INTRODUCTION

Over the past six years we have seen converged data and voice services enter the mainstream by both large and medium enterprises.

This white paper examines the benefits of such network strategy and the important aspects to consider when deploying a converged voice and data network.
WHY A CONVERGED DATA AND VOICE NETWORK?

Advancements in networking and application technology have led enterprises down a converged network designed to enhance business application delivery and improve access to information and collaboration.

Organisations often have an existing voice network managed separately from their data network. In many cases, the legacy voice infrastructure is dated and difficult to manage, with multiple vendors and extension additions over years giving rise to a heterogeneous network with many different PBX and key systems, resulting in high management and maintenance costs. Hence, more organisations are taking the first convergence step to implement an IP telephony system (IP PBX), moving onto other applications such as unified messaging in due course.

With IP telephony, voice calls will be digitised and carried using VoIP technology on an existing IP-VPN. Voice will then be viewed as just another application alongside other critical business resources such as ERP and CRM to be running across the IP-VPN. There are many business benefits for a converged voice and data network.

1. COST SAVING AS THE KEY DRIVER
Cost saving is expected when moving to a converged voice and data network. The main cost savings are typically from:

**Voice hardware**
By deploying VoIP and centralising the call switch functions, PBX hardware and key systems are no longer required in the branches or small sites.

**Maintenance support**
The high support cost for disparate and multi-vendor systems usually found in various offices can be significantly reduced to the support for a centralised system in the head office or data centre.

**Voice call costs**
This is often the most prominent reduction, as inter-office calls can now be carried over the IP-VPN, resulting in significant savings in PSTN call charges.

**Network management**
There is now only one network to manage, resulting in saving on IT support costs and freeing up IT resources to focus on the core business applications.

**Trunk cost saving**
By removing ISDN and phone lines and replacing them with SIP trunks, savings of up to 60 per cent in monthly rental costs can be achieved.
Business Continuity - there are two elements to this: high availability network and disaster recovery features.

2. BUSINESS CONTINUITY

High availability
As all communication services and applications are being carried over a single converged IP network, high availability is critical to the business. Hence the IP-VPN services should be carried on a high performance MPLS core network with in-built redundancy and multi-carrier access to eliminate any single point of failure. Diverse transmission paths should be implemented between any core switching nodes to provide high availability. It should be well managed by a network centre that operates 24/7 with sophisticated network management tools to provide fast resolution to network faults. Select a service provider with a fully meshed network and high availability targets for its core network.

Disaster recovery features
Protection on the WAN is not sufficient to safeguard business operations. The possibility of voice CPE equipment failure or natural disasters – such as flooding – affecting the office site can also disrupt your voice network, with potential loss of business due to customers being unable to reach you. This risk can be mitigated if one chooses a SIP trunking service that comes with business continuity features such as auto call diversion. When the IP PBX is not reachable, calls can then be diverted to your employee’s mobile or to another office.

3. PRODUCTIVITY IMPROVEMENT

Implementation of IP telephony is only the starting point on the journey of a converged voice and data network. IP PBX very often comes with a rich set of Unified Communications (UC) features such as audio/video conferencing, unified messaging, web collaboration, softphone and mobility extension to provide a more flexible working environment and facilitate effective collaboration, leading to increased work efficiency. UC is becoming very popular in Australia. More than $2 billion has been spent on UC solutions in Australia in the last 3 years*. Apart from enterprise telephony, email integration and conferencing and collaboration attracted the most investment in 2010**.

From a recent market survey, it has been revealed that enterprises that have deployed UC have reaped the following benefits:

- Reduced operating costs (54%)
- Increased productivity (50%)
- More reliable communications (44%)
- Improved cross-functional communications (37%)

4. FUTURE-PROOF YOUR NETWORK

To future-proof your organisation when implementing an IP Telephony system, select a service provider with SIP trunk service. Up to 70% of PABX systems in Australia are not IP-PBX with SIP Trunking capability and hence cannot be directly connected to the NBN network. These systems will need to be replaced or upgraded to future proof your network for NBN rollout.

5. SIMPLICITY

This is an obvious benefit as the number of network overlays can be reduced with less network elements leading to reduction in network management cost.

Source:
*Frost & Sullivan Australia ICT Outlook 2012
**CDW 2010 unified communications tracking poll
KEY CONSIDERATIONS WHEN DEPLOYING A CONVERGED DATA AND VOICE NETWORK

INTERNET VS PRIVATE IP
When implementing a VoIP network, there is often confusion around what is the appropriate IP network required to carry business grade voice services. Some may believe that VoIP can work well over a secure public internet line via IPSec (a data encryption technology) because of the perceived cost benefits. However, this solution is plagued with quality of service issues. The resulting loss of business or impact on company image very often outweighed the cost saving.

To achieve toll quality voice, an IP Telephony network has to be implemented over a private IP-VPN with end to end Quality of Service (QoS).

THE IMPORTANCE OF QOS
QoS is essential to give priority to voice and video traffic. As voice and video are very sensitive to network latency and jitter, but not so much as to packet loss, a converged data and voice network should give priority to these two traffic types to ensure reliable, high quality communication.

QoS in the LAN
Ideally, a separate VLAN should be used to separate voice and video traffic from data traffic to improve performance. Use standard 802.11q VLAN tagging system to segment this traffic into your LAN. When configuring QoS on LAN Switches, always give the highest priority to VoIP traffic and second priority to VC traffic.

QoS on the WAN
Always choose an IPVPN service provider that has implemented a carrier grade Multiprotocol Label Switching (MPLS) network with a full end to end QoS model. The end to end model is important as any single weakness point on the end to end path can cause substantial degrade in voice quality.

MANAGEMENT TOOLS
As your traffic is being carried on a virtual private network, visibility and control on your traffic performance metrics is essential for fault finding and network planning purposes. Choose a service provider that can show a full set of QoS traffic performance measurements and report them in real-time via a secure portal with a single sign-on. Such tools should give you complete visibility and control of your IP-VPN and SIP Trunking services for effective management of your converged network. Additional tools that can alert you to potential performance or capacity utilisation issues will also help you manage the network.

APPLICATION ACCELERATION
These technologies indirectly help VoIP implementation. They should be considered especially if you have remote or branch offices where there is bandwidth constraint due to either high cost (e.g. remote areas) or technical feasibility (e.g. the site is relatively far from a local exchange). These technologies are usually deployed in the form of a single appliance sitting between the LAN and the router in the branch office. Most have a failsafe to hardwire technology to avoid network reliability impact.

The strategy is to improve the bandwidth utilisation and speed up the delivery of business applications to the end users through the WAN. Depending on the types of applications, most enterprises can achieve typical bandwidth reduction up to five times, enabling capacity to carry VoIP traffic to the remote and branch office sites.

STAGED IMPLEMENTATION VS ALL AT ONCE
This decision is mainly driven by size of the organisation, its geographic spread, number of legacy PBX systems to replace, complexity of its current network configuration and availability of IT resources. Choose a service provider based on its flexibility to accommodate your specific requirements. If staged migration is needed, it is essential to use a service provider with an IP gateway for legacy PBX to connect SIP Trunking services without the need to replace all legacy systems at once.
SUMMARY

Convergence is an essential step for every organisation to achieve significant cost savings and improvement on productivity. Those who do not adopt convergence are forfeiting a key competitive advantage.

TAKE A STAGED APPROACH

If you are constrained by IT or financial resources to implement the full convergence and UC roadmap, you can adopt a staged approach by deploying your first IP telephony system and SIP trunking connections to sites where legacy PBX systems are due for replacement.

SERVICES

Service can be extended to other sites progressively and additional UC features can be activated over time to reap the full benefits of UC and a converged voice and data network.

CHOOSE THE RIGHT PARTNER

Choose a carrier partner that is well experienced in convergence, one who operates high availability QoS-enabled IP networks and one who can provide SIP Trunking services with business continuity features and powerful management tools to help you effectively manage your converged network.
ABOUT MACQUARIE TELECOM

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ALWAYS ON

Ensured availability of service in its entirety - from the network to the data centre.

ALWAYS EFFICIENT

Extending your team and infrastructure through one source of exceptional service.

ALWAYS SECURE

Keeping your data safe and in the country with the most secure service provider in Australia.