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MINI SHOOTOUT-I

Clustering Linux Distros   p 126-128

Three most popular clustering distributions have been downloaded and tested against each other. You can get all these distros in our last month's DVD. Also know how to use these clusters, the difference between HPC and load-balancing clustering distros and understand how and where each would be used.

MINI SHOOTOUT-II

Media Players   p 129-132

We have chosen eight popular media players and tested each on the basis of their features and performance and chose the best one for you. These are all free and downloadable from the Web.

Allied Telesyn AR410S Security Appliance

PCQuest Power Pack

PCQEssential
Sales and Marketing tools

PCQXtreme
Mobile Application tools

PCQLinux 2005 SP-I
Critical and security updates

IN DEPTH

Mobile Productivity   p 86-96

The cellphone has become an office on the move, thanks to its integration with the PDA. Ever tried delivering a presentation to a customer with your cellphone? Or get critical alerts about your IT infrastructure through SMS and then log into your network remotely to do something about it? All this and more has been made possible thanks to all the technological development in the mobile space. Our focus here, is on the technologies available in this space and what you can do with them. Technologies like push to e-mail, and push-to-talk are already here, and those that let you use your cellphone to make VoIP calls are about to be launched. We've covered all these and more here.

Where Will Implementations Happen?

Krishna Kumar, Editor

Many sectors of Indian industry are going to see a further acceleration in IT implementation rate, and a few would take time to mature.

India is one of the few growth engines for the IT industry, ranked second after China. But it is not as if the whole of India is busy implementing IT. There are variations in the rate of adoption of IT across sectors, across geographies and across demographies. Let's take a quick look at what is happening where. Before that, a word of caution; this is not based on any scientific survey, but on my interactions with a wide cross section of informed people from across the country. The conclusions are my own.

The past couple of years, the BPO and financial sectors were leading in IT spend. BPO is expected to slow down this year, now that the initial spurt is through. The financial sector can be further divided into three. Foreign and private banks fall in tier one. They were the drivers of the huge investments that we saw in the sector thee past few years. This is expected to slow down. In tier two we have the large PSU banks. So far, they were behind tier one and can now be expected to accelerate their rate of implementation, and growth in implementation rates in the banking sector will primarily come from here. Tier three comprises the smaller, regional and cooperative banks. In fact, some of them, particularly the cooperative banks based in Maharashtra and Karnataka were the leaders in bank computerization till private banks were allowed to be set up. This group would now get busy upgrading their older platforms and applications. Insurance mirrors the first two tiers in banking. Government is going to be another area of rapid growth. By government I do not mean the PSU's, but the various departments, ministries and the different tiers of governance, such as local self-government bodies. The budgetary outlays for e-governance are huge and I don't expect that to be fully spent. But a percentage of the budget still works out to a significant volume. The military can also be expected to significantly improve its usage of IT in the coming years. Academics, particularly schools and colleges are going to be another growth area. At one time, the manufacturing sector contributed to the bulk of domestic IT implementations. Then the sector went into a slump, but has since risen phoenix like. Manufacturing is now ready to upgrade, update and otherwise add-on to its already sizeable IT infrastructure. So, this sector also will see significant growth in implementations starting this year. Natural resources exploration, including petroleum and mining will also see increased growth in IT implementations as will the infrastructure—particularly the transport and communications sectors.

Two other sectors, which the IT industry sees as sunrise sectors, are the medium-sized business segment and retail. Here, I beg to differ with the projections of the IT industry. The expectations from these sectors reminds me of the earlier, failed home computing thrust by all vendors. These two sectors are similar, disorganized and extremely price sensitive and lack in adequate IT skills. Sure, the potential is there, it but will take some time for it to mature.

16 cities contribute to 80 % of the IT purchases and implementations in the country. Many vendors have started a big push into the hinterland, the C and D cities and smaller towns. That too, I feel will take time to mature.

□

Security Appliances vs Security Software

Anil Chopra, Associate Editor

The number of security appliances being deployed on enterprise networks is growing dramatically as compared to software-based ones. This is possibly an indication of a new trend in the security arena, thanks to the ever-increasing number of security threats. So much so that they might end up capturing a large chunk of the software-based security solutions market. Could this mean the end of software-based security software? Not necessarily, because both security appliances and software have their own share of advantages and disadvantages. Let's first take network security appliance. A security appliance is a hardware box, dedicated to some security function. Currently, the dominant appliances are firewalls/VPN boxes, IDS, and UMT (Unified Threat Management). Out of these, UMT has the largest base. The biggest advantage of appliances is the ease with which they can be deployed, just like a TV or fridge at home, or a switch/router in the office. Simply plug them into your network, run through a few configuration screens and they're on. Appliances don't carry any over heads and only perform the function they're meant to.

One major concern that's normally raised about appliances is on the updates. As security threats are constantly coming up, all security devices have to remain constantly updated to tackle them, otherwise they're as good as not being there at all. Most appliances are able to automatically update themselves directly from their manufacturer/vendor's website, provided they have an Internet connection. The concern here is that the administrator needs to constantly keep a check on the appliance to ensure that it's indeed getting updated automatically. Another advantage of appliances is performance. Since they use dedicated hardware for scanning all incoming and outgoing packets, comparing virus signatures, or running encryption algorithms if creating a secure channel, their performance is much faster than security software. However, this benefit is only visible when the volume of traffic passing through the appliance is enormous.

Another point that might seem like a disadvantage is that appliances have a high initial acquisition cost as compared to software. This may not be an issue for large enterprises with deep pockets, but it could deter medium-sized organizations from purchasing. There is one more fact, which needs to be kept in mind about multi-function appliances. Usually, an appliance vendor would not own all elements of security. Say vendor of appliance X has a great firewall technology, but doesn't have any anti-virus expertise. So the vendor licenses the anti-virus engine from another vendor and incorporates it in the appliance. While this may sound good, this can lead to several issues, like support. The vendor might service the appliance for its firewall, but may ask you to contact the anti-virus vendor for support. Moreover, in case the tie-up between the two vendors breaks, then you might be at risk, because you won't get support from either.

Security software on the other hand is installed on an OS like Windows or Linux, which sits on a PC or server. Since OSs are designed for multiple functions, they do carry a lot of overheads. So the network administrator has to put in extra efforts to do a lot of optimization and tweaking after installing the security software, such as disabling all unnecessary features, services, etc of the OS. Even before that, all hardware incompatibilities also have to be resolved, to ensure that the security software interacts optimally with the underlying hardware. Moreover, the cost of OS, licenses, PC, and server hardware also have to be borne. In most medium-sized businesses, the same machine also ends up being used for multiple functions. For instance, a server that's configured as a firewall or IDS can also be configured as a proxy server, or offer other services like DNS, DHCP, etc. This can affect its performance and make it more vulnerable to crashes. Plus, the administrator has to worry about keeping track of the latest patches and updates for all services, and has to ensure that the machine runs smoothly even after all updates have been installed.

All this may sound as if software based security is bad, but it has its own advantages as well. One is the sheer variety of security software available. The lowest price for it is free, because lots of open-source security software is available for free download. In fact, there are some dedicated Linux-based firewalls, VPNs, etc available, which can easily be installed on a PC. Like appliances, these are also dedicated to doing security functions only. They're also freely available, but the trouble there is that you have to keep track of their updates on your own and nobody else but you would be responsible if anything goes wrong. Here again, there are companies offering open-source security software, along with support.

So the bottomline is that while appliances are definitely in, they're not going to kill the security software market. □

To forums with love

I came across this item at newsforge praising the *PCQuest* forums: "…These forums are populated by many users, as well as developers. As forums go, *PCQuest's* are among the better ones out there. Most times, a reply with the solution to your problem can be seen within only a few hours."

— *Vasu*

Redesign

We have just finished a quick redesign of the magazine—done in just four days (and three nights).

The objective of the redesign is to make the magazine more contemporary and of course to increase the content. *PCQuest* has traditionally followed a conservative, rather than flamboyant design, and that continues. The basic colors continue to be the same.

There are some tweaks to the layout. We have increased the amount of content per page, by increasing the coverage per page and by doing away with some of the larger design elements, such as the large box at the beginning of each section.

The sections have also been reworked

— *Krishna Kumar*

PCQLinux download

Does anyone know how can I get a copy of PCQLinux 2005? I don't think there's any mirror or FTP site to download. Thanks.

— *Eric*

Sorry, the PCQLinux 2005 distro isn't downloadable. We have been trying to get the editor to put it online so everybody can download it. Where are you located? Maybe someone on the forum can burn a set and send it to you?

— *Dinesh A Joshi*

Unique touch

I am very happy to be part of one of the leading magazines in India. *PCQuest* has a unique touch to it, which captures the attention of the reader. I received this month's magazine on the 8th itself.

I have read many other magazines and found that *PCQuest* is the only one which discusses the technical aspect of the topics instead of just giving information about it.

That's why I decided to subscribe to it. Even though I am not well versed with the IT jargon, I am able to understand many of the things just by reading the magazine.

— *Raghavendra Rao*

Books contest

It is not reasonable to fix the last date of receipt of entries for the *Books Contest* as 15th of the next month. This is because the current issue reaches the subscribers (not the newsstand copy) only by 20th of every month. Please do justice to all concerned.

— *Raveendranathan K C*

More contests

Redesign is always welcome. I've been observing changes in *PCQuest* since the year 2000 and all the changes have been pleasant.

As far as the contests are concerned, the more the better.

— *Chinmay.in*

I think you can also start a contest having one of the products reviewed in the *Shootout* section as the prizes.

Looking forward to the new look of *PCQuest*.

— *SP Shukla*

Web-based project management

Have a look at http://www.basecamphq.com/?ref=free . It's a cool Web-based project management site, where one project can be done freely. Try it in collaboration with others.

The technologies used here include fun. neat. and ajax.

— *Gary_no_1*

Winners

Thanks to *PCQuest* and *Wiley Dreamtech India* for sending me the book—*How to Do Everything with Email, Spam and Viruses.*

I just wanted to share the happiness this prize has given me. The book is a great one too. So thanks once again!

— *Manish Kumar*

Thanks for sending me the book *How to Do Everything with Email, Spam and Viruses.* I congratulate and hope that all my fellow winners too have got their prizes already.

— *Gobinda Ghosh*

Bad naming

The file names in some of the places in the May DVD are incomplete? For instance, in KDE , all are rpms. And cluster knoppix is corrupt too. Also in the CD , in bolitaire in the *You Made It* section, all the files are badly named and few empty directories are also there?

— *Vasu* □

Digitally Securing the Number Plates

Despite government's endeavors and the specifications it has laid down for migrating to a more safer option of having secure number plates for all vehicles, the technology used is not fool proof. A look at the alternatives

P S V Ananthanarayana, MD, Maruthi-IT.com

Existing number plates are not secure and can be faked easily. As a result, the government has already decided to add new security features to these plates to make it easy to identify vehicles, avoid theft and provide uniformity across the country. All the vehicles (including the old ones) are required to have the new high-security registration plates. This will be achieved in a phased manner, within a time period of about two years.

Ministry of Road Transport and Highways has laid out a set of recommendations for taking care of the security features. These specifications need to be incorporated in the manufacturing process.

But most of these processes are either external operations or outsourced. Hence, these cannot be considered really secure (see the box for Ministry's recommendations). To understand why they are not secure, let's analyze the manufacturing process first and then move on to review some enhancements that would make the new number plates more secure.

Existing manufacturing process

The manufacturing process requires two setups—the mother setup and the RTO setup.

Mother setup

The manufacturer has to set up a hot stamping mother facility from where the front and rear number plates (Aluminum) are supplied to the RTO. To protect against counterfeiting, a Chromium-based hologram is hot stamped on the plate. The hologram contains the 'chakra' emblem. A permanent identification number is also laser branded into the reflective sheeting of the number plate. The legend 'IND' is impressed by hot stamping or embedded into the film for country uniform identity.

RTO setup

Letters and numerals of registration number marked in English are embossed on the registration plate and 'INDIA' inscription is hot stamped on the letters /numerals/border.
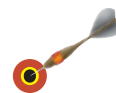
Security threats

Now let's figure out why the high security number plates are not so secure as they were thought to be.

- The manufacturing process and hot stamping of the Chromium hologram of the high security number plate is outsourced, which makes it susceptible to frauds.
- Hologram is not a state-of-the-art security feature. It can be faked easily too.
- Loose manufacture control

Alternative manufacturing process

Mother setup

Just as we have a unique image and security thread on our currency notes, there can be images such as the chakra emblem and security thread as part of reflective sheeting. This reflective film can be laminated on to the Aluminum plate. Also, the permanent identification number can be laser branded into the reflective sheeting.

Then we have infrastructure and large spare capacity available at various ▷

High security specifications

- Base registration plate to consist of Aluminum and Retro Reflective Sheeting
- Letter and numerals of registration mark in English to be embossed on the registration plate
- Chromium-based hologram to bear the 'Chakra emblem'
- Seven digits digital code to be engraved by laser marker
- Third registration plate to be in the form of a self-destructive Chromium-based hologram sticker
- Legend 'IND' to be impressed for country identity
- 'INDIA' inscription to be hot stamped on letters/numerals/border
- To be fastened with non-removable/non-reusable snap lock system for tamper proofing

Indian government mints. The defense production establishments such as the ordnance factories and the government should look at these as establishments for secure and controlled manufacture of the mother plates.

Digital printing

Embossing is not a high-security feature. Also, it will require a huge investment to provide embossing stations across the RTO offices in the country.

A better solution is digital printing; letters and numerals can be digitally printed on a film giving the same effect as embossing. Also 'INDIA' inscription can be digitally reverse printed, while printing the letters/numerals/border. Legend 'IND' can also be impressed by digitally printing along with the numerals and letters. This film can then be laminated on to the secure mother (Aluminum) plate. The digital printing on the film with the required information can be can be managed at the RTO office by the RTO staff in a seamless manner.

Third number plate

As per the current specifications, the sticker for the third number plate has a Chromium hologram and contains the basic information about the vehicle such as the code of registering authority, registration number of the vehicle, laser branded permanent identification number, engine number and chassis number of the vehicle. This sticker could serve only for manual identification.

It is recommended that the transport department be allotted a frequency band by the Ministry of Communications and vehicles be provided with RFID windshield stickers. Each RFID windshield sticker comes with a unique identification number.

Before a vehicle rolls out of the plant, the manufacturer can embed basic information such as the engine and chassis number on the RFID tag and conceal it in any location that is not easily accessible for tampering. The RTO, during the registering of the vehicle, can encode on to the RFID tag details such as vehicle registration number, date of registration and owner's name.

This RFID sticker will, therefore, ensure automatic and contact-less verification/ compliance of vehicles.

Conclusion

Thus, the complete strategy needs to be looked at again in order to beat the apparent threats. But this is for sure that the implementation of the new set of recommendations is going to drive down, to a large extent, the frauds and thefts related to the vehicles that occur today.

At the same time, the strategy makers must keep themselves ready for the new loopholes that will be visible once the implementation unfolds completely over the next two years. □

Linux Running Out of Time

The year 2038 is still far away, but if a cracker somehow sets this year on a Linux-based system even today, it could create havoc

Anindya Roy

Remember Y2K? Yes, I am talking about the infamous time-dependent bug, which gave most of us sleepless nights, let alone enjoy the arrival of the new millennium. But thankfully it didn't result in as major a problem as expected, probably because everyone became very conscious and handled it very well. But ask for wisdom and strength and God gives you more problems to solve! So now there is another bug to create chaos, and this time it's targeting Linux users—the 'Year 2038' bug.

What is the 2038 *nix bug?

Most UNIX, Linux and other *nix based OSs are written in ANSI C language. And if you are a C programmer, you probably know that in C we use a 32-bit data type 'time_t' which stores time, and the mechanism for doing this is very simple. It converts the complete date into seconds and saves the value into it. The time starts from 1st Jan 1970 00:00 Hrs GMT. This means according to the counter, the value of 1st Jan 1970 1:00 AM will be saved as '3600' into the variable.

Since time_t is a 32-bit data type, it has 32 memory units each of which can have a value of either 0 or 1. As the first bit is used for storing whether the value is negative or positive, we're left with 31 bits. The maximum value a 31-bit variable can take is $2^{31} - 1$, which is equal to '2147483648', meaning that the data type can store 2,147,483,648 seconds starting from 1st Jan 1970 00:00 Hrs. This means that the approximate number of years it can store is 2147483648 / (60 * 60 * 24 * 356), which is equal to around 68 years. Add 68 years to 1970 and you get 2038. So in the year 2038, the 'time_t' data type won't be able to store more data and will thus fall back to zero.

How dangerous is it?

This will obviously lead to many problems. To give you an idea of how dangerous it can be, let's do a test. Don't do it on a production system, because the output of this test will crash the GNOME environment. Go to your Linux machine, restart it and enter the BIOS. Set the time to anything beyond 2038, save and restart the machine. When your Linux machine starts up, you will find that GNOME refuses to start up and will show some error messages, including problems of nautilus, xscreensaver and gnome-panel. If you move out to the command line and run the 'top' command, you will find that some of the applications such as xscreensaver have gone into an infinite loop and occupy the full processing power. If a single simple desktop machine
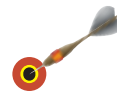
that isn't running any mission-critical applications can crash like this, imagine what can happen to enterprise applications ! It sounds scary, but probably by 2038, most implementations would have moved to 64-bit versions of various *nixs, where this problem doesn't exist. But those who don't migrate will have to find a solution. Just because 2038 is still far away doesn't mean you don't need to do anything about it today. Think of all the devices that are embedded with Linux, such as firewalls, IDSs and various other security appliances. If a hacker manages to get into any of these devices and simply changes their date to 2038, the devices will start malfunctioning. Or what if somebody sends out a spam mail with malicious code that generates a fake time stamp of the year 2038? This could cause a Linux mail server to crash.

So what do we do about this problem? For one, you need to ensure that your systems are protected from such threats. Secondly, if you're a developer, then use larger data types for storing dates in databases, eg using 'double data types'. □

The moment you change the date of your Linux system to 2038, many applications crash and messages like the ones shown above pop up

Content Delivery Networks

The concept is nothing new, but new ones like CoralCDN can do load balancing and ensure higher availability for your Web content

Sujay V Sarma

The concept of CDN (Content Delivery Network) is an old one. It means that there is a service that takes care of taking your content from your server to whosoever demands it, like the courier companies do. Only, a CDN that exists for load balancing or providing high availability services is something that's been evolving recently.

In fact, if you look at the listing at web-caching.com/cdns.html, you will notice that there are CDNs for different purposes, ranging from static content through streaming media to EDGE and rights-protected broadcasting. Let's take a step back and examine why these networks exist.

Why?

A one word answer—bandwidth. It costs a lot of money to put a server on the Internet and one of the costs involved is bandwidth. Typically, you get a fixed amount of bandwidth to use in a month (or billing cycle) and for anything above that, you are billed. Suppose, your organization is bringing out a new product that's going to be downloaded by everyone, there would be no way to ensure the well-being of your server without significant investments to enhance both your servers as well as bandwidth. For many emerging businesses today, this is just not viable.

That's where CDNs step in. A CDN allows you to mirror (or replicate) your content on their servers for a short period of time. This time interval could range from a few hours to a few days. Within this period, the CDN provider's net-work will take the brunt of visitor load on your website and relieve your systems of that bandwidth. Most CDNs also give you (the website owner) a lot of control on what content is available on their network and for how long.

The usual procedure for setting up a CDN service for your website might again involve payment, but there are free services such as CoralCDN promising to take this Web-model to the next level. Let's look more closely at what CoralCDN is doing.

CoralCDN

This is a service from the New York University's Secure Computer Systems project. CoralCDN is funded by MIT's Project IRIS (Infrastructure for Resilient Internet Systems). It aims to create a de-centralized and self-organizing peer-to-peer content delivery mechanism. Currently, the network has about 225 nodes all over the world and plans to expand services over systems and networks belonging to third parties that have bandwidth to spare.

CoralCDN provides a generic URL (.nyud.net) at port 8090 that you can insert into your regular URL to get the network to automatically include your website in its

cache-no setups, no sign-up forms and free of cost.

For example, to include pcquest.com in CoralCDN, you just have to type in pc-quest.com.nyud.net :8090 on the Web browser instead of just pcquest.com. Hold on a second! One, how do you let people know about this long URL and two, isn't that too long to remember or type in?

Easier ways

CoralCDN is more server-operator centric than being end-user centric. That is, as a Web master, you can simply redirect the visitor to your server to a CoralCDN URL than advertise the URL itself somewhere. This also allows you to control for what pages the user sees the cached pages and for which the live ones. Typically there would be a homepage for a website and a script could determine whether the visitor could be served from the actual server itself or from the CDN.

How it works

So, how does this work? When a visitor hits your CDN URL, the CDN server requests live content from your server(s) and ▷

CoralCDN has servers around the world for faster content delivery from the one nearest to you. Large the cluster, larger the letter above

Salient features of a CDN

- ■ Helps in load balancing

- ■ High availability with distributed content on many CDN servers

- ■ Faster content delivery from the closest server

- ■ Web master retains visitor control since he decides what pages/ URLs to serve from the CDN

- ■ Works best for static content

- ■ Re-coding for basic elements of a website (like cookies and frames) required because of security issues

- ■ Visitor tracking needs a work around since CDN visitors will not register a hit on your log

caches it before displaying to the user. Content from third-party sites (like advertisements) are not given this benefit, since they are always absolutely referenced (full URL instead of relative).

The second time the request comes to the CDN URL, if the life time of the cache is still valid, the cached content is served. According to the FAQs on CoralCDN, their servers also poll your website periodically for new information. Cached content is also replicated across their servers so that it can be served from the location closest to you.

Search engines

Today, much of the search-engine optimization depends on Web pages having a large number of links pointing to it. A part of this is because search-ranking algorithms consider such content with more importance. Since the content itself resides on the CDN's servers while being served from there, would that page's rank actually improve if multiple CDN URLs are generated and submitted for it? We found no conclusive answer since such an effect would build up over time.

CoralCDN's proposed use for their service is for posting links on blogs and Wikis. And currently, they are only serving static content. Note, however, that the 'static' content does not preclude the use of server-side scripting. What they mean is content that does not keep changing, unlike that on a news or forum website. They also do not encourage CoralCDN use for file-download mirroring.

Further extensions

As of now, any content on such networks cannot be personalized (through cookies, etc) because the network itself does not support cookies by design. Let's explain. Cookies are allowed to be set and manipulated only by the original website. So, if pcquest.com creates a cookie, it cannot be manipulated by pcquest.com.nyud.net. Trying to do this would show a security error.

It is natural to expect that visitors accessing your website through the CDN will not register in your logs. The best work around for this is to have some element unique to each page that must come from your server and cannot be cached—doing this is easy and usually suffices to append a parameter with a session ID value.

We also found on the CoralCDN FAQs that the service does not operate well with a Windows DNS server. However, we use a Win 2000 DNS server in *PCQuest* and CDN worked just fine for us.

IBM Research predicts that application distribution would be the next level of CDN where Web applications can also extend personalization to the distributed content. This would be done by sharing both code as well as data. IBM Research's own media portal (http://www.research.ibm.com/cdn /mediaportal.html) seeks to do this for digital video content. □

Preventing VoIP Spam

As VoIP networks proliferate, the threat of voice-based spam clogging them becomes more and more real. Looking at the nuisance created by e-mail spam, will history repeat itself here also?

Sujay V Sarma

Spam on VoIP is called SPIT (SPam over Internet Telephony). Everyone gets spam, especially if he/she has an e-mail address. While we're still fighting e-mail spam, it's threatening us on VoIP too. Spam is quite possible over voice circuits, especially the VoIP ones, and it can be just as menacing as that over e-mail. And the reason for this is because it uses the same TCP/IP for transport.

In fact, the annual cost to companies around the world for just fighting spam was as high as Rs 45 Bn in 2003 and this is expected to rise to Rs 765 Bn this year. Besides huge financial loss, companies also have to put up with loss of productivity and increased costs of support on their IT desks. Since the IT desk would need to intervene in tracking and blocking such spam on your coporate networks. This cost will only go up once spam becomes prevalent over VoIP if not controlled in time. Let's look at this threat a little more closely.

How would it work?

Voice based spam has already become common today, although limited to PSTN networks. Remember the calls that offer a new credit card, or ask you to renew your car insurance, or offer a bank loan? It's all spam, and they come at the worst possible time —like when you're in an important meeting. While we have enough of this spam, imagine if all that forwards, chain mail and jokes you get over e-mail also started coming to you over the phone. With VoIP, it's quite possible, because it's using the same standard TCP/IP network as the data traffic. It's just that the termination point for your regular spam is a mail client, while for voice it's a VoIP phone or softphone (software VoIP phones).

Moreover, voice spamming over VoIP is easier than traditional PSTN networks, because now you can just store a standard voice message on a server somewhere, and keep forwarding it to different VoIP extensions from time to time. Or perhaps a voice message comes hidden inside a trojan as an e-mail attachment and starts spreading over your VoIP network – because they share the same network. You would lose a lot of time and money simply tracking them.

There are other reasons why VoIP spam is more dangerous than voice spam over PSTN networks. For instance, current methods of spamming on your PSTN network are very costly and risky. Simply speaking, no one would bother to call up to spam you, from US or Canada, or even from a far away city in the same country – the costs are far too prohibitive. Plus, your call is traceable using tools available with both the PSTN provider as well as law-enforcement agencies, quickly. This makes the proposition attractive only for tele-marketers in your local vicinity. In many countries including India, PSTN and cellular spam is even illegal. But the same does not hold true when you talk about VoIP, because now the call can originate from anywhere on the globe and even if they talk for an hour the cost to the spammer is a mere fraction of the same call through a PSTN line. And even if you manage to track down the spammer, you would still need to use international bureaucratic channels before you could do something about it.

Is prevention possible?

One of the biggest challenges in dealing with voice spam is that it is next to im-

possible to get automated software to analyze and filter out voice data in real time unlike with text data. Accents, languages and purpose behind a voice-message are far more complicated to decode (for software) than it is to guess the purpose of a text message.
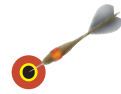
However, some of the techniques developed to combat e-mail spam can be applied to VoIP as well—such as the DomainKeys, Sender ID (*New Techniques to Fight Spam* , page 20, *PCQuest*, November 2004,) and IBM's recent FairUCE technologies. These techniques work by comparing the sender of the message with lists of people who can or cannot send such a message and then deciding if it was spam or not. Since VoIP data travels over TCP/IP packets (just like e-mail), the same techniques can be easily adapted to combat voice spam as well. People in the US/UK would be able to use their DNC (Do Not Call) registries to rid themselves of this menace early.

Prevention techniques

How exactly do you police voice traffic? One way would be to have a limitation on the number of voice connections that a certain voice gateway is allowed to make in a given time interval (say, a day). Similar techniques are already in vogue for In- ▷

Equipment required for VoIP

■ What is VoIP? Who is it meant for?

VoIP or Voice over IP refers to the transmission of voice signals (as in telephone calls) over TCP/IP networks, like the Internet. This reduces the costs associated with its transmission since a TCP/IP network is far cheaper to set up compared to a traditional PSTN one.

■ What changes do I need in my infrastructure to use VoIP?

For one, you would no longer need to use your PSTN connection to make voice calls. Instead, you would purchase a VoIP phone (also called an IP Phone) unit. For corporate setups where you would use EPBAX networks, 'voice gateways' are available that provide you similar functionality. All these equipment ultimately plugin to your Ethernet/Internet network to transmit the call out of your premises. IP phones need not be hardware only, software IP phones (softphones) are also available.

■ What about functionality vis-à-vis a PSTN/EPBAX network?

All traditional features of a PSTN or EPBAX network are available on VoIP circuits as well. Call forwarding, call waiting, multiple lines, voice-mail, answering machine and so on, are the software (that run the network) features and are available on VoIP as well.

■ Is it easier to use VoIP?

Yes. If you use hardware IP phones, the interface is similar to your regular PSTN units, perhaps with added functionality (such as LCD displays and video conferencing). On software phones, all features are laid out on on-screen GUI anyways, thus, making it easy-to-use.

---

that the sender of messages authenticate and authorize themselves before they send a message. Making it mandatory for spammers to identify themselves would work the same way with voice messaging as it does with e-mail today .

Unlike with e-mail where the sender need not be online when the recipient reads the message, VoIP senders must be online while the call is in progress. This makes it easy to use filtering techniques against them.

One last viable method is challenge/response authorization. In this case when someone rings your VoIP phone, the software at your end could require a series of inputs (like a numeric password) to be entered. Only on valid authorization, the call would be allowed to complete.

Unlike with e-mail where automated messages from 'no-reply' dead-boxes (where the sender's e-mail ID is faked to eliminate replies) would never see the challenge messages and, thus, cannot respond to them, a VoIP call remains active till disconnected and so this could catch out spammers big time. However, for business users or regular users of voice messaging, this may soon become an irritant, causing them to abandon the service altogether.

Therefore, in the short-term, we predict blacklists and IP-filtering methods from e-mail spam fighting to jump in to keep our voice networks clean. Later, challenge/response and other complicated mechanisms may find their way in, depending on how effective the existing methods prove to be, to keep humans from talking to humans. ☐

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ternet usage, where an ISP would place a bandwidth limit on your account. This would at least limit the amount of spam, though not eliminate it.

IP Filtering

Like we said earlier, a VoIP connection mandates a valid Internet connection and hence an IP address. Filtering of this IP address using well-known black or white lists could alleviate the problem. But if the caller is on a connection with a non-static IP address, this becomes ineffective as well.

Authentication

VoIP protocols and specifications like the H.323 (including its .450.x extensions) and SIP have been designed to support authentication mechanisms that demand

Installing PCQLinux 2005 SP1

Use this service pack to get bug fixes for common problems and updates for some of the software in PCQLinux2005, the OS we released this March

Anindya Roy

We are releasing the much-awaited update to our Linux distro with this issue that will provide you with the latest critical patches and updates for the distro. There is a separate CD for it along with this issue. There are two major updates—the kernel update to version 2.6.11-1.14 and the latest version of Glibc, which is 2.3.5. Besides these, we've also given fixes to problems based on the feedback from our readers. These include a fix to print on HP printers and automatically mounting NTFS partitions. The update is easy to install. Pop the PCQLinux 2005 SP1 CD in your machine's optical drive and boot from it. If you don't have any version of PCQLinux installed, it will detect that and terminate after the second screen with a message that no installation of PCQLinux was found. Otherwise, it will continue. Note that this is only meant for PCQLinux 2005 installations, and not for the older versions of PCQLinux.

1

The first screen you see after booting. Simply press Enter to continue, or type 'text' and press enter to undertake a text-based installation

2

After a few screens, it asks you to do a media check . We strongly recommend that you do so. Once you have done that, click on OK

3
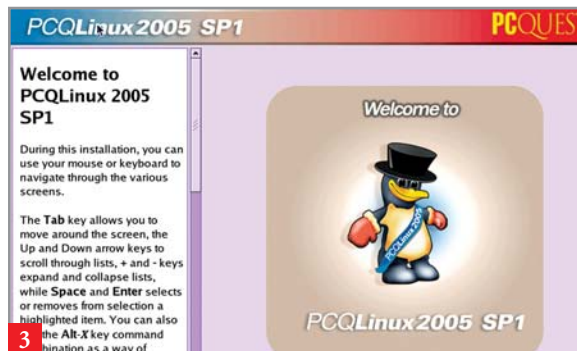
Old, slow computers might get text based installation automatically, otherwise it uses graphical installation

4

You will see multiple instances of PCQLinux here, if any. Select one you want to upgrade and click on Next
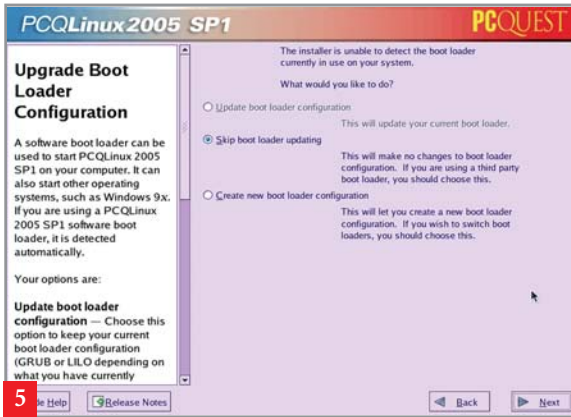
Here you will be prompted to upgrade the boot loader, but we recommen against it. So choose the 'Skip the Boot Loader upgradation' option

If you want to go back and modify any changes you made so far, do it here. You can't go back and do it once you click on Next here
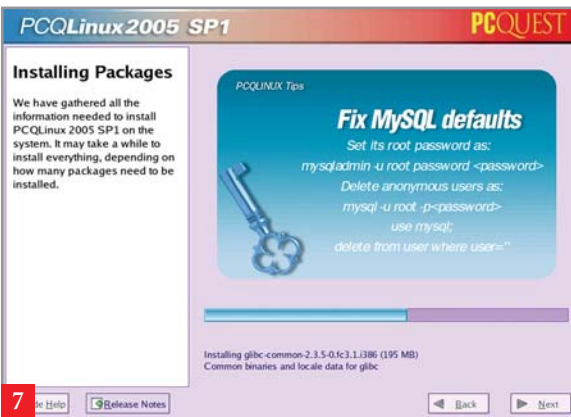
This screen shows the installation progress and estimated time left for completion

If installation is successful, you'll get a Congrats screen. Simply reboot your machine and you're done
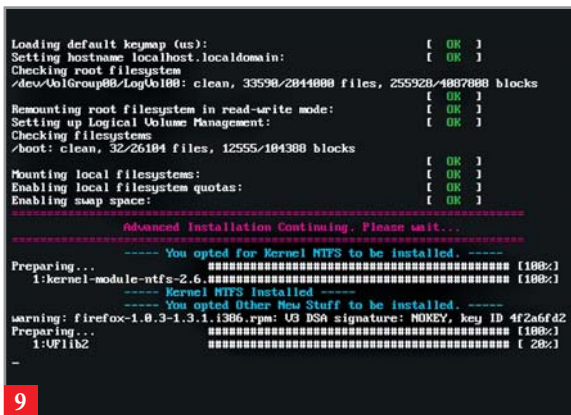
After first reboot, the system automatically starts the advanced installation process and reboots into PCQLinux
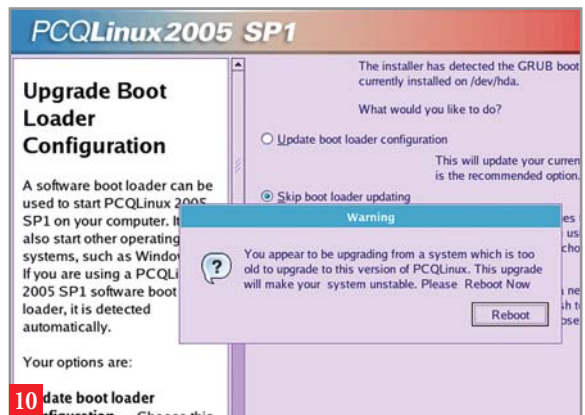
The upgrade process will terminate with this message if it finds an older installation of PCQLinux

Access Network Files Offline

You can make your network files and folders available locally in offline mode and sync them back to the network storage whenever you want

Sanjay Majumder

In most organizations, employees keep important files and documents on the network file server and may share these files amongst themselves. In a scenario, when a user moves out of office but still needs those files to work on, it is difficult to configure this without using Web-based tools or FTP. Even then, the user has to first get Internet access, login, and then access the files.

One way out, would be taking a copy of those files along and after working on them, saving the files back on the server. This is not only cumbersome but some changes may be missed out.

Win XP has a feature called synchronize, which allows you to automate this. It creates an offline copy of the files you specify on your local machine. When you are reconnected to that network, Win XP will automatically synchronize these files to the server. We'll walk you through configuring this feature in just four easy steps.

Direct Hit!
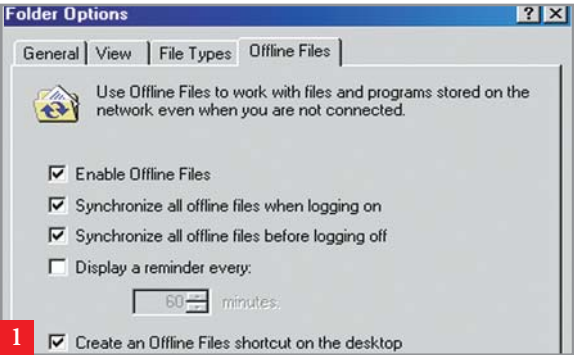
Applies to: Mobile Win XP users

USP: Synchronize files with network shares for mobile users

Primary Link: http://support.microsoft.com /kb/ 307853/EN-US/
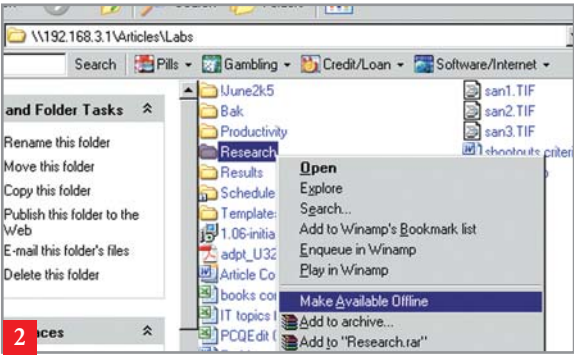
Google keywords: Offline sync Win XP
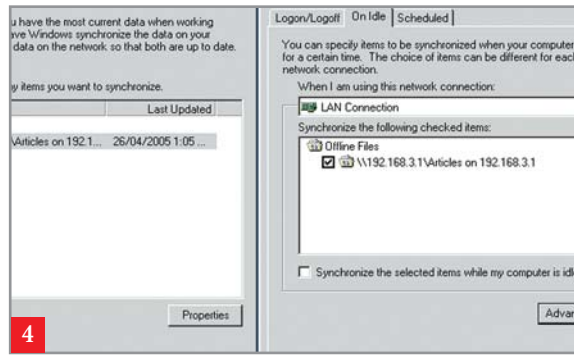
1 In 'My Computer', go to the File menu and select Tools> Folder Options. Here select the 'Offline Files' tab and check off 'Enable Offline Files' and then click on OK

2 Open 'My Network Places' and double click on the network place, where the target resides. Right click on it and select 'Make Available Offline'

3 The files will be copied to your PC. A synchronization error message will pop up if any of them are in use. Ignore it

4 To schedule synchronization, from Start>Programs> Accessories>Synchronize, click on 'Setup' and 'On Idle'   □

Memory Protection in Win XP

Win XP SP2 bundles a tool to protect your PC from the impact of malware and to prevent crashes. By default it is configured only for Windows services

Sanjay Majumder

Security threats have become so common and come in through so many avenues that you never know where will they stike next. So the usual precautions are to install anti-virus software and firewall on your PC.

By and large, these are sufficient to block most threats. However, malware writers can also write code to bypass the anti virus and execute it from the physical memory itself. So you need to

do something more. If you are a Win XP user, there is a tool you can use that comes with Win XP SP2, known as DEP.

DEP (Data Execution Prevention) is a method that prevents the system from executing contents in the 'data' areas of RAM. This also eliminates many situations where the system would otherwise have crashed. By default, the feature is enabled in systems with SP2 installed. We need to fine tune it. In this article, we see

how to do that. Make sure you have SP2 installed on your PC.

1 The feature is always on, but we need to configure it a little better. Run the System applet from the Control Panel and go to Advanced tab, and click on Settings for performance

2 Here enable the 'Adjust for best performance' tab and select the DEP or the 'Data Execution Prevention' tab to configure

3 By default DEP is set for Windows programs and services. So, you need to turn it on for all programs/services

4 It prevents any application from executing from the non-executable (data) memory, and displays this message   □

Instant Collaboration

InstaColl is a tool that enables MS Office users collaborate on their Word, Excel, and PowerPoint documents over the Web. In its trial version as of now, only two users can share documents

Sushil Oswal

I nstaColl enables team members collaborate with others over the Web using their Word, Excel and Power-Point documents easily and quickly. Users can also share their desktops with each other for doing interactive demos. It also has a built-in chat module to chat simultaneously. It keeps user-wise track of changes while collaborating in Excel and uses color codes to mark changes in Word. In PowerPoint, however, it doesn't allow

editing of slides. Also, its performance and session creation depends upon your Internet speed and connectivity with the Insta-Coll server.

We've given a trial version of InstaColl on this month's PCQEssential CD, which allows document sharing between two users only. Installing the same is pretty easy and only takes a minute. It needs Win 2000 and Office 2000 or above with IE 5.0. Let's see how to use it.

1 Click on 'Get an InstaColl ID' and a website opens, which will create your username and password in two steps

2 Click on Yes when security warning appears to open this window. Click on 'InstaColl Now' to create the session

3 Enter the session details and the agenda. Passkey generates a four digit number identification for the session and is optional. Click on Invite to start the session

4 E-mail client will open and you have to send the e-mail to the person to collaborate with. The e-mail has a passkey and a link for him to join the session ▷
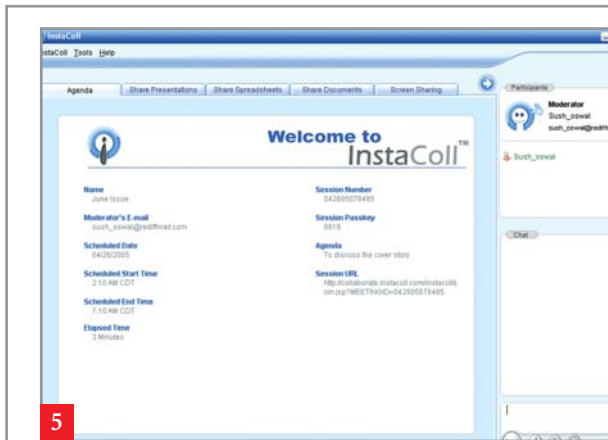
On the InstaColl interface, left pane shows the session details and right pane lists the moderator, users and a chat window
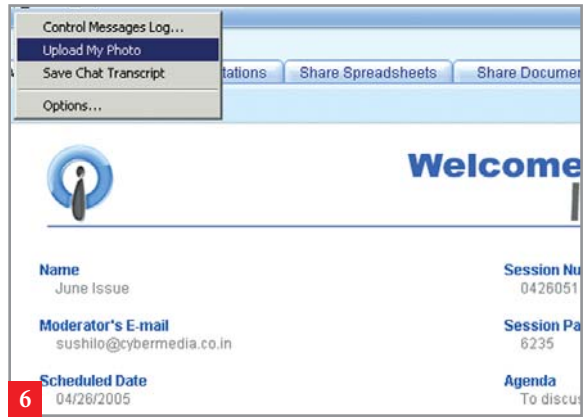
To upload photos, click on Tools>Upload My Photo. Click on Tools>Options>Administrator. Select the user and give the rights. Select the application from the tabs on top
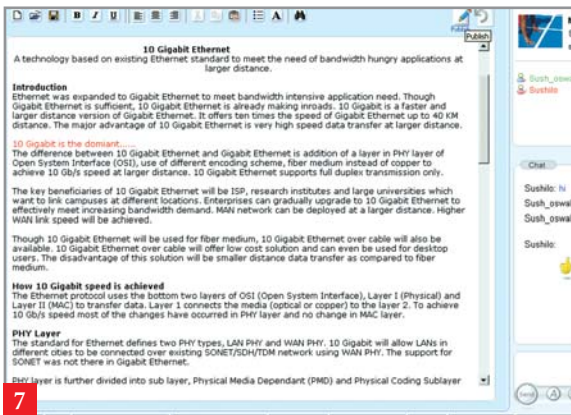
A word document shared. Click on Publish to render the document to the user. The user now needs control
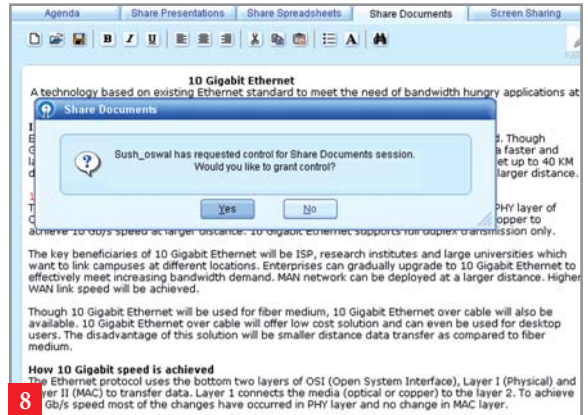
User clicks on Request Control button on the top to get control. Click on Yes to give control to the user
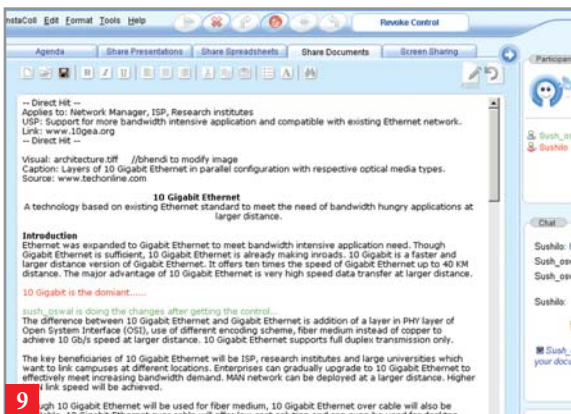
The user can now change the document (as seen in green) and publish it for the other person to see
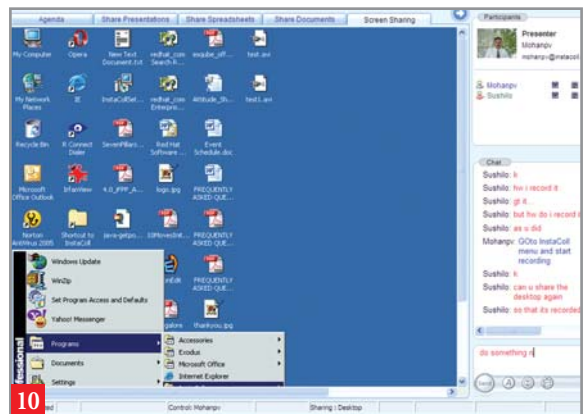
Click on Screen Sharing tab to share your desktop. To record this as avi, select InstaColl>Start Screen Sharing □
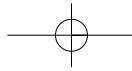
Transfer Settings from One PC to Another

Whether you're shifting from one machine to another or just adding a new hard drive. Here's how you can transfer all your application and desktop settings from one PC to another

Ankit Kawatra

How often does it happen that you buy a PC or a hard disk and are reluctant to use it because you are afraid to lose all the settings that you have on your existing PC? Saving a copy of your files and then transferring them to a new PC is still thinkable, but changing all the settings individually in the new PC is too tedious and simply unthinkable.

There is an easy way out—the 'File and settings transfer wizard', a built-in Win XP feature. It lets you save and transfer your files and settings from one PC to another and you can choose the medium you want to use to transfer data. You can connect two PCs directly with an Ethernet cross cable or serial cable. Or you can store them on a floppy or external hard drive and then connect it to the new PC and transfer settings and data.

The settings we are discussing here are not only your network and Outlook settings but also the minutest details such as

Direct Hit!

Applies to: Win XP users

USP: **Use the Files and Settings Transfer wizard to transfer your settings**

Primary link: **http://tinyurl.com/2or8z**

Google keywords: Win XP transfer settings

the screen saver and desktop icon placement. Let's see how to do this.
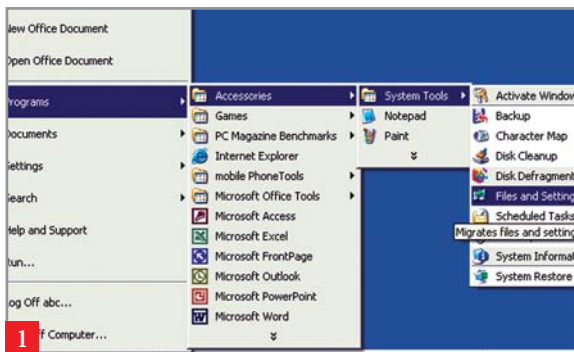
1 The wizard helps you collect the data to transfer. To start the wizard go to Program files>Accessories> System tools> File and Settings Transfer Wizard
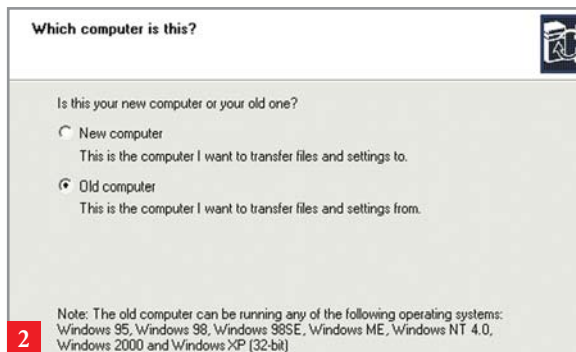
2 Click on Next on the first screen and you will be asked to choose whether it's the old PC or the new one to which you want to transfer the settings. Choose 'Old computer'
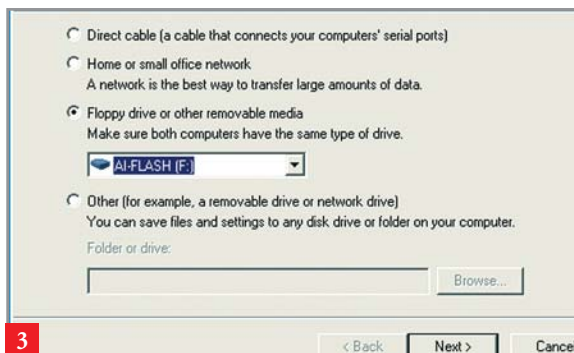
3 Select the way in which you want to transfer data between the two PCs. We chose to use a USB flash drive
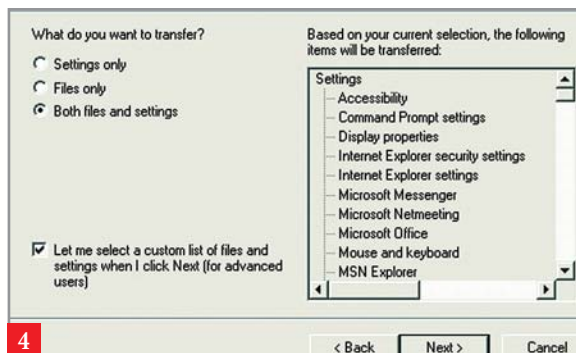
4 You can choose to copy files, or settings or both. Check the box that says 'let me select the custom list ...settings' ▷

■ Hands on

5
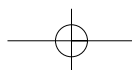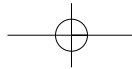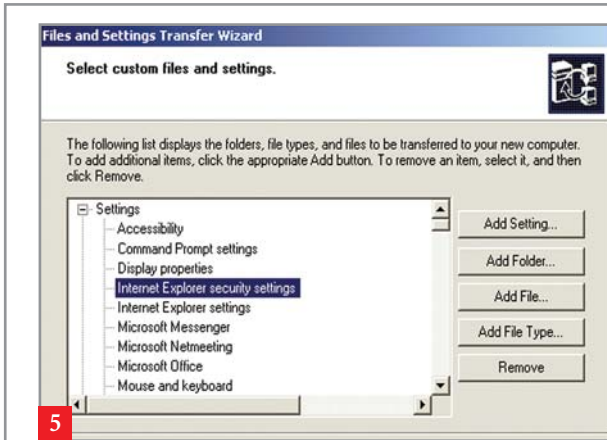
Here specify which files and settings to back up or transfer. All types of files and settings can be added to this list. Click on Next and your back-up disk is ready

6
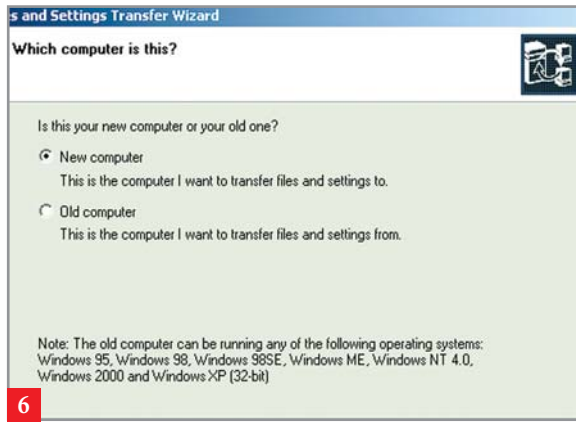
Now we have to transfer the backed up files and settings to the new PC. Repeat the same procedure as in step 2 and this time choose 'New computer'

7

Here choose the last option, which says 'I don't need the wizard, ... files and settings from my old computer'

8
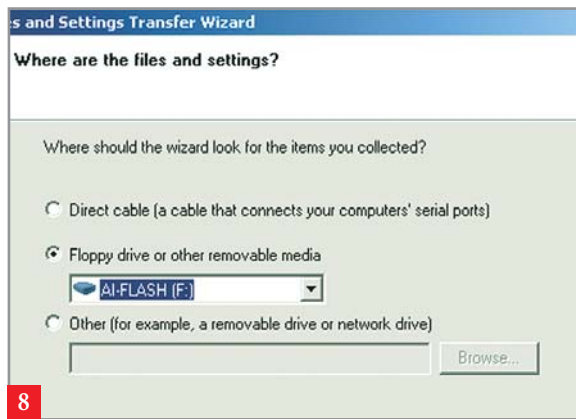
Give the path of the drive where you have stored a copy of the files and settings or choose direct PC-to-PC link

9
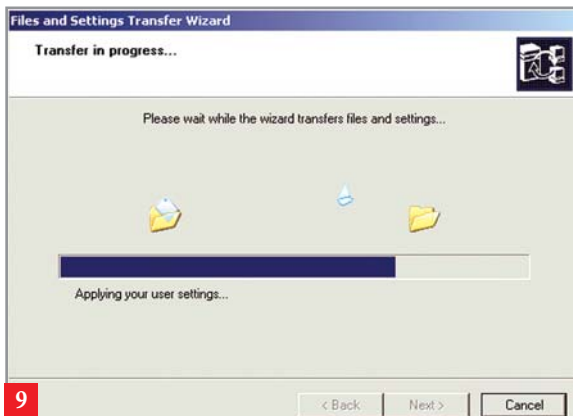
After giving the path just click on Next and the wizard will start copying the files and settings onto the new PC

10

Click on Finish and you will be asked to re-login. Once you do that, your old settings and files will be in place □
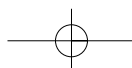
LDAP Mod for phpBB Forums

Use Lightweight Directory Access Protocol (LDAP) to authenticate users on phpBB forums, from the same authentication server as used for other applications

Sandeep Gupta

In our March 2005 issue, we saw how to set up online forums using phpBB on PCQLinux 2005. In this article, we'll explore ways to install and configure LDAP (Lightweight Directory Access Protocol) mod on an already running phpBB forum. The mechanism explained is OS independent and would work fine on any OS that can run phpBB.

LDAP

Organizations use single server for authentication purposes for various intranet applications such as e-mail, defect registers and ticket-logging system. Most often, this server uses LDAP (Lightweight Directory Access Protocol) authentication. phpBB, by default, creates its own user and password database. If one wants phpBB to use LDAP authentication, one has to use 'LDAP Auth MOD (phpBB)' available at http://sourceforge.net/projects/ldapauthmod/.

Enabling LDAP will let you authenticate users against a Windows ADS domain on using Samba/LDAP on Linux.

Configuring php

LDAP support in PHP is not enabled by default. You will need to use the '--with-ldap[=DIR]' configuration option when compiling PHP to enable LDAP support. DIR is the LDAP base install directory. For Windows users, to enable this module, copy files from the DLL folder of the php/Win32 binary package to the SYSTEM folder of your Windows machine (c:\windows\system32). Next you need to copy some files as follows. If you are running a PHP version up to 4.2.0, copy only 'libsasl.dll' to the Windows system 32 folder. For PHP 4.3.0 and above you need to copy both 'libeay.dll' and 'ssleay32.dll' to this folder. Then you need to edit php.ini to uncomment the line below.

extension = php_ldap.so

Direct Hit!

Applies to: Forum administrators

USP: Configure and install a platform-independent LDAP mod on phpBB forums

Primary Link: http://sourceforge.net/projects/ldapauthmod/

Google keywords: LDAP mod + phpBB, LDAP authentication

(or php_ldap.dll for windows)

Also, `extension_dir' is set to a directory where the extension files are actually present.

Installing LDAP mod

Extract the file (downloaded from Sourceforge) to a directory of your choice. This mod comes with files that need to be replaced over original ones but a manual installation of the mod is highly recommended. 'Install.txt' explains manual installation in a lucid way. Before applying the patch, follow the good old practice of backing up the current installation. Also, make sure that you have created an admin account in phpBB with the same name as in LDAP or you will not have admin access.

After installing the LDAP mod in your phpBB server you can authenticate users through your Windows 2000 machine

After this, simply apply the patch as explained in 'install.txt'. The document uses the following conventions.

```
---[ OPEN ]---
[file name]
```

Open the file to be edited.

```
---[ FIND ]---
around line [xxx]
[code]
```

This would find the line number xxx, in/around ▷

phpBB and mods

phpBB is a popular discussion forum software that can be used to host forums on the Internet or the intranet. phpBB's functionality can be extended using add-on software called mods or modifications. There are many mods available. In the last issue (*Mod up your Forum*, page 51, *PCQuest*), we have given an overview of how to install mods. Popular mods include the poll mod, the attachment mod and so on.

You can view a comprehensive list of mods in the mods database at www.phpbb.com/mods. Mods are fairly easy to install and manage.

which modifications/addition needs to be done. It must be noted that this line number might not always be exact, depending on the version of phpBB you are using. So, a better idea is to search for the code in the file rather than the line number.

```
---[ AFTER, ADD ]---
[code]
```
            after the lines found, add [code].

```
---[ REPLACE WITH]---
[code]
```
            replace the code found previously by [code]

A couple of other conspicuous labels are used, which are easily understandable. After editing 17 files, a couple of files, namely functions_ldap.php and functions_ldap_groups.php, have to be copied to 'includes' directory in phpBB installation.

Also, one has to connect to MySQL/MS SQL/other database (whichever is used as the forum database) and run about 20 SQL queries. These queries, essentially, add LDAP specific fields in the database. phpBB code has already been modified in previous steps to use these fields.

It should be noted that the mod's installation guide shows you how to modify only the default template—SubSilver. If you are using any other custom template, make sure that you do similar changes in that template as well.

Configuring LDAP Mod

Manual installation of the mod is tedious and takes half an hour. Before, making your forum available to the public, it is a good idea to get LDAPCheck.php (available with the mod) running. This is a small php script, which connects to the LDAP server you specify and searches for a specific user. If everything goes fine, it displays all the details related to that user.

After installing the mod, login as admin to the forums (do not use LDAP password, yet). Go to Admin Panel>General Admin> Configuration>Authentication Setting. Set Authentication mode to LDAP; LDAP host name to your server name; LDAP port to 389 (or whatever is used by your server).

Often, the LDAP server that you will want to connect to would contain user-related information of several divisions/locations of your organization. For performance and security reasons, you might like only a few specific users to be authenticated for using phpBB forums.

In such cases, you should specify Base DN (Base Directory Name) of the LDAP directory server. To identify the actual values, an LDAP client like GQ or LDAP Browser from Softerra (http://www.softerra.com/ products/ldapbrowser.php) should be used.

One should also fill fields, namely, LDAP User ID Field (LDAP property/field that you want to use as your forum user names, default = 'uid'); LDAP property/field containing user e-mail addresses; LDAP property/field containing user website addresses, etc based on actual fields used on the LDAP server.

Once all these settings are saved, you can use LDAP usernames and passwords for logging on to the forums.

□

Managing OpenAFS

We implement user and access control management, server management and disaster recovery process of the OpenAFS system

Sanjay Majumder

SERIES
OpenAFS
PART II

Last month (*OpenAFS*, page 70) we'd discussed what OpenAFS is and how you can deploy it on your network. This time we take the series further and will discuss how you can manage it. In this article, we will see creating users and groups, setting access rights on folders, managing server operations and closely look at its disaster recovery feature.

Managing users and groups

In any implementation, user authentication plays a very important role. OpenAFS has a built-in user and group management system for an AFS cell (we talked about AFS cells in the previous part). Before creating users, you need to create the user groups and then add the users to these groups. Creating groups simplifies managing the users.

Go to the 'AFS Central Control Server' and open 'Accounts Manager' from Start>Programs>OpenAFS>Control Center. This will open an 'Accounts Management' window on your screen showing the four built-in users. Here, select the Groups tab and you will find one built-in group called 'system:Adminstrators'. To
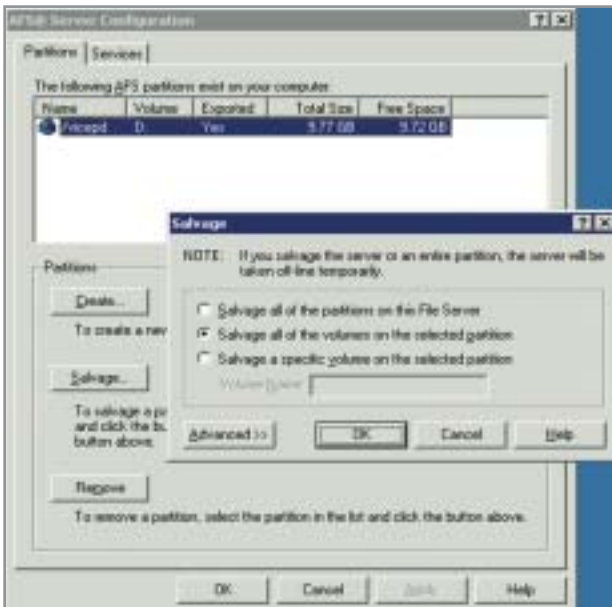
Rebuild the AFS volumes/partitions using Salvage. The time taken for it depends on the amount of data in them
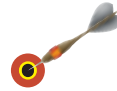
create a new group, click on the Create button. In the 'Create Group' window that pops up, type in the new group name you want to create and click on OK.

Once you have created the groups according to your organizational structure, proceed to creating the users. From the 'Accounts Manager' window, go to the Users tab and click on Create. Here, on the 'Create Users' screen, type in the username and password and then click on Groups button first and then on 'Create users-Advanced'. Next click on Add. The groups you created above will be displayed. Select the group that you want to assign to this user and click on OK.

Managing access control

Administrators can set up access control polices on the OpenAFS shares. This is a simple task to do. Just go to the 'Control Server' machine and click on Start>Run and type in \\afs. This will open an Explorer window showing all the AFS shares. Note that you cannot set up ACL on the root shares, you will need to create subfolders within these shares to set up access control.

So, create a folder inside any of the shares you now see, and then right click on that folder. From the context menu, select AFS>Access Control list. On the screen that appears, check on the access control items on the left side as per your requirements.

By default the Administrator has all the rights and 'everyone' has only 'read' and 'lookup' rights. If you want to set up access control for specific groups then click on the Add button. A new window will appear. Here in the Name textbox, type in the group name with the syntax 'system:GroupName' and then click on OK to save the settings.

Server management

Managing OpenAFS is also not difficult, as you can create ▷

Server-management options in OpenAFS

Lock/Unlock: Allows or disallows using that folder or file which is on the OpenAFS share till the option is changed again. Use it to remove access to files/folders, say, during backup or house-cleaning operations.

Synchronize: Syncs the offline files, files being accessed remotely and those that exist on the server. It is used to force changes made to be visible to all users.

Backup: Backs up the files and folders.

Edit server security: Allows you to view/modify the encryption keys for the AFS server. An encryption key is a string of octal numbers used to encrypt and decrypt packets of information. In the AFS, a server encryption key is the key used to provide security for information being transferred between the AFS server processes and their clients.

Salvaging volumes: Refer to the 'Disaster recovery' section for details.

as many virtual volumes and partitions as you want. To manage OpenAFS, go to the 'Control Center Server' and open 'Server Manager' from Start>Programs>OpenAFS>Control Center. You will get a window showing the virtual AFS volumes. Here you can lock/unlock, synchronize, backup, edit server security and salvage the volumes. If you have used a Netware system, these operations are exactly the same.

Disaster recovery

If one of the virtual AFS volumes get corrupted due to an improper shutdown, OpenAFS gives you the ability to re-build the entire volume, using its Salvage tool. To use this tool, open the 'Server Configuration' from the Start>Programs>OpenAFS> Server. Select the mounted AFS space (by default it's named as 'vicepd'). From the same window click on Salvage button, a warning window will appear, showing three salvaging options. Select 'Salvage all of the volumes on the selected partition' and then click on OK. If you want to Salvage all the volume from all AFS partitions then select 'Salvage volume on all the partitions'. This will re-build the corrupted AFS volume. This process takes sometime because it recollects the data from the Backup serverand rebuilds the AFS volume. So if you have implemented openAFS, make sure you have configured the Backup server as well. □

An ERP with Integrated CRM

This open-source ERP and CRM solution can be got up and running by mid-sized businesses fairly fast. It uses an Oracle database at the back end

Sanjay Majumder

I f yours is not a large enterprise that can afford to buy an ERP solution, but you badly need one because it makes better business sense, there is good news for you. Compiere offers a free open-source ERP and CRM solution that can be implemented in just an hour's time. You, however, have to buy an Oracle database and recruit ERP and Oracle experts, who can implement this solution to suit your needs.

Compiere's ERP has an integrated CRM functionality. Its core modules are General Ledger, Accounts Payable, Accounts Receivable, Inventory, Order Entry and Job Cost. It simplifies your order processing and POS (point-of-sales), customer commerce and care, and manages your inventory and automates accounting. This article walks you through implementing Compiere ERP in your organization.

Requirements

To run Compiere, you need to install Oracle 9i or above database and Java 1.4.2 SDK on the machine you want as your server. You can use either Windows 2000/2003 server for this. You can also run Compiere with Oracle Personal Edition and this can run on Windows XP (this is what we used). You can download Oracle 9i RC 2 (Personal Edition) from www.oracle.com. To be on the safer side, perform a full install of Oracle 9i on this server.

During installation, you will be asked to give the global database name and SID. In our case we used the 'compiere.pcqlabs.net' and 'compiere' as the global database name and SID respectively. Once the installation is complete, it will create a default database

Installation of the Compiere client using Compiere's Web application interface is as simple as clicking on a button

Direct Hit!

Applies to: Mid-sized businesses

USP: Implement an open-source ERP and CRM solution

Primary Link: http://compiere.org

Google keywords: Open-source ERP and CRM

On the PCQEssential CD: \Sales and Marketing

and this will be named 'compiere.pcqlabs.net'. After this install Java 1.4.2 SDK, which can be downloaded from http://java.sun.com/j2se/1.4.2/ download.html.

Once these packages are installed, we proceed to configure the database before installing the ERP itself.

Configuring connection for Oracle

Configure the Oracle 9i database, so that Compiere can use it for its back end. First of all, create a connection, which will help you connect your Oracle database to any front-end application. To do this, open 'Net configuration Assistant' from Start>Programs> Oracle-orahome92>Configuration and Management Tool. This will initiate a wizard that will help you to create a new connection.

Select 'Local Net Service Name Configuration' and click on Next. Select Add and click on Next again. Now select 'Oracle 8i or later database or service' and click on Next. You will be asked for the name of the database service you want to connect to. Type in the global database name you had given during installation, in our case it was 'compiere.pcqlabs.net'. After this, click on Next and define TCP as the protocol to use for connections. In the next step, you need to fill-in the hostname of the server running Oracle and then click on Next. Now it's time to test the connection, so click on 'Yes Perform a Test' and then on Next. The test result should be successful.

In order to use Compiere from all PCs from your network, you will need to install the Oracle client on those PCs as well. Use the Oracle client CDs for this. Once you are done with that, you need to launch the 'Net Configuration Assistant' on these PCs and configure them in ▷
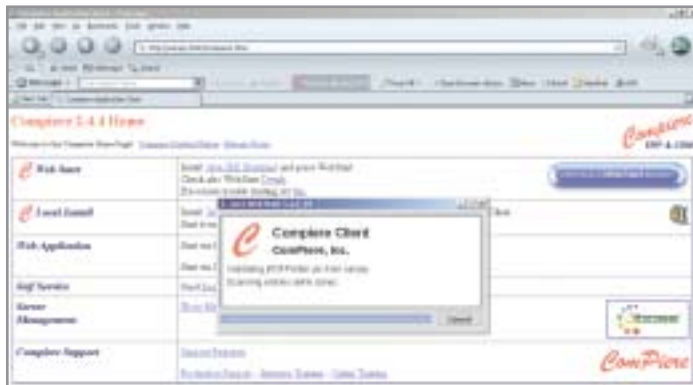
the same way as we did above. We can now proceed to install Compiere.

Installing Compiere

Once the database is ready, you have to set up Compiere on the same server. We have given Compiere on this month's CD. Copy the Compiere_244. zip file to the target machine and unzip it to the C:\compiere folder. Compiere's application server requires Java and you need to set up the Java environment for Compiere accordingly.

To install Compiere you have to run a script from the C:\compiere\utils folder. Open a command prompt window and issue the command as follows. Verify the path of the Java SDK before you run the command.

```
C:\Compiere> cscript WinEnv.js C:\Compiere C:\j2sdk1.4.1_01
```

Configuring Compiere with Oracle

Go to the C:\compiere folder and double click on the 'RUN_setup' batch file. It will bring up a Java-based Compiere configuration screen. Here, set the WebPort to 8443 and replace the shown 'Database Server' value with the hostname of your Oracle database server. Set 'Database Name' to 'compiere'.

On the same screen, come to 'TNS Name' and select the connection name created above in the 'Configuring Connection for Oracle Database' step (compiere.pcqlabs.net) Then, you need to set up a password for the system and the database, so that Compiere can connect to Oracle. When you're done, click on the Test button to check the configuration. If all is fine, click on Save to save the settings.

Creating tables in database for Compiere

Now we'll create a data structure and demo users for Compiere. For this, Compiere provides you with a pre-defined data-

Creating an invoice with Compiere is easy and the details entered here make all aspects of it traceable later

base structure that you need to import in Oracle. To import the data structure, go to the utils folder and execute the 'RUN_ImportCompiere' batch file. This will open a command window and start creating data structures for Compiere.

Running Compiere application server

Compiere is now ready with all the required data structures and demo users. To use Compiere, you have to first run its application server, which is based on Jboss application server. To run this, go to the utils folder again and double click on 'RUN_Server2' batch file. It will start its application server in a command window.

Installing the Compiere client

After configuring the server, install a Compiere client on the client PCs. Now open a Web browser and type in the address of the Compiere application server. This runs on port 8443 of the machine you installed it on. In our case, it was http:// 192.168.1. 12:8443 . This will open the Compiere home page. Here from 'eWeb Start' section click on the 'Web Start' button. It will install the Java-based Compiere client. Once, it is installed, you have to configure the client.

To do so, double click on Compiere client on the desktop and it will open a small window showing Host, User, password and Language. Click on the Host drop-down list and set 'Application server Host name'. Also set the application port to 8443. Then in the same window, in the User/Password section give the password for the Compiere user— this will be the same password that we've set for the database in the 'Configuring Compiere with Oracle section' above. Now click on the 'Test Application' button to test the configuration. If the test is successful, save the settings by clicking on the green button with a check mark.

Using Compiere

With this, the Compiere client is ready for you. To use it, give the demo username GardenUser and password GardenUser, and click on the button with the check mark. By default this demo user is authorized to HQ and Store (departments) only. But you can add more users and assign them other roles and departments. Click on the button with the checkmark and you will get a Java-based interface running the Compiere ERP and CRM solution.

On the left side of the window, you will be shown all the defined automated business process modules. Let's take an example. Suppose, you want to create an invoice for a customer. From its interface select 'Quote-to-Invoice'. Under this you will see a number of invoice modules. Double click on 'Invoice Customer'. It will open a performa of a customer invoice. Here, fill in the details and the transaction will be automatically percolated in the sales book. Apart from this demo, you can create workflow and business rules for your own business too. □
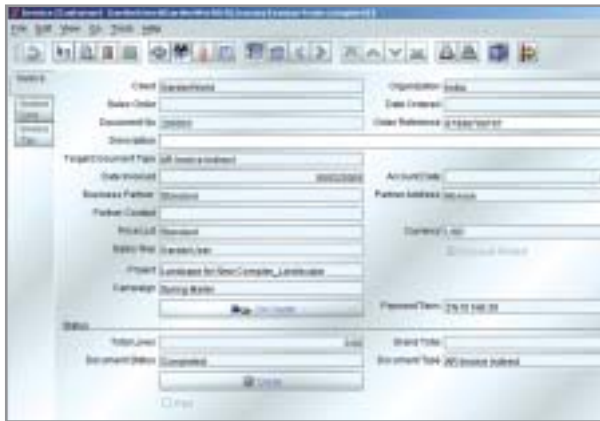
INDIA'S 44

Best IT Implementations of the year 2005

Implementations that have broken new ground, are a role model for others to follow, or unique. The PCQuest best IT implementation survey tries to capture and bring to you some of India's best IT projects

Anil Chopra, Anoop Mangla, Krishna Kumar, Sujay V Sarma

The Best IT implementation awards are now two years old, and over the last year, we have been able to clearly lay out the procedure for determining the winners. This year, we had a four-tier process, starting with the public nominations and ending with the jury deliberations. The whole process took two and a half months.

For those who are not aware of the process, here is a brief overview.

Nominations open in the month of February and any one can nominate a project. There are two conditions for a project to be nominated. First, the project should have become operational during the financial year in which the nomination opens. Second, the benefits of the project should be available in India. Though the physical infrastructure could be anywhere.

Our definition of project completion is kept fairly loose to give the projects the benefit. The project has to have started functioning and delivering. You could have done a soft launch, or could be in the midst of a launch process.

Nominations are accepted both at the project website and on paper. (This year, all nominations, barring one, were received at the project website.) Any one can nominate any project. It is not necessary that you nominate your own project; though you could nominate your own.

The opening of nomination is publicized through e-mail and print announcements sent to more than 5000 people, including senior management in IT user companies, Senior Government officials, IT industries and so on. The nominations are open for about a month (though we do try and include good projects even if they

Awards

Overall Best
Cell/Landline Rail Reservation Services, IRCTC

Most Innovative
Plasma Display
Wockhardt Hospital

Maximum Social Impact
e-procurement
Govt Of Andhra Pradesh

Maximum Business Impact
Risk Mgmt - GIS
ICICI Lombard

Most Technologically Challanging
Parallel Risk Management System
NSE India

are a bit late). At the end of this time period, we go through all the nominations and try to complete incomplete nominations as well as remove redundant ones. We also remove projects that are as yet incomplete or the ones that have been completed before the time window.

Once this is done, we get into the serious task of short listing projects for collecting follow-up data. The follow-up questionnaire is a 15-page document that collects detailed information on background, concept, business case, people involved, project architecture, technologies involved, consultants involved, timelines, milestones and financials. Some of the information we collect is marked as confidential and is not disclosed. The *PCQuest* team gets involved in getting the documentation complied.

This year, we had a total of 47 projects for which the detailed documentation was sought. Some projects dropped out at this stage because of confidentiality issues, and some sadly, because the project heads were simply too busy during that time.

Once the documentation is completed, we start analyzing the projects and shortlisting the finalists. We use a five-point criteria for this short-listing. This year, 16 projects made it to the finals. after the shortlisting.

At this stage, we start talking to the project heads, and even visiting the implementations to get an in depth understanding about the projects.

PCQuest appoints an internal champion for each project. It is that champion's responsibility to understand the project in detail and to present its case to the jury.

Finally, the jury meets to decide the final winners. The jury has representation from past winners, IT users and the IT industry. The jury decides the final winners of each of the awards. It is also free to recommend additional awards, if they feel the need. This year, the jury did not recommend any changes to the awards structure, over the last year.

▷

The
Jury

Jury deliberations in progress. Facing the camera are the Jury members, *PCQuest* team is facing away from the camera. Shyam Malhotra, Executive Director and Editor-in Chief of CyberMedia is in the middle

Mohanachandran M R
Deputy Director,
CDIT

(Representing past winners). An engineer by training, Mohanachandran is currently heading the e-governance initiatives taken up by CDIT, on behalf of the Government of Kerala. He was also instrumental in setting up CDIT's first regional center. The FRIENDS project, that he was responsible for was adjudged as one of the 10 best IT implementations in the country last year. FRIENDS is now active in all districts of Kerala.

The *PCQuest* team at the jury meeting: (L to R) Ankur Shinghal - Product Manager, Krishna Kumar - Editor, Rinku Tyagi - Senior Sub Editor, Anil Chopra - Associate Editor and Anoop Mangla - Senior Reviewer

George Paul
Vice President, Marketing,
HCL Infosystems

(Representing IT industry). In an industry where a quick change of jobs is often seen as a virtue, George Paul Edasserry has stayed with HCL for the last twenty-five years. He has been closely associated with some of the most successful IT brands and projects in the country. Today, he heads the marketing initiatives of HCL Infosystems, and is a member of the senior management team of the company.

Sanjay Singh
Head IT,
Timex watches

(Representing IT users). Sanjay was on the jury last year also, and provided continuity to the deliberations.

After completing his engineering, Sanjay started his profession as a C programmer for embedded devices, moved on to networks and database management and then got back to embedded-systems' design. He joined Timex in 1998 and has a total of 12 years of experience. He is a proponent of Linux, having converted many of Timex's systems to run on Linux. He has been running PCQLinux ever since the early Slackware editions.

Sivakumar S
CEO,
International Business Division, ITC

(Representing past winners). Sivakumar is the brain behind the hugely successful e-Chaupal project of ITC. e-Chaupal was adjudged the best IT implementation in the country last year. Topper of the 1983 batch from the IRMA (Institute of Rural Management), Anand, he served a farmers' cooperative in the oilseeds sector for six years before joining ITC. He is on the Boards of ITC Infotech India Ltd, Agro Tech Foods Ltd and SOPA Board of Trade Ltd. He is also on the Management Committees of several industry bodies. He has been with ITC since 1989 and is presently in the International Business Division.

He chaired the deliberations of the jury this year.

Kallol Hazra
Practice Principal,
HP

(Representing IT industry). Kallol has extensive experience in conceptualizing and implementing large IT systems. He has been in the combined entity of Compaq and HP for more than nine years handling various roles in Technical Support, Sales, Solution Marketing and business development. His current focus is the telcom industry and he is responsible for managing HP India's Telecom Practice. Prior to joining HP, Kallol has had professional stints with Tata IBM, PCL and PSI Data Systems.

Overall Best
Telephonic train ticket booking
IRCTC

Project Head: Amitabh Pandey, Group GM- IT Services, J. Vinayan, Joint GM-Operations
Location: All India

This project claims to be the first mobile commerce project in the country and is available over both the cellphones and land lines. Our jury was unanimous in its opinion that the future impact of this project would be tremendous, cutting across geographies, languages and classes.

IRCTC's Internet ticketing project won the award last time for having the maximum social impact. This year, when they reentered the fray, to be frank, we were skeptical on whether they could have achieved something new of similar scale yet again. However our audit of the project proved that they had, and the jury had no hesitation in awarding it the top prize. In fact, this is the only project to get the highest ratings from all jury members.

The project under discussion rides on top of the Internet ticket-booking project that got the award last year. What the current project does is to make available a Web service to telephony service providers— both fixed and mobile—that they can in turn use to provide train ticket booking services to their customers. For cellphones, you can have both SMS and IVR (voice) based booking services, while for the landlines, the service will be over voice.

Prior to the launch of full booking services, a PNR alert service over SMS was launched, over a four-digit short code 7245, to which you can SMS your PNR number and receive up to four SMSs informing of changing status of the ticket on

Amitabh Pandey
Group General Manager/IT Services

J. Vinayan
Joint General Manager/Operations

Number of agencies, both government and private are working in tandem on this project.

the 8th, 3rd, 2nd day before journey, and on the day of journey. This service is available on Airtel, Hutch/Orange, Idea, MTNL-Delhi, MTNL-Mumbai, Reliance & Tata Phones.

For the booking service, which is an extension of this effort, the concerned operators have to build their own application for making the service available to their customers.

Three operators already offer this service across the country.
Idea Cellular: SpeechRecognition Application
Hutch/Orange: SpeechRecognition/GPRS
Reliance: CDMA (Java Based)

Five more operators are finalizing their applications for rollout.
Tata Indicom: For cellphones andWLL phones-Speech Recognition
Reliance: Speech Recognition
BSNL: Menu driven application on GSM phones, Speech Recognition
MTNL Delhi: Speech Recognition
Airtel: Speech Recognition, Menu driven application on GSM phones, Landline Speech Recognition on Touchtel phones.

Unlike conventional IVR systems, speech recognition based systems will actually let you book rail tickets over the phone without punching numbers and going through a complex menu. Such systems are quite popular abroad, but their deployments in India are still fairly low.

The application runs on HP Proliant servers, on BroadVision's One-to-One En-

terprise e-commerce platform. A combination of Tomcat and Apache running on Windows is used to provide the webservices to the operators.

A new service being planned is the booking of a ticket with just two SMSs, once you have registered at the IRCTC site and filled in the required information. This will be an SMS short code-based service and will be available soon.

Another factor that makes the project stand out is the number of agencies, both government and private that are working in tandem on the project. There is CRIS, which manages the original railway reservation system. BroadVision developed the e-commerce application with an Oracle backend, HCL is charged with the network and its security.

Fifteen banks from both the private
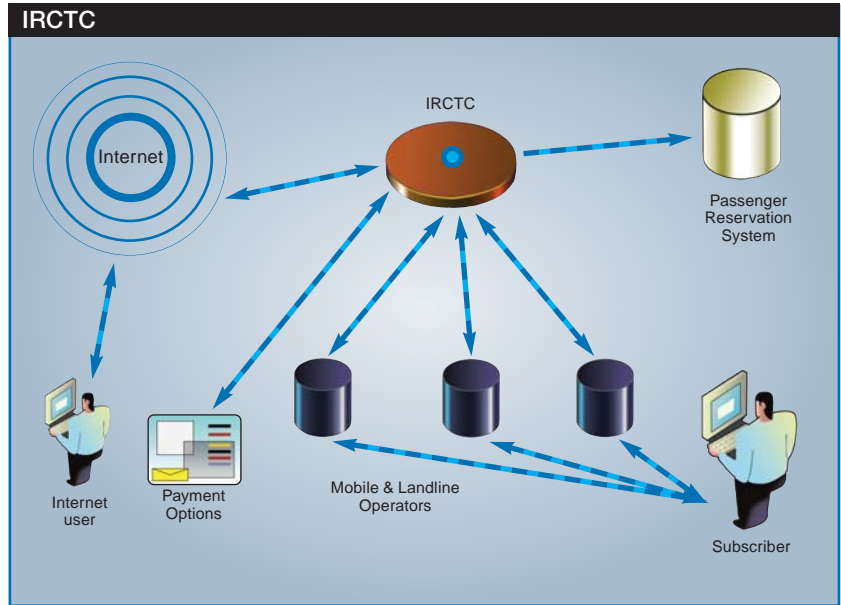
The SMS conversation sequence between the user and the IRCTC

First SMS by user :
PLAN <userid> <passwd> <trainno> <FromStationCode> <ToStationCode> <date of journey> <class> <passenger list>
Example : PLAN kkumar kkumar123 1081 CSTM PUNE 10/05/2005 SL LIST2
Note : <passenger list> is the name of the list of passengers as registered on the IRCTC website.

Reply from IRCTC:
Ticket fare:Rs 161.0, Availability status:AVAILABLE 0228, SMS TXN ID:501. Pls send sms BOOKPAY SMSTXN ID ICICIBANK MSHOPNAME to 7245 to book ticket.
Note : SMS transaction ID identifies a particular SMS instruction to the relevant transaction in the IRCTC database

Reply by user:
BOOKPAY <SMSTRANSACTIONID> <ICICIBANK> <MSHOPNAME >
Example: BOOKPAY 501 ICICIBANK 1234

Booking confirmation from IRCTC:
Tkt bkd PNR NO 2305429392 Train 1081 CSTM –PUNE Dt 10-05-05 Class SL. S1-10; S1-11; S1-12; S1-13; S1-14; S1-15. Fare 121. Ticket being couriered

and public sectors offer online payment through direct debit from users' accounts maintained with the bank, while three on-line payment gateways process credit card payments (it is cheaper to book tickets through direct debit than by credit card). Payments can also be effected through a cash card provider. Delivering the SMA or voice booking service to the end customer are a plethora of telephony service operators, both state owned and private. And courier delivery is effected through Overnite express. Finally, bringing all these together is the IRCTC, a subsidiary of Indian Railways.

Our jury was of the unanimous opinion that in sheer reach and in the ability to bring about a sea change in attitude as well as approach, this project outshone the rest of the contenders.

It also builds up and extends the excellent foundation they have built for on-line ticket reservation, which today has achieved a monthly turnover of 2 lakh tickets booked and a revenue of Rs 29 crore. Thus it is a fitting winner of the Best IT implementation project of the year award.

Maximum Social Impact

e-procurement exchange under public private partnership model

Govt of Andhra Pradesh

Project Head: Ajay Sawhney, Secretary to Government, IT&C Department, Secretariat, Govt of Andhra Pradesh **Location:** State of Andhra Pradesh

While setting up a procurements portal isn't such a unique task, it's the scale of this project and the social impact it creates, which made the jury decide to give it this award. The project affects all the government departments, PSUs, local bodies and even autonomous institutions like universities in AP. As of now, there are 2000 users from 40 departments/SBUs, registered with the portal and are already using its procurement services. In terms of social impact, it reduces cartel formations amongst contractors and suppliers since all the bidding is done online through the portal. It has actually increased the participation from the supplier community since anybody can bid for a tender. This helps empower even the small and medium-sized suppliers. Approximately 5000 suppliers are already registered with it, and the service has been extended right down to the *panchayat* level. Another social benefit is that due to the transparency, the citizens of state feel satisfied that the taxes they pay are being spent wisely.

The e-procurement exchange was set up by the Goverment of Andhra Pradesh to streamline its procurement process across various departments and SBUs. It was done to introduce and enforce best procurement practices. Annually the government used to spend about Rs 8,000 crores on procurement, and the process was plagued with

The project has resulted in the reduction of tender processing time by 70%. In a procurement worth Rs 16,000 crores, AP government saved 16%, which is tremendous.

problems. For instance, it took four to six months to process tenders, which is fairly long. A lot of paperwork was involved and not to mention multi-level scrutiny during procurement, which took up even more time. Like most manual tendering and procurement processes, this one was also affected by cartel formations as we just said.

The e-procurement portal helped resolve many of these problems. For one, it has done demand aggregation. So instead of each department floating its own tenders, everything is centralized, resulting in better buying power from suppliers. This helps the departments get goods at the best possible price, and even helps control inventory. It even helps pre-qualified vendors to access other government departments as well, giving them more business opportunities. It uses various types of e-auctions for getting better deals. Lastly, it increases transparency in the system, allowing for better monitoring and control over the procurement system.

The architecture

The project has been built on an n-tier architecture. There's a presentation tier that's supported by two load-balanced Web servers. These provide the front end for the e-procurement portal. There's a business logic tier, which handles several tasks including authentication, authorization and

workflow management. Then there's an XML data layer tier, which handles communication with the Web services. Lastly there is a database tier, which also runs on two hardware servers, configured in a two-node active/passive cluster to ensure high-availability.

The business logic has been kept separate from the presentation logic by design. This makes the system more scalable allowing new departments to be incorporated into the system. All workflow and navigation code has been abstracted from the user interface for achieving this. Being an online system where users are logging in, getting authenticated and filing tenders the system needs to have proper security. For this, two-factor authentication, digital signatures and 128-bit SSL encryption have been incorporated. This architecture can even be extended to other devices beyond the desktop, such as the mobile devices.

Skill sets and key players

A project of this scale requires several skill sets, to be fruitful. Since the project cuts across the entire geography of AP, foremost it needed somebody capable of bringing together diverse views and opinions to a single platform. That's the reason the secretary of the state, AP, Mr Ajay Sawhney, headed it. Secondly, it needed a steering committee, consisting of people who were empowered to recommend and make decisions regarding changes in the legal and government framework. The project manager for the steering committee was Mr K Bikshapathi. Thirdly, it needed an external agency that could do the implementation and look at the technicalities. AP government chose C1 India as the external agency. The project manager for C1 India was Mr N. Kalyan Chakradhar Reddy. Fourth requirement was of the representatives elected from all the participating departments. These representatives were given extensive training on implementing e-governance initiatives, so that they could become effective CIOs of their respective departments. Together the team dealt with government

e- procurement system
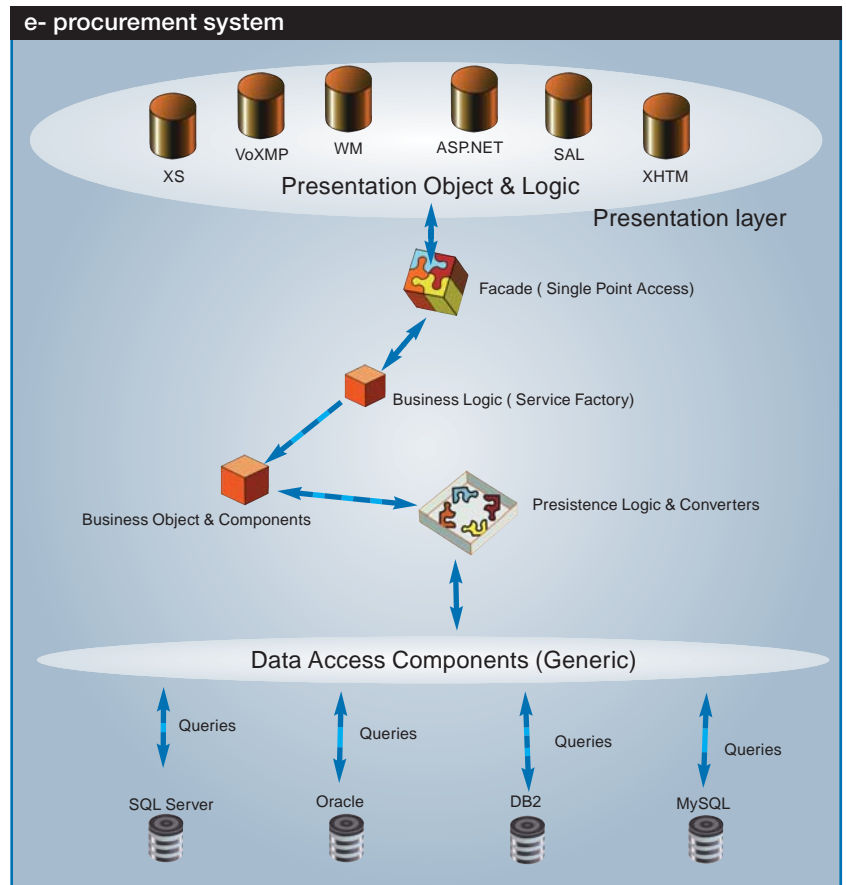
policies as well as external stakeholders like vendors and consultants to carry forward the project. The project has made the complete procurement process paperless, which basically eliminates a lot of activities that add no value to the system. Some of these include manual sale of tender documents, manual opening and reading of bids, preparations of comparative statements, time spent in movement of files between people, manual creation of purchase orders and delivery schedules. This sort of a system ensures that at any point of time, authorized personnel can check the status of a particular transaction. There were three stages in the project—pilot, roll out and operations and ongoing maintenance. The project has been implemented using the public-private-partnership model (PPP). In this model, the government doesn't invest in the hardware, software and cus-

tomization of the project. It's all borne by the service provider right up front. The service provider recovers the investment through service charges for all transactions carried out on the portal. These are charged to the individual government departments carrying out all the transactions. The benefit to the government in this case is that it doesn't have to worry about maintaining the IT infrastructure, upgrading the hardware or software or the technology changes. As all these are borne by the service provider. The service provider needs revenues to the tune of Rs 4.55 crores per annum to operate and maintain the e-procurement portal.

At the end of the day, the project has resulted in the reduction of tender processing time by 70%. In a procurement worth Rs 16,000 crores, AP government saved 16%, which is tremendous.

Most Innovative

Plasma Display

Wockhardt Hospital & Heart Institute

Project Head: Herbert Albert, IT Incharge , Vishal Bali, VP Operations **Location:** Bangalore

There are projects that cost a lot of money and effort and still end up going nowhere, and there are projects that cost, what seem like peanuts but still end up making a huge impact. The patient status display system at Wockhardt Hospital & Heart Institute, Bangalore falls in the latter category. The project is simple in concept and implementation, and while it could have been done by any other hospital, has not been attempted by any one else.

To understand the full impact of the system, you need to put yourselves in the shoes of relatives of patients undergoing surgery, or recuperating after the surgery in the ICU. Their anxiety is only understandable. Typically, they would be groping for the smallest bit of information. The system takes patient information from the hospital information system, and keyed in put from medical staff during the operation or when the patient is in the ICU, and displays it on a plasma TV kept in the visitors area. The displayed information can be from a menu of predefined items or keyed in. the system can also run timed PowerPoint shows (.pps files) or flash animations.

Each patient's status is displayed for a minute. In case of emergency, there is a freeze button, which can override the cy-

Vishal Bali, VP Operations (Top)
Herbert Albert, IT Incharge

cling display and emergency information like, paging a relative to meet a doctor or to provide blood at the blood bank can be flashed. The system has a simple operating interface, where attending nurses call up all information from menus. Only one line of additional information, which is usually about when relatives can meet patients, is typed in. The menu items on patient status range all the way from 'operation in progress', through various recovery stages. The messages of the system are meant to pacify the relatives. There is one item 'patient is critical', which is flashed when necessary, only with the attending doctor's permission. The application front end, the data entry screen is a Visual Basic application running on Windows PCs. The back end is a MySQL database running on Linux. The concept was developed by Vishal Bali and Herbert Albert, with implementation done by Think Ahead Advisory services. Also involved was the ten member team from the operation theatre and the ICU. The project got the go ahead in Jan 2003, was piloted in Jan 2004 and implementation was completed by May 2004 at a cost of Rs 8 lakhs.

Our Jury was of the unanimous opinion that this was one of the most apt usages of IT that they had come across, delivering on a high priority need, albeit of a limited audience, with a very simple solution. Hats off to the solution for its simplicity.

Most Technologically Challenging

PRISM
National Stock Exchange of India

Project Head: Satish Naralkar, MD & CEO, NSE.IT Ltd
Location: Mumbai

PRISM or Parallel Risk Mgmt System is a fine example of using parallel computing to meet the business needs. Parallel computing is generally used in super computers for performing complex scientific calculations, but it's been used here for doing risk management in the stock market. The NSE (National Stock Exchange) deployed this project for its wholly owned subsidiary, the National Security Clearing Corporation or NSCCL. This subsidiary is responsible for the clearing and settlement of all trades executed on the NSE. When the futures and options market opened in India, there was a need to develop a risk-management system for it, which could monitor the risks associated with each investor. The computation of risks in this form of trading is quite complex, and if NSE's trading members violate any norms while doing so, they can be barred from trading any further. It's therefore not only important for trading members to know of the risks involved in derivatives trading, but they also need to know it in real time to avoid disablement. Moreover, any system that provides this information can't afford to drop even a single transaction, because that's equivalent of one trade being missed. If that single dropped trade turns out to be a risky one, imagine the consequences. That's where the PRISM or Parallel Risk Management system comes in, which provides this information to all trading members in real time during intra-day trading hours of NSE. Building

> **PRISM is a classic example of utility hardware** being used to create a parallel computing system for calculating the risks in derivatives trading

such a system is a technological challenge given the complexities involved in risk computations, which is why PRISM gets this prestigious award. The parallel computing architecture is normally used in super computers for running scientific applications. PRISM is a live example of

using the same architecture for a business application.

Typically, to create such a parallel computing system, it would have required mainframes or super computers. This would have considerably shot up the cost of building such a system. However, PRISM was developed using utility hardware, comprising a few 4-way Intel Xeon-based servers running RedHat Linux. The software for it was developed completely in-house using ANSI C, MPI or Message Passing Interface, Java, RMI and Perl. MPI is a standard communication interface used in super computers. Specifically the MPICH implementation of MPI was used, which is freely available. As the system's been developed in ANSI C, it can be deployed on any UNIX-based system, hence RedHat Linux was used. Java was used to build the front end of the system.

Plus, the methodology used to calculate the initial margin requirement for each investor was SPAN or Standard Portfolio Analysis at Risk. SPAN identifies the overall risk in a particular portfolio for futures and options contracts for each trading member. It uses 16 standardized definitions of risk scenarios, which are defined based on the probable change of price over a day, or probable change in price volatility over a day. These help identify the largest loss a portfolio is likely to suffer during a day.

How it works

The entire parallel architecture of

PRISM is divided into four processes. These are called Received, GUI handler, Mother and Child. The Received process, as the name suggests receives live data from NSE's trading system. The GUI handler handles all GUI queries and user interactions.

The mother does basic portfolio handling for traders, maintains the margin data and also monitors for all the trading violations. Plus, it does the crucial task of child process scheduling, ie finding a free child process and routing requests to it in real time.

The child process is responsible for doing the margin computation. In case a child process crashes due to some reason, the mother will automatically assign it to another child process. Until a child process is assigned, the computation load is shared by the remaining child processes.

The best part of the system is that its highly scalable. Any number of mother and child processes can be added to the system, based on the transaction load. Blade servers can be used for scaling the system up, since they can pack more computing power into lesser space. Currently the system can perform 200 computations per second, which is quite significant.

Further still, the system has built-in software-based fault tolerance, instead of hardware-based fault tolerance to save costs. The fault tolerant system is identical to the live system and runs in parallel with it. In case the live system fails, control is automatically shifted to the fallback system, which then starts using the child processes.

Both systems compute positions and monitor violations, but the disablement messages are only sent out by the live system. Such a system could not have been built with technical knowledge alone. It required a mix of software development skills in Java and C, as well as functional skills in derivatives and risk management. The real challenge, as claimed by NSE was in ensuring that the system worked in real time.

NSE Prism
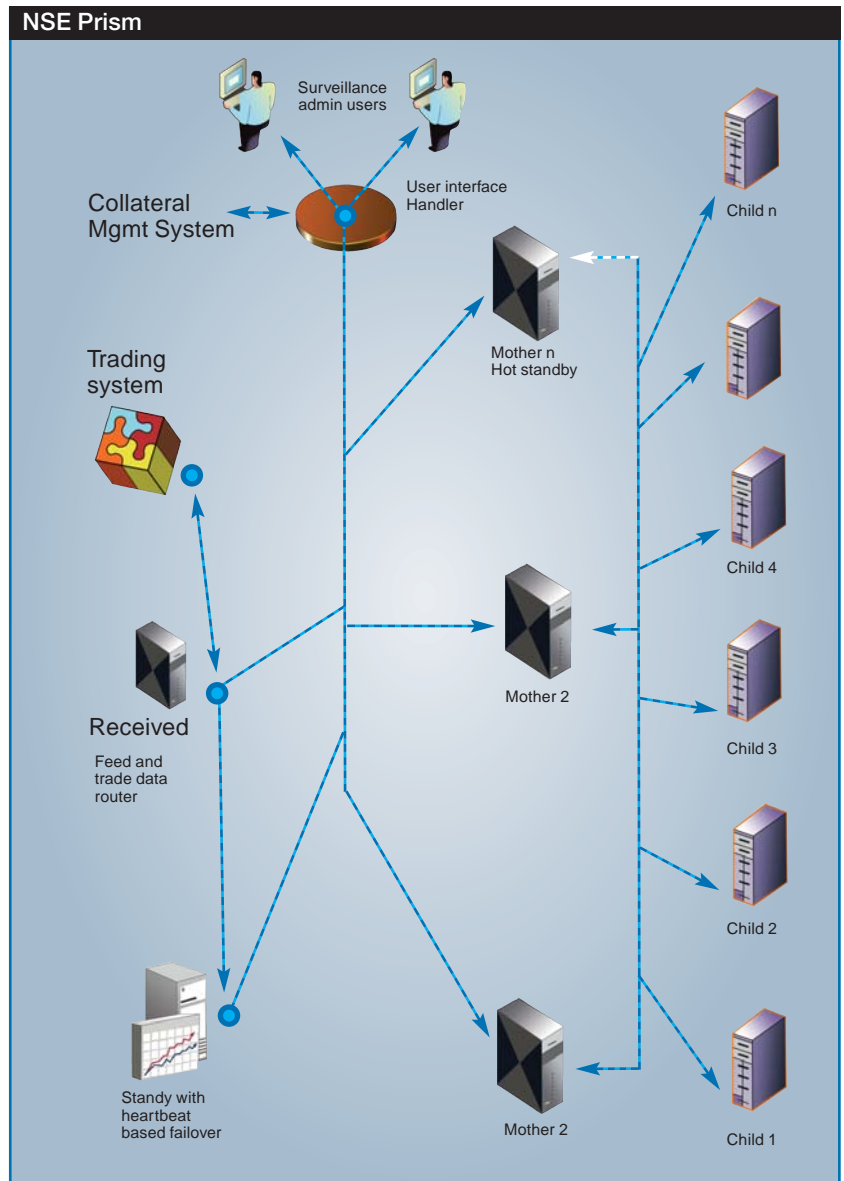
The beneficiaries

The original beneficiary of PRISM is the trading community as it provides them online results to prevent their exposure limits from exceeding. This reduces the risks in this business, which could otherwise be very heavy. Returns offered by the system are instantaneous, as NSE handles 99.5% of all derivatives trade in India.

The system was tested at CDAC's supercomputing facility, and can be used in areas other than risk computation as well.

It's actually brought the cost of super computing down, and can be used for other business applications like decision support, surveillance and trading engines.

Overall, PRISM is technologically a very challenging project. It's a combination of ingenuity and complexity. Ingenuity is in developing such a system in house using utility hardware and freely available super computing standards. Complexity is in using the SPAN algorithms in real time for risk computation.

Maximum Business Impact
GIS-based Risk Mgmt System
ICICI Lombard

Project Head: Naganathan Sriram, National Manager-Technology **Location:** Mumbai

ICICI Lombard, a joint venture between ICICI Bank and US-based Fairfax Financial Holdings, is a general insurance company, which deals in insurance of personal, business and rural products, including house, motor, health, fire and special perils, industrial risk, corporate cover, tea crop, and many others. In the insurance business, success of a company depends largely on its ability to identify, quantify and manage the risk associated while issuing policies. The insurance premium for any policy depends upon the risk associated with it.

Typically, premium for, say, a motor vehicle is calculated on the basis of the price and age of vehicle. However, there are several other parameters, which can help better predict the risks associated with a policy. Factors such as distance to work, route driven, auto theft statistics for work and home can play an equally important role while underwriting motor vehicle policies. Thus, apart from the conventional parameters used for underwriting, factors which have a geographical component can and should be used to calculate risk involved in underwriting. Similarly, property insurers can use geographical data such as distance to fire station, windstorm risk pattern, distance from sea cost, and floodplain for calculating policy premiums. In conclusion, each and every object or event has got a geographical component, as at any point of time everything has to be somewhere.

As said above, the working rule for the insurance business is to minimize risk or, to better align pricing with risk, and geo-

> A very important factor for calculating risk, which has traditionally been ignored by most insurance companies, is the geographical component of data and its applicability to determine product pricing.

graphical data can play an important role in achieving that. A way to utilize this data in the insurance business can have a tremendous impact on the overall business. This is precisely what ICICI Lombard has done in its Geographical Information System

(GIS)-based risk management system. Any point on the surface of earth can be identified by a latitude and longitude pair. Once this pair of information is defined for an area, the area can then be linked to many other types of information available about that area. The information could be in the form of demographic data, weather pattern, flood susceptibility, seismic zone, etc on a macro level and in the form of the condition of roads and intersections, theft statistics or distance from fire station at a micro level. A GIS represents such geographical information about a particular area or location onto visual geographical maps.

GIS plots different types of geographical data as separate layers on the map. So, you can have a layer of, say, rainfall pattern data plotted on to the map, another layer could be about disaster zones. This GIS information when combined with, the static and moving location of objects which are to be insured, such as house, motor vehicle or factory, can give valuable insights into deciding policy premium prices. A visual representation in the form of maps, gives an easy way of looking at and understanding data, thus enabling better decision making, identification and management of risk involved with various geographical locations, enhances policy processing, reduce cost, manage customers and accounts better.

ICICI Lombard is presently using four layers of data that includes spatial, demographic, rainfall pattern and disaster zone information. The system is used for reinsurance, underwriting, customer service, rural and agricultural business group, and

marketing. It facilitates online tracking of various risks down to the pin code level in any geographical location. The company, in coordination with World Bank, has introduced Weather Insurance, a GIS that provides weather information like rainfall patterns can give much better understanding and decision making for weather underwriting.

Apart from managing risk, the GIS system is helpful in marketing activities. It can give details such as number of policy holders in a particular location, which can be used to make marketing efforts for areas where the number is less and to cross-sell other products where the number is more. Pre-underwritten products can be offered to customers based on risk analysis provided by the GIS for separate locations.

The GIS is also actively used by sales and other field personnel, who are probably not well versed to understand and analyze complex reports, but the same data presented in the form of a visual map lets them understand it better, allowing them to be more analytical as well as be more productive.

The project started in November 2004 and the application uses ASP.NET to deliver GIS content over the Web. The maps are provided by MapInfo's MapXtreme software to the ASP.NET system. Oracle8i is used to store all GIS data, which is provided by various vendors. The hardware cost, which includes a Dual-Xeon server, was Rs 2 lakhs. Application software and development cost comes out to be Rs 30 lakhs. Considering these numbers, the overall cost of the project is not too high, whereas, the returns offered are much higher.

Though, the results cannot be quantified in absolute financial terms, it is clear that such a system can definitely have a very great impact on the way an insurance business operates. Along with it, the quality of data presentation through maps is much higher than reports or charts. Being a Web-based application, it can be accessed all across the country by various agents, sales personnel, branch offices, etc.

Risk Management System (RMS)

Browser
Browser
Map Xtreme
Application server (ie ASP.NET)
Request map
Return map
Oracle (GIS Database)
Web Server
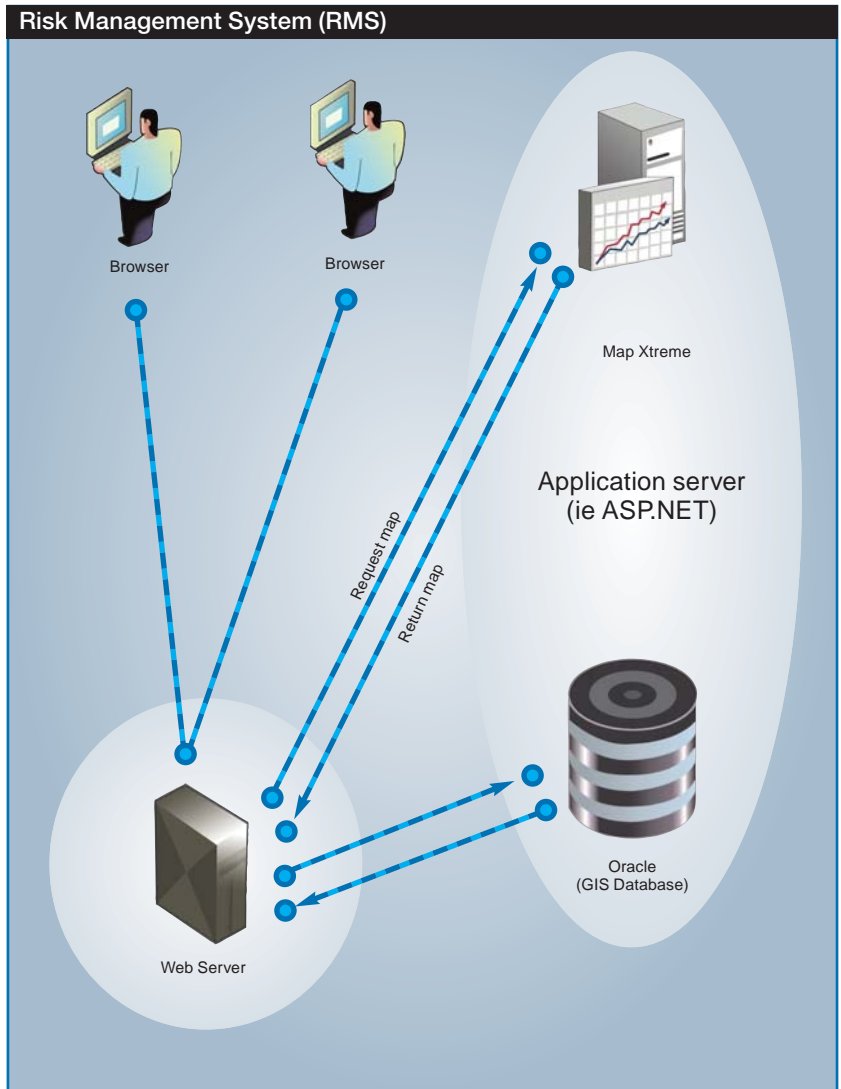
Bottom line

Offering best priced products in the insurance industry, while simultaneously enhancing profits, requires managing the risk associated with underwriting in the most efficient way. However, a very, if not the most, important factor for calculating this risk, which had traditionally been ignored by most insurance companies, is the geographical component of data and its applicability to determine product pricing. ICICI Lombard's GIS based Risk Management System, aims at accumulating, processing and presenting that geographical data, which can be used to create better insurance products for both the customers and the company.

The GIS project, while managing risk also helps in other business activities, such as marketing and customer care. Considering the importance of location based data for insurance industry, this GIS based risk management system does become the project which can have the maximum impact on a business.

It helps insurers assess risk more efficiently by tracking accumalation in real time. It also helps the organization better align processes with risk and thereby provide pro-active customer service.

Products Cross-sell
ICICI Bank

Project Head: Joydeep Dutta, Jt GM Location: All India

You want to find out how much you made on your deposit interests and you call up the ICICI call center. The executive greets you and then you both go through the exercise of identifying yourself, specifying your account and the items you want to check. At the end of the conversation, the call center executive says "By the way sir, could we interest you in a life insurance policy we have pre-approved for you?" You get curious and ask for details. At the end of it, you buy not one policy but another one for your wife too and decide to insure your car and house too. Neat.

This is called 'cross-selling'. What happens in cross-selling is that you are their customer for one or more products and they use these relationships to sell you more products. Cross-selling and the technology it leverages (data mining) have been around for years. Yet, one seldom sees data mining actually being applied for a business application such as this, which is one of the reasons that the project managed to get a slot in the top 10.

How it works

In the case of ICICI, they are leveraging their existing CRM data to first find out what relationships you have with them. Then, these are analyzed on some 90 different parameters that can range from your credit worthiness to the strength of your payments, deposits or service accounts (cards, policies, etc). Your total score is then compared with a list of services those points qualify you for, and this short list is called up on the call-center executive's screen when you call them.

Although ICICI is using this marketing technique majorly for the incoming calls—that is they pitch a product to you when you call them up—they are also using their on-field representatives use outward calls to promote pre-approved products. Note though that you should have already qualified for being sold something. That is, they won't be selling every calling customer a product.

Systems

This pre-approval system is keyed in to their IVR system, their internal financial database as well as their data-warehousing application ('Teradata'). The front end was coded in VB 6.0 and the back end is hosted on an IIS 5.0 Web server.

Given the simplicity of the implementation, the entire project was completed in a total of 35 days from conception to going 'live'.

Costs

They have revealed that this is their 'most significant project completed in the last financial year'. They also say that the development did not cost them anything—perhaps because 3i Infotech (formerly ICICI Infotech) did their development with a team of 20 to 40 people. The project is expected to run through its life over the next five years.

Impact

Although we would find the entire concept of someone trying to sell us yet another product when we call a call center —yes, usually we call them up to shout at them, right? ICICI says the project has been immensely successful on the ground. They wouldn't give us a figure that we could print, but they are said to have sold a large number of other products to their existing customers.

ICICI Cross Sell

EDW

Non EDW OLTP

Account Data Transaction Data Customer Profile

In Bound Customer Call

IVR

Pre Approved Offers

Authenticated Customer

Cross Sell Application

Operations/Sales Channel
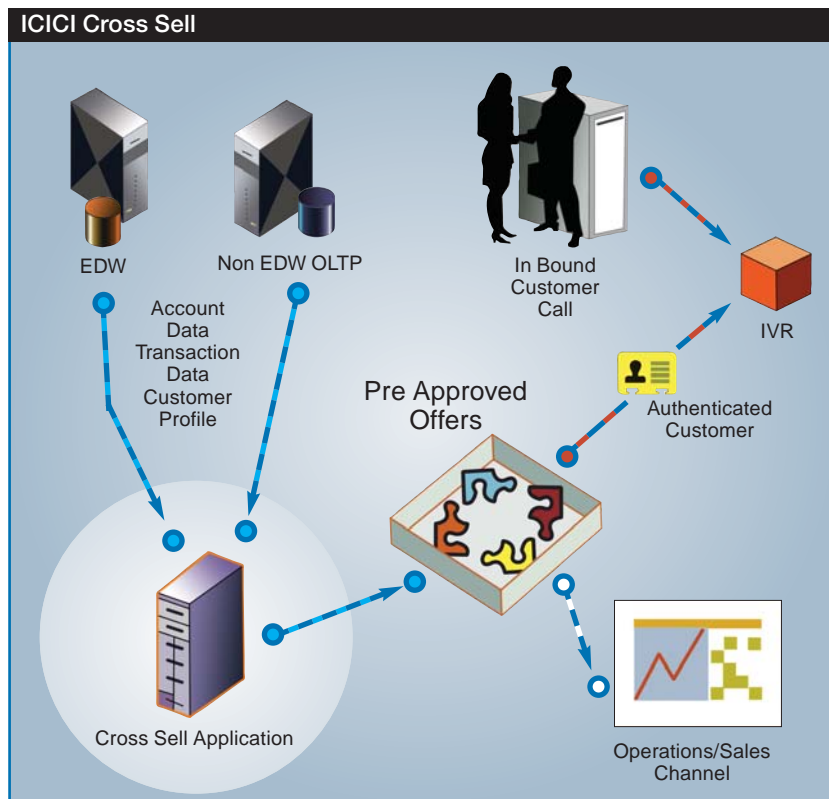
Optilearn
Pfizer Limited, India

Project Head: Arun Gupta, Senior Director, Business Technology
Location: All India

This is an e-learning project, which allows Pfizer to conduct tests on-line for its employees. As far as technology goes, this is just another e-learning project. However, it gives a completely different picture if you look at the environment and manner in which this project has been implemented. For one, a pharmaceutical company has put it to practice. Pharmaceutical sector is an aggressively marketed and defended arena, where even a day of laxity can lose you entire regional markets. As such, a pharma company needs its operatives in the field to stay sharp and atleast one-step ahead of competition. That's where Optilearn comes in handy.

Currently, the role of Optilearn is simple, small and 'humble'. It serves merely to certify Pfizer's thousand or so field representatives, marketing personnel and executives. However, the twist comes from the fact that the company has made certain certifications mandatory for those three rungs of its operation. These certifications ensure that these employees are up to date on the latest, not only on their employer's products and offers, but it also provide valuable feedback to the company about who needs training.

How it works

We are not going to delve into the programming mechanics of Optilearn. The designated test administrator adds and schedules an exam. Automatically, an e-mail is sent out to all the marketing and sales employees. They are to take the exam by a certain date. To provide some element of unpredictability and test-rigor, the questions and even their multiple-choice

> Pharma sector is an aggressively marketed and defended arena, where even a day's laxity can lose you entire regional markets. Operatives in the field need to be one-step-ahead of competition. Optilearn comes in handy here.

answers appear in random order. The tests are also graded according to dynamic difficulty—the tougher the question, the more points awarded to the candidate.

If the candidate cannot appear for the test due to some reason by the given date for some reason, they can re-schedule to take the test. This flexibility allows for Optilearn to be efficient and useful to its maximum.

When Pfizer decided to implement such a solution, they had an important concern. Their in-house application called, Optima, had to interoperate with Optilearn. Optilearn could not, thus, maintain a stand-alone database of users or results, they needed to be shared with Optima.

For this purpose, Pfizer added a Web service to Optima that authenticated users for Optilearn as well as saved back the results of the certification attempt. This was a key deliverable and once this was achieved, the rest of the system falls into place.

The systems

Optilearn is a browser-based solution that requires just a PC or Mac with a browser to run. It supports both Netscape or IE. For the server-side software, it needs a Windows Server, .NET Framework 1.0 with SP 2, SQL Server 2000 with SP3 to run.

Costs

The entire implementation took Pfizer and Learning Mate about four months (February to June) and costed approximately 10 lakh rupees. They also had to deploy additional hardware worth another 8 lakh rupees. The project is expected to prove its worth over the next three years.

Looking at the future

Now that the basic goal has been achieved, they're starting work on porting it over to the handheld so that it can be used offline. It could, thus, also be put to use to carry around a knowledge base of ready-to-use information about products and technologies offered by Pfizer.

Centralized Core Banking
Punjab National Bank

Project Head: K S Bajwa, GM-IT
Location: All branches of PNB across the country

Punjab National Bank is a 110 years old bank, and its employees are used to working in a particular way. Introduction of the core banking solution required a dramatic shift in their orientation. People who were used to following traditional banking processes had to be trained to use the new system. So in effect, implementing the core banking system wasn't the biggest challenge.

Even more challenging was the task of bringing in this change management. People had to be trained in phases, so that bank's existing operations didn't get affected. Another major challenge was managing so many different vendors, which had to be handled very carefully. Another major challange for the bank was handling vendors such a huge implementation-would obviulsy involve multiple vendors. It was a challange for the bank to get the best support.

The project started way back in 2001. So far, the bank has managed to implement the core banking solution across 1050 of its 4500 branches across the country, some of which are in the remotest of areas.

The bank has used all possible communication links for different branches, depending upon the requirement. These included everything from leased lines to VSATs, radio frequency, etc and even different service providers. Such a wide mix of communication equipment is necessary considering that the bank has branches even in areas where the basic infrastructureitself doesn't exist.

The scope of this project was to centralize the core banking solution so that a single customer database is maintained to provide a consolidated view of the bank's operations. This way, the customers would belong to the bank and not any particular branch. The branches would function as the delivery channels, managing customer accounts.

The result of centralizing the database was that the bank could build a strong MIS for strategic decision-making. A more long-term objective of having centralized database is to build a data warehouse with a cross sell application on top of it for all customers. Currently it's functional only for the bank's premium customers.

The Centralized Banking Solution has made it easier for Punjab National Bank to provide customers anytime, anywhere banking service. It has also integrated various delivery channels like ATM, tele-banking, Internet banking, debit/credit/smart cards, etc. This allows the bank to attract and retain the right customers, and business in the core branches has grown by as much as 2.5 times.

The bank uses a three-tier architecture with multiple delivery channels integrated to provide a unified enterprise banking system. There have been other challenges that have been managed here as well.

For instance, security risks in Internet banking are huge. For this, besides having a proper security infrastructure, the bank also provides a virtual keyboard for customers to enter their account details. Other issues like other people using the bank's domain name for malicious intent have also been resolved. The bank also has a remote DR site in Mumbai, which is asynchronous. Another synchronous DR site is also being considered. Plus a risk management system is also being deployed.

Cost of doing such a massive implementation, of course, runs into hundreds of crores of rupees. Of course, even the team size for deploying such a project has to be huge. It consisted of 80 people, who brought several skill sets to the table, such as DBA, reporting, help desk support, quality control, project management, etc.

> Implementing the core banking system wasn't the biggest challenge. Even more challenging was the task of getting the people to use it.

Wireless Franchisee
Reliance Infocomm

Project Head: Ashish Kumar Chauhan, CIO
Location: All across India

Bandwidth availability and penetration has increased manifold but, when it comes to connecting the remotest of villages, wired connectivity are either not available or not up to the mark. In several cases people have used VSAT) to provide connectivity to such places. ITC's e-Chaupal, last year's Best Implementation, uses VSAT to connect such villages. A VSAT link suffers from high latency; the equipment is expensive, has high power requirement, and setup is time consuming. When it comes to connecting, a 1000 locations with minimum cost, using a device with minimum power requirement, for transaction oriented applications, VSAT is not suitable.

Faced with a similar problem, where neither VSAT nor wired links fit the bill, Reliance Infocomm used CDMA and phones to wirelessly connect around 2200 Reliance shops, and partners to its corporate network. The phones, used as data modems, are ordinary CDMA phones, which people use for Internet-access on the move. The connectivity provided is used for running Reliance's Web-based POS and CRM applications, enabling real-time bill payment, account status checking and instant connection booking. VPN is the solution that organizations use to remotely and securely connect to corporate applications. Rather, than doing encryption and tunneling at the user end, VPN connections to the corporate systems are provided by the network for all phone numbers of Reliance franchisees. This eliminates the need for the users to create VPN tunnels to the corporate network to access it.

The project, started in Feb 2004, is the first time that mobile phones have been used as a medium of connectivity to thousands of locations, including the remotest, for running business applications. Though, the project can be easily passed as run-of-the-mill by many, it has presented to all of us an alternate connectivity option for making secure WAN links, which can be used by, say, a bank to connect some remote branch, or a project like e-Chaupal, which is running across hundreds of villages. Presently, the maximum theoretical speed offered by CDMA is 144 kbps, which should be sufficient for many applications. Apart from that, it can also be used for securely connecting ATM machines, mobile credit-card payment devices and other POS terminals.

Reliance VPN
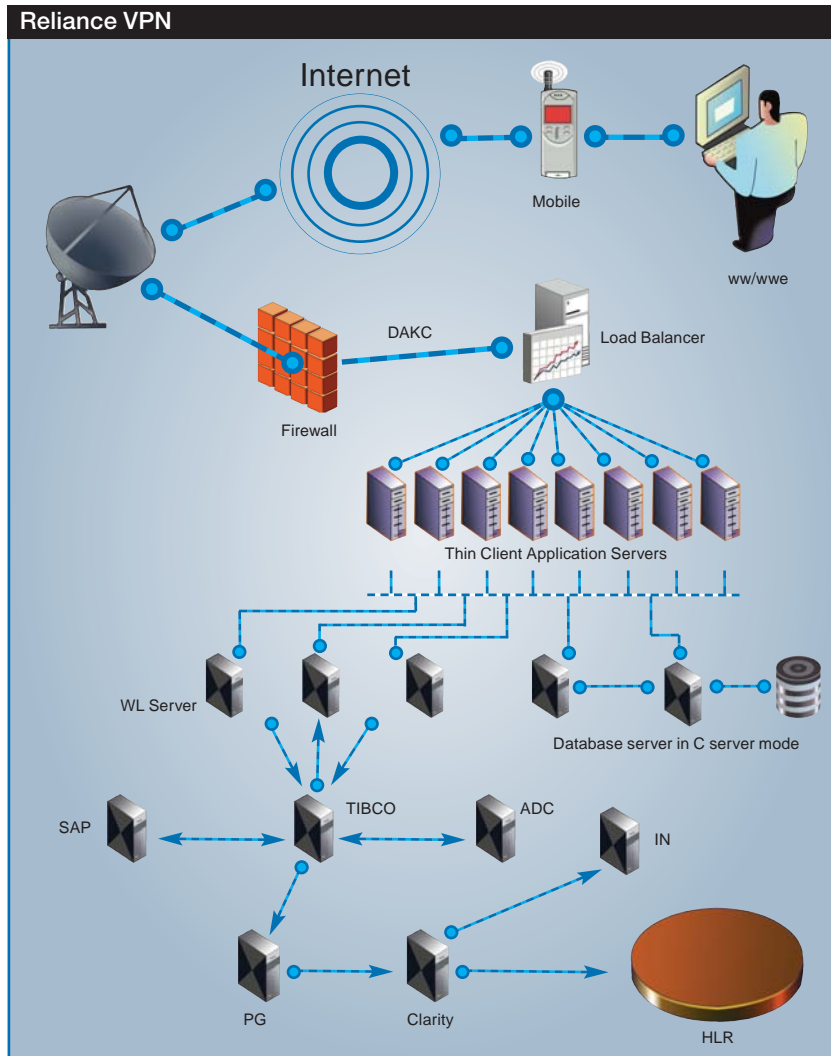
Tools Planning System
Titan Industries

Project Head: A C Chidanand, Group Manager, SAP team
Location: Watch Division, Hosur, Tamil Nadu

The tools planning system is meant to help Titan's tools department to analyze tools' life, re-estimate tools' requirements to ensure that the production doesn't get delayed. The company had been using SAP R/3 and SAP APO systems for their demand planning and availability check during production planning. However, the system didn't have a proper tools planning system, and the customized solution that had been implemented earlier was too complicated.

The problem was that all parts required for watch assembly didn't reach on time or in the right quantities in the watch assembly plant. As a result, there was misalignment in the plant, leading to production delays. A full-fledged study of the existing supply chain process was done. This included a review of the processes for demand planning, manufacturing, sales and distribution. At the end of the study, the company decided to implement a system that would calculate the approximate number of tools required as per the demand and projected lifecycles.

There were two challenges in implementing this system. One was that it had to integrate with the existing SAP R/3 system without touching SAP's source code. And second had to do with the transactions carried out by the tools planning system itself. While a user would perform one transaction on the system, the system did several transactions internally. Even if one of them failed, reconciliation had to happen, leading to inconsistencies in the database. The solution that was created for this problem was

> There were no costs other than manpower for building the tools planning system, as it didn't require any change of hardware, and programming was done in SAP's own proprietary language.

that if one transaction failed, the other transactions were called back. If you've ever used a SAP system, then you will definitely know of how difficult it is to track the flow of information in it. SAP or any other ERP system for that matter face the problem of batch roll back, ie, if you feed any information to it, you don't know where all it will go. So if you want to reverse the transaction, it can be pretty difficult since you don't know where the data is sitting and what all it has affected.

The project was executed in three phases. First, the discover phase, which involved understanding the supply chain system. Second, the diagnose phase, which involved studying each of the issues identified in the first phase one and providing alternative solutions. Third and last was the define phase, wherein a detailed solution was proposed and pilots done. Infact, even the supply chain was segmented into demand and supply. The demand pact kept track of distribution planning while the supply side was responsible for procurment and manufacturing. The entire project was completed in 14 weeks. The system was developed using three elements. The first was to use features of SAP's standard materials management and plant maintenance modules. Second was ABAP, which is a proprietary language for developing on SAP. Third was the creation of a customized database table to the existing database. Despite all these changes, the existing hardware used in the setup was not altered. There were no costs other than manpower for, as it didn't require any change of hardware, and programming was done in SAP's own proprietary language. It did however lead to better system efficiency, helping Titan cut down on their inventory costs and even reduce the manpower. The planning time was reduced at shop levels. It helped release the material into production based on capacity of bottleneck resources.

The team behind this project

e-HRD Model

Govt of Assam

Project Head: Dr Prem Saran, IAS, Commissioner, Hill Areas Dept, Govt of Assam

Location: Karbi Anglong and North Cachar Hills of Assam

e-HRD

The objective of this project has been to improve the human resource potential of the government employees in the insurgency affected hill districts of Assam. Essentially, the model itself has nothing to do with IT. It's a simplified version of a traditional technique of meditation and visualization, used to tap the potential. This technique was developed by the project head, Dr Prem Saran, and a 20-minutes video of the same was created. IT was used as the medium to reach the employees, and NIC's (National Informatics Center) infrastructure was used for the job. A high-end server was set up, with VSAT connectivity to a NIC server.
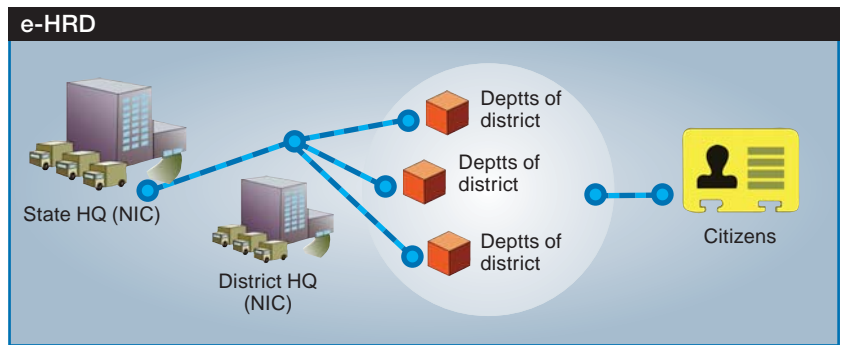
At the district level, NIC's gateways with VSAT connectivity to the state level server. The districts are further connected to various district offices over OC links. The offices themselves already have computer networks in place. The video is streamed to the computers over the Internet. Training staff has been put in place to train the government officials. The cost of putting up this project is very low, as it's using NIC's existing IT infrastructure for the job. However, the benefits of the same are plenty. Life in an area, which is insurgency-hit isn't simple. So besides protection, the government employees also need motivation to work. This model will help officials measure up to their potential, make them more productive and help them with delivery of services to customers.

Hospital Information System

Fortis Healthcare

Project Head: Sunil Kapoor, Head-IT **Location:** Mohali, Chandigarh, Amritsar, Punjab

The beauty of the homegrown HIS or Hospital Information System at Fortis is in the way it's been integrated with other systems of the hospital and the level of information it processes. The system goes beyond the standard HIS functionalities of patient admission/discharge, physician order entry system and ward/OPD management. These are anyways a part of the system, but along with that the system also integrates with the PACS (Picture Archiving and Communication System) and labs-management systems, patient satisfaction measurement and analysis system, patient's refunds tracking system, and many others. Plus, it has made the single window clearing system a reality, which allows registration, administration, discharge and transfers for both OPD and in-patients departments all from a single counter. The system can also do remote monitoring of the patient-bedside monitors, which is useful when specialists sitting in the Mohali hospital want to monitor a patient in Fortis' hospital in Amritsar. This hub and spoke model can be implemented across multiple locations, and Fortis plans to implement this right down to the general physician level.
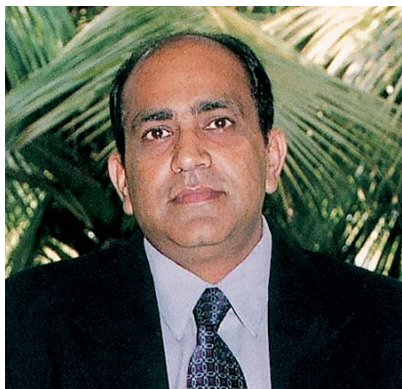
Moreover, an enterprise wide Web-based MIS has also been implemented, which provides detailed information about various parameters that are critical for strategic decision-making. The entire HIS has been developed using a database at the back end with a VB front end and Web tools. Besides these, a SAN has been implemented for storing data, and various medical equipment also interface with the HIS, such as those at the radiology labs and X-Rays. Currently, besides the features we mentioned, the HIS also includes diagnostic reporting, materials management, and even smart cards implementation for the employees for attendance, access control and even dispensing food in the cafeteria.

Platform Migration
HDFC Bank

Project Head: Surya Prasad, *Vice President* **Location:** Mumbai covering 215 branches across India

As businesses continue to grow, the pressures on the IT infrastructure that supports the business grows too. An answer to handle this additional load is to scale up the infrastructure. However, technology obsolescence and inflexible systems restrict scaling up. HDFC Bank faced a similar problem, it required additional infrastructure support that could optimize performance and also future proofs their investment. But, their existing Alpha server infrastructure could not offer the kind of flexibility, performance and manageability, which would serve their growing needs. Also, a solution was required that could handle peak time workloads. HDFC decided to shift the system platform from Alpha to Power5. The reasons for this were better performance, virtualization, which allows dynamic partitioning of the system resources, and on-demand feature, which provides a way for handling peak loads. The systems decided were two IBM P570s each having 12 Power 5 CPUs and 50GB RAM, and configured in failover cluster mode. Of the twelve CPUs, ten are used for normal operation, and the remaining two are standby, which are utilized as and when the load starts peaking. Apart from the main systems, an eight CPU system is used at the disaster recovery site. The project started in August' 04 and took nine months for completion, including migration of Oracle data, and FlexCube and CashIn applications, which are used for corporate banking and for cash management respectively.

Harmony
Infosys Technologies

Project Head: Shailesh Kumar Agrawal, *Group Project Manager* **Location:** Across the globe

Managing human resource is the biggest challenge faced by IT companies today. Employers find ways and means to reach out to the employees better and provide them with necessary information.

In such cases, an employee relationship management system is the needed. Infosys technologies embarked on this project, which would be an HR and Money (read finance) system for its employees. In fact, the project name 'Harmony' does not mean harmony comes from HR plus money.

The system is meant to be one place for Infosys' employees for all kind of structured and unstructured data. It has modules for storing personal and official data, such as bank account details, PAN, emergency contacts, electronic forms of documents such as degrees, mark sheets and passports; tools for managing personal finance, income tax, provident fund, esop, and more. The system also displays company policies and related information.
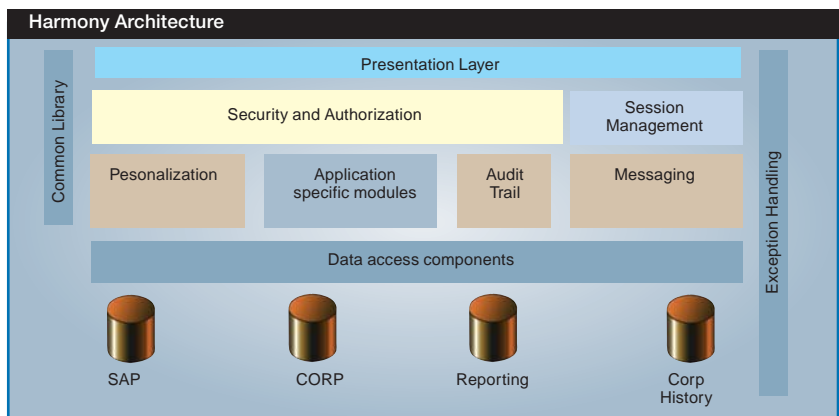
Developed using ASP.NET and SQL Server2000, it is globally accessible by all employees. Infosys was the first Indian company to e-apply for NSSN (National Social Security Number)

This also facilitated Infosys' Tsunami relief contribution program. Several other modules like loans, employee assessment are under way to be included in the system.

Harmony Architecture

Common Library

Presentation Layer

Security and Authorization | Session Management

Personalization | Application specific modules | Audit Trail | Messaging

Data access components

Exception Handling

SAP | CORP | Reporting | Corp History

Data Warehousing
J K Industries Limited

Project Head: S S Sharma , GM (IT)
Location: HO-Delhi & Regional Offices

JK Industries, Data Warehousing

As the name suggests, this is a data-warehousing project, implemented for analyzing data on warranties and claims from different sales regions of J K Industries. The company has more than 100 sales offices, doing invoicing, collection, warranty claim, etc. Before this, a heterogeneous platform was used for the job, leading to duplicity in data.

This system centralized all the data and the data redundancy was reduced by an astounding 75%. It also helped the sales force become more productive, as they could now analyze the data easily and make more informed decisions using the past data.
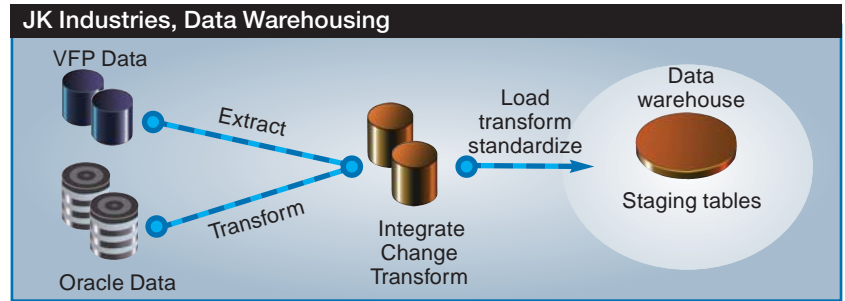
Their initial project used MS SQL Server 2000, in which they found some desirable features missing. To overcome this problem, they switched to Oracle 9i/AS midway. Using this arrangement, the data at the warehouse level is captured into a Visual FoxPro database, which is then filtered and moved into the new Oracle system. Also, in doing all this, they ended up with the ability to Web-enable their entire data and increase the accuracy of information by eliminating what was redundant. They were also able to utilize their Oracle experience in other areas, streamlining a lot of systems in the process. Programmer-independent reporting and MIS systems added by this project help their executives query, drill-down, roll-up the information (using OLAP cubes) and assess lag and lead functions.

The original system was mainly to reduce the time required to process warranty and claims applications of JK's tyres division. The application helped them reduce this from 30 to 3 days per month, which is a commendable leap.

Sankraman
Mahindra & Mahindra

Project Head: Krishna H Nabar, Head – Business Solutions, Corporate IT **Location:** Mumbai (Data Center) catering to around 50 locations across the country

One of the first industries in India to go for large-scale computerization was the manufacturing industry. Companies, such as Hero Honda and Maruti had gone through complex ERP implementations much before such terms even became industry buzzwords. Mahindra & Mahindra, an automobile manufacturer, also implemented SAP R/3 way back in 1997. The communications infrastructure, being poor in India at that time, forced Mahindra & Mahindra to go for a distributed implementation with SAP servers spread across eight locations all across the country. The distributed architecture brought its set of problems along; maintenance costs were high, data consolidation was cumbersome and time consuming.

Now, with the much improved communication infrastructure, and bandwidth prices having been slashed significantly, a solution to the above problems lied in a central SAP implementation which will cater to all Mahindra & Mahindra locations. Mahindra & Mahindra decided to do a fresh implementation of SAP R/3 4.7 on a single server (8 CPU, IBM P570 in a fail over cluster configuration with another 4 CPU IBM server) and then to merge data from all SAP R/3 4.6B servers into that server. As simple as it may sound, data migration from multiple servers is a complex task. It requires data collation, which should then be examined to remove redundancy and duplicity. After this, a single meaningful data instance should be created for the central server.

The implementation, which also includes a disaster recovery site, was spread across a time frame of nine months, starting from July 2004. The expected life of the implementation is five years. The implementation, while reducing administrative tasks, also brings direct business benefits by providing better performance and features than the previous implementation.

Application Process System (APS)

ICICI Bank

Project Head: Badrinarayanan K S AGM (RTG)
Location: All India

APS is a Web-based application that processes loan applications from ICICI Bank customers. It uses the existing knowledge to determine whether to accept or reject the loan application. Nucleus Software Exports Limited (NSEL) and 3i Infotech consulted on the project. APS runs off Solaris 9 and Windows 2000 servers supported by Pramati 3.5.

Credit Appraisal Rating Tool (CART)

SIDBI

Project Head: A K Kapur, GM (BPRC)
Location: All India

CART analyzes credit-worthiness of an applicant. The system has a two-level security – a creator and a checker who can also be the same person. CART allows for three basic forms—the appraisal, documentation of verification and the disbursement note on approval. Fully developed by SIDBI, it uses Lotus Notes 5 with Oracle 9i. It was completed in five months.

C-Query

ICICI Bank

Project Head: Mukesh Kumar Jain, General Manager
Location: Mumbai, and covers several cities across India

Meant for corporate customers of ICICI, it provides a Customer Query (C-Query) card to representatives authorized to make non-financial transactions—balance enquiry, account statement and cheque status. The card when used with the C-Query card reader, gives read only access to most account information, but does not allow making any transactions.

SSI Registration

Govt of Tamil Nadu

Project Head: Thiru N Vasudevan, IAS
Location: State of Tamil Nadu

An online service to help new entrepreneurs get provisional SSI registration certificate, without having to go to the respective District Industries Center. The facility is available in more than 260 browsing centers across the state. So far, 70,740 certificates have been issued. It even provides online verification of registrations through other agencies like banks, TNPCB.

Electronic Issuer Interface

National Stock Exchange of India

Project Head: Satish Naralkar, MD and CEO, NSE.IT
Location: Mumbai

Using the Electronic Issuer Interface project, companies listed on the NSE can pass all corporate announcements to the Exchange in electronic form, which will subsequently be broadcast to the market and displayed on the NSE website. Digital certificates are used to identify, authenticate and verify the integrity of data posted by the companies.

Global Cash Management (GCM)

ICICI Bank

Project Head: Bharath Bhushan, AGM
Location: All India

GCM allows ICICI's international customers sitting in India see a consolidated view of all their accounts and holdings with the bank on a single Web interface. The system also provides the customer with up to date currency-wise information as well as their net overseas value. 3i Infotech did the development for this project using .NET technologies.

IT Infrastructure Upgrade

LG Balakrishnan and Bros.

Project Head: K. Viswanathan, Manager IT
Location: Coimbatore, Bangalore, Mysore, Karur

The IT infrastructure of the company consisted of multiple OSs, messaging systems, and a homegrown ERP running on SCO UNIX and Oracle 7.3 with PowerBuilder 5 as the front-end tool. The infrastructure was ageing and needed upgradation to cope with the changing business requirements. So, they opted for MS products based IT infrastructure.

Myplaywin.com

Pan India Network Infravest Pvt Ltd

Project Head: Ishwar Jha, VP, Business Technology
Location: Pan India

This is India's first online lottery and gaming portal. It's allows users to play lottery in three easy steps. Moreover, the customer's account has to be debited/credited instantly. For this, a bet server is in place to issue tickets and a real time connection is set up with the ITZ cash server for payment authentication and crediting of customer account.
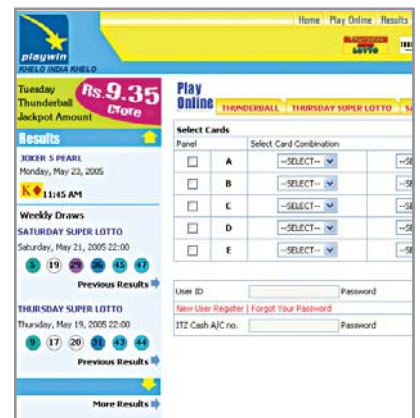
My playwin.com

Jawahar Knowledge Center

Govt of Andhra Pradesh

Project Head: Subarao Ghanta CIO (AP)
Location: Andhra Pradesh

JKC is a project for the crème-de-la-crème of the computer science, electronics and IT streams in AP colleges. The project aims to augment the top 4% of these students with quality training and world-class infrastructure. The project currently has 41 industrial partners and 32 Jawahar Knowledge Center setups all wired and ready to go.

Online Manager

ICICI Lombard GIC Ltd

Project Head: Mr Anuj Gulati Head Tech & Ops
Location: World

This online-management S/w works through a Web browser and allows an ICICI Lombard customer to view and manage all their insurance policies from a single interface. It's common to individual users, business users, intermediaries and internal users. Developed at a cost of Rs 24 lakhs, its has an expected recurring expenditure of Rs 5 lakhs pa.

ICICI Lombard's single-interface browser

Insight

Aztec Software and Technology Services Ltd

Project Head: Natraj, Head IT/IS
Location: India and offshore teams

This project improves efficiency by giving Aztec Software's customers access to a dashboard that gives them the project status. Insight is a single system that can manage documents, defects, business process, collaboration, reporting, and finance among other things. Earlier the company had separate systems for doing each of this, which has now been integrated into one.

STAR

Registration Department, Govt. of Tamil Nadu

Project Head: N. Danam Jeyan Inspector General of Registration **Location:** Tamil Nadu

Simplified and Transparent Administration of Registration has been taken up by the Registration Dept of TN to provide related information and quicker services for registration of property, issuance of encumbrance and marriage certificates, providing of certified copies of documents. It plans to cover 600 offices (presently 350 covered). Services are provided through a website.

Parishkaram

IT&C Department, Govt of AP

Project Head: Director, EDS (eSeva)
Location: State of Andhra Pradesh

The project (a call center) was launched as an agricultural pilot in 2003 to provide helpline facility to farmers. Thereafter, its scope was expanded to include all major depts of Govt of AP. Citizens can call a toll-free number for a range of grievances in areas of education, power supply, etc. The call center representatives take up calls and forward the grievances to the respective depts.

Trade Factory

ICICI Bank

Project Head: A S Das, AGM
Location: All India

Trade Factory seeks to centralize all of ICICI Bank's trading activities. In particular, it pools together information about their imports, exports, remittances and bank guarantees. It uses deal-matching algorithms to ensure the bank is on top of all transactions. NewGen has supplied them their OmiDocs solution, and extensive use has been made of digital-document management.

VAT-enabled Tally

Tally Solutions Pvt Ltd

Project Head: Bharath Gopalakrishnan, President (SEB) **Location:** All India

Tally Solutions has added support for VAT transactions and has poised their flagship accounting package at the emerging business segment. While an accounting package is nothing new, Tally was one of the first products out there in its category with support for the Indian VAT regime. In addition it supports almost all the different VAT formats in each of our different states.

Apollo ERP Implementation

Apollo Tyres Ltd

Project Head: Dheeraj Sinha, Head IT
Location: Gurgaon

Apollo has been running their business on a Foxpro environment for the last ten years. The system, however, meeting end user requirements, presented several problems to the growing company, with data consolidation and report generation being on top. So, they went in for a SAP R/3 4.7 implementation covering more than 140 locations, linked by redundant VPN links.

Dealer e-confirmation

Company: LG Electronics India
Project Head: Arindam Bose , Head - IT
Location: Mumbai

Leveraging technology in creating a platform of communication and business reconciliation with about 600 dealers across India on a monthly basis.

Core Banking Solution Implementation

Company: State Bank of India Group
Project Head: Krishnan Ramanujam,
Program Director
Location: Belapur, Mumbai

One of the most complex core banking implementations in the country.

Dynamic Bandwidth Allocation

Company: All Aztec Software end customers
Project Head: Nataraj , CIO
Location: Bangalore

An internal project to resolve bandwdith allocation problems to do the offshore software devlopment in India with better QoS and at much lesser cost. A high-speed Internet connection was set up and this was segmented to different customers dynamically as per the demand. So customers paid for what they used.

IVR APIN Project

Company: ICICI Bank Ltd
Project Head: Joydeep Dutta ,
Deputy General Manager
Location: ICICI Bank, Mumbai with users across country

A single authorization window for customers for ATM and phone banking. The system integrated multiple applications online. It helped significantly reduce PIN mailer costs and there was an increase in customer phone banking usage.

Knowledge Management Portal

Company: BSNL
Project Head: V K Mahendra, Abhay Kumar and V K Shrivastava,
Sr. DDG (IT), Jt DDG (IT-III), Jt. DDG (IT-II)
Location: Delhi

This project introduced the organization to e-culture, providing an effective mode of communication. It offered an added advantage of tremendous saving in fax/telephone usage as vital information is always available, even to the remotest BSNL offices.

Life Test of High Speed Bearings

Company: Timken Engineering Research India
Project Head: Senthil Raj Desappan,
Lakshmanakumar, Project Managers
Location: Bangalore

The software controls and monitors a rail rig that simulates a high-speed train. This is meant to do the life test of high speed rail bearings in such a way that the rig can be controlled and monitored from anywhere in the world using their intranet

Manthan

Company: Indian Oil Corporation
Project Head: J K Puri, Executive Director
Location: India

SAP R/3 implementation in the petro sector, which covers the entire business scenario, provides easy availability of data everywhere across 405 locations. This helped IOCL optimize its resources and make the right information available at the right time for taking the right decisions.

McDonalds India

Company: Cannought Plaza Resturants (I) Ltd
Project Head: Sameer Murgai
Location: New Delhi, Noida and 43 stores in North India

A project that integrates the complete business value chain, providing Intelligence to decsion makers for maximising their return on resources

Modi Integrated Solution

Company: Modi Industries Ltd
Project Head: Sameer Murgai
Location: Modinagar, Delhi and 17 Depots accross India

Integrates the information and proceess flow in different businesses under one umbrella to modernize and maximize the resources

Reference Monitoring System (REFNIC)

Company: Government of Himachal Pradesh
Project Head: Sanjeev Gupta,
Secretary (IT, BT and S&T)
Location: Himachal Pradesh Secretariat

A file and paper tracking system with on-line search

Underwater Crawler Data Acquisition & Control

Company: National Institute of Ocean Technology
Project Head: Senthil Raj Desappan, Valliappan, Project Managers
Location: Chennai

Software written to automate and control an underwater crawler that lands on the ocean bed up to a depth of 600 m from the mother ship and provides absolute remote control of the crawler and gives all information to the user

Rural ATM

Company: ICICI Bank Ltd
Project Head: Bharath Bhushan, Chief Manager
Location: ICICI Bank, Mumbai with users across country

Designed for remote penetration, offering biometric authentication for customers. It's been desiged to incorporate the smart card technology, and is connectivity independent. It even provides information other than account information

Manage Databases with EJB

Query and fetch records from the database using container-managed persistence bean mechanism through EJB-QL language

Sushil Oswal

SERIES
Java
PART V

In our April 2005 issue (*Persistence Storage with EJB*, page 104) we had demonstrated an entity bean application. The application stored data (there were four rows of data) in the table 'bank' using a container-managed persistence. That table consisted of three fields (name, id and department). In this article we will demonstrate querying and fetching of records from the same table. We will also show how to fetch records for 'id' greater than 101.

In order to do this, the home interface and client classes need modification and we also need to recreate our deployment descriptors files. There is no change in the remote interface and the bean class. The modified home interface and client class files are given on this month's PCQEssential CD.

The new home interface

A finder method is now added to the home interface. The home interface can have multiple finder methods. As per the J2EE specification, this method should have the prefix find, return type as either collection interface or remote interface and throw finder and remote exceptions as shown in the code below.

```
public Collection findId(String fid) throws FinderException, RemoteException
```

Client

The method find_id_greater is added to the client that calls the 'findId' method of the home interface and fetches the records from the table through the 'Iterator' interface.

```
public void find_id_greater_101(String s)throws RemoteException, FinderException{
        Collection c = home.findId(s);
if(c.isEmpty()){
log("No id greater than 101 found");
}
Iterator it = c.iterator();
while (it.hasNext()) {
Bank b = (Bank) PortableRemoteObject.narrow(it.next(),
Bank.class);
log("Id" + " " + b.getId() + " " + "name is " + b.getName());
}
}
```
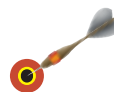
Direct Hit!

Applies to:	Java developers (Beginners/intermediate)
USP:	Use container managed persistence mechanism to fetch database records
Primary Link:	www.java.sun.com/j2ee/index.jsp
Google keywords:	entity bean
On PCQEssential CD:	systems\lab\CMP

Deployment descriptor

Compile the home, remote and bean classes and create the .jar file. Also ensure that a new connection pool and data source are created. Open the .jar file in the WebLogic Builder and make the required entries. For all these three steps, refer to our article in the April 2005 issue. Give the JNDI name under the General tab as 'bank_june'.

Take care to enter the new JNDI name of the data source under 'Container Managed Persistence'. Click on Finders on the left-side pane. Select the findId(java.lang.String) below the Method label and click on Edit on the right-side pane. In '* EJB QL: window' add the query as:

```
SELECT OBJECT(o) FROM BankBean AS o where o.id > ?1
```

The query will fetch records for id's greater than 101. The value 101 is passed to findId method in the client. Click on OK and go to Tools>Validate Descriptor, 'ejbc successful' message will be displayed. Click on File>Save. Deploy the application in the WebLogic server as before. Start the Point Base Server.

Running the client

Copy the client in the bank folder and run the command.

```
C:\bank> javac -d . Client.java
C:\bank>java com.bank.Client
```

The output will be as follows.

```
Id 102 name is gyan
Id 103 name is rishi
```

□

Mobile
Productivity

Technologies that keep you connected and working, no matter where you are

Anil Chopra, Shekhar Govindarajan and Vinod Unny

Today, the cellphone has become an office on the move, thanks to their integration with the PDA. Similarly, PDAs are no longer the glorified personal information managers of yesteryears. They've become as powerful as a PC or a notebook, and you can use them for regular work. Besides this, they can do a lot more. Ever tried delivering a presentation to a customer with your cellphone? Or get critical alerts about your IT infrastructure through SMS and then log into your network remotely? All this is possible today thanks to all the technological development in the mobile space. However, there is no single factor responsible for this, rather a combination of several things.

For one, most mobile devices have modular specs, just like PCs and notebooks. So, you'll find that a smartphone has a CPU, RAM, storage space, display, a built-in digital camera and even portable accessories such as keyboard and bluetooth/WiFi cards. They all have their own OS as well, with a lot of useful features such as a Web browser and e-mail client. Plus, to extend their utility further, you can add more applications on top of the OS as per your requirements. Further still, the use of all these applications would be really limited if there wasn't a proper back-end infrastructure to support them. This is made available by the cellular service provider, who provides these devices both voice and data access.

In this story, our focus is on the technologies available today in the mobile space and what you can do with them. Technologies such as push to e-mail, and push-to-talk are already here and those that let you use your cellphone to make VoIP calls are about to be launched. We've covered all these and more here.

Push e-mail

There are millions of e-mail clients available for the different platforms that let you check your mail. However, all of them rely on the pull technology—that is, the e-mail client requests the e-mail server for the list of messages or contents of a particular message—in essence pulling the information from the server.

A more recent technology is the push e-mail technology. In this technology, as soon as the e-mail server receives a message it is automatically pushed out to the user's device. This means that the important messages are instantly delivered to the user's inbox on his device. Remember 'A.J.' in the TV ad who gets all the contracts? This is why push e-mail is becoming very popular around the world.

For push e-mail to work, you must have a push e-mail capable client, which the cellphone service provider must provide. The service for push e-mail is availed by installing a push e-mail server. For instance, if you want the service for your company, you'll need to install a particular push e-mail software that will associate your corporate e-mail account with a virtual push e-mail account at the service provider's end (ie you@company.com=yourmobile@serviceprovider.com). Then, as soon as an e-mail arrives in your inbox, the software at your end will pick it up and deliver it in your cellphone's inbox.

In India only Airtel provides this facility and you need a Blackberry device to be able to receive these pushed e-mail. But these two alone will not be sufficient to get your corporate e-mail to you. For that, you will require that your company e-mail servers support pushing the e-mail. The software that allows this is available for MS Exchange and Lotus Domino that must be set up at your end. You can also get your personal Indiatimes and Rediff e-mail delivered to you by subscribing to this service from the Airtel site.

Nokia (with their next version of Symbian) and Microsoft (with Windows Mobile 2005) are betting on this technology and are going to provide push e-mail enablers. Microsoft is also expected to include push e-mail capabilities into their next Exchange service pack, which will be free. So be ready for the next big jump in cellphone e-mail.

WiFi and VoIP on your cellphone

A cellphone till recently had been just a voice communication device—something that allowed a user to talk to another user. Since recently though, cellphones have begun becoming much more than just that. Even if we leave out the features that are cooler for teens and college students such as MMS, cameras, MP3, etc, there are a lot of innovations happening on them that are of particularly interest to a corporate user.

Connectivity options such as IR, bluetooth, GPRS, EDGE, CDMA etc. are available on many phones now. Higher end phones such as the Nokia Communicators, smartphones and others also have features such as Office support, e-mail clients, full-fledged Web browsers, software install support and more. Amongst all these is a new feature that's coming up in a lot of new phones— WiFi access.

A cellphone with WiFi support can be very useful. Consider a case where you wish to connect to your mail server to download a large attachment. Doing this over GPRS can be very time consuming. However, if your phone is WiFi capable and you're sitting in a WiFi hotspot, you can use the much faster speed of the Internet on the network to do the same job. And you do not have to pay any GPRS download costs as well.

Many of the new PDA/cellphone combinations available currently—both from the Palm world and the Windows Mobile world support WiFi in their devices, making Internet access a good bit better. But it is another feature that is part of the recently released Windows Mobile 5.0 platform (for PocketPCs and smartphones) that really uses the WiFi access in a very inttelligent manner.

The feature is of using Voice over IP (VoIP) for voice conversations between different mobile devices on the same WiFi network. Let us illustrate this with an example. Suppose Amit works in company XYZ, which has a WiFi network. He has colleagues named Bose, Charu and Deepak also in the same organization. When within the premises of the office, they are all connected to the WiFi network using their smartphones. When Amit wants to call any of the others, he simply uses the name of the contact to call up.

The software then figures out that the contact is already available in the same network that the mobile device is connected to. So instead of making the call through the cellular service provider's network, it makes the call using VoIP on the WiFi network. In large companies, this itself would see a significant reduction in mobile phone fees that one has to pay.

Also, when the device finds that the contact being called is not on the network it is connected to, it will use the normal method of calling—using the cellular service. For the user, this happens seamlessly and he does not need to open any other application or setup anything else.
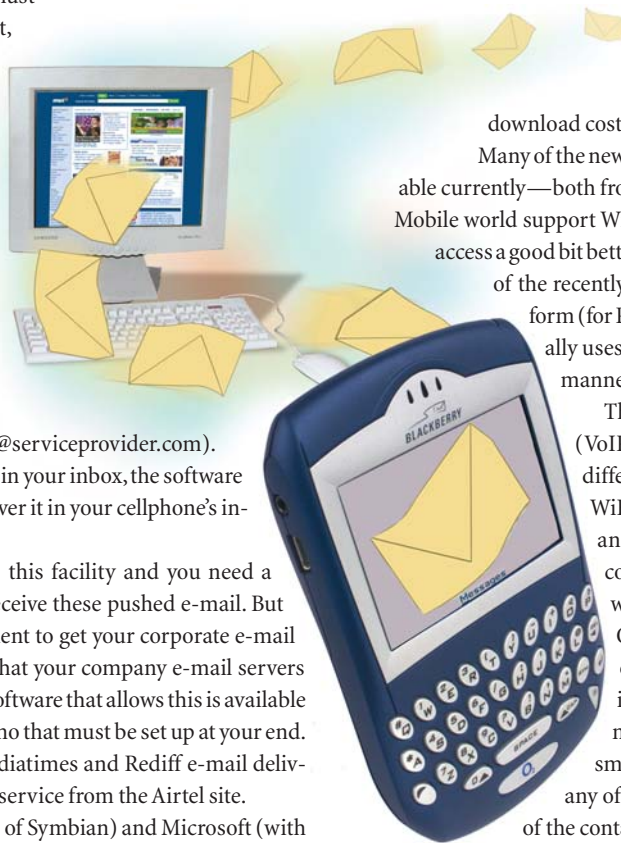
■ In Depth

Mobile video conferencing

Modern cellphones enable you to do everything that a regular desktop PC can do, with the added advantage of mobility. Connectivity to the Web and e-mail on the move are now things of past. New technologies in the cellphone arena are aiming at providing broadband services to cellphones. The transition from the low data rate services to broadband services is similar to what happened for PCs (dial-up to broadband). Hence, similar bottlenecks of infrastructure, cost and hardware exist for broadband services for cellphones. One such service is video conferencing using cellphones. Today there are technologies that allow video conferencing between two cellphones, and between a cellphone and a PC. The latter happens over the Internet. Let's look at the elements involved in this technology and roles they play.

The devices

While we may assume that all camera-equipped cellphones are ready for video conferencing, they are not really so. Note that most cellphones have camera at the back. During a video conference, you must face the camera so that your photograph can be transmitted to the participant(s) on the other end. Facing the camera located at the back and operating the cellphone simultaneously during a conference is not comfortable. This is where cellphones with camera lens on both sides, rotating lens and add-on accessories for video conference have an upper hand. Take, for example, the Samsung SGH-D500 whose lens can rotate by 180 degrees (called a swivel camera) to take pictures at the front or on the rear. The latest Nokia 6630 can be used along with an add-on accessory called Nokia Video Call Stand PT-8 for video conferencing. On this compact stand which houses a camera lens, you can mount the cellphone and initiate a conference call. You will be able to see the participant and yourself on the cellphone's screen. Your images will be transmitted to the viewer on the other side via the camera on the stand.

The connectivity or the service

Connectivity is the biggest bottleneck to make video conferencing a reality, especially in India. We have gone only upto GPRS (while still using GSM) as far as the quality of the services go. Video conferencing experience over the 14.4 Kbps offered by GPRS will be like using a legacy modem for desktop video conferencing, jittery and not happening. There are promises that the cellphone operators have made to provide 3G (Third Generation) connectivity and services like EDGE (Enhanced Data GSM Environment). Connectivity over EDGE offers a whopping 384 Kbps, a must for a better video conferencing experience. But it does not end at having a 3G connectivity only. Mobile operators should allow and route video calls and offer services, such as directory services to locate participants and encrypted sessions, for a widespread adoption.

The software

Picking up a cellphone that boasts of video conferencing capabilities will give you out of the box and integrated applications for video conferencing. For example in Nokia 6630, you just make a video call without launching any application to start the video conferencing from the phone's menu. Under the hood, it's the Symbian OS version 8.0 (refer to Cellphone OSs) running on the cellphone, which provides the conferencing capabilities. Video conferencing may be integrated with instant messengers for the cellphones and the phones running Windows may have a Pocket NetMeeting.

The service provider side

There is an added infrastructure involved at the service provider's side makes video conferencing possible across a 3G network—H.323, the standard protocol. It works with most video conferencing application and services. H.323 defines how video conferencing can take place across the networks, across different applications and devices. Being network independent, it is used for a 3G network.

An additional device that may be required at the service provider end is a MCU (Multipoint Conferencing Unit). This device sitting on a 3G network can allow many mobile users to participate in a video conference.

■ In Depth

Last but not the least, a H.323 gateway device/software will be required to facilitate video conferencing across mobile and the computer network. This will translate the data from the 3G network to a format (TCP/IP packets) recognizable by the Internet and also vice versa.

The use of a gateway device is nothing different as it is used for many mobile applications such as WAP, SMS over Internet and Web browsing over GPRS. Lets hope, with the connectivity and services are in place, we get better at business and at keeping in touch.

Instant messaging on the move

Instant messaging is both, a boon and a bane. Using IM to communicate with others in your organizations, when on the move, can be quite cost effective compared to using SMS or roaming STD calls from your cellphone. It is possible to use most of the popular IMs like Yahoo on cellphone, on most carriers, using SMS. However, remember that each message you send has a fixed cost associated with it.

There are different universal instant messaging clients available for cellphones. We look at one of the best ones around—Agile Messenger, which is absolutely free to use!

Agile Messenger is available for different cellphone platforms including Symbian, Palm OS, Windows Mobile and J2ME. Binaries are available for many Nokia, Seimens, Sony Ericsson and PocketPC/smartphone devices. Once you install the tiny application on your phone, run it to set it up for the first time.

The first time you run it, the application prompts you for the protocols you wish to use—MSN, Yahoo, ICQ and AOl. You can select one or more protocols from this screen and the wizard then asks you to enter your login name and password for each service. It then connects to the Internet and downloads the contacts for each chosen service. The contacts are clearly identified by different colors for different services.

To start a conversation with any of the online contacts on your list, simply select the name and click on it. A new tabbed 'window' opens up in which you can start your conversation. You can have multiple chat windows and talk to different contacts from different services as well. Almost all the chat features such as smileys, quick texts and offline messages are supported by the client.

The coolest feature is of voice messaging using PTT (Push-To-Talk) technology. On certain platforms, Agile Messenger allows you to assign a PTT key and when you wish to have a voice conversation with a contact (over the Internet), you can press this PTT key and talk. Release the key to send the voice message. When a new voice message comes in, it is automatically played for you.

Unified messaging and communication

We use different methods such as, fax, voice call, e-mail, SMS or video conferencing to communicate with each other over several devices such as landline phones, cellphones, fax machines, e-mail clients, instant messengers and PDAs. Moreover, some of these devices support more than one method of communication. With so many different modes and devices, it can become difficult to keep track of all the communication. You may not remember whether you sent an e-mail or a fax, or whether you used your PC or PDA for the job. Perhaps that important contact is lying in your PDA's address book, while you're hunting through your e-mail client's address book for it. This is where the concept of unified messaging and communication comes in.

Unified messaging, as the name suggests, aims to integrate various methods of communication and make them accessible from a single interface. Currently, most modes are accessible over a PC, but they use their own proprietary interfaces. For instance, you can send and receive faxes using your built-in fax modem but that will require its own software for fax management. You can't for instance, send out a fax and save it in the Sent Items folder of your mail client, or in your Inbox. If you receive a voice call, you have to answer it on your cellphone or landline phone. You can't convert it to text and save it in your mailbox. Further still, you can't convert your voice to text on the fly and fax it to somebody. What we have are essentially isolated islands of communication with no real integration among them.

Some of the technology trends indicate the move towards unified messaging, but it will be a while before it comes into action. For instance, today you can send and receive your SMS messages using MS Outlook (See *Send SMS from Outlook 2003*, page 48, April 2005). PDAs are merging with cellphones, thus, integrating e-mail and SMS to some extent. But the real challenge lies in integrating everything into a single mailbox, which is still a distant dream.

PC vs cellphone

When you buy a PC, you usually note down its hardware specs, which includes the processor type and speed, amount of memory (RAM), hard disk capacity, display type, graphics card, and various types of external devices and peripherals like a printer, scanner, keyboard, mouse, etc. However, when you buy a cellphone or PDA, you typically look at the size, style, color and whether or not it has a digital camera. One doesn't even imagine that devices could also have hardware specs similar to a PC, but if you look closely, you'll find this to be true. In fact, some mobile devices have more processing

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speed and memory than older PCs. Sounds unbelievable? For instance, Nokia 6630 houses a 230 MHz processor—giving the same processing speed as a PII processor. And the O2 Xphone II comes with 32 MB RAM (SDRAM)—the recommended memory to run Win 98 on PCs.

Why should this similarity matter to someone going for a mobile device when most of the buying is still based on style, color and features set? It matters because mobile devices are getting more feature-rich and the number of applications you can run on them is also increasing. Plus, you'll also find a lot of accessories and peripherals available for mobile devices today. Most of these factors are governed by the underlying hardware. We now look at some of these specs.

The Processor

Currently, speed is the criteria as opposed to brand (as in the case of desktop PC). Different cellphones house different brands of processors but it seems mobile device manufactures stick to a particular brand for their models. For example, Nokia uses ARM processors in most of its cell phones. So if you go the Nokia way, the distinguishing criteria will be only speed that the latest models offer.

Also Intel's XScale processors are being used in many PDA cum cellphones. AMD has also recently introduced Alchemy Au1200 processor for handhelds. With the distinction between a cellphone and a PDA becoming narrower (because of convergence) the brand conscious Intel and AMD fans can find their preferred processor in cellphones too.

Note that there are plethora of processors used in different brands of cellphones. Listing them and their features for comparison would not be worth since the buying criteria remains the cellphone brand, as of today.

Memory/Storage

The more the merrier—describes it the best. Cellphones will come with some in-built memory to store basic cellphone software (like OS) and to load

the applications into the memory to run. SRAM and SDRAM are popularly used for the main memory for cellphones. Note that this SDRAM cannot be expanded as in case of PCs. So going by the latest offerings, you should go for 32 MB or more. Coming to the secondary and the non-volatile memory, depending on the type of the memory card supported, the options are SD, MMC and Memory Stick. You can easily go up to 1 GB of secondary storage using external memory cards.

Today cellphones can play MP3s and video clips, and storing them on the cellphone will require such external cards. The memory on the phone is usually used to store the contact details, notes, calendar schedules and MMS messages. Hence, the memory on the cellphones may fall short to store the former data.

Display

Gone are the days of the white backlight, blue backlight (as in the old Nokia 8250) or options to choose amongst different backlights (like that in Panasonic GD93 and GD94). Now majority of phones come with 64 K colored TFT display. The resolution of the screen has also become better. For instance, the screen resolution of Nokia 6630 is 172x200. This means colored foreground besides just the background.

Not a hardware feature, but some phones such as Nokia 6630 support a landscape display, which is great for watching video clips. Latest cellphones have a larger display screen. On the flip size, the display or screen size of a cellphone may increase the overall size of a cellphone making it difficult to fit in your pocket. However some cellphones like the Samsung D500 have a slide out keypad that can be sided in for the cell phone to fit in your pocket.

Nokia 6630 supports landscape display, ideal for watching video clips

Ports, peripherals and connectivity options

The standard connectivity options are infrared and bluetooth with WiFi making its appearance in some of the latest cellphone cum PDAs like O2's XDA IIs. The option of a USB in the charging cradle can allow you to connect your cellphone with a PC for data synchronization or use your cellphone as a modem. For example, the Reliance phone can be con-

nected to the PC via USB to connect to the Internet. A USB charging cradle is sold as an accessory by the phone vendor or third-party vendors. There are also more than a couple of accessories, which come for cost after buying a cellphone. A car charger kit lets y charge your phone on the move while a bluetooth handsfree allows you to talk freely while driving. On the costlier side are the accessories which can turn your phone into a video conferencing device like the Nokia Video Call Stand PT-8 (refer to *Mobile video conferencing*).

O2 XDA II's USB port lets you connect it to a PC

or meant for PDAs, whereas the smartphone edition recognizes T9 and a phone keyboard input method. Both offer the user a very familiar Windows look and feel.

Windows Mobile 5.0 also adds WiFi support to the phones, which enhances their abilities such as browsing at higher speeds than GPRS can allow and for enabling VOIP over WiFi when talking to another person on the same network (refer to *WiFi and VoIP*). It also adds 'mini' versions of Office viewers that lets users view and read popular file attachments such as DOC, XLS and PPT files directly on the device itself.

Cellphone OSs

In the world of PCs, Windows is the dominant OS and is used by a very large percentage of people. However, the mobile-device world is dominated by a different player called Symbian. This is the OS that runs on most common cellphones that you see, including the ones from Nokia and Sony Ericsson. However, in the last two years, other OSs have also come up that can and are challenging the leadership of this OS. Lets look at some of the major players in this market.

Symbian

As mentioned earlier, Symbian is the OS for cellphones that is used by a large number of manufacturers such as Nokia, Sony, Motorola and others. Symbian is currently in version 8.0 and a version 9.0 is in the works. Both these versions provide support for high level of interactivity and connectivity. Symbian 8.0 based phones have the ability for Push-to-Talk, GPRS, EDGE/3G, and Bluetooth. Most Symbian phones also have a Java runtime that allows users to install applications written in J2ME such as Java utilities or games that run on the phone itself.

Windows Mobile

An offering from Microsoft's stables, Windows Mobile is available in two versions—Windows Mobile PocketPC Edition and Windows Mobile Smartphone Edition. In fact the latest release of this OS called Windows Mobile 5.0 has just been released. Devices based on Windows Mobile 5.0 are expected to hit the international market by July or August 2005.

Both these versions run on PDA or smartphone devices respectively and the only major difference between the two is in the form factors and the input type they recognize. The PPC edition recognizes a touch screen and larger form

Palm OS

Palm has always been a good player in the PDA market, but made a few strange mistakes earlier on. However, they have bounced back with Palm OS 5 and the upcoming Palm OS 6.x (Cobalt).

This new release will also add in features that are now available in Windows Mobile 5.0 such as WiFi and other connectivity options. It will also be a fully multitasking and multi-threaded OS that allows multiple applications and threads to run simultaneously. Support for a large number of expansion options (SD, SDIO, MMC, etc.) as well as a number of device resolutions (QVGA, and more) are going to be some of the new features of the OS.

Software for cellphones

What good is an OS if you can't add applications to it? If computers had an OS only, they would never have become as popular as they are today. They're popular because they give users the choice of installing applications that they like on top of the OS. Similarly, a PDA or cellphone would have also remained just a device with limited functionality if it only had an OS (refer to *Cellphone OSs*). One reason they're gaining popularity is that you can install lot of applications on them. There's a plethora of them available, just as for computers. Here, we look at some to give you a feel of what's available for improving business productivity.

Getting your news

One of the popular ways of getting news headlines these days is by using RSS, a service provided by many sites that allows you to download and read news headlines and a summary, and then read the complete information only if you are interested in it. To do so, you need to use a software called an RSS

Now you can get news on your mobile devices too

reader or RSS aggregator. Many RSS readers for computers are available. But imagine having the same functionality on your cellphone. Here are some of the popular ones you can make use of for this purpose:

- DoHeadlines for Symbian
- NewsBreak for Windows Mobile
- Hand/RSS for Palm OS

All of these support the latest RSS specifications, have a large number of built-in categories to choose from and allow you to view a headline or a complete item just by selecting it.

Control your presentation

Imagine having to do a presentation, where you'd not only like to move about the stage, but also like to control the display, such as moving to the next or previous slide, show/hide slide or notes and so on. Several gadgets are available that give you this freedom. There are devices such as wireless mouse or a USB device meant specifically for this. Now imagine translating the same task to a cellphone. What you need is a bluetooth enabled cellphone and a notebook. You can buy a bluetooth adapter in case the notebook doesn't have it in-built. Once you have these, you can use any of the following software for the job, depending upon the make of your cellphone and the OS it uses:

- Windows Mobile PowerPoint Mobile
  (Part of Windows Mobile 5.0)
- Pocket Slides 2.0
- Digia Imagexpo for Symbian OS

Work with data

When on the move it is imperative that you be able to work with your documents, whether it be a proposal, a data analysis spreadsheet or a presentation you wish to make. Doing all this on your notebook is convenient if you have one or can use it. All this can be done with a cellphone too, if you have the necessary software and gadgets attached. Most mobile OSs now support such applications. Some of these are as follows:

- Office Mobile on Windows Mobile 5.0
- ClearVue Suite on Windows Mobile 2003/5.0
- Documents to Go for Symbian and PalmOS

Connect your mobile device via IMAP4 to Exchange server to read your mail on the cellphone

Office mail on Exchange via cellphones

When on the move, you can check your official e-mail in different ways —use a public terminal, connect from your notebook using WiFi or GPRS/CDMA. However, most of these solution require that you have access to a full-fledged PC.

Using a Windows Mobile 2003-based device such as a PocketPC Phone or a Windows Smartphone like the Krome and XPhone devices currently available in India, you can use all the familiar features of your regular mail applications like Outlook. Both these kind of devices come with a PDA version of the popular mail application and is called Pocket Outlook. Here we set up Pocket Outlook on the Windows Mobile Smartphone. The first thing you need is access to your Exchange mail from outside your company network. Ask your system administrator if this is possible and get the settings for connecting via IMAP4 to the Exchange server.

On the Windows smartphone, select Start>Messaging (or Inbox on some versions). Click on the right context key to get the menu and go to Options>Account Setup. Select New to open the New Account wizard on the phone.

Fill in the details of your new account in the wizard. Make sure you fill in your organization's Domain Name when prompted, for connecting to Exchange otherwise the username and password will not authenticate against the company ADS even if they are correctly entered. Make sure you select IMAP4 as the server type when asked. Next, enter the incoming and outgoing mail server addresses that you got from your systems administrator. If required turn on the Outgoing server authentication and SSL connection options also.

Finally, select what you wish to download from the e-mail server —all messages or headers only, the amount in bytes to download for each message and the frequency at which e-mail is automatically checked. Save the settings and you are ready to go.

Switch to the account you just created from your Home screen and select Menu>Send/Receive. You will start seeing your mail (or headers), download just as you do in Outlook on the desktop. You will even have a small preview of what the mail contains. If you'd selected to download headers only,

you can click on a message, and mark the complete message to be downloaded on the next Send/Receive. This way you can avoid downloading all spam you might get, but still reach the important mail you need to read without waiting for all the mail to download.

Java Web services on cellphones

Here we write a Web service in Java, which provides access to the system information on a server. Subsequently, we write a small mobile application for a Java enabled cellphone to access this Web service. While we have carried only the snippets of the code, the complete code is available at forums.pc-quest.com under the 'Developer Stuff' thread. To keep it simple, our Web service will only retrieve the disk space information and beam it to a cellphone when requested. Such an application is quite useful for system administrators who are on move and suddenly get panic calls saying all services on the server are dying and nothing is working. A probable culprit may be the disk space which suddenly got full because of the ever growing logs. Such a Web service that we are about to code, will give a system administer a one click access to the server's disk space information on move.

The preliminaries

We will deploy the Web service using Tomcat and Axis on PCQLinux 2005. We assume that you have installed and setup Tomcat on PCQLinux 2005. If not, refer to the article *JDBC Drivers*, page 76, March 2005 and do that.

To deploy Web services on Tomcat you will need a package called Axis which can be downloaded from the following URL: http://www.wmwweb.com/apache/ws/axis/1_2/axis-bin-1_2.tar.gz. Extract the archive which will produce a directory named axis-1_2. Copy the directory named axis found under axis-1_2/webapps to /opt/tomcat/webapps.

Next download Java Activation Framework from http://java.sun.com/products/javabeans/glasgow/jaf.html. Extract the downloaded archive and copy the file named activation.jar to /opt/tomcat/webapps/axis/WEB-INF/lib. Next, issue the following:

```
export AXISLIB=/opt/tomcat/webapps/axis/WEB-INF/lib
export AXISCLASSPATH=$AXISLIB/activation.jar:$AXISLIB/com-
mons-discovery-0.2.jar:$AXISLIB/log4j-1.2.8.jar:$AXISLIB/axis-
ant.jar:$AXISLIB/commons-logging-1.0.4.jar:$AXISLIB/saaj.jar:
$AXISLIB/axis.jar:$AXISLIB/jaxrpc.jar:$AXISLIB/wsdl4j-1.5.1.jar
```

Also append the above commands to the file named bashrc found in /etc. Now we are ready to write the Web service. Save the following code in a file named ServerDiskUsage.java under /opt/tomcat/webapps/axis/WEB-INF/classes.

```
import java.io.*;

public class ServerDiskUsage{
 public String getDiskUsage(){
         String output="";
         try {
         Process ps = Runtime.getRun-
time().exec("/bin/df -H /");
         ps.waitFor();
         .
.
                    output=ioe.toString();
     }
  return output;
}}
```

We will deploy the method or function named getDiskUsage
( ), in the above Java class, as a Web service. Note that, in getDiskUsage( ), we issue the 'df -H /' command, to get the disk usage information on the root filesystem, by using the statement:

```
Process ps = Runtime.getRuntime().exec("<command>");
```

We can issue any Linux command and get its output using the above statement. So you are free to extend the code to retrieve other system information besides disk space. Compile the above code as:

```
javac ServerDiskUsage.java
```

Next, save the following content in a file named deploy.wsdd in the same directory (that is, /opt/tomcat/webapps/axis/WEB-INF/classes).

```
<deployment xmlns="http://xml.apache.org/axis/wsdd/"
xmlns:java="http://xml.apache.org/axis/wsdd/providers/java">
.
.
</deployment>
```

Stop and start the Tomcat application server as:

```
/opt/tomcat/bin/catalina.sh stop
/opt/tomcat/bin/catalina.sh start
```

🟥🟨 In Depth

While in the same directory deploy the web service by issuing:

```
java -cp $AXISCLASSPATH org.apache.axis.client.AdminClient -l
http://127.0.0.1:8080/axis/services deploy.wsdd
```

Now key in http://<ip-address-of-linux-machine>:8080/ axis/services URL in a Web browser and you should be able to see the ServerDiskUsage web service. Right click on the WSDL link and copy the URL. This URL to the WSDL (Web Services Description Language) will be required while coding the mobile client to the Web service.

The mobile client application

Now we code a mobile application to access the above deployed Web service. The simplest way to code, deploy and test a mobile application is to use the J2ME Wireless Toolkit (version 2.2 as of this writing) which can be downloaded from http://java.sun.com/ products/j2mewtoolkit/download-2_2.html. We downloaded the Linux version of the toolkit and used it on PCQLinux 2005. Once downloaded issue the following to install the toolkit:

```
chmod +x j2me_wireless_toolkit-2_2-linux-i386.bin
./j2me_wireless_toolkit-2_2-linux-i386.bin
```

Follow the onscreen instructions and when prompted for the path of Java interpreter, type in /usr/java/jdk1.5.0_01/bin (the JDK bundled with PCQLinux 2005 is installed at this location). When prompted for the directory to install the toolkit, type in /opt/WTK2.2. To launch the toolkit, change to the directory /opt/WTK2.2/bin and issue './ktoolbar' to launch the Wireless Toolkit. Click on New Project. For 'Project Name' and 'MIDlet Class Name', type in ServerDiskUsageClient. In the window that pops up subsequently, select CLDC 1.1 for the Configurations and check the box for 'Web Service Access for J2ME'. Click on OK.

Generate the payload to access the Web service

With the Wireless Toolkit, accessing a Web service is a breeze and requires only a few lines of code. All the necessary payload (called stub) to access the Web service is generated by the toolkit. All you need to do is, click on Project>Stub Generator. For the 'WSDL Filename or URL' type in the URL to the WSDL file that you noted down above. For 'Output Package' type in com.pc-quest. Click on OK. This will generate the required stub (some Java

code), required to access the Web service, in the directory /opt/WTK2.2/ apps/ServerDiskUsageClient/src. Next we code a MIDlet (a mobile app) to access the Web service using the generated stub. Copy the following code in a file named ServerDiskUsageClient.java in the directory /opt/WTK2.2 /apps/ServerDiskUsageClient/src.

```
import javax.microedition.lcdui.*;
import javax.microedition.midlet.*;
import javax.microedition.rms.*;
import com.pcquest.*;
.
.
private StringItem siUsageReport;
}
```

While the code might look long, the only statements that are used to access the Web service are:

```
ServerDiskUsage_Stub service = new  ServerDiskUsage_Stub();
siUsageReport.setText(service.getDiskUsage());
```

The first statement gets a reference to the Web services from the generated stub. The second statement directly calls the method getDiskUsage( ) as service.getDiskUsage() which returns the disk usage. This is displayed on the mobile screen in a StringItem using its setText( ) method.

Launch the MIDlet

On the toolkit window, click on Build and then on Run. This will show up a cellphone emulator as in the screenshot. First click on the Select button. Then click on the button at the right to execute the Web service. This will flash a warning saying that the application will send and receive data using the network and may use airtime. This is obviously not applicable to our case when we are running the application locally. So again hit the button on the right. This will show the output of the df command which can be easily comprehended by a Unix/Linux system administrator.

Developing smartphone applications

Now that most modern cellphones have full fledged OSs, manufacturers are also giving different ways of writing applications for these phones. Microsoft offers the mobile version of Windows in two

flavors—PocketPC and smartphone—both capable of working as PDAs and cellphones. Although it was quite possible to write applications for older versions of WinCE and PocketPC, the introduction of .NET has made it simpler.

Both Windows Mobile 2003 and Windows Mobile 5.0 come with the .NET Compact Framework preinstalled. You can, however, install the NETCF, on older version of WinCE as well, for instance, on PPC2002. Once it is installed, you can write applications that use this runtime and have them run without any other intervention. This also lets you take advantage of the excellent RAD tool—VS.NET and all the other .NET features such as the plethora of controls, Web Services, etc. Now, we'll take a look at how easy it is to create a small application that runs on your cellphone. We'll create an application that sits in your phone and lets you do currency conversions. The added advantage of this application will be that it will get the latest currency rates and use them for calculations. We will use the upcoming

Push-to-Talk

Think of PTT (Push-to-Talk) to be like a walkie-talkie conversation. During a Push to Talk conversation all participants can hear what is being spoken by one of the participants. Unlike a typical phone call where both the participants can speak (a full duplex conversation), a Push-to-Talk conversation allows only one person to speak at a time. The speaker presses a button to start speaking and can continue speaking till he releases the button. This subsequently gives the other users a chance to speak. But the noteworthy feature is the speaker can be heard by all participants without any action required at their end. As the name suggests, you can push a conference to another person and he will start hearing you on the handset. This method of pushing a call is called 'barging in' and the call itself is called a barge call. This can be uncomfortable if you don't want to join the push to talk conversation. This is where an alert call comes into picture. An 'alert call' displays a message on the cellphone saying that someone is trying to initiate a PTT conversation with you and whether you want to join in. It's quite similar to the alert you receive when someone is trying to connect to your cellphone using bluetooth. If you choose to accept the call, simply press the accept key. Last but not the least you will need a cellphone (like Nokia 3230) that supports Push-to-Talk and your cellphone network must provide Push-to-Talk services. As of now, nobody in India is offering it, as TRAI's approval is still awaited.

VS.NET 2005 for doing this.

Open up VS.NET and create a new Smart Device Application for smartphones. Give it a name like CurrencyConvertor and create the project. Once the project is open, you will see a form that looks like a phone itself. This is the form on which you can make your application. Remember that the form factor of the phone has to be maintained.

Drag and drop a few labels and textboxes onto the form and change their text so that they look like the one in the picture. Also click the menu item at the bottom of the form and type in the text

Creating an application in VS.NET for mobile devices, is as easy as dragging and dropping a few labels and text boxes

like 'Get Value'. In the picture below, we are hard coding the currency from as USD ($) and currency to as INR (Rs), since this is an example program.

The next thing we do is add a Web service from which we will retrieve the currency rate for the two currencies. Right click on the solution and select Add Web Reference. Key in the value: http://www.webservicex.com/CurrencyConvertor.asmx?WSDL. This will download the Web service to your local project. Give it a recognizable name like wsCurrency and add the reference.

Now double click on the 'Get Value' menu item you created earlier. This will take you to the event handler for that item. Put the following code into the handler.

```
Dim wsCurr As New wsCurrency.CurrencyConvertor
Dim Rate As Double=wsCurr.ConversionRate(wsCurrency.Currency.USD,wsCurrency.Currency.INR)

Dim Amount As Double = Rate *
Convert.ToDouble(TextBox3.Text)
TextBox4.Text = Amount.ToString
```

Save the file and press Ctrl+F5 to start the application. Since this is not a Windows application, but rather a Windows Mobile Smartphone application, you will be prompted for the target on which it should run. You can select a real device if it is attached or the Smartphone Emulator. The emulator lets you run and debug the application on Windows itself without requiring a real device. Once the application is deployed, it runs in the emulator and you can check out whether it runs fine or not. □

13 LCD Monitors Tested

Whether you need a highly affordable option or a very feature rich one, we present to you a complete range of 15"/17" LCD monitors for the office desktops

Sushil Oswal

The cost of LCD monitors has finally come down to affordable levels. Though their prices are still nowhere near the CRT prices, they've reached a level where organizations can consider buying them for their users. For instance, the cheapest LCD monitor we received was 10K, and it's likely that as their usage increases, their prices will come down even further. This time, we received four 15" and nine 17" LCD monitors from five different manufacturers for the shootout.

We used our three-axis model of performance, price and features for testing to arrive at the winners. The Brown-Gibson model was used to calculate the weightages for each. Here's how we tested them.

Performance

To test each monitor, we used a P4 3.2 GHz with 512 MB RAM and a GainWard FX 5900XT 128 MB RAM graphics card. The tests were done in the native mode of

Pricing

Here we have looked at the price and warranty of each monitor, where lower price and higher warranty are better. Please note that we've not given a separate detailed specifications sheet for the monitors. Instead, we have uploaded it on the forums. So logon to http://forums.pcquest. com and visit Current Issue thread.

each display category, viz 1024X768 for 15" and 1280X1024 for 17". We used the DisplayMate for Windows (Video Edition) test suite to test their performance. It's a comprehensive benchmark that checks out a wide variety of parameters for LCD monitors.

In addition to this, we also measured the time each monitor took to power up and show the display. Incidentally, we found a significant difference in this for different monitors.

The tests were split into the following four categories:

- Display tests
- Color and gray scale tests
- Video tests
- Miscellaneous effects tests

Each of these had further sub tests. Display tests check the brightness and contrast range of each display by doing black-level adjustment, pixel tracking and timing-lock. Black-level adjustment is used to measure the number of visible dark gray bars on a black background while pixel tracking and timing-lock are used to check for the noise level on the display.

The color and grayscale category had the maximum number of tests and measure the color reproduction capabilities of an LCD. It's meant to see differences in color scales, color intensity levels and 256 intensity level ramp. It checks for streaking and ghosting, white and black level shift.

Streaking and ghosting helps us detect light or dark shadows that trail an image particularly for graphs. The color scales test looks for a smooth shift in the ten principal colors palette. The color intensity measures the linearity in the intensity level for primary and secondary colors. It also checks whether colors don't shift hue as the color level increases or decreases. This is important for displaying photographic images with a mix of col-

ors. 256 intensity level ramp is similar to color intensity level but doesn't have a palette and looks for individual color linearity and hue across the screen.

There are two tests under video tests, namely video bandwidth and transient response. The two let us decide the degree of image sharpness affected by a video signal.

The miscellaneous tests check for screen uniformity and dark screens. The first is meant to look for irregularities caused by variations or reflections inside the display panel in color intensity. The second, viz dark screen is used to evaluate LCD black level capability by spotting any reflection.

Features

There are several features that you need to look out for while buying an LCD monitor. Here's what we look for:

Power consumption: The lower the power consumption, the better.
Bezel size: If space is at a premium on your table, then a small bezel is what you need.
Tilt angle: Check whether the LCD monitor lets you tilt it vertically, and also

ensure that the monitor doesn't topple over at the maximum tilt angle.
Brightness and contrast levels: Check the rated levels for your monitor. Higher value is, of course, better.
OSD controls: These should be easy to use, and you can look for special presets that adjust the screen for working with text, video, Internet browsing, etc. In monitors having both analog and digital inputs, there should be a control to switch over between the two. Some monitors even let you lock the OSD controls so that nobody tampers with the settings. Some also come with additional software for controlling OSD controls.
Analog and digital inputs: It's becoming fairly common for monitors to have both types of connectors these days.
Viewing angle: This is the maximum readability angle from the top and sides.
Weight: For this parameter too, the lighter the better.
Special features: There are several other features that everyone may not need. These include a USB connection, wall mounting capability, portrait viewing, DVI connector, built-in speakers and power adaptor.

17" LCD Monitors

Acer AL1714   ➕ Price, lightweight   ➖ Contrast ratio, digital input, turn-on time

Average features, but decent performance and a great price make this monitor the winner in this category. At around 15K, it was the second cheapest monitor of the lot, after the Zebronics, and its price matches with three of the monitors in the 15" category. Its OSD controls are pretty easy to use. Plus it is the lightest monitor we received in this category. It's pretty barebones in terms of features. The rated vertical viewing angle is lowest of the lot at 120 degrees while the horizontal viewing angle is average.
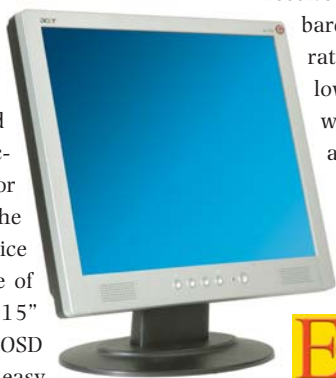
There's no digital input or built-in speakers. The power consumption is a little high and it has a separate power adapter. On the negative side, we found that the re-sponse time is high and the contrast ratio is low. On the performance gauge, it scored highest in all

Price: Rs 14,999

Warranty: 3 years

Vendor: Acer India, Bangalore. Tel: 25219520. E-mail: rajesh_aiyar@acer.co.in

the color and gray scale tests. The turn on time was much higher and it didn't fare well in pixel tracking and timing lock test. So if you're looking for a no-frills, cheap option for your desktop, then this is a good choice. RQS# E80 or SMS 130680 to 9811800601

Shootout

NEC MultiSync LCD 1770NXM

➕ USB 2.0 ports, Mac compatible ➖ Heavy, high power consumption

If you are looking for the most feature-rich monitor, then this is the right choice. Design and looks wise also, it can turn out to be a crowd puller. Some unique features of this monitor include a detachable sound bar, five USB 2.0 ports (one upstream and four downstream) and an adjustable height stand, which lifts it up by 472 mm. Tilt-

ing the monitor is also very smooth and doesn't require too much pressure. Plus it's Mac compatible. The scrollable OSD control takes time to get used to. It was the heaviest of the lot and power consumption was on higher side at 55W. The monitor comes with NaViSet software to adjust its OSD controls. Apart from the normal controls options, it also has more than 20 test patterns for testing the display. The monitor

performed well in most of the tests except for black level adjustment and 256 intensity level ramp. It only took around 2 seconds to power up, which is the lowest and the best. Overall, if you are looking for a great looking, feature-rich monitor, you won't mind spending the extra amount on this one. RQS# E81 or SMS 130681 to 9811800601

Best Features

Price: Rs 23,850
Warranty: 1 year
Vendor: Shiba Comp, Delhi.
Tel: 26413437.
E-mail: shiba@del2.vsnl.net.in

Samsung SyncMaster 710N

➕ Mac compatible, color management software ➖ Speaker, digital input

An overall combination of performance, features and price make this monitor highly recommended. This monitor comes with Magic tune and Natural Color management software. Magic tune lets you control the OSD while Natural Color adjusts the color mix for better image printout for different environment conditions. Both soft-ware were im-

pressive and useful. Magic tune also allows you to save settings for up to five users. It was the only monitor with a transparency control option for the OSD.

Plus it had Text, Internet, Entertain and Custom modes. The only place where it lacked in features from NEC 1770NXM was a USB hub and speakers. This monitor is Mac compatible and has separate panel for sharpness. The only thing we found amiss in this was digital input. It had

the highest contrast level and lowest power consumption of the lot. The monitor comes second in overall performance and was a few points behind in color scales and screen uniformity tests. The turn-on time was average. RQS# E82 or SMS 130682 to 9811800601

CYBER MEDIA LABS HIGHLY RECOMMENDED

Price: Rs 25,000
Warranty: 3 years
Vendor: Samsung India Electronics, Delhi.
Tel: 51511234. E-mail: sunil.m@samsung.com

ZEBRONICS 729A

➕ Price, lightweight ➖ Display quality

If cost is your prime criterion, then this is the right choice in the lot, being the cheapest. In fact some 15" monitors cost more than this. However, don't expect great performance and features at this cost.

During our testing we even noticed a few dead pixels on its screen. This was the only monitor in which the vertical visibility was not as good as others. On the per-

formance front, it stood the last. The only tests it did well in were the turn-on time, and color and gray scale tests. Though it performed well in video image test, it was the last in black level adjustment test and noise was noticeable in two color levels. On the other hand, the monitor has the highest brightness level and also lightest of all. It has most of the OSD controls and easy to use. The OSD has three predefined modes—

economy, text and picture. You can even use it through 'turbo' key on the monitor. We did notice differences in these modes. The rated horizontal and vertical viewing angles were average while the tilt angle was good at 114 degrees. Its response time is 16 ms which is higher among others and it comes with an external power supply. RQS# E83 or SMS 130683 to 9811800601

Best Price

Price: Rs 13,700
Warranty: 1 year
Vendor: Top Notch Infotronix.
Tel: 26616202.
E-mail: zebronics@zebronics.com

BenQ FP737s

➕ Lightweight, built-in power adapter, good contrast ratio ➖ Low brightness level and high response time

It's an overall average monitor in performance, price, and features. It did very well in the black level adjustment test and reasonably well in color and gray scale test. It was behind most of the monitors in video bandwidth and transient response tests. It had a tilt angle of 115 degree, which is good, but its brightness level is slightly lower than the others at 260 cadilla, though the contrast ratio is decent at 500 cadilla. Its rated response time is also on the higher side at 16 milliseconds.

There's no Digital connector. However, the power adapter is built into the monitor, which is good. This BenQ monitor also has an 'iKey' button that adjusts the horizontal and vertical positions to the screen geometry.

Unlike other monitors, this one lets you adjust the degree of sharpness up to six levels, which is good.

Compared to others on the performance front, this monitor took close to 5 seconds to power up, while others took around 2 to 3 seconds. Power consumption of this BenQ monitor is fine at 45W. RQS# E84 or SMS 130684 to 9811800601

Price: Rs 24,990
Warranty: 3 years
Vendor: BenQ India, Mumbai. Tel: 25705230. E-mail: NemishParekh@BenQ.com

BenQ FP785

➕ Pivot software, good quality speakers and contrast ratio ➖ Expensive, OSD control not very user friendly

This monitor gave the best performance results thereby, scoring the highest on that front. However, this was the costliest monitor in this 17" category. Other than tests for color scale and intensity levels, it was ahead in most of the tests. The monitor has some pretty good features. Amongst the lot, its built-in speakers gave amongst

Best Performance

the best audio output, and it has both analog and digital connectors. It had the highest contrast level of 600, but lowest brightness level at 250 cadilla. Its rated response time was, however, the highest of the lot at 25 ms. Compared to others, this monitor was the only one to support for portrait viewing, and it even came with an anti-static cloth for cleaning the display. The OSD control isn't as easy to use as some of the others. The circular shape makes it cumbersome to use and the labeling is also not too clear. Plus the oval bezel occupies lot of desktop space and connecting the cables is also a little inconvenient. Overall if you need the best performance, and are willing to pay for it, then it's a good buy. RQS# E85 or SMS 130685 to 9811800601

Price: Rs 34,990
Warranty: 3 years
Vendor: BenQ India, Mumbai. Tel: 25705230. E-mail: NemishParekh@BenQ.com

BenQ FP783

➕ Good response time and tilt angle, Three-port USB 2.0 Hub ➖ Highest power consumption

This was the second costliest monitor of the lot, but gives decent features and performance. Response time is decent at 12 ms, though its power consumption is the highest of the lot at 60 W.

The brightness and contrast level are average, but it has external power connectivity. Worth mentioning is the built-in USB hub with three ports for connecting devices like webcams, keyboards, digital camera, etc.

Its tilt angle is also pretty decent at 120 degrees, though one has to apply a lot of pressure to tilt it. The monitor's stand takes a little extra space and its OSD controls are on the right side making it a bit tricky to use.

This one also has a digital input like most monitors, and even has a DC input jack for powering optional external speakers. On the performance front, it did not perform well in black level adjustment and pixel tracking, and lock timing tests. It performed well in all the tests for color and gray scale test. RQS# E86 or SMS 130686 to 9811800601

Price: Rs 29,990
Warranty: 3 years
Vendor: BenQ India, Mumbai. Tel: 25705230. E-mail: NemishParekh @BenQ.com

■ Shootout

BenQ FP71E   ✚ Good response time   ▬ Lowest tilt angle, viewing angle

Compared to others monitors, the BenQ FP71E monitor comes at the second position on the features front. It has a digital input and good response time of 12 ms.

We were impressed by the audio quality of the built-in speakers. It had the lowest tilt angle of the whole lot at 108 degrees and similar to its cousin FP783, its OSD controls are not very comfortable to use. Plus to tilt the monitor, you need to exert more pressure as compared to others.

You can switch between four modes, standard, movie1, movie2 and photo through 'mode key'.

The standard mode is suitable for normal applications, movie1 and movie2 for viewing videos (movie1 and movie2 enhance the color and contrast levels) and photo for still images. Un-like others, this monitor has an earphone jack and a key for adjusting brightness and contrast.

On the performance front, this BenQ monitor did well in color and gray scale tests but remained little behind in display test, which checks for the black level adjustment, pixel tracking and timing lock etc. RQS# E87 or SMS 130687 to 9811800601

Price: Rs 26,990

Warranty: 3 years

Vendor: BenQ India, Mumbai. Tel: 25705230. E-mail: NemishParekh@BenQ. com

NEC MultiSync LCD 1770NX   ✚ Tilt angle, turn-on time   ▬ Weight

There is not much difference in the features, performance and price compared to its cousin in the category. It lacks sound bar, adjustable height stand and USB ports. You do get Naviset software. Though it has digital input connection but it doesn't provide cable for it. The monitor has key to shift between analog and digital mode. It is the second heaviest but has the highest tilt angle. Power consumption is low compared to most of the monitors. An OSD lock prevents unwanted changes in the display settings and option for power off after a time period. When OSD is locked, only brightness and contrast level is adjustable through the key on the monitor.

Though it had second lowest turn-on time, it was behind in the black level adjustment and pixel tracking and timing lock display test. It did score in transient response test unlike others in the category. Interestingly, the price difference between this and the 1770NXM model is less than a thousand rupees. RQS# E88 or SMS 130688 to 9811800601

Price: Rs 23,000

Warranty: 1 year

Vendor: Shiba Comp, Delhi. Tel: 26413437. E-mail: shiba@del2.vsnl .net.in

━━━━━━━━━ **15" LCD Monitors** ━━━━━━━━━

Acer AL1512   ✚ Lightweight, speakers   ▬ Power consumption, external power adaptor

Our choice in the 15" category. A reasonably priced LCD that has some unique features not found in similar monitors. It was the lightest and the only one to have built-in speakers and was Mac compatible. There are no separate controls for the volume. It's done through the button for the OSD controls. It consumes more power than others. The monitor bezel is easy to move and had a maximum tilt angle of 111 degrees. It also had among the highest brightness and contrast levels. Unlike others, it requires an external adapter. The limitations are the poor response time of 23 ms. Its performance wasn't good as othes mainly due to high turn-on time and 256 intensity level ramp test (non-uniform color increase from left side to right). Though it scored well in setup display test, it was behind in transient response test. Price being important consideration, this monitor is great for office and corporate desktops. RQS# E89 or SMS 130689 to 9811800601
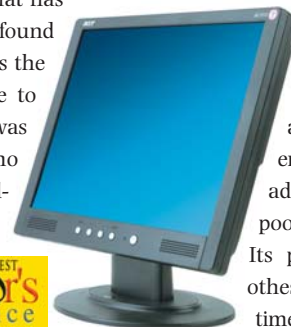
Price: Rs 9,999

Warranty: 3 years

Vendor: Acer India, Bangalore. Tel: 25219520. E-mail: rajesh_aiyar@acer. co.in

PCQUEST Editor's choice

Samsung SynMaster 510N

+ Response time, OSD control software   **–** Weight, brightness level

If you are looking for the most feature-rich LCD that's a performer and is also decently priced, then this LCD gets the thumbs up. It achieved the highest viewing angle and contrast ratio and comes second for power consumption at 25 W. Added to this was the fact that it is the second lightest after the Acer.

But it had the highest response time of 16 ms. Like its cousin in 17" category this monitor also comes with Magic tune and color management software, which requires a whopping 225 MB hard disk space. You can use upto four viewing modes, namely the Text, Internet, Custom and Entertain.

The difference of picture in each mode is clearly noticeable. It's also Mac compatible like the Acer. It loses to Acer in weight and brightness level.

It scored the highest in the black level adjustment test and comes second in turn-on time.

Like a few other monitors, it was behind in screen uniformity test but scored average in color and gray scale and video obstacle tests. Given the features and performance, it's a good buy. RQS# E90 or SMS 130690 to 9811800601

Price: Rs 15,000
Warranty: 3 years
Vendor: Samsung India Electronics, Delhi.
Tel: 51511234.
E-mail: sunil.m@samsung.com

NEC AccuSync LCD 52V

+ Power consumption, Naviset software   **–** Response time

The only white colored monitor and the second cheapest of the lot after Acer! Like its cousin in the 17" inch, it has Naviset control software. Though the software provides good OSD control option and test patterns, it consumes 192 MB hard disk space. Plus the monitor stand needs some pressure to tilt it.

It consumes the lowest power. The OSD control is not that easy to use, but it can be locked to prevent others from tempering with it. Even when locked, the brightness and contrast level can be controlled. Unlike other monitors there are no labels to tell you which control does what.

A resolution notifier indicates after 30 secs whether the LCD is set to the optimal resolution or not.

On the performance front it did equally well except for a few tests. It was the last in the black level adjustment test where only 19 out of 32 dark gray blocks were visible. It was leading in turn-on time and transient response tests with a blazing 2 secs.

Overall this monitor is a good choice for offices on a budget. RQS# E91 or SMS 130691 to 9811800601

Price: Rs 13,950
Warranty: 3 years
Vendor: Shiba Comp, Delhi.
Tel: 26413437.
E-mail: shiba@del2.vsnl.net.in

BenQ FP537s

+ Response time   **–** Weight, turn-on time

Compared to others, this monitor is the winner in performance and comes with decent features. It was also the only monitor to score higher than others in the screen uniformity and 256 intensity level ramp test.

It scored well in color and gray scale and video obstacle test. Perhaps its biggest fall was its poor turn-on time of 6secs.

Talking of features, it was the heaviest of the lot and consumed power compared second only to the Acer. OSD controls were comfortable to use and easy to learn. A good feature is the 'color recall' option that sets factory-default color settings. With a special 'iKey' you can set the geometry along with vertical and horizontal position.

It has an auto adjustment key like all the monitors and keys to adjust brightness and contrast level. It does score well in response time but was behind brightness and contrast level.

It is very close to the NEC Accusync 52v in performance and features but loses out against it primarily due to its price. RQS# E92 or SMS 130692 to 9811800601

Price: Rs 16,490
Warranty: 3 years
Vendor: BenQ India, Mumbai.
Tel: 25705230.
E-mail: NemishParekh@BenQ.com
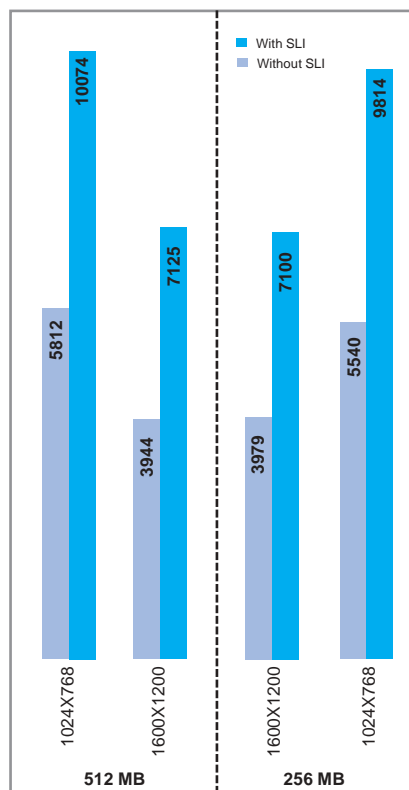
Zebronics SLI Gaming Machine

Ever wanted to own the fastest gaming machine in the country and are willing to pay for it? Check out this dual-GPU based system, reviewed exclusively by *PCQuest*, which puts even the fastest gaming cards to shame

Anil Chopra, Anindya Roy and Sanjay Majumder

Last month we reviewed 50 mouth watering video cards, ranging from entry level AGP to the highest end of PCI-Express. The highest score we got using the 3DMark 2005 benchmark was 3267. That's pretty high by any standards, but the extreme gamers always want more. The option then is to upgrade the machine to a better processor, add more RAM, or possibly get a better motherboard with overclocking capabilities. Still, the best you could achieve with all this would be a 20% increase, unless of course you start using a liquid Nitrogen based super cooling sys-tem for your graphics card. Even then, you might get another 10% boost. In this review, we'll take you through a machine that will go beyond this limit by more than 100% .

The Zebronics machine is a custom assembled system that uses NVIDIA's SLI (Scalable Link Interface) technology. As a quick refresher, SLI is a hot technology for gaming cards, which allows you to use two GPUs (Graphics Processing Unit) on a single machine, meaning you can plug in two SLI capable graphics cards in the same machine.

Performance

Coming to performance, the only benchmark we ran on the machine was 3DMark 2005, because we wanted to take its score to as high as possible. We used two sets of SLI cards for the tests. Both were based on NVIDIA 6800 ULTRA GPU, but one set had 256 MB of video memory, while the other had 512 MB. Though we didn't get too much of a performance difference between the cards themselves, the differences with and without SLI were truly amazing as can be seen from the chart. The performance jump was close to 90% without doing any overclocking.

Price: Rs. 245,000 with free shipping

Meant For: Extreme gamers

Key Specs:
Motherboard: Asus A8N-SLI Deluxe
Motherboard chipset: NVIDIA nForce 4 SLI
CPU: Athlon 64 FX 2.6 GHz
RAM: 2 GB DDR 2 in Dual Channel configuration
Graphics cards: Two sets of NVIDIA GeForce ULTRA 6800 Ultra with 256 and 512 MB RAM
CPU Cooler: Asus StarIce cooler
Hard Drive: 40 GB, 7200 RPM IDE
Display: 19"
SMPS: 620 Watts
Cabinet: Special perforated cabinet with four fan controllers for effective cooling
Others: Anti-bacterial keyboard and optical mouse, Zebronics gaming wheel, Webcam, full version of a latest game.

Contact: **Top Notch Infotronix, Chennai.** Tel: 26616202. E-mail: zebronics@zebron-ics.com RQS# E50 or SMS 130650 to 9811800601

After some minor overclocking from the motherboard, the performance shot up to 10289 3DMarks. Possibly we could have taken this even higher, but we received the machine just around the time our magazine was going to press and were, therefore, hard pressed for time. Nevertheless, the scores it churned out are impressive by any standards. Having said that, let's look at how this machine is built.

A peek inside the SLI machine

Setting up the hardware to create a SLI based system isn't very difficult, but you need all the right components for it. Currently, some of these are a little hard to find in India, such as the 620 Watts SMPS and the excellent cabinet we received for

With SLI enabled, 3DMark 2005 scores almost double

The highest score we could achieve on the SLI machine after doing some mild overclocking

Keep watch on CPU temperature and control the fan speed here

The cabinet has four fans, two on side, one on top and one at the front

review. It had perforations on the front, sides and top with fans placed all around for proper cooling of the machine. Plus, the cabinet came fitted with fan rpm speed controller and LCD panels to display fan speed, CPU and cabinet temperature.

You need a SLI capable motherboard and two SLI cards. The cards should preferably be from the same manufacturer. An SLI ready motherboard has two PCI-Express slots, one for each SLI-based card. Plus, the board also comes with a small bridge connector, which is used to connect the two graphics cards once they're fitted.

Typically, SLI-based graphics cards require plenty of cooling, and therefore come with a heavy fan and heat sink of their own. The fan requires a separate power connection from the SMPS to run. So you also need

to ensure that your SMPS has the connectors for this.

The machine we received came with an Asus StarIce CPU cooler, which looks more like an aircraft engine, and sounds like one too while it's running. You need a proper CPU cooler because with so much hardware fitted inside the machine, tremendous heat gets generated. Plus, running high-end games at super high screen resolutions also gives the CPU quite a workout causing its temperature to shoot up.

BOTTOM LINE: It all depends on how much are you willing to pay for your dream machine. If it's a dream, then sky is the limit. And the price of this machine definitely reaches for the sky while being the best at performance. ☐

The bridge that connects the two SLI cards

The Asus StarICE CPU cooler, with looks of an aircraft engine

EMC Dantz Retrospect Professional Backup 7.0

The program comes with the right features, configuration, interface and price to make data backup an easy task for mid-sized businesses

Anoop Mangla

While, most backup software available in the market are either for large enterprises or meant for personal use, this backup application from EMC is specifically meant for SMEs—those having a small network. Although the software lets you back up networks, unlike many others, it doesn't mandate you to install the central backup program on a server OS. In fact, you can install the central backup program only on a Win XP, 2000 Professional or NT 4.0 workstation machine. The network backup client can be installed on any Windows desktop OS starting from Win 95, Linux, Solaris and Mac OS.

The program can be used to back up data from a local machine, remote client machines and network shares. Backup can be made to tape (AIT, DAT, DLT, LTO, Travan, and VXA), local disk, network share, CD and DVD (re) write-able disks, and removable disks, such as REV, Zip and Super Disk.

The installation is simple and fast for both the clients and the central backup program. Linux client installer comes as an rpm package and a tarball, so you can choose to install the way you like. The default preferences for the client machines are sufficient for most purposes and need not be changed. An intuitive wizard-driven interface guides you to create backup jobs on the central backup machine. The wizard lets you find client machines on the network, which have the client backup program installed. Client machines are protected by passwords, so that not anybody could search for them on the network, using the pro-

gram, and access their data. Additionally, to prevent data theft during transmission, you can choose to encrypt the link between the back-up and client machines. After the client machines get detected, you can select the files and folders you want to back up. The backup wizard also lets you access network shares and local files that need to be backed up. After this, you get an option to select the backup location for your files. You can choose between any of the above-mentioned backup options. Finally, you can choose to run the backup operation once or schedule it to run on selected days and time. To back up to multiple locations, say, tape, disk and DVD, you can create multiple backup sets, each targeted to a different type of media; and different backup operations can then be configured to back up to different backup sets. One good feature that we found was the ability to password-protect and encrypt backup sets, to prevent any unauthorized access to backup data. But you need to be careful with the passwords. If they are lost, there is no way you can restore data from the backup sets. To save space on the back-up media, there is an

Price: Rs 5,800 (includes 2 client licenses)	
Meant For: Mid-sized businesses	
Key Specs: Open-file backup, disaster recovery	
Pros: Easy-to-use wizard-driven interface, password protected and encrypted backup sets	
Cons: Disaster recovery doesn't work for the client machines	
Contact: EMC Data Storage Systems, Delhi.Tel: 55563800. E-mail: madan_nikhil @emc.com RQS# E51 or SMS 130651 to 9811800601	

option to compress the data that is being backed up. The way it is simple to perform back up operations, it is also easy to restore lost files and folders. The software manages catalogues of all files that have been backed up, making it easy to search for files within the backup sets.

Apart from its easy-to-use interface, the program also provides some advanced backup features. Open-file backup feature allows files to be backed up even if they are open and being used. Disaster recovery allows complete recovery of a system, eliminating the time- consuming installation and configuration processes of the OS and programs.

BOTTOM LINE: With an easy to use interface and several thoughtful features, a price of Rs 5,800, which also includes two client licenses, is very justifiable. However, for backing up additional machines, you will need to purchase additional licenses. But, you can always back up data from multiple machines by sharing their data on the network. □

Retrospect's pasword protection can encrypt your backup. This is an excellent but an uncommon feature

RedHat Enterprise Linux 4 AS Distribution

More CPUs and RAM supported, better scheduling, emphasis on security and manageability. RHEL 4 ups the ante on major server fronts

Sujay V Sarma

RedHat has upped the ante with this release of its enterprise Linux. Compared to RHEL 3, this one has support for 16 more 32-bit CPUs or 56 more 64-bit CPUs. It can also run on more architectures—x86, Itanium, EM64T, AMD64 and the IBM Power Series. RHEL 4 supports PCI-Express (Gigabit Ethernet). RedHat has chosen the 2.6.9 kernel which is very stable.

SELinux is being billed as the best security system around, but its configurability is still a major issue—the 'system-config-securitylevel' interface features far too few options or rules for an enterprise's needs. Much of it still needs to be done over complicated CLI commands and this is not easy. The Linux file system sees an improvement with the addition of features to Ext3 that sees it addressing storage up to 8 TB. Better I/O algorithms in the 2.6.9 kernel, like noop, deadline, anticipatory and complete fair queue (CFQ) scheduling make for better application performance. To enable these schedulers, you need to pass parameters on the boot command-line. The noop scheduler performs no optimization at all and is suitable for memory sticks, USB drives and virtual storage. Deadline reduces wait-periods for processes by monitoring how much time each of them waits for data. Anticipatory scheduling will pre-fetch data from areas surrounding the current data and this works best for sequential information and database retrievals. CFQ reduces I/O bandwidth usage across applications by dividing the available I/O time between all running processes.

The current release has no method to select this on a per-device basis, however, a patch is available to let a script write a value to a block-device's configuration file and change its scheduler dynamically. You can read more about it at http://lwn.net/Articles/50685.

Like SUSE Linux (we reviewed it in March 2005), RHEL 4 bundles Samba 3.0 and hence includes the WinBind authentication module that lets it integrate with Active Directory servers on your network in one easy step. 'system-config-samba' is the tool you would look for configuring this. LVM (Logical Volume Management) is now

Price: Std Ed: Rs 74,950; Prem Ed: Rs 1,24,950	
Meant For: High-end mission-critical enterprise servers	
Key Specs: Kernel 2.6.9, support for up to 32X86 processors and 64 ia64 processors on a single system, 16 GB RAM and PCI-Express. Bundles SELinux and ExecShield for security	
Pros: High on security, bundles the latest (if not bleeding edge) versions, stable	
Cons: Not as manageable as SUSE/YaST	
Contact: RedHat, Mumbai. Tel: 22881326. E-mail: smohan@redhat.com RQS# E52 or SMS 130652 to 9811800601	

version 2 and includes tools in GNOME that helps you perform tasks like volume expansion, shrinkage, mirroring and striping easily. CLI tools (lv* commands) help you do the same too.

RHEL 4 is supposed to see a new service called 'audit' which is to replace the aging LAus daemon for system auditing. This service is slated for debut later this year.

This should improve single-point management functions in a typical enterprise scenario. Another worthy addition to RHEL 4 is the ExecShield and PIE (Position Independent Execution) prevention system that blocks execution of programs from unauthorized locations—much like the Windows' DEP (Data Execution Prevention) system.

Compared to other enterprise OSs such as SUSE Linux or the Windows Server 2003, RHEL 4 still has a long way to go in the realm of administrative flexibility and ease. But given its stability, you would only need to configure it and perform minimal maintenance through Webmin.

BOTTOM LINE: Much improved release of RHEL, well suited to its role of serving mission-critical environments. □

Samba can now be configured with WinBind authentication that allows it to connect to Windows Active Directory Servers

Novell Linux Desktop 9 Operating System

An easy-to-install and use Operating System for novices and experts alike that contains all essential productivity applications a PC user may use

Anindya Roy

If your organization is planning to give you a taste of Linux on your desktop, then this may be a good product to consider. Before we get into it, lets first see why this product is so easy to use. It's actually a result of a number of interesting company acquisitions. To cut the long story short, Ximian a company that was a major contributor to the GNOME desktop, also had a mail client called Evolution, with features similar to the MS Outlook. This company was bought over by Novell and after this acquisition; Novell also acquired SUSE Linux, which has the famous YaST configuration and installer tool. After these acquisitions, Novell introduced its Linux desktop, which has the best of both SuSE and Ximian.

The distribution comes in a set of three CDs with both GNOME and KDE desktop environments. The installer for the OS is YaST, which is standard for all SuSE Linux distros and is one of easiest installers around. It can install the OS in just a few clicks. All you need is 2.0 or more GB of unpartitioned space on your hard drive. YaST will automatically create the partition, detect all hardware and update the boot loader.

You will be just prompted with one selection where you have to select which desktop environment you want to install (GNOME or KDE) and that's all. Obviously you have an option for manual installation wherein you can also change the default settings done by YaST. However, for an end user it's not needed because the automated installation process is too easy. One not so good thing we noticed in the installer is that you can't do a full install by default. This means you can not install both KDE and GNOME at the same time. Though this saves some disk space, it's not good for those who like to use some applications each from GNOME and KDE.

Look and feel

Usually when you install a regular Linux distro, you get a huge list of applications to choose from. These can be quite intimidating for a newbie to see tens of mail clients, browsers and media players. All that an ordinary user needs are applications that would meet his productivity requirements. This distribution provides a very uncluttered desktop with only the best desktop applications. Looks wise, we found the GNOME desktop more professional and uncluttered when

It is possible to configure any service or device with YaST, and it only takes one or two clicks

Price: Free for download with 60 days support
Meant For: Desktop users
Key Specs: YaST installer and configuration tool, GNOME and KDE, Ximian Evolution, all office productivity software
Pros: Very easy to install and use
Cons: None
Contact: Onward Novell, Mumbai.Tel: 28342244. E-mail: apanjwani@novell.com RQS# E53 or SMS 130653 to 9811800601

compared to the KDE. But at the same time KDE was more application rich and stylish looking. The standard applications are same in both like in OpenOffice.org 1.1.3, FireFox-1.0 and Evolution-2.0.1.

Configuration and updating

YaST is the installer/configuration tool of SUSE/Novell Linux Desktop. Name any service or device, be it a Kerberos client, LDAP client, remote administration or Tftp server, you can configure everything within one or two clicks. Obviously since this is a desktop, don't expect to configure services such as DHCP, DNS and Web server using YaST as these applications are not present in the distro.

As far as updates are concerned, this is the first distro that uses Red-carpet for updating the OS and applications. Red-carpet was natively the online installer for Ximian desktop environment and it is the first time that it's been used for updating the full distro. However, even here it's quite easy to use.

BOTTOM LINE: Overall, it's a very easy to install and use the desktop, which could be a good desktop to start if you're planning to give your users the taste of Linux on the desktop. □

Lobbytech Photo-badge Creation S/w

Sushil Oswal

Maintaining daily visitor (or temporary badge) details in a register becomes a cumbersome task, when dealing with a large numbers of visitors. Lobbytech software for small and medium offices generates photo ID badges and maintains visitor details in an easy-to-use manner.

The software lets you create customized badges in varying sizes with a provision to attach your company's logo too. There is an option to attach photo-

graphs, as well, but you need a camera—a Web cam will do. A good thing to note is that the badges can be pre-created for expected visitors. Once the badge details are entered and the photo is attached, you just need to print it for use. The quality of your camera does affect the print quality of the badge. You should remember, though, that taking high quality photo-badges printouts would add to the cost.

The Setup option enables you to enter details such as department and designation that can be used for faster badge creation, by not having to enter it every time. A good feature of this software is its Search option. You can search for badges created,

The software creates temporary badges for visitors. You can search for a visitor by name, organization or date of visit

Price: Rs 2,500 (1 month warranty)

Key Specs: Generates photo badges for visitors and detailed visitors report

Contact: Soft-AID Computers, Pune. Tel: 25447802. E-mail: support@libsuite.com RQS# E54 or SMS 130654 to 9811800601

either in a grid format or photograph with details, or photograph with only the name. The visitor report generated has detailed information such as check in, check out times and the host. Security personnel can mitigate any unwanted security breach in the office instantly, by quickly tracking down visitors and identifying them.

BOTTOM LINE: The software provides better visitor management facility and is a good buy for offices that have large number of daily visitors. At the same time, the extra cost of printing the badge along with the photo has to be kept in mind. □

Saral VAT Accounting S/w

Sushil Oswal

Relyon Softech has come up with an accounting software, called Saral VAT, exclusively for VAT. It allows you to exchange accounting information with Tally 5.4/6.3 and TCS Ex VAT using its import and export modules. This version of Saral generates VAT-related forms for a few states only. We expect that the next version will have support for more states and for importing data

from Tally VAT (see *Tally with VAT*, May 2005, *PCQuest*, page 99). A demonstrative example is also included to help the customers understand VAT better.

We created a sale and purchase transaction and found that the module had options for entering a lot of information about that. VAT rates are also pre-entered, which ma kes it very convenient. It also gives you detailed information about transactions such as opening balance, payments and their analyses. Plus, it lets you view information classified in a number of ways, such as date wise and item wise. The search option for the pur-

You can search the VAT opening balance either bill date wise or item wise for individual suppliers

Price: Rs 3,600 (Single user, 1 yr warranty)

Key Specs: Extensive capturing and generation of VAT information, good search feature and import/export data from Tally and TCS Ex

Contact: Relyon Softech, Bangalore. Tel: 23354600. E-mail: info@relyonsoft.com RQS# E55 or SMS 130655 to 9811800601

chases and sales made is worth mentioning, as it classifies your VAT and non-VAT transactions. The reports module lets you generate reports either in Crystal or Excel formats. Apart from the reports module, report generation and print options are also included in most of the other modules. This enables you to instantly file a report and save time.

BOTTOM LINE: The software helps organizations take advantage of the new VAT structure. You need to ensure that support is there for the state you deal with. □

SonicWall TZ 170 Wireless Security Appliance

TZ170 is a feature-rich, one-stop network security device from SonicWall that protects both wired and wireless networks for small networks

Anindya Roy

This is a complete security appliance for a small office or a branch office handling around 20 clients, with the added advantage that it offers security to both wired as well as wireless networks. It's a fairly feature-rich device offering multiple security features in one box. These include anti virus/anti spam, IDS systems, deep packet inspection firewall, IPSec-based VPN and even a remote access solution. One interesting feature of the product is that it can be used in meetings or guest rooms of big corporate offices where you can provide Internet access to guests without giving them access to your main network.

The device comes with a built-in five-ports switch for the wired clients. There's a WAN port to connect to the Internet and an additional 'Opt Zone' port, which can be used to connect two of these appliances together for automatic failover functionality. It can also be used as a DMZ (De-militarized Zone) port.

The device has two antennae to function as an 802.11b/g wireless access point, which has built-in security options like WEP, WPA-passkey (authentication using 104-bit passkeys) or WPA-EAP (authentication using radius server). It also has wireless over VPN, which allows wireless clients to connect to it over a secure and encrypted channel. You can also implement one more layer of security on it by using ACLs on the device. This product works on the proprietary SonicOS, which is used in all security appliances from SonicWall.

Usability and configuration

The device is really very easy to configure and install. All you have to do is push the Reset button at the back of the device to clear any settings and get the factory defaults.

Now connect it to a crosswire (that comes with the bundle) to any PC and access the class 'C' IP 192.168168.168. From here you can fire up a comprehensive wizard, which will help you configure the device, the way you want. In fact, it's so easy to configure that even a novice can use it.

Security

To test the firewall's strength, we decided to run some vulnerability and firewall penetration tools on both the LAN and WAN interfaces of the device. We first configured a machine with Nessus and did an aggressive vulnerability scan on the firewall's WAN interface. The result was just one security warning, which also turned out to be a false negative saying that 'the VPN server is enabled on the device and some one can connect to the local resource of your network from outside the network'.

Another interesting thing while we were running the scans was that all the attack packets were dropped by the firewall without much of a problem, and the device created comprehensive logs for the activities. We then ran firewalk (a firewall penetration tool) on it and it was not able to penetrate the device. We also did a brute force attack, using a tool called Hydra over the appliance's wireless LAN interface. In this case, the appliance's built-in IPS was able to detect the attack and dropped all packets from it. We then ran the same Nessus tool on the firewall's LAN side. This time, the tool gave us more warnings. It showed two security holes, out of which one was high risk. Actually the host gives out predictable TCP sequence numbers, which means that an attacker can use this flaw to establish a spoofed TCP connection. This problem is not very crucial if you are using VPN or other security mechanism but if the device is not configured properly, it can cause problems.

BOTTOM LINE: This security appliance is very easy-to-use and feature-rich that supports all security mechanisms for WiFi. So, the price that it comes for is justified and it's worth a buy. □

Allied Telesyn ADSL AT-AR236E Ethernet/USB Combo Router

Sujay V Sarma

Given its rich set of features and an uncluttered management interface, the AR236E is for home users and small businesses alike. It has both an Ethernet as well as USB port, which can be used simultaneously. So, you can connect the router to a PC using USB, and to a hub or switch using the Ethernet port so that everybody on the LAN as well as single machine on the USB port can use it. Unlike regular USB routers, which let you dial out directly from the PC, this one creates a virtual LAN interface on the PC instead. Due to this, only the combo router itself can dial to the connection. As a result, only the combo router gets the external IP address assigned by the ISP. You might feel that this is a setback because you can't access the PCs on your LAN or USB port directly from the Internet, but the router has taken care of that as well. It supports VPN pass through, port-forwarding,

and even DMZ to allow access to specific internal IP addresses, applications, and services from the Internet. So you could for instance, have an internal machine running an FTP server over port 21, and make it accessible from the Internet. This is good for network administrators as they can choose the services they want, to be accessible over the Internet. The router has made life easier even for home users by putting in preset rules for a huge number of games for Internet gaming. So you could set up a game server on your machine, and allow your friends to access it through your combo router. The router supports eight different connectivity options, some of which include PPPoE, PPPoA and bridged connections.

In our tests, the router was pretty stable on both interfaces and rarely, if ever, dropped connections. We saw uptimes of

Price: Rs 3,950 (1 yr warranty)

Key Specs: SPI firewall, router with port forwarding, DMZ, VPN pass through, simultaneous USB and Ethernet usage

Contact: Allied Telesyn, Mumbai. Tel: 56764244.
RQS# E57 or SMS 130657 to 9811800601

upto 6 hours at a stretch, interrupted only by line-problems. It also allows you to configure UPnP, SNMP traps, QoS on IP, filters based on intranet MAC addresses, multicast, static and dynamic routing. When you access the Web interface for the first time (or after a factory-reset), you get a nice quick-start wizard that takes you through setting up your DSL connection parameters.

BOTTOM LINE: Overall, it's a pretty good router that takes care of the ease of use for home users and adds all relevant features for small businesses. □

Allied Telesyn AR410S Security Appliance

Sujay V. Sarma

The AR410S is a 'security appliance' and comes with options for monitoring and management. It is secure against gateway level attacks, illegal service requests, port-scans and in-bound connections from outside your LAN. It does not handle malware attacks. All the router's functions can be configured and managed from its command line (via terminal), and Web-browser. Plus it is also a 4-port switch, making it an all-in-one network device for small networks. An uplink port cascades to another switch. You can use the Web interface to create VLANs in any combination of the four ports.

Routers don't usually have IPX routing but the AR410S has a separate submenu to configure IPX circuits, services and static routes. For failover routing and load balancing, the

router provides PPPoE based link-quality and heart-beat monitoring. The router will then choose the best route to complete a connection. Ping-polling is a useful feature that can check if important routes are active and you can use upto 100 ping targets, with different intervals of criticality and latency times. IP, RIP, Multicast, OSPF, IGMP and SNMP are some other protocols it supports. For advanced Layer-3 features such as IPv6, DMVRP, etc you need to contact Allied Telesyn and purchase, at a cost, licences to activate.

The AR410S supports multi-level log-

Price: Rs 36,550

Key Specs: 10/100 Mbps router, four ports switch, protection against gateway level attacks, illegal service requests, portscans, pingpolling to check active routes

Contact: Allied Telesyn International, Mumbai. Tel: 56764244. E-mail: sgupta@alliedtelesyn.com
RQS# E58 or SMS 130658 to 9811800601

ging . These logs can also be e-mailed to a designated address or added to the system log of another system.

The router supports three-levels of diagnostic counters – 802.1x, PPP and PPPoE, and one each for supported protocols like IP and IPX. It can also keep track of DHCP request and response statistics for troubleshooting.

BOTTOM LINE: An excellent router with adequate security features. □

Millennium Black Tornado PC

Sukhsagar Prajapati

This is an ordinary PC for office or home users alike. It has an attractive ATX cabinet in black and silver combination, with a provision for adding a chassis fan on its side. The configuration is also pretty much standard, comprising of an Intel D915GAV motherboard, P4 3 GHz processor, 256 MB DDR RAM, 10/100 Mbps Ethernet card and 40 GB 7200 RPM HDD. It has a 15" flatscreen monitor, which is a Samsung OEM.

We wished it had a SerialATA hard drive instead, considering the fact that it has four SATA ports onboard. It comes with a 52X CD drive, but it could have been better if it had a DVD or combo drive in place of that. The Black Tornado has an optical mouse and a multimedia keyboard, which has an extensive array of keys for controlling your Web browser, Windows Media Player, mail client and many others.

But the default machine ships with Linux, so these extra keys would actually be of no use. You'll have to get it changed to Win XP by paying an extra amount.

While it's a barebone machine with its default configuration, it does have plenty of room for expansion. It has an x16 PCI Express slot to add a better graphics card, four PCI slots for adding other cards and four USB slots on the rear panel. It has four large bays out of which three

Price: Rs 24,250 (with Linux), Rs 27,750 (with Win XP Pro) (1 yr on-site warranty, 2 yrs limited carry-in)

Key Specs: P4 3 GHz, 40 GB HDD, 256 MB RAM, multimedia keyboard, optical mouse, 15" monitor

Contact: Millennium Automation and Systems,Delhi.Tel: 26495941. E-mail: maslinfo@milleniumsystem.com RQS# E59 or SMS 130659 to 9811800601

are free for you to add more drives. As far as the results are concerned, performance with the default configuration is average for Business Winstone with a score of 28.4 and above average in Multimedia Content Creation Winstone, with 43 Winstone units. These benchmarks are meant for checking performance in business and multimedia productivity applications.

BOTTOM LINE: Overall, a good buy with plenty of room for expansion. □

Plextor PX-708A DVD Combo Writer

Sanjay Majumder

Plextor PX-708A, is an IDE DVD/CD combo writer that can write DVD+R and DVD-R at 8X and 4X speeds respectively. It has 2 MB of buffer memory. On the rewriting front, the drive rewrites minus and plus RW at 2X and 4X respectively. It writes CDR at the speed of 40X and rewrites CDRW at 24X. It has a feature called 'lossless linking' for DVD+RW, which allows DVD+RW discs to be edited and played simultaneously in DVD-ROM players. Then it also has a 'zero link' feature for DVD-RW, which leaves a zero-byte gap between each session of a multi-session disc, so that the discs are compatible with all DVD players. The drive supports multiple DVD types such as DVD-ROM, DVD-Video, multi-border, multi-session, DVD+ VR for read and write and DVD-VR for read only.

We tested this drive on a P4 1.6 ma-

chine with 256 MB and 40 GB 7200 RPM drive. All the DVD tests were done on Mitsubishi DVDs and the CD tests were carried on a 52X Samsung media. We used Nero 6.3 for writing. On writing 4.33 GB of data on DVD-R and DVD+R, it took around 8 mins 23 secs and 15 mins 14 secs, respectively.

In the CDR writing test also the drive was slower than other drives with the same writing speeds, such as nu-DDW163 reviewed in Novemeber 2004. It took around 5 mins 28 secs while the old drive

Price: Rs 5,500 (1 yr warranty)

Key Specs: 8X DVD+R, 4X DVD-R, 4X DVD+RW, 2X DVD-RW and max 12X DVD-ROM, 40X CD-write, 24X CDRW

Contact: Zeta Technologies, Mumbai. Tel: 24102288. E-mail: sales@zetaindia.com RQS# E60 or SMS 130660 to 9811800601

took only 3 mins 17 secs to burn 650 MB of data. To create a 73 mins audio CD, the drive took 9 mins 17 secs whereas the nu-DDW163 took only 6 mins 8 secs. On rewriting front, the drive took only 45 secs to format the CDRW media and its data transfer time was 31 mins to copy 447 MB of data in bust mode.

BOTTOM LINE: Overall, though the drive's performance is average, it's a good buy largely due to its attractive price tag. At that price, one can wait for the extra time it takes for writing. □

Seagate Momentus ST94811A Notebook Hard Drive

Ankit Kawatra

This is a 40 GB hard drive for notebooks, with 8 MB cache buffer and 5400 RPM spindle speed. We tested it on an IBM ThinkPad R-51, which had a P M and 256 MB RAM. To see how the higher spindle speed affects performance, we compared it s transfer rates against the default 40 GB,

4200 RPM Hitachi drive that shipped with the notebook. The Seagate drive came out better as far as the raw performance was concerned. It did better than the Hitachi drive in disk access time (15.8 ms against the 17.9 ms of the Hitachi drive). Seagate Momentus also gave better results for disk transfer rate. However, in the Business Disk and High-End Disk Winmarks, the Hitachi drive scored over Momentus. In the Business Disk Winmark benchmark, Hitachi won by a margin of 30%. And in the High-End Disk Winmark, Hitachi left Seagate behind by a margin of 7%. These bench-

Notice how the throughput drops as you move from the outer circle to the inner circle of the hard disk platter

Price: Rs 4,500 (5 yrs warranty)
Key Specs: 8 MB cache buffer, 5400 RPM, 40 GB capacity
Contact: Esys Information Technologies, Delhi.Tel: 51811694. E-mail: naresh@esys-mail.com RQS# E61 or SMS 130661 to 9811800601

marks test the drive's performance in running business applications. In terms of raw throughputs, we got lower scores than what was mentioned in the drive's specifications. The drive claims a sustained internal transfer rate of 48.25 Mbps and an overall claimed transfer rate of 34.5 Mbps. But, we found that it started with a transfer rate of 34.5 Mbps and ended with 19.3 Mbps (see the graph).

BOTTOM LINE: Overall, it's a good choice if you're looking for upgrading your notebook's hard drive, especially considering the attractive price tag □

Seagate 100 GB External Hard Drive

Ankit Kawatra

Compact and light are the words that best describe this 5400 rpm external drive from Seagate. And yet it can store up to 100 GB of data. One good thing about the drive is that it derives its power from the USB port itself, so you don't need a separate power supply to operate it. However, it still bundles a separate power supply in case your USB port is not self-powered.

We tested the drive on a MSI P4N Diamond motherboard with Intel P4 3.6GHz processor and 1GB RAM. We tested it mainly for the drive's read/write data capabilities since that's what it will be used for mostly, and not for installing and running apps. It took 1 min 45 secs to write 1.3 GB of data onto the hard drive (write

speed) and 1min 20 secs to copy from the external hard drive to an internal one (read speed). The data set included a mix of MP3s, movie clips, pictures, Word and Excel files. We also ran a benchmark to test its read/write speeds. The average read speed came out to be 23.5 MB/s, with the maximum and minimum being 26.2 and 15.9 MB/s respectively. The drive's average write speed was 9.7 MB/s with a maximum and minimum of 19.3 MB/s and 4.5 MB/s respectively.

The drive comes bundled with a back-up software known as Bounce Back Express, which has a user-friendly interface to back up your files. The software allows you to create a bootable drive image, synchronizing with the

Price: Rs 13,000 (2 yrs warranty)
Key Specs: 8 MB cache, 100 GB data capacity, USB powered
Contact: eSys Information Technologies, Delhi.Tel: 51811694E-mail: naresh@esys-mail.com RQS# E62 or SMS 130662 to 9811800601

PC to check for and automatically update the backed-up files. It also lets you access the older versions of the backed-up files.

BOTTOM LINE: The best thing about the drive is the price at which it comes—that of 13K, that makes it fairly cheap considering its performance, capacity and portability.

Other portable drives with much lesser capacities such as the 5GB portable drive from Seagate itself cost around Rs 10,000. So 100 GB of capacity and absolute portability is definitely worth the price. □

MSI RS480 Motherboard

Ankit Kawatra

This motherboard from MSI is a fairly feature-rich one that has FireWire connectivity, eight USB ports, four SATA connectors, two regular PATA connectors, one PCI Express x16 slot and three PCI slots.

That 's not all. The board also manages to fair well on the performance that it delivers. As far as the price is concerned, it falls between the regular AGP boards and the high end feature-rich PCI-Express ones. We tested the board with an Athlon64 Pro 3500+ processor, Radeon X850 series graphics card and 1 GB of RAM.

The results in most of the benchmarks were even better than the 915 and 925 chipset-based motherboards that we'd reviewed last month (MSI 925XE Neo Platinum and MSI 915G Neo2). In the Business Winstone

benchmark, the RS480 beat the 925XE Neo by a margin of 22 %.

In the graphics intensive Quake3 benchmark, RS480's victory margin was again 22 %. MCCW (Multimedia Content Creation Winstone) was the only benchmark in which the RS480 board scored lower than the 925XE. The 925 clinched victory by a margin of 9.5% in this benchmark.

The board is almost half the price of the 925XE Neo and almost the same

Price:	Rs 7,500(3 yrs warranty)
Key Specs:	FireWire support, eight USB connectors, 5.1 channel audio
Contact:	Cyberstar Infocom, Delhi.Tel: 51629979.E-mail: info@msi-india.com RQS# E63 or SMS 130663 to 9811800601

price as the 915G Neo2, but yes the 925XE Neo has lots more features as compared to the RS480.

Based on ATI's XPRESS 200 chipset, the board can support upto 4GB of DDR-333/400 RAM in either dual or single channel mode.

The board supports 64-bit Athlon64 and Athlon64 FX processors (socket 939). Also, processors above AMD 3500+, 3800+ and Athlon 64 FX 53 are supported too.

BOTTOM LINE: Overall, the board is a great performer with rich feature set, and is affordable too. □

MSI RS350 Motherboard

Ankit Kawatra

The MSI RS350 has been specially designed for the Indian market. So you may not even find this motherboard listed on MIS's website. It's a MicroATX form factor motherboard that's based on a new chipset from ATI called RS350. Its feature set includes support up to 4 GB DDR memory and dual channel configuration, AGP 8X interface, integrated 5.1 channel audio, eight USB 2.0 ports, and two SerialATA ports, which can be configured in RAID 0,1 levels. Plus, it has the usual serial and parallel ports, a 10/100 LAN port, and audio jacks. It supports Front Side Bus speeds of 800/533/400 MHz .

There are several optional features that the board supports. These include FireWire, Wake On LAN, and Gigabit Ethernet. It can even come with an optional TV-Out port.

We tested the board with a P4 3.2 GHz processor and 1 GB of RAM. It supports socket 478 CPUs. We tested it with its onboard Radeon 9100 pro IGP graphics chipset as well as with an external graphics card, for which we used a Gigabyte FX5900XT with 128 MB of video memory.

The board's performance stands nowhere compared to the PCI-Express based RS480. The RS480 beats it hands

Price:	Rs 5200 (3 yrs warranty)
Key Specs:	5.1 channel audio, eight USB 2.0 ports, SerialATA with RAID 0,1
Contact:	Cyberstar Infocom, Delhi.Tel: 51629979.E-mail: info@msi-india.com RQS# E64 or SMS 130664 to 9811800601

down with more than double the scores in almost all benchmarks. Moreover, the RS480 is only Rs 2K more expensive than the RS350, which is not much considering that you get PCI-Express support with it. But if you're price conscious and need a board that supports P4, which can be used for regular office productivity, then this is a suitable choice.

BOTTOM LINE: While the board comes with a good onboard graphics chipset, its overall performance isn't very impressive. However, considering the price and supported features, it's a good buy. □

MSI P4N Diamond Motherboard

MSI P4N Diamond motherboard gives you great performance with loads of features (including SLI support), thus, making it a great buy

Ankit Kawatra

Following the latest trend, MSI has also come up with boards which support multiple graphics cards. This diamond series board from MSI is based on the NVIDIA nForce4 SLI Intel Edition.

Features

Some of the features include 7.1 channel audio, dual channel DDR2 support (400/533/ 667), FireWire support, six SATA ports, IRDA, a total of ten USB 2.0 ports and SLI support. The memory size can go up to a maximum of 16 GB. That's not all. The board is also Smithfield ready, Intel's latest dual core CPU, which recently hit the market.

The board also has SATA2 RAID. Other features include PCI Express-based gigabit LAN, and a 1 GHz FSB speed. The board supports MSI's liveupdate3 tchnology, which provides a graphical user interface to update the firmware, as well as DOT (Dynamic Overclocking Technology), which lets you adjust the CPU clock ratio.

Another of MSI's technologies that

have been incorporated is Corecell, which is in the form of a chip that does a lot, ranging from decreasing overall system noise to power saving. The motherboard includes a utility for monitoring CPU speed,

voltages, temperatures and fans' speeds.

The P4N Diamond also comes with an optional dual 802.11g WLAN cum Bluetooth card, along with a utility called Digicell to facilitate the controlling of this card. You can even use your PC as a wireless access point with the use of Digicell and this card.

For SLI support, the board has two PCI

Express x16 slots (called the primary and secondary slots).

When in the normal mode, the primary PCI-E slot is compatible with PCI Express x16 and the secondary PCI-E slot is

Price: Rs 19,000 (3 yrs warranty)	
Meant For: Enthusiasts and extreme gamers	
Key Specs: SLI capable, Gigabit LAN, onboard SATA2 RAID, overclocking, dual WiFi/Bluetooth card	
Pros: Feature rich and good performance	
Cons: None	
Contact: Cyberstar Infocom, Delhi.Tel: 51629979.E-mail: info@msi-india.com RQS# E65 or SMS 130665 to 9811800601	

also compatible with PCI-E x1 (in addition to the x16). On the other hand, in SLI mode, both cards are equivalent to the PCI-Expres x8 slots.

Performance

We tested the board on a P4 3.6 GHz CPU, NVIDIA GeForce 6800 series GPU (256 MB video memory), 1GB of RAM and Win XP SP2. The board performed very well in MCCW (Multimedia Content Creation Winstone benchmark), beating the MSI RS-480 by a significant margin.

Business Winstone was the only benchmark in which the board performed worse than the RS-480.This is strange considering the fact that the RS-480 motherboard is less than half the price of the P4N Diamond.

At Rs 19,000 the board might seem too expensive but the features that it has and the performance justify the hefty price.

BOTTOM LINE: At a little under twenty thousand rupees, this gamer's dream motherboard might seem to be expensive but the feature set and the performance justify the price. ☐

Model	Quake III Arena	3DMark 2003	BW 2002	MCCW
	FPS	3DMarks	Winstone Units	
MSI RS-350 (onboard graphics)	78.4	643	21.3	26.7
MSI RS-350 (external graphics)	181.7	4586	21	26.7
MSI RS-480	415	*	43.8	51.5
MSI P4N Diamond	454.4	11546	36.4	63.1
MSI 925 XE Neo	338	12553	35.8	56.4

Network Security Bible

Cybermedia Labs

This book gives you in depth knowledge of network security. It covers topics such as security principles and practices, security fundamentals, OS and application security, communications, security threats and responses. It talks about security for all popular platforms, including Windows, UNIX and Linux. The book also discusses securing your e-mail servers, risk management, Web infrastructure, DNS and various other server applications.

It is a useful book for prac-

titioners in commercial, government and industrial sectors. It's good for beginners and professionals alike covering important topics such as securing Web browsers, protecting corporate portals and implementing secure e-commerce applications.

Advanced topics such as best security approach for various network protocols with detailed explanations of ODI layers, TCP are also covered. To add, it covers both wired as well as wireless aspects of network

| Authors: Dr. Eric Cole, Dr. Ronald Krutz and James W. Conley |
| --- |
| Price: Rs 449 |
| Pages: 660 |
| Distributor: Wiley-Dreamtech India, Delhi. Tel: 23260877. E-mail: wdt@vsnl.net RQS# E66 or SMS 130666 to 9811800601 |

security. On the communications front, it covers cryptography and steganography.

The author provides useful diagrams, charts and tables wherever necessary, and a summary at the end of each chapter. Overall, good book for security professionals. □

Programming Java 2 Micro Edition on Symbian OS

Cybermedia Labs

If you're a Java programmer, who's already familiar with software development in the wireless space, then you may want to check out this book, primarily for its practical approach to the subject. It explains J2ME fundamentals, its configuration and profile, and how to do programming in MIDP (both v1.0 and 2.0) and advanced APIs. Also discussed in detail are writing quality code for smartphones and the evolution of the wireless Java market, wherein the author
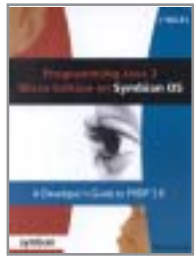
provides details of how wireless Java could evolve in the Symbian OS.

This is supplemented by coverage of the latest generation of Symbian-based phones. Both design and implementation considerations involved in writing code have been considered with examples.

For instance, besides discussing MIDP, even optional J2ME APIs found on phones such as Sony Ericsson P900 and Nokia 6600 are also covered. The author has covered many

Authors: Martin de Jode
Price: Rs 399
Pages: 471
Distributor: Wiley-Dreamtech India, Delhi. Tel: 23260877. E-mail: wdt@vsnl.net RQS# E67 or SMS 130667 to 9811800601

standard J2ME optical packages that Symbian Operating System is currently supporting or will support in the future.

Overall, this is a very well written book with plenty of examples, diagrams and visuals that facilitate easy understanding of the textual concepts. □

Books Contest June 2005

Answer these questions and win one of these books. A total of 30 books are to be won. Send your replies to edit@pcquest.com with the subject 'Books Contest June 2005'. Please include your full name, mailing address and telephone number in the e-mail. All entries should reach latest by 30th June. Winners will be announced on forums.pcquest.com under the Current Issue thread.

Which of the following is not a way to secure your computer?
❏ Firewall
❏ Computer updates
❏ Antivirus
❏ Downloading unknown software from the Internet

What is the full-form of MIDP?
❏ Media Information Device Profile
❏ Mobile Information Device Profile
❏ Memory Information Device Profile
❏ Micro Information Device Profile

Clustering Linux Distros

We have many a times talked about clustering Linux distros, but how easy are they to use comparatively? We analyze three of the most popular ones

Anindya Roy and Sanjay Majumder

After the rise in the popularity of Live Linux distributions, a new specialized class of distros came into existence—the clustering/parallel processing distros. These distros are of two major types. One is the standard PVM3 supporting HPC clusters and the other are the load balancing clusters that use Open-Mosix at its core. The biggest reason for the popularity of these distros is the fact that you can turn any heterogeneous network into a cluster within 15 minutes and without even touching whatever else is set up on that system. That is, you boot off the distro's live CD, perform your number crunching and simply reboot off the hard disk to get the machine back into its normal state.

So to test them out, we downloaded three most popular clustering distributions and tested them against each other. You can get all these distros in our last month's DVD. This article is not a complete shootout in the traditional sense. It is more or less a how-to on the three distros. In the beginning, we wanted to do our regular shootout with them, but then we realized that it would not be possible to compare a load balancing cluster against an HPC cluster.

So we will first see the difference between HPC and load-balancing clustering distros, and then try to understand how and where each would be used.

Load Balancing Clusters (LBC)

The biggest benefit of an LBC is that you can share any day-to-day application on different machines. This means that you do not need to write any applications specifically for the cluster. And in an LBC the whole network will be available to you as a single machine with the added processing power and memory of each machine on that network. So in this case you don't need to do any PVM coding to access the extra processing power. The clustering application which is used for this is OpenMosix and is basically a kernel patch. To know more about installing and using OpenMosix, check our May 2005 issue or go online to http://www.pcquest.com/content/linux/103050601.asp.

High Performance Computing (HPC)

On the other side of the spectrum are PVM (Parallel Virtual Machine) or HPC (High performance computing) clusters. These clusters need special programs using PVM and MPI standards. Such programs can use the power of machines with multiple processors. These multiple processors can be in a single hardware box or can be distributed among multiple machines in a network. But the prob-

lem with this is that other than harnessing much more flops per machine, it cannot be used to run common day-to-day applications.

So if you have a network where some machines are always overloaded and others have extra resources, you should go for an LBC. On the other hand, if you need a massive number crunching and you can do the required customization in your software or your software is MPI/PVM compliant then you should go for the HPC distros.

PVM standards

PVM supports software that runs on each machine in a user-configurable pool, and provides a unified, general and powerful computational environment of real-time applications. Users can write programs in C or FORTRAN and can access PVM using calls to PVM library routines for functions such as process initiation, message transmission and reception, and synchronization via barriers or rendezvous. Users can also optionally control the execution location of specific application components. The PVM system can transparently handle message routing, data conversion for incompatible architectures, and other tasks necessary for operation in a heterogeneous network environment.

PVM is best suited for heterogeneous applications that use specific power of individual machines on a network. PVM is widely used for making parallel supercomputer environments because it can do scientific computing, and are used for applications such as molecular dynamics simulations, superconductivity studies, distributed fractal computations and matrix algorithms.

What we did

We created a small network with just three nodes and booted each node with the distro. We made one machine the master node and the other two as the client or slave node. Finally we ran linpack (a benchmark which overloads the machine and reads the flop counts) on all the machines to test the number of teraflops on a standard node. The machines were all standard PCs with a single P4 2.8GHz CPU and 512 MB of RAM.

ClusterKnoppix

This was the only distribution of the three that was based on OpenMosix (LBC). This is also the easiest one to configure. PVM/MPI are not supported on ClusterKnoppix and thus, we were not able to run Linpack on it. Still let's see how to configure and use it.

To create the master node, burn a CD of ClusterKnoppix and
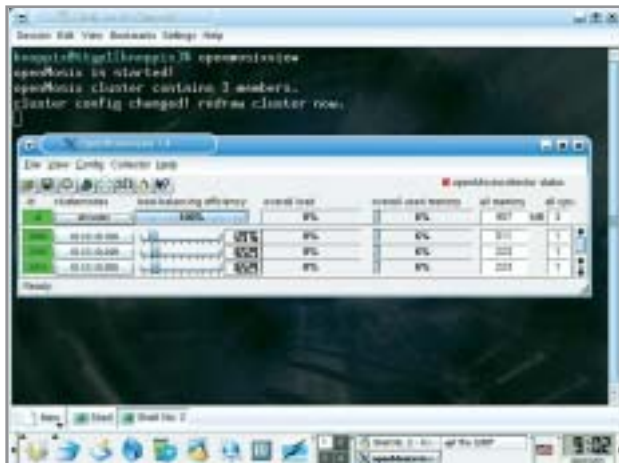
You can adjust the sliding buttons to set the amount of
processing power to be shared with the cluster

boot a machine with it. Press Enter at the boot prompt. Within a few
minutes, the OS will detect your hardware and boot the machine
into a nice KDE desktop. Now open a terminal window and run:

```
# ifconfig eth0 192.168.3.10 netmask 255.255.255.0 up
# add –net 0.0.0.0 gw 192.168.3.1
```

The following command initiates the OpenMosix server.

```
# tyd –f init
```

Adding the slave nodes into the cluster is very easy. Just fol-
low the same steps as mentioned above but give a fresh IP ad-
dress to each one and finally run the following to add the node.
The IP given below is the same as that of the master node.

```
# tyd –m 192.168.3.10
```

ClusterKnoppix in dynamic environment

You can also run OpenMosix in a dynamic environment
where systems get random IPs from a DHCP server. While this
will eat up some more network bandwidth, it saves a lot of work
when creating a huge cluster. To do so just run the following
command in all the nodes

```
# omdiscd –n eth0
```

To monitor your cluster, go to the KDE terminal on any
cluster node and run the following command.

```
# openmosixview
```

This will pop up a window that shows a list of all the servers in
the cluster, the amount of RAM and processor utilization in each.
From here you can configure the load-balancing efficiency of the
cluster. Each node has a slider bar for load balancing. When you
move this bar, OpenMosix automatically adjusts the processes run-
ning on each machine. It will automatically migrate them to
another node if the existing node is overloaded. You can also
migrate the processes manually from one node (processor) to
another by selecting the Processes option from the toolbar. It will
show you a list of the processes that are running. By double click-
ing on any process, you'll get another window in which you can
choose the node you want to migrate the process to.

Tablix

Based on morphix 0.0.2, this HPC clustering
distro is very easy to set up compared to the
other HPC distro in the shootout. It
creates clusters on PVM3, which enables a collection of heteroge-
neous computers to be used as a logical and flexible parallel com-
putational resource. With Tablix, you can share individual
computers. Local memory multiprocessors of vector supercom- ▷
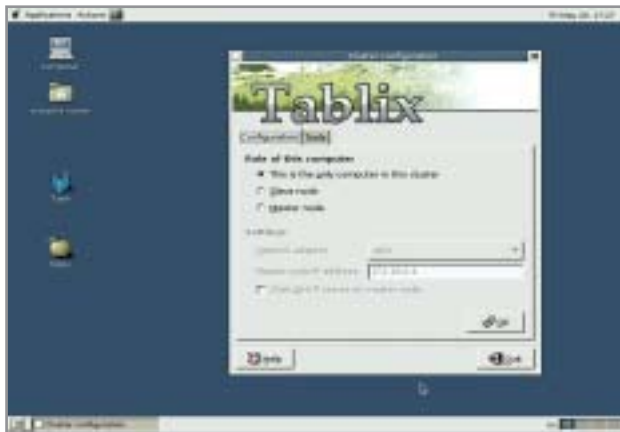
On the cluster configuration window, set master or slave according to the set up you have defined
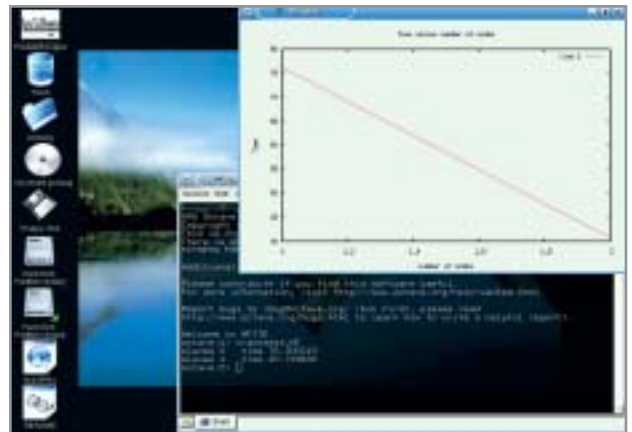
Here Parallel Knoppix is running its own benchmark and plots the performance on a graph

puters, specialized graphics engines or scalar workstations can also be interconnected by a variety of networks, such as Ethernet or FDDI.

To setup Tablix, you would need ateast two machines with a sufficient amount of RAM. Then connect these machines on a switched 100 Mbps Ethernet network. Now choose any one of the machines that you would like to use as a control cluster.

To create the master node, boot off the Tablix Live CD. You will get a GUI Cluster Configuration window. Here select 'Master node' as the role of this computer. Then on the same window, check on the 'Start DHCP server on master node' option. By default Tablix sets up 172.16.0.1 as the IP for the master node, but this can be changed. Once you click on OK on this window, a box will pop up saying the master node is waiting for nodes to connect.

Now come to the slave node and boot off the CD as before. This time, select 'Slave node' instead from the configuration screen. Tablix will automatically add the node to the HPC cluster. Back on the master node, you should see this machine listed in the 'Waiting for connect' box. To test whether the cluster is actually working or not, open the Tablix folder on one of the desktops and start Tablix with 'tablix file.xml'.

When we ran Linpack on a Tablix node we got 4.21 teraflops. With 24 such nodes, you can take this upto a 100 teraflops.

Parallel Knoppix

Parallel Knoppix is another HPC clustering distribution based on Knoppix Live CD. This allows you to create a parallel processing using the LAM-MPI and/or MPICH implementations of MPI. Its implementation is quite easy and doesn't take more than 15 minutes, if the machines have PXE network cards. Here one machine will act as master node and rest as slaves. The master node needs a hard disk.

To implement Parallel Knoppix, boot the machine selected to be the master (with a hard disk) node using the Parallel Knoppix CD.

Open KDE>Parallel Knoppix and select 'Setup Parallel Knoppix'. This will launch a script in a terminal window.

You will get a message 'Terminal Server is started to boot the slave computers' click on OK. On the window to configure the terminal server, click on OK to proceed. Now, you will be asked how many nodes you need in the cluster. Give a number between 2 and 200. Then you will be required to select the network drivers for your cluster nodes. Make sure to select all the network card drivers that you have in the cluster.

You need to export the CD to a mounted NFS disk space. To do so, select the Disk Option and click on OK. With this, your master node is ready to serve your slave nodes. Boot all the slave nodes using their network cards and they should remotely boot from the terminal server, running on the master node. All slave nodes should be mounted on master's NFS partition. If nodes are not mounted properly, then you won't be able to use that node's processing power. So make sure the configuration you have done above is correct.

Using Parallel Knoppix

Here, we will use one of the example files on the Parallel Knoppix CD to check the cluster. Go to the master node and copy the /home/knoppix/Desktop/ParallelKnoppix/Octave directory to the NFS share. Then open a terminal window and change to this NFS share. Now go to /parallel_knoppix_working/Octave/kernel directory and issue:

```
# octave
```

It will open another console where you where you have to type-in 'kernel_example1'. It will start drawing an output of kernel regression, both in serial and in parallel.

It achieved 3.17 teraflops by running Linpack on the nodes. So, this distro will require 32 such nodes to achieve 100 teraflops. □

Media Players

We compare eight media players, all free and downloadable from the Web, and find out which is the best, why and where it can be used best

Sanjay Majumder

There was a time when media players were used just to listen to music or watch videos. Since then, media players have seen substantial changes. Now, there are players that can rip CDs, burn them, organize audio/video files and play DVD s as well.

Your prime concern while buying a media player should be that its lightweight and does not use much memory or CPU power. If such a player can also play a movie once in a while, it makes it worthwhile to have. A player that has music/video on CDs and DVDs and can rip, organize and even burn them on other CDs for us—then that would be a great plus. With cheaper availability of bandwidth, streaming has also become popular. Online radio and video-streaming stations are very popular and so are media players that play them.

In this shootout, we've chosen eight popular media players and tested each for their features and performance. We tested their performance—both video and audio—and factors like streaming quality, CPU and memory usage, and chose the best one.

For testing, we used a P4 machine with 256 MB RAM running Win XP SP2. Then we simulated a normal work environment with MS Office applications like Word, Excel and Outlook opened up.

We then launched the particular media player and played both music and video files one by one. We left the player at its default settings. While the player was busy with audio/video, we opened the Windows Task Manager and noted the CPU and memory usage at the moment.

As a general comment across all the players, CPU and memory utilization goes up when using visualization (the fancy dancing lights and patterns).

Also, different types of visualization give different usage figures because of their levels of complexity. Our CPU/memory figures are with visualization turned off. We have also rated the players on the number of functions and audio/video formats that the player supports. All the players that we've reviewed have been given on this month's CD. Do let us know how good you found them.

iTunes for Windows 4.8

➕ Fast search   ➖ Supports very few audio/video formats

iTunes for Windows has been around for about two years now. This player from Apple can play audio/video formats like MP3, AAC, AIFF, WAV and a new format called 'Apple Lossless'. Apple Lossless delivers good quality uncompressed audio files of half the normal size. iTunes has a cool looking interface, which is very easy to navigate. It also has a media organizer which offers fast search. iTunes is gaining popularity because of seamless integration with the iPod. It's auto-sync feature with iPod lets you sync music really quickly. You just need to connect your iPod to your PC/Mac and iTunes will automatically detect it and transfer your music to it. Plus you can encode an audio CD into MP3 or

5%	32 MB
CPU	**Memory usage**
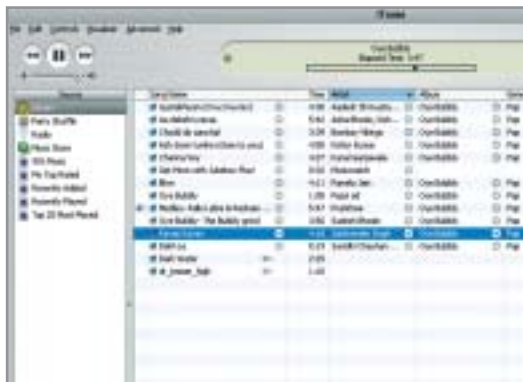
AAC format and can burn an audio CD of it. iTunes plays the streaming audio/video very well, but it takes more buffer time compared to other media players. On playing an MP3 file, it gave above average performance and gave crystal clear audio quality.

Generally, iTunes can do a larger bit-rate range for MP3 than the Windows Media Player. For instance, WMP sometimes skips or breaks out of an MP3 while playing, iTunes plays such files also properly. The same also applied while playing the video. In the earlier version of iTunes , video was not supported at all. However, in this player we found the video quality to be stunning. But before you get excited by all this, note that iTunes can only play Apple's MOV and MPEG-4 file format format. This player utilizes 5% of CPU and takes around 32866 KB of RAM.

Career Guide

PCQUEST

PCQuest brings to you an Exclusive series on the jobs that exist, have vanished, or are likely to come up for all those who are skilled in IT. We begin with an overview of where the job market is headed

IT Jobs Today

Monster, the leading job portal in the country, answers top of the mind questions about the job market

Which are currently the hottest areas to watch out for in IT?

The demand in IT is currently fuelled by enterprise spending activity, and as such all areas pertaining to enterprise applications are on an upswing. This would include ERP systems, SCM systems, analytics etc on the domain front; and Java/J2EE, .NET, C++, Oracle etc on the technology front. Besides development, there is also demand in testing and technical writing.

Are there any areas that have been hot in the recent past but are likely to die down, so that one doesn't try to get into those?

One should take care of avoiding technologies that are getting obsolete, and make sure he is upgrading to newer ones. For example, only VB skills have become obsolete in favour of .NET platform. Similarly, with Oracle acquiring PeopleSoft, we expect a drop in the demand for People-Soft skills going forward. Web development skills are also much less in demand compared to the 1999-2000 demand levels.

What's the scene of the Indian IT jobs market viz-a-viz the international job market?

Indian IT jobs mirror the demand in US and Europe on a technical front. However, there is relatively less demand for domain skills, which are the last to get offshored. Similarly, product development and management skills are under-represented in India.

The frenzy with which people used to rush to the US to build an IT career seems to have died down. But are there still opportunities in the US that can be tapped?

The US market has begun picking up over last year or so, and this upward trend is expected to continue. Over the next few years, a lot of people in US are going to retire, and that is likely to create a fresh shortage of IT professionals. We expect this to get addressed both through immigration of foreign workers, as well as offshoring.

Is software development still the hottest area for building an IT career, or do you see some other areas that hold equal potential?

In terms of employment numbers, BPO is now bigger than IT and is adding close to 200,000 workers every year. While the entry level positions in BPO tend to pay less than that in IT, the career prospects are equally bright. There are other industries also such as retail, healthcare and telecom, which are seeing an employment boom because of local market demand.

With companies focusing on B and C class cities in India, owing to saturation of the market in the metros, do you see a lot of career opportunities emerging in those cities? Or does a person in the smaller cities of India still have to rush to the nearest metro to build a strong career in IT?

IT is still a laggard in smaller cities in proportion of the jobs created in large cities that continues to dominate. Even in the BPO sector, very few companies have gone to class B and C cities, and hence the choice amongst job seekers is limited. These cities are likely to see stronger demand in areas that are fuelled by local industries mentioned above. For IT and BPO, choices are likely to remain wider in large cities. ■

BPOs
Not Just Call Centers

Most people know BPOs as call centers. What they do not know is the other activities and businesses that the BPOs are into. Today, most companies have begun to outsource all business processes that are not their direct line of business

Most people associate BPO with call centers. That is quite incorrect. BPO companies include call centers, back-office workers, research labs, engineering setups and design studios, and many more. So, you may have a BPO company in Chennai doing page-design work for a publishing company in Gurgaon. Or, you may have an IT helpdesk BPO company in Manila, Philippines solving the IT problems of the customers of an American bank.

In the first example, the BPO company is not a call center. Simply because the people working in the BPO in Chennai are not making or receiving (phone) calls to achieve their work; rather they are designing pages of books and sending them to Gurgaon over high-speed dedicated links. The second example is that of a call center. Here the call-center executives are attending to calls of the customers of the American bank.

The skill set required for different types of BPOs depends on the domain in which they operate. So, a BPO in the travel domain will require knowledge of airlines, destinations, culture, languages, hotels and airlines, while a research BPO in the pharma space will require skills in Chemistry and Medicine.

Do you need to attend a course in the required domain before joining? In the case of specialized work such as animation, engineering services, CAD/CAM design and research, yes, you need a background and an understanding of the domain. In lesser-specialized work, where domain skills can be learnt (such

as travel), companies offer on-the-job training. But, of course, if you do a course it will help.

If the BPO requires its executives to interact with customers (mostly in call centers), then other than having the domain skills, you also need to be proficient in the English language.

What do BPOs do?

Customer care services: This is the most primitive type of business process that most companies outsource as they cannot handle customers' grievances coming directly to them. Instead, organizations outsource this activity. Such services include marketing, sales, support for products bought by customers and customer complaint handling. Support here can be extended over the phone (call center) or e-mail and chat. Some companies offering such services include IBM Daksh and Wipro Spectramind.

Back-office work: This includes mostly data entry and data-reconciliation work. For example, insurance claims processing for an insurance company, accounting transactions for a bank, or passenger reservations for an airlines. American Express and Wipro Spectramind are two examples in this area.

Transcription: Medical transcription, which involves listening to and transcribing the recordings made by doctors, is an area here and the companies involved include Healthscribe, Heartland and C-bay.

Specialized services: These include a variety of high-end work such as ani-

BPO, ITeS, outsourcing, offshoring... What do these terms mean?
Outsourcing: is when a company gives out some of its work to another company to handle. For example, your company may outsource its security, catering or payroll management.
BPO: is used in the context of outsourcing services of processes. An example is an insurance company outsourcing insurance claims or a bank outsourcing loans processing to a BPO company.
Offshoring: is when a company outsources a process to a company based in another country. For example, a bank in Germany offshoring its credit-card services to a BPO company in Hungary.
ITeS: (IT enabled Services), a term used more in India than anywhere else, includes work that is heavily dependent on IT. BPO falls under it because it requires transferring of voice, data and video, something that is dependent on telecom and information technology.

mation, engineering services, product lifecycle management, radiology, remote sensing, drug research, developing Geographical Information Systems. Pentamedia, Bechtel and RMSI operate in this area.

Juhi Bhambal

Old is Gold

Know how of a not so modern language can get you a niche position in the jobs' queue

Heard about programming languages such as COBOL, Fortran, Smalltalk and ADA? You may have heard about them and may believe that they are no more in use. The fact is that they are still in use but not in popular use like modern languages (C#, Java). These old languages may not be opted for new projects but there is a huge existing base for them. Below, we have jotted down some of the possible scenarios where the know-how of legacy languages is required.

1 *Porting the legacy application to a modern language/technology:* A company may want to port a legacy mainframe program written in COBOL (say) to a modern language. A know-how of COBOL can save significant time and efforts that may be otherwise required to understand the existing system.

2 *Maintenance of legacy applications:* A company may not want to port but maintain and upgrade a legacy system. Your knowledge of an old language can fetch a long term maintenance contract.

3 *Documentation of a legacy application (for porting/maintenance)*

4 *Occasional projects on old languages:* A software developer firm may get occasional projects on these old languages from their clients.

The first scenario is the most common one. The second scenario is also rather common, wherein the company
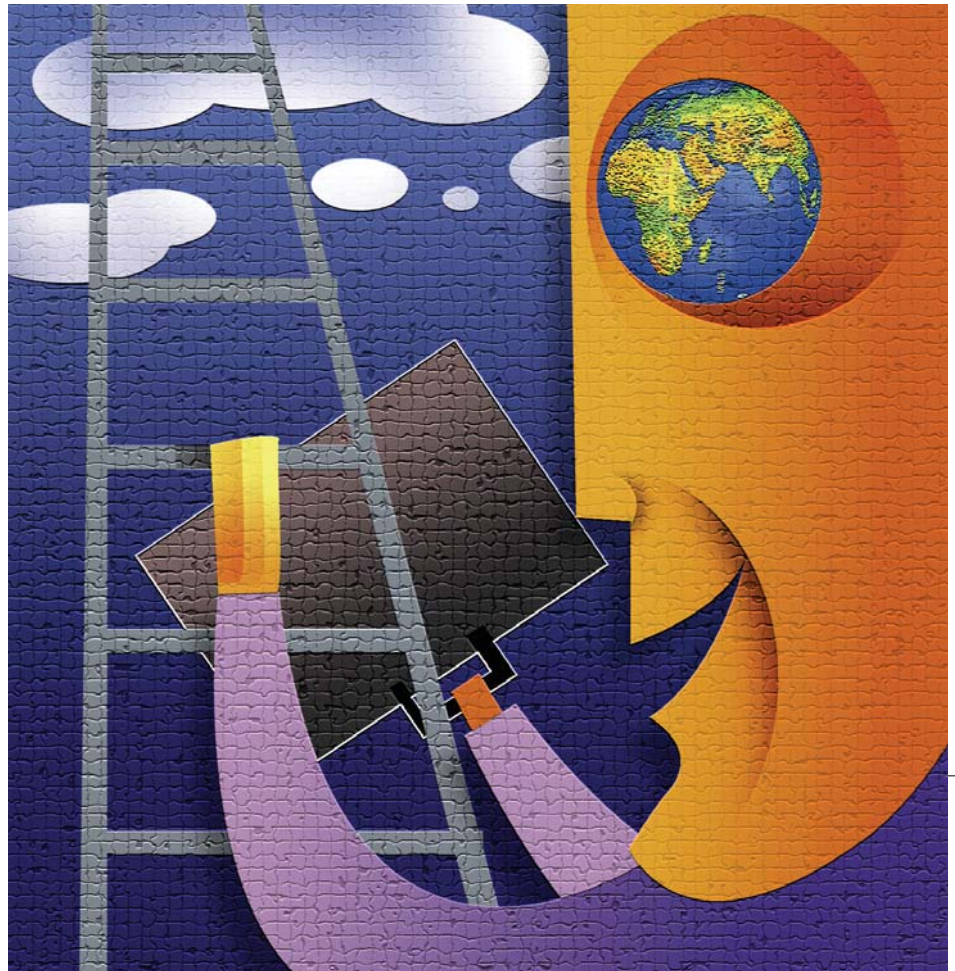
feels that the legacy application is doing fine and might, at best, need some minor modifications. As an example, the application may be recording the first names, last names and addresses but not the e-mail of users. If you know the language, it should be easy to add the new field.

Documentation is one of the important yet neglected needs. It may have happened that the application did not get documented and those who developed it are no longer available. A wise approach would be to get the application documented before any upgrade or migration. Here is where you can again jump into the picture.

Older languages are even used for latest development work in some instances, particularly where they have evolved with the times (all these languages have been extended to support the .NET technology). If

you are good at programming, learning a language should be a matter of just mugging up the syntaxes.

We now pick up each of the mentioned languages and state convincing reasons for their existence and survival.

COBOL

This was the first programming language for business, while Fortran was the very first programming language. It gained early adoption and its continued use (largely because of its installed base) may be a bit of a surprise to most of us. COBOL's survival does make sense, especially after the Y2K bug fixes, where corporates, particularly in the financial-services sector, invested heavily to fix their code and would certainly not want to throw away the fixed COBOL appli-
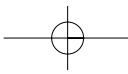
COBOL vacancies

naukri.com : **582**

jobsahead.com: **376**

cations after a couple of years.

COBOL has been used to develop transaction-intensive business applications that typically run on a mainframe system and interact with a DB2 (IBM's) database. These applications process millions, and even billions, of transactions per day. And, they have been doing this for years. Crucial business processes rely on these applications day in and day out. In most cases, there may be no plans at all to rewrite these COBOL applications in a new language, and hence there would be a need for continued maintenance and documentation.

Job sites (see box) reveal a healthy demand for COBOL programmers. The vacancies range from those for developers and team leaders to COBOL consultants. The expected experience level starts from two years.

Fortran

Fortran is used very specifically for engineering and scientific applications because of its early comprehensive vocabulary for number-crunching routines. Engineering students still go through Fortran at least for a semester and many engineering professors don't believe that there is anything better than Fortran for

Fortran vacancies

naukri.com : **24**

jobsahead.com: **8**

their work.

A point that we would like to make here is that Fortran is a niche language that is used best for engineering or research applications. It is used for simulation, machinery control, supercomputing and other specific engineering and scientific applications. If you are an engineering student, you can spruce up your chances of getting a job by revising your Fortran skills.

A look at the vacancy posts at various job sites reveals that the desired experience level starts from two years and the desired qualification is usually an engineering degree in the appropriate field, such as mechanical, aeronautical, thermodynamics and fluid dynamics.

ADA

Unlike C (which was developed as a general-purpose, high-level language), ADA was designed from ground-up for defense projects. But ADA is occasionally used for civilian projects as well.

ADA is usually used in real-time

ADA vacancies

naukri.com : **13**

jobsahead.com: **24**

applications and embedded devices. So, a person knowing ADA is assumed to be comfortable working with embedded devices and preferably be a hardware or an electronics engineer.

The requirements for ADA usually also require the knowledge of C and Assembly. Given its origins in defense projects, ADA is very popular in Avionics projects and vacancies are available for the same. The expected experience

starts from two years and there are also openings for only testing ADA-based applications. Note, however, that ADA is popular for defense projects more in the US and other countries than in India, where C seems to be the preferred language for defense projects. Time to get your visa extended!

Smalltalk

Smalltalk is object oriented to the extent that it is said to be the purest object-oriented language. Smalltalk was developed by the Palo Alto Research Center of Xerox (the same place where the GUI, the mouse, etc were developed). Smalltalk is used as a general-purpose language, such as C, C++, Java and C# and is unlike

Smalltalk vacancies

naukri.com : **12**

jobsahead.com: **11**

COBOL and Fortran, which are used for specific purposes as stated above.

Although the object-oriented pioneer, Smalltalk was marginalized by other object-oriented languages such as Objective C, C++ and Java. In our context, Smalltalk falls in the domain of maintenance, upgradation and documentation rather than in new development.

The job sites have comparatively (to other languages we talked about) lesser openings for Smalltalk. But, in spite of Smalltalk being so old and C++ and Java being strong modern languages, the listed number of vacancies may be worth the effort. The entry-level experience for some vacancies varies from one to two years.

Shekhar Govindarajan, IT4Enterprise

To be continued

Dell Latitude X1

Meant for traveling professionals, the Latitude X1, features the TPM 1.1 (Trusted Platform Module) for generating and storing onboard encryption keys for security. Starting at 1.14 kg, the Latitude X1 has a 12.1-inch, wide-aspect display. When configured with the optional six-cell battery (Rs 5418), it provides up to six hours of battery life. Prices start at Rs 95,285 (includes tax and delivery); E-mail: Priscilla_kh_goh@ dell.com RQS# E01 or SMS 130601 to 9811800601

Four Toshiba notebooks

The new Toshiba line up comes with different USPs and includes the Satellite M40 series offering professional multi-media performance; the Portege S100, world's first thin and light notebook supporting RAID; Portege M300 ultra portable with system bumpers and spill resistant keyboard; and the Satellite R-10 wide screen notebook with handwriting support. Prices start

at Rs 45,000.
RQS# E02 or SMS 130602 to 9811800601

Acer Ferrari 3400

The new Ferrari 3400 notebook based on AMD's 64-bit microprocessors, has a 128 MB ATI Radeon 9700 graphics card and 512 MB of DDR333 memory upgradeable to 2 GB. Price Rs 99,999. Tel: 29219090 (Delhi) RQS# E03 or SMS 130603 to 9811800601

EMC Celerra Gateway

EMC has unveiled the high-end EMC Celerra NSX NAS gateway delivering up to 300,000 NFS operations per second. The Celerra NSX can scale using simple online upgrades up to eight X-Blades. It also includes the new Celerra Automated Volume Management, via the Celerra GUI. Also introduced is the EMC Centera FileArchiver software that integrates with the Celerra FileMover API (application programming interface) to deliver policy-based data management and movement. Price: four-X-

Blade Celerra NSX system lists at $278,250. Tel: 55563800 (Delhi) RQS# E04 or SMS 130604 to 9811800601

Websense Web security

Websense has released the latest versions of Websense Client Policy Manager and Websense Web Security Suite-Lockdown Edition. Price: per seat ranges from Rs 1,000 to Rs 5,000 depending on modules installed. Tel: 5630 9466 (Mumbai) RQS# E05 or SMS 130605 to 9811800601

Trend Micro OfficeScan

Trend Micro OfficeScan Corporate Edition 7.0 is an integrated client and server security solution that combines anti virus and anti spyware, with manageability and policy enforcement compatibility. Price: Rs 2,000. Tel: 52699000 (Delhi) RQS# E06 or SMS 130606 to 9811800601

Xerox WorkCentre MFD

Xerox WorkCentre PE 114e for small and medium office workgroups features 14 ppm (A4) speed, 8 MB memory, 600 dpi image quality and color scanning. It also includes Scansoft Omni Page SE and Scansoft PaperPort OCR Software. Price Rs 17,000 (list). Tel: 2561930 (Gurgaon) RQS# E07 or SMS 130607 to 9811800601

Iomega NAS

Iomega has launched two professional storage products

—the Iomega NAS 200d w REV and the internal Iomega REV 35GB SATA drive. Both, Iomega NAS 200d w REV and the internal Iomega REV 35GB SATA drive ship with Iomega Automatic Backup Pro (IAB Pro) software and Computer Associates' eTrust Antivirus Software. Price: The Iomega NAS— Rs 89,250 upwards; Iomega REV—Rs 21,250 with one disk Tel: 22333071 (Chennai) RQS# E08 or SMS 130608 to 9811800601

TestAdvantage

GrapeCity India has launched 'TestAdvantage' from Infragistics. TestAdvantage is a collection of Custom Libraries, automating the testing of the presentation layer in Windows Forms applications, compatible with Infragistics NetAdvantage 2005 Volume 1 and allows for automated regression testing of user interfaces developed on the .NET Framework. Price $2,995. Tel: 247 0123 (Noida) RQS# E09 or SMS 130609 to 9811800601

Aventail VPN platform

Aventail Corporation has released version 8.5 of its VPN platform, the Aventail Smart SSL VPN. It includes new features like Smart Tunneling, Adaptive Access, Bidirectional Tunnel Control and Cross-platform End Point Control. Price starts at $6,995 RQS# E10 or SMS 130610 to 9811800601 □

Netgear wireless travel router

The 802.11b/g compliant 54 Mbps wireless travel router (WGR101) measures just 0.7 x 2.3 x 3.4 inches and incorporates an internal antenna to eliminate concerns of breakage during travel. It incorporates both NAT routing and SPI (Stateful Packet Inspection) forming a 'double firewall', VPN (IP-Sec and PPTP) pass-through, 64/128-bit WEP encryption, wireless SSID suppression and is WPA (WiFi Protected Access) upgradeable. Price Rs 6,500 (MRP). Tel: 28221013 (Mumbai)
RQS# E11 or SMS 130611 to 9811800601
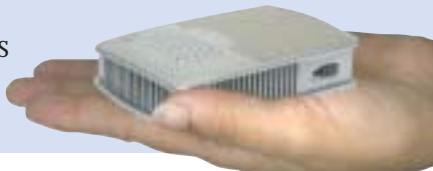
Long distance LAN

I have to write a report on connecting two locations, assuming the distance between them to be 20 km. At one location there is a toyshop in which I have to network two desktops and one server. And at the other location also i have to network two desktops and one server. Please tell me how to do this? What hardware and networking OS is required, and which type of network do I have to choose?

— *sam_123aa*

PCQuest: You can connect the two locations using the Internet. Here is what we would suggest. At both the locations, connect both the desktops and the server to a switch. Connect the Internet modem (DSL or cable) to the switch.

This will allow you to connect the two locations using the Internet and also save on the cost.

PCQLinux with Windows

I've installed PCQLinux 2005 as the workstation. I am having Windows Server 2003 domain controller. Also my Windows Server 2003 is providing DHCP services. Is it possible to configure Windows Server 2003 as DHCP Server and PCQLinux 2005 as DHCP client?
If yes, please specify how to establish this.

— *Sandeep*

PCQuest: By default PCQLinux 2005 is configured to get IP from the DHCP server. If you are not getting the IP, then just open a terminal window and issue this command.

```
# ifup eth0
```

Win XP problem

In Win XP, after connecting to the Internet, a warning message appears that says, "...some system file is corrupted so the system is restarting in 60 sec." After 60 secs Win XP gets restarted. This occurs everytime I connect to the Internet.

I can't figure out why this is happening. Can you tell me what is the problem?

— *Sathya23*

PCQuest: Go to Run and type in services.msc. Then press Enter. Now scroll to RPC and click on Recovery tab. Set all three of 1st, 2nd and subsequent failure to restart the service. Click on OK and restart.

Also check for the blaster worm. If you find one, remove it using a tool from MS or Symantec. Once you are sure there's no blaster, install SP2 to make Win XP sasser and blaster free.

Admin account blocked

I use Win XP and my administrator account has got blocked. How do I login to the system?

— *Vikas Chauhan*

PCQuest: Boot Windows into 'Safe Mode with Command Prompt'. Press F8 to select this option while booting. When you get the login screen, use your administrator username and password to login. From Run, type lusrmgr.msc. Open the Users folder in the window that opens. Right click on Administrator, select Properties and check

off the 'Account is disabled' option. Now reboot and your account is usable again.

Clear half screen

I want to know whether there is any function that helps to clear 50% of the console screen for the following problem. I issued:

```
for (i=0;i<25;i++)
cout<<"sample line<<endl;
```

This code prints 25 lines. I need to clear half of the screen, ie it should clear the line numbers from 15 to 25. If I issue

```
system("cls");
```

it clears the full screen. How do I achieve what I want to?

— *ootsoo*

PCQuest: There are several methods to get this done. You can try this one.

```
#include<conio.h>
    void function_name(int start_line,
int end_line)
        {
        for(int
i=start_line;i<=end_line;i++)
            {
                gotoxy(1,i);
                clreol();
            }
        return;
        }
```

The above code can solve your problem in C/C++ (under DOS) version. □