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- No question: IP Telephony is coming. It is mature, easy-to-use, and far more productive than conventional phone systems. While the latter will not be threatened yet, expect IPT to be a fixture in enterprises soon.

IPT MIGRATION CHECKLIST

- A checklist of steps for organisations moving from legacy phone systems to IP PBX-based ones.

CASE STUDY

Accenture Singapore

PARTNERSHIP

- Network integrators is a crucial link between product vendors and end user organisations. Certification programs like Cisco's Certified Partner Program makes it easy for end users to recognise expertise when they see it.



IP TELEPHONY RISING

THERE IS A POTENT BREW THAT'S RISING: IP AND VOICE. IP TELEPHONY (IPT) HAS BECOME SO COMPELLING TODAY IT IS ON THE VERGE OF CHANGING THE WAY OFFICE WORKERS COMMUNICATE. A LOOK AT IPT TRENDS AND TECHNOLOGY.

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INCOMING!

NO QUESTION: IP TELEPHONY IS COMING. IT IS MATURE, EASY-TO-USE, AND FAR MORE PRODUCTIVE THAN CONVENTIONAL PHONE SYSTEMS. WHILE THE LATTER WILL NOT BE THREATENED YET, EXPECT IPT TO BE A FIXTURE IN ENTERPRISES SOON.

There are 3 acid tests to gauge the viability of a replacement technology. The first is usage test: This technology should be able to work interchangeably and transparently with the incumbent technology. Second is adoption test: Some of your neighbours should be already using it, and you're already convinced enough to have pencilled it down for your next upgrade. And third is vendor interest test: There should be a rush of vendors clamouring to go to market with the technology.

If any new technology can pass all three tests, then it not only has arrived, it is here to stay—as is the case of IP telephony (IPT). This technology, which started as a novel way to dovetail public data networks like the Internet into the world of voice communications, is rising on a fast-track—both in user acceptance and technology maturity.

Telecom experts are bullish about IPT, and many have predicted that IPT adoption will be explosive. International Data Corp (IDC) has predicted that worldwide IP telephony service revenues will rise to US\$18.7 billion by 2004—or 10 times more than last year (which already raked in a sizeable US\$1.6 billion). IDC also predicted that Asia will be a major IPT hotbed, with the IPT service market in Asia-Pacific (outside Japan) to hit US\$6.9 billion by 2005.

Much of this rise will be at the expense of traditional telephone services, which will not

only see its usefulness shrink, but become more costly by comparison. This is already happening. TEQConsult Group recently reported that sales of traditional private branch exchanges (PBX) shipments declined last year for the second year in a row. It found that there was a 12% drop of traditional PBX sales in 2001, adding to the 10% drop from 1999. This means that PBX sales had declined by more than 22% since 1999.

Another analyst tracking PBX sales is Frost and Sullivan. Based on current shipments, the US-based market researcher predicted that IPT will account for more than half of PBX shipments by 2006.

THE REASONS: COST SAVINGS

All these figures point to rising levels of user acceptance for IPT. But what makes it so appealing? Let's consider the reasons first from a cost savings standpoint.

IPT enables voice, data and video collaboration over existing IP-based networks and the Internet. With IPT, only one network is required for voice, multimedia and data. The result is better network manageability, the potential of a new breed of collaboration tools,

increased productivity and ultimately, lowered costs.

In fact, cost benefits begins right at deployment. Given that most organisations already equip each employee with a desktop PC and data network connection, setting up IPT incurs almost nothing in terms of network infrastructure costs. What's more, combining data and voice wiring infrastructures will result in a savings of between 33 to 50 percent per user, according to a Cisco study. In new—so called "greenfield"—environments, savings of up to US\$300 per seat is possible—just because organisations can now run a PC and an IP phone via the same Ethernet port. In its own earlier IP telephony deployment, Cisco Systems saved over \$1.5M on wiring costs across six new facilities.

Any premise administrator will tell you that the costs of moves, adds and changes (MACs) is a regular pain for any organisation. It is estimated that re-configuring a traditional telephone system can cost as much as US\$500 per telephone point. Given that a 1,000-strong company is likely to experience an attrition rate of between 10% to 20%, this translates to an expense item as high as US\$100,000 a year—just to move people around. While this may be less marked in the Asian context because labour costs here are lower, the cumulative effects of MACs are still

valid—and painful.

Another area for cost savings can be found in the hardware connection between your PBX and voice mail. In a traditional telephony set-up, connecting an existing voice mail server to PBX typically requires two E1 cards, which, at a combined cost of US\$6,000, provide a 2 megabit link. This in turn supports up to 30 concurrent sessions.

When you move to a converged IP-based network with 100 Mbps or Gigabit Ethernet connections, a unified messaging solution can easily support up to 2,000 concurrent sessions. With it, you swap the two E1 for two Gigabit Ethernet cards. And the cost of the Ethernet cards? Only US\$600 in total. Talk about getting more for less.

In the long term, the mere fact that PBX upgrade costs can be eliminated will mean huge savings for some organisations, especially those which has PBX-leases that are due to expire. And savings on network

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UP TO 70 PERCENT.**

management, due to the merging of voice network infrastructure into the LAN or WAN, will also be significant. In fact, many organisations will find that they will be able to manage more users due to the infrastructure convergence. A good example is the Ministry of Social Policy in New Zealand, which found that it was able to support an additional 2,500 users with the same network support staff of 10 people—after it migrated to IPT.

THE REASONS: PRODUCTIVITY

The last point illustrates the immense productivity potential of IPT. Since IPT is based on software and open platforms, it offers an unlimited ground for growth and new applications. Furthermore, deploying IPT applications—and subsequently upgrading them—will be quick and painless. The fact that IPT offers the potential for merging multiple communications channels (as with Unified Messaging, or UM) and using different end-user devices, opens up all sorts of productivity applications in future. This lets organisations fine-tune their telephony services according to different operating environments—thereby increasing employee productivity.

According to the Radicati Group, UM systems can generate 25 to 40 minutes of additional productivity per employee per day, and reduce IT support and

administrative costs up to 70 percent. The US-based market researcher predicted that the UM market, which includes vendors, service providers and suppliers, will swell to US\$3.9 billion by 2006.

UM's sleekness contrasts sharply with the clumsy ways in which we communicate today. In many organisations, employees typically have multiple contact points, leading to missed calls, 'phone tag', and the inability to contact a critical resource in times of need. In contrast, UM on a converged network supports a universal inbox that can contain all possible types of messages. Employees can easily access their e-mail, voice, and fax messages from wherever they may be.

READY TO MOVE?

Cisco Systems, which had shipped more than 1.6 million IP phones to date, found in a study of its 6500 IPT customers that the average annual savings per user is US\$334. But short-term financial payback only paints half the picture. Long term productivity gains and the ease of adoption combine to make the other half of the IPT appeal.

The last point is significant for IT managers and CIOs who are just wading into the technology. IPT deployment is not a forklift upgrade. Phased migration can be done. And many migratory options are available. How an organisation plan its IPT move will depend on the extent of the IP telephony coverage required, and when leases of existing PBX installations will expire.

As explained earlier, organisations may want to install new IP PBXs when TDM-based PBX leases expire, or when the need for expensive equipment upgrades arises. Or you can tie TDM-based PBXs that have not yet fully depreciated into the converged IP network using TDM-to-IP interfaces. There are countless examples of organisations that have deployed hybrid TDM and IP networks.

Another option is to off-load the chores of running and managing the IPT service. Already, many service providers in more mature markets like Singapore are offering managed IP network services, which include premises-based voice-over-IP (VoIP) calling services and other managed IPT solutions.

Most organisations have made significant investments in both voice and data networks, and are understandably concerned about the protection of these investments while migrating separate networks into a converged one. IPT's many migratory options, as seen above, means that there will be flexibility in deployment and a low-risk migration path—both good signs when lobbying for new technology budget.

In the long run, a converged network will make additional technology purchases more interoperable. Either way, moving to IPT will take an enterprise to a new cost-benefits equation—now, and well into the future.

MOVE EASY

A CHECKLIST OF STEPS FOR ORGANISATIONS MOVING FROM LEGACY PHONE SYSTEMS TO IP PBX-BASED ONES.

Ready to migrate to IP telephony (IPT)?

Although the move should be no more complicated than any other new IT deployment, the sheer significance of telephone communications in the enterprise means that extra precautions and steps must be taken—both before and during the roll-out. For a smoother ride with no surprises, here are what organisations should look out for:

1. PRE-MOVE PLANNING

Take stock before you start, like the number of employees, size and dispersion of offices. Consider also how much moves, adds and changes (MACs) you need to do. To reduce wastage, cross-check with employee re-location schedules before you migrate. A big organisation may see a sizeable number of employees moving to new locations at any time. This may happen for a variety of reasons—new positions within the company, business expansion, organizational changes, new hires, etc. To reduce unnecessary MACs, you may want to issue new IP phones to employees only at the time of their re-location.

Retrofitting for IPT should be done in stages, building by building. It is crucial to identify all the phones with their users before the weekend shift. Here, it may be worthwhile to conduct a pilot test on a less critical building before the actual move.

2. ASSIGNING PEOPLE

First, prime and commit your IPT integrator to the move. Secondly, you will need to assemble an effective project team that the integrator can work with. Your project team should seek to include every key representative from the organization affected by the initiative—typically the LAN/WAN design and engineering, tech support, voice support, finance and facilities management. Technology representation will ensure that teething problems will be resolved quickly, while involving support early will help it familiarize better with the technology. The presence of finance ensures that the budget stays on track and approvals can be expedited quickly, while facilities management can help improve the logistics of the physical migration.

For example, it may want to halt any MACs at least a week before the conversion so that the data used by the implementation team will be current and clean.

At this stage, it is important that you judiciously identify the critical business users in your organisation, and how they use their phones. Reports generated from the existing PBX switch, the voice-mail system, and the directory listing will yield critical information about your existing phone population.

3. NETWORK PROVISIONING

One crucial IPT migration step is to implement VLAN to separate voice and data network virtually. In Cisco's converged network architecture, one set of IP addresses (VLAN) is used for data while another set (VVLAN or Auxiliary VLAN) is used for voice. Both can coexist on a single desktop switch port, where you can connect an IP phone to the port and a PC connection to the phone while using different VLANs. Segregating traffic this way makes managing IP voice and data traffic easier. Quality of voice will also improve as a result.

Another crucial migration step is to implement quality of service (QoS) within the network infrastructure to ensure an acceptable level of voice quality. Unlike most data traffic, voice is time-sensitive and adding voice packets to a bursty IP environment will demand QoS to the desktop. Good voice QoS can be achieved by traffic classification and marking, queuing, data packet fragmentation and interleaving techniques. And aim to have end-to-end QoS policy management in all routers and switches.

Thirdly, implement in-line power for desktop Ethernet connections. In-line power lets you power up IP phones without requiring an additional electrical outlet. Besides the obvious wiring savings, having in-line power also reduces the cost and extent of future MACs. Network switches with in-line power capability, like the Cisco Catalyst 6500, 4500 and 3550 switches, will be required for this.

Fourthly, evaluate your WAN bandwidth provisioning to meet the requirements of your inter-office voice communication. The WAN link affects the quality of IP calls that are routed from, say, the head to remote office. There are 2 key issues to consider here: The number of concurrent calls that will be supported on the WAN; and your WAN's existing traffic pattern and utilisation rate. You may need to upgrade bandwidth to ensure voice quality do not suffer over the WAN.

Lastly, remember to apply rigorous virus protection plans to the LAN. If a virus can affect the data network, it can also affect the new converged IP network. If you have not been vigilant in antivirus protection before, now is the time to get serious.

COMPONENTS FOR IPT



1. IP-PBX (essentially a Call Manager software in a server).
2. IP-phones.
3. A connection to the PSTN (otherwise known as a voice gateway).
4. Voice mail application (like Cisco Unity Voice Mail).
5. Network switches with in-line power capability (like the Cisco Catalyst 6500, 4500, 3550 switches).

robust and flexible back-end. What its 400-strong Singapore office wanted was a new phone system that can integrate voice with data networks so that management and resource sharing between both networks becomes one. For such a system, it turned to Cisco's AVVID (Architecture for Voice, Video and Integrated Data) IP telephony system, which provided not only robustness, but also ease of use and open-standards benefits.

FOLLOW ME!

THERE'S SOMETHING SPOOKY GOING ON IN CONSULTING FIRM ACCENTURE'S SINGAPORE OFFICE THESE DAYS. TELEPHONES THAT ARE TETHERED TO WORK DESKS SEEM TO FOLLOW THEIR OWNERS AROUND— NOT PHYSICALLY, BUT INCOMING CALLS INVARIABLY RING FROM THE PHONE NEAREST ITS INTENDED RECIPIENT.

But only the uninitiated will be spooked. This neat trick is actually a basic feature of IP telephony (IPT) systems, called "follow-me". Here is how it works: By using Dynamic Host Control Protocol (DHCP), IP phones are dynamically assigned an IP address. Which means that the IP address, or identity, of the phone can be changed easily and on the fly. By writing a script that lets users easily assign the nearest phone with a userID, the phones will appear to move around the office, and follow its owner.

This liberates employees from their workstations. It allows office workers to take calls when roving about in the office. And if you think this is trivial, try to remember how many times you have told colleagues that you need to stay at your desk because you were waiting for an important conference call.

But here, the concept is taken one step further. Accenture's clever implementation requires no user intervention. Instead, employees moving around the four floors of their new office at the heart of the Singapore business district are constantly identified with sensors reading an employee badge. They would then automatically be able to receive important phone calls at the phone closest to their location.

Sounds simple? Actually, this clever adaptation of a basic concept is rare even amongst IPT practitioners. "As far as we know, we're the only company in the Cisco IP telephony world with such (automated) follow-me functionality," says Samuel Kheng, an Accenture regional network engineer.

THE GOALS

Elegant niceties aside, Accenture knew its IPT system must also be supported by a

Reliability is crucially important in IPT. This is because of the high standards that were already been set. Simply, voice quality of IPT must not be lower than normal telephones, or else all bets are off even if other advantages proved compelling. Furthermore, as any consultancy will tell you, business is hinged directly to telephone calls, which means the IPT system has no margin for teething pangs. "We needed a system that will deliver full performance straight off the blocks," says Ramdan Pawi, a manager in Accenture's Singapore office.

This also means that the IPT system must be a breeze to learn, and use. Aided by Cisco partner NCR, Accenture found AVVID to be one of the easiest IPT systems to install and use. "The learning curve is very short, and everyone was able to step in with minimal training and use it," says Pawi.

He adds that since AVVID is based on open systems, scalability and software upgrades will not be a problem in future. That's the premise of open systems. This is a crucial aspect because the company plans to embark on enhanced packet voice telephony in the near future, where other data can be exchanged between employees during the same telephone session. It also plans to wade into the much-touted notion of unified messaging, which combines e-mail, voice mail and paged messages into a single application.

Those goals are no problem for open-standards-based IPT systems. In fact, the beauty of open-platform IPT is its limitless possibilities in future functionalities and application integration. As dazzling as its new "toy" has been, Accenture knew that its IPT journey had only just begun.

about accenture Accenture is a world leading management and technology services consultancy with 75,000 employees in 110 offices and 47 countries around the world. The company was spun off as a distinct and independent company from the Arthur Andersen accounting firm in 1989, and rebranded as Accenture in 2001. The New York-based consultancy had revenues of more than \$11 billion in the fiscal year that ended August 31, 2001. Its Singapore office is base for more than 400 consultants.

CERTIFIABLY GOOD

NETWORK INTEGRATORS ARE A CRUCIAL LINK BETWEEN PRODUCT VENDORS AND END USER ORGANISATIONS. CERTIFICATION PROGRAMS LIKE CISCO'S CERTIFIED PARTNER PROGRAM MAKES IT EASY FOR END USERS TO RECOGNISE EXPERTISE WHEN THEY SEE IT.

Love the product, love the integrator? While that may be true in monopolistic markets, most customers don't have to grin and bear unresponsive or ineffectual network integrators, especially in the current austere economic climate.

So what makes a good network integrator? Three factors come to mind. For starters, it has to be a product expert. In an ideal world, the network integrator would be as knowledgeable as the vendors it is representing. Secondly, it must be robustly supported by principal vendors. This ensures that help, and a larger pool of resource, is always at hand for end users. This is especially crucial when dealing with difficult projects. Third, and perhaps most crucial factor is network integrator experience. Given the turnkey nature of IT deployment these days, experience can make or break new deployment and complex projects.

But how can end users tell if their network integrator fulfils these criteria at face value? The answer is a partner certification program. A good example is the Cisco Channel Partner program, which addresses precisely the three aspects above.

To ensure a high level of integrator expertise, the program mandates that Cisco partners undergo rigorous training and stringent qualification tests before they can

attain certification. And this leads to more, because once they are certified as registered partners, network integrators will be given access to a wealth of Cisco resources and collaterals available only internally to Cisco.

Further, to sharpen network integrator focus, technology-specialisation is a requirement, in areas like VPN/Security, IP Telephony, WLAN and others. This is crucial in enterprise networking deployment, which have become too complex an operation these days to allow for generic value-adding from network integrators. Specialisation means that deployment can be tackled quickly and expertly.

There are three tiers of Cisco partnership certification: Gold, Silver and Premier. Each reflect the different levels of operational competency and expertise of network

integrators. At the helm is the Gold Certified Partner. To appreciate its stringency, consider some of the requirements needed: Round-the-clock call centre and tech support, one-hour call-back support requirement, and 4-hour onsite response time. Furthermore, both Gold and Silver Certified partners are required to maintain a specified number of staff with recognised industry certifications like CSE, CCNA, CCDA and CCIE, to tackle customer deployment. CCIE, in particular, are widely considered by many to be "guru" consultants, who are trained to handle the most complex network deployment issues.

What about network integrator experience? This one is easy. Cisco partners are tested not just rigorously, but repeatedly. Across all partner tiers, certification status is reviewed and renewed yearly, so no Cisco partner can rest on its laurels. In other words, an integrator which has long-term certification status demonstrates not just excellent experience, but longevity.

But all the certification in the world would be useless if customer-satisfaction levels are not worked into the mix. The Cisco Certified program does so by tying certification renewal and employee incentives to a yearly customer satisfaction survey—a surefire way to keep network integrators on their toes, and on top of their technology.

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*Independent study by Walker Information

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