

VOIP - It is now reality

In today's tough business climate for IT investment, the pendulum has swung from the overspending of the late 1990's to caution with demands for justification of return on investment and pressure for lower ongoing costs. IT buyers are, rightly, sceptical of past fads and vendor hype. Facing difficult decisions about the allocation of scarce IT dollars, many companies have decided to adopt Voice over Internet Protocol (VoIP) to achieve flexible communications solutions and reduced ongoing support costs. The issue now is what is the best path to IP telephony for your organisation and what vendor is the best partner?

The purpose of this paper is to enable IT decision makers to select the most appropriate pathway to IP telephony and discuss how NEC Business Solutions visionary strategy provides the lowest capital investment and the least risk implementation path.

What is VoIP?

Voice over IP technology (VoIP), or IP Telephony refers to the integration of voice, data and video solutions onto a single IP based network.

The introduction of IP as a transmission mode for voice communications has made it possible to eliminate separate voice and data infrastructure and move all communications (voice, video and data) services onto a single network.

Compression technology is utilised to make more efficient use of available bandwidth. Calls over IP are compressed effectively reducing bandwidth consumption as compared to a traditional call. This allows the link to be cost effectively shared with other applications.

VoIP – Top priority for the largest 500 companies

Organisations cannot effectively plan their future IT strategy without considering IP telephony.

The recent introduction of IP as a transmission mode for voice communications has made it possible to transmit voice conversation with a reasonable level of quality over the usual data infrastructure (switches and routers) used to connect computers.

A joint study by McKinsey and J.P. Morgan showed that traffic transmitted across telephone networks using IP will grow explosively. Long distance traffic will grow by 60% per annum with IP traffic taking significant share from traditional services.¹

An interData survey of 500 of Australia's largest companies in March 2003 showed that 42% of respondents rated IP and voice/data integration as the technology that will have the greatest business impact on their organisation over the next one to three years.²

¹ P Ewens, S Landless, S Newman, "Showing Some Backbone" McKinsey Quartely 2001 Number 1.

² "The Corporate Report", February - March 2003, interData.

Drivers of VoIP Growth

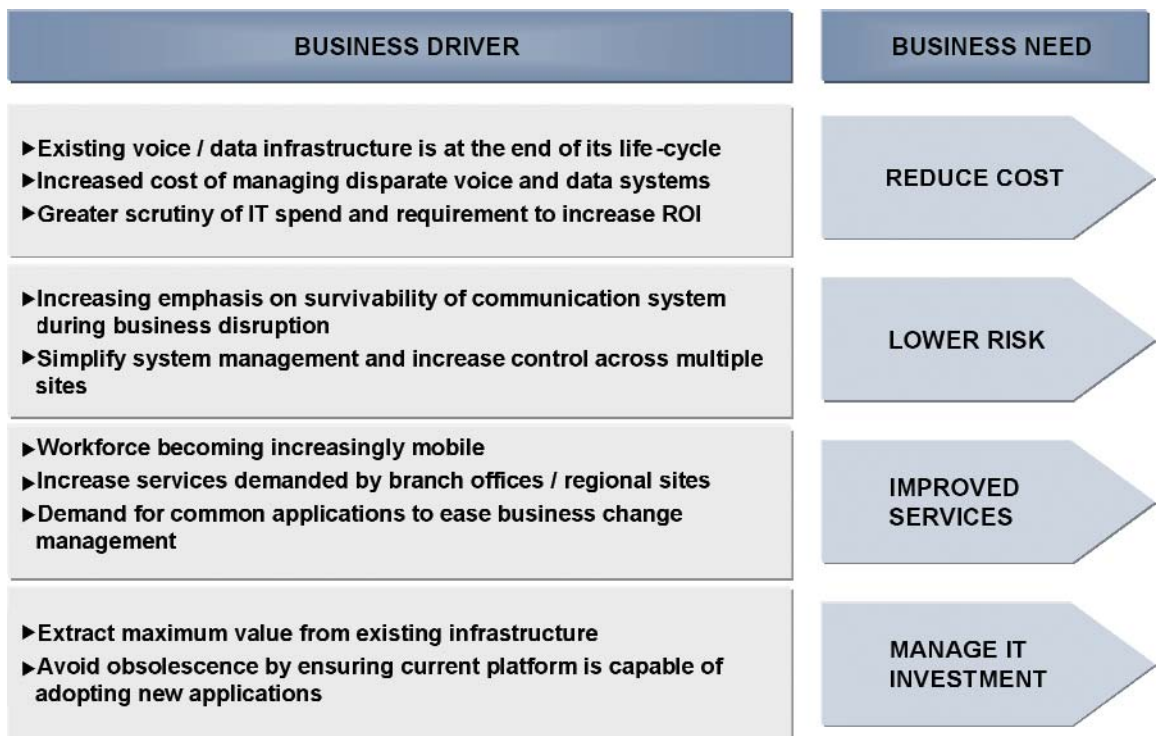
A key driver of VoIP growth is the financial pressure on IT capital and recurring expenditure. Any major capital decision is subject to intense scrutiny and options to defer or avoid expenditure are closely examined. There is also the requirement to deliver higher service levels with lower recurring costs.

The need to replace existing infrastructure is frequently the catalyst for an assessment of VoIP. Faced with a large capital outlay, organisations reassess IT strategy and consider the benefits of new technologies.

In addition to the imperative for cost reduction, strategic considerations include the demand for greater service levels, the need to protect existing infrastructure investments and risk management considerations.

The sources of motivation driving organisations to adopt VoIP can be summarised into four business needs.

Figure 1: Business drivers leading organisations to consider VoIP technology



Businesses are demanding solutions that will save money and simultaneously deliver proven benefits with relative ease of implementation.

Building the case for change

For many, cost savings have been the initial motive to evaluate IP telephony systems. However, lower cost is just one of the benefits available. Figure 2 summarises the benefits of VoIP into four categories.

Figure 2: Business benefits of VoIP technology

BUSINESS NEED	VoIP BENEFITS
REDUCE COST	<ul style="list-style-type: none"> ▶ Utilise existing data network to minimise toll charges ▶ Lower implementation costs through efficient rollout of software updates and changes across multiple sites ▶ Reduced operational and management costs (MACS) through the central management of IT administration
LOWER RISK	<ul style="list-style-type: none"> ▶ Migration strategy deploying hybrid solution ▶ Network consolidation ▶ Survivability, continuity of service across multiple sites
IMPROVED SERVICES	<ul style="list-style-type: none"> ▶ Total mobility of office telephone across multiple sites and between home and office ▶ Full telephony functionality standard across all sites
MANAGE IT INVESTMENT	<ul style="list-style-type: none"> ▶ Leverage existing data infrastructure ▶ Ability to migrate existing voice technology to IP

Reduce cost

The main driving force behind VoIP is demonstrated cost savings through;

- lower call charges;
- reduced requirements for maintenance and support; and,
- potential to avoid significant capital investments.

Savings in call charges, commonly referred to as “toll bypass”, arise from the ability to utilise data networks to call between traditional telephony systems without incurring additional carrier charges. Compression technology allows the efficient use of available bandwidth and sharing of VoIP with other applications over a data network. When a call is not in progress, or there is silence during a conversation, bandwidth is shared with other applications, including other IP telephony conversations.

VoIP – It is now a reality

Consolidation of voice and data networks into a single network eliminates the overheads associated with running two completely separate communication systems. Managing a converged network is more cost effective as support resources, such as the help desk and technical staff, are shared between voice and data. In addition to the reduction in system overhead arising from a single network, telephony support is simplified in a VoIP environment. Telephony changes associated with adding and moving people no longer require the involvement of technical staff. Moves can become as simple as picking up a telephone and plugging it into an available network port.

For companies setting up 'Greenfield' sites, investment in voice and data infrastructure can be dramatically reduced through sharing of switches, routers and cabling.

Lower risk

Consolidation of voice and data into a single network simplifies network management and allows a greater concentration of resources on risk management including disaster recovery and business continuity planning. Change management is made easier as there are fewer elements within the IT infrastructure that are impacted by a change.

IP based networks can be engineered to minimise downtime in the event of a network failure through remote survivability nodes. This ensures continuation of service through network disruption.

Furthermore, VoIP can be implemented with low risk through adoption of a hybrid solution which incorporates IP technology into existing voice infrastructure. This avoids the risk of totally replacing existing infrastructure in a 'big bang' upgrade.

Improved services

The functionality of VoIP systems varies significantly based on the focus of the vendor. Suppliers with a long history of product research and development and practical implementation experience offer dramatically improved services.

Often regional sites use different combinations of equipment and services that limit common applications across the business. This results in additional complexity of IT management, higher training requirements and increased change management costs. VoIP solutions allow all sites to utilise the central telephony system. This creates a standard structure across the entire organisation with greater functionality while reducing infrastructure requirements at regional sites.

Mobile users can utilise VoIP to access the same features and functionality as those who are directly connected to the main telephony system.

Customer calls can be answered immediately, avoiding the costs and frustration of 'telephone tag'. Moreover, 'multi-site hoppers' who frequently move between offices can utilise a PIN and login system at any extension nationally with the result that calls are routed to that extension as if they were back in their own office.

Manage IT investment

IP telephony can be introduced without the need to replace existing infrastructure. The introduction of a hybrid solution allows VoIP that combines best-in-class voice technology with an existing communications infrastructure.

Commercial developers are concentrating their effort on creating new services based on the IP platform, enabling adopters of IP telephony the ability to utilise future applications.

Pathways to the future

Once the business need has been identified and the decision is taken to move to VoIP, an organisation must decide the most appropriate way to proceed. The key determinants are whether existing or new premises are being considered and whether an evolutionary or revolutionary path best suits your organisation. A model of potential paths to VoIP is presented in Figure 3.

Figure 3: Pathways to VoIP

	EVOLUTIONARY	REVOLUTIONARY
EXISTING PREMISES	<p>UPGRADE Leverage existing IT investment</p>	<p>FORKLIFT Replace existing infrastructure</p>
NEW PREMISES	<p>HYBRID Increase business flexibility</p>	<p>PURE IP Minimise investment in infrastructure</p>

Existing premises - forklift

The term ‘forklift’ refers to the situation where an entire communications infrastructure is replaced in a single instance.

The ‘forklift’ approach is often touted as the fastest way to achieve the business benefits of VoIP in an existing premise. This approach is firmly rejected by Gartner, the worlds leading IT&T research organisation which states ‘Forklift expansions are bad news for all customers’.³

The ‘forklift’ approach to a change over of communications systems has the potential for a high degree of business disruption. The loss of existing infrastructure, combined with the high up front investment in new equipment means that this approach is seldom cost effective.

Given that technology manufacturers have been building IP enabled systems since 1994, a comprehensive replacement of infrastructure is rarely required.

³ “Convergence: Evolution or Revolution” Gartner White Paper, 2000

Existing premises - upgrade

A system upgrade refers to the conversion and integration of existing infrastructure with current IP telephony while still supporting the use of analogue and digital phones where required.

An upgrade of voice systems provides the lowest capital investment and a low risk implementation path to achieve an IP solution. Organisations can migrate to IP in stages, preserving their existing telephony investment while taking advantage of the next generation of network benefits that IP offers. In this way, a company can choose what is implemented and when, according to the expected benefits. Results of each phase can be clearly measured on implementation.

When considering upgrading existing infrastructure it is important to evaluate existing and future capacity of the data network to ensure it has the capacity to accommodate the additional load of voice traffic and whether quality of service mechanisms are in place to give voice priority over other data traffic.

New premises - hybrid

A hybrid solution integrates the high level of functionality offered by traditional telephony systems with the benefits of IP telephony.

Users benefit from the familiarity of traditional telephony systems yet infrastructure costs are minimised as voice and data networks are combined. Organisations have the flexibility to apply IP telephony where it makes sense across the business. At the same time, digital and analogue technology is available to provide a low cost alternative where IP functionality is not required by users. Furthermore, analogue technology may be required to support equipment such as fax machines, emergency and elevator telephones. Applying a combination of IP, digital and analogue technology results in a cost effective solution.

A vendor with strong technical competence in both traditional and IP technology will be required to implement and support a hybrid solution.

New premises - pure IP

A pure IP model describes a converged voice and data network that uses IP as the transmission mode.

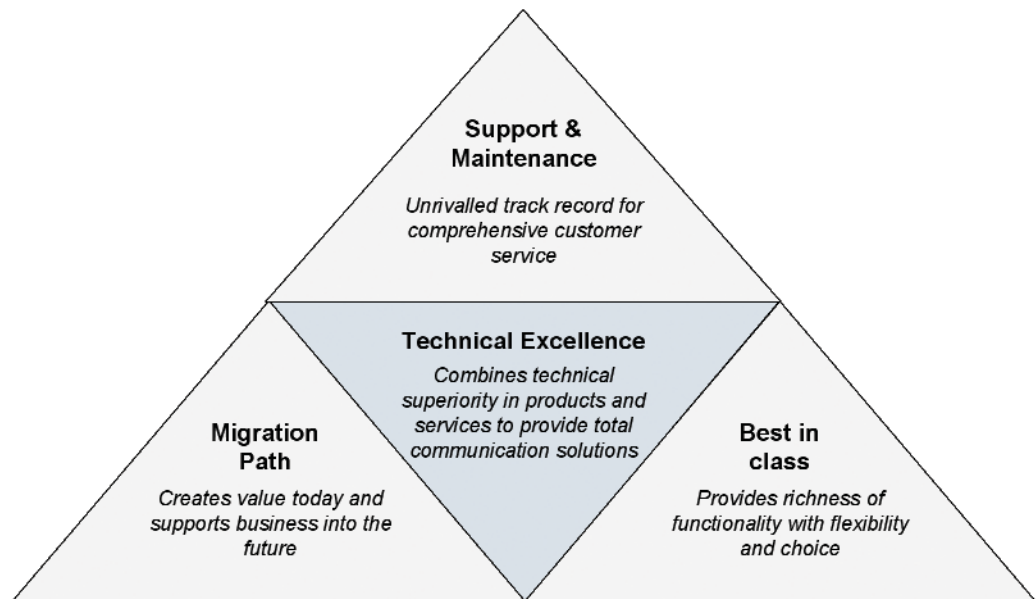
A decision on whether to follow a Pure IP route in new premises will depend on the preferences of the business. Network simplification is achieved through the complete consolidation of voice and data infrastructure, reducing on-going IT management and administration costs.

The key determinant for organisations with a Greenfield site considering a Pure IP solution is the ability to justify the initial investment in infrastructure through cost savings.

Why NEC Business Solutions?

In 1977, Dr Koji Kobayashi, the then CEO of NEC Worldwide predicted the convergence of computing and communications networks at around the turn of the century and announced the concept of “C&C”, computers and communications. Since that time NEC has built its convergence strategy on combining renowned technical excellence with legendary customer support, a migration path that dates back to 1983 and a “best in class” philosophy.

Figure 5: Foundation of NEC's strategy



Technical Excellence

Technical excellence is the cornerstone of NEC's ability to deliver end-to-end voice, data and video solutions for business and government.

NEC has recently been ranked as the number one IT&T vendor in Australia in independent surveys of federal government agencies and Australia's top 500 corporates⁴.

For the past twenty years, NEC has been Australia's leading telephony supplier with sales of more than 20,000 traditional systems and 50,000 systems in the key telephone systems market.

NEC has always been an active participant in the generation and acceptance of internationally accepted communications standards. Adopting international communications standards ensure that products from a wide range of third party vendors can be effectively integrated into NEC solutions.

NEC's managed services arm currently serves

- 5,200 clients in Australia
- across more than 1,000 sites nationally
- with 180,000 handsets under management.

⁴“The Corporate Report”, May 2003 & “The Canberra Report”, July 2002, East & Partners

Australia's most responsive IT&T vendor for maintenance and support

NEC's total commitment to maintenance and support is renowned within the IT&T industry. Customers can confidently rely on NEC to have the resources and the technical expertise for ongoing support following a transition to VoIP no matter where they are located in Australia.

NEC's standard for excellence in customer service is based on;

- over 200 support staff nationally
- NEC's world-class national operations centre is equipped with industry tools to proactively manage customer networks, systems and applications.
- NEC's customer service centre operates 24 hours per day, 365 days per year and provides desktop enquiries, end-user technical assistance and remote system access capabilities
- NEC's geographic coverage is virtually unrivalled with a comprehensive network of services partners throughout regional Australia and the largest dealer network in Australia.

A proud history of migration

NEC's solutions were built on the philosophies of flexibility and choice for all customers. NEC provides a complete technology 'roadmap' that allows customers to protect their existing investment in communications technology infrastructure.

NEC has an impressive and consistent strategy of offering investment protection for existing NEC customers.⁵ Over the past two decades NEC has introduced new technologies in its traditional telephony line that are evolutionary and not revolutionary. Gartner stated that NEC has provided a consistent upgrade path for its traditional telephony customers and has been able to offer migration and backward compatibility to earlier systems, dating back as far as 1983.

NEC's technical excellence and consistent migration path means that customers can achieve the benefits of VoIP through a smooth transition that utilises and builds upon existing infrastructure. This negates the need for the "Forklift" approach where existing infrastructure investments are discarded whilst the business faces a period of significant disruption during an uncertain changeover.

Proven 'best in class' solutions

NEC does not believe that a single vendor can provide an end-to-end solution for convergence. Its strategy is to integrate into its customers preferred network infrastructure, combining the richest functionality with flexibility and choice. NEC has developed VoIP solutions to be 'best in class' and has a recognised ability to create, deliver, and maintain the best communications solution that bring a competitive advantage to its customers.

⁵ "Convergence: Evolution or Revolution" Gartner White Paper, 2000

Conclusion

VoIP growth has increased significantly as Corporate Australia moves to capture the compelling cost savings that can be achieved. Individual business needs must determine the most appropriate path to IP telephony for your organisation.

NEC's long-term ability to deliver end-to-end voice, data and video solutions to government and corporate Australia is based on four dimensions of excellence:

- Technical excellence
- Support and maintenance
- Migration path
- Best in class

NEC's proven track record against each of these dimensions makes it a clear choice of vendor partner in the transition to VoIP.

CASE 1: Hammersley Iron – Managing The Tyranny Of Distance

Hammersley Iron is one of Australia's leading mining companies, with extensive operations in Western Australia's remote Pilbara region. Spread across a vast and inhospitable area, Hammersley's 17 facilities are well beyond reach of the public switched telephone network.

Hammersley Iron has gradually expanded its operations, adding new telephony technology and infrastructure as needed. It has also taken advantage of the higher capacity infrastructure being installed by telecommunications carriers such as Telstra's 2Mbps Megalink service. However, capacity on such leased line services is expensive, along with the need to upgrade its 13-year-old NEC telephony system, led Hammersley Iron to review its communications infrastructure.

NEC's solution migrated Hammersley to a converged voice and data solution, while retaining traditional telephony functionality. A key step was to replace aging routers and other network equipment with next-generation telephony systems, which handle traditional telephony but are also Internet Protocol (IP) servers. This enabled telephony for Hammersley's remote sites to be brought onto a single data network, greatly simplifying network management and maintenance requirements.

By upgrading from the Megalink service to Frame Relay with its more competitive data traffic pricing, NEC has helped Hammersley to:

- reduce overall connectivity costs by around 30%.
- reduce network capacity usage by up to 88% by moving from time division multiplexing (TDM) to Telephony over IP on trunk routes.

On top of reduced data communication costs, the collective result is exceptional voice quality and application performance for users.

According to Mr Perry Lowth, Commercial Analyst, Hammersley Iron, the NEC solution offers Hammersley a growth path to telephony over Internet Protocol in the future. Not only will Hammersley be able to leverage from its existing technology investment, backwards compatibility will provide Hammersley with continued access to traditional telephony features.

CASE 2: Moonee Valley City Council's – Networked Telephony

Moonee Valley City Council provides services to over 112,000 residents within the Melbourne metropolitan region. With over 350 employees, located across seven council sites, the council's is focused on serving its constituents.

Like many councils, Moonee Valley faced the challenge of updating an antiquated telephone system to efficiently and effectively service customer enquiries while utilising existing infrastructure and keeping expenditure to a minimum. "We were hamstrung by a system that had reached maximum capacity and realised that to expand the existing telephone network to meet future organisational and customer service needs, was going to be a very costly exercise for Council" commented Maureen Trezise, Manager Information Services, Moonee Valley City Council.

Following twelve months of research and planning, Moonee Valley became the first City Council in Melbourne to switch to networked telephony – a solution which carries data, video and voice traffic simultaneously on the one network. The new system, supplied by Tiecom, comprises an NEC Enterprise Communication Platform (ECP), network infrastructure from Hewlett-Packard Australia (HP) and Performance Solutions software. The network utilises NEXTEP Broadband technology.

"What initially impressed me about this offering was that we could combine the NEC telephony over Internet protocol technology with our existing HP infrastructure, greatly reducing our infrastructure costs," says Trezise. "We didn't have to totally replace our system in order to upgrade our technology."

The solution allows the Council to:

- move voice calls and data over the same network
- easily relocate employees as personal details and internal extension numbers travel with the staff member to the new location – the telephone is simply plugged into any PC/data point
- deliver computer operated voice mail, call forwarding and direct internal dialling
- significantly reduce phone maintenance charges and line fees by enabling internal calls between sites.

The Council has already begun to experience immediate benefits and savings after implementing the system. "In addition to switching to a cheaper carrier service, we calculated the ongoing costs of phone rental, maintenance charges, on-hold messaging, adding or moving an employee, and the frequent external calls to other Council sites, and realised our savings would be substantial. As a result, the system is already paying for itself."

"This system has exceeded all our expectations: communication in all areas of the Council has been streamlined; it has obvious customer service benefits; and we can prove return on investment to our community."

CASE 3: National Jet Systems – Voice and Data Converged

National Jet Systems, a leading passenger and surveillance aircraft service provider, wanted to improve communications between its 8 regional sites while simultaneously reducing operating costs.

National Jets Systems have service sites in Adelaide, Broome, Perth, Darwin, Cairns and Melbourne. This wide geographic dispersion meant a high volume of long distance calls.

To address these issues, National Jet Systems installed an NEC converged IP voice and data network.

“Initially we were reluctant to go down the track with VoIP as it was fairly new to the market,” said Steve Tucker, IT Manager, National Jet Systems. “However, when we pursued it with NEC, they demonstrated a clear expertise with IP solutions, and particularly VoIP.”

With NEC’s IP Solution, National Jet Systems has realised many business benefits. The greatest of these has been an improvement in the robustness and availability of their voice circuits. “After a month of testing the system we’ve experienced outstanding improvement in the quality and robustness of our voice networks. There has also been a dramatic improvement in the quality of our data – applications are now much faster and more reliable,” said Daniela Marsilli, Managing Director, National Jet Systems.

The converged network gives the group greater efficiency in terms of network utilisation. In addition, National Jet Stream has more liberty to deploy real-time server-centric applications, which until now have proven far too slow over the WAN environment.

The IP migration solution provided by NEC Business Solutions gave National Jet Systems the most cost-effective method of carrying its voice and data via their existing network, and of providing the ability to grow according to their needs.

“We anticipate cost savings of between \$24,000 and \$48,000 per year, as a direct result of migrating our communications infrastructure to a single IP network,” said Daniela. “Additionally, we expect longer term productivity increases, as a result of our user’s adopting more server-based applications across the network.”

National Jet Systems have plans to further explore IP telephony. “Desktop IP telephony and remote IP telephony are things we are keen to train and test with NEC Business Solutions”, said Steve. “NEC pioneers these technologies and then makes them available to us which is another advantage of dealing with NEC.”