Openomy. You can read the status of their service at <http://openomystatus.blogspot.com>

Openomy offers their API to developers so they can integrate their services into the applications they develop. The API documentation is comprehensive and well-structured.

Having a simple, traditional interface can be an advantage, especially with browser and cross-platform compatibility. However, the lack of features such as drag and drop, the use of AJAX, and an iconic interface are an obvious disadvantage when compared to services like Box.net. However, there is support for tagging and RSS feeds. The file upload process is another area where Openomy loses out: you don't get details about the amount of data uploaded, the upload speed, and so on.

You get support via e-mail, a set of FAQs, and via their blog.



The Openomy file manager

Streamload

Having featured in Time Magazine's list of the 50 "coolest" Web sites, Streamload (www.streamload.com) is an online storage service of note. You get a 25 GB account free upon signup, with a 100 MB/month bandwidth cap. Paid accounts have unlimited storage but limited bandwidth. For instance, for \$4.95 (Rs 225) per month, you get 2 GB/month bandwidth, and for \$9.95 (Rs 450), you get 25 GB/month. The bandwidth limitation explains the "unlimited storage"!

Streamload's desktop client is available only for Windows. However, we had no issues accessing Streamload with any browser.

The interface is simple, and drag-and-drop support is well implemented. You can upload files using the desktop client (if you're running Windows) and also via the Web interface, which offers options for single file uploading, batch uploading, video and photo sharing, and you can use the TV and Movie Locker (a fancy name for the feature for uploading videos). They call their service "the largest online media center."

Streamload, too, misses out on features such as AJAX implementation, RSS feeds, and sharing. However, one advantage is that you get permanent URLs for your files. Support is in the form of a set of FAQs, tutorials, and help via e-mail.



The Streamload file manager is quite nifty

If Streamload is to compete with top-level service providers, they'll have to take a hard look at the price plans, which offer unlimited storage on the one hand and limit the bandwidth to low levels on another.

In Conclusion

The six services we've reviewed were close to each other in terms of features offered as well as price plans. While .Mac stands out for offering Web hosting along with online storage, Jungle Disk offers the best value for money due to their pay-as-you-use model. Box.net offers the best Web-based interface, and Openomy offers the simplest interface of all. Omnidrive (see box Omnidrive) is excellent, considering its early stage of development; the feature set is very impressive. Streamload loses out on cross-platform support.

Overall, we think .Mac is the best of the lot. Omnidrive seems to us a strong contender for top spot, but it's in private beta as of now, like we've mentioned. If JungleDisk decides to incorporate a Web-based interface in the future, it will probably share top spot with .Mac. ■

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We Want You!

Run a screen saver, help humanity!

Samir Makwana

Normally, we use this space to tell you what people or companies have done for society. This time, we're here to tell you about how you can help society, without even lifting a finger!

Too many of us have the habit of leaving our computers unattended and unused for a while—sometimes for a few minutes, and at times, for hours (that's where all the screensavers come in!). And many of us—especially those of us in offices—have the privilege of an always-on Internet connection. Instead of shutting down and then rebooting, how about assigning your computer's idle time to a productive purpose—like aiding a cancer research?

From Years To Months

In scientific research, huge amounts of processing power—measured in gigaflops, teraflops and even petaflops—are required to perform long and complex calculations in the areas of human protein folding, cryptographic ciphers, and such. These computational tasks are typically performed using supercomputers or other highly powerful computer systems.

Some research projects, such as those trying to find cures for diseases such as AIDS and cancer, can take quite a few years to complete, depending upon the computation they require:

they tend not to have a specified time to completion. But a solution has evolved to cut down on that time. That solution is called *Distributed Computing*.

In distributed computing projects, people contribute their idle computer processing cycles using a middleware platform for the projects open for public participation. Middleware refers to

developments: on the one hand, minicomputers, workstations, and then personal computers; and on the other, computer networks, including, eventually, the Internet. The first Internet-based distributed computing project was started by the DEC System Research Center at Palo Alto, California. The project sent tasks to volunteers via e-mail, who would run these programs in their computers' idle time, then send the results back to DEC—and then get a new task. The DEC System Research Center was taken over by Compaq in 1998 and was merged with the HP SRC Classic lab.

The Distributed.net project, started in 1997, actually made use of the Internet to distribute data for calculation and collect the results. They used independently-owned computers, and allowed the users to download programs that would utilise the idle time of the CPUs. The project was focused on breaking real-world cryptographic ciphers.

[www.distributed.net/projects.php]

The SETI@home (Search for Extra-Terrestrial Intelligence at home) project was initiated in May 1999, hosted by the Space Sciences Laboratory at the University of California at Berkeley. This was the project that really popularised the concept of distributed computing, and you've probably heard of it. SETI@home searches for evidence of extra-terrestrial radio signal transmissions and



Photograph Jiten Gandhi

the software that performs the function of agents that use the CPU cycles on the computer processing the data, and sends the results back to the server.

The Paradigm

Distributed computing goes back a long way, actually. It began in 1970 with the emergence of two

analyses any such they find.

[<http://setiathome.berkeley.edu>]

Non-profit organisations, universities, and even commercial organisations such as United Devices, Intel, IBM, Sun, and Microsoft are actively participating in scientific research. These are focused on designing distributed computing processes using open and scalable platforms on Internet-connected systems.

How It Works

So what we're talking about here is, you can help by "becoming part of a grid," donating the idle time of your computer. If you would like to help, there are a number of projects by the Berkeley Open Infrastructure of Network Computing (BOINC), Stanford University, World Community Grid, the National Foundation for Cancer Research, The Rothberg Institute for childhood diseases, and others.

The majority of the software clients for the purposes of these distributed computing projects are available for the Windows, Mac, and Linux/FreeBSD/Unix platforms. An application needs to be installed on the volunteer's computer, which will act as an agent and use that computer's CPU power when the computer is idle and connected to the Internet. After you download and install this software, they return the identification details of your system to the host computer server.

You'll then need to choose the projects you want to participate in, through this common software, for example, that of BOINC. As a result, when you're registered with a project, a screensaver runs when the computer is idle; the software works

on calculations in the background, and sends back the calculated results. Note that calculation is done only during idle time, so there's no interference with your regular work.

The Efforts Thus Far

Many projects are currently underway in various fields. Let's take a look at some of these.

BOINC-based Projects

BOINC is a distributed computing infrastructure that was developed after the success of SETI@home. BOINC serves as a software platform by which one can register for a number of distributed computing projects. Participation in multiple projects is possible through a single BOINC software.

BOINC was developed by a team based at the University of California at Berkeley, led by David Anderson, who works there as a research scientist. It is supported by the US National Science Foundation through awards for their research and development.

A number of projects come under the BOINC umbrella. These are in the fields of extraterrestrial intelligence, climate changes, chemistry, nanotechnology, cryptography, mathematics, and the life sciences. Here are some scientific research projects ongoing at BOINC. The current BOINC program version is 5.4.9, which is what you'll need to install. For more details, head to <http://boinc.bakerlab.org>.

Folding@home: This project, run by Stanford University, is a project where accurate simulations of protein folding and unfolding enable the scientific

community to better understand the development of many diseases, including Alzheimer's disease, BSE (mad cow disease), cancer, Huntington's Disease, cystic fibrosis, and other aggregation-related diseases.

Sony announced the Folding@home client for the PlayStation 3, which will contribute to medical research by utilising the idle time of the PS3's Cell processor. Recently, Stanford University announced the release of software that will utilise the processing power of ATI X1900 graphics processing units from ATI Technologies, and that will help them bring down the research period of Folding@home from three years to just a month. [<http://folding.stanford.edu>]

Climateprediction.net:

Under this project, the climate is being monitored so as to forecast climatic changes. The BBC Climate Change Experiment and Seasonal Attribution Project, which helps determine extreme weather events (cyclones, snowfalls, and the like) that could cause an impact on human activity, are also part of the project.

[<http://climateprediction.net>]

Rosetta@home: This one aims at solving the protein prediction problems run by the Baker Lab at the University of Washington. The ultimate goals of this project are the accurate prediction of human proteins that consist of amino acids, and the design of the protein structures that will help in the development of cures for diseases such as HIV/AIDS, cancer, Alzheimer's disease, malaria, and many others. The project has been successful thus far in accurate protein prediction.

[<http://boinc.bakerlab.org/rosetta>]

Jargon Buster

Gigaflops, Teraflops, Petaflops: FLOPS is an acronym for Floating Point Operations per Second. These are used as a measure of a computer's performance, especially while performing scientific calculations which make heavy use of floating-point calculations.

Aggregation-related diseases: Diseases caused due to clustering or amassing together of independent but similar particles, parts or bodies. For example, Alzheimer's disease is caused by development of abnormal tissues and protein deposits over thin surfaces consisting of nerve cell bodies.

Protein Prediction: A process of accurate prediction and design of protein structure and protein complexes.

Proteome Folding: The determination of the shape that certain proteins will take, and what kind of structure they will form, is called proteome folding. Proteome refers to the collection of all human proteins.

Protein Folding: A process by which proteins that consists of amino acids in the human body coil into a three-dimensional shape to perform their biological function.

Similar Ventures

World Community Grid: The WCG is run and funded by IBM to create the world's largest computing grid, and uses the idle time of volunteering Internet-connected computers. Currently, the WCG is undertaking research projects such as Help Defeat Cancer, Fight-AIDS@home, and Human Proteome Folding.

[www.worldcommunitygrid.org/projects_showcase/viewResearch.do]
Drug Design and Optimisation

Lab: This lab helps in evaluating potential drugs that will work against deadly diseases such as anthrax, smallpox, Ebola haemorrhagic fever, SARS, malaria, botulism, plague, and avian flu, which have affected many people in the recent past: several developing countries have had to take corrective steps against diseases such as SARS, anthrax, and avian flu. Africa, India, Korea, Indonesia, and many other regions urgently need to find a cure for infectious diseases such as avian flu.

The project is sponsored by a non-profit organisation called The Rothberg Institute for Childhood Diseases, based in Connecticut, USA.
[www.d2ol.com/pathogens.html]

**National Foundation For
Cancer Research**

The Screensaver-Lifesaver Project at the NCRF Center for Computational Drug Discovery at Oxford University is a unique program to rapidly screen billions of molecules, each with the possibility of becoming a drug that cures cancer. The project partners are the NCRF,

University of Oxford, United
Devices Inc., Intel, and Microsoft.
[www.nfcr.org/Default.aspx?tabid=274]

Grid.org

This is a grid computing platform and test bed that runs distributed computing projects such as the United Devices Cancer Research Project, which looks for potential candidate drugs for the treatment of cancer.

[www.grid.org/projects/cancer]

India is in 46th position amongst 236 countries, in terms of participation in such projects, according to the statistics available at BOINCstats.com. Our country is rapidly growing in the IT sphere and has the potential to contribute much more.

Make A Difference!

The world, as you know all too well, faces problems relating to diseases, the environment, climate, and other things. All countries except possibly the most poverty-stricken are trying their best to research and find solutions.

To do your bit, you don't

have to take out banners and roam the streets; nor will you need to accost people for donations. All you have to do is participate in any of the projects mentioned above, and any others you may come along when browsing the sites!

Participation in non-profit scientific research projects is one workable way ahead for humanitarian welfare. It doesn't require your presence, and won't cost you anything more than a slightly larger electricity bill—which you pay anyway by leaving your computer idle. This is, of course, assuming your Internet connection is always on.

We're hoping that after having read this article, you'll participate in one of the above projects—to make this world a better place!

Companies, too, can take a conscious decision to donate CPU time of company computers, and consider the increased electric bill as their contribution to charity... nay, *humanity!* ■

samir_makwana@thinkdigit.com

[illegible]



Neither Here Nor There



The unassumingly-named *MotoGP* comes across as a game that's trying to be a good motorcycle-racing simulator without compromising on the fun of flat-out arcade racing. To its credit, it pulls it off fairly nicely—you don't need much in the cranial department to fire it up and get started for the first time.

There isn't really much more to *MotoGP*—you can either race single races in the Arcade mode, or race all the world's official MotoGP tracks one by one till you drop dead from boredom. Every so often, you'll unlock a reward—like a hidden rider or a cool *MotoGP* movie. Yawn.

For the most part, the game is pretty responsive to the controls, but steering around corners is a

tricky thing to execute properly—even at the maximum, the bikes don't seem to be turning as much as we'd like. We even tried tuning the bike for better cornering, but it doesn't seem to help the situation much. Racing down straight portions is fun, but not fun enough. Simulation geeks are also going to wonder at the fact that no matter how stupidly you execute a wheelie, you seem to come out of it without crashing. Weirder still, you absolutely can't turn to go backwards!

Honestly, they should have stuck to pure simulation like in all the official licensed games—this one is a confusing mish-mash of both styles.

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Developer: Namco, **Publisher:** Sony
Platform: PSP, **Distributor:** Milestone Interactive
Web site: www.milestoneinteractive.com

Insane, Unbridled Fun

Ridge Racer 2 (RR2) has to be one of the most bizarre games we've reviewed here, not because of its concept—it's as simple as it gets—but because it mixes some terrifying flaws with a racing experience that's incredible fun. Good news first: racing in RR2 follows a simple mechanic—go as fast as you can, drift (skid in one direction while you face another) like a maniac to get rewarded with nitrous boosts which make you go even faster so you can drift in crazier fashions. It's a vicious circle, this.

The drifting—undoubtedly the highlight of the game—is tremendous fun, and never seems to get old. The tracks are gorgeous, and are a mix of high-speed and twisty, keeping the interest alive. Opponents are easy to beat till

you get to fourth place—climbing beyond will require you to tune your skills a bit more; challenging enough for us!

On the flip side, the car models themselves aren't that great to look at, and the collision physics are awful at best. The in-game announcer is also as annoying as a blister—like I *really* need to be told that I'm in a heated battle for the lead. If you're into plain-jane racing, this game is going to bore you—it isn't much if you strip it of the drift and nitro.

If you've played the first part, though, you're not going to find *anything* different—it's almost an expansion. Overall, RR2 stands tall on its own, but buy it only if you haven't played RR1.

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COMPANY of HEROES™



Heroism Pvt. Ltd.

Another RTS game based on WWII. Big deal. But to call *Company of Heroes* (COH) just another RTS game would be sacrilege—the game is as gripping and visceral as any first person shooter out there, and very nearly as visually stunning. A gorgeous graphics engine under the hood always sets the right tone, and COH looks amazing for any genre (especially the typically bland RTS), with realistic aftermath effects like fire, smoke, and fog to match the combat effects and explosions. Unit detailing is phenomenal, and I spent quite a bit of time just zooming in and panning around!

Add to the splendid visuals a real killer audio experience that brings the battlefield to vivid life—I could very nearly imagine myself there (All right, so I got carried away!).

Gameplay is where COH really packs a wallop, with great mission depth and variety that don't always come together in RTS games today. There's a nice collection of both the units and the situations you find yourself embroiled in. In the usual RTS style, certain units counter others rather well and are weak against other units: a sniper might

excel against infantry squads, especially if he's garrisoned in a tall building, but will fail miserably to impress against an armoured car!

The cutscenes are compelling: they actually feel like they're integral to the story, and not just afterthought-additions.

Unlike many other RTSes, COH involves goodly doses of both resource garnering (through capturing and holding sectors, similar to the *Dawn of War* 40K series) and tactical combat situations, and you'll find yourself challenged equally by

these activities. A mundane resource-point capture can become a struggle for survival as enemies swarm out of the fog of war. You'll also be challenged while advancing with your entire army, as you need to handle tactical situations. For example, advancing with tanks, though prudent—to protect vulnerable infantry—may not always be the best way out: a couple of squads of Nazis with bazookas in a choke point position can easily take out a tank or two before you can eliminate them. Similarly, using a squad to scout could prove costly if the Krauts have a couple of snipers on high ground. The game encourages you to actually think before making a move, and then think some more!

I can account for more than a few sleepless nights spent huddled in front of my monitor courtesy *Company of Heroes*. A great concept that's been implemented to perfection! On a negative note, you'll need a killer rig to run COH, and if you're running anything less than 2 GB of memory, expect to see long load times and frame drops, regardless of your graphics card.

Quite simply, if your machine is up to the challenge, join the war!

michael_browne@thinkdigit.com



Rating: **9/10**

Developer: **Relic**

Publisher: **THQ**

Minimum System Requirements: **Pentium 4 1.8 GHz, 512 MB RAM, 128 MB Direct X9 compatible graphics card**



CIVCITY
ROME

 Rating: 7/10
 Developer: Firefly Studios
 Publisher: 2K Games
 Distributor: E-Xpress Interactive
 Contact: 022-28850245

The City's There; Where's The Civ?

When we first heard of *CivCity: Rome*—the city building strategy game that takes its inspiration from Sid Meier's *Civilization* (Civ)—there were only good things expected. After all, with such impressive pedigree, how much could go wrong? No, this isn't one of those corny reviews where we say "plenty"; strictly speaking, there's nothing wrong with *CivCity Rome*, and therein lie its faults. Confused yet?

In *CivCity: Rome*, you'll be building cities all over Italy and generally doing your bit for the glory of Rome by feeding it resources and researching new technologies. On the surface, it looks like Firefly Studios took *Caesar III*, fixed some of the minor annoyances we had with that superb game, added a couple of new in-game features, and threw it back at us before *Caesar IV* could come out. Not that we're complaining. You can now track the location of every resident of every house—where he works, what he's doing and what he thinks of your city. You can even peek into his

home, though you don't get to know much from that.

Playing the game is dead easy—there are no manuals to read before starting. An in-game voice guides you through, and difficulty isn't that high either. An interesting addition is the *Civilopedia*, which gives you a wide and comprehensive look into the lives of the ancient Romans. If you're looking for links to the *Civilization* series, though, a microscope would help. None but the series' most hardcore fans can find the connections (save the researching technologies and *Civilopedia* bits), and even then they don't make much of a difference.

Big picture: like I said, there's really nothing wrong with the game. But then again, there's nothing about that jumps out and screams "Play me!". If you're a first-timer to the genre, it's brilliant, and if you're returning, you'd lose very little if you gave it a miss.

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We Knew It All Along!

This is downright funny. *The Wall Street Journal* carried an article about how record labels are now admitting that file sharing is indeed a way to market to music fans! It's laughable, but, well, it's a small step forward.



Lots Of Old-Timers Out There

One in three Americans write down computer passwords, a new study shows. "This is a lot like mom and dad buying a great new security system for the house and junior leaving the combination under the doormat," says an analyst about the new finding...



Escape

"DUMBER THAN HIGH-SCHOOLERS"

Smarts Tags For Bloggers?

Look at these two sentences, which mean pretty much the same thing: (1) Democracy has proven itself as a better governmental proposition time and again. Consider, for example, the fall of the former USSR. (2) democracy is good you see its always good. the USSR was communist and they failed.

Notice the difference? Some bloggers write as in (1), and some prefer the new-age (2). OK, the second one is an extreme example, and most bloggers fall somewhere in between. Anyway, someone over at scienceblogs.com got the communistic gem of an idea of testing whether the average blogger really does write well, the idea being that those who write regularly for fun *should* be able to churn out better prose. The recent Blogger

SAT Challenge invited bloggers and blog readers from around the world to test their skill at writing SAT-style essays.

So what were the results? You'd be surprised. Scienceblogs.com came up with "Bloggers Dumber Than High-School Kids." OK, there's all the messy details about test conditions, statistical relevance and all, but that was the conclusion.

A bloke called Dave Munger then disputed that finding, and thought up a new comparison—between bloggers and non-bloggers. Oh, the variety of serious graphs and calculations on his page—to prove that bloggers are a smarter bunch! And then lots of people went ahead and dug the page.

We gather that people seem to be getting more

sensitive to the fact that some blogs are crap and some are enlightening; that some bloggers are ramblers and some can be philosophers and friends.

But then comes an interesting, un-democratic thought. In the spirit of the aforementioned exercise, how about making it mandatory for bloggers to have a photo ID on their blogs? This could display such details such as IQ, age, sexual preference, and so forth, so we can filter out the bleats of:

1. Imbeciles (IQ below 80)
2. Women (for MCPs)
3. Kids (in case their age isn't apparent)
4. Fuddy-duddies (dated views)

And on the list can go. Heck, who needs a Semantic Web when we can have a Smarts Web that works this way?

Whatever Happened To...

Broadband Over Power Lines

As long ago as the year 2000 (well, long in tech terms, anyway), there came the idea that one should be able to access the Internet using cabling that's already there in their homes—power cables. Thus, Broadband over Power Lines (BPL) was born. The idea was (and still is) brilliant, especially when you look at the promise—just plug your broadband modem into a power connection, and be treated to 200 Mbps of glorious bandwidth. It uses already existing power infrastructure, so there's virtually no installation cost—perfect for rural areas.

Then came the opponents. Apparently, BPL interferes with about a billion other services around it—broadcast and HAM radio, aircraft frequencies, and generally any electrical signal unfortunate enough to be in the vicinity. You wouldn't want to bring an aircraft down every time you blogged, would you? And so, the BPL companies went home, tail between their legs.

As of August 2005, though, BPL Global Ltd. has started providing broadband to its customers, after convincing the US Federal Communications Commission (FCC) that if done right, BPL doesn't interfere with any radio frequency, so the world's already frightened air passengers can breathe a sigh of relief.

Win! My Desktop

Last month's winner is Arkopal Bhattacharya
Congratulations!

Here's how he made his Mac-crazy desktop:

1. FinderBar 1.3 for a MAC OSX style taskbar.
2. RAM and CPU meter widget for DesktopX
3. ClockX for the apple clock
4. ObjectDock for a MAC style dock bar
5. Wallpaper from macdesktops.com

Participate in this contest and win next month

XML

by Mitch Amiano, Conrad D'Cruz, Kay Ethier & Michael D. Thomas
Published by

 **WILEY-INDIA**



Send 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

"Cyber" Cafe



Last month's
winner is

Ankit Agarwalla
Guwahati
Assam

Participate and win next month
Administering Data Centers
by Kailash Jayaswal

Published by
WILEY-INDIA

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.

"GET A MAC"

Sure We're Convinced!

Oh, this is fun! There's ads out there advocating the purchase of Apple Macintosh computers. It's all listed out point-wise, and specifically written to <sarcasm> entice the poor, long-term, deluded Windows addict. </sarcasm>. Head over to www.apple.com/getamac.

There's no way to comment on the ad but to dissect each of the points—at least the more hilarious ones—one by one.

"#1: It just works. How much time have you spent troubleshooting your PC?"

<Smug> Not much, really. </smug> OK, OK, 98 was bad, but you don't need to keep reminding us.

"#2: You can make amazing stuff. Every Mac

comes with iLife '06, a suite of software that transforms your photos, music, and video into all kinds of projects."

Yeah again. Like you don't get software suites for Windows that "transform" our photos and videos into "all kinds of projects," whatever that's supposed to mean.

"#3: Design that turns heads. You don't want to hide your Mac in a corner of the den."

Like we hide our PCs, you narcissistic show-offs!

"#4. 114,000 Viruses? Not on a Mac."

Ah, this is an advertising gem—a superior example of twisting the thought process! The line makes it sound like all 114,000 are on the bloody PC at the same time! Don't you get it?

The list goes on, and we won't deign to get indignant at each of them. But then, there's this:

"All those reasons you never bought a Mac? Not

true anymore."

"#1. Know iTunes? You know the Mac."

Sure. And we don't like iTunes, by the way.

"#3. Yes, Macs run Microsoft Office. Microsoft Office for Mac OS X gives you Word, PowerPoint, and Excel, all with familiar features and the same shortcut commands."

Hey, who is this ad for anyway?

MINESWEEPER FOR VISTA...

Fun, Games, And Geo- politics

It might be a touch insensitive to say it, because it involves people getting killed, but this is a hilarious one! It's about how and why Microsoft is going about revamping the Minesweeper game for Vista. They've changed the look and all, but they want to make it more globally friendly. (That's where "geopolitics" comes in.) This, of course, is in the spirit of the new-age things that began in the '90s, such as calling handicapped "challenged," and all that kind of stuff. Only, Microsoft is making too much of an issue of it.

According to Dave Vronay, research manager for the Windows User Experience Compliance group, Microsoft has received many complaints about Minesweeper over the years. Here's a sample:

"For those of us living in North America, land mines are an abstract

People Who Changed Computing

The Sketchpad Whiz

Ever wondered who took us beyond the command prompt? It was Ivan Sutherland, considered by many to be the



Ivan Sutherland

creator of computer graphics. The first graphics program was Sketchpad; Sutherland

developed it as part of his PhD thesis at MIT. Sketchpad made it possible to create graphic images directly on the display screen using a handheld object such as a light pen. The program went on to influence the development of the GUI!

For this invention and for related work, Sutherland received the Turing Award in 1988: that award is something like the Nobel Prize in computing.

Sutherland had learnt to program a computer when he was in high school—a rarity in his time. A multi-faceted genius, he also dabbled in IC design. There's more: with the help of Bob Sproull, Sutherland created the first Virtual Reality and Augmented Reality Head Mounted Display in 1988.

Former employees of his company—Evans and Sutherland, which did some ground-breaking work in 3D hardware—included names like John Warnock and Jim Clark—who would then go on to found Adobe and Silicon Graphics respectively!

Sutherland is currently a vice president and Fellow at Sun Microsystems.

Bluff

YOUR WAY THROUGH

iSpeak

The world's been in love with Apple's products since the launch of the first iMac, and after the iPod, Apple's iCult has expanded manifold—fans are falling over themselves claiming they know what the next iProduct is going to be. Here, we present a quick guide to iProducts that exist, don't exist, and aren't even Apple. Of course, you'll need to figure out which ones are which first—we sure aren't going to tell you! Like they say, the best way to learn bluffing is to be on the receiving end once in a while.

iHome: Apple's answer to the Windows Media Center PCs, this gorgeous iMac-based media centre came on to the scene around MacWorld 2005.

iTV: This is supposedly just a code-name for the video-streaming device. The set top box will let you watch high-definition video on your television, and is about the size of a Mac Mini.

iWalk: Really now, the Newton debacle had to be avenged eventually, didn't it? The iWalk PDA will even run Palm applications thanks to the emulation layer on its *nix-based OS.

iDog: This Aibo-esque pet will dance to your music at your slightest whim—and if that music comes from your iPod, even better!

iTablet: Using Apple's patented multi-touchscreen, you can now use all your fingers to "crush" a big window, a la *Minority Report*!

iPhone: Is it fake? Is it real? Rumours of Apple's "inevitable" music phone have been entertaining us for ages. We predict three new rumours between our writing this and your reading it.

Now go online and find out—iReal or iFake?

Wild Wild Web

Four, Oh Four!

It's almost too often that you receive forwards with variations on a theme, but here's a page we really feel like mentioning. The theme is this: "Is there an art of 404 pages?" And the variations are many and funny.

Consider, for example, the "Philosophical" one:

"The Web page you seek Cannot be located but Endless others exist."

That one's almost a koan.

(If you don't know what a koan is, you should be ashamed of being Asian, you klutz! (Heh! Just kidding! Google it!))

There are many at www.365questions.org/2006/10/15/is-there-an-art-of-404-pages, but here's our pick - "For psychos":

Server Error-404

Psychiatric Support Page

Your file cannot be found!

...Please try the following:

1. If you are *obsessive-compulsive*, please check the URL repeatedly. ...
3. If you are *paranoid-delusional*, we know who you are and what you want. Just stay online until we can

trace your computer.

4. If you are *schizophrenic*, listen carefully and a little voice will tell you the correct URL.

Be sure to check out the "Rude" one! *Warning: Explicit Content*

The Google Graveyard

Head to www.seopedia.org/seo-news/google/goggles-56-forgotten-secret-pages-part-two. This is the second instalment of



forgotten and unused Google pages which you probably never knew existed! Here's a sampling of weird stuff you can actually find at Google.com.

1. www.google.com/explanation.html: Google's explanation of their disturbing results when searching for "Jew".

2. www.google-store.com:

The Google Store—a very colourful page where you can buy stuff branded with Google, like a Google beach towel or a White Google Polo Shirt. Like anyone needs to promote Google!

3. www.google.com/Easter/feature_easter.html:

The 2000 Google Easter Animation, where you catch the eggs in order to spell "Google". If you complete the game twice, there's a surprise, according to seopedia.com! Try it and tell us—it's a bloody silly game, so we didn't try it—but we'd like to know what the surprise is!

4. www.google.com/jobs/reasons.html: Top ten reasons to work at Google. Here's a sample: "Good company everywhere you look. Googlers range from former neurosurgeons, CEOs, and US puzzle champions to alligator wrestlers and former-Marines. No matter what their backgrounds Googlers make for interesting cube mates."

There are 56 pages listed on the site, and you should definitely give it a look!

entity that you really only see in a movie, but in many parts of the world people are killed or maimed by mines on a daily basis. Over the years, these users have repeatedly asked us to either remove minesweeper or change the concept from landmines to something a little less obnoxious."

Now what we're wondering is, they actually play Minesweeper in areas where they're getting killed "on a daily basis"? Is the game that great?

So anyway, the alternative Microsoft came up with for the interface is Flower Garden, where, ostensibly, you don't pluck a flower by mistake or something. But that's not all: they want to keep it Minesweeper in places where it isn't considered "obnoxious," and change it

to F.G. in places where it is. And this adds new twists to the tale. Vista lacks an easy way to change the name and icon for localisation; changing the name of the game could confuse people looking for Minesweeper, which would generate more support calls, and so forth. Actually, some people were even demanding that Minesweeper not be included with Vista at all.

What can we say? We looked up a popular discussion forum, and here are some of the comments:

1. *Why is it offending? You are looking for mines, not planting them.* Good point.
2. *What, some races can't handle bombs? Microsoft = racists.* Actually, it's not about race.
3. *Make it not selected by default, tell people who don't*

want it not to install it. The ideal solution, we think.

Wait a minute: why are we getting into all this?

FOR THE FUDDY-DUDDIES

Teens Say No To E-Mail

E-mail is, like, so yesterday. That's the sentiment amongst teens of today—at those of the American variety—according a new survey by a company with a very official-sounding name.

Teen e-mail use is dropping in favour of—you guessed it—more "instant" alternatives such as IM and MySpace. In fact, even IM use is dropping, and they're soon going to say IM is, like, you know, so yesterday.

In surprisingly good language, a teen called Jessica commented on a Web site: "It's too complicated to send e-mail. I have to go in and type it, and send it, then wait for a reply." Jessica, we do it all the time, and we aren't any the worse for it. We old folks, that is—those of us above, like, 20.

The study also mentions that 60 per cent of American teens have a cell phone and, in more emergent situations, use that gadget, SMSing.

What's the world coming to? (We need to use that phrase at least once in every issue.) But this time we have an answer: we think it's, like, going to, you know, like, the dogs.

Why we say this is that we're noticing a trend: tech and the Internet changing the language of kids, making them irreverent, ridiculously informal, more demanding of everything instant, impatient, and, like, you know, smart-arsed.

Case in point: we have openings here at *Digit*, and here's a sample e-mail from a student to our editor:

Dictionary 2007 Beta

Give me my home in the townie any day;
You call this *dumper* a city? No way!
It's all *conjusted*,
Dirty and *dusted*,
This *inglorified* place that's Bombay!

That might well be Michael's song: it reflects his sentiments about our city, and there's a boo-boo in each line.

We, the copy editors, have our own guilty pleasures: we receive stuff to edit, laugh out sinfully loud at each goof-up, then share them amongst ourselves at lunchtime. Then we laugh loudly again. This month, the sensitive issue of Michael's penchant (wrong usage, but the man would approve) for using the wrong word at the right time was raised. Now he's really a likeable old chap, plus he *might* read this, plus he kills people, so we won't try and be

funny any more—just state the facts.

It went like this: he wrote "longetivity" for "longevity." Raaabo noticed this, did a spell-check right in front of Mikey, and showed him. Mikey was ~~incredible~~ incredulous. The spell-check was performed in Word 2007.

That must have been why he couldn't believe he'd made one of his cool *faux pas*. Here's precisely what he blurted out: "Is that a word in Office 2003 as well?"

Raaabo, very insensitively, began laughing out loud. Then he shared it with Ram, who, no less insensitive, wrote this.

Copy Editors are Ghost Writers. Thankless job. Ever see an article that says "By Joe Browne, Edited by John Smith"? So just this one time, we get to use this space. But we're not telling Michael—and please don't spill the peas.

DIGIT DIARY

"Hi man—heres the stuff you asked me to send over. I know one of them is a bit crappy—I sort of like wrote it in a rush—but the other two should be just ok, tell me what you think of them"

Notice the irreverence? The hurried tone? The brattishness? They're all becoming like that. And

they're calling anyone over 20 "old." What will they turn out like when they become, well, responsible adults? Will they, like, hold corporate meetings via IM?

Anyway, the bottom-line: in 2002, *The Guardian* hosted a poetry competition, where only poems written through text messages were eligible.

The winning poem read:

"I left my pictur on th ground wher u walk so that someday if th sun was jst right & th rain didnt wash me awa u might c me out of th corner of yr i & pic me up"
Don't, like, ask us about the non-winning poems. ☒

Blog WATCH

Leopard vs. Vista is the topic of many blog posts—as we'd expected. And everyone's talking about Apple's new offerings and Nintendo's Wii, of course

Yasser Dahab
<http://snipurl.com/nov001>
(<http://theappleblog.com/2006/10/08/google-next-free-mac/>)

Google: The Next (free) .Mac

...Google sweetens the deal with their hosted solutions, providing anyone with a web domain the option of using Gmail, Google Talk, and Google Calendar with their own email address. You can also browse your RSS subscriptions from within Gmail, a trick I wish Apple's Mail would've learned long ago...

...It seems to me that Apple has doomed .Mac by forgetting to uphold three relatively simple rules: Listen to your users. Deliver on your promises. Make your die-hard fans feel special.

Steven J. Vaughan-Nichols
<http://snipurl.com/nov003>
(<http://desktoplinux.com/articles/AT5194932909.html>)
Firefox 2.0 RC 2: better, not perfect

The anti-phishing feature is first rate. With it working, which it is the default in this release, it automatically checks that a site really is the site that it's claiming to be, by comparing the website's information with a list of known phishing sites. If you really want to go on to the bogus site, you can also do that.

Marshall Kirpatrick
<http://snipurl.com/nov002>
(<http://www.techcrunch.com/2006/10/09/ten-things-i-wish-ie-7-was-about-to-deliver/>)

Ten Things I Wish IE 7 Was About to Deliver

...There are a lot of shortcomings still. Over all it's an improvement and I'm thankful that if nothing else tabbed browsing will be spread around the world. Some people might say I'm just looking for feature overload, but there are clearly a lot of new features already being added. I'd just like to see a few more and better implementation of what's coming in this release.

Jeremy Zawodny
<http://snipurl.com/nov005>
(<http://jeremy.zawodny.com/blog/archives/007665.html>)

Hit counter 2.0 or "Web 2.0 Metrics"

...At one time it was common to see a hit counter on every page, but this is no longer the case for several reasons:

- They have been replaced (or augmented) by more complicated web analytics methodologies that give the webmaster a better overall picture of site traffic besides a simple, perpetually increasing number...

... But Ajax is only part of the reason pageviews are obsolete. Another one is RSS. About half the readers of this blog do so via RSS.



October 2006

Bitten By The Anti-piracy Bug

I recently bought the PC of my dreams, which I wanted to do for over a year. All thanks to you guys. I decided—like all the other fans of my favourite Digit-ian Agent001 out there—to go paid. I decided on a legal copy of Windows XP Home for Rs 3,800. Something happened which I would like to share with all the “please go paid” fans you inspired...

My vendor showed me two packs of Windows XP: one was a thin SIM-card-style package, which he said was an old one, and another was a plastic box (read hopelessly transparent) package. In the new package, the CD got dislodged from the cover when I accidentally tapped the side of the box, and this revealed the CD key (with genuineness certificate and all)! Thinking that this was a package defect, I asked the dealer for another pack, and the same thing happened again!

Couldn't people misuse this information and pirate the copy before it was even sold? Now why would people want to pay for software whose developers don't even bother to keep the information secure?

Anyway, as always, your magazine is the best one there is, and your *Fast Track* issues rock. Hope you include this letter in the mag!

Siddharth P Shanbhogue
Mysore

Dear Siddharth,
Your vendor is obviously a pirate. It's not that the companies don't bother to keep the license information secure—your vendor had

obviously opened the packages to make a list of working license keys.

What can I say—except that the only thing you could and should have done is to walk out of that store, telling the vendor you wouldn't purchase a PC from someone who pirates software keys! I hope this message reaches out to more such readers like you, who have (thankfully) been bitten by the “go paid” bug.

— Executive Editor

I Want Code!

I am a second-year BCA student doing a computer hardware and networking course at Jetking. I've found that *Digit* is very helpful in my studies. I request you to send some notice on languages like C, C++, Java, HTML, etc. If you have extra notice on B.C.A., please provide that as well. Most of the people (85 per cent) in my class buy *Digit*, and this is a joint request—thanks!

Kanwaljeet Singh,
Bathinda, Punjab

Dear Kanwaljeet,
I'm not quite sure what you mean by “notice,” but if you mean information, we have plans to cover programming languages in upcoming issues of *Fast Track* as well as the magazine.

— Executive Editor

Thank You My Friend!

I read *Digit* for the first time in January 2002, and since then, it has been my best friend. I did not subscribe to the magazine, but I've never missed a single issue. It not only taught me how to troubleshoot computers, but also kept me updated with technology. I was accustomed to using pirated software and I had all the popular software. But now I only use either licensed software or Open Source software. Thank you, *Digit*, for being my best teacher and best friend!

Vedant Choudhary

Dear Vedant,
We're extremely glad to have got the message about piracy across—your letter is the second one this month that talks about using legal software, and that doesn't include the unpublished letters! Thanks for writing in!

— Executive Editor

I Want It All

I have been reading your magazine for the past two months. The *Fast Track* series is really good. But I could only lay my hands on two of them! Is there any way to get all the *Fast Track* books, free software, and game CDs—for a price and at one go? I'd be grateful if you could tell me how.

Kishore

Dear Kishore,

We're sorry to tell you that you can't—apart from the fact that we provide the entire *Fast Track* series as PDFs on the CD/DVD once a year. You can get all the previous issues of our *Fast Track* series on our December 2006 CD. That apart, how about getting yourself a subscription of the magazine—since you liked the two issues you bought, we're sure it'll grow on you!

— Executive Editor

Jukeboxes Rule

Your article on the Home Jukebox had perfect timing. I recently acquired a Samsung Bordeaux 40-inch beauty and was looking for a way to watch all my DivX movies and also my huge collection of digital photographs on it. A DVD player just didn't cut it.

I had an old machine (a Pentium III 550 MHz with around 128 MB of RAM) lying unused, so I thought of putting it to good use. I installed a Wi-Fi card, a friend's old 40 GB HDD (plus the 20 GB drive that was already in it), and a USB TV-Tuner! Now I can watch all my movies and pictures in high definition! And believe me, it's glorious! Since the system is already hooked up to the home theatre for audio, I can also play back my music collection over wireless!

Do you guys know whether GeeXboX is dual-boot compatible? Because I'd like it if XP were there too... in case I ever needed it!

Reeve Luiz

Dear Reeve,

Well done! Lots of people like you have loved that article, so keep watching these pages for more along these lines.

Yes, GeeXboX is dual-boot compatible—it installs the GRUB boot-loader when you put it on your hard disk, and that will detect your Windows installation. Just make sure you install Windows first!

— Executive Editor

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

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Inbox

LETTER
OF THE
MONTH

Publish My Letters!

This is my third letter to Team Digit. Unfortunately, you haven't published either of the preceding two. Anyway, the purpose of my writing is to keep in touch with you...

The October issue was mind-blowing and really useful. The laptop section was helpful for everyone, especially for students. The way you categorised the laptops was indeed great. I really liked the Compaq Presario at a good price of Rs 50K, and the Dell Inspiron 6400. But I was disappointed that you missed out on Apple notebooks. Really, those MacBooks are cool—you should have reviewed them.

Could you suggest a laptop that supports SuSE Linux 10.1 under 70K?

Last month's issue was close to being the best *Digit* ever! Graphics cards, laptops, and other stuff were mind-blowing.

If only you could've shipped a Linux distro like SuSE 10.1 or Fedora Core. I'm looking forward to seeing a shootout between SuSE Linux 10.1 (Xgl), Windows Vista (the Aero interface) and Mac OS X Leopard (its 3D interface).

These OSes are very advanced—why don't you review them for us in the coming months? Anyway, keep up the good work, guys! You really are praiseworthy.

Tarun Brari

Dear Tarun,
Glad you liked the laptop test. Comparing the MacBooks on the same platform as the rest wouldn't have been fair to either. You can, however, find the MacBook and MacBook Pro reviewed in this issue.

If you plan on using SuSE Linux on your laptop, rest assured—SuSE has some pretty impressive hardware support, and should run fine on any of our test winners—just take your pick!

If you intend to use XGL, however, do make sure you choose one with a good graphics card.

Finally, the battle for the prettiest desktop may rage on as much as it chooses to, but if we do pit the three OSes against each other, we'll be looking at what lies underneath.

— Executive Editor

Worth Every Penny!

Your mag is awesome! I can't believe all the money that I've spent for your mag...and every time I bought it, it left me empty-pocketed, but delighted. I just want you guys to know that you have helped me win a lot of battles between man and machines. Thank you guys.

Moses Hnamte
Mizoram

Dear Moses,

We always knew that our mag gives a bang for every buck you spend, but to get that from a reader does motivate us further.

— Executive Editor

Sold Out!

Thanks to your magazine, it has really improved my knowledge on technology. I recently got selected from my school to represent it at the All Goa Computer Quiz on 12 November, 2006. When enquired about my knowledge source, I told them its *Digit*. Soon I saw a lot of students buying your magazine and within 4 days all bookstalls in the city had finished their stock of *Digit*!

Please review PDAs as soon as you can. Also, please try to include *Fast Tracks* to Internet, Gaming, Windows XP, Web Design, etc.

Aashish Kamath
Goa

Dear Ashish,
Congratulations on being selected for the computer quiz at Goa and wish you good luck for it. I am sure you're gonna win laurels for your school at this competition.

As for the *Fast Track* to the titles you have mentioned, well as I have said earlier in my reply to a reader, we've got a lot of letters from readers asking whether they can purchase past titles or can we send them our old stock by VPP—the answer to that is No. Sorry to say this, but we do not have past issues of *Fast Track* to sell or distribute free as of now. But yes, we promise to give all of them as a PDF in our December 2006 CD. So make sure you grab it in the 1st week of December. Your PDA review demand has been noted, we did review them in our June 2006 issue, and will revisit them soon.

— Executive Editor

Even More Ways To Stop Piracy

I have been a regular subscriber to *Digit* since its inception and enjoy reading the articles. Though my work domain is not directly IT-related, functionally I am required to be IT-savvy, and *Digit* is one of the resources to fulfil this requirement.

Recently, I have seen several letters to you with regard to software piracy in India, and the responses from *Digit*. While there are several strong arguments on both sides, especially how overseas software companies treat India with regard to the pricing of their products, I do agree that piracy is not the solution.

Therefore, in order to "educate" the general Indian public, *Digit* would do good work if you could frequently publish a list of free software that are equivalent to popular operating systems (Windows), office applications (MS Office), and multimedia software.

Further, *Digit* could consider occasionally bundling such freeware in an exclusive DVD or CD that are supplied with the magazine, or sell them separately if allowed by the freeware license. I am sure that with such a concerted effort, software piracy can be reduced substantially.

However, please understand that open source freeware such as Linux does not find favour for most "non-geek" users, who are averse to command-based software, and therefore would not serve much to accomplish the prime objective.

I hope *Digit* will find this suggestion suitable for adoption.

Ashok Sundar
Chennai

Dear Ashok,

We never miss an opportunity to remind readers that we're clairvoyant—this time's *Fast Track* to Open Source Software, and the pile of open source software on this time's DVD should give you all you need, and then some.

Please let go of the "open source is for geeks" attitude—it's true to some extent for Linux, but both the OS and the software have evolved into more user-friendly packages over the years, and will continue to do so in the future.

— Executive Editor

Cannibals, Pirates, and Zombies

1 In which country does a Pirate Party—an actual profile-sharing *political* entity—exist?

- a) Holland b) Sweden
c) Russia d) China



2 What is Niue, a little island in the Pacific, known for?

- a) Its "export" of domain names
b) Complete Wi-Fi coverage
c) Online gambling hosting
d) Cannibalistic tribes with a preference for Sumo wrestlers

3 Which of the following is an ongoing tech rumour?

- a) Intel will buy ATI
b) Intel will buy NVIDIA
c) AMD will buy Intel
d) Transmeta will buy ATI

4 The term is no longer used, but what were four bits called?

- a) A fobit b) A chomp
c) A nibble d) A munch

5 A company called Pure Digital is bringing out camcorders that can/will...

- a) Automatically upload videos to video sites
b) Automatically delete explicit footage

- c) Sport 1000 GB hard disks
d) Use automechanics to eliminate camera shake

6 Just guess. After the company with the NYSE symbol "THE", what comes up first when you Google "the"?

- a) The site of The Independent newspaper
b) A satirical news site called The Onion
c) The dictionary meaning of the word "the"
d) The official page of the White House

7 Again, just guess. What is god.com.hk?

- a) An evangelical site
b) A site advocating atheism
c) A bookstore
d) A furniture store

8 Trick question. What is a zombie?

- a) The term used by techies for technologies past their time
b) The term for an (obviously fearsome) un-dead techie
c) A PC that has been taken over by an attacker
d) A process abandoned by the one that spawned it

9 An easy one—Java is an evolution of what

programming language?

- a) Kava b) Sumatra
c) Oak d) Pine

10 Recursion is often used in programming. Which of the following is an example?

- a) $a = a + 10$
b) $b! = (b-1)! * b$
c) $C++$
d) $\text{while } (10==10) \{d=d\}$

A googol is a 1 followed by a hundred zeroes. Google founders Brin and Page originally intended to call Google "googol", but ended up with "Google" because of a spelling mistake on a cheque that investors wrote them!

Did You Know?

Answers

1. b) Sweden	2. a) Its "export" of domain names	3. b) Intel will buy NVIDIA	4. c) A nibble	5. a) Automatically upload videos to video sites	6. b) A satirical news site called The Onion	7. d) A furniture store	8. Both (c) and (d) A PC that has been taken over by an attacker	9. c) Oak	10. b) $b! = (b-1)! * b$
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Got an interesting question? Send it in with the answer to **TQ@thinkdigit.com**. Mark "TQ" in the subject area.

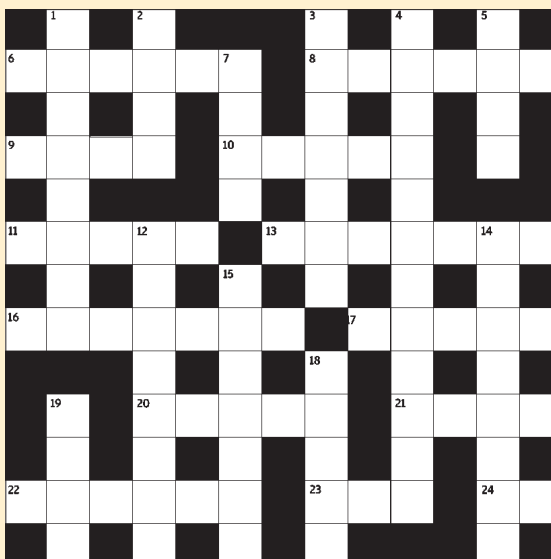
Crossword

ACROSS

6. ____ A file'-handy function available in most mailers(6)
8. Pictures scanned and saved are bitmap ____ (6)
9. 'R' in ROM(4)
10. Key ____ is a text input device(5)
11. Electronic version of the letter on the internet(5)
13. SAP AG-largest European software enterprise based in Walldorf, ____ (7)
16. A community-based BBS, usually in a public library(7)
17. Unit of frequency(5)
20. World's largest chip manufacturer headquartered in California(5)
21. Open Database Connectivity(abbr)(4)
22. A virtual representation of the player in a game(6)
23. ____ light Saving Time(3)
24. ____ Screen keyboard(2)

DOWN

1. Backing storage device-tape ____ (8)
2. ____ card-is the asterisk sometimes used in database queries(4)
3. Illegally obtained software(7)
4. R and M in RAM(6,6)
5. ____ and receive SMS messages(4)
7. Ethernet ____ or concentrators(4)
12. National ____ card- plasticized card with digitally embedded information(8)
14. Small compact portable computer(8)



Due to a printing error, last time's crossword printed with the wrong grid—we apologise for the inconvenience. Naturally, there was no winner last month (If you managed to crack it, we're very impressed!)

Send in your entries with complete contact details to **TQ@thinkdigit.com** on or before **September 20**. One lucky participant will win **AutoCAD 2007 and AutoCAD LT 2007** by David Frey

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Tabloid TECH

People And Events That Grabbed Headlines—For Better Or For Worse

“Brittany”

Many people seem to be sticking to the old-world spelling of “Britney”—which is why “Brittany Spears” makes it to the Yahoo! top-20 list of search typos.

An aside: stuff.co.nz reveals that this top-20 list was released on Yahoo’s “Buzz

4. Wierd Al Yankovic (Weird Al Yankovic)

Ever since we’ve been seeing the sunlight, Americans seem to be spelling “weird” the more intuitive way.

5. Evanescence (Evanescence) Now that’s a tough one. Even for some of us.



blog.” And here’s what Yahoo! had to say about it: “Thanks to our advanced computerised technology, we can catch most of your mistakes and provide you with the correct result.” No, don’t bother checking. We aren’t kidding.

So here’s the list:

1. Rachel Ray (Rachael Ray) Who’d guess?
3. Scarlett Johansson (Scarlett Johansson) Swedish—you can’t expect Americans to get it right.

7. Barbara Streisand (Barbra Streisand) Again, who’d guess?

9. Jamie Presley (Jaime Pressly) Sounds like “Jaim.”

11. Brittany Spears (Britney Spears)

14. Eva Mendez (Eva Mendes) Mexican and all... OK, no racist comments here.

15. Jessica Beil (Jessica Biel) Why do Americans pronounce “ei” “ee”?

20. Micheal Jordan (Michael Jordan) Duh.

Oh, Behave!

California governor Arnold Schwarzenegger’s veto of a bill that was aimed at protecting Californians from even more Big Brother-style RFID tracking should come as no shock if you understand his penchant for paternalistic power, say the authors of *Spychips*, which talks about how evil RFID is.

Californians wanted more privacy, so they introduced this bill in the face of startling new developments. US Homeland Security is already testing RFID tags in visitor documents, and is looking for a very powerful form of RFID that could allow law enforcement to “read documents secured in wallets and even in speeding cars,” according to the authors of *Spychips*. Then Herr Schwarzenegger went ahead and said, in a very strong Austrian accent, “Nein! Dere vill be no such Bill! No Privacy in mein Kalifornian Faterland!”

Well, what can you expect? After all, he comes from a past where he admired Hitler (go find out if you don’t believe us), and



from a future where computers control everything.

In a 1990 U.S. News interview, Schwarzenegger actually did say: “My relationship to power and authority is that I’m all for it. People need somebody to watch over them. Ninety-five per cent of the people in the world need to be told what to do and how to behave.”

Heil der neu Führer!

The Passion Of The Cruise

Penitent Disclaimer: we lifted that title off Sciencetomogy.info. Anyway, ever heard of Scientology?

Anyway, the news is that the Church of Scientology, in typical self-defensive fashion, is threatening legal action. Of course. A Web site called *The Scoop* reports a legal letter sent to the creators of the site: it reads,

“You are hereby on notice that the registration and use of this domain name in this fashion has caused your name to be falsely associated with our client’s registered mark, Scientology.

“The fact that you have changed one letter does not protect you from trademark infringement.” Apple vs. Arple, anyone? Arple exists, and Apple haven’t sued...

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