

Connectivity 4.0 series – part 1

The new business imperative

Your road map to building tomorrow's networks and connected technologies to support your whole-of-business digital transformation.



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Foreword

As the world emerges from the COVID-19 pandemic, businesses are doubling down on the new strategies they put in place to ensure they not only survive the disruption but ultimately thrive.

Yet with each year come new challenges. A redistribution of the workforce has challenged employers to maintain service levels amid today's chronic skills shortfalls.

Just as cybercriminals declared cyber war on the world's business community when it was at its most vulnerable, renewed conflict on the battlefields of Ukraine has escalated risk for every business – even in Australia. This is the peril of increased connectivity. Yet even as organisations face these challenges head on, an increasingly challenging economic climate is further distorting the situation.

The end of cheap money is behind us, forcing a complete return to the fundamentals of business. In this environment, you must be brutally clear about where your business makes money, how it makes money, and what kind of people and culture will enable it to succeed.

The sharpening of the macroeconomic climate means that the companies best poised to succeed will be those that not only understand their business and their market, but also appreciate the strategic value of new technologies – and understand that connectivity is the glue that holds it all together.

Far removed from the point-to-point connectivity of yesteryear, today's connected business environments are vast, interconnected webs of data and services. Connections are being created and changing continuously as businesses embrace new technologies for supporting remote teams,

integrating closely with partners, servicing customers, extending control to industrial environments and linking new sensors.

These are just some of the many things that keep today's enterprises moving – and they all depend on having fast, pervasive, ultra-resilient, future-proof networks.

At Vocus, we have long been working with many of Australia's most important government and enterprise organisations to tap this promise, and it is only getting more significant as time goes on.

This report explores the challenges of the current era and how next-generation connectivity solutions can resolve them. I trust you will find it illuminating and challenging in equal measures – and I look forward to hearing how you leverage it to build competitive advantage for your business and your customers.



Andrew Wildblood
Chief Executive, Enterprise and Government, Vocus

Executive summary

Emerging from the pandemic, businesses and governments have been lashed with a perfect storm of challenges — rising costs, the redistribution of the workforce, labour shortages, increased cyber risks, global geo-political instability, climate change and increasing customer expectations.

As a result, many organisations have doubled down on the digital transformations they began or accelerated during the pandemic. In fact, they are now transitioning to new operating models based entirely on digital tools and services.

These operating models are not about implementing one or two applications, but instead revolve around a complete rebalancing of the business. This includes reviewing the organisation's existing technology debt and implementing a whole-of-business technology transformation to take it to the next level.

Challenge established standards

It's a complete return to the fundamentals of the business, challenging established connectivity paradigms in the same way that Industry 4.0 has driven manufacturers to reinvent the way they develop and distribute their products.

Applying similar concepts to Industry 4.0 more broadly across the business spectrum means addressing issues in three key areas: mission-critical operations, employee experience, and environmental, social and governance (ESG). Within these areas are a range of business concerns, from managing risk and retaining talent to enabling sustainable business growth.

There are also technological issues to resolve, such as how to best optimise architectures for

hybrid cloud environments, deliver value from advanced technologies such as artificial intelligence (AI) and the Internet of Things (IoT), securely integrate operational technology (OT) and information technology (IT), and connect new and expanding digital ecosystems.

Reimagine connectivity

At the core of this reinvention is Connectivity 4.0, a new era in which network technologies designed to meet business needs have evolved to make ubiquitous connectivity a reality.

This first paper in our series introduces the bold new world of Connectivity 4.0 — the technologies driving it, how it works and why you need to embrace it, so your organisation can reimagine what's possible like never before.

We explain why runaway digital transformation has created a mandate to review corporate connectivity strategies; what elements it entails; and how it raises considerations such as information security and competition for relevant skills in the era of the Great Resignation.

Indeed, as we look past the Great Resignation, Connectivity 4.0 is a fundamental part of what we might call the Great Reconfiguration — and it's going to affect you, whether you're ready for it or not.

Read on to find out how your business can take control of this change and ensure that it stays ahead of the wave of business transformation.

What is Connectivity 4.0?

Just as the transition to Industry 4.0 is revolutionising business by integrating digital services and processes into every aspect of operations, Connectivity 4.0 can revolutionise the way those services connect with each other and the world around them.

Connectivity technologies have evolved through several eras, from the original public switched telephone network to early computer networks, the internet and beyond. And as businesses have become more connected, they have adopted an increasing range of technologies. However, choosing those technologies has traditionally involved balancing performance with flexibility and availability.

Connectivity 4.0 is a new era in which these technologies have evolved to the extent that organisations no longer need to compromise. Together, these technologies can provide ubiquitous connectivity across terrestrial and subsea fibre, regional 4G and 5G mobile services, satellite coverage, and private long-term evolution (LTE) campus networks.

What's more, you can choose a mix of technologies that provides both fibre-like performance and unprecedented resilience, along with the network flexibility and availability for your business needs.

Connectivity 4.0 is paving the way for high-speed, low-latency applications like autonomous vehicles and widespread sensor networks. But it's also driven by the need for ubiquitous connectivity for core business needs right now — including building resilient mission-critical services, transforming the employee experience, and achieving ESG objectives. It does this by unlocking a new level of pervasive connectivity, enabling organisations to reimagine what's possible like never before.

Drive change to address new business fundamentals

The forces driving digital transformation were in place well before the COVID-19 pandemic redefined the world as we know it. Organisations that were focused on steadily achieving growth and efficiencies have had to accelerate their digitalisation plans, or rapidly change strategies over the past two years.

They have had their resilience tested by pandemic-disrupted supply chains, climate change, natural disasters, and the Ukraine conflict and other geopolitical instability. To top it all off, inflation is rising in Australia and abroad, for the first time in decades.

Organisations have had to change their approach to managing talent as workers have reassessed their expectations and considered other opportunities. Amidst a resurgent global economy, staff and skills shortages have affected production, exacerbating the gap between supply and demand more than at any time in recent memory.

Daniel McCormack, Head of Thought Leadership (Research) in Macquarie Asset Management, part of Macquarie Group, has watched the perfect storm of disruptive forces take its toll as businesses scramble to deal with new economic, workforce, cybersecurity, supply-chain and other risks.

“The world has changed in some very fundamental ways,” he explains. “COVID-19 wasn’t the cause as such, but it accelerated the change.”

Recognise the core transformation enablers

Early in the pandemic, digital transformation was recognised as a critical way to meet new challenges. One Gartner survey, conducted in mid-2020, found that 69% of boards of directors had accelerated their digital business initiatives as a result of the pandemic’s disruption.

Microsoft CEO Satya Nadella famously noted that the company had seen two years’ worth of digital transformation in just two months.

That was an experience shared across the business world as companies sped up years-long transformation plans that suddenly had to be fast-tracked in a matter of weeks.

This increased overall spending on IT solutions and services dramatically. Gartner projected last year that Australian IT spending would

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increase from \$96.8 billion in 2020 to \$109.1 billion in 2022, as businesses invest heavily in new technologies to transform their operations.

Much of this IT spending was needed for pandemic-related purposes — to support remote employees, deliver goods and services to house-bound customers, gain more visibility of supply chains, and take advantage of market opportunities to reduce costs.

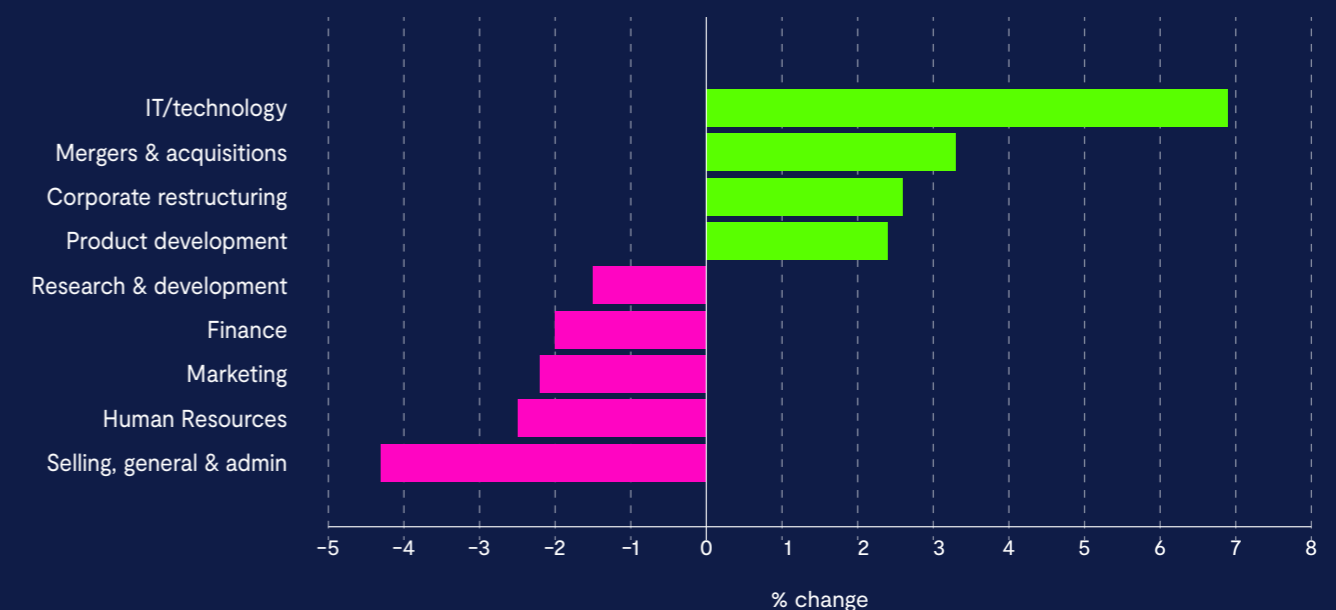
Networking and other connectivity technologies became even more vital as enablers of this change. “There was a general structural demand for connectivity going on already,” McCormack comments.

“But COVID-19 exacerbated that — and with a lot more people now working from home, there’s just a much greater need for connectivity.”

For many organisations, this meant embracing cloud-based technologies that deliver scale and ease of access to support new ways of working and operating. For others, it meant overhauling business processes to take advantage of data analytics and advanced technologies such as AI, IoT devices, and process automation.

Faster, richer and more robust connectivity has created new business opportunities, but it has also raised the stakes around data and infrastructure security. That has become more important than ever as increasingly digital businesses find themselves exposed to cybercriminals seeking to disrupt or destroy the business processes that these systems enable.

Average budgetary changes in 2020 as a result of COVID-19 impact



Source: Gartner, September 2020

Lay the groundwork needed to tackle new challenges

Even as the world opens up again, it's clear that the business operating environment has changed forever. Remote working has evolved into hybrid working, which is now a business imperative in the battle for talent. The digitalised services that were born out of need have become an ever-increasing customer expectation. Meanwhile, economic conditions remain volatile — and are likely to stay that way for some time as the world's business community feels its way back towards normal operations.

“The global economy bounced back robustly from the pandemic and demand came back because of the aggressive easing of monetary and fiscal policy,” McCormack says. “But supply didn't come back, both because of disruptions to supply chains and because the supply of labour just hasn't come back as forcefully as people would have expected.”

Exacerbated by the pause in migration, the labour shortage has hit hard as organisations struggle to find and retain the staff they need.

The Australian Bureau of Statistics recorded 480,100 job vacancies in May 2022 — up 13.8% from the previous quarter and 29.7% year on year. One in four businesses reported having at least one vacant position, more than twice the number at the beginning of the pandemic.

After decades of low inflation and interest rates, the explosion in demand, and limited supply of resources and staff, have pushed businesses into a fundamentally different operating environment. It has sent them scrambling to find ways to maintain the continuity of their operations in the face of all this change.

In this environment, digital transformation is more important than ever if organisations are to survive and thrive. It's a new world, full of both challenges and possibilities — and the organisations that most effectively transform to take advantage of those possibilities will be best positioned for future success.

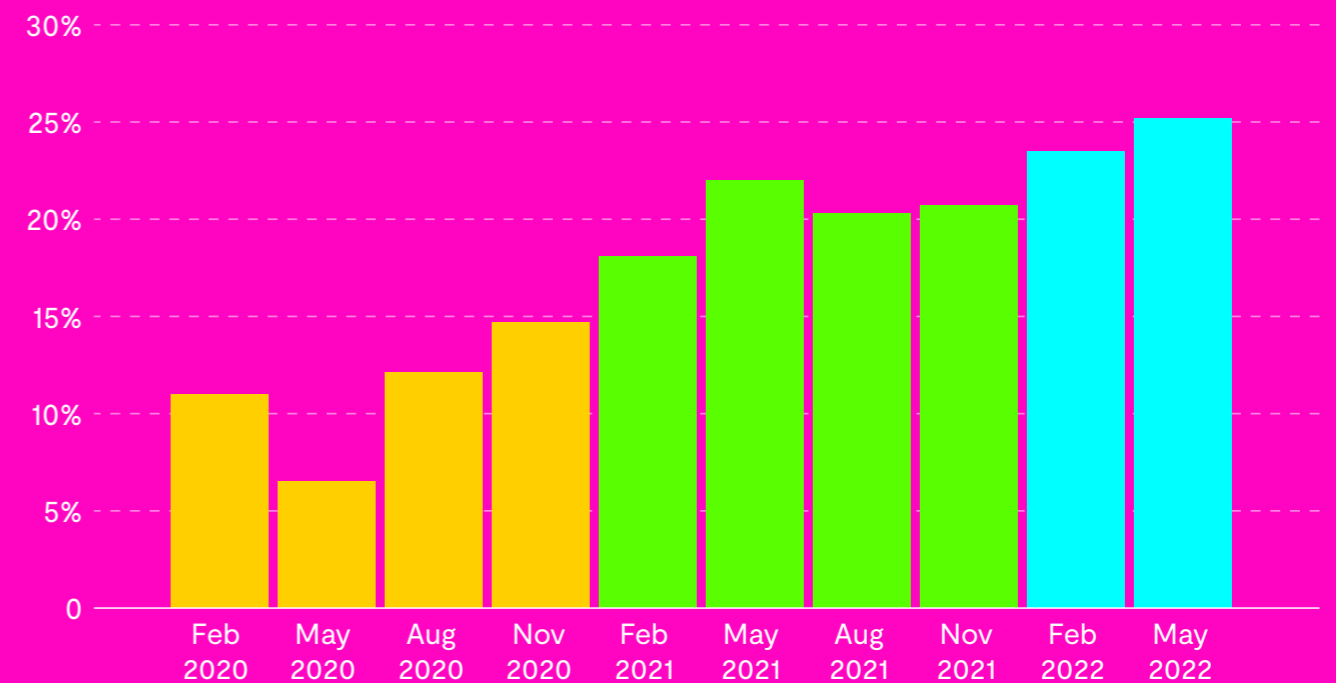


480,100 job vacancies in May 2022

up 13.8% from the previous quarter

Source: Australian Bureau of Statistics

Proportion of businesses reporting vacancies, Australia



Source: ABS Job Vacancies, Australia, 2022

The technology underpinning Connectivity 4.0

Underpinning Connectivity 4.0 are fast, ultra-resilient future-proof networks and connected technologies. At its core is fibre, which has the ability to provide extremely high-capacity and low-latency networks for linking offices, networks and hybrid cloud environments.



Fibre services can link major business precincts across a CBD — or across the country — to provide highly reliable connectivity that is also highly scalable. An ever-increasing array of subsea fibre cables is also extending the performance and reliability of fibre to provide global reach for new connectivity paradigms.



Augmenting fibre are wireless technologies such as microwave — a high-speed, point-to-point service for extending fixed connectivity across an area. Satellite was previously constrained by limited bandwidth, but with the launch of high-speed low Earth orbit (LEO) services is now capable of delivering fast speeds and much lower latency, anywhere in Australia or around the world.



Another key Connectivity 4.0 technology is private LTE, privately operated mobile networks that are installed in specific locations — such as at a mine, industrial site or factory — to provide continuous connectivity and latency low enough that it can support real-time control of autonomous vehicles or industrial processes.



Communications technologies have progressed enough that they no longer impose the speed or reliability trade-offs of legacy technologies. The availability of LEO satellite services has resolved the coverage dilemma, allowing satellites to work together with the other elements of Connectivity 4.0 to give businesses reliable, resilient and future-proof connectivity no matter where or how they operate.

All these technologies are fast, providing local area network-like speeds for both upload and download streams. They also offer much better latency profiles than in the past. They can ensure that organisations keep digital business processes running as smoothly as possible. Connectivity 4.0 technologies are also highly flexible, since they can be reconfigured and scaled on the fly to match changing business requirements.



Fast-track your whole-of-business transformation

The challenging new business environment will put further pressure on productivity, which has been stagnant for the best part of two decades, according to Australia's Productivity Commission.

“Companies need to invest more in the digital space to boost productivity,” McCormack says, “and they’ll be incentivised to do that because labour is becoming more expensive — and the economic world is going to be a bit more volatile. Those risks can be managed, but you’ve got to invest in the resources and know-how in doing so.”

McCormack identifies AI and automation as key technologies for improving productivity and freeing up workers to focus on activities that add more value.

By 2025, Gartner has predicted 70% of organisations will have implemented the structured infrastructure automation that will help them to significantly improve their flexibility and efficiency. That’s up from just 20% of organisations that were doing so last year — highlighting the game-changing nature of automation technologies.

Similarly, forward-looking organisations are fast-tracking the transition to Industry 4.0. A conceptual successor to the Third Industrial Age of mass production, Industry 4.0 refers to the wave of transformations in which organisations use connectivity and digital technologies to greatly improve their agility and drive efficiencies through automation.

For example, mining companies have invested heavily in automating vehicles that enable 24x7 mining operations at their remote sites. Government bodies are streamlining citizen services using workflow engines and extensive integration to bring together a range of back-end data sources. And utility companies are using IoT technologies to proactively and efficiently maintain equipment.

However, these and other digital solutions can’t be viewed in isolation. They are highly dependent on supporting IT infrastructure, and often on each other.

Digitalisation initiatives have resulted in enterprises building up huge quantities of data across widely distributed networks of applications and systems, both in the cloud and on-premises.

At the same time, many enterprises have adopted new platforms and modernised their application architecture to become more agile and accelerate their digitalisation initiatives. These apps, systems and platforms need to be connected and their

data integrated to unlock the full potential of analytics and AI, delivering the insights and productivity enhancements that organisations need.

Extracting full value from these new IT paradigms, however, requires a top-to-bottom review of technologies and operations as companies work to address core challenges such as building increasingly mission-critical services and enhancing the employee experience to attract the best

talent. Businesses are also under pressure to drive sustainable business growth by aligning their efforts with corporate ESG objectives.

Considering these challenges is a crucial part of any comprehensive business strategy. Enterprises must look beyond simply becoming ‘digital’. They must focus on how they can leverage extensive connectivity to drive whole-of-business technology transformations.

Why connectivity is the backbone of digital transformation

Digital transformation has been the defining business trend of the past few years, and telecommunications providers are widely acknowledged as being a core part of this transformation.

In fact, recent Vocus research found that 44% of telecommunications decision makers agreed that their provider plays a major or integral role in the success of their digital strategy.

56% of telco decision makers expect to increase their spend on telecommunications and ICT products and services in the next three years.

What are the most important traits of your telecommunications provider?

1. Having a strong network that is highly reliable and available
2. Having products and services with customised solutions that can scale with the business
3. Network reach and coverage, particularly to rural and remote areas

What factors are most likely to prevent you from choosing a certain telecommunications provider?

- Lack of coverage in rural/remote areas
- Inability to meet capacity/latency/ uptime requirements
- Inability to comply with network security requirements

Source: Vocus research, 2022

Build next-generation connectivity into your strategy

Given the increasing importance of data integration and dependency on digital connectivity, robust connectivity infrastructure is vital to the success of whole-of-business technology transformations.

“There’s very strong underlying structural growth in connectivity infrastructure,” McCormack says. “It’s a game of leapfrog, with strong demand absorbing bandwidth, followed by investment to expand bandwidth, incentivising new use cases, and then demands expand again.”

However, just as organisations have radically changed their approaches to IT over the past few years, transformation architects are readjusting their thinking to meet the connectivity challenges of today and tomorrow. They are looking beyond bandwidth to embrace Connectivity 4.0 — a holistic, flexible and scalable approach to reliably connecting the many apps, systems and platforms that organisations depend on in the digital age.

Whereas once business systems were built around slow, fixed wide-area network (WAN) connections, contemporary connectivity models abstract communications traffic onto internet protocol (IP) WANs. These networks can run over several technologies, including high-speed fibre-optic cables, point-to-point microwave connections, local wireless and satellite services.

With this speed comes flexibility. Businesses no longer have to schedule backups for off-peak hours so they don’t congest office network connections, for example. New, highly responsive, low-latency network technologies allow organisations to support increasingly decentralised applications that run in the cloud and integrate components from all manner of systems.

These days, there are so many communications options that businesses no longer have to worry that lack of connectivity will prevent them from communicating from one side of their operations to the other.



In fact, Connectivity 4.0 is enabling businesses to think about the way their people and systems communicate in completely new ways.

Networks no longer need to be viewed and managed in isolation. By tapping fast, ultra-resilient, future-proof networks, businesses can engage Connectivity 4.0 service providers capable of linking a broad range of networks and devices into a coherent, manageable whole.

In this context, the focus is less on thinking about connectivity as a point-to-point communications service, and more about thinking of it as a way of coordinating the many components involved in keeping digital business solutions operating efficiently.

“You have to change the people you’re talking to,” explains Phil Martell, Head of Strategic Network Development with Vocus. “You’re not talking to the IT community about delivering X megabits a bit faster anymore. You’re talking about an integrated solution to a wider range of problems.”

“You have to think about what it is that you’re trying to create, work backwards to look at what the infrastructure needs to support, and then come up with a proposal based on a mix of infrastructure and services.”

This service-based approach is particularly important in the era of hybrid-cloud infrastructure, which relies on connectivity to coordinate hundreds or thousands of application components and services that may be located anywhere in the world.

The faster those services operate and the lower their latency, the more seamless the digital business services they can deliver — enabling organisations to drive the whole-of-business digital transformation that today’s challenging environment requires.

In this context, increasingly connected data centres become key drivers of business change.

The increasing array of connected technologies is steadily reshaping the business infrastructure — and opening up new possibilities for businesses that are truly beginning to benefit from the redesign of contemporary business processes. In this way, Connectivity 4.0 has emerged as a critical enabler for change — and a core element of the digital businesses of the future.

Next steps for your whole-of-business transformation

1 Measure the success of change and outcomes

It's not enough anymore for applications and systems to just work. To optimise your business and employee experience, clarify your key performance indicators and develop monitoring tools that allow you to meaningfully track the progress of your reinvention. This includes partnering with infrastructure providers capable of providing clear, real-time visibility into operations and automation to help ensure mission-critical services are never running at less than their optimal performance.

2 Build resilient mission-critical services

In a world where digital transformation has made cloud-first deployment table stakes, services must be designed with the speed, robustness, and resiliency necessary to support continuous operation. In part 2 of our Connectivity 4.0 series, we outline a road map to building next-generation networks and connected technologies to support, modernise and secure mission-critical infrastructure and services.

3 Transform the employee experience

There's no point digitally transforming businesses if employees don't know how to make the best use of the new environment. A focus on employee experience ensures business platforms are designed in a way that makes them usable and effective from day one. In part 3 of our Connectivity 4.0 series, we provide a road map to building next-generation networks and connected technologies to help you attract and retain the best talent.

4 Drive sustainable business growth

Success for today's businesses means not only delivering products and services, but also operating in a way that meets the expectations of customers and investors that want to buy from and support environmentally and socially responsible suppliers. To meet this expectation, businesses must boost transparency by mapping their key initiatives back to ESG goals. In part 4 of our Connectivity 4.0 series, we outline a road map to building next-generation networks and connected technologies to help you realise your ESG objectives.



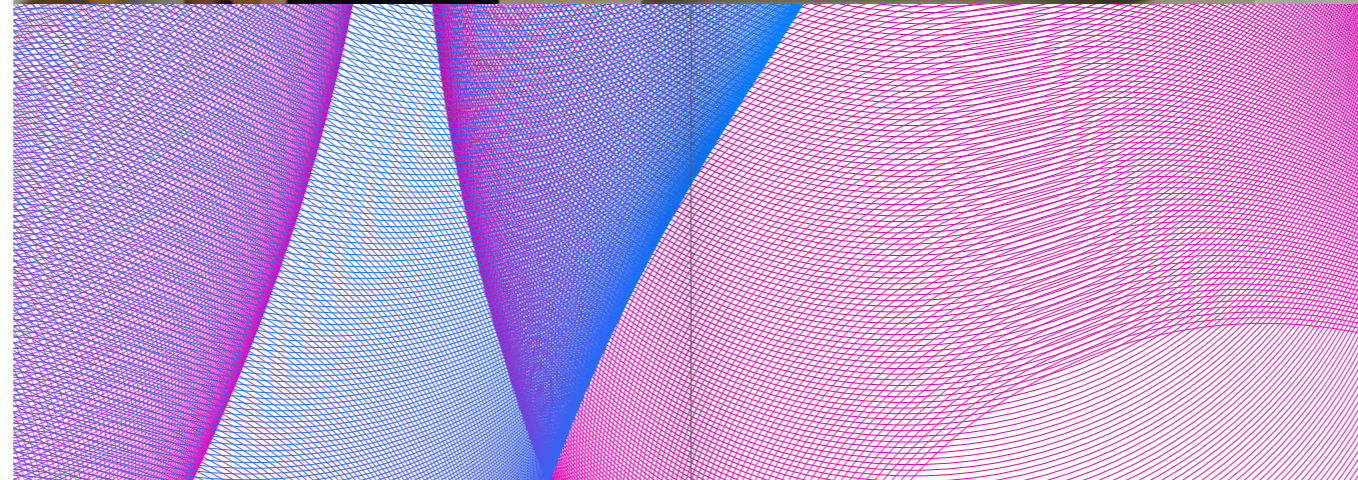
Transform your connectivity for the future

Change is an ever-present part of business, but in recent years the amount of change that organisations and workers need to deal with — human, technological, industrial, political and more — has been truly transformative.

Remote work has fundamentally rewritten the employee experience. The shift to online interactions has escalated the importance of customer engagement, driving businesses and governments to expedite their digital transformations. Natural disasters and interrupted supply chains have forced companies to be more agile and more resilient than ever. And staff shortages have pushed companies to deepen their commitment to hyper-automation as they look for new ways to do more with less.

Underlying all these changes is a need for ubiquitous, fast, resilient connectivity that not only provides and links the technologies involved but also enables the process change that businesses need to remain relevant.

No matter where your organisation is on its digital journey, Connectivity 4.0 will unlock a new level of pervasive connectivity, enabling you to reimagine what's possible like never before, and help better prepare your organisation for the future.



We thank the industry experts and Vocus experts for their contribution to our report.



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Vocus, Australia's specialist fibre and network solutions provider, owns and operates 25,000kms of secure, high-capacity fibre connecting all Australian mainland capitals with Asia and the USA. Vocus' network includes the 4,600km Australia Singapore Cable (ASC) from Perth to Singapore via Indonesia and the 2,100km North-West Cable System (NWCS) from Port Hedland to Darwin, connecting offshore oil and gas facilities. Vocus owns a portfolio of well-recognised brands catering to enterprise, government, wholesale, small business and residential customers across Australia.

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