A TIME FOR RESILIENCE

aarnet

"*2020* was a *defining year* for AARNet. It was one where the *resilience* of AARNet's infrastructure and our people came to the fore as *we responded* to the challenges caused by the bushfire crisis and the COVID-19 pandemic."

CHRIS HANCOCK AM, CEO AARNET

ANNUAL REPORT 2020 *A TIME FOR RESILIENCE*

CONTENTS

THE YEAR IN REVIEW

ABOUT US

SPOTLIGHT

FINANCIALS

Who we are & what we do

For more than *30 years* AARNet has provided reliable telecommunications services, along with an *expanding range* of data, collaboration and cyber security services, all designed to *meet the unique and ever-changing needs* of the research and education sector.

AARNet is a national resource, a national research and education network, run by AARNet Pty Ltd, a not-for-profit company owned by 38 Australian universities and CSIRO.

AARNet's customers include the shareholder universities (listed on page 41) and CSIRO, as well as most of the publicly funded research agencies, such as Australian Nuclear Science and Technology Organisation, Geosciences Australia and Australian Institute of Marine Science, several state government agencies, hundreds of schools, many TAFEs and hospitals, and most state and federal galleries, libraries, archives and museums.

AARNet infrastructure interconnects over two million users—researchers, faculty, staff and students—at institutions across Australia with each other and research and education institutions worldwide, the public internet, and resources such as scientific instruments, data storage and high performance computing facilities. We also interconnect content and service providers and organisations that collaborate with the research and education community.

AARNet underpins education across the life-long learning spectrum and research across a diverse range of disciplines in the sciences and humanities, including high energy physics, climate science, genomics, radio astronomy and the arts.

For researchers and educators working in today's increasingly globalised data-intensive world, AARNet services remove barriers to discovery and innovation.

WHAT SETS AARNET APART?

We pride ourselves on being future focused and providing what commercial operators are unequipped or unable to provide: an ultra high speed network and over-the-top services that push the boundaries of networking technology whilst delivering cost-effective and sustainable infrastructure for Australia. The research and education community relies on AARNet for outstanding service availability and service quality.

OUR VISION

is of a high bandwidth, globally connected Research and Education Network that connects Australian educators and researchers to those with whom they wish to collaborate anywhere in the world, with ease, speed and convenience that makes the issue of physical separation irrelevant. Unashamedly we care about enabling outcomes that benefit future generations of Australians.

OUR MISSION

is to enable globally competitive research, education and innovation by providing transformational connectivity and collaboration services to meet the unique needs of our customers.

OUR VALUES

ONE TEAM
Everyone counts and is accountable.
We are committed to teamwork and partnerships
– collaboration is at our heart.

CREATIVITY
Strive to innovate – it's in our DNA.
We embrace creative solutions to problems,
seek out diverse perspectives and enjoy what we do.

TRUST
Communication is open and transparent.
We are honest and ethical, and always respect
and support each other.
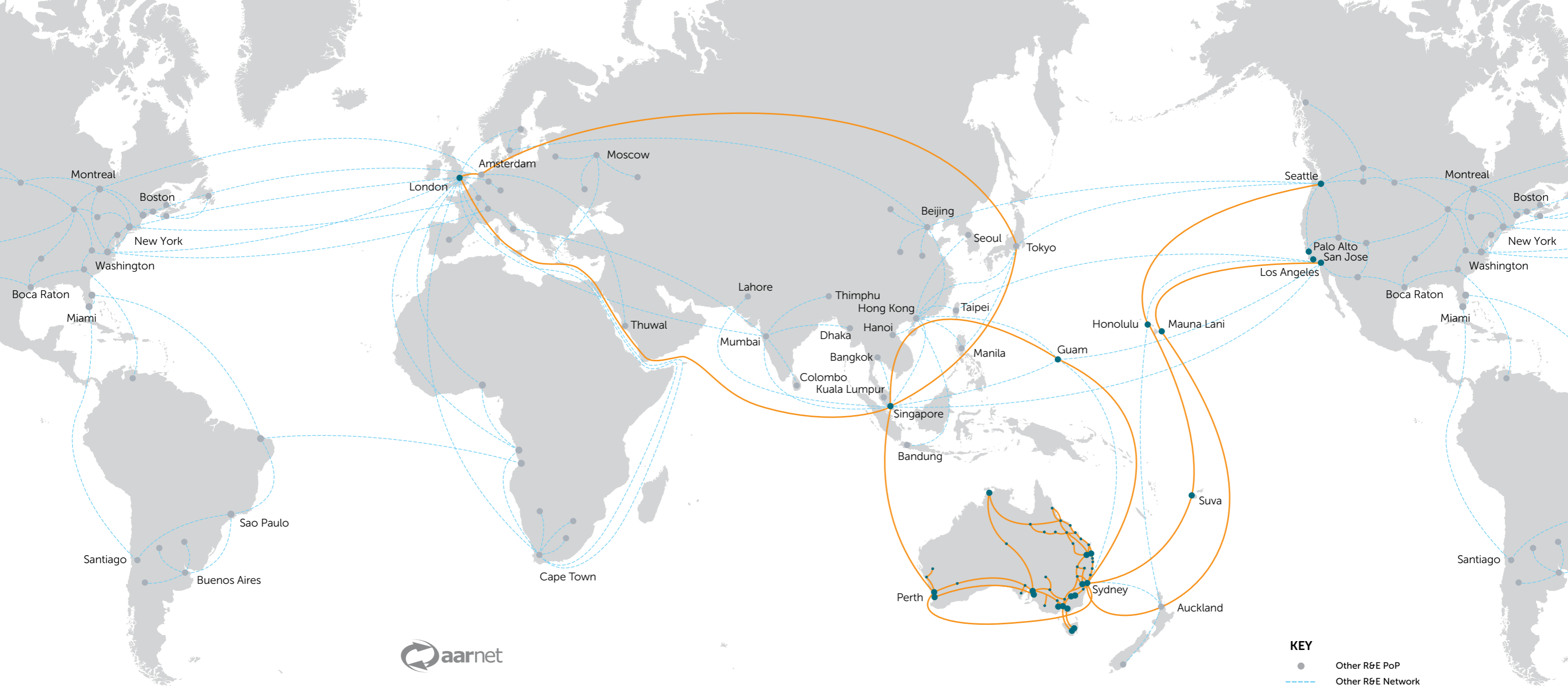
AARNET INTERNATIONAL NETWORK

This map is designed to be a conceptual
representation of the international R&E network

KEY

- ● Other R&E PoP
- --- Other R&E Network
- ● AARNet PoP
- — AARNet Network

AARNET NATIONAL NETWORK

Darwin

Cairns
Townsville
Mt Isa
Mackay
Emerald
Rockhampton
Longreach
Blackwater
Gladstone
Alice Springs
Roma
Sunshine Coast
MRO
Toowoomba
Brisbane
Geraldton
Gold Coast
Lismore
Narrabri
Armidale
Kalgoorlie
Port Macquarie
Perth
Broken Hill
Port Augusta
Parkes
Newcastle
Whyalla
Sydney
Adelaide
Mildura
Wollongong
Shepparton
Bendigo
Canberra
Ballarat
Mt Gambier
Geelong
Melbourne

Hobart

KEY

● Major Capital City Nodes
• Key Regional Sites
— AARNet Network

Message from our Chair

2020 has been a year in which the resilience of Australians was on full display. The year started with terrible bushfires across much of the country and by March, it was clear that the COVID-19 pandemic was picking up speed across the world.

Universities, along with most of our society, have faced many challenges in the past year. The need to move learning, teaching and work online in a great hurry, and the inability of many international students to enter Australia to continue or commence their studies has been one of the sector's greatest challenges. But these institutions have been remarkably resilient, with strong leadership and dedicated teams ensuring that students could continue to learn from afar.

In practical terms, this past year for AARNet meant being prepared for these challenges and difficulties. It also meant collaborating widely, as we are always stronger when we approach problems together. These two themes, of resilience and collaboration, have defined much of our work over the past twelve months.

We've long given priority to developing the AARNet network and services so that when disasters occur, be that bushfire, flood or a global pandemic, we can be sure that traffic will continue to flow across alternative paths and that services like Zoom and CloudStor scale to meet increases in demand. This kept educators, students and researchers working and learning, something that is surely more important now than ever.

Researchers are critical to the nation's preparedness. Research underpins our ability to respond to all manner of challenges, as demonstrated by the global response to COVID-19. From universities tracking the early spread of the virus, and the progress of vaccination programs, to the customisation of the vaccines. Contrary to popular belief, these vaccines have not been "rapidly developed" but instead are based on a well-established, and more importantly, well-tested vaccine platform – the technology for which originated from university researchers.

The pure clout of global scientific collaboration has powered the incredible pace with which knowledge about this virus, and the tools to fight it, have developed. Supporting collaboration is a key part of the purpose of AARNet, and we are working with universities and research organisations to develop the tools and infrastructure to facilitate Australia's part in this global effort.

Looking to the future, we will work with our stakeholders to develop tools to help bring the great research done at our nation's institutions together with the innovative minds in business. Sharing, and ultimately commercialising, our best research will leverage value for the country, and will help to develop our leadership standing globally.

Finally, in a time where the global and collaborative nature of research is a given, security must not be taken for granted. In 2020, the launch of the AARNet Security Operations Centre marked the culmination of several years of effort, and collaboration with our customers, to raise visibility of security issues across the sector. This is critical work to shore up confidence in security protocols for our institutions and is another way AARNet is collaborating widely, both nationally and globally, for the betterment of the institutions we serve.

As Chair of the AARNet Board, I would like to thank my fellow Board members, and members of the AARNet Advisory Committee, for their support for us and the sector we serve. In a particularly challenging year, I want to acknowledge the leadership shown by our CEO, Mr Chris Hancock AM, and our senior management, who together supported our outstanding AARNet team to deliver for our customers and shareholders in exceptional circumstances throughout 2020.

Gerard Sutton AO – Chair, AARNet Board

Message from the CEO

2020 was a defining year for AARNet. It was one where the *resilience of our infrastructure* and our people came to the fore as we *responded to the challenges* caused by the bushfire crisis and the COVID-19 pandemic.

Throughout the year, undoubtedly one of the most challenging in recent history for the research and education sector and our nation, we continued to execute on our strategic plan and deliver for our shareholders and customers.

The bushfires and the pandemic highlighted just how important telecommunications and collaboration services are for the sector, and the role AARNet plays. At the same time, how we responded to the unexpected challenges of 2020 says a lot about the strength of our operations and our strategy, and this, in turn, contributed to the ability of our sector to respond.

At the beginning of the year, our strategy of building diversity and triversity into the design of our network enabled our team to quickly divert traffic to alternate paths and keep the network up and running in the event of bushfires damaging a link. In the early days of the pandemic, we responded by rapidly deploying upgrades to our network and significantly increasing the capacity of our Zoom video conferencing platform to support shareholders and customers as they closed campuses and transitioned to remote working and online teaching and learning. We rapidly increased capacity between the AARNet network and commercial network providers in response to changing traffic patterns caused by the transition to working and learning from home. We also more than tripled AARNet capacity to some international internet destinations to support remote learning for the thousands of international students unable to return to Australia. In addition, we established new COVID-safe rules to enable our field-based staff to continue supporting our infrastructure, ensuring the AARNet network maintained high availability to support the changing teaching and research needs of our shareholders and customers.

To quote a vice-chancellor, "If it wasn't for AARNet the university sector in Australia may not have survived". While I feel this quote underestimates the strength of our institutions, the sentiment is a tribute to the efforts of everyone at AARNet working together with the universities and other customers to respond to COVID-19 challenges.

During 2020, we passed the midway point of our five-year strategic plan, which lays out the strategic platform and priorities that guide our investments in network and technology solutions for our shareholders and customers. Operating in an environment where change is the only constant, our strategy drives our performance and success and while we focused many of our activities and resources on responding to the COVID-19 pandemic, we also continued to deliver against our strategic priorities.

Our mantra is that the network is never complete, and in 2020 AARNet continued to invest in upgrading capacity and extending our fibre footprint nationally and internationally.

Within Australia, this priority is about owning fibre optic cable in the ground, and adding diversity and triversity to the AARNet backbone in the form of fully redundant and diverse paths, to further strengthen the reach and reliability of our services. Internationally, this is exemplified by our investment in international subsea cable systems. The JGA-South subsea cable system, connecting Sydney and Guam, went live in 2020, complementing AARNet's investment in the Indigo subsea cable system, which was completed in 2019. Wherever possible, we have continued to focus on our priority for building regional infrastructure, leveraging opportunities to extend the reach of the network to improve access to high-speed broadband services for campuses, libraries, study hubs, precincts and scientific instruments across regional Australia.

In 2020, we continued to strengthen our engagement with the health and medical research community, forming the AARNet Health and Medical Advisory Committee and progressing work on developing solutions for health and medical researchers. In line with this strategic priority, we also focused effort on developing a proof-of-concept for an AARNet Sensitive Data service, with our CloudStor platform as its foundation.

Our research data platform CloudStor grew to log over 100,000 registered users by the end of the year, gaining users as we continuously evolve the service, adding tools and features to meet the unique data and collaboration needs of Australian researchers – another strategic priority. It has certainly become evident over the past 12 months that Australian-based research data storage is an imperative for this country.

Zoom usage soared to extraordinary levels with staff and students working and learning from home for most of the year due to COVID-19. AARNet Zoom customers hosted over 5.7 billion Zoom meeting minutes in 2020 compared to around 146 million in 2019.

With Denial of Service (DoS) attacks and other malicious cyber threats to network availability and information security escalating worldwide during the pandemic, we continued to invest effort and resources in developing AARNet's cyber security capability. Throughout 2020, AARNet's Early Warning and DDoS Detection systems proved their value by minimising the impact of attacks on the AARNet network and the networks of our customers. Our Security Operations Centre launched into production, leading the way with machine learning, and with four universities onboarded, plus an additional eight universities contracted to the service, by the end of the year. We also added a DDoS Protection service to our expanding portfolio of cyber security services. AARNet is firmly focused on helping to improve the security posture of the sector.

Our financial results post a loss for the first time in my 17 years at the helm of AARNet. This reflects the impact of COVID-19 and the investments we made in hardware for Zoom and other infrastructure to keep our shareholder universities connected, and to support working and learning from home for all. Other investments were made in our Security Operations Centre and cyber security service portfolio, including DDoS Protection and Cyber Security for Schools products, to support the security uplift of the sector. I am still proud to say that AARNet remains a fundamentally strong business ready to support the sector as it has for the last three decades.

The past year proved to be hugely challenging for everyone in our ecosystem and the resilience AARNet demonstrated in 2020 would not have been possible without the commitment of the AARNet Board, AARNet Advisory Committee and our highly-dedicated team of people. I would like to personally thank the AARNet Advisory Committee and Board, our shareholders, customers and team, and everyone engaged with AARNet, who have gone above and beyond this year. As we look ahead into 2021, we are confident that we can continue to deliver vital infrastructure and services that meet the evolving needs of Australia's research and education sector.

Chris Hancock AM – Chief Executive Officer, AARNet

The year in numbers

ZOOM

5.7 BILLION
Meeting minutes

109 MILLION
Meeting participants

15.2 MILLION
Meetings

aarnet

$219.80
Net assets in millions

$55.6 M
Invested during 2020

99.96%
Network availability

cloudstor

100,709
Registered users

3.46 PB
of Data stored

10000000000000 BIT/S

TEN TERABIT PER SECOND NETWORK FOR RESEARCH AND EDUCATION

eduroam

430+
Locations in Australia

100+
Countries Worldwide

The year in review

2020 will be remembered as *a year unlike any other* for the AARNet team, our shareholders and customers. It was a year when both our network and people demonstrated the *ability to cope with unexpected changes* and difficult challenges. These challenges arose largely as a result of the COVID-19 pandemic, which required an *unprecedented response* from our sector and indeed from the wider society of which we are a part.

Strategic plan

The AARNet 2018-2022 Strategic Plan defines a *long-term vision* for a globally networked data-sharing ecosystem that *accelerates knowledge creation and innovation,* reinforces the resilience of AARNet's infrastructure and builds out *new capabilities* to meet the evolving digital needs of our customers.

We will *continue to develop new and innovative products* and services to accelerate Australia's participation in teaching, learning and research on a *global scale.*

STRATEGIC PRIORITIES

OPTIMISE FOR CUSTOMER VALUE

INVEST IN HEALTH & MEDICAL RESEARCH INFRASTRUCTURE

STRATEGIC PLATFORM

EVOLVE AND OPTIMISE OUR ORGANISATION

OPERATE AND ADVANCE AUSTRALIA'S RESEARCH AND EDUCATION NETWORK

OWN THE NETWORK INFRASTRUCTURE

ENGAGE AND GROW THE RESEARCH, EDUCATION AND INNOVATION COMMUNITIES

ESTABLISH NATIONAL RESEARCH DATA PLATFORM

DEVELOP SERVICES TO MEET THE NEEDS OF OUR CUSTOMERS

ENSURE FINANCIAL SUSTAINABILITY

INVEST IN REGIONAL DIGITAL INFRASTRUCTURE

DEVELOP CYBER SECURITY CAPABILITY, SERVICES AND INFRASTRUCTURE

Operating & advancing Australia's research & education network

Core to AARNet's mission is the operation of an *ultra-fast* high quality and highly available and resilient national and international telecommunications network to *meet the unique needs* of the research and education sector.

NETWORK AVAILABILITY

The AARNet network continued to perform at consistently high levels while carrying increasing volumes of traffic for AARNet customers. For 2020, the average network availability was 99.96% which was slightly higher than the level achieved in 2019 (99.93%). Network availability was affected by the bushfires and floods of early 2020 and COVID-19 restrictions impacting maintenance.

This exceptionally high level of reliability is achieved over the vast geographic footprint of our infrastructure through strategic long-term planning and carefully designed network redundancy. Diversity and triversity in the network design and equipment enables the operations team to deploy alternate paths and minimise the impact of outages on AARNet customers.

Traffic patterns shifted in 2020 with staff and students predominately working and studying from home due to COVID-19 restrictions. While traffic carried to campuses fell, traffic carried from campuses grew by 13%. Traffic from AARNet to residential internet service providers grew dramatically, by over 200%, with this increase driven largely by Zoom usage.

NETWORK EXPANSION

During 2020 AARNet continued to invest in upgrading the capacity of the AARNet network and expanding the geographic reach of the network's fibre footprint.

One of the distinguishing features of a research and education network such as AARNet is careful capacity planning to remain ahead of the demand curve, and to accommodate the increasingly data-intensive requirements of research. The peak demands of the academic year determine the sustained capacity required, and the needs of the most data-intensive research disciplines, such as radio astronomy, climate science and bioinformatics, determine the absolute peak capacity. We continually monitor the network load of the AARNet backbone links to determine when upgrades are required. This approach enables us to provide the high-quality service our customers rely on.

NATIONAL NETWORK

To support the growing capacity and connectivity needs of our customers and our response to the COVID-19 pandemic, AARNet4 backbone router hardware upgrade work was completed this year. This enabled newer generation 100G/200G/400G line cards to be deployed across the network to ensure headroom for large research flows and provide redundancy in case of an outage on one of our inter-capital paths.

The upgrade on the AARNet backbone between Sydney and Canberra from 100Gbps to 400Gbps transmission was also completed. The 400Gbps wavelengths are running across 350km of AARNet's optical network.

Our customers increasingly value the reliability of the AARNet network, particularly for accessing cloud services and content providers that are critical for business operations, as well as for teaching, learning and research. To improve the performance and availability of these services for AARNet customers, we increased capacity to selected domestic service providers. We also deployed multiple direct-connect links to Amazon Web Services and Microsoft Azure for AARNet customers. We will continue to enter into partnerships to connect popular global content and service providers to the network.

Throughout 2020 we extended the reach and diversity of our national network. In particular, we expanded our fibre footprint in Sydney, Melbourne and Brisbane, closing loops and shortening paths to provide connected institutions with multiple diverse connectivity options, greater network resiliency and reduced latency.

During the year, customers across the sector and the country, including universities, schools, hospitals, medical and other research institutes, upgraded their connections to meet their growing bandwidth needs. Universities and larger research facilities upgraded to multiple 100Gbps connections to support not only big science research, but also day-to-day business operations. Deployments included new diverse connections for the CSIRO campus at Australian Technology Park in Sydney and for the new University of Sunshine Coast Moreton Bay campus in Petrie.

Similarly, many technologically innovative K-12 schools implemented multiple diverse 10Gbps network links to campuses, cloud providers and the internet, rather than simply using 1Gbps non-resilient internet connections of the past.

INTERNATIONAL NETWORK

A significant milestone for AARNet international connectivity was reached in late 2020 when we lit the AARNet spectrum on the Japan-Guam-Australia-South subsea cable system (JGA South) connecting Sydney, Australia and Piti, Guam. JGA South extends the reach of the AARNet network into North Asia and provides AARNet with additional connectivity options across the Pacific Ocean via Guam to North America.

The new JGA-South cable complements AARNet's investment in the Indigo subsea cable system, which went live in 2019 connecting Sydney, Perth and Singapore, and CAE-1, connecting Perth, Singapore and London.

The innovative technology used to extend spectrum from the Indigo subsea cable landing station across the AARNet national Dense Wavelength Division Multiplexing (DWDM) network directly to AARNet data centre locations across Australia has also been deployed for JGA-South. This approach of directly connecting the submarine network into the data centre locations allows AARNet to maintain diversity onshore and reduce the cost and complexity of connecting to research networks in Asia, North America and Europe.

The Indigo West (Perth to Singapore) submarine cable was out of service for several months due to a fault and subsequent delays to repairs due to COVID-19 restrictions. At one point in time, three out of four direct paths between AARNet and Singapore were down at the same time underlining the need for diverse international capacity.

The need for diversity in international capacity was also demonstrated when the NREN collaboratively-funded link from Singapore to London, known as Collaboration Asia Europe or CAE-1 was impacted by an unplanned outage lasting several weeks. Traffic diverted to the backup link via Japan and trans-Siberia to London. Together these two links form the NREN Asiapacific-Europe Ring (AER), an international collaboration, which is an aggregation of global NREN community network resources to optimise and improve the availability of international connectivity for research and education.

Indigo and JGA South are long-term investments in subsea cable systems and provide AARNet with control over scalable international capacity upgrades at the wholesale level for at least the next two decades. This boosts our network capacity, diversity and resilience, further reinforcing our position as a leading provider of national and international connectivity and data services. AARNet's participation in the development of these new international systems not only benefits the research and education sector in Australia, but also provides new and much needed competitive infrastructure for the nation's commercial telecommunications market.

AARNet is a founding member of the Global Network Advancement Group (GNA-G), a community of network professionals from research and education networking organisations from all over the world. The GNA-G community meets a couple of times a year. These meetings were held virtually during 2020 and working groups overseen by the GNA-G leadership team focused on various activities, including supporting data intensive science, developing a GREN map, network automation and connecting offshore students during COVID-19. The goal of the group is to work together to better align resources and make the country-to-country interconnections more efficient for global science collaborations and transnational education.

NETWORK SECURITY

AARNet's Early Warning System (EWS) and Distributed Denial of Service (DDoS) Detection System proved their value. 250 attacks were detected, enabling the AARNet Operations team to notify any affected customers and filter out unwanted traffic to minimise the impact of these attacks on our network and connected institutions.

AARNet, along with 10 other NRENs in Europe, USA and China, and a number of commercial providers, is a member of the Mutually Agreed Norms for Routing Security (MANRS) initiative. This is a global effort, supported by the Internet Society, with the aim of protecting the stability and reliability of the internet. Throughout the year, MANRS shared information with network operators and provided crucial fixes to reduce routing threats, including route hijacking, route leaks, and IP address spoofing.

AARNet is a founding member of the Securing the GREN Working Group, a global research and education network (GREN) initiative established in 2020 to facilitate cyber security collaboration amongst member NRENs for creating capabilities that are unique to the global research and education sector. The collaboration is focused on compliance, sharing and capacity building. For the compliance area, the group is developing a GREN standard aligned to MANRS. Sharing involves building a shared threat intelligence capability. A memorandum of understanding between AARNet, Jisc (UK), OmniSOC (USA) and CanSSOC (Canada) was drafted in 2020 for ratification in 2021. AARNet's intention is to share this threat intelligence information with relevant Australian government agencies for the protection of the Australian higher education and research sector. We are grateful for the support of AustCyber and the Australian Government and the funding they have provided for this project. For capacity building, AARNet and Jisc are aligning several security operations and engineering development efforts to maximise resource utilisation across both organisations.

Opposite page: Rolling out the network in regional New South Wales. Previous page: The AARNet supported ASKAP telescope in outback Western Australia. Image: CSIRO

Growing the research, education & innovation communities

AARNet *fosters collaboration, knowledge sharing and discovery* by connecting organisations with a research and education mission across Australia and working closely with them to provide the infrastructure and services they need to deliver *excellence in research and education.*

RESEARCH

AARNet is aligning effort and strategy across research disciplines in the sciences and humanities to find common research infrastructure elements that can then be rolled out more broadly, as services, to aid researchers at AARNet shareholder institutions.

To facilitate a greater collective understanding of the eResearch challenges faced by Australian researchers, AARNet hosted an in-person AARNet eResearch Roundtable in March at the University of New South Wales. Then, when COVID-19 restrictions and associated travel bans threatened to jeopardise planned events, we quickly transitioned our events online and helped members of our community shift to an online format using Zoom.

In the early days of the pandemic, AARNet hosted a 'Supporting Remote Research' webinar series, featuring content designed to help researchers continue to collaborate, share data and perform analysis while working from home.

AARNet hosted a virtual eResearch Roundtable in August, which was attended by key stakeholders and researchers from across the country. In October, we hosted a Defence Research Roundtable to explore how AARNet can best support researchers at shareholder universities working in this field.

AARNet is one of Australia's national data and digital eResearch platforms (DDeRPs). In 2020, virtual meetings replaced physical meetings to ensure collaborations with the other DDeRPs (Australian Research Data Commons (ARDC), Australian Access Federation (AAF), the National Computational Infrastructure (NCI) and the Pawsey Supercomputing Centre) progressed. We are working closely with the DDeRPs, the Australian Government's National Collaborative Research Infrastructure Strategy (NCRIS) facilities and the wider eResearch community to develop solutions to address the collective need for sustainable, persistent data tools and data services, secure cloud storage, transfer and compute services for sensitive data, and a sustainable model for national data collections.

We also engaged with our shareholders and with industry to explore opportunities for providing connectivity and collaboration services that will help bridge the gap between industry and universities to support research commercialisation priorities.

genomic sequencing capabilities – the need for high-speed network access has become vital for moving data generated in a clinic or laboratory to supercomputing resources for analysis, and on to researchers at institutions across the country.

During 2020, AARNet collaborated with universities and research institutes to develop infrastructure and solutions for addressing the specific data transfer challenges faced by health and medical researchers. This included working with the Association of Australian Medical Research Institutes (AAMRI) and their member base of 57 medical research institutes to understand their research data needs, and hosting an online workshop with the Digital Health Co-Operative Research Centre to evaluate opportunities for jointly contributing to current and upcoming projects.

AARNet also supported COVID-19 research by providing a cloud environment (CloudStor) for storing and sharing open data, and working closely with the Australian Alliance for Artificial Intelligence in Healthcare to support their COVID-19 Research Platform.

The first meeting of the new AARNet Health and Medical Advisory Committee was held in November. The committee includes representatives from peak research groups and research institutes across the health and medical sector.

K-12 SCHOOLS AND TAFES

Throughout 2020, Australian schools and TAFEs continued to take advantage of the benefits of AARNet; both new customers accessing powerful R&E network bandwidth for the first time, as well as schools already connected to AARNet using their access to leverage online content and cloud services, and manage the remote delivery of teaching and learning during the pandemic.

By the end of 2020 over 600,000 K-12 school students at more than 1,200 schools were connected to AARNet. AARNet continued to focus on improving access to high speed telecommunications services for K-12 schools in metropolitan and regional Australia, notably connecting NSW Department of Education and Catholic Education Melbourne, as well as schools in Ballarat, VIC, Shepparton, VIC and Port Macquarie, NSW.

AARNet worked with many K-12 schools, delivering network and cyber security solutions, as well as providing support for the rapid growth in Zoom usage when staff and students transitioned to working and learning from home.

Our engagement with the international NREN, eResearch and Research Data communities, including the Research Data Alliance, also continued throughout the year to ensure that our services are leading edge and leveraging innovations from the international community. AARNet is a founding partner in the Global Research Engagement Group (GREG), a new global NREN strategic collaboration to share knowledge and facilitate a co-ordinated and aligned effort in engaging with established and emerging Big Data research groups. The goal is to ensure that these groups are aware of and can maximise the value of the global research and education network community to enable a frictionless research experience throughout the research and data lifecycle.

HEALTH AND MEDICAL RESEARCH AND EDUCATION

By connecting researchers and educators at university campuses, health research organisations, health systems and health precincts across Australia, AARNet underpins and enables life-changing research and innovation in education for the next generation of health researchers and medical practitioners.

A growing number of health education and research facilities are connected to AARNet, including facilities involved in COVID-19 vaccine research across Australia. Eduroam is also deployed in many hospitals and health-related institutions to support mobility between campuses, research facilities and hospitals for students, faculty and researchers.

With the volumes of data used in health research increasing exponentially – primarily due to rapid advances in imaging and

---

DIGITAL INFRASTRUCTURE FOR GLAMS

Many of Australia's state and national galleries, libraries, archives and museums (GLAMs) are connected to AARNet. The State Archives and Records Authority of New South Wales joined this year.

With this underlying network connectivity in place, AARNet is focused on delivering services 'above the network' to enable the GLAM community to preserve, share and analyse their collections. AARNet's CloudStor platform and SWAN (Service for Web-based Analysis) play a key role in this endeavour, helping GLAMs to strengthen their capacity to seize new opportunities for collaborative research, engagement and outreach, and develop large scale, data driven services.

GLAMs working with AARNet have the opportunity to leverage unequalled access to storage and compute resources all connected to the research network, enabling humanities, arts and social science research and partnerships to flourish.

In response to the pandemic, and with physical site excursions either cancelled or severely restricted, network traffic from connected GLAM institutions grew in 2020 to support the delivery of online education outreach programs and remote access for staff.

TRAIN-THE-TRAINER WORKSHOPS

As the network provider for Australia's universities and research institutions, AARNet's aim is to enable all researchers to get the most of the network and the technologies available to support their work. Training is one of the ways we do this. Our workshops are for research support staff in a train-the-trainer style so participants such as librarians, eResearch analysts or faculty research support staff can reuse the content to train researchers.

Our training is focused on workshops that demonstrate how to use the services we provide, such as CloudStor and SWAN, and improve the sector's understanding of the capabilities of networks and data movement. The content we deliver encompasses the practical knowledge needed to transfer, store and manage research data (of any size) in complex scenarios throughout the research and data lifecycle.

We continued to engage and build the community through training workshops during 2020, pivoting from face-to-face workshops to an online format in response to COVID-19 travel restrictions and providing tailored training to universities and research organisations across Australia. The online format has enabled AARNet to scale and deliver these popular workshops to more people at shareholder universities. 450 people from 11 universities, and several other customers, participated in the 30 workshops held in 2020. By comparison, 17 training workshops were held in 2019.

NETWORKSHOP WIRED

A record number of technologists working on networking and networked technologies at AARNet-connected universities and research institutions participated in AARNet's flagship technical community-building event on 28 May. The 2020 edition of Networkshop was called Networkshop Wired, acknowledging the transformation from an in-person to an online event due to COVID-19 travel restrictions. With an emphasis on technical collaboration, skills development and the exchange of ideas, Networkshop Wired was well received by over 250 attendees.

Developing services to meet the needs of our customers

Along with our network and other telecommunications services, *AARNet's expanding portfolio* of data, collaboration and cyber security services continued to be *embraced by the research and education sector.* We are focused on developing services and solutions that leverage the network to *enable seamless and secure collaboration,* data flow and mobility for the sector.

ZOOM

Use of the AARNet Zoom videoconferencing service grew significantly in 2020 as institutions of every size moved their operations online in response to the COVID-19 pandemic.

By end of 2020, there was a total of 148 customers subscribed to the Zoom service via AARNet. 51 customers are new subscribers and they include universities, K-12 schools, museums and research institutes.

Zoom usage reached extraordinary levels in 2020: AARNet Zoom customers hosted over 5.7 billion Zoom meeting-minutes with 109 million participants in 15.2 million meetings. This is an increase of 3,800% from 2019 total meeting minutes and a 3,223% increase from 2019 total participants. The number of meetings per month rose from 66,100 in January 2020, to almost 2.2 million in May 2020. As the world went online and into lockdown, the intuitive user interface of Zoom and the great performance our users experienced on the AARNet network were key contributors to a more than 30-fold global expansion in just three months. Zoom became a verb, a household name, and the backbone of much of Australia's remote teaching, learning and working activity.

To cater for this increased usage, AARNet rapidly increased the number of Zoom meeting servers 50-fold during March 2020.

We added an additional 400 Zoom virtual servers for auxiliary services such as cloud recordings and H.323/SIP room connectors.

As the demand for online recordings surged, the AARNet Zoom Cloud Recording service was upgraded to improve scalability and performance, enabling faster delivery of cloud recordings. By the end of July, the Semester 2 surge in demand for webinars for teaching and learning saw CloudStor process nearly 6,000 new recordings every day. As the semester progressed, virtual tours of campuses and open days used Zoom webinars, large meetings, and Zoom Rooms.

The AARNet team worked closely with Zoom and customers to upgrade the safety and privacy of the service when Zoom's security profile started to attract media attention, and fostered the adoption of secure usage practices across the research and education sector.

To add value and help facilitate knowledge sharing within the community of Australian education Zoom users, AARNet launched a series of Brunch and Learn sessions for Zoom administrators at AARNet-customer institutions. These popular events included Zoom feature updates and case studies by institutions demonstrating best practices.

EDUROAM

Eduroam (education roaming) is the secure, worldwide roaming access service developed for the international research and education community. Eduroam provides students, researchers and staff from participating institutions with secure connectivity at thousands of hotspots across more than 100 countries. With international borders and campuses closed and students and staff working from home, there was understandably a significant decline in eduroam usage in 2020 globally. However, AARNet continued to work with our shareholder universities, customers and local councils throughout 2020 to extend access to eduroam beyond campuses in metropolitan and regional areas. Eduroam was deployed at more than 20 new sites in 2020, including Brisbane Airport, South Australia Public Libraries and Eastern Regional Libraries in Victoria.

CYBER SECURITY SERVICES

Malicious cyber threats to network availability and information security are rapidly increasing in the research and education sector. In response, AARNet is building out a portfolio of integrated security services. We are co-developing services with our customers to detect and help them respond to incidents quickly and keep AARNet and our customers' networks and services up and running.

EARLY WARNING SYSTEM

The AARNet Early Warning System (EWS) monitors nominated key online services for customers 24/7, such as public websites and learning management systems, to provide early notification of issues affecting performance and allow teams to respond quickly to incidents impacting network availability. 23 customers are now signed up for the AARNet EWS.

DDOS PROTECTION

The AARNet DDoS Protection manged service went into production in late 2020. This solution helps customers manage DDoS attacks and the risk of business disruption. We have developed a system for the research and education sector that efficiently detects, filters and mitigates attacks well before they reach campus networks. Using AARNet's extensive international and domestic network of border routers, real-time traffic analysis and automated application of firewall filters, mitigation of attacks occurs in seconds, significantly faster than most current commercial offerings. Legitimate traffic remained unaffected in 100% of incidents, following its normal route, without limitation or disruption.

SECURITY OPERATIONS CENTRE

In 2020, the AARNet Security Operations Centre (SOC) moved from pilot phase to production, with four universities onboarded, and an additional eight universities contracted to the service by the end of the year, to be onboarded in 2021. The SOC has been developed by AARNet on behalf of our shareholder universities and CSIRO and is supporting efforts to uplift the security posture and capability of the sector. The AARNet SOC operates 24/7 to monitor and protect the networks and information of our universities and other customers, and identify and respond to threats and compromises. Funding from the Australian Government's AustCyber Projects Fund is supporting the onboarding of eight universities to the AARNet SOC and the development of a cyber threat intelligence sharing capability.

CYBER SECURITY FOR SCHOOLS

Uptake of AARNet's Cyber Security for Schools service grew in 2020, with seven schools signed up to the service by the end of December. This service is a unique learning enablement and cybersafety platform, designed to keep students safe while allowing them to access the online resources they need to accelerate their own learning.

Co-developed by AARNet in partnership with customers and CyberHound for AARNet Direct Connect schools, the service offers a comprehensive and integrated set of network and security services. AARNet is continuing its collaboration with CyberHound to bring additional enhancements to this service in 2021.

PARTNERSHIPS

The Australasian Higher Education Cybersecurity Services (AHECS) initiative, an AARNet, AAF, AUSCERT, CAUDIT and REANNZ partnership, delivered the inaugural AHECS Cybersecurity Summit in November 2020. The event was well attended and will be repeated in 2021. The aim of AHECS is to help safeguard the reputation of the Australasian higher education sector through coordinated, complementary cybersecurity-related portfolios of activity.

AARNet is an industry participant in the Cyber Security Cooperative Research Centre (CSCRC). The CSCRC connects participants from industry, government, and leading cyber security research organisations (including six universities) to develop and potentially commercialise products and services that improve Australia's cyber security posture. The CSCRC plays an important role in raising cyber security awareness more broadly and exploring key cyber security issues with respect to the legal, policy and regulatory implications of cyber security risks.

RESEARCH INFRASTRUCTURE SERVICES

Collaborating with the research community to develop tools and services that meet the unique needs of researchers is at the heart of what we do. We are focused on developing national collaborative research data infrastructure to meet current and future needs of the research sector.

CLOUDSTOR

CloudStor is a research data storage, sharing and analysis service designed and built by AARNet to support data-intensive research collaborations. The service is available to all AARNet-connected institutions, providing individual researchers and staff with personal allocations of one terabyte free storage, with larger group allocations available on request. CloudStor storage is located in Australia and is hosted on equipment owned and operated by AARNet, avoiding data sovereignty issues.

CloudStor usage grew strongly in 2020. Usage of SWAN (Service for Web-based ANalysis) within our CloudStor environment continued to grow with 3,000 unique users logged by the end of 2020. SWAN provides a Jupyter Notebook (scientific notebook) capability to all users of CloudStor. Jupyter Notebooks have gained widespread worldwide adoption as the preferred electronic lab book for researchers, enabling them to combine data, narrative, code and output in one document. This adds processing and analysis to the data storage capability of CloudStor. SWAN has been enthusiastically adopted by researchers across many disciplines and complements CloudStor's other capabilities, such as OnlyOffice document editing, FileSender data sharing, data ingest tools, data visualisation tools, and the packaging of data collections.

The focus of much of 2020 was on improving the reliability and performance of CloudStor, including the implementation of upgrades to address the scalability of the platform.

Work towards achieving ISO 27001 compliance for CloudStor also commenced. Collaboration with international partners and vendors continued unabated, with the ownCloud Infinite Scalability (OCIS) project yielding testable software and the CERN-led Science Mesh project providing prototype tools supporting the interoperability of cloud storage platforms across international boundaries. In addition, a proof-of-concept was developed to include AARNet's big data stores (underpinning CloudStor) in a powerful consortium, ESCAPE (European Science Cluster of Astronomy & Particle Physics research infrastructures), investigating how next-generation Super Science will be conducted, with CERN and the Square Kilometre Array (SKA) Project being the lead partners on this project. If successful, this next generation paradigm will power both the data science platform for the SKA telescope as well as CERN's upcoming high-luminosity Large Hadron Collider run. With the underpinning "Data Lake" successfully formed, the next phase of the project has commenced, adding compute to the storage pool.

BIOCOMMONS

Through a partnership with the Australian BioCommons, the integration of CloudStor with the Galaxy Australia platform was completed in October 2020. The integration provides life science researchers in Australia with the capability to seamlessly use their data stored in CloudStor with the analytics tools available in Galaxy, and is helping to streamline workflows for researchers collaborating nationally and internationally on projects across the sciences and humanities.

AARNet commenced a Globus data movement platform pilot this year to tackle data movement challenges for the bio/life sciences community. This initiative was kick-started by the data movement challenges identified in our collaborative work with the BioCommons.

SENSITIVE DATA

Development of a proof-of-concept (POC) for an AARNet sensitive data service progressed in 2020, with a pilot slated for production in the first half of 2021. Participants in the POC included universities and health and medical research institutes.

The AARNet Sensitive Data service will provide researchers across the Australian research sector with a rich collaboration and analysis environment coupled with the controls needed to work with sensitive data safely. Workflows and audit trails will enable controlled collaboration across institutions, and compliance with legislation and funding body requirements. All stages of the research data lifecycle will be supported through the provision of tools for the analysis, management and storage of sensitive research data. The service will enable cross-disciplinary advances and innovation to bring economic, commercial, environmental, social and cultural benefits to the Australian community.

DIGITAL PRESERVATION

During 2020, AARNet was involved in national and international collaborations focused on developing technical solutions to address the challenges of the long-term preservation of and access to research data and digital cultural heritage. Activities included contributing to the work of the Digital Preservation Coalition; leading work to add FAIR (findable, accessible, interoperable and reusable) data capabilities to the Science Mesh, a foundational component of the European Open Science Cloud; and participating in the early adopter program of the CERN-led ARCHIVER project. AARNet also continued to support the "Play it Again" Australian Research Council Linkage project which aims to recover and preserve the history of Australian-made video games of the 1990s.

CUSTOMER SUCCESS

A new Customer Success team was formed in 2020 to provide advice, technical design and engineering assistance to AARNet customers across the research and education sector. The team is focused on ensuring that the solutions we provide are both tailored to meet the unique needs of our customers and delivered smoothly. The team also provides ongoing support to ensure our customers are making the most of their AARNet products and services. Key activities during 2020 included supporting the design and delivery of on-boarding activities for the AARNet SOC; providing engineering and design guidance for the implementation of new high-speed AARNet AWS Direct Connect links for a university; and requirements gathering and design for a wide-area network uplift for an institution with multiple sites across regional Victoria.

AARNet is working with health and medical researchers to develop a rich collaboration and analysis environment with the controls required to work with sensitive data safely.

Our team

2020 was a year of *unimaginable challenges*, for AARNet, our shareholders and customers, and our sector. Through strategic planning, rigorous decision making and an unrelenting commitment to continued excellence, *AARNet came through 2020 with a strong and focused team*, who are poised to execute on our exciting 2021 plans.

HEADCOUNT AND DIVERSITY

AARNet was not immune to the financial challenges of 2020, and this resulted in a small rationalisation of our operations during the third quarter. Our overall team of 145 is comprised of 27% female and 73% male, well above the technical industry average of 18% female. Pleasingly, our leadership positions are held by 45% female staff members. AARNet has a strong diversity strategy for 2021/2022, which will allow us to further increase our depth and breadth of diversity across all areas of the company.

COVID-19 MANAGEMENT

Importantly AARNet's workforce did not suffer a single case of COVID-19 in 2020. AARNet proactively implemented a thorough and detailed risk management plan in March 2020 which saw our entire workforce transition to a working from home environment. This plan also encompassed an individual approval process for necessary works that had to be undertaken outside of the home. This allowed AARNet to seamlessly maintain our network services, including 'above the net' services, ensuring our shareholders and customers received uninterrupted service and increased support during this challenged time.

Our focus for 2021 will be on re-opening our workplace and gradually moving a portion of our people back to the office in a safe manner, while also complying with the various regulations which govern this move. At the same time, we will be evaluating our longer-term response to the COVID-19 outbreak and determining how to incorporate the positive learnings from 2020 into lasting changes to enhance the way AARNet operates.

This page: Undertaking a geotech assessment in the field. Opposite page: AARNet staff inspecting construction work.

INTERNATIONAL ENGAGEMENT

AARNet continued to host and oversee content production for the In The Field website (inthefieldstories.net), a global collaboration for sharing impact stories and promoting the value of research and education networks worldwide. By the end of the year, there were 370 stories published on the site, covering a wide range of topics in the sciences and humanities and featuring 105 networks.

AARNet staff continued to collaborate with their global peers and participated remotely in international projects, working groups, conferences and forums for the benefit of the research and education community. These included Research Data Alliance, Science Mesh, Cloud Storage Services for Synchronization and Sharing (CS3), Asia Pacific Advanced Network (APAN) meetings, Global NREN CEO Forum, GÉANT Marcomms Special Interest Group, Global Researcher Engagement Working Group, GÉANT Research Engagement Development Task Force, GÉANT Education Task Force, Global Network Advancement Group, Securing the GREN Working Group, MANRS, Digital Preservation Coalition, and others.

R&E COMMUNITY ENGAGEMENT

Every year AARNet is involved in a broad range of research and education community events: presenting, attending and/or providing sponsorship and network support for conferences, workshops, working groups and forums. In 2020, many events were cancelled or postponed to 2021 due to the pandemic, and some switched to an online format. The AARNet team supported the community with moving various conferences and events online, and participated in various national virtual events throughout the year, including eResearch Australasia, AHECS Cybersecurity Summit, AusCERT, Cyber CRC Symposium, Australian Cyber Week and others.

EMPLOYEE WELL-BEING AND MORALE

An important area of focus throughout our changed working conditions in 2020 was employee morale and communication. Fortuitously, our workforce is well versed in using Zoom which allowed an easy transition of our processes and operating rhythm. Our main focus from an employee well-being perspective was a unique and tailor made programme available to all employees, with an acute focus on personal resilience. Over 80% of our workforce attended this programme, and reported overwhelmingly positive feedback, including both improved personal well-being and effectiveness at work.

LEARNING AND DEVELOPMENT

Under the guidance of our Human Resources department, AARNet has made a significant commitment to whole of workforce employee training and development with key focus on the important compliance areas of equal opportunity and anti-discrimination, and the newly introduced whistleblower provisions. AARNet has continued to assume a global leadership role within our NREN community, fully developing a 2-year Leadership Training Programme for the global NREN group. The programme covers various areas of personal leadership skills and development as well as having a strategic technical focus on cyber. It is expected that the programme will commence when the global COVID-19 landscape permits.
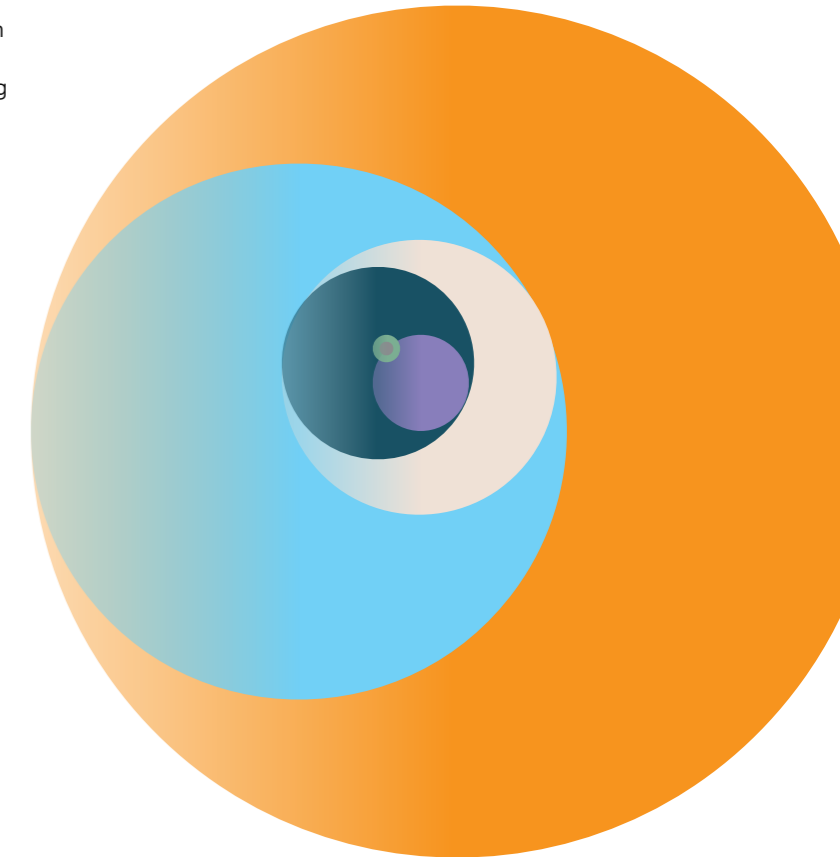
AARNET STAFF AS AT END 2020

TOTAL: 145	WA 14
NSW 62	ACT 7
VIC 39	SA 2
QLD 20	EUROPE 1

Corporate governance

THE ORGANISATION

AARNet Pty Ltd [ACN 084 540 518] is the not-for-profit company that operates the AARNet network, Australia's national research and education network, also known as an NREN.

Shares in AARNet Pty Ltd [AARNet] are held by 38 Australian Universities and the CSIRO as listed on page 41.

AARNet is a licensed Australian telecommunications carrier [#61 under the Telecommunications Act 1997 Cth].

The Chief Executive Officer is charged with the efficient and cost-effective operation of the company and reports to the Board of Directors, as listed on page 41.

THE AARNET BOARD OF DIRECTORS

The Board of Directors is responsible for the overall direction and management of AARNet.

For more than 30 years, AARNet and its predecessor have shared and exchanged expertise with shareholders and customers in many ways, supporting national and international collaboration and innovation in networking and associated services for research and education.

AARNet has been effective in making representations to government on policy, legislation, strategy and programs to improve the telecommunications facilities and services available not only to the education and research sector, but to all Australians.

THE AARNET ADVISORY COMMITTEE

The AARNet Advisory Committee [AAC] represents the interests of the members and is a source of advice on policy and business matters. CSIRO, and shareholders in each state, elect one representative to the AAC. Members of the AAC are listed on page 41.
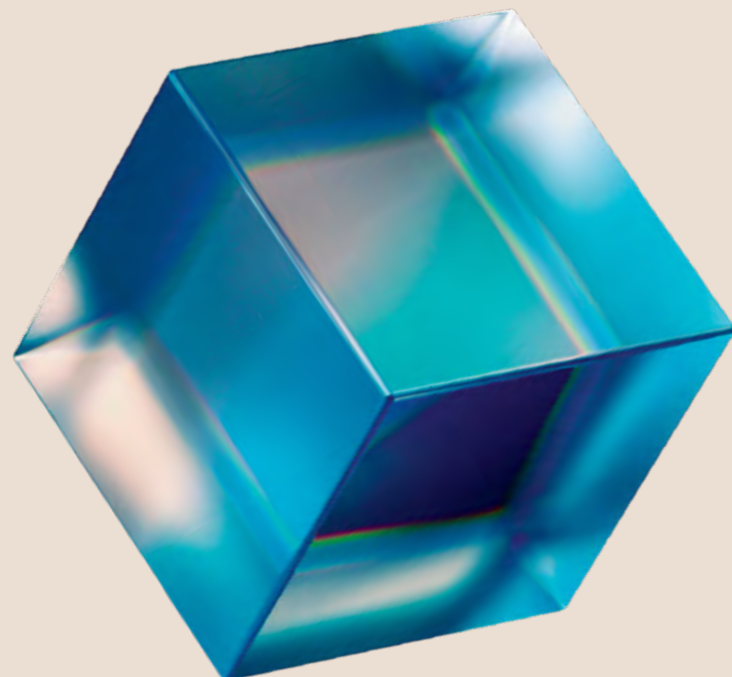
LIST OF SHAREHOLDERS

Australian National University
Commonwealth Scientific and
 Industrial Research Organisation
University of Canberra
Charles Sturt University
Macquarie University
Southern Cross University
The Australian Catholic University
University of New England
University of New South Wales
University of Newcastle
University of Sydney
University of Technology, Sydney
Western Sydney University
University of Wollongong
Charles Darwin University
Bond University
Central Queensland University
Griffith University
James Cook University
Queensland University of Technology
University of Queensland
University of Southern Queensland
University of the Sunshine Coast
Flinders University of South Australia
University of Adelaide
University of South Australia
University of Tasmania
Deakin University
La Trobe University
Monash University
RMIT University
Swinburne University of Technology
The University of Melbourne
Federation University Australia
Victoria University
Curtin University
Edith Cowan University
Murdoch University
The University of Western Australia

BOARD OF DIRECTORS

Emeritus Professor Gerard Sutton AO
Chair of the Board and Chair of the Nomination and Remuneration Committee
Dr Christine Burns
Professor John Dewar AO
Mr Robert Fitzpatrick
Member of the Audit, Finance and Risk Committee
Mr Chris Hancock AM
Chief Executive Officer
Professor Brigid Heywood
Ms Fiona Rankin
Mr John Rohan
Deputy Chair of the Board, Chair of the Audit, Finance and Risk Committee and member of the Nomination and Remuneration Committee
Professor Deborah Terry AO
Emeritus Professor Mark Wainwright AM
Member of the Audit, Finance and Risk Committee and the Nomination and Remuneration Committee
Dr David Williams
Mr Jeff Murray (until 25 March 2020)
Mr David Formica (appointed 25 March 2020; until 12 February 2021)
Mr Scott Sorley (appointed 18 March 2021)

AARNET ADVISORY COMMITTEE

Chair: Mr Jeff Murray (TAS, University of Tasmania) (until 25 March 2020)
Chair: Mr David Formica (ACT, University of Canberra) (appointed 25 March 2020; until 12 February 2021)
Chair: Mr Scott Sorely (QLD, University of Southern Queensland)(appointed 18 March 2021)
Mr Chris Hancock AM (CEO AARNet)
Mr Malcolm Caldwell (NT, Charles Darwin University)
Mr Adrian Dillon (TAS, University of Tasmania) (appointed 25 March 2020)
Mr Vito Forte (WA, Edith Cowan University)
Mr Tim Mannes (NSW, Charles Sturt University)
Ms Bev Wright (SA, University of Adelaide)
Mr Tom Minchin (CSIRO)
Mr Zoran Sugarevski (VIC, Victoria University)

SPOTLIGHT

Here's a closer look at some of the projects and *success stories* in the research and education community enabled by our powerful network and services. To read more stories, go to *news.aarnet.edu.au*

Preserving our digital heritage
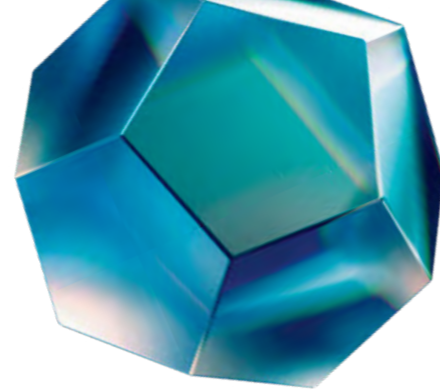
In the contemporary era, with much of everyday life and institutional memory recorded digitally, as well as the ongoing threat of software and hardware obsolescence, *preserving the increasing volume of digital material* and ensuring that it remains accessible is *proving to be a significant challenge.* This is a challenge that a growing number of projects are working to address.

Many of these projects are collaborative in nature, drawing on broad expertise from creative, academic and technical industries around Australia and globally. AARNet is playing a role in several of them.

For more than 30 years, AARNet has been the provider of high-speed, low latency fibre optic network infrastructure that connects universities, research organisations, schools and major cultural organisations around Australia to each other, scientific instruments, computing resources and the public internet. More recently, our role in supporting critical digital activities in organisations has expanded from the provision of network capabilities to include infrastructure and services for data storage, collaboration and cyber security.

As we gear up to deliver new cloud infrastructure and expand our existing services to meet the changing needs of the research and education sector, we have sought to understand the requirements and responsibilities of researchers, data curators and institutions, including the challenges of digital preservation. AARNet is pursuing this goal through membership of the Digital Preservation Coalition, an international community that exists to preserve the world's digital legacy, and by supporting several projects with digital preservation dimensions: Science Mesh, ARCHIVER and Play it Again.

Science Mesh is a foundational component of the European Open Science Cloud (EOSC). One of its aims is to federate existing and emerging data infrastructures with the objective of offering a virtual environment in Europe and globally to share and re-use research data across borders and disciplines. AARNet's CloudStor platform is part of the initial consortium of services to be connected into EOSC.

The role of the Science Mesh is to provide inherently findable, accessible, interoperable and reusable (FAIR) cloud data storage and collaboration tools for researchers. The outcome is for interoperable research workspaces, data movement and management between research organisations. The work package to deliver this FAIR data capability for the Science Mesh is executed by Australian, Polish and German developers, and is project managed by AARNet.

To create a data packaging tool chain that forms a foundation for preservation efforts, development lead Marco La Rosa is building tools based on Dr Peter Sefton's work with the Oxford Common File Layout (OCFL) and Research Object Crate (RO-Crate) specifications. This tool chain was initially proposed for the Pacific and Regional Archive for Digital Sources in Endangered Cultures (PARADISEC) archive of endangered language resources, which includes audio, video and descriptive material. The tools have been released as products named Arkisto and Describo.

The OCFL specification is an approach to packaging digital material without relying on any particular technology and in a way that allows a repository to be indexed, presented and recovered in the event of disaster using familiar, commodity tools and well understood methods. Digital material is packaged with metadata, similar to BagIt, to form archival information packages, and is designed to be scalable to petabytes and beyond.

AARNet is also participating in the ARCHIVER Project early adopter program. This project is an initiative of CERN, the European Organization for Nuclear Research, and one of the world's largest and most respected centres for scientific research. ARCHIVER is piloting digital preservation solutions "towards 'research-ready' commercial services for long-term archiving and preservation of scientific data" for EOSC.

Observing the FAIR data principles does not automatically assure the long-term preservation of digital material. There is much work to do in weaving digital preservation into the fabric of institutions and lowering obstacles to procurement.

Emulation is a preservation strategy that has broad application but is not trivial to develop, maintain and deploy. Developed by computer scientists at Freiburg University, the Emulation-as-a-Service (EaaS) platform provides access to obsolete computer environments, enabling legacy software and other complex digital artefacts to be emulated and accessed by users in a web browser.

This solution is being used or evaluated at a number of institutions, including Rhizome, the Tate and a consortium of universities and archives in the USA led by Yale that are participating in a networked version of EaaS, known as EaaSI ('easy').

Play it Again is a project led by Professor Melanie Swalwell at Swinburne University that continues her research into historic video games and media arts from Australia and New Zealand. EaaS is central to this project, to ensure the ongoing access to obsolete software.

AARNet has also joined the Software Preservation Network, an organisation aiming to advance technical and legal capabilities to ensure long-term access to software and software-dependent cultural heritage by proposing standards, developing software (including EaaSI), training, advocacy and fostering a community of practice.

Initially this membership is in support of Play it Again, to foster collaboration among cultural heritage collections that contain obsolete software that cannot be migrated to accessible formats.

AARNet's long-term goal is to host EaaSI as a shared service on its emerging cloud-computing platform for Australian cultural heritage, academic and research institutions.

Knowledge is power: investing in cyber threat intelligence

Malicious cyberattacks against the Australian research and education sector have become increasingly prevalent and sophisticated in recent years due to the sensitive data and intellectual property academic institutions hold.

Cyber threat intelligence (CTI) and the role it can play in protecting these institutions from cyberattacks is also growing in importance.

AARNet recognises the potential benefits of improving the availability of CTI and is investing time and resources in developing a capability that will allow threat intelligence to be collected and shared at scale to better support the sector.

This initiative complements the capabilities of the AARNet Security Operations Centre (SOC), which was launched in late 2020, and is enabled by the reach of the AARNet telecommunications network. It also leverages the relationships AARNet maintains with the global network of National Research and Education Networks (NRENs) and similar research and education sector SOC initiatives in the United Kingdom, Canada and the United States.

As the number of universities using the AARNet SOC services increases the cumulative effect will generate a significant scale of data related to threat activity across the sector. In the process of detecting this activity and then analysing and categorising the individual attacks or attack attempts, AARNet is able to generate threat intelligence. This intelligence is contextual knowledge that can be used by the sector to understand risks and make informed decisions about how to respond to threats and protect information, assets and people more efficiently and effectively.

AARNet received funding from the Australian government's AustCyber Projects Fund to support onboarding universities to the AARNet SOC and to develop a global cyber threat sharing capability to help protect the Australian research and education sector. With this support, AARNet has been able to expand the scope of the CTI sharing initiative and the value it will deliver.

AARNet has been working closely with fellow NREN Jisc (United Kingdom), and international research and education sector SOCs CanSSOC (Canada), OmniSOC and REN-ISAC (United States) to develop an arrangement for sharing CTI derived from academic institutions connected to their networks and systems to build a global picture of threats aligned to the research and education sector. This sharing arrangement seeks to give each partner access to much more extensive CTI than is currently available to the sector. The four partners have set up a collective malware indicator sharing platform (MISP), which allows information to be shared in near real time and helps with the timely identification and mitigation of attacks against the sector.

Over time, as each of the international partner SOC operations increases in maturity and scale, the effort of developing the CTI sharing capability will increase in value for all the participating parties and their associated academic institutions.

AARNet will share CTI sourced from the international partnership with the sector via the Australian Higher Education Cybersecurity Service (AHECS) partnership, a partnership between AARNet, Council of Australasian University Directors of Information Technology (CAUDIT), Australian Access Federation (AAF), Research and Education Advanced Network New Zealand (REANNZ), and the CAUDIT Information Sharing and Analysis Centre (CAUDIT ISAC). AARNet is also collectively working with AusCERT to ensure threat intelligence activities are aligned across the AHECS ecosystem. In addition, AARNet is developing relationships with relevant Australian Government agencies to assist with aligning CTI sources.

Data sharing in the fight against COVID-19

A positive outcome of the COVID-19 pandemic is the unprecedented rapid *international sharing of data* that has helped researchers *fast-track* their understanding of the SARS-CoV-2 virus and the *development* of effective treatments and vaccines.

Shortly after the COVID-19 outbreak was reported in China, publicly available data was aggregated, summarised, monitored and visualised, outlining the spread of the disease worldwide. The number of affected countries, people, tests, deaths and recoveries related to the virus has been reported daily ever since, making this health data openly available in a way never seen before.

Open access to data has been vitally important to researchers in the fight against COVID-19. Early in the pandemic, initiatives such as the World Health Organisation (WHO)'s "COVID-19 Open", a data sharing and reporting protocol, encouraged researchers to share data as quickly and widely as possible. Rapid data sharing has proven to be an imperative for public health decision making and action by governments and health authorities worldwide.

Data experts in the Research Data Alliance (RDA), of which AARNet is a member, also swiftly came together to tackle COVID-19. The RDA set up the RDA COVID-19 Working Group to clearly define guidelines on data sharing and re-use under the present COVID-19 circumstances to help researchers follow best practices and maximise the efficiency of their work.

Researchers at many of our shareholder institutions have contributed data to the global collaborative effort, supported by national research infrastructure that enables data sharing and collaboration, such as the network infrastructure provided by AARNet.

The Peter Doherty Institute for Infection and Immunity at the University of Melbourne, for example, was the first to grow the virus outside of China and share it with public health laboratories nationally and the WHO. The University of Sydney's Professor Edward Holmes was the first to publish the genome sequence of the coronavirus, although it was his colleague, Professor Yong-Zhen Zhang at Fudan University in China, who initially sequenced the SARS-CoV-2 genome code. The Garvan Institute of Medical Research genome sequencing, Monash University antiviral drug modelling, University of Queensland vaccine development, CSIRO Australian Centre for Disease Preparedness vaccine testing and CSIRO data analytics, scenario planning and modelling for understanding the spread of the virus, to call out only a few of many initiatives across the Australian research sector, have contributed, and accessed, data to help with the global response to the pandemic.

The lesson learnt from the COVID-19 crisis is that research collaboration across borders and timely access to data can improve opportunities for discovery and innovation and how global crises are managed. To this end, AARNet is involved in initiatives that aim to develop research infrastructure that makes the national and global exchange of data easier. We are a member of the RDA Technical Advisory Board, which is working on developing global standards for inherently findable, accessible, interoperable and reusable (FAIR) data sharing. We are also contributing to Science Mesh, a foundational component of the European Open Science Cloud, which aims to federate existing and emerging data infrastructures with the objective of offering a virtual environment in Europe and globally to share and re-use research data across borders and disciplines.

AARNet is committed to providing infrastructure and services that help researchers solve the biggest challenges of our time.

Leading Australian regional school boosts network capacity and cyber security protection

Resilient, scalable and secure solutions delivered by AARNet infrastructure and *Cyber Security* for Schools services *support excellence* in *teaching and learning* for The Rockhampton Grammar School.

The Rockhampton Grammar School is an independent day and boarding school located in the Central Queensland city of Rockhampton. The School caters to over 1,400 students ranging from Prep to year 12 as well as running an early learning centre. As one of the largest co-educational boarding schools in the country, The Rockhampton Grammar School takes a forward-thinking approach to technology implementation and understands the risks involved in today's fast-moving digital society.

Early in 2020, when the School was seeking to improve the quality and reliability of the internet experience for staff and students, and ensure high availability of business-critical services hosted in the Microsoft Azure cloud, they turned to AARNet for a solution. AARNet had recently built fibre through the region, which meant that schools located there now had the opportunity to overcome the 'tyranny of distance' and connect to the nation's reliable high-speed dedicated network for research and education.

At the same time, with cyber threats rapidly increasing in the education sector, The Rockhampton Grammar School was looking to uplift network security to better protect the School's information and keep students safe online. Connecting to AARNet meant that the School could take advantage of the

integrated set of network and cyber security services co-developed by AARNet and CyberHound for AARNet Direct Connect schools.

AARNet worked closely with the School's IT team to understand the School's current and future needs and design a cost-effective solution. To boost capacity and mitigate the risk of potential network outages, AARNet built a 10 gigabit per second primary link and 1 gigabit per second backup link into different locations on campus. This diversity in the network design means that if there is an outage on the primary link network traffic can be diverted to the backup link, minimising any impact on the availability of web services. A secure direct private connection over the AARNet network to Microsoft Azure optimises the performance of the growing number of services the school is planning to migrate to the cloud.

Improving network security was also a key priority. Leveraging AARNet's partnership with CyberHound, a high availability pair of next-generation firewalls were installed as part of the solution. To support the reliable functioning of the high availability architecture, AARNet provided an integrated managed router service to ensure network and security functions are optimally aligned.

As an AARNet Cyber Security for Schools customer, the School also benefits from the AARNet Early Warning System, which monitors the availability of nominated online resources, such as websites and learning management systems, and the AARNet Distributed Denial of Service (DDoS) Detection System.

As well as looking after the students' physical wellbeing, the School's responsibilities encompass student pastoral care and online safety. To assist with this the School is using CyberHound's behavioural analytics platform ClearView, which is offered through the AARNet's Cyber Security for Schools service in partnership with CyberHound. ClearView identifies at-risk online behaviour and provides the School's leaders with actionable intelligence that enables timely support to individuals who need it.

"Network diversity and security along with high capacity connectivity has enabled us to embrace cloud services and the efficiencies that come with them. We've been able to achieve a huge uplift in our capabilities for a regional school," said The Rockhampton Grammar School's IT Manager Neil Nankivell.

This page and opposite page: technology plays a vital role in the classroom at The Rockhampton Grammar School in regional Queensland. Images: The Rockhampton Grammar School.
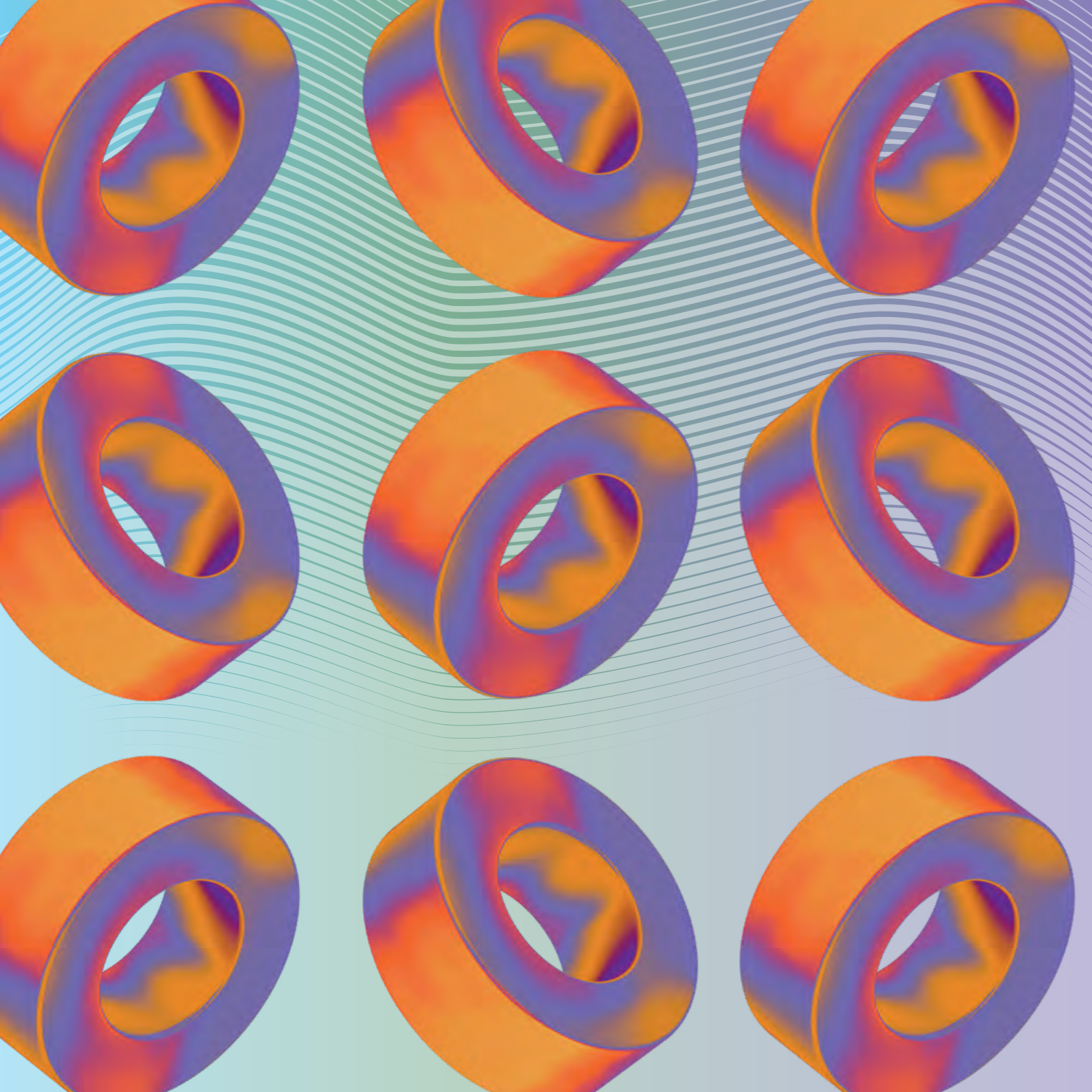
AARNet Pty Ltd Financial Report and Directors' Report 2020

for the year ended 31 December 2020
ABN 54 084 540 518

CONTENTS

DIRECTORS' REPORT

Your Directors present their report on the Company, AARNet Pty Limited ("AARNet"), for the year ended 31 December 2020.

The following persons were Directors of AARNet during the whole of the financial year and up to the date of this report:

Emeritus Professor Gerard Sutton AO
Chair of the Board and Chair of the Nomination and Remuneration Committee

Dr Christine Burns

Professor John Dewar AO

Mr Robert Fitzpatrick
Member of the Audit, Finance and Risk Committee

Mr Chris Hancock AM
Chief Executive Officer

Professor Brigid Heywood

Ms Fiona Rankin

Mr John Rohan
Deputy Chair of the Board, Chair of the Audit, Finance and Risk Committee and member of the Nomination and Remuneration Committee

Professor Deborah Terry AO

Emeritus Professor Mark Wainwright AM
Member of the Audit, Finance and Risk Committee and the Nomination and Remuneration Committee

Dr David Williams

Mr Jeff Murray was a director from the commencement of the financial year until his resignation on 25 March 2020.

Mr David Formica was appointed a director on 25 March 2020, and served as a director until his resignation on 12 February 2021.

Mr Scott Sorley was appointed a director on 18 March 2021, and remains a director at the date of this report.

PRINCIPAL ACTIVITIES

AARNet is a not for profit, proprietary company in which 38 Australian universities and the Commonwealth Scientific and Industrial Research Organisation (CSIRO) have an equal shareholding.

AARNet's principal activity is the provision of internet and advanced telecommunication and network services to its shareholders ("Members") and to other relevant organisations. Services are provided in accordance with the AARNet Access Policy in order that Members and other customers may:

a) use AARNet's internet and other telecommunications facilities and services to provide educational programs and conduct research activities in an efficient and cost effective manner, and

b) collaborate with other parties (nationally and internationally) in furtherance of research and education objectives.

OTHER ACTIVITIES

In addition, AARNet:

a) facilitates the construction of optical fibre infrastructure to extend the AARNet backbone and to connect campuses and other locations to facilitate services for Members and customers;

b) provides applications and services which operate across the AARNet network supporting education and research activities;

c) secures those applications and services operating across the AARNet network through a Security Operations Centre and additional cyber security-related applications and services;

d) monitors equipment and infrastructure on Member's campuses and other premises to identify and alert Members to potential cyber attacks or potential cyber threats allowing the Member to take early action to prevent, close down or mitigate cyber risks;

e) participates in the design and deployment of advanced network infrastructure in partnership with network organisations in Australia and internationally, to develop national and global research and education networks; and

f) makes representations to all levels of government on policy, legislation and programs to improve the telecommunications facilities and services available to its Members and other costumers.

DIVIDENDS

AARNet's constitution prohibits the payment of dividends or other distributions to its shareholders. Accordingly, no dividends have been paid, declared or recommended either during the financial year or in the period since that year ended (2019: nil).

REVIEW OF OPERATIONS

COVID-19

2020 will undoubtedly be remembered for the COVID-19 pandemic. Following directions issued by the Commonwealth and state governments, and in line with practices adopted by many other businesses, AARNet responded to the challenges of COVID-19's impact on our Members, customers and our staff through a series of actions:

a) rapidly increasing video conferencing services and capacity (Zoom) and connecting new customers and locations – these efforts enabled AARNet's Members and many other educational institutions to promptly shift teaching and learning to online delivery as campuses and schools were shut to restrict the spread of COVID-19;

b) increasing the capacity between the AARNet network and those of commercial providers in response to changing traffic patterns as campuses, school and other locations were closed and the community moved to working and studying from home;

c) increasing our international capacity to support students outside Australia to continue their studies at our Members;

d) defining new rules of working under COVID social distancing parameters to enable field-based provisioning and maintenance activities to continue, ensuring the AARNet network maintained high availability to support the revised teaching and research needs of our Members and other customers; and

e) closing all AARNet offices and sending all staff home immediately, then establishing new ways of remote working across all functions of AARNet.

These actions invariably caused additional but necessary financial expenditure that delivered the continuity of teaching, learning and research referred to above.

Network Expansion

Throughout 2020 AARNet's network continued to perform at consistently high levels while carrying increasing volumes of traffic for Members and other customers.

For 2020 the average availability was 99.96% which was slightly higher than the level achieved in 2019 (99.93%). Network availability in 2020 was also affected by the bushfires/floods and COVID-19 restrictions which impacted maintenance.

Traffic patterns shifted in 2020 with staff and students predominately working and studying from home. While traffic carried to campuses fell, traffic carried from campuses grew by 13% and traffic from AARNet to residential internet service providers grew dramatically, over 200%, driven particularly by Zoom usage.

Network Expansion

During 2020 AARNet continued to invest to upgrade the capacity of the AARNet network and to expand the geographic reach of the network's fibre footprint.

Overall spending on communication assets (including network infrastructure and equipment) was $43,531,447 during the year (2019: $43,297,410) (refer to note 21 of the financial statements).

This investment reflected the continued investment in AARNet's domestic fibre footprint as well as the completion of the JGA submarine cable venture.

JGA South

The JGA South consortium, of which AARNet is a member, has laid a submarine fibre system between Sydney and Guam. JGA South was brought into service during 2020.

Guam is a significant hub for telecommunications services and by owning fibre between Sydney and Guam AARNet has gained high capacity bandwidth able to on-connect to research and education networks in Asia (particularly into North Asia).

Subscriptions and Telecommunications Revenues

AARNet's Members pay subscription and related fees for connection to the network and carriage of data across the network (to research and education facilities in Australia, international research and education networks, and the general internet). These charges form the largest single component of AARNet's revenues.

During 2020, Members' subscription and related charges were in line with 2019 revenues, despite the growth in Members' traffic discussed above.

	2020	2019	Increase
	$	$	
Members: Subscription, Traffic and Access	40,840,735	40,825,590	0.0%
Non-Member: Subscription, Traffic and Access	14,294,221	16,456,613	(13.1%)
Other Services	23,498,715	19,453,705	20.8%
Telecommunications Revenue	78,633,671	76,735,908	2.5%

Until mid 2019 a national research and education network based outside Australia used capacity on AARNet's international network in return for paying a subscription to AARNet. This arrangement, although expiring in 2019, contributed revenue for the 2019 year.

Without this revenue in 2020 the value of non-Member subscription fees in 2020 was lower than in 2019.

Other Services

AARNet offers a range of other services to Members and other customers. Broadly, these services fall into three categories:

i) transmission services providing point-to-point capacity: these enable Members and customers to link together geographically diverse campuses, research centres and remote research instruments; or to provide dedicated high-speed capacity between user facilities and third party data centres;

ii) above the network services which directly support the delivery of education and research outcomes (including Zoom, a video conference/meeting service offered in conjunction with Zoom Inc, and Cloudstor, a service which is optimised for the storage and sharing of research data sets); and

iii) cyber security-related applications and services, predominately the Security Operations Centre.

Revenue from these other services rose by 20.8% during 2020. AARNet's suite of video conferencing, cloud storage and cyber security services continue to be embraced by users across the research and education sector; and this was supplemented by continued growth in our more traditional services of transmission services and circuits.

Overall, subscriptions and service revenues increased by 2.5% from 2019.

Infrastructure Revenues

Infrastructure establishment fees (income from the provision of new fibre infrastructure) grew by 12.9% in 2020 reflecting the value of infrastructure projects completed and brought into service.

	2020	2019	Increase
	$	$	
Infrastructure Establishment Fees	5,252,005	4,652,770	12.9%
Infrastructure Construction Revenue	1,999,444	1,361,084	46.9%
	7,251,449	6,013,854	20.6%

Revenues from infrastructure construction and allied activities (such as services to relocate infrastructure) were 46.9% higher in 2020 than 2019. This income stream is very reactive to the impact of activity by utility providers, other telecommunications carriers and civil infrastructure projects (such as transport projects) and income can vary significantly from year to year.

Other Revenues

In addition to revenues from the provision of telecommunications services and infrastructure, AARNet also gains income from interest and dividends on invested funds. In 2020, this investment income totalled $1,501,934 (2019: $2,759,901) (see note 10 to the financial statements). In 2020 investment returns were lower than the previous year due to lower amounts held in investments (as funds were expended on the investments in the network outlined earlier), lower interest rates and the impact of COVID-19 on financial markets.

Telecommunication Supply Expenses

Telecommunication supply expenses totalled $26,460,940 in 2020 compared with $20,129,253 in 2019.

There were two significant factors behind this increase:

a) Development of the Security Operations Centre and broader AARNet cyber security capability; and

b) Additional expenditure in capacity, peering and Zoom licensing to enable our Members to quickly reset their teaching and learning environments in response to the COVID-19 pandemic (as noted above).

There were also additional telecommunication supply costs driven by increases in traffic and capacity on the AARNet network. This includes costs for transmission, duct rental and maintenance as well as charges associated with INDIGO and JGA subsea cable systems.

Employee and Administration Costs

To support the growth of our network and services, AARNet added staff to its infrastructure development and cyber security teams.

Depreciation and Amortisation Charges

Depreciation and Amortisation charges, inclusive of depreciation on equipment, depreciation on infrastructure and amortisation of Indefeasible Rights to Use (IRUs) totalled $25,009,632 in 2020 compared to $22,068,461 in 2019.

The main factor behind this increase was the commissioning of additional assets which expanded the capacity and reach of the network (particularly the JGA subsea cable between Sydney-Guam).

Other Expenses (including Finance Costs)

These costs of $2,393,337 are higher than 2019 ($897,811) mainly due to movements in the value of foreign currency contracts, incurred as part of AARNet's hedging activities (refer discussion in note 25).

ACCUMULATED SURPLUS AND RESERVES

In 2020, AARNet recorded a net deficit of ($2,808,008) (2019: net surplus of $7,602,686).

Despite a small net deficit for 2020, surpluses earned in prior years, aided by conservative financial management, have enabled AARNet to withstand the COVID-19 pandemic with a significant holding of cash and investments.

Surpluses earned by AARNet cannot (by virtue of the terms of AARNet's constitution) be distributed to the shareholders.

In the Board's view, and in line with the company's long range plans, it is prudent for AARNet to return to generating a surplus in order that investments in network capability and services may be funded without calling on Members to contribute further equity into the company.

Investments in network capability and services are expected to continue into future years to:

a) finance investments in technology to enhance the delivery of services to Members and other customers;

b) supplement Members' subscriptions and other income in future years;

c) meet obligations to settle lease liabilities which totalled $49.7m at year end as shown in note 8(i) to the financial statements; and

d) defray part of the significant financial commitments in respect of capacity commitments (principally rights to use the traffic paths of cable systems operated by other telecommunication carriers) which, at year end, were $34,152,034, refer to note 2(b) to the financial statements.

NET ASSETS

Net assets at 31 December 2020 were $219,785,490 (2019: $222,798,104). The decrease represents the deficit for 2020 and the change in value of available-for-sale financial assets during 2020.

SIGNIFICANT CHANGES IN THE STATE OF AFFAIRS

Except for the matters discussed under the heading "Review of Operations" there were no significant changes in the Company's state of affairs during the financial year ended 31 December 2020.

MATTERS SUBSEQUENT TO THE END OF THE FINANCIAL YEAR

Except for matters discussed under the heading "Review of Operations" no other matter or circumstance has arisen since 31 December 2020 that has significantly affected or may significantly affect:

a) AARNet's operations in future years;

b) the results of those operations in future financial years; or

c) AARNet's state of affairs in future financial years.

LIKELY DEVELOPMENTS AND EXPECTED RESULTS OF OPERATIONS

Despite COVID-19's disruption to AARNet's operations and the operations of our Members and other users, AARNet expects network traffic will continue to grow during 2021. In addition, investment in AARNet's domestic fibre network will continue during 2021.

AARNet also expects to generate increasing revenues and incur additional costs in relation to the provision of cyber security services to Members and other customers.

ENVIRONMENTAL REGULATION

AARNet's operations are not adversely affected by any significant environmental regulation. AARNet believes its greenhouse gas emissions are substantially below the thresholds that are subject to the reporting requirements of either the *Energy Efficiency Operations Act 2006* and the *National Greenhouse and Energy Reporting Act 2007*.

INSURANCE FOR OFFICERS

During the financial year, AARNet paid a premium of $71,280 (2019: $40,759) in respect of liability insurance for the Company's Directors and Officers. The liabilities insured against are costs and expenses that may be incurred in defending civil or criminal proceedings that may be brought against the Directors and Officers in their capacity as Directors and Officers of AARNet, and any other payments arising from liabilities incurred by the Officers in connection with such proceedings, other than where such liabilities arise out of conduct involving a wilful breach of duty by the Directors or Officers or the improper use by the Directors or Officers of their position or of information to gain advantage for themselves or someone else or to cause detriment to AARNet. It is not possible to apportion the premium between amounts relating to the insurance against legal costs and those relating to other liabilities.

No known liability has arisen under these indemnities to the date of this report.

AGREEMENT TO INDEMNIFY OFFICERS

Under the terms of its Constitution, AARNet provides indemnity to persons who are, or have been, an officer or auditor of AARNet, but only to the extent permitted by law and to the extent that the officer or auditor is not indemnified by Directors' and Officers' liability insurance maintained by AARNet. The indemnity is against liability incurred by that person as an officer or auditor of AARNet to another person and for costs and expenses incurred by the officer or auditor in defending such proceedings.

Separately, AARNet and each director of AARNet have entered into a Deed of Indemnity under which AARNet indemnifies each director against any liability:

a) to a third party (that is, other than to AARNet) unless the liability arises out of conduct involving a lack of good faith; and

b) for legal costs incurred in successfully defending civil or criminal proceedings or in connection with proceedings in which relief is granted under the *Corporations Act 2001.*

No known liability has arisen under these indemnities as at the date of this report.

AUDITOR

A copy of the Auditor's Independence Declaration as required under s.60-40 of the Australian Charities and Not-for-profits Commission Act 2012 is included on page 7 of this financial report.

PricewaterhouseCoopers continues in office in accordance with section 327 of the Corporations Act 2001.

This report is made in accordance with a resolution of Directors.

Emeritus Professor MS Wainwright AM

Director

Sydney

31st March 2021

Mr JF Rohan

Director

AUDITOR'S INDEPENDENCE DECLARATION

Auditor's Independence Declaration

As lead auditor for the audit of AARNet Pty Limited for the year ended 31 December 2020, I declare that to the best of my knowledge and belief, there have been no contraventions of any applicable code of professional conduct in relation to the audit.

Scott Walsh
Partner
PricewaterhouseCoopers

Sydney
31 March 2021

PricewaterhouseCoopers, ABN 52 780 433 757
One International Towers Sydney, Watermans Quay, Barangaroo, GPO BOX 2650, SYDNEY NSW 2001
T: +61 2 8266 0000, F: +61 2 8266 9999, www.pwc.com.au

Level 11, 1PSQ, 169 Macquarie Street, Parramatta NSW 2150, PO Box 1155 Parramatta NSW 2124
T: +61 2 9659 2476, F: +61 2 8266 9999, www.pwc.com.au

Liability limited by a scheme approved under Professional Standards Legislation.

STATEMENT OF SURPLUS

	Notes	2020 $	2019 $
Services revenue	9	85,885,120	82,749,762
Other revenue	10	3,483,356	4,839,425
Grants and contributions received	10	454,333	554,333
Total revenue		**89,822,809**	**88,143,520**
Telecommunications supply expenses		(26,460,940)	(20,129,253)
Depreciation and amortisation - Telecommunications	11	(16,985,351)	(14,849,014)
Employee benefits expense - Telecommunications		(22,677,181)	(20,215,614)
Other administration - Telecommunications		(8,653,256)	(10,807,930)
Infrastructure construction expenses		(3,363,268)	(2,668,950)
Depreciation and amortisation - Infrastructure	11	(8,024,281)	(7,219,447)
Employee benefits expense - Infrastructure		(3,297,882)	(3,042,773)
Other administration - Infrastructure		(775,321)	(710,042)
Other expenses (including finance costs)	11	(2,393,337)	(897,811)
Total expenses		**(92,630,817)**	**(80,540,834)**
Net (deficit) surplus		**(2,808,008)**	**7,602,686**
Other comprehensive income			
Movement in the fair value of financial assets		(204,606)	996,491
Total comprehensive (deficit) surplus for the year		**(3,012,614)**	**8,599,177**

The above Statement of Surplus should be read in conjunction with the accompanying notes.

BALANCE SHEET

	Notes	31 December 2020 $	31 December 2019 $
ASSETS			
Current assets			
Cash and cash equivalents	12	27,161,647	21,826,815
Receivables	14	47,407,290	55,394,340
Accrued income	15	384,453	418,344
Financial instruments at amortised cost	17	14,500,508	24,503,602
Derivative financial instruments	25	-	752,667
Total current assets		**89,453,898**	**102,895,768**
Non-current assets			
Financial instruments at amortised cost	18	32,704,868	35,470,029
Financial assets at fair value through other comprehensive income	19	14,985,878	15,880,605
Receivables	20	2,561,679	-
Property, plant and equipment	21	222,324,601	188,802,379
Indefeasible Rights to Use traffic paths	22	69,510,202	65,905,781
Derivative financial instruments	25	-	25,131
Total non-current assets		**342,087,228**	**306,083,925**
Total assets		**431,541,126**	**408,979,693**
LIABILITIES			
Current liabilities			
Payables	3	15,533,210	20,921,837
Income in advance	4	76,044,057	64,635,938
Provisions	6	6,832,450	5,750,872
Lease liabilities	8	2,437,987	1,586,377
Other liabilities		150,032	308,130
Derivative financial instruments	25	651,580	-
Total current liabilities		**101,649,316**	**93,203,154**
Non-current liabilities			
Income in advance	5	61,493,986	47,602,483
Provisions	7	1,017,401	877,679
Lease liabilities	8	47,266,848	44,494,632
Derivative financial instruments	25	328,085	3,641
Total non-current liabilities		**110,106,320**	**92,978,435**
Total liabilities		**211,755,636**	**186,181,589**
Net assets		**219,785,490**	**222,798,104**
EQUITY			
Contributed equity	23	39,039	39,039
Reserve (accumulated unrealised gain/loss on investments)	24	543,374	747,980
Retained earnings	24	219,203,077	222,011,085
Capital and reserves attributable to members of AARNet Pty Ltd		**219,785,490**	**222,798,104**
Total equity		**219,785,490**	**222,798,104**

The above Balance Sheet should be read in conjunction with the accompanying notes.

STATEMENT OF CHANGES IN EQUITY

	31 December 2020 $	31 December 2019 $
Total equity at the beginning of the financial year	222,798,104	214,198,927
Net (deficit) surplus for the year	(2,808,008)	7,602,686
Other comprehensive income		
Changes in financial assets at fair value, net of tax	(204,606)	996,491
Total comprehensive (deficit) surplus for the year	(3,012,614)	8,599,177
Total equity at the end of the financial year	219,785,490	222,798,104

The above Statement of Changes in Equity should be read in conjunction with the accompanying notes.

STATEMENT OF CASH FLOWS

	Notes	31 December 2020 $	31 December 2019 $
Cash flows from operating activities			
Receipts from members and customers (inclusive of goods and services tax)		128,180,337	109,192,855
Payments to suppliers and employees (inclusive of goods and services tax)		(73,698,410)	(65,732,198)
Interest received		1,116,637	2,152,199
Interest payment on leases		(3,248,695)	(3,018,895)
Net cash inflow from operating activities	13	52,349,869	42,593,961
Cash flows from investing activities			
Payments for property, plant and equipment		(46,659,281)	(43,165,837)
Payments for Indefeasible Rights to Use traffic paths (intangible assets)		(11,100,776)	(6,161,095)
Payments for financial assets at fair value through other comprehensive income		(4,277,431)	(9,111,402)
Payments for financial instruments at amortised cost		(30,753,725)	(69,906,202)
Proceeds from sale of financial assets at fair value through other comprehensive income		4,334,736	3,482,648
Proceeds from financial instruments at amortised cost		43,500,000	81,508,050
Dividends received		351,183	766,384
Proceeds from sale of property, plant and equipment		10	46,658
Net cash outflow from investing activities		(44,605,284)	(42,540,796)
Cash flows from financing activities			
Principal elements of lease payments		(2,409,753)	(1,928,682)
Net cash (outflow) inflow from financing activities		(2,409,753)	(1,928,682)
Net increase/(decrease) in cash and cash equivalents		5,334,832	(1,875,517)
Cash and cash equivalents at the beginning of the financial year		21,826,815	23,702,332
Cash and cash equivalents at end of year	12	27,161,647	21,826,815

The above Statement of Cash Flows should be read in conjunction with the accompanying notes.

NOTES TO THE FINANCIAL STATEMENTS

1. BASIS OF PREPARATION

These general purpose financial statements have been prepared in accordance with Australian Accounting Standards - Reduced Disclosure Requirements and interpretations issued by the Australian Accounting Standards Board and the Australian Charities and Not-for-profits Commission Act 2012. AARNet Pty Ltd is domiciled in Australia and is a not-for-profit entity for the purpose of preparing the financial statements. The registered address of AARNet Pty Ltd is Tower A, Level 7, 799 Pacific Highway, Chatswood, NSW, 2067.

Going concern

The Company has net current liabilities of $12,195,418 as at 31 December 2020 (2019: net current assets of $9,692,614) and incurred a deficit of $2,808,008 for the year ended 31 December 2020 (2019: surplus of $7,602,686). Included within current liabilities is income in advance of $76,044,057 (2019: 64,635,938) which is not expected to be cash settled. Accordingly, the directors are of the opinion that the Company will be able to pay its debts as and when they become due and payable and have prepared the financial report on a going concern basis.

Historical cost convention

The financial statements have been prepared on a historical cost basis, except for the following: financial assets at fair value through statement of other comprehensive income, financial assets and liabilities (including derivative instruments) and certain classes of property, plant and equipment.

Income tax

AARNet is exempt from income tax under Section 50-5 of the Income Tax Assessment Act 1997 and therefore, no provision for income tax is included in these financial statements.

2. COMMITMENTS AND CONTINGENCIES

(a) Expenditure and capital commitments

	31 December 2020 $	31 December 2019 $
Within one year	8,330,480	22,184,680
Later than one year but not later than five years	9,723,158	5,695,480
Later than five years	38,058,285	9,539,874
	56,111,923	37,420,034

(b) Capacity commitments

	31 December 2020 $	31 December 2019 $
Within one year	10,325,705	13,643,217
Later than one year but not later than five years	13,201,439	22,031,491
Later than five years	10,624,890	13,107,998
Commitments not recognised in the financial statements	34,152,034	48,782,706

(c) Contingent Liabilities

AARNet's bankers have issued bank guarantees in favour of the Company's landlords and a third-party contractor with total face value of $1,035,270 (2019: $1,035,270).

3. CURRENT LIABILITIES - PAYABLES

	31 December 2020 $	31 December 2019 $
Current liabilities		
Trade payables	7,104,742	10,982,121
Other payables	8,428,468	9,939,716
	15,533,210	20,921,837

Trade payables and accruals are expected to be paid within 30 days.

These amounts represent liabilities for goods and services provided to AARNet prior to the end of the financial year which are unpaid. The amounts are unsecured and are usually paid within 30 days of recognition.

Accounting Policy

The fair value of financial liabilities for disclosure purposes is estimated by discounting the future contractual cash flows at the current market interest rate that is available to AARNet for similar financial instruments.

4. CURRENT LIABILITIES - INCOME IN ADVANCE

	31 December 2020 $	31 December 2019 $
Infrastructure establishment fees	28,583,404	24,109,009
Other deferred income	803,242	803,242
Infrastructure service fees	13,128,365	8,408,864
Subscriptions	33,529,046	31,314,823
	76,044,057	64,635,938

Accounting Policy

The Accounting Policy for Income in Advance is described in note 9.

5. NON-CURRENT LIABILITIES - INCOME IN ADVANCE

	31 December 2020 $	31 December 2019 $
Infrastructure establishment fees	59,398,174	44,951,317
Infrastructure projects	989,233	1,232,495
Other deferred income	1,106,579	1,418,671
	61,493,986	47,602,483

Accounting Policy

The Accounting Policy for Income in Advance is described in note 9.

6. CURRENT LIABILITIES - PROVISIONS

	31 December 2020 $	31 December 2019 $
Employee benefits	6,832,450	5,750,872

Accounting Policy

Wages and salaries and annual leave

Liabilities for wages and salaries, including non-monetary benefits and leave entitlements expected to be settled within 12 months of the reporting date, are recognised in respect of employees' services up to the reporting date and are measured at the amounts expected to be paid when the liabilities are settled.

7. NON-CURRENT LIABILITIES - PROVISIONS

	31 December 2020 $	31 December 2019 $
Employee benefits	549,789	393,620
Make good on leased premises	467,612	484,059
	1,017,401	877,679

Movements in provisions

Movements in each class of provision during the financial year, other than employee benefits, are set out below:

2020	Make good on leased premises $
Non-current liabilities - Provisions	
Carrying amount at start of year	484,059
Decrease in provision recognised	(16,447)
Carrying amount at end of year	**467,612**

2019	Make good on leased premises $
Non-current liabilities - Provisions	
Carrying amount at start of year	436,903
Additional provision to make good	47,156
Carrying amount at end of year	**484,059**

Accounting Policy

Employee benefits

These are liabilities for long service leave and annual leave not expected to be settled wholly within 12 months after the end of the period in which the employees render the related service. They are therefore recognised in the provision for employee benefits and measured as the present value of expected future payments to be made in respect of services provided by employees up to the end of the reporting period using the projected unit credit method.

Consideration is given to expected future wage and salary levels, experience of employee departures and periods of service. Expected future payments are discounted using market yields at the end of the reporting period of corporate bonds with terms and currencies that match, as closely as possible, the estimated future cash outflows. Re-measurements as a result of experience adjustments are recognised in the Statement of Surplus..

Make good on leased premises

Provisions for make good costs on leased premises are recognised when AARNet has a present legal or constructive obligation as a result of past events; it is more likely than not that an outflow of resources will be required to settle the obligation; and the amount has been reliably estimated.

8. LEASES

This note provides information for leases where AARNet is the lessee.

i) Amounts recognised in the balance sheet

The balance sheet shows the following amounts relating to leases:

	31 December 2020 $	1 January 2019 $
Right-of-use assets		
Communication assets	46,918,130	44,730,203
	46,918,130	44,730,203
Lease liabilities		
Current	2,437,987	1,586,377
Non-current	47,266,848	44,494,632
	49,704,835	46,081,009

The movement in the right-of-use assets over the year are as follows:

	$
Opening right-of-use assets as at 1 January	44,730,203
Depreciation charge of right-of-use assets	(3,845,652)
Additions to right-of-use assets	6,033,579
Right-of-use assets recognised as at 31 December 2020	46,918,130

ii) Amounts recognised in the Statement of Surplus

The statement of surplus shows the following amounts relating to leases:

	2020 $	2019 $
Depreciation charge of right-to-use assets		
Communication assets	3,845,653	3,279,488
Interest expense (included in Telecommunication Expenses)	3,248,695	3,018,895
Expense related to short-term leases (included in Administration Expenses)	903,851	1,270,790
Expenses related to leases of low-value assets that are not shown above as short-term leases (included in Administration Expenses)	7,822	29,181
Expenses related to variable lease payments not included in lease liabilities (included in Administrative Expense)	271,286	185,648

The total outflow for leases in 2020 was $8,277,307.

iii) AARNet's leasing activities and how these are accounted for

AARNet leases various offices, data centre space and dark fibre. Rental contracts are typically made for fixed periods of 1 to 20 years, but may have extension options as described in (iv) below.

Contracts may contain both lease and non-lease components. AARNet allocates the consideration in the contract to the lease and non-lease components based on their relative stand-alone prices. However, for leases of real estate for which AARNet is a lessee, it has elected not to separate lease and non-lease components and instead accounts for these as a single lease component.

Lease terms are negotiated on an individual basis and contain a wide range of different terms and conditions. The lease agreements do not impose any covenants other than the security interests in the leased assets that are held by the lessor.

Assets and liabilities arising from a lease are initially measured on a present value basis. Lease liabilities include the net present value of the following lease payments:

- Fixed payments (including in-substance fixed payments), less any lease incentives receivable
- Variable lease payments that are based on an index or a rate, initially measured using the index or rate as at the commencement date
- Amounts expected to be payable by AARNet under residual value guarantees, and
- Payments of penalties for terminating the lease, if the lease term reflects AARNet exercising that option.

Lease payments to be made under reasonably certain extension options are also included in the measurement of the liability.

The lease payments are discounted using the interest rate implicit in the lease. If that rate cannot be readily determined, which is generally the case for leases at AARNet, the lessee's incremental borrowing rate is used, being the rate that the individual lessee would have to pay to borrow the funds necessary to obtain as asset of similar value to the right-of-use asset in a similar economic environment with similar terms, security and conditions.

To determine the incremental borrowing rate, AARNet uses a build-up approach that starts with a risk-free interest rate adjusted for credit risk for leases held by AARNet.

AARNet is exposed to potential future increases in lease payments based on an index or rate, which are not included in the lease liability until they take effect. When adjustments to lease payments based on an index or rate take effect, the lease liability is reassessed and adjusted against the right-of-use asset.

Lease payments are allocated between principal and finance cost. The finance cost is charged to statement of surplus over the lease period so as to produce a constant periodic rate of interest on the remaining balance of the liability for each period.

Right-of-use assets are measured at cost comprising the following:

- The amount of the initial measurement of lease liability
- Any lease payments made at or before the commencement date less any lease incentives received
- Any initial direct costs, and
- Restoration costs

Right-of-use assets are generally depreciated over the shorter of the asset's useful life and the lease term on a straight-line basis.

Payments associated with short-term leases and leases of low-value assets are recognised on a straight-line basis as an expense in statement of surplus. Short-term leases are leases with a lease term of 12 months or less. Low-value assets comprise of equipment and small items of office furniture.

iv) Extension and termination options

Extension and termination options are included in a number of leases. These are used to maximise operational flexibility in terms of managing the assets used in AARNet's operations. The majority of extension and termination options held are exercisable only by AARNet and not by the respective lessor.

9. SERVICE REVENUE

	31 December 2020 $	31 December 2019 $
Telecommunications		
Members: Subscription, Traffic and Access	40,840,735	40,825,590
Non-Member: Subscription, Traffic and Access	14,294,221	16,456,613
Other Services	23,498,715	19,453,705
	78,633,671	76,735,908
Infrastructure & service agreements		
Infrastructure Establishment Fees	5,252,005	4,652,770
Infrastructure Project Construction	1,999,444	1,361,084
	85,885,120	82,749,762

a) Disaggregation of revenue from contracts with customers

AARNet derives revenue from the transfer of goods and services over time and at a point in time in the following major product lines:

	Teleco-Members	Teleco-Non-Member	Teleco-Other Services	Infra Establishment Fees	Infra Project Construction	Total
2020						
At a point in time	-	-	-	-	1,999,444	1,999,444
Over time	40,840,735	14,294,221	23,498,715	5,252,005	-	83,885,676
Total	40,840,735	14,294,221	23,498,715	5,252,005	1,999,444	85,885,120

	Teleco-Members	Teleco-Non-Member	Teleco-Other Services	Infra Establishment Fees	Infra Project Construction	Total
2019						
At a point in time	-	-	-	-	1,361,084	1,361,084
Over time	40,825,590	16,456,613	19,453,705	4,652,770	-	81,388,678
Total	40,825,590	16,456,613	19,453,705	4,652,770	1,361,084	82,749,762

b) Assets and liabilities related to contracts with customers

AARNet has recognised the following assets and liabilities related to contracts with customers:

	31 December 2020 $	31 December 2019 $
Current Liabilities- Income in Advance in relation to:		
Infrastructure Establishment Fees	28,583,404	24,109,009
Other Deferred Income	803,242	803,242
Infrastructure Service Fees	13,128,365	8,408,864
Subscriptions	33,529,046	31,314,823

	31 December 2020 $	31 December 2019 $
Non-Current Liabilities- Income in Advance in relation to:		
Infrastructure Establishment Fees	59,398,174	44,951,317
Infrastructure Projects	989,233	1,232,495
Other Deferred Income	1,106,579	1,418,671

(i) Significant changes in contract assets and liabilities

Contract liabilities for Infrastructure and service agreements have increased due to an increase in establishment fees for new projects that have not been completed as at 31 December 2020, despite no change in the timing of satisfied performance obligations; the nature of the goods supplied; nor the terms of payment.

(ii) Revenue recognised in relation to contract liabilities

The following table shows how much of the revenue recognised in the current reporting period relates to carried forward contract liabilities.

	31 December 2020 $	31 December 2019 $
Revenue recognised that was included in the contract liability balance at the beginning of the period		
Members: Subscription, Traffic and Access	28,324,969	26,321,311
Non-Members: Subscription, Traffic and Access	2,989,854	3,274,464
Other Services	7,580,135	7,657,765
Infrastructure Establishment Fees	4,596,918	4,219,599
Infrastructure Project Construction	786,579	243,261
Total Service Revenue	44,278,455	41,716,400
Other Revenue	12,950	481,610
Total Revenue	44,291,405	42,198,010

There are no material amounts of revenue recognised for both financial years in relation to performance obligations satisfied in previous periods.

(iii) Unsatisfied long-term transmission service contracts

As permitted under the provisions in AASB 15, the transaction price allocated to (partially) unsatisfied performance obligations is not disclosed where the entity has a right to invoice the customer in the amount that corresponds directly with the value of the entity's performance completed or the original expected duration of the underlying contract is one year or less. For Infrastructure establishment fees the total amount allocated to unsatisfied performance obligations is $87,889,556. The anticipated timing for revenue recognition of liabilities related to contracts with customers (including Infrastructure establishment fees) is as follows:

	31 December 2020 $	31 December 2019 $
Within one year	76,044,057	64,635,938
Later than one year but not later than five years	21,273,108	16,754,318
Later than five years	40,220,878	30,848,166
	137,538,043	112,238,422

Accounting Policy

Service revenues (derived from contracts with customers) have been accounted for under the accounting standard, AASB15 *Revenue from Contracts with Customers*.

(i) Transmission Services
Transmission services consist of a series of performance obligations where revenue is recognised as data services have been delivered in accordance to the contract.

The performance obligation for Transmission services is coupled with a performance obligation relating to access rights to the AARNet network, for the service agreement performance obligation cannot be executed without an access agreement.

An establishment fee forms part of the transaction price for transmission services. The establishment fee is not a consideration for a performance obligation in its own right, for the work to enable a transmission service cannot be separated from the transmission service itself.

(ii) Infrastructure Project Construction Revenue
Revenue from the provision of infrastructure where the infrastructure becomes the property of the customer is recognised when the underlying performance obligation is completed.

(iii) Stand alone selling price in the application of AASB15 Revenue from Contracts with Customers
The stand alone selling price in relation to all performance obligations contained within service contracts with customers is judged to be the fair value of those performance obligations if bought on a stand-alone basis.

(iv) Discounts and Taxes
Amounts disclosed as revenue are net of any discounts or taxes paid.

(v) Income in Advance
Amounts received or due and receivable in respect of future subscription periods or for services which have not been delivered are recorded as Income in Advance and appear as a liability (refer notes 4 and 5). Income in Advance is classified as either a current liability or a non-current liability depending on when the relevant subscription expires or the related service is expected to be delivered.

10. OTHER REVENUE, GRANTS AND CONTRIBUTIONS RECEIVED

2020 and 2019 AARNet recorded significant amounts of Other Revenue, Grants Received and Other Contributions.

These amounts are a material component of the surplus recorded by AARNet.

	31 December 2020 $	31 December 2019 $
Interest	1,039,485	2,083,862
Gain on foreign currency transactions	739,588	1,216,745
Other income	1,241,824	822,120
Dividends	462,449	676,040
Net gain on disposal of property, plant and equipment	10	46,658
Other Revenue	**3,483,356**	**4,839,425**
Grants and Contributions received	**454,333**	**554,333**

Grants and Contributions Received

This item includes amounts received by AARNet by way of grants and contributions where AARNet does not supply a service to the organisations providing the funding, however grants and contributions are recognised only upon completion of all performance obligations and when there are no unfulfilled conditions or other contingencies attaching to the grants.

Accounting Policy

Interest and Dividend Income

Interest and dividend income is recognised as it accrues and dividends are recognised as revenue when the right to receive payment is established.

Contributed Assets

Contributed assets (including the contribution of funds by government agencies or other persons to facilitate the construction of infrastructure for the AARNet network) are recognised at fair value when title and control of the asset passes or when the conditions to receive or retain funding are met.

11. EXPENSES

		31 December 2020 $	31 December 2019 $
Depreciation			
Communication assets		14,852,789	12,366,904
Office equipment		2,105,022	1,620,564
Leasehold improvements		405,141	339,263
Software		147,043	34,630
Buildings		3,282	3,272
Total depreciation	21	**17,513,277**	**14,364,633**
Amortisation			
Intangibles - Indefeasible Rights to Use traffic paths	22	7,496,355	7,703,828
Total depreciation and amortisation		**25,009,632**	**22,068,461**
Other expenses (including finance costs)			
Loss on foreign currency contracts		1,753,821	546,361
Loss on financial assets at fair value through other comprehensive income		632,816	238,857
Loss on disposal of assets		6,700	112,593
Total other expenses		**2,393,337**	**897,811**
Superannuation expense		**3,292,520**	**2,892,067**

Loss on Foreign Currency Contracts

AARNet hedges a significant proportion of its exposure to foreign currency movements (refer note 25) and does not apply hedge accounting. The accounting policy adopted with respect to derivatives and hedging activities is described below. During 2020 movements in the Australian dollar produced a loss (including realised and unrealised gain) on the hedging instruments held during and as at the end of the year of $1,753,821 (2019: loss of $546,360).

Accounting Policy

Depreciation and Amortisation

The accounting policy for depreciation and amortisation is described in notes 21 and 22 respectively.

Foreign Currency Contracts

At year end, Foreign Currency Contracts are recognised at fair value as described in note 25 (see Derivative Financial Instruments). Realised and unrealised gain or losses on such contracts are taken into account each year in the Statement of Surplus. AARNet does not apply hedge accounting.

12. CURRENT ASSETS - CASH AND CASH EQUIVALENTS

	31 December 2020 $	31 December 2019 $
Current assets		
Cash at bank and in hand (AUD)	6,788,076	8,036,392
Cash at bank (USD and EUR)	5,768,652	9,191,540
Deposits at call - all denominated in AUD	14,604,919	4,598,883
	27,161,647	21,826,815

Cash at bank and on hand

Cash at bank and on hand is held at interest rates varying between 0.00% and 0.66% (2019: 0.00% and 0.90%). During the year, cash is transferred to or from term deposits to meet liquidity requirements.

Deposits at call

Interest bearing deposits at call attracted interest rates between 0.01% and 0.10% (2019: 0.10% and 1.70%).

Accounting Policy

For the purpose of presentation in the statement of cash flows, cash and cash equivalents includes cash on hand, deposits held at call with financial institutions, bank overdrafts and other short-term, highly liquid investments with original maturities of three months or less that are readily convertible to known amounts of cash and which are subject to an insignificant risk of changes in value.

13. RECONCILIATION OF NET (DEFICIT) SURPLUS TO NET CASH INFLOW FROM OPERATING ACTIVITIES

	31 December 2020 $	31 December 2019 $
(Deficit)/ surplus for the year	(2,808,008)	7,602,686
Depreciation and amortisation	25,009,632	22,068,461
Dividend income	(462,449)	(676,040)
Net loss (gain) on sale of investments	632,816	238,857
Net amortised interest income	21,980	(17,908)
Net loss on sale of property, plant and equipment	6,690	65,935
Decrease/ (increase) in trade receivables	3,180,390	5,005,433
Decrease/ (increase) in accrued income	145,157	289,197
Decrease/ (increase) in prepayments and other debtors	2,244,981	(8,188,229)
Decrease/ (increase) in derivative financial instruments	1,753,822	546,249
Increase in trade payables	(3,737,966)	4,550,906
Increase/ (decrease) in other operating liabilities	(158,098)	(18,616)
Increase in provisions	1,221,300	668,773
Increase/(decrease) in income received in advance	25,299,622	10,458,257
Net cash inflow from operating activities	52,349,869	42,593,961

14. CURRENT ASSETS - RECEIVABLES

	31 December 2020 $	31 December 2019 $
Trade receivables	40,026,184	43,206,574
Provision for impairment of receivables	(255,000)	(255,000)
	39,771,184	42,951,574
Prepayments and Other Debtors	7,636,106	12,442,766
	47,407,290	55,394,340

Trade Receivables

Trade receivables are due for settlement no more than 30 days from the date of recognition.

At 31 December 2020, trade receivables included balances of $708,514 (2019: $1,499,426) which are past due but not impaired or considered uncollectable. These amounts have been outstanding for more than 90 days. These relate to a number of customers for whom there is no history of default.

Prepayments and Other Debtors

Payments for goods and services which are to be provided in future years are recognised as prepayments.

Other debtors generally arise from transactions outside the usual operating activities of AARNet. Interest is not normally charged.

Fair Value

Due to the short-term nature of these receivables, their carrying amount is assumed to approximate their fair value.

Accounting Policy

Trade receivables are recognised initially the amount of consideration that is unconditional, unless they contain significant financing components when they are recognised at fair value. They are subsequently measured at amortised cost, less provision for impairment.

Collectability of trade receivables is reviewed on an ongoing basis. Debts which are known to be uncollectable are written off. The group applies the simplified approach to providing for expected credit losses prescribed by AASB 9, which permits the use of the lifetime expected loss provision for all trade receivables. To measure the expected credit losses, trade receivables have been grouped based on shared credit risk characteristics and the days past due. The amount of the provision is recognised in the Statement of Surplus in Administration- Telecommunications expenses.

The carrying value less impairment provision of trade receivables is assumed to approximate fair value due to the short-term nature of the receivables.

15. CURRENT ASSETS - ACCRUED INCOME

	31 December 2020 $	31 December 2019 $
Current assets		
Accrued interest receivable	375,565	319,471
Other	8,888	98,652
Infrastructure projects	-	221
	384,453	418,344

16. FINANCIAL ASSETS AND INVESTMENTS

AARNet holds financial assets and investments (other than prepayments or trade receivables) including:

- Financial instruments at amortised cost (notes 17 and 18)
- Financial assets at fair value through other comprehensive income (note 19)
- Derivative financial instruments (shown on the Balance Sheet)

Accounting Policy

Financial instruments at amortised cost

Financial instruments at amortised cost are non-derivative financial assets with fixed or determinable payments and fixed maturities that management has the positive intention and ability to hold to maturity. If AARNet were to sell other than an insignificant amount of financial instruments at amortised cost, the whole category would be tainted and reclassified as financial assets at fair value through other comprehensive income. Financial instruments at amortised cost are included in non-current assets, except for those with maturities less than 12 months from the end of the reporting period, which are classified as current assets.

At initial recognition, AARNet measures a financial instrument at amortised cost at fair value plus transaction costs that are directly attributable to the acquisition of the investment. Financial instruments at amortised cost are subsequently carried at amortised cost using the effective interest method.

If a financial instrument at amortised cost has a variable interest rate, the discount rate for measuring any impairment loss is the current effective interest rate determined under the contract. As a practical expedient, AARNet may measure impairment on the basis of an instrument's fair value using an observable market price.

Purchases and sales of financial assets are recognised on the date on which AARNet commits to purchase or sell the asset. Financial assets are derecognised when the rights to receive cash flows from the financial assets have expired or have been transferred and AARNet has transferred substantially all the risks and rewards of ownership.

Financial assets at fair value through other comprehensive income

Financial assets at fair value through other comprehensive income are held at fair value with gains and losses recognised in other comprehensive income. Debt or equity securities that are not held to maturity are recognised as financial assets at fair value through other comprehensive income. They are included in non-current assets unless the investment matures or management intends to dispose of the investment within 12 months of the end of the reporting period.

At each reporting period, AARNet assesses whether any financial assets at fair value through other comprehensive income are impaired. Impairment exists if one or more events have occurred which have a negative impact on the security's estimated cash flows which can be reliably estimated.

If financial assets at fair value through other comprehensive income are impaired, the cumulative loss - measured as the difference between the original cost and the current fair value, less any impairment charge previously recognised in the Statement of Changes in Equity - is removed and recognised in the Statement of Surplus.

Impairment losses on equity financial assets at fair value through other comprehensive income previously recognised in the Statement of Surplus are not reversed in subsequent periods. If the fair value of a debt security which has been impaired increases, due to an event which has occurred after the impairment was recognised, the impairment charge is reversed through the Statement of Surplus.

When securities classified as financial assets at fair value through comprehensive income are sold, the accumulated fair value adjustments recognised in other comprehensive income are reclassified to net surplus.

Derivatives and hedging activities

Derivatives are initially recognised at cost on the date a derivative contract is entered into and are subsequently remeasured to their fair value at each reporting date.

AARNet has entered into forward exchange contracts which are economic hedges for foreign currencies to be traded at a future date but do not satisfy the requirements for hedge accounting. Any changes in fair values are taken to other comprehensive income immediately.

Fair value measurements

AARNet measures and recognises the following assets and liabilities at fair value on a recurring basis:

- Financial assets at fair value through profit or loss; and
- Derivative financial instruments.

AASB 13 Fair Value Measurement requires disclosure of fair value measurements by level of the following fair value measurement hierarchy:

- Level 1: quoted prices (unadjusted) in active markets for identical assets or liabilities;
- Level 2: inputs other than quoted prices included within level 1 that are observable for the asset or liability, either directly or indirectly; and
- Level 3: inputs for the asset or liability that are not based on observable market data (unobservable inputs).

The following table presents the company's assets and liabilities measured and recognised at fair value at 31 December 2020 and 31 December 2019:

31 December 2020	Level 1 $	Level 2 $	Level 3 $	Total $
Assets				
Financial assets at fair value through other comprehensive income				
Equity securities	8,868,569	-	-	8,868,569
Bonds	6,117,309	-	-	6,117,309
Total assets	14,985,878	-	-	14,985,878
Derivative financial instruments	-	(979,665)	-	(979,665)
Total financial liabilities	-	(979,665)	-	(979,665)

31 December 2019	Level 1 $	Level 2 $	Level 3 $	Total $
Assets				
Derivative financial instruments	-	777,798	-	777,798
Financial assets at fair value through other comprehensive income				
Equity securities	9,606,181	-	-	9,606,181
Bonds	6,274,424	-	-	6,274,424
Total assets	15,880,605	777,798	-	16,658,403
Derivative financial instruments	-	(3,641)	-	(3,641)
Total liabilities	-	(3,641)	-	(3,641)

The fair value of financial instruments traded in active markets (such as financial assets at fair value through other comprehensive income) are based on quoted market prices at the end of the reporting period. These instruments are included in level 1.

The fair value of financial instruments that are not traded in an active market (such as derivative financial instruments) are determined using valuation techniques. These valuation techniques maximise the use of observable market data where it is available and rely as little as possible on entity specific estimates. If all significant inputs required to fair value an instrument are observable, the instrument is included in level 2.

17. CURRENT ASSETS - FINANCIAL INSTRUMENTS AT AMORTISED COST

	31 December 2020 $	31 December 2019 $
Debt securities (fixed and floating rates)	8,500,508	8,503,602
Term deposits	6,000,000	16,000,000
	14,500,508	24,503,602

Bank guarantee and credit facilities

AARNet has a $1,500,000 Bank Guarantee Facility provided by the National Australia Bank. AARNet has drawn on this facility to provide bank guarantees in favour of the landlords for leased premises and a third party contractor. AARNet has an unsecured credit card facility of $300,000.

18. NON-CURRENT ASSETS - FINANCIAL INSTRUMENTS AT AMORTISED COST

	31 December 2020 $	31 December 2019 $
Debt securities (fixed and floating rates)	32,704,868	35,470,029

19. NON-CURRENT ASSETS - FINANCIAL ASSETS AT FAIR VALUE THROUGH OTHER COMPREHENSIVE INCOME

	31 December 2020 $	31 December 2019 $
Non-current assets		
Debt securities (fixed and floating rates)	6,117,309	6,274,424
Equity securities	8,868,569	9,606,181
	14,985,878	15,880,605

20. NON-CURRENT ASSETS - RECEIVABLES

	31 December 2020 $	31 December 2019 $
Prepayments	2,561,679	-

21. NON-CURRENT ASSETS - PROPERTY, PLANT AND EQUIPMENT

	Freehold buildings $	Leasehold improvements $	Office equipment $	Communication assets $	Software $	Total $
At 1 January 2019						
Cost or fair value	81,927	4,521,238	10,226,227	178,261,159	1,164,015	194,254,566
Accumulated depreciation	(3,071)	(2,334,294)	(6,751,504)	(76,432,060)	(1,118,229)	(86,639,158)
Net book amount	78,856	2,186,944	3,474,723	101,829,099	45,786	107,615,408
Year ended 31 December 2019						
Opening net book amount	78,856	2,186,944	3,474,723	149,176,007	45,786	154,962,316
Additions	-	1,105,757	2,494,202	43,297,410	757,137	47,654,506
Additions (Right-of-Use Assets)	-	-	-	662,783	-	662,783
Disposals	-	-	(2,246)	(110,347)	-	(112,593)
Depreciation charge	(3,272)	(339,263)	(1,620,564)	(12,366,904)	(34,630)	(14,364,633)
Closing net book amount	75,584	2,953,438	4,346,115	180,658,949	768,293	188,802,379
At 31 December 2019						
Cost or fair value	81,927	4,209,954	12,098,157	267,602,762	1,921,152	285,913,952
Accumulated depreciation	(6,343)	(1,256,516)	(7,752,042)	(86,943,813)	(1,152,859)	(97,111,573)
Net book amount	75,584	2,953,438	4,346,115	180,658,949	768,293	188,802,379

	Freehold buildings $	Leasehold improvements $	Office equipment $	Communication assets $	Software $	Total $
Year ended 31 December 2020						
Opening net book amount	75,584	2,953,438	4,346,115	180,658,949	768,293	188,802,379
Additions	-	90,281	5,825,258	37,497,869	1,595,212	45,008,620
Additions (Right-of-Use Assets)	-	-	-	6,033,579	-	6,033,579
Disposals	-	-	(6,700)	-	-	(6,700)
Depreciation charge	(3,282)	(405,141)	(2,105,022)	(14,852,789)	(147,043)	(17,513,277)
Closing net book amount	72,302	2,638,578	8,059,651	209,337,608	2,216,462	222,324,601
At 31 December 2020						
Cost or fair value	81,927	4,253,085	17,811,534	310,813,944	3,516,364	336,476,854
Accumulated depreciation	(9,625)	(1,614,507)	(9,751,883)	(101,476,336)	(1,299,902)	(114,152,253)
Net book amount	72,302	2,638,578	8,059,651	209,337,608	2,216,462	222,324,601

Communication Assets- Finance Leases

AARNet provides other parties with rights to use components of AARNet's fibre and other infrastructure in return for that party providing AARNet with similar rights to use components of its fibre and infrastructure.

These arrangements are in the nature of two separate finance leases with each party acting as lessor and lessee. Each lease is treated as settled when both sides of the swap agreement come into force. Consequently, there is no lease finance cost or outstanding lease liability arising in respect of such transactions.

Right-of-use assets

Communication assets include both assets and leased right-of-use assets. See Note 8 for more detail on right-of-use assets.

Assets in the course of construction

Included in the carrying amounts of the assets shown above are assets that were in the course of construction as at the end of the reporting period. The relevant amounts are as follows:

	31 December 2020 $	31 December 2019 $
Communication assets	41,639,027	25,884,091
Office equipment	4,894,098	1,226,847
Leasehold improvements	61,669	14,630
Software	1,962,276	737,389
Total assets in the course of construction	**48,557,070**	**27,862,957**

Accounting Policy

Acquisition

Property, plant and equipment is stated at historical cost less depreciation. Historical cost includes expenditure that is directly attributable to the acquisition of the items.

Subsequent costs are included in the asset's carrying amount or recognised as a separate asset, as appropriate, only when it is probable that future economic benefits associated with the item will flow to AARNet and the cost of the item can be measured reliably.

Fibre and Infrastructure Swaps

AARNet may enter into arrangements granting other parties the right to use AARNet's fibre or infrastructure in return for receiving rights to use fibre or infrastructure owned by the other party ("swaps"). Where such swaps involve significant values of assets, AARNet records an asset disposal in respect of the assets used by the other party at the carrying value of the relevant assets at the time the swap becomes effective. AARNet then recognises an asset

of equivalent value, being the right to use the fibre or infrastructure of the other party.

Unincorporated Joint Operations

AARNet accounts for interests in unincorporated joint operations by recognising its share of the assets and liabilities held or owed by the joint operation along with its share of the expenses incurred by the joint operation.

Where the assets held within the joint operation include assets in the course of construction, AARNet's share of those assets is included in the values for assets in the course of construction shown in this note.

Depreciation

Property, plant and equipment is depreciated using the straight-line method to allocate cost, net of residual value, over each item's estimated useful life, as follows:

Leasehold improvements	10 years
Office equipment	3 years
Leased communication assets	5 - 6 years
Leased office equipment	3 years
Communication assets	3 - 20 years
Software	2 - 3 years

The assets' residual values and useful lives are reviewed, and adjusted if appropriate, at the end of each reporting period; such adjustments may result in a revised useful life shorter than that shown above.

Impairment of Assets

Assets that are subject to depreciation or amortisation are reviewed for indicators of impairment whenever events or changes in circumstances indicate that the carrying amount may not be recoverable. An impairment loss is recognised for the amount by which the asset's carrying amount exceeds its recoverable amount. The recoverable amount is the higher of an asset's fair value less costs to sell and value in use. As a not-for-profit entity, value in use is calculated on the basis of the depreciated replacement cost, which represents the current replacement cost of an asset less, where applicable, accumulated depreciation calculated on the basis of such cost to reflect the already consumed or expired future economic benefits of the asset.

For the purposes of assessing impairment, assets are grouped at the lowest levels for which there are separately identifiable cash flows (cash generating units). The company has only one cash generating unit.

Gains and Losses

Gains and losses on disposals are determined by comparing proceeds with carrying amount. These are included in the Statement of Surplus.

22. NON-CURRENT ASSETS - INDEFEASIBLE RIGHTS OF USE TRAFFIC PATHS (INTANGIBLE ASSETS)

	Total $
At 1 January 2019	
Total payments	164,007,918
Accumulated amortisation on a straight line basis	(96,559,404)
Net book amount	**67,448,514**
Year ended 31 December 2019	
Opening net book amount	67,448,514
Additions	6,161,095
Amortisation charge	(7,703,828)
Closing net book amount	65,905,781
Total payments	170,169,013
Accumulated amortisation on a straight line basis	(104,263,232)
Net book amount	**65,905,781**
Year ended 31 December 2020	
Opening net book amount	65,905,781
Additions	11,100,776
Amortisation charge	(7,496,355)
Closing net book amount	**69,510,202**
At 31 December 2020	
Cost	181,269,789
Accumulated amortisation	(111,759,587)
Net book amount	**69,510,202**

AARNet's intangible assets are Indefeasible Rights of Use (IRU) capacity on traffic paths across communication infrastructure owned by other parties.

Accounting Policy

The value of each IRU is amortised from the date each right become available for service and will continue to be amortised over the term of the right, which varies from 10 to 28 years. The longest remaining amortisation period is approximately 20 years.

Impairment

IRUs are also subject to impairment review as described in note 21.

23. CONTRIBUTED EQUITY

	31 December 2020 Shares	31 December 2019 Shares	31 December 2020 $	31 December 2019 $
Ordinary shares				
Fully paid ordinary shares	78	78	39,039	39,039

Movements in ordinary share capital

Date	Details	Number of shares	$
1 January 2019	Opening balance	78	39,039
31 December 2019	Balance	78	39,039
31 December 2020	Balance	78	39,039

AARNet's shareholders are 38 Australian Universities and the Commonwealth Scientific and Industrial Research Organisation (CSIRO). Each shareholder holds two ordinary shares.

Holders of ordinary shares are entitled to one vote per share on resolutions put before the members. Holders of ordinary shares are not entitled to dividends and have no right to receive any distribution during a winding up.

24. RETAINED EARNINGS AND RESERVE

Retained earnings

Movements in retained earnings were as follows:

	31 December 2020 $	31 December 2019 $
Balance 1 January	222,011,085	214,408,399
(Deficit) surplus for the year	(2,808,008)	7,602,686
Balance 31 December	219,203,077	222,011,085

Reserve - accumulated unrealised gain/loss on investments

Movements in reserve were as follows:

	31 December 2020 $	31 December 2019 $
Balance 1 January	747,980	(248,511)
Changes in the fair value of financial assets through other comprehensive income	(204,606)	996,491
Balance 31 December	543,374	747,980

25. FINANCIAL RISK MANAGEMENT

AARNet's activities are exposed to a variety of financial risks including:

a)   Market risk (including currency risk, interest rate risk and equity price risk);

b)   Credit risk; and

c)   Liquidity risk.

This note explains the Company's level of exposure to these risks, how these risks could affect the Company's future financial performance and how AARNet manages the impact of these risks.

AARNet's overall risk management program focuses on managing its liquidity and seeking to minimise potential adverse effects on financial performance. The Board, through the Audit, Finance & Risk Committee, is responsible for setting the overall objectives for risk management and provides specific policies where necessary.

The day to day risk management is carried out by identifying, evaluating and hedging financial risks. This is the responsibility of the Chief Executive Officer (CEO) and the Chief Financial Officer (CFO) and they are supported by operating management.

a)   Market risk

(i)   Currency risk

AARNet operates equipment at international locations and deals with certain suppliers in foreign currencies and is impacted by changes in foreign exchange rates. The Company is primarily exposed to changes in the US dollar (USD) and to a smaller extent, the Euro (EUR). AARNet currently has monthly requirements in excess of USD200,000, for the purchase of international communications capacity and other services. These requirements are expected to increase over time.

Currency risk is measured using sensitivity analyses and cash flow forecasting, summarised below.

Currency risk is managed by holding foreign currency, entering into forward foreign exchange contracts and purchasing options to acquire foreign currency. At year end, AARNet held USD4,362,219

(AUD5,659,390) in USD denominated bank accounts and EUR68,872 (AUD109,261) in a EUR denominated bank account. AARNet's risk management policy is to hedge at least 60% of anticipated short-term cash flows (mainly for the purchase of capacity to the USA) in USD.

The following table summarises the sensitivity of the Company's financial assets and financial liabilities to foreign exchange risk for the year

			Currency risk		
		-10%		+10%	
At 31 December 2020	Carrying amount $	Surplus $	Equity $	Surplus $	Equity $
Cash and cash equivalents	27,161,647	(640,962)	(640,962)	524,422	524,422
Trade Receivables	40,026,184	(50,330)	(50,330)	44,087	44,087
Derivative financial instruments (liabilities)	(979,665)	108,852	108,852	(89,060)	(89,060)
Trade payables	(7,104,742)	122,000	122,000	(106,868)	(106,868)

			Currency risk		
		-10%		+10%	
At 31 December 2019	Carrying amount $	Surplus $	Equity $	Surplus $	Equity $
Cash and cash equivalents	21,826,815	(1,021,282)	(1,021,282)	835,594	835,594
Trade Receivables	43,206,574	(25,127)	(25,127)	20,559	20,559
Derivative financial instruments (assets)	777,798	(86,422)	(86,422)	70,709	70,709
Derivative financial instruments (liabilities)	(3,641)	405	405	(331)	(331)
Trade payables	(10,982,121)	148,212	148,212	(121,264)	(121,264)

(ii)   Interest rate risk

AARNet's main interest rate risk arises from its cash at bank, cash in deposits and financial instruments at amortised cost.

The Company's interest rate risk is monitored using sensitivity analysis and is reviewed by management and the company's external investment consultant.

The following table summarises the sensitivity of the Company's financial assets and financial liabilities to interest rate risk for the year.

			Interest rate risk		
		absolute -1%		absolute +1%	
At 31 December 2020	Carrying amount $	Surplus $	Equity $	Surplus $	Equity $
Financial assets					
Cash and cash equivalents	27,161,647	(3,886)	(3,886)	213,930	213,930
Financial instruments at amortised cost, term deposits	6,000,000	(60,000)	(60,000)	60,000	60,000
Financial instruments at amortised cost, floating rate notes	41,205,376	(412,054)	(412,054)	412,054	412,054

			Interest rate risk		
		absolute -1%		absolute +1%	
At 31 December 2019	Carrying amount $	Surplus $	Equity $	Surplus $	Equity $
Financial assets					
Cash and cash equivalents	21,826,815	(35,166)	(35,166)	126,353	126,353
Financial instruments at amortised cost, term deposits	16,000,000	(160,000)	(160,000)	160,000	160,000
Financial instruments at amortised cost, floating rate notes	43,973,631	(439,736)	(439,736)	439,736	439,736

(iii) Financial assets at fair value through other comprehensive income (price risk)

AARNet's equity price risk arises from holding financial assets at fair value through other comprehensive income such as equity instruments, listed bonds and hybrid investments.

Price risk is measured and using sensitivity analysis and is monitored by management and the company's external investment consultant.

The following table summarises the sensitivity of the Company's financial assets and financial liabilities to price risk for the year.

			Other price risk		
		-1%		+1%	
At 31 December 2020	Carrying amount $	Surplus $	Equity $	Surplus $	Equity $
Financial assets					
Financial assets at fair value through other comprehensive income	14,985,878	-	(149,859)	-	149,859

			Other price risk		
		-1%		+1%	
At 31 December 2019	Carrying amount $	Surplus $	Equity $	Surplus $	Equity $
Financial assets					
Financial assets at fair value through other comprehensive income	15,880,605	-	(158,806)	-	158,806

b) Credit risk

Credit risk arises where a debtor fails to make contractual payments to AARNet as and when they fall due. AARNet is exposed to credit risk on its holdings of cash and cash equivalents, term deposits, corporate bonds and loan notes, hybrid securities and derivative financial instruments. Further credit risk arises from credit exposures to customers in the form of outstanding receivables and committed transactions.

AARNet's credit risk is mainly managed through the following measures:

Credit risk source	Management
Bank deposits and derivative financial instruments	• Principally deal with highly rated financial institutions.
Investments in hybrid loan notes and bonds	• Bound by an approved investment policy which stipulates minimum ratings or other criteria for investment funds. • Investment decisions based on recommendations from a licensed investment advisor.
Customers	• Assessment of credit quality of the customer, taking into account its financial position, past experience and other factors. • Invoicing in advance for significant portion of income.

(i)   Trade receivables

AARNet applies the simplified approach to providing for expected credit losses prescribed by AASB 9, which permits the use of the lifetime expected loss provision for all trade receivables. To measure the expected credit losses, trade receivables have been grouped based on shared credit risk characteristics and the days past due.

During the year, no material gain/(loss) was recognised in Statement of Surplus in other expenses in relation to impaired receivables.

In the prior year, the impairment of trade receivables was assessed based on the incurred loss model. Individual receivables which were known to be uncollectable were written off by reducing the carrying amount directly. The other receivables were assessed collectively, to determine whether there was objective evidence that an impairment had been incurred but not yet been identified. For those receivables, the estimated impairment losses were recognised in a separate provision for impairment. The group considered that there was evidence of impairment if any of the following indicators were present:

- Significant financial difficulties for the debtor
- Probability that the debtor will enter bankruptcy or financial re-organisation
- Default or delinquency in payments (more than 60 days overdue).

(ii)   Other financial assets at amortised cost

Other financial assets at amortised cost include debt securities and term deposits (previously held-to-maturity). All of these financial assets are considered to have low credit risk, and thus the impairment provision recognised during the period was zero. Management consider 'low credit risk' for listed bonds to be an investment grade credit rating with at least one major rating agency. Other instruments are considered to be low credit risk when they have a low risk of default and the issuer has a strong capacity to meet its contractual cash flow obligations in the near term.

c)   Liquidity risk

Prudent liquidity risk management implies maintaining sufficient cash to meet the needs of the business. Management monitors AARNet's liquidity and cash and cash equivalents on a rolling forecast expected cash flow basis. This analysis is prepared in Australian Dollars.

AARNet's Board periodically considers longer range financial forecasts (5+ years) provided as part of the normal course of its deliberations. The Board also considers the expenditure commitments disclosed in note 2 when assessing the liquidity of the Company.

26. CRITICAL ACCOUNTING ESTIMATES AND JUDGEMENTS

The preparation of financial statements requires the use of certain critical accounting estimates. It also requires management to exercise its judgement in the process of applying the Company's accounting policies.

Often, this involves estimates and assumptions concerning the future. The resulting accounting estimates will, by definition, seldom equal the related actual results. The estimates and assumptions that have a significant risk of causing a material adjustment to the carrying amounts of assets and liabilities within the next financial year are discussed below.

(i) Useful life of intangible assets

The Directors have assumed in the ordinary course of business that AARNet's customers will continue to use AARNet's services into the forseeable future. The useful economic lives assigned for intangible assets are based on the contractual terms agreed for each Indefeasible Right of Use.

(ii) Useful life of assets

AARNet is the owner of a significant amount of assets and infrastructure. Estimates are made as to the useful life of these assets which can affect both the amount of depreciation and amortisation expense during the year and the amount of revenue recognised in relation to Establishment Fees.

(iii) Lease term

In determining the lease term, management considers all facts and circumstances that create an economic incentive to exercise an extension option, or not exercise a termination option. Extension options (or periods after termination options) are only included in the lease term if the lease is reasonably certain to be extended (or not terminated).

For leases, the following factors are normally the most relevant:

- If there are significant penalties to terminate (or not extend), AARNet is typically reasonably certain to extend (or not terminate).
- If any leasehold improvements are expected to have a significant remaining value, AARNet is typically reasonably certain to extend (or not terminate).
- Otherwise, AARNet considers other factors including historical lease durations and the costs and business disruption required to replace the leased asset.

The lease term is reassessed if an option is actually exercised (or not exercised) or AARNet becomes obliged to exercise (or not exercise) it. The assessment of reasonable certainty is only revised if a significant event or a significant change in circumstances occurs, which affects this assessment, and that is within the control of the lessee.

27. DIRECTORS

The Directors of AARNet Pty Ltd during the financial year were:

Chairman - non-executive
Emeritus Professor Gerard Sutton AO*

Executive Directors
Mr Chris Hancock AM, CEO

Non-executive Directors
Dr Christine Burns
Professor John Dewar AO
Mr David Formica (appointed 25 March 2020, resigned 12 February 2021)
Mr Robert Fitzpatrick*
Professor Brigid Heywood
Mr Jeff Murray (resigned 25 March 2020)
Ms Fiona Rankin
Mr John Rohan*
Mr Scott Sorley (appointed 18 March 2021)
Professor Deborah Terry AO
Emeritus Professor Mark Wainwright AM*
Dr David Williams

*Denotes independent director

28. KEY MANAGEMENT PERSONNEL DISCLOSURES

Key management personnel compensation

The key management personnel are those who had authority and responsibility for planning, directing and controlling the activities of AARNet, directly or indirectly, during the year. The remuneration for key management personnel including directors is as follows:

	31 December 2020 $	31 December 2019 $
Short-term and long-term employee benefits	3,131,021	3,270,448
Post-employment benefits	369,895	407,842
	3,500,916	3,678,290

Transactions with key management personnel

Directors Mr J Murray and Ms F Rankin are members of the Council of Australian University Directors of Information Technology (CAUDIT) to which AARNet provides payroll bureau services. AARNet receives no consideration for this service.

Other directors represent, act for, or hold offices at certain AARNet shareholders and customers. AARNet provides services to these shareholders on arm's length terms.

29. REMUNERATION OF AUDITORS

PricewaterhouseCoopers

Audit and other assurance services

	2020 $	2019 $
Audit and other assurance services		
Audit and review of financial statements	232,000	225,000
Other assurance services		
Audit of special purpose finance reports	12,000	-
Total remuneration for audit and other assurance services	244,000	225,000
Taxation services		
Taxation services	3,000	27,250
Other services		
Remuneration for advisory services	-	15,000
Total remuneration of PricewaterhouseCoopers	247,000	267,250

30. OTHER SIGNIFICANT ACCOUNTING POLICIES

New, revised or amending Accounting Standards and Interpretations adopted

AARNet has not applied any standards for the first time in this reporting period.

AARNet has not early adopted any standards that have been issued but are not yet effective.

Foreign currency translation

Foreign currency transactions are translated into the functional currency using the exchange rates prevailing at the dates of the transactions. Foreign exchange gains and losses resulting from the settlement of such transactions and from the translation at year end exchange rates of monetary assets and liabilities denominated in foreign currencies are recognised in the Statement of Surplus.

Revenue recognition

The accounting policies for the group's revenue from contracts with customers are explained in Note 9.

Leases

The accounting policies for the group's leases are explained in Note 8.

Goods and Services Tax (GST)

Revenues, expenses and assets are recognised net of the amount of associated GST, unless the GST incurred is not recoverable from the Australian Taxation Office (ATO). In this case it is recognised as part of the cost of acquisition of the asset or as part of the expense.

Receivables and payables (except accrued expenses) are stated with the amount of GST included.

The net amount of GST recoverable from, or payable to, the ATO is included as a current asset or liability in the Balance Sheet.

Cash flows are included in the Statement of Cash Flows on a gross basis. The GST component of cash flows arising from investing and financing activities which are recoverable from, or payable to, the ATO are classified as operating cash flows.

Investments and other financial assets

The accounting policies for the group's revenue from investments and other financial assets are explained in Note 10.

New Accounting Standards and Interpretations not yet mandatory or early adopted

The AASB has issued a new standard (AASB1060) providing a revised Financial Statement and simplified disclosure framework for Tier 2 Not-for-Profit Entities like AARNet.

The new AASB 1060 standard is required to be applied to financial years beginning on or after 1 July 2021. AARNet will be applying AASB 1060 from 1 January, 2021.

DIRECTORS' DECLARATION

In the Directors' opinion:

(a) the financial statements and notes set out on pages 8 to 30 are in accordance with the Australian Charities and Not-for-profits Commission Act 2012, including:

   (i) complying with Accounting Standards and other mandatory professional reporting requirements, and

   (ii) giving a true and fair view of the entity's financial position as at 31 December 2020 and of its performance for the year ended on that date, and

(b) there are reasonable grounds to believe that the Company will be able to pay its debts as and when they become due and payable.

This declaration is made in accordance with a resolution of Directors.

Emeritus Professor MS Wainwright AM

Director

Sydney

31st March 2021

Mr JF Rohan

Director

Independent auditor's report

To the members of AARNet Pty Limited

Our opinion

In our opinion:

The accompanying financial report of AARNet Pty Limited (the Company) is in accordance with Division 60 of the *Australian Charities and Not-for-profits Commission (ACNC) Act 2012*, including:

(a)   giving a true and fair view of the Company's financial position as at 31 December 2020 and of its financial performance for the year then ended

(b)   complying with Australian Accounting Standards - Reduced Disclosure Requirements and Division 60 of the *Australian Charities and Not-for-profits Commission Regulation 2013*.

What we have audited

The financial report comprises:

- the balance sheet as at 31 December 2020
- the statement of surplus for the year then ended
- the statement of changes in equity for the year then ended
- the statement of cash flows for the year then ended
- the notes to the financial statements, which include significant accounting policies and other explanatory information
- the directors' declaration.

Basis for opinion

We conducted our audit in accordance with Australian Auditing Standards. Our responsibilities under those standards are further described in the *Auditor's responsibilities for the audit of the financial report* section of our report.

We believe that the audit evidence we have obtained is sufficient and appropriate to provide a basis for our opinion.

Independence

We are independent of the Company in accordance with the ethical requirements of the Accounting Professional & Ethical Standards Board's APES 110 *Code of Ethics for Professional Accountants (including Independence Standards)* (the Code) that are relevant to our audit of the financial report in Australia. We have also fulfilled our other ethical responsibilities in accordance with the Code.

Other information

The directors are responsible for the other information. The other information comprises the information included in the annual report for the year ended 31 December 2020, but does not include the financial report and our auditor's report thereon.

Our opinion on the financial report does not cover the other information and accordingly we do not express any form of assurance conclusion thereon.

In connection with our audit of the financial report, our responsibility is to read the other information and, in doing so, consider whether the other information is materially inconsistent with the financial report or our knowledge obtained in the audit, or otherwise appears to be materially misstated.

If, based on the work we have performed on the other information that we obtained prior to the date of this auditor's report, we conclude that there is a material misstatement of this other information, we are required to report that fact. We have nothing to report in this regard.

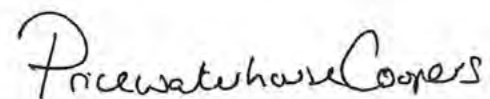## Responsibilities of the directors for the financial report

The directors of the Company are responsible for the preparation of the financial report that gives a true and fair view in accordance with Australian Accounting Standards - Reduced Disclosure Requirements and the *Australian Charities and Not-for-profits Commission (ACNC) Act 2012* and for such internal control as the directors determine is necessary to enable the preparation of the financial report that gives a true and fair view and is free from material misstatement, whether due to fraud or error.

In preparing the financial report, the directors are responsible for assessing the ability of the Company to continue as a going concern, disclosing, as applicable, matters related to going concern and using the going concern basis of accounting unless the directors either intend to liquidate the Company or to cease operations, or have no realistic alternative but to do so.

Auditor's responsibilities for the audit of the financial report

Our objectives are to obtain reasonable assurance about whether the financial report as a whole is free from material misstatement, whether due to fraud or error, and to issue an auditor's report that includes our opinion. Reasonable assurance is a high level of assurance, but is not a guarantee that an audit conducted in accordance with the Australian Auditing Standards will always detect a material misstatement when it exists. Misstatements can arise from fraud or error and are considered material if, individually or in the aggregate, they could reasonably be expected to influence the economic decisions of users taken on the basis of the financial report.

A further description of our responsibilities for the audit of the financial report is located at the Auditing and Assurance Standards Board website at:
http://www.auasb.gov.au/auditors_responsibilities/ar4.pdf. This description forms part of our auditor's report.

PricewaterhouseCoopers

Scott Walsh   Sydney
Partner   31 March 2021