JULY/AUGUST 2021 Vol.8 No.5

critical comms

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comms critical

Inside

July/August 2021

READ ONLINE! *This issue is available to read and download at*
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ON THE COVER

Powerful service box for complete base station functionality

The new DAMM Service Box SB422 supports up to two DAMM MultiTech Base Stations BS422 with full functionality, including power supply, base station controller, switching and alarm handling. Using the DAMM SB422 allows users to reap the full benefits of the DAMM BS422 base station.

Key benefits include: powerful PC that can run Network Management and gateways directly on the Service Box; ability to run two DAMM BS422s; Windows 10 IoT; integration of gateways; PTP synchronisation; compact, rugged IP65 design; resilience and high-capacity coverage.

Using two service boxes, resilience can be easily achieved through a redundant setup. Alternatively, this setup can be used to achieve high-capacity radio coverage by operating up to four DAMM BS422 base stations at one location.

Simplicity at the core

Status and alarm indicators show the status of the power supply, link and node controller at a glance, enabling quick fault location and repairs. Installation and maintenance is equally simple, with direct mast mounting, pre-arranged connections and remote maintenance, keeping costs to a minimum.

Easy Windows upgrade, flexible migration

The SB422 can be used as a replacement for the DAMM SB421 service box to run two existing DAMM Outdoor Systems BS421, providing gradual and cost-effective migration to a Windows 10 IoT platform.

Damm Australia
www.damm-aus.com.au/

Transmit

It is July and the uncertainty continues.

Dire emergencies are those times the critical communications industry is specifically geared to perform its primary function. But this pandemic is not your usual emergency.

Most sectors of industry, where radio comms are used, are closed down, for example: mines, hospitality, events; plus, due to the widespread lockdown, emergencies are down as well. With people confined to their homes there are fewer cars on the road, fewer industrial accidents and fewer recreational pursuits where ambulance and search and rescue would be traditionally called in to play during an accident.

Sitting quietly at home we can only watch the news as events outside our bubble filter through: Miami building collapse, Euro Cup, Wimbledon, plus various ongoing military manoeuvres of varying degrees of hostility around the globe's hotspots.

There will always be a need for two-way, immediate and close communication somewhere in the world.

Meanwhile, the encroachment of digital communications maintains its pace. Is this a future danger to critical communications or an opportunity to seize? As any good business person will tell you: definitely the latter.

Besides the benefits of getting on the digital waveband, I feel there will always be the need for the traditional communications methods as well. Recent upsurge in ransomware and even terrorist attacks highlight the dangers of a fully digital and, therefore, hackable world.

Sitting around at home can give you plenty to think about.

Phillip Ross, Editor
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Calendar

August

APCO 2021
15–18 August 2021
San Antonio, Texas

AFAC21
17–20 August 2021
Sydney
afacconference.com.au

September

IWCE 2021
27–30 September 2021
Las Vegas
iwceexpo.com

October

EENA Conference & Exhibition 2021
6–8 October 2021
Riga, Latvia
eenaconference.org

Comms Connect Melbourne 2021
19–21 October 2021
Melbourne Convention & Exhibition Centre
comms-connect.com.au

November

Critical Communications World 2021
3–5 November 2021
IFEMA, Spain
critical-communications-world.com

For a full list of industry events, see criticalcomms.com.au/events

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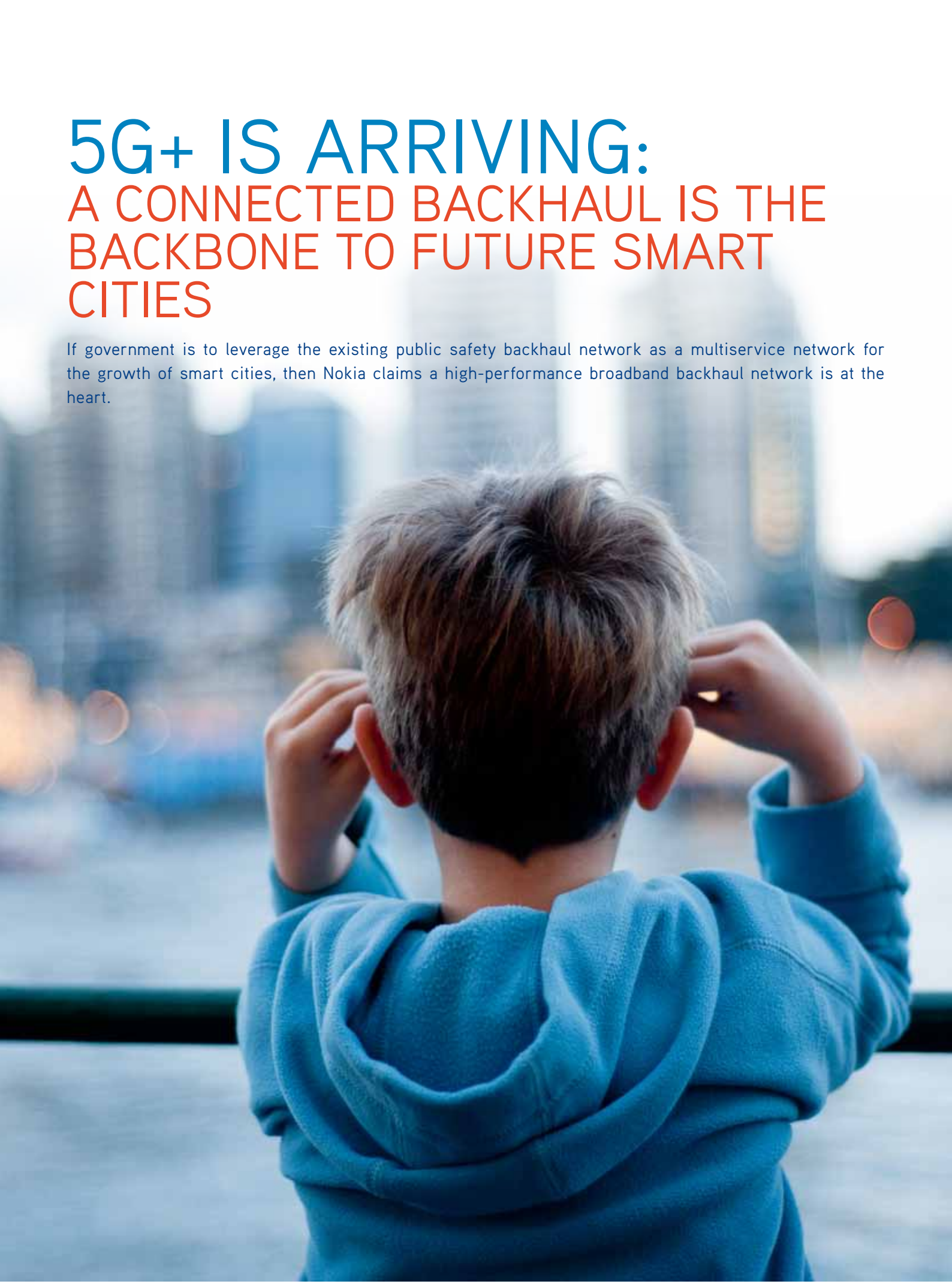
5G+ IS ARRIVING:
A CONNECTED BACKHAUL IS THE BACKBONE TO FUTURE SMART CITIES

If government is to leverage the existing public safety backhaul network as a multiservice network for the growth of smart cities, then Nokia claims a high-performance broadband backhaul network is at the heart.



To accomplish smart city goals, governments are upgrading infrastructure by considering private LTE networks. A cost-effective solution is to leverage the existing public safety backhaul network as a multiservice network to carry smart city data.

Smart cities offer the promise of safe, prosperous and sustainable living for all citizens, delivering effective emergency services and providing citizens with better public services. Consequently, governments are already upgrading land mobile radio (LMR) systems and harnessing broadband LTE services, such as in America with the US FirstNet, for a more coordinated emergency response.

To accomplish the smart city goals, governments are planning for other connected city infrastructure deployment that encompasses a wide range of systems such as CCTV, smart lighting and an intelligent transportation system.

Fundamental to a smart city infrastructure is a high-performance broadband connectivity platform connecting its associated assets. Because the infrastructure has a large footprint, to reach all assets economically, a private wireless network is the natural choice. Among the various wireless technologies, open standard-based LTE is the preferred radio technology because of its rich ecosystem, robust security and an evolutionary path to 5G.

In the past, a lack of spectrum has hampered local governments' efforts to deploy private LTE networks for smart city infrastructure. However, national radio authorities around the world have now started to make suitable spectrum available.

In the US, the FCC has opened up the 3.5 GHz band (also known as band 48 with 3GPP). In Europe, countries such as France have also made the 2.6 GHz band available for vertical industries. These spectrum initiatives have prompted many infrastructure operators, including local governments, to investigate or plan for a private LTE network.

An essential element of a private LTE network is the backhaul network connecting LTE base stations (eNBs) and the LTE core. However, deploying a backhaul network adds significant cost and effort, causing additional time for the project.

Fortunately, there is an alternate option. Many local governments already have backhaul networks dedicated to public safety communications. If they can use those backhaul networks as multiservice networks to transport the private LTE traffic, this will improve the project economics and expedite smart city application deployment.

However, when using a public safety backhaul network as a multiservice network, it is imperative that public safety application performance is never degraded and the communications are never compromised.

Challenges for smart city public safety backhaul

To provide the required performance, a public safety backhaul network transporting smart city private LTE traffic must meet the following challenges:

- Assured delivery of LMR traffic
- Cybersecurity
- Interworking with the cloud
- Readiness for 5G.

Assured delivery of LMR traffic

Radio communication is a lifeline for first responders. It needs to be up and running 24/7. It is also a real-time application that is sensitive to network delay.

When the backhaul network expands to transport smart city private LTE traffic, there is a diverse set of smart city applications across the smart city infrastructure that run atop the network and compete for network bandwidth. Examples include intelligent traffic management systems, smart lighting and CCTV.

In addition, real-time, mission-critical LMR traffic requires strict delay with the highest possible reliability while smart-city applications have less demanding requirements. It is crucial that the network is application-aware to classify traffic for different quality of service (QoS) so that it always reliably delivers critical LMR traffic, even when there is network congestion, so that first responders can constantly communicate with their radios without disruptions.

Cybersecurity

A backhaul network provides meshed connectivity so that any device can reach any other device attached to the network. With more application systems such as the LTE system, the attack surface increases.

Furthermore, when the use of the backhaul network is further broadened to connect to city offices and public amenities, the attack surface expands further. And because these facilities are easily physically accessed, there is a concern that network vulnerabilities are increased significantly. When attached devices are compromised, attackers can use them as launching pads to move across the backhaul network and penetrate into the LMR and other critical systems to cause serious disruptions.

Interworking with the cloud

Smart city applications such as video analytics are evolving to a distributed, cloud-based architecture so they can scale up to

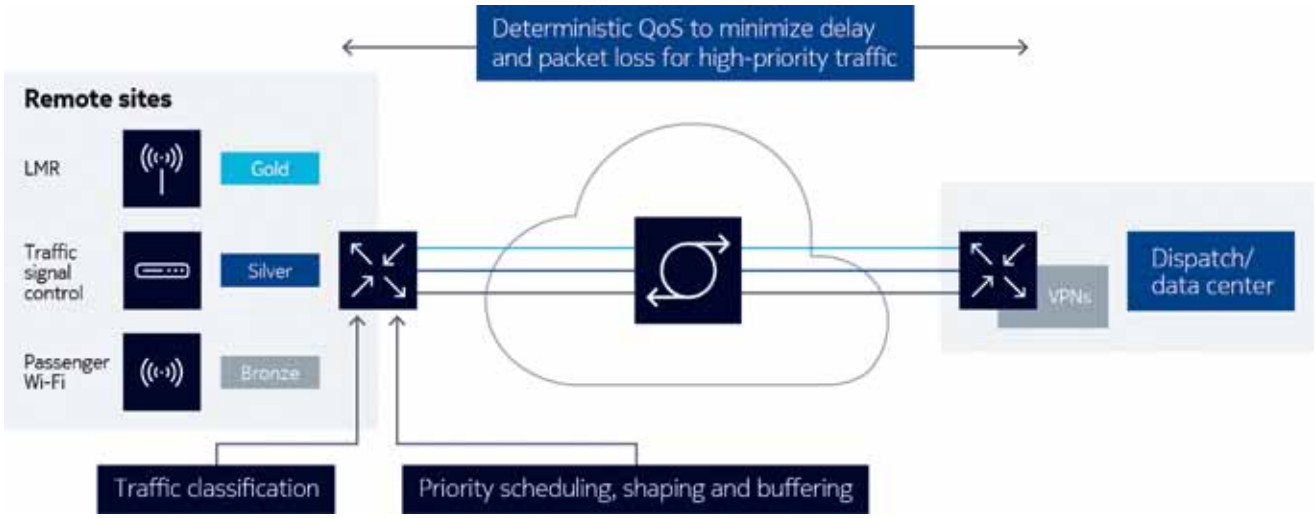


Figure 1: IP/MPLS backhaul network delivering QoS assurance.

process a large number of high-definition video streams, improve anomaly detection time and optimise backhaul bandwidth.

This architecture takes advantage of LTE local breakout capability and places the video analytics gateway function on a mobile edge computing (MEC) platform at the edge of the network. The MEC is even colocated with the eNB in some circumstances, with the general operations, administration and maintenance (OAM) functions of the video analytics system remaining in a video analytics cloud server application in the data centre.

With data centres embracing cloud technology, the compute resource hosting the video analytics cloud server application becomes dynamic and mobile. The cloud management system (CMS) can create, delete and migrate compute resources from one server to another and from one data centre to another for server upgrade, optimisation or maintenance.

When this happens, the traditional data centre network fabric connecting all servers does not learn about these events in an automated way, and the connectivity to the applications is disrupted. Consequently, many data centres have transformed their network fabric with software-defined networking (SDN) so that the network fabric can adapt its connectivity to compute resource events in an automated way.

This automation brings two challenges to the communications between the video gateway in the field and the cloud server application:

- Between the backhaul network and the cloud (referred as network-cloud interworking hereafter): A new network function called a network-cloud interworking gateway is required to seamlessly extend connection from the backhaul network domain across the data centre SDN fabric domain to reach the application.
- Determining how to make the cross-domain connection adaptive when the application migrates to another data centre.

Readiness for 5G

Because LTE is a 3GPP technology, local governments will benefit from a smooth evolution to 5G when and where needed for more bandwidth-intensive and time-sensitive applications while they continue to use the LTE coverage. Therefore, it is essential that the backhaul network is also ready to provide backhaul for the 5G network.

How IP/MPLS can help overcome challenges

IP/MPLS brings the following capabilities to a public safety backhaul network to help overcome the challenges described:

- Deterministic QoS for assured LMR traffic delivery
- IP/MPLS VPN with encryption for cybersecurity
- Network-cloud interworking
- Support for 5G transport.

Deterministic QoS for assured LMR traffic delivery

QoS is a set of network capabilities to control delay, jitter and packet loss for data traffic flowing through the network. This is done by controlling and managing bandwidth resources in network equipment.

Although IP and Ethernet platforms do offer QoS, next-generation IP/MPLS routers, with extensive packet classification, queuing and scheduling capabilities, have advanced. A wide range of applications send intensive data with a diverse range of QoS requirements based on a customised QoS policy for each service created for each individual application.

IP/MPLS backhaul routers can classify, buffer, schedule and shape traffic to constantly satisfy the requirements of LMR traffic and various other applications. This capability of constantly meeting the service requirement is called deterministic QoS. See Figure 1.

As an example, when the IP/MPLS router is receiving a lot of public Wi-Fi data sent by citizens, as soon as the LMR radio sends critical voice or data traffic, the router recognises the LMR traffic and strictly prioritises it over other data traffic, minimising delay and jitter and avoiding packet discard when link congestion occurs. This is essential to ensure high LMR communications performance.

As more cities are considering a private LTE network as a foundation for a smart city project, those that have already deployed an IP/MPLS backhaul network for their public safety communication infrastructure can leverage this important network asset to simplify and accelerate the deployment of a private wireless network.

IP/MPLS is a technology already chosen by many mobile service providers around the world to backhaul their LTE networks. Due to its deterministic QoS capability, ability to support network segmentation with secure IP/MPLS VPNs and network-cloud interworking as well as its 5G readiness, an IP/MPLS backhaul network delivers the performance and economics needed to support both public safety communications and the future connected smart city services reliably.

Excerpted from Nokia's Broadening Public Safety Backhaul for Smart Cities white paper.
Nokia Solutions and Networks Singapore Pte Ltd

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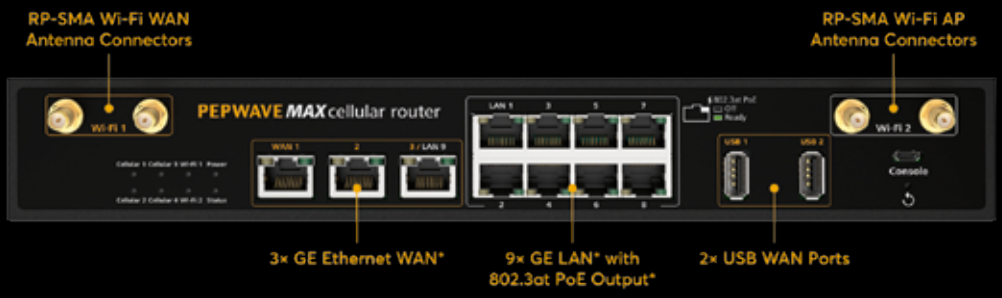

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News

VIC GOVT BOOSTS EMERGENCY SERVICES COMMS AND FACILITIES

The recently announced Victorian Budget for 2021/22 includes a $138.8 million boost over seven years to replace Country Fire Authority (CFA) radio equipment with modern digital technology, strengthening brigades' emergency response and keeping volunteers safe.

More than $133 million will upgrade the digital radio service for Forest Fire Management Victoria staff and other emergency response personnel, so forest fires are contained more quickly while also keeping firefighters safe. This will mean personnel can avoid radio black spots and communicate better with other first responders, including Country Fire Authority volunteers, when fighting fires and responding to remote emergencies.

Also announced is $70.6 million provided for critical programs and increased demand for Life Saving Victoria, the State Control Centre, Emergency Management Victoria and the Emergency Services Telecommunication Authority.

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An additional $39.2 million will further support critical upgrades to VicEmergency and other information systems, and progress emergency management reforms, like improving cross-border arrangements and communications and investing in the Australian Fire Danger Rating System.

To ensure emergency services have the dedicated spaces and resources they need to continue their incredible work, $28 million will go towards upgrading local facilities. This includes the development of Life Saving Victoria's Point Lonsdale Beach Base and the Wonthaggi and Williamstown Life Saving clubhouses, and delivery of a Victoria State Emergency Service unit in Port Fairy. Local CFA brigades will also benefit with the replacement of the Irymple, Serpentine and Metcalfe stations, upgrades and refurbishment of the Doreen station and new equipment for Edithvale station, while also supporting local jobs. More than $28.8 million will replace the Benalla police station to ensure the hardworking local police have a state-of-the-art facility to serve their community.

RF and PIM analysis over CPRI

The IQ Fiber Master MT2780A PIM and RF analyser is a CPRI-based solution that provides critical PIM diagnosis across multiple bands and sectors using live traffic. Cell sites remain active during testing as this instrument uses a non-invasive process to report real-time results. Identify PIM levels, locations, and conduct RF spectrum analysis to efficiently hunt and debug PIM and interference issues.

Use live traffic to get an accurate picture of cell site environment — no site turn down, no tower climb. Monitor up to three downlinks and one uplink during PIM over CPRI testing for analysis of multi-band sites or 4x4 MIMO antennas. Resolve intermittent PIM problems by continuously monitoring cell site remotely for days or weeks; IQ Fiber Master MT2780A automatically records and captures PIM events with time stamping to make debugging easier. Support for all 4G/LTE bands and bandwidths and MIMO configurations up to 4x4 MIMO; supports CPRI line rates 1–8 as well as equipment from all major manufacturers including ALU, Ericsson, Nokia, Huawei and Samsung.

The solution features: RF over CPRI spectrum for interference measurements; PIM over CPRI for any frequency PIM measurements; PIM analytics for long-term PIM monitoring; PIM location (DTP); 4 SFP ports; 4x4 MIMO support; CPRI line rate 1–8 support; up to 12 AxC traces simultaneously for multiple sectors/carriers

Anritsu Pty Ltd

www.anritsu.com

Body-worn cameras

Body-worn cameras can be used with radios to deter aggressive behaviours and protect staff. Evidence capturing also assists in easing processes in managing allegations and complaints.

The VT100 is a small, lightweight and unobtrusive device with a standby battery life of up to 6 months. The device can live stream for up to 90 min and streams audio and video to a security operations centre or video management software. The VT100 is customisable for brand recognition, secure, impenetrable and tamperproof, providing court-ready evidence.

The VB400 is a slightly larger, more heavy-duty camera device with a wide-angle, 1080p HD lens to capture high-quality video and a recording time of up to 12 h on a single charge. If paired with radios over Bluetooth, the VB400 can automatically record when the user's radio enters an emergency state. When tethered to a trusted Wi-Fi network or a personal 4G hotspot, users are able to live stream video footage to remote colleagues.

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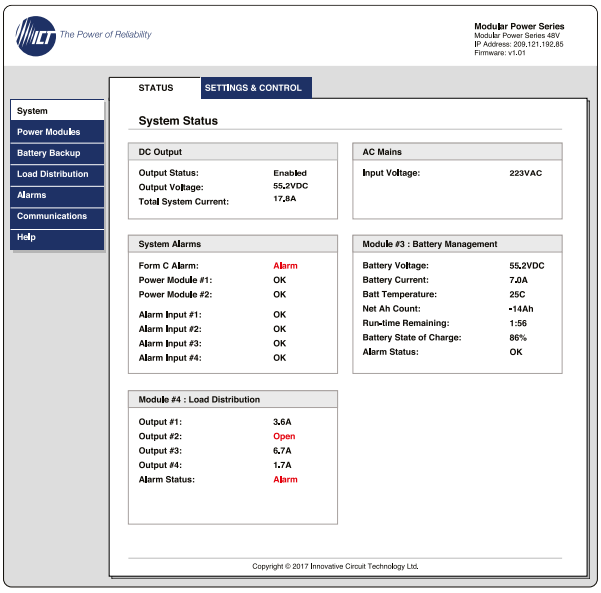

The optional Intelligent Controllers on Modular Power and Platinum Series include a secure, easy to use web browser interface which provides remote monitoring, alarm reporting, and control of the system over an Ethernet link. SNMP support allows integration of the power systems into your wireless network management infrastructure.

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News

QUEENSLAND SES RECEIVES GRANTS TO UPGRADE FACILTIES

The Queensland Government has awarded more than $586,000 in grants to councils across Queensland to help them support the local SES groups. State Fire and Emergency Services Minister Mark Ryan announced the grants on Wear Orange Wednesday (WOW) on 19 May — a national day recognising and celebrating the achievements of SES volunteers.

Twenty grant applications had been successful during the 2021–22 funding year. They can cover up to $75,000 of the costs of upgrades and improvements to SES facilities, buildings and structures, or up to $30,000 of the costs of new and replacement SES vehicles.

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RADIO REGULATIONS INTERNATIONAL TREATY AGREEMENT

The Australian Government Joint Standing Committee on Treaties has tabled Report 195, concerning three treaty actions: revisions to the Radio Regulations which regulate radio spectrum and satellite orbits, a film co-production agreement with Malaysia and a new tax information exchange agreement with Timor-Leste.

The revisions to the Radio Regulations make a number of improvements to the management of the radio spectrum and satellite orbits, which are used to support everything from mobile phones to satellite communications. The improvements include providing greater bandwidth to support 5G mobile broadband services, enhanced connectivity on aeroplanes and ships, and expanded global maritime distress and safety system satellite services.

The Joint Standing Committee on Treaties is a federal government appointment passed in 2019, currently under the committee chair of David Sharma MP.

Lithium batteries

Power back-up systems for telecommunications have historically been expensive and challenging. Traditional batteries need to be frequently changed, diesel is costly and pollutes the environment, and actual back-up time and life expectancy of batteries is uncertain due to lack of intelligence.

Polarium's range of smart lithium batteries is small, light and maintenance-free. The Polarium SLB modules are built with cells from leading manufacturers of lithium cells. Compared with lead-acid, they have many benefits, such as half the volume, a quarter of the weight and five times higher energy density.

The SLB modules are available in both 2RU and 4RU form-factor with capacity up to 250 Ah in a single module (SLB48-250-146-2). This high energy density means significant cost savings across solar and hybrid sites as fewer batteries are required less batteries, along with fewer cabinets and site work requirements.

Powerbox Australia Pty Ltd

www.powerbox.com.au

800G transceiver test unit

Viavi has announced the expansion of the Viavi ONT solution portfolio with the 800G Flex XPM module, an integrated test product for pluggable 800G transceivers that utilise 100G electrical lane speed, with integrated test applications. 800G represents the current peak of practical optical networking speeds and, as network traffic continues to surge, it is fast becoming part of operators' upgrade plans.

Enterprises are accelerating technology modernisation plans and service providers are upgrading their networks and data centres with higher transport speeds, cloud-native architectures and machine learning. In preparation, industry groups are issuing 800G specifications, 800G-ready silicon is emerging and the optical networking ecosystem is readying 800G class modules.

The module provides a wide range of critical test and measurement capabilities that manufacturers need to design and validate 800G optical modules based on 100G electrical signalling. The module has been designed for IC development and validation test, 800G transponder testing and vendor selection, system verification test and manufacturing test. Key features include: support for 2x400GE, 8x100GE, 4x200GE and 1x800G unframed; dynamic skew; forward error correction (FEC) validation; and automation integration with the Viavi ONT family.

VIAVI Solutions Inc

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VT100

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- Can live-stream for up to 90 minutes
- Customisable for brand recognition
- Secure and impenetrable
- Tamperproof, providing court-ready evidence

VB400

RUGGED AND INTUITIVE DESIGN

The large central button and robust side switch are positioned for easy operation, even when wearing gloves.

LONG BATTERY LIFE

With a recording time of up to 12 hours on a single charge.

RADIO INTEGRATIONS

If paired with select radios over Bluetooth, the VB400 can automatically record when the user's radio enters an "emergency state", which is when the user presses the radio's emergency button, or when the radio's man down sensor detects the user is down.

HIGH QUALITY VIDEO

In instances where footage is required for evidence, the camera's wide angle, 1080p HD lens captures high-quality video from the wearer's viewpoint - providing accountability, protecting people and proving professionalism.

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Tether to a trusted Wi-Fi network or your personal 4G hotspot to live-stream video footage to remote colleagues for assistance.

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News

POTENTIAL FOR MOBILE PHONE SIGNALS TO MEASURE BUSHFIRE SMOKE

Led by Dr Adrien Guyot, Research Fellow in Monash University's Department of Civil Engineering, this Australia-first study analysed radio link signal fluctuations during smoke events associated with the 2019–2020 Australian bushfires.

Observations showed that dry air containing large amounts of smoke within a surface layer above the ground acted as a lid, reducing dispersion, trapping and maintaining high ground-level concentrations of smoke. This climate also created irregular broadcast conditions for radio links and operational weather radars. Unique signal patterns were identified and shown to be related to these specific atmospheric conditions and smoke concentrations by analysing the received signal levels of these links.

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Researchers say this routinely recorded data by telecommunication companies could be used to predict smoke concentrations at ground level during haze events, in collaboration with other hazard reduction technologies. The study, developed in collaboration with Delft University of Technology (The Netherlands), Wageningen University (The Netherlands), the Australian Bureau of Meteorology and Monash University's School of Earth, Atmosphere & Environment, was published in the journal *AGU Advancing Earth and Space Science*.

Dr Guyot said the future of improved smoke prediction capabilities is likely to be a blended product combining modelling, satellite remote sensing, weather radar ground clutter, in situ observations and mobile phone data. Received signal levels (RSLs) from radio links have been used to measure rainfall and humidity. Radio links, otherwise known as commercial microwave links (CMLs), are the backbone of cellular communication networks.

Researchers found the qualitative information from CML signals showed differences to climate and atmospheric conditions, as well as temperature inversions that could be precursors to elevated PM levels associated with a smoke incident.

Ultraportable spectrum analysers up to 170 GHz

Anritsu's Spectrum Master MS276xA family of ultraportable spectrum analysers provide continuous coverage to 170 GHz. The spectrum analysers are pocket-sized yet big on performance, with good dynamic range, sweep speed and amplitude accuracy, the company claims. The ultraportable size of the instruments enables a direct connection to almost any DUT, eliminating the need for lossy, expensive cables. This should enable the user to more efficiently advance their technology development and reduce time to market.

Utilising Anritsu's patented nonlinear transmission line (NLTL) technology provides >100 dB dynamic range. Measurements include channel power, adjacent channel power and occupied bandwidth with support for up to six traces, three trace detectors and 12 markers. The 145 and 170 GHz models are said to be the world's first handheld, millimetre-wave spectrum analysers to provide broadband, continuous coverage from 9 kHz to 170 GHz and break through the 110 GHz barrier. Having frequency coverage in to the higher bands enables research and development in the entire D band spectrum as well as advanced millimetre-wave applications like radio astronomy, automotive radar, antenna beam pattern testing and more.

The Spectrum Master MS276xA family are all USB-powered and controlled from a Windows-based PC, laptop or tablet, making them flexible for use in the lab, on the manufacturing floor or even in the field.

Anritsu Pty Ltd
www.anritsu.com

Electrical connectors

Digi-Key Electronics now offers Molex power connectivity solutions — whether for increased connectivity in tighter spaces, high-tech automotive and industrial solutions or diverse medical applications.

To meet current industry demands for smaller interconnects, Molex provides connectors designed to support power supplies and systems requiring high-current transfer in challenging and thermal-constrained spaces. Molex connectors are also suitable for next-generation computing applications requiring higher-power distribution for long-term performance and reliability in a range of industries.

With current ratings of up to 200 A and broad circuit size options, the Molex range includes proven solutions such as the FiT Family and KK Connector Systems, as well as products including the Coeur CST High Current Interconnect and L1NK Connector Systems.

Digi-Key Electronics
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News

PUBLIC SAFETY NETWORK TOWER INSTALLED AT UMINA

An emergency communications tower has been constructed at Umina Beach in a bid to expand the Central Coast's public safety network. The site, which is located at 51 Castle Circuit, Umina Beach, was delivered by the NSW Telco Authority.

Parliamentary Secretary for the Central Coast Adam Crouch said the radio site is vital to ongoing community safety, "alongside Australia's triple zero emergency hotline, the Public Safety Network is the most critical communications network in our state", he said.

"Public Safety Network sites provide emergency services organisations with a single, integrated network upon which they communicate.

"During the Black Summer of bushfires, the Public Safety Network allowed the Rural Fire Service, Police Force, Fire and Rescue, Ambulance and SES continue to communicate even when the general mobile network stopped functioning," Crouch said.

CALCULATE YOUR OWN EMF RADIATION

Ofcom is the British organisation looking after all forms of communications in that country, including wireless devices like cordless phones, walkie talkies plus even some car keys and doorbells. It even keeps an eye on the Royal Mail.

On its website it has uploaded an EMF calculator for the purpose of assisting spectrum users to assess separation distances required for their own radio equipment. It is to help licensees assess compliance with the EMF licence condition.

Downloadable by anyone, it is easy to enter basic parameters of the radio system, such as radiated power, maximum time transmitting in any six-minute period and frequency, into the calculator. The spreadsheet will calculate a separation distance to be maintained between the radio equipment and members of the general public in order to demonstrate compliance with the British regulation.

To download the Excel spreadsheet EMF calculator, click here. The calculator does not currently cover frequencies below 10 MHz.

The calculator has been designed to allow licensees to simply and easily assess compliance, without the need for technical knowledge. It therefore uses simplified assumptions and will produce conservative results. In some cases, it may significantly overestimate the separation distance; for a more detailed analysis the organisation recommends using a detailed technological tool or seeking help from a professional installer.

ISR encoder

Crystal Group's rugged ISR encoder module, available in Australia from Metromatics, uses the Haivision Makito X1 encoder to deliver real-time streaming of MISB-compliant full motion video capabilities required for intelligence, surveillance and reconnaissance applications.

The integrated system combines a Makito X1, eight-port switch, six 2.5″ SSD storage drives and dual Intel Xeon scalable processors into the RS1104 1U server. At just under 9.98 kg, the compact server has the workload of three separate 1U units, including two simultaneous compression functions via two separate encode engines for machine learning applications running on the RS1104 and a low-bitrate video stream to reach remote users over constrained network links.

The system also delivers performance mission computing, storage, layer 2+ switching and encoding capability.

Features include network adaptive H.265/HEVC encoding and it supports 802.1Q VLAN switch with 8K MACs, 4K VLAN and link aggregation (IEEE 802.3ad).

Optional features are available such as: Mil-CIRC power connector, EMI filter, humidity protection, dust filter, tamper-proof coatings.

Using the Crystal Force server as the foundation, the RS1104 is engineered to meet strict MIL standards, accelerate compute-intensive workloads and provide advanced thermal management, ensuring operation in demanding and unpredictable situations.

Metromatics Pty Ltd

www.metromatics.com.au

Antenna placement

Antenova has launched a software app to help designers place antennas in a wireless design. It has been developed to assist product designers who do not have access to antenna skills in-house.

The tool displays the optimum position for embedded antennas on the PCB, depending on the dimensions of the PCB and the specifications of the antennas. It places each individual antenna on the PCB in the best location for signal strength. It can be used for one single antenna, or up to three antennas from different categories or a pair of antennas in a diversity configuration.

The app also displays the 'keep-out' area adjacent to the antenna, which must be kept free of other components.

Antenova Limited

www.antenova.com

COMMS CONNECT MELBOURNE ON TRACK

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It was heartening to see a successful live CommsConnect NZ last month in Wellington, and the program is filling up with headline speakers and other highlights for CommsConnect Melbourne, to be held at the MCEC, 19–21 October.

Headlining day one will be respected Commissioner Shane Fitzsimmons from Resilience NSW, discussing the future of emergency and disaster management. The opening keynote will be followed by an update from the USA's FirstNet CEO, Ed Parkinson, regarding the rollout of its First Responder Network.

The Australasian Critical Communications Forum (ACCF) is jointly facilitating a workshop at CommsConnect Melbourne on the morning of 19th October 2021 with the Australian Control Room Network Association (ACRNA) and Australian Radio Communications Industry Association (ARCIA). The workshop highlights the importance of ANZ involvement in continuing global efforts towards open standards in delivering on the promise of mission critical broadband networks and enhancing existing digital narrowband standards (TETRA, P25, DMR) to achieve seamless interoperation across networks, between devices and with critical control centres.

The advancement of critical communications networks is essential to address the increasing demands coming from end users for voice and data functionalities in resilient, secure and more interoperable ways.

The workshop will consist of presentations by a number of vendors actively involved with the development of both critical narrowband and broadband communications including a number of end user case studies. The ACRNA presentation will focus on how the mission critical communications evolution affects the future of the control rooms.

An afternoon 'Town Hall' meeting focussing on public safety mobile broadband will give attendees the chance to learn and have their say on the future of this critical technology. Bringing together industry specialists and end users the meeting will explore industry capabilities relevant to a national mission-critical communication infrastructure and the way Australia is currently organised to deliver through various government communications infrastructures.

Nationwide PSMB activity and interoperability with existing narrowband LMR and GRN systems has been identified in multiple enquiries as a critical issue to be addressed as demand for information rich support for service delivery increases in response to man-made and natural disasters become more frequent. This includes public protection and disaster response and vital utility services including public access communications, transportation, healthcare, education and other government/industry services that underpin the general economy of the nation.

The workshop is proposed as an interactive session between industry leadership and operations experts from government (federal, state, local), emergency services, critical service industries (water, gas, electricity, transport and others) and peak industry associations.

The workshop will be moderated by Euan Ferguson an experienced government and emergency services leader and seeks to bring together users, industry and government for information exchanges on non-commercial, user-needs based and evidence-based research basis.

Key outcomes of the afternoon town hall workshop will be discussed at a plenary panel session at the Comms Connect conference Day 1 following the keynote presentations by Resilience NSW Commissioner Shane Fitzsimmons and FirstNet USA CEO Ed Parkinson.

The program will also include a 'Black Spots' panel session moderated by Scott Leyonhjelm of Nova Systems. A similar Comms Connect Virtual webinar last year saw a strong attendance at the live streamed event. Overall there are currently 18 speakers confirmed with more being added each week; check the full list here.

Other confirmed program highlights include:

- a joint presentation on the fire and disaster infrastructure planning being undertaken by Data61 on the Western Sydney Digital Twin project with NSW Dept of Customer Service
- drone pioneer Jackie Dujmovic on the mission-critical role this new tech can play
- global smart cities guru Meredith Hodgman on how we can better build critical comms infrastructure into the cities of tomorrow
- an ACMA update on the many changes taking place this year to the Radiocommunications Reform & Modernisation Act.

Fortunately, the opening of the Trans-Tasman travel bubble permitted the Comms Connect New Zealand conference to held last May. Hundreds of critical comms and public safety professionals gathered in Wellington, with a program full of quality technical and technology-focussed presentations. The highlight of day two was the expert panel session, chaired by cartGIS MD Chris Stevens, to discuss where the future of the industry lies and how best to optimise the available resources and funding. It was the success of this panel that set the groundwork for the upcoming 'State of the industry' panel in October.

The New Zealand event registered a number of critical communication and public safety professionals coming from Australia to add to the already strong registration numbers from New Zealand. It is expected the Comms Connect Melbourne, next in line this October, will be even stronger. The conference organisers are still taking registrations for speakers and exhibitors.

So far, 33 exhibitors have signed on showing commitment to the expo. There are four levels of status on the exhibiton floor, with three platinum, five gold and three silver exhibitors currently signed up. Companies include Hypha, Hytera and Simoco. Check the full list here.

As an indication of the importance of the Australian market in the global industry there is excellent support so far from both Australian/New Zealand and overseas companies and industry associations.

If you are interested in becoming a part of Comms Connect as a sponsor or exhibitor, contact Narelle Granger: ngranger@wfmedia.com.au.

For speaking submissions, contact Mara Gonzales with a topic/speaker/abstract: mgonzales@wfmedia.com.au.

Comms Connect (WFevents)
www.comms-connect.com.au

Easy migration from MPT1327 to PTT

The P1 to P4 buttons on the Impulse Wireless VM2 can now make private two-way PTT calls or predefined group PTT calls. Users can also dial other PTT users from its optional keypad microphone.

The VM2 and its new functions support Impulse Wireless PTT, Vertel PTT, Simoco Push, ChatterPTT, Tassta and a number of other PTT/PoC platforms.

With many users still on MPT1327 systems, this is a helpful feature, which assists migrating from radio technology to PTT by virtually eliminating the need for user retraining.

PTT users can now dial other users like they did on their legacy Vertel, Telstra Fleetcoms or other radio system. Customers still have the flexibility of choosing to allow private, group or ad hoc PTT calls as needs dictate. System admins may also allow or disallow certain functions on a per-user basis.

Priority levels and 'transmit interrupt' means dispatchers can always contact their team, regardless of how busy the radio is with private calls or user chatter.

The benefits to companies implementing the system are reduced user training and ease of migration; additional features and functionality thanks to PTT; voice quality and coverage.

IMPULSE Wireless

www.impulsewireless.com.au

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10 GbE tester

Viavi Solutions launched Fusion JMEP 10, a small form-factor pluggable (SFP+) gigabit ethernet transceiver for network test, turn-up and performance monitoring up to 10 GbE. It addresses the emergence of 10 GbE as an ethernet bandwidth being used for applications like 5G xHaul, business ethernet services, Distributed Access Architecture for cable or GPON/XGSPON for fibre access networks.

5G requires 10 GbE to the tower, compared to 1 GbE for 3G or 4G. Cable networks require 10 GbE links that connect to remote-PHY devices at the edge. Traffic growth and complexity are further driving adoption of virtualised test and monitoring solutions.

The optical transceiver offers an ethernet testing solution easy to deploy in existing SFP+ ports, simplifying test, service activation and troubleshooting to reduce equipment upgrades, truck rolls and mean time to repair. The inline performance monitoring capability turns network ports into service assurance tools, enabling ethernet operation, administration and maintenance for any 10 GbE network. A micro-burst detection feature monitors traffic with millisecond accuracy to detect spikes that can cause packet loss, which can have a dramatic impact on application performance.

VIAVI Solutions Inc

www.viavisolutions.com.au

Data logging app

The Acromag microBlox multi-logger app from Metromatics allows data logging from up to 14 Acromag microBlox signal conditioning devices simultaneously. Users can download the multiLogger application free of charge from the Google Play Store or the Apple App Store.

Features include the collection of data from one or more uB series data acquisition modules, which can log data from up to 14 microBlox signal conditioning devices simultaneously. Scaled inputs in custom engineering units correspond with the native output range and quick field diagnostics with easy troubleshooting are possible due to real-time data and trend charts. Users can save logs and share via email or iCloud.

The uB Series I/O modules offer a compact, high-performance solution for interfacing sensors and field devices with data acquisition systems. uB signal conditioning modules are suitable to isolate, filter, convert and amplify a wide variety of signal types for test, measurement and control systems. Plug uB modules into 4-, 8- or 16-channel backpanels in any mix for a high-density analog I/O interface. Channel-to-channel isolation provides optimal noise and surge protection from ground loops, spikes and high common mode voltages.

Metromatics Pty Ltd

www.metromatics.com.au

Industry Talking

Firstly, I would like to congratulate Comms Connect and RFUANZ for a successful show in Wellington New Zealand in May. Given the uncertainty of COVID-19, borders and local hot spots right up to the week of the event, it was a credit to all involved that the event happened.

The show was well attended by the New Zealand industry and government representatives. Everyone enjoyed being able to meet, network and catch up on industry matters.

RFUANZ also had their annual dinner, which was a great event and equally well supported. I was fortunate to be able to travel to New Zealand for the event and made the most of the opportunity by investing in local businesses, among many other industry members.

While in New Zealand I had the opportunity to attend the AGM of the RFUANZ and discuss some common objectives that our associations have. The intention is to sign an MOU between the RFUANZ and ARCIA on sharing training ideas and material. Both organisations have similar industry needs and also limited resources, so sharing makes sense.

Hopefully, as this is being published, ARCIA is conducting our first state event in Sydney over 15 and 16 of July at the Rydges Hotel Rosehill. The two-day training event will be complemented by an industry dinner on 15 July at the same location. The training event will be based on professional development training aimed at students and others who may be new to the industry, as well as those who have experience but want to expand their knowledge.

ARCIA is planning a range of professional development courses and events around Australia over 2021 so keep an eye on the events page of the website for local events: https://arcia.org.au/events. The next planned sessions will be in Perth on 12 and 13 August this year. The annual Perth networking dinner will be held at the same time and is always a great event, more details will be posted on the ARCIA website soon.

Planning is well underway for Comms Connect Melbourne and the ARCIA annual gala dinner, now in October. Hopefully Melbourne can overcome the COVID events currently affecting the city and we can return to the big show for the year. We think that everyone will really want to get together, and considering how tough our Victorian colleagues have had things over the last 18 months, they deserve our support.

As we look to the future, we should also recognise the events of the past year — in many ways our industry has been through the COVID-19 pandemic with little really serious impact, certainly nothing like many other industries have experienced and are still struggling to recover from.

The wireless communications industry has been proven to be resilient and many people have not yet realised just how critical communications are in hard times. Learning to work remotely, video meetings, infection control measures... we have accepted these changes and in many cases our industry has thrived, we should be proud. In addition, as we talk to young people it is important to point out that from a career perspective the wireless communications industry is vibrant and resilient.

The new financial year also sees two new promotional partners joining ARCIA. We welcome Progility Technologies and Cambium Networks as Silver level partners and this year, Simoco, Wireless Innovations (T/as Hypha) and CSE have stepped up to Elite level partners. These changes have demonstrated the confidence in our industry and we thank our partners for their commitment, it will enable your Association to continue to promote our industry and opportunities.

Keep safe everyone.

Hamish Duff, President
Australian Radio Communications Industry Association

Radio test solutions

Viavi Solutions released auto-Test sets for the L3Harris Technologies XL Connect 95P, single-band XL-185M, multi-band XL-200M and Unity XG-100M radios on the Viavi 3920B radio test platform and 8800SX digital radio test set. The radio test systems enable automated test and alignment of L3Harris P25 and public safety two-way radios.

The auto-test applications perform fast, repeatable and accurate alignment and test-matching the L3Harris maintenance specification.

These latest radio test products provide support for L3Harris P25 and public safety radios, including the L3Harris XL-200P, XL-200Pi, XL-185P, XL-185Pi, XL-150P, XL-95P, TP9100, TP9300, TP9400, TP9600, XG-15P, XG-25P, XG-75P, XG-75Pe, P7300, P5500, TM9400, XG-25M, XG-75M, XG-100M, XL-185M, XL-200M, TM9100, TM9300, M7300 and M5300 radio families.

VIAVI Solutions Inc
www.viavisolutions.com.au

Micro remote radio heads

Nokia launched additions to its industry-leading AirScale small cells portfolio for premium indoor and outdoor 5G coverage.

AirScale micro remote radio heads (mRRH) deliver outdoor 5G coverage, enhancing capacity and coverage in dense urban environments. They allow operators to cost-effectively densify their networks, especially where the deployment of a macro cell would not be appropriate. Micro RRH have small footprints and offer increased deployment options, as well as lower power consumption, thereby lowering operational cost. An enhanced mRRH portfolio also offers broader mid-band capabilities with the n79 product.

Also released was its latest millimetre wave (mmWave) radio product line-up, suitable for high-capacity 5G connectivity for stadiums, airports or pedestrianised areas. The compact products support a wide range of deployment options to ease installation considerations in busy locations. Nokia's mmWave portfolio supports all spectrum bands including 24/26 GHz, 28 GHz and 39 GHz.

Nokia Solutions and Networks Singapore Pte Ltd

Hytera is always moving forward to deliver innovative technologies for critical communications users

Recently, Hytera Communications shared its plans for 2021, convergence solutions, 5G and the importance of delivering customer-focused solutions.

Hytera has delivered various new products and technologies, as well as online live events to engage with the global customers and to fight against COVID-19

Despite the problems caused by the global COVID-19 public health crisis — and the US-China trade conflict — Hytera is still generating steady growth in terms of annual revenue, especially in European markets where the focus is mainly on public safety users.

Hytera continues to innovate in the TETRA and PDT-standard radios, as well as broadband and narrowband convergence solutions, such as the Multi-mode Advanced Radios. Hytera is also providing updated PoC radios and body worn cameras for the public safety, and oil and gas markets in particular. In recent years, Hytera has been exploring a promising new sector, which involves co-operating with local network operators to deliver mission critical solutions.

One impact of COVID-19 has been that the majority of live events, conferences and exhibitions have been cancelled or delayed. However, Hytera has responded to this setback by launching a wide range of digital marketing campaigns. Hytera has created online partner portals, EDMs, buyer guides, webinars, online training sessions and workshops for dealers and end users, to provide better access to information and to engage with us.

In addition to creating these new digital channels, Hytera has managed to develop, within a very short timeframe, a new solution to help public safety, healthcare and commercial users, who are on the frontline of battling the COVID-19 pandemic. The solution aims to combat the spread of COVID-19 by using fast-deployable, non-contact, body temperature detection and communication technology.

Regarding European market highlights, in 2020, the European PMR industry expected to witness the highest growth over the forecast period. This was due to the shift from analog to digital technology, and the increasing deployment of TETRA technology due to its fast call set-up, group calls, and direct mode communication advantages.

Public safety remained the largest end user industry, due to the increasing adoption in police departments as well as by emergency responders, such as fire departments, healthcare, paramedics, and others. The demand for two-way radios in the commercial market also saw the highest growth over the period, due to the increasing demand from transportation, public utilities, construction, retail, private security, and others.

The impact of COVID-19 is ongoing in 2021, Hytera will continuously focus on digital campaigns to provide more innovative technologies, for example, 5G related products and solutions

Given the ongoing impact of COVID-19 and the likelihood that live events will remain on hold — at least in the early part of the year — Hytera will continue to focus on its online marketing campaigns and solutions. For example, the Hytera Partner


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Portal is a real asset, as it provides a one-stop platform for dealers. They can log onto the portal and gain access to marketing, technical, purchasing and sales materials whenever they need it. The partner portal currently has hundreds of dealers on the platform across the EU region. Other digital services are also available on subsidiaries' websites.

2020 marked the first year 5G became available for commercial use. With that in mind, in 2021, 5G will be more widely applied globally in vertical industries. Hytera will keep innovating and investing in 5G-related businesses, products and solutions. For example, Hytera's Industrial IoT smart factory solution will soon be upgraded.

Hytera envisages that 5G technologies will be widely applied in public safety and other vertical industries in the coming few years

5G has become one of the main focuses of technology in recent years, as it brings the opportunity for introducing huge changes to different vertical industries. In fact, 5G is considered to be an essential driving force for digitisation of the entire community. With the advent of 5G, technologies such as AI and big data will be able to provide stronger network infrastructures and more powerful convergence platforms for public safety and other vertical industries.

Hytera talked about '2+5+N', a hybrid and convergent concept to benefit the users of critical communications

Hytera believes that there is no single technology capable of fixing all problems. At CCWeek 2020, Hytera talked about '2+5+N', a hybrid and convergent way of meeting a variety of critical communications demands.

The '2' stands for 2G such as TETRA. As the first choice of mission critical users, TETRA/PDT/DMR provide stable and reliable voice services, which broadband networks cannot satisfy. But since TETRA/PDT/DMR technologies are developing more slowly than broadband, Hytera believes that by combining LTE/5G broadband technologies with TETRA/PDT/DMR, the needs of PMR users will be better served.

'5' stands for 5G supporting high throughput, low latency and massive connections. Conventional PMR networks incorporating 5G technology can strengthen indoor coverage and support some non-critical services, which can provide supplementary services to private networks.

Different industries require different data demands over 5G networks, and Hytera believes that there are three main modes for public safety users in relation to 5G technology.

The first mode is end-to-end network slicing based on 5G networks, which is suitable for general industry business.

The second is to reserve wireless communications resources over 5G networks with physical-like security isolation and guaranteed capacity. This model is suitable for daily public safety services and certain critical communications situations.

The third mode involves the independent construction of private 5G networks. These are suitable for providing key area coverage and critical communications in certain situations.

'N' stands for various applications based on different kinds of technologies, which provide complete solutions for vertical industries.

Take Hytera's public safety convergence communication solution, for example. This creates a converged and unified network, so end users can achieve full connections, seamless switching, and positioning services.

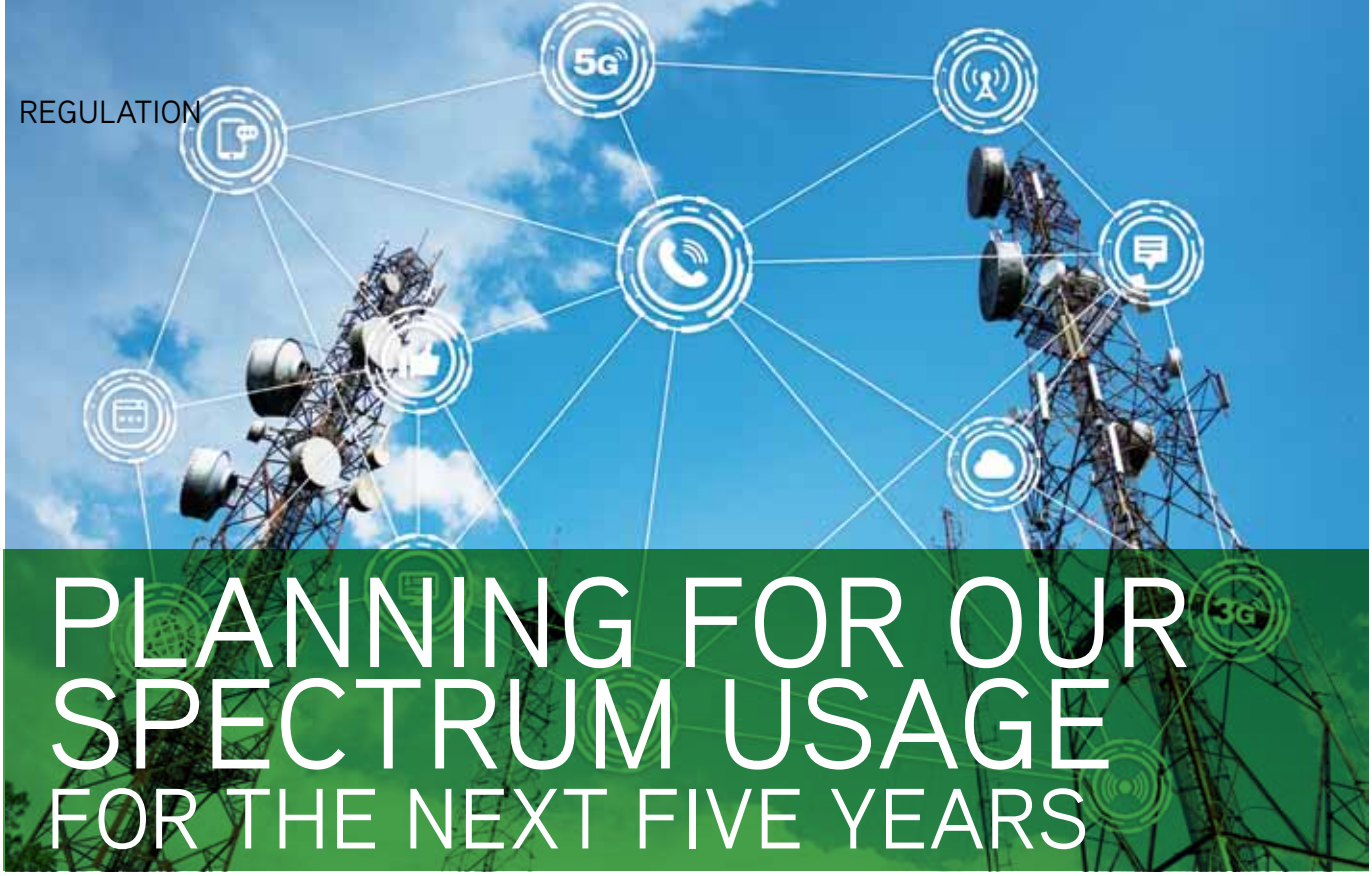
At the network level, including 5G and on-site emergency systems, the multi-network infrastructures can be seamlessly switched to quickly respond to the command and dispatch centre when public safety incidents occur. Convergence places the emphasis on the business application level, including the convergence of voice, video, data and positioning. Unification refers to the ability of the solution to provide unified information, command, coordination, and combined operations.

Hytera has launched 4G & 5G solutions to serve the MNO and vertical industry markets in June

Recently, Hytera has introduced its new 4G/5G portfolio including its industry-leading HyXG O-RAN solution. HyXG forms a key part of Hytera's total solution aimed at serving the MNO and vertical industry markets. It comprises DU board, O-BBU and a high-end Edge-Node. The online launch event was held on 29 June 2021 to coincide with MWC Barcelona 2021.

Hytera

Hytera Communications (Aust) P/L
www.hytera.com.au



PLANNING FOR OUR SPECTRUM USAGE FOR THE NEXT FIVE YEARS

Ian Miller, Executive Officer, Australian Radio Communications Industry Association (ARCIA) Inc.

The association has concerns the ACMA five-year outlook shows a bumpy road ahead in some areas.

Each year the Australian Communications and Media Authority (ACMA) prepare a work plan for spectrum management for the coming five years. The document is known as the Five Year Spectrum Outlook (FYSO) and although it has been in operation for several years now, under the new *Radiocommunications Legislation Amendment (Reform and Modernisation) Act 2020* it is a required document for the ACMA to report to the Minister for Communications. It is also how the ACMA advises industry on what it is planning and what has been achieved over the past year.

Over several years the Australian Radio Communications Industry Association (ARCIA) has been a contributor to the FYSO comments, in particular about any planned actions regarding the spectrum used by ARCIA members, but also in an overall spectrum advisory role to ensure that other user groups are also protected, with their specific needs recognised. It has also been through involvement in the FYSO process that we have been able to have the need for spectrum for private LTE/5G systems recognised and now included in the spectrum allocation plans.

In addition to the usual spectrum planning works for the coming years, there will also be changes to be managed as part of the transition to the new Act, which begins to take effect from mid-June 2021. In this regard, ARCIA has concerns with the lack of detail around the outline of work that has been included in the FYSO outline, one small item to cover many significant changes to the regulator's role and operations.

One important area that will involve significant work is to do with equipment standards. Under the new Act the ACMA is able to set Equipment Rules, which will determine the requirements for approval of radio transmitters. Until now the standards were determined by Standards Australia and then subsequently adopted by the ACMA; however, with the new globalised markets and policy changes within the Standards Australia regime it means that there is a need to recognise international standards and not have specific requirements for our market.

As a result, ACMA must now not only establish the Equipment Rules, but must also ensure that they are easily accessible by any potential supplier or importer of equipment. One of the underlying aims of the spectrum review and resultant new Act is to address the concerns about those who buy radio products on the internet without the technical capacity to ensure compliance with standards.

With no actual industry input into the selection of equipment or the relevant technical standards, who will be responsible for ensuring interference remediation caused by non-compliant equipment?

At the basic level ACMA must also ensure that the technical requirements of equipment as outlined in the proposed Equipment Rules are readily available to everyone and provided in a language and format that is easily understood by non-technical personnel. ARCIA is concerned that in the FYSO outline of the future work plans for ACMA there is little indication given on the amount of work involved in this process. In addition, the existing ACMA website does not seem suited to providing ready and simple access to this critical information. Anyone who has tried to seek technical information from the ACMA website will understand this concern.

Unless these areas are addressed correctly and the information is readily available, there is a real risk it will lead to degradation of the spectrum, with poor quality equipment and unlicensed users gradually creating interference that will hamper the ability of licensed users to get proper use of the spectrum. Near enough will not be good enough in the long term, while ACMA will not have the resources to manage the concerns when the situation deteriorates.

Unless the effort is invested initially to make sure things are correct, it may not be possible to retrospectively correct the issues and a valuable resource may become corrupted and lose efficiency.

Ian Miller is the Executive Officer of the Australian Radio Communications Industry Association (ARCIA) Inc., "the voice of the Australian wireless communications industry".

Australian Radio Communications Industry Association
www.arcia.org.au

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PRODUCTIVITY COMMISSION REPORT LOOKS AT USER 'RIGHT TO REPAIR'

Should the owner of a product be able to repair what they have bought or does the manufacturer retain that right?

The Australian Government commissioned the Productivity Commission, its independent research agency, to look at what can be done to address growing concern that products are becoming harder to repair, leading to higher costs, greater inconvenience for consumers and growing waste. A 'right to repair' is the ability of product users to have their products repaired at a competitive price using a repairer of their choice.

Realising this aspiration in a practical way involves a range of policies, including consumer and competition law, intellectual property protections, product design and labelling standards, plus environmental and resource management. It is calling for further information and feedback from the community to inform its final report, which will be delivered to government in October 2021. A draft report was released last June for comment from stakeholders.

For industry there are concerns that some manufacturers are making it difficult for consumers and independent repairers to repair goods, such as by not providing repair information, tools or spare parts. This can give manufacturers the ability to increase the price of repair and reduce the choice of repairers.

The Commission is considering ways to make it easier for independent repairers to access the things they need to repair goods. The proposed reforms would improve a user's right to repair, without the uncertainty and costs associated with more forceful policy interventions.

One approach could be to change copyright law to allow independent repairers to legally access and share copyright information such as manuals and diagnostic information. Another approach could be to require manufacturers to provide independent repairers and consumers with access to repair information, tools or spare parts. This may be more beneficial for certain products, such as agricultural machinery or mobile phones and tablets. However, the evidence base on the magnitude of repair barriers in these markets is patchy and largely anecdotal, preventing a rigorous assessment of whether additional policies would provide net benefits to the community.

Warranties should be made clearer to inform users that even if they use independent repairers, they will not lose legal rights. The Commission is also considering a ban on voiding warranties if consumers do not use the manufacturer's repairer.

The Commission is seeking further evidence on other reforms that could help users obtain repairs and make more informed purchase choices. These potential reforms involve:

- requiring manufacturers to provide software updates for a reasonable period
- amending copyright laws to enable third-party repairers to copy and share repair manuals, and access repair data hidden behind digital locks
- prohibiting manufacturer warranties from being voided if consumers do not use the repairers and spare parts specified by the manufacturer
- developing a product durability or repairability labelling scheme to help consumers identify products that best meet their needs.

The Commission is seeking evidence on the net benefits of a more extensive right to repair policy through a 'positive obligation' that would require manufacturers to provide third-party access to repair information and supplies.

According to the report, some responses from manufacturers state that their repair information is proprietary, or that there are safety and other concerns resulting from the use of information by unskilled repairers.

Australian Government Productivity Commission
https://www.pc.gov.au/

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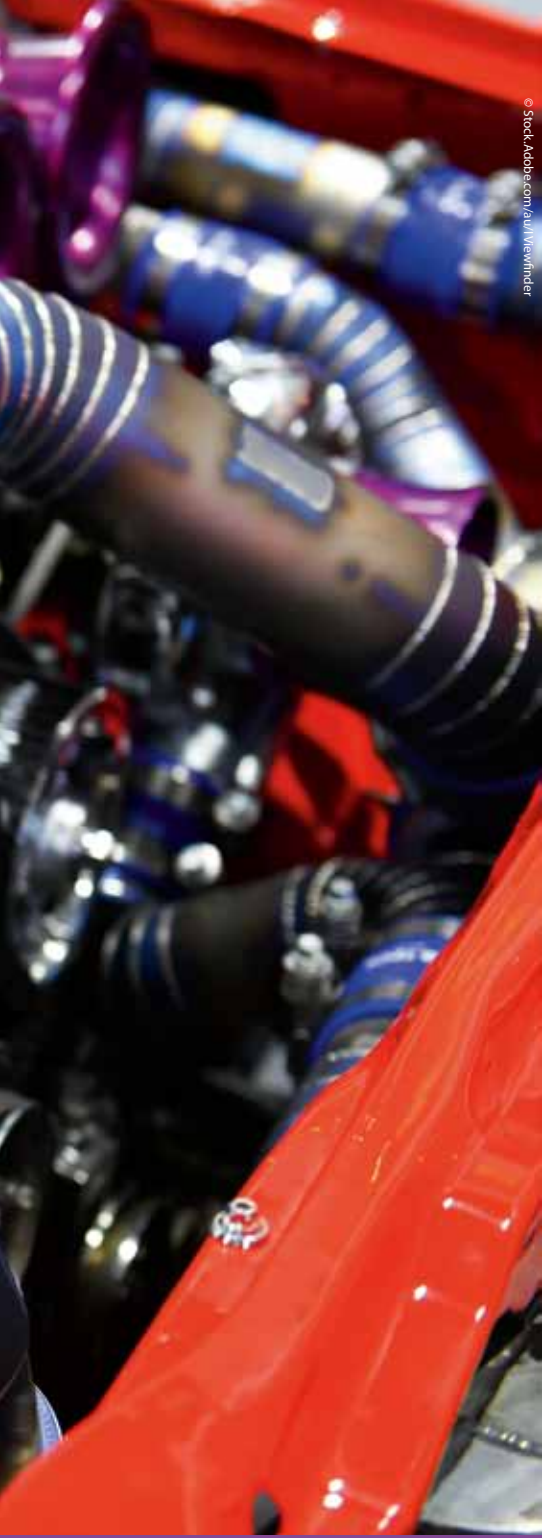
MEET THE TURBO ENGINE FOR THE INFORMATION AGE

Giovanni D'Amore



The history of technology is characterised by innovative tools that have radically transformed the way we live, work and socially interact.

From the steam and water engines of the first industrial revolution, to the microprocessor hallmarks of the digital revolution, up to the information age where radio spectrum is used as a vehicle to transmit data and energy — each era has developed its engines to transform material, energy and, most recently, knowledge and information.

As we move forward towards the next wireless industrial revolution, radio spectrum is a key enabler within the information age engine.

The need for information

There is no doubt that information technology has a great impact on the way we communicate, learn and think. Access to information immediately and everywhere plays an important role in everyday life.

Especially now in the times of a pandemic, our reliance on this technology increases even more. Between February and April 2020, internet traffic surged by nearly 40%, mobile network traffic by 50%; there is no sign this trend will slow down soon.

Information connects people, but also objects. Forecast shows more than 29 billion networked devices by 2023 with machine-to-machine (M2M) connections representing half of the total. This type of communication needs to rely on a high transmission speed and a low latency to enable mission-critical applications.

Self-driving cars and advanced driver-assistance systems are great examples of the importance of transmission speed and latency. When it comes to connected driving, data must be transmitted and analysed in real time because decisions must be made in fractions of a second so the vehicle can stop before hitting an obstacle, or act to ensure passenger safety. High transmission speed can save lives and make driving safer.

Moving up to mmWave

The radio spectrum span is part of the electromagnetic spectrum with frequency from 30 to 300 GHz. Until recent time, the frequencies used for communication purposes were limited to the microwave band, typically defined to cover the 3–30 GHz range. The majority of the commercial wireless networks use the lower part of this band — between 800 MHz and 6 GHz, alias the sub-6 GHz band.

This means the 3G/4G/5G cellular connection on your smartphone, your home Wi-Fi, the Bluetooth connection on your wireless headset, plus almost anything you can think of, will use those frequencies to transmit information. This represents the main critical challenge of today's wireless network.

While the number of users and devices consuming data increase exponentially, the radio spectrum frequency band available by the telecom carriers is unchanged. This means that each user is allocated a limited amount of bandwidth, leading to slower speeds and frequent disconnections.

One way we may solve this problem is to transmit signals on bands where spectrum is readily available. The millimetre-wave (mmWave) band is particularly interesting, due to a huge amount of under-utilised bandwidth that lies in this part of the electromagnetic spectrum.

Key advantages of mmWave include frequency reuse and channel bandwidth making this band particularly suited for multi-gigabit mobile communication systems and high-throughput satellites. Also, components working in the mmWave bands are more compact and smaller in size, making them particularly useful in a scenario where we have a high density of devices operating simultaneously and in close proximity.

Those advantages make mmWave technology the way to boost the performance of our data transmission: the turbo engine of the information age.

Let's explore four use cases where mmWave technology is the key enabler.

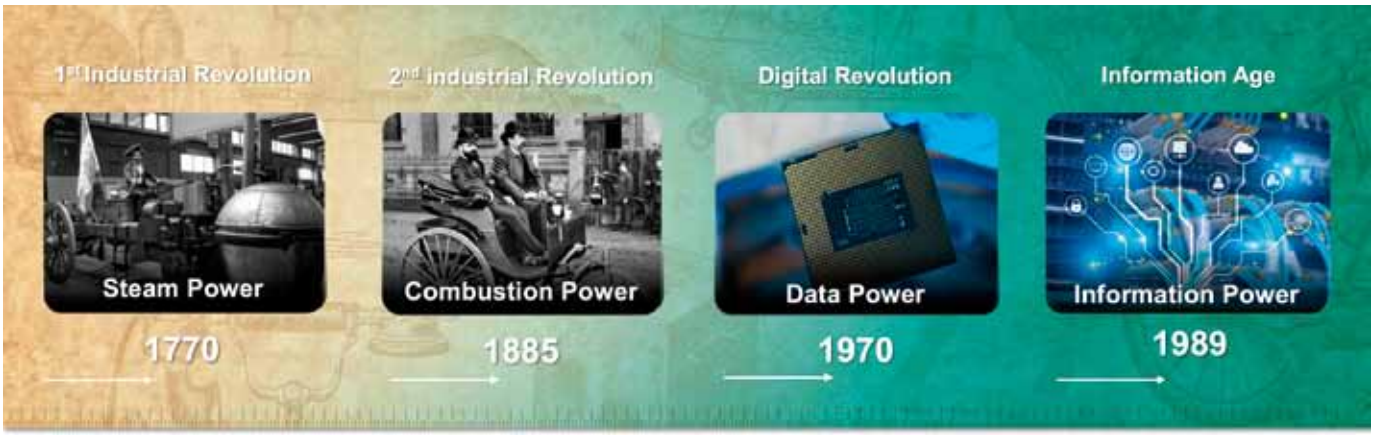


Figure 1: Periods of the technological revolution.

Multi-gigabit connectivity: fulfil the need for capacity and speed

Satisfying the demand of high-quality services for the greatly increasing subscribers accessing the mobile cellular network is essential for network operators.

The sub-6 GHz cellular bands, in use on today's latest communication systems, are extremely crowded and fragmented. Therefore, to meet the expected and desired data throughput, high frequency bands in the mmWave range need to be adopted in a way to accommodate more users in a spectrum section still free of interferences and not yet allocated.

The mmWave bands give new estate and large information bandwidth allowing data transfer rates up to 10 Gbps. This speed is comparable to optical fibre and a hundred times faster than the current 4G technology.

More users and more connections mean stress on the network. While we assume the air is used as a wireless transmission medium and does not have bandwidth limitation — it does.

If the number of connections increases and the network does not adapt to this new need, our life will be as if we are in a big stadium attending a football game and not able to call or message our friends due to the overwhelming number of users that want to do the same things, at the same time.

New technologies like 5G or Wi-Fi (802.11ay) are designed to overcome those challenges and guarantee what is defined as 'great service in a crowd'.

Millimetre wave characteristics are, for instance, important to tackle this challenge. Due to the properties at high frequencies in relation to the atmospheric absorption, as you move to higher frequencies, transmission range gets shorter.

Millimetre waves allow close-range communication up to 100 metres, rather than kilometres. In this scenario, frequency can be reused allowing simultaneously operating networks that do not interfere with each other.

Technologies such as beamforming also increase the cellular network capacity improving the transmission efficiency targeting the users.

Satellite communication: enabling more flexible approaches

Satellite communication plays a vital role in the global telecommunications system. More than 3000 operational satellites are currently in orbit around Earth and more than 1800 are communication satellites.

In the past two years, multiple commercial satellite operators have begun launching high-throughput satellite (HTS) constellations. These next-generation satellites will be able to provide far more throughput, of up to 400%, compared to conventional fixed, broadcast and mobile satellite services.

This significant increase in capacity is achieved by using a 'spot beam' architecture to cover a desired service area, as in a cellular network; in contrast to the wide beam used in traditional satellite technology.

This architecture benefits from a higher transmit/receive gain, permitting the use of higher order modulation, so to achieve higher data rate. Also, being a service area covered by multiple spot beams allows operators to configure several beams to reuse the same frequency band and polarisation, boosting capacity where it is needed and requested.

Most of the high-throughput satellites in operation today work in Ku (12–18 GHz) and Ka-band (26.5–40 GHz), but frequencies are getting higher, with deployment on the way in Q and V-band (40 to 75 GHz).

Automotive radar: taking advantage of the mmWave resolution

Automotive radar is the most reliable technology at detecting an object's distance (range) and motion, including velocity and angle in almost every condition. It uses reflected radio waves to detect obstacles behind other obstacles and has low signal processing requirements.

Automotive radar sensing technology, mainstreamed by the 24 GHz narrow band sensors, is now rapidly evolving towards

	MULTI-GIGABIT CONNECTIVITY	HIGH-THROUGHPUT SATELLITE	AUTOMOTIVE RADAR	EXTENDED REALITY
Frequency	24.25 to 52.6 GHz	12.4 to 75+ GHz	76-81 GHz	> 100 GHz
Bandwidth	800 MHz	up to 4 GHz	Up to 5 GHz	~10 GHz

Figure 2: Four use cases of mmWave technology with indication of frequency coverage and signal bandwidth.

the high frequency 76–81 GHz band and the wide 5 GHz bandwidth, offering a superior range resolution and immunity to obscurants such as fog and smoke. The magnitude of improvement delivered by the higher frequency and wider bandwidth automotive radar systems in range resolution is significant, because the errors in distance measurement and minimum resolvable distance are inversely proportional to the bandwidth.

Transitioning from 24 GHz to 79 GHz delivers 20x better performance in range resolution and accuracy. Also, with smaller wavelength, the resolution and accuracy of velocity measurement increases proportionally. Therefore, by transitioning from 24 GHz to 79 GHz, velocity measurements can be improved by a factor of 3x.

Another advantage of the transition from legacy 24 GHz to 79 GHz systems is the gain in size and weight. With the wavelength of 79 GHz signals being a third of a 24 GHz system, the total area of a 79 GHz antenna is one-ninth of a similar 24 GHz antenna. Developers can use smaller and lighter sensors and hide them more easily for better fuel economy and car designs.

Extended reality: the beginning of a new age

Extended reality (XR) is an emerging umbrella term that encompass all the immersive technologies. The ones we already have today: augmented reality (AR), virtual reality (VR) and mixed reality (MR) plus the area interpolated among them.

XR will have exciting applications in diverse fields such as entertainment, medicine, science, education and manufacturing, changing the way we see and interact with the world around us, real or computer-generated.

While VR and AR applications already exist in the market, the adoption rate is slow with the main reasons being bandwidth and latency. Today's wireless networks place serious limitations on those applications, such as latency and capacity, which can negate the user experience entirely.

Millimetre-wave technology, as implemented in 5G thanks to the increased transmission bandwidth and low latency, will strengthen existing experiences and enable novel ones, paving the way for mass adoption.

However, to provide a truly immersive AR, at least a tenfold increase in data rate is needed. Thus, posing major challenges for the actual 5G technology. However, technology keeps innovating and this time, the radio spectrum will be pivotal to tackle those challenges. 6G will be the sixth generation of wide-area wireless technology, expanding the availability of frequency bands to terahertz (THz) bands, above the mmWave frequency range where 5G operates.

6G will also increase the data rate from 5G's 20 gigabits per second (Gbps) to 1 terabit per second (Tbps). In addition, 6G will reduce the latency to less than 1 millisecond. As a result, 6G's traffic capacity will increase from 5G's 10 megabits per second per square metre (Mbps/m^2) to a theoretical maximum of 10 gigabits per second per square metre (Gbps/m^2).

Holographic communication, tactile internet and fully immersive virtual/augmented reality are among other applications that this future technology will make possible and, once again, mmWave is the engine of this change.

Probably the trigger of the beginning of a new age, where creativity and imagination will hold a central spot in our existence.

Giovanni D'Amore is the director of product marketing at Keysight Technologies. Prior to that, he has held numerous marketing, business development, and applications support positions across several product lines with Hewlett-Packard, Agilent Technologies, and now Keysight Technologies. Giovanni is an engineer with a M.Sc. in electronic and telecommunication from the University of Palermo, Italy and authored several articles around microwave measurement techniques. He is a regular speaker at microwave conferences such as IMS and EuMW.

Keysight Technologies Australia Pty Ltd
www.keysight.com

TETRA vs CELLULAR

KEY ELEMENTS TO CONSIDER WHEN PLANNING A MISSION-CRITICAL NETWORK

When production, safety and operational managers start planning activity on a new site, they know they will need a secure communications platform to connect their teams across all the site and enable efficient working practice.

The next step is which technology platform to use. As ever there are numerous solutions to choose from, and it is important to choose one that best suits your specific needs.

What are the key critical communications issues?

It is critical to ensure interoperability between devices, radio terminals and control room functionality. Open standards and associated interoperability between TETRA vendors deliver an open market for devices, and other services across the network, maintaining competitiveness, driving innovation and ensuring continuity of supply and choice from a diverse ecosystem of suppliers across the network.

Compliance with industry standards and solid interoperability between components of the system and devices will ensure quality, reliability and choice, and hence each type of user will be able to choose a solution fit for their purpose.

Cellular or TETRA — which best fits specific user groups?

TETRA networks are specialist networks delivering mission-critical communications services, with specific feature sets that have evolved and improved over time. These require-

Typical requirements for mission-critical users

Reliable coverage:

The network must provide reliable communications, always available in all circumstances. Quality of service and performance KPIs must be sustained to ensure successful operations, both within the network coverage and when the network is not available. Direct mode operation is a key operating requirement for most mission-critical users who need to be able to rely on communications however the network status changes, planned or unexpected.

Robust design:

The devices must be sufficiently robust to keep working in adverse weather conditions — whether hot, cold or wet — or adverse environmental conditions; for example, in dusty, salty or dirty locations. The devices must also be tough enough to stand repeated cycles of deployment with varied users and withstand heavy kicks, drops and intensive use.

Practicable usability:

Audio must be intelligible, loud and clear so that information and instructions are heard first time, every time. This includes whilst operating in noisy, dangerous or busy environments. This intelligibility must be supported by a portfolio of mission-critical quality proven, accessories allowing users to use devices in a manner that supports their daily operational needs; for example, eyes-free usage and being easy to access using gloves and other protective equipment.

ments are based on extensive user interactions, across various sectors understanding how people interface with technology whilst undertaking their role.

TETRA networks are designed to provide a high level of inherent resilience and redundancy in their architectures. The networks are dimensioned to provide a specific grade of service at peak load to the user groups they serve; if peak demand is overreached, calls are queued, rather than dropped.

The choice between cellular and TETRA is based upon user needs. Different networks offer different benefits to the mission-critical user. No doubt in time cellular networks will evolve, become hardened and mature in the same way that TETRA has done, and broadband will then become the single operational network. However, for now, broadband is not able to take on all the attributes required to provide the lifeline of mission-critical voice communications.

In addition, the TETRA devices are designed for use in mission-critical situations, with a rugged design capable of many years' service in hostile and abusive environments and must perform at their rated specification reliably every time they are used over their lifetime.

Further information

Sepura has extensive experience in deploying critical communications solutions to some of the harshest environments in the world. We can assist you with the planning and development of scalable critical communications networks to best suit your individual needs. To speak to one of the team, please mail marketing@sepura.com or visit www.sepura.com.

Sepura
www.sepura.com

COMMS CONNECT NZ — BIG NIGHT OUT

John Laughton, Chairman Radio Frequency Users Association of New Zealand

An opportunity to break out from COVID gave the RFUANZ night added spice.

The annual Comms Connect went off well at the Lower Hutt Event Centre last May. As always, the conference and exhibition culminated in the highlight dinner and awards night of the Radio Frequency Users Association of New Zealand (RFUANZ).

During the exhibition RFUANZ also held their annual general meeting and the following were appointed to the committee:

- Chairman: John Laughton (Downer)
- Vice Chair: David Johnstone (Logic Wireless)
- Treasurer: Mike Head (Tait Communications)
- Secretary: Debby Morgan (RFUANZ/NZART)
- Committee members: Corey Weir (Outback Communications), Dale Roberts (Go Wireless), Steffen Kennerly (CSE Genesis), Justin Wonderlick (Vital), Carl Garner (Ashley Communications)
- Conference Co-ordinator: Desire Morris (St John)

For the annual gala dinner and awards evening, the crowd was entertained by Darren Shand, current manager of the NZ All Blacks rugby team. Shand has been the All Blacks Manager since 2004, which included the 2011 and 2015 Rugby World Cup winning campaigns and, in 2013, the first undefeated test season.

The night was a great success, setting the bar high for the follow-up dinner at Comms Connect Melbourne, coming in October.

Award winners on the night were:

- Technical excellence: Outback Communications
- Project excellence: Roger Scott, PowerNet
- Outstanding sales and support: Corey Weir, Outback Communications
- Employee of the year: Darcy Sapwell, Ashley Communications
- Apprentice of the year: Sam Aldworth (Hamill), Nelspecs
- Lifetime service to the industry: David Thomson

For the diners, David Thomson needed little introduction as his name is familiar to many in the industry and his award well deserved. Thomson recently retired after almost 50 years in the industry and it was fitting to be able to recognise those years of dedication to radiocommunications in NZ.

Many of those years he served on the RFUANZ committee, including as RFUANZ chairman. He has been an incredible knowledge source and a great teacher over the years. In a time of no official RF qualifications, he spent many hours teaching new staff RF and electronics theory as well as practical skills such as soldering antenna bases and constructing folded dipoles.

Formalities finished with the crowd farewelling Candice Stanley, as she resigned her position as conference co-ordinator to start a family. Candice had worked tirelessly for RFUANZ for the past 10 years to ensure the annual dinners were noteworthy.

Outgoing president Corey Weir hands the keys to incoming John Laughton.

Lifetime service award winner David Thomson.

Radio Frequency Users Association of New Zealand (RFUANZ)
www.rfuanz.org.nz

Hospital safety and security by unifying comms technology

Motorola Solutions in the US has announced its Safe Hospitals solution, a unified technology to help hospitals proactively manage threats, drive operational efficiencies and create the environment of safety needed to provide the highest level of patient care. Combining video and analytics, command centre software and critical communications information, hospitals detect and analyse events then communicate and respond appropriately in any situation.

For example, security cameras with analytics can detect a vehicle belonging to a banned individual on hospital grounds, triggering an automated alert to two-way radios, allowing security officers to assess the scene via camera feeds and dispatch personnel to the right location with detail about the incident. This kind of intelligent workflow is created by the hospital in a simple cloud-based platform allowing the hospital to tailor how the technologies work together to meet specific needs.

The automation and integration of security technology in this new and meaningful way can be critical in saving minutes and seconds in every incident response.

Motorola Solutions Australia Pty Ltd
www.motorolasolutions.com.au

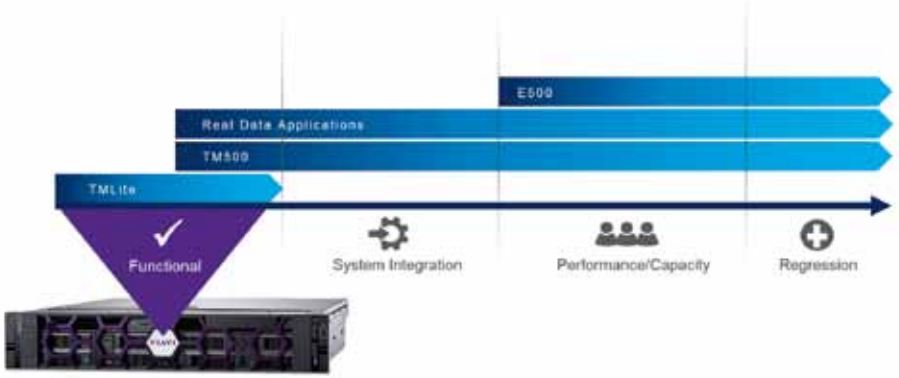
Signal analysers

Keysight Technologies has launched the N9042B UXA X-series signal analyser solution, which enables users to test the performance of millimeter-wave (mmWave) innovations in 5G, aerospace and defence and satellite communications.

The analyser provides wide analysis bandwidth and deep dynamic range to challenges including tight design margins and timelines, complex modulation and stringent standards.

Measurement accuracy can be enhanced by adding a V3050A signal analyser frequency extender; plus the RCal receiver calibrator to correct system path losses and frequency responses up to 5 GHz IF bandwidth without the need for an external vector network analyser, cabling and manual test-plane characterisation.

Keysight Technologies Australia Pty Ltd
www.keysight.com



5G network test

Viavi has released TMLite, a streamlined version of its TM500 network tester.

The tester enables vendors to identify software errors by deploying test tools earlier in the development cycle. It also enables smaller vendors to gain access to the TM500 family with this compact version, by delivering features, software environment and user experience consistent with the TM500.

In order to maximise 5G coverage, service providers will need to densify their networks, increasing the diversity of radio types and suppliers. Smaller scale manufacturers may not require the large number of carriers and high-capacity testing typical in traditional base station validation, but they still need early access to 3GPP features, as well as network parameters used by other manufacturers to confirm interoperability.

The tester enables functional, system and performance testing for the latest 5G standalone features, including: FR1, FR2, FDD, TDD, and up to 4x4 MIMO; plus the RF, baseband and higher layer processing for one 5G NR carrier. All on a single COTS server.

VIAVI Solutions Inc

www.viavisolutions.com.au

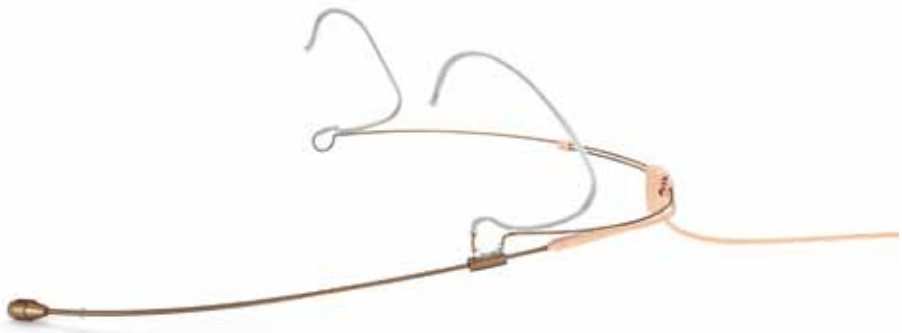
Antennas upgraded

Panorama Antenna's LPB and B4BE-7-27 have been upgraded to cover more frequency bands. The LPB-6-60 and B4BE-6-60 look identical to the predecessors but now cover 600 to 6000 MHz (6 GHz) utilising LTE Bands 46, 47 and 71 with this antenna solution without loss of performance.

The upgrades allow users to migrate to faster and advanced networks now and in the future, with no need to upgrade a cellular antenna again. Both antennas are useful for LTE, M2M and IoT applications, providing coverage booster antennas for 2G/3G/4G and 5G devices. The Panorama B4BE is the bracket-mount alternative.

Panorama Antennas Pty Ltd

www.panorama-antennas.com



Headset microphones

DPA Microphones and Amber Technology introduce the 4466 Core omnidirectional and 4488 Core directional headset microphones, featuring its 5 mm round microphone capsule.

The headsets deliver security, durability and flexibility required for use in theatre, broadcast, worship and corporate conferencing. With a one-size-fits-all design and adjustable height and boom length, the 4466 and 4488 headsets accommodate small to large head types. A three-point gripping system — above, below and behind the ear — provides security, while the flexible ear hooks provide continued comfort during extended use.

The two headsets share the same interchangeable cable and boom options as the 6066 subminiature headsets. This includes the 90-degree adjustable cable guide at the neck, which keeps the cable out of sight.

The headset frame, boom and capsule have a non-reflective surface for unobtrusiveness and ease of use for camera crews. Available in black and beige options, with a brown version coming soon.

Amber Technology Limited

www.ambertech.com.au

Sealed DC power systems for challenging environmental locations

Darren Salter, Eaton Product Line Manager, PQ/Telecom DC

5G telecommunication networks began rolling out in 2019 and Australia's largest telecommunications companies are already offering 5G capabilities in selected areas connecting consumer 5G handsets. But 5G isn't just for consumers: what 4G did for consumer devices, 5G will do for new markets including industrial, automotive, medical and even defence.

As we move into the era of Industry 4.0 and the Internet of Things (IoT) there is the need for ubiquitous connectivity between people and between machines — and that connectivity needs extremely high levels of reliability and continuity. To achieve this high reliability and continuity, the machines and connectivity devices need 100% reliable power, and that power needs to have backup.

Since 5G has a smaller transmission range than 4G, there is a need for a much larger number of small cell towers to provide sufficient coverage. The power systems to support this equipment in many cases now needs to be designed to operate in locations and environments previously unthought of — on the tops of towers, on street-side electricity poles, on building facades, or in fact just about any conceivable location able to provide line-of-sight transmission to users and machines.

All these locations are subject to the vagaries of the environment: not just extremes of temperature, but also the extremes of moisture, pollution, dust and sunshine. The backup power systems to support 5G small cells therefore need to be likewise designed to survive the same extreme environmental conditions.

Highly efficient power electronics with full remote-control capability, together with lightweight and resilient lithium batteries, can be housed in special sealed IP65 enclosures to provide backup power systems capable of surviving the most difficult outdoor and environmentally challenging locations.

Another example of where backup DC power is required that challenges the norm is the surveillance cameras around an airport perimeter. The cameras are located hundreds of metres from the control or monitoring centre and return high-definition signals via fibre-optic cable. These cameras need 100% reliable 24x7 capability.

The backup power system is located alongside the camera, high up on a pole and subjected to winter and summer temperatures, as well as fumes and dust from aircraft and machines. Only IP65-sealed backup power systems can meet this difficult requirement.

Even mining sites like those in Australia's inhospitable Pilbara region are fully connected, with machines, processing plants, monitoring equipment, railways and people needing 24x7 reliable telecommunications. In the Pilbara temperatures can exceed 40°C for months on end or at the same time be subject to cyclonic storms and the continuous and incessant red dust and dirt. Again, IP65 sealed backup power systems, capable of temperatures exceeding 40°C, and fitted with remote monitoring and control, can be deployed in such locations to ensure power is always on and supporting the assets.

Eaton is a specialist in backup uninterruptible power systems, whether they be DC or AC based, and develops solutions for extreme environmental locations, providing backup power for just about any location, from data centres and hospital operating theatres to remote mining and radio transmission towers.

To meet the needs of telco operators and for other outdoor networking sites, Eaton has taken traditional power system designs and shrunk them down into its Outdoor Pole Solution (OPS). The OPS2 is a 48-volt DC power system with options for battery backup that can be pole-mounted to support 4G and 5G remote radio units, as well as potentially supporting CCTV and industrial IoT equipment. The OPS2 also has an in-built web server and supports remote operations.

The OPS2 features include the ability to add third-party lithium-ion batteries to enable a no-break UPS capability, and it is built in a compact IP65 environmentally hardened design. Full remote monitoring and control using Simple Network Management Protocol (SNMP) and web interfaces enable network operators to manage the power usage of their 5G small cell deployments.

Powering a 5G network does not have to mean a massive increase in energy consumption. Eaton's solution allows network operators to build on existing deployments with smart power backup technology that uses energy-saving hardware and is optimised for outdoor conditions.

EATON
Powering Business Worldwide

For more information, visit www.dcpower.eaton.com/australia

BENEFITS OF ADVANCED DC POWER MANAGEMENT AT TOWER SITES

Comprehensive monitoring and control of the DC power at tower sites enhances the effectiveness of wireless communications networks.

Even the most robust, well-designed communications networks can experience problems with network devices such as RF radios, base station repeaters, RF amplifiers, network switches and other network devices. External events such as power surges or lightning strikes can cause network devices to lock up and, with the transition of radio network equipment from analog to digital within the last decade, onboard firmware in these devices can also occasionally freeze. While these instances are infrequent, they do occur.

A well-designed communications network will often allow for these events to occur without affecting the overall operation. However, such events often require a visit to the communication tower site to resolve the problem, which can be sometimes as simple as cycling power to the troublesome device.

Sending a technician to do this can be both costly and time-consuming. If the affected devices are non-operational, this can occasionally cause disruptions to the communications network.

Within the last decade there has been a technology shift in radio and network devices — the IT world has converged with the RF world. The ability to remotely monitor devices within a radio network is becoming the standard. This change in technology is also occurring with DC power plant products, with some DC power conversion equipment manufacturers leading the way in providing, via Ethernet, remote power monitoring and remote power control capabilities for their DC products such as DC power supplies, DC distribution panels and inverters.

Virtually all communication networks require DC power plant infrastructure to power various network devices and communication tower sites. This DC power plant infrastructure is critical in maintaining reliable power. Being able to remotely monitor and control DC power plant devices such as rectifiers, power supplies, distribution panels, batteries and inverters provides substantial benefits.

Communications network operators can monitor power conditions for each device that is connected to the DC plant, enabling the monitoring of parameters such as:

- power consumption of individual devices;
- fault conditions;
- system voltage levels;
- AC mains status;
- backup battery conditions, including voltage, state of charge and runtime remaining.

Although DC power plants vary based on each site, a typical site comprises a primary and secondary power source. The AC primary is typically provided by the electric utility company. The secondary source is typically a battery bank, which

is sized to provide the required amount of backup time should the AC mains fail. In very remote areas where AC mains from a utility is not available, solar power and generators are sometimes used to supplement the battery bank.

Most devices within a communications network will operate from DC, so converting from AC mains power to DC is required. Depending on the number of devices (loads) that are at the site, the DC power from the power supply is distributed to the loads using a distribution panel. While most devices are DC-powered, some require AC; in this case an inverter is used to convert the DC to the AC.

Many power supplies developed specifically for these applications incorporate circuitry to power the load(s) and charge the battery bank simultaneously to keep the battery in optimal condition. In the event of an AC mains failure, the energy stored in the battery bank is diverted to the loads to provide continuous, uninterruptable power to these devices.

This functionality is important; a failure of the AC mains should not cause a network to shut down, having a seamless transition to battery power in the event of a mains failure is crucial to maintaining network operation. A low-voltage disconnect device can also be incorporated, or installed externally, which will automatically disconnect the battery bank should the battery voltage become too low.

Over-discharging a battery bank can permanently damage the batteries. By using an intelligent DC power supply and DC distribution panel with Ethernet monitoring and control, communication network operators can remotely cycle DC power to individual devices, often resolving issues without having to physically visit the site. The ability to remotely disconnect, or load shed, non-critical loads while maintaining critical loads online enables longer preservation and runtime of the backup battery bank in the event of an AC mains failure. The ability to monitor battery voltage at a site and determine how much runtime remains on a battery bank enables technicians to schedule their visits to the site for corrective action.

Communications network designers are adopting this technology at a rapid pace. It enables them to provide more robust network designs with more monitoring and control capabilities. It provides benefits not only to the network operators themselves, but also to the users of the network. The ability to have comprehensive monitoring and control of the DC power plant at communication sites ultimately enhances the effectiveness of these networks.

Helios Power Solutions
www.heliosps.com.au

CASE STUDY

Brazil airport the first facility with a Wi-Fi 6 network

The Wireless Broadband Alliance (WBA) has announced that travellers, employees and retailers at Brazil's São Paulo/Guarulhos International Airport (GRU) are now able to access the world's first at-airport Wi-Fi 6 network using OpenRoaming.

Based on 802.11ax and featuring channels up to 160 MHz wide, Wi-Fi 6 can deliver speeds up to three times faster than 802.11 technologies. Designed for use in the 2.4, 5 and new 6 GHz bands, Wi-Fi 6 also provides greater reliability, ultralow latency and higher network efficiency in airports, stadiums and other environments with large numbers of simultaneously connected devices.

The GRU network features a unified Wi-Fi 6 infrastructure based on Cisco Catalyst access points, controllers and switches. Samsung provided GRU operations employees with ruggedised handsets and other devices with Broadcom's Wi-Fi 6 chipset, enabling them to use Wi-Fi 6 to maximise productivity and responsiveness to passengers while different OpenRoaming identities are used to separate automatic access for GRU employees versus guests.

Airport employees and passengers will no longer have to log in to public Wi-Fi networks repeatedly. It will also improve consumers' experience in the retail stores as it will allow a smoother check-out process and support back-office operations.

The service frees travellers, airport employees and other users from the repeat registration and log-in that public Wi-Fi networks often require. Instead of re-registering or re-entering log-in credentials, GRU users will enjoy the convenience of instant network access matched with enterprise-grade security. When coupled with the Wi-Fi 6 infrastructure, OpenRoaming also helps provide a carrier-grade Wi-Fi experience.

OpenRoaming provides secure, automatic and friction-free access to the Cisco-powered network that is managed by Boingo, who designed and installed the GRU network — said to be the world's first airport Wi-Fi 6 network when it launched in October 2020. Travellers have up to four hours of free access, including from their older-generation Wi-Fi devices, thanks to Wi-Fi's backward compatibility.

Samsung
www.samsung.com

Matrix switch

From Cambium Networks, cnMatrix TX provides wireless ISP operators and industrial users a non-blocking, fully managed, enterprise-grade L2/L3 switch portfolio, flexible and intelligent PoE and Cambium synchronisation in a single box solution that is easy to install and manage while improving network performance.

Fully integrated switching solution purpose-built for WISPs and industrial customers that simplifies deployment operations while improving network performance. Integrated with the complete Cambium portfolio of connectivity solutions, managed via the cnMaestro cloud-based management system. Designed based on the specific needs of wireless ISPs.

The cnMatrix platform of switches provides full line rate, non-blocking architecture; easy and simple, free cloud (or on premise) management with cnMaestro or XMS (to be included in a future release); zero-touch deployment of switches makes installation easy; policy-based automation eliminates manual and time-consuming configuration; enhanced security with automated device profiling and segmentation; policy-based automation eliminates manual configuration during adds, moves and changes of network devices; unified wired-wireless access solution.

The cnMatrix TX series of switches provides the following addition functionality: Cambium sync; redundant input sync sources internal GPS module (with external antenna) cnPulse and full per-port control with stats available.

A comprehensive/Intelligent PoE solution: 802.3af/at/bt — up to 90 W; 24 V passive PoE — up to 15 W; 54 V passive PoE — up to 90 W.

Dual redundant removable power supplies (TX2020R-P) for AC: 600, 930 and 1200 W options. For DC supplies: fully isolated — supports positive/negative input voltages; 36–72 V; 600, 930 and 1200 W options; grounding lug nut located on front panel.

Cambium Networks Ltd

www.cambiumnetworks.com

TRANSTECTOR

The industrial PoE surge protection device for data line applications helps prevent damage from energy spikes that can be caused by lightning or other strong electrical power. The TVSS / transient voltage surge supression device for power over ethernet can act as a lightning surge arrestor as well as an electrical overvoltage spike protection unit.

Surge protector device for dataline equipment part number 1101-1030 from Transtector is designed to protect Gigabit Ethernet/PoE+ from transient voltage power spikes.

Through innovative RF engineering and manufacturing capabilities PolyPhaser has created a protection technology that virtually assures uninterrupted communications flow of data and information through global networks.

PolyPhaser

Siklu EH-8010FX radio delivers 10Gbps full duplex point-to-point wireless Ethernet connectivity with the longest mmWave reach by means of the highest system gain in the market. Incorporating dozens of Siklu innovations, the EH-8010FX is based on the same platform that has been deployed in tens of thosuands of links from the Etherhaul family. Enquire now about our limited offer of 24 month extra warranty.

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- Mobile Backhaul

Streakwave

Streakwave Australia
Phone: +61 3 9001 4295
Email:sales@streakwave.com.au
www.streakwave.com.au

Siklu

5G routers

Tekdis has introduced the AirLink XR Series of supercharged 5G gateways, designed to deliver the fastest speeds in the most challenging environments.

The first two routers in the XR Series, the AirLink XR90 and XR80, enable users to leverage the higher data speeds, lower latency, ultra-reliability and enhanced security of 5G required for real-time video streaming and voice communications in mission-critical environments and high-performance, business-critical 5G applications.

The XR90 is purpose-built for vehicles, such as transit and public safety. The XR80 is purpose-built for mobile and fixed applications such as commercial fleets, manufacturing and distance learning.

The XR Series offers a complete solution including device-to-cloud security and remote out-of-band management capabilities, which should provide users with the confidence that their devices are operating at top performance.

Tekdis

www.tekdis.com.au

Radio fleet audit app

Sepura has added to its suite of applications by introducing RadioAudit, a simple, effective tool to improve the radio auditing process.

Regular auditing of TETRA radios to verify both the device owner and the radio's security status is a requirement for keeping communications secure. RadioAudit is a data application designed to simplify and automate the auditing process, reducing time-consuming manual handling of radios.

Fleet administrators should benefit from a quicker audit process as the confirmation is carried out remotely by users, while automatically generated reports ensure compliance with security and other regulatory requirements.

The app is scaleable to the size of radio fleet and works across both new and legacy Sepura radios. Because the process is completed remotely by radio users, there is less requirement to physically attend meetings, enabling efficiency and less risk from unnecessary handling of radios.

The app incorporates built-in reminders, the ability to preset schedules for regular audit checks and easy-to-use forms on the radios for data entry by each radio owner, which should result in an accurate response rate. Built-in analytic tools enable administrators to view and query the collected audit data, with the option to export to Excel when required.

The app is available as a licensed option on radios across Sepura's portfolio of mobile and handheld radios.

Sepura

www.sepura.com

5G product

Cradlepoint has released its second-generation 5G product portfolio at its 2021 Virtual Global Partner Summit. The global product spans low-band to millimetre-wave solutions and external adapters to integrated 5G routers.

The need for agile, fast and reliable wireless connectivity within the enterprise wide-area network (WAN) is growing to support the cloud, mobile and IoT technology that enables it. The second-generation 5G product portfolio will commence shipping in May and roll out globally over the next 90 days based on the completion of carrier certifications.

The company has developed high-performing wireless edge routers for 5G branch and mobile use cases and a 5G modular modem that is field-upgradable.

Cradlepoint Australia Pty Ltd

www.cradlepoint.com

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Smart Cities Chair
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Visit www.melbourne.comms-connect.com.au for more information

Cradlepoint helping to keep seafarers in touch with families during pandemic

Cradlepoint has enabled Tas Bull Seafarers Foundation to provide internet connectivity to thousands of international seafarers entering Australian ports in a program called the Seafarer Connect Initiative.

Tas Bull Seafarers Foundation has rolled out Cradlepoint wireless cellular routers and its NetCloud Service at nine ports across New South Wales, Western Australia and Victoria so far, with the aim of equipping every port around Australia to enable connectivity for all seafarers entering the country.

"Supporting mental health and welfare of seafarers is a huge challenge in the industry across the world," said Robert Coombs, Executive Chair, Tas Bull Seafarers Foundation. "Normally, seafarers are working on ships for nine months at a time; however, during the COVID-19 pandemic, crew have been on ships for nearly two years, which is impacting the mental health of the workers."

Due to restrictions on international arrivals all around the world, seafarers have been unable to disembark their vessels, meaning they cannot call or connect with loved ones at home. The Seafarer Connect Initiative aims to enable international seafarers to connect with families and friends through Wi-Fi, free of charge, on their mobile devices. Worldwide, seaports are not built to provide internet connectivity for incoming ships. Nearly all ships have no access to Wi-Fi onboard except through satellite, which is very expensive and paid for by the seafarers.

Connectivity provided with Cradlepoint's enterprise wireless WAN solution means that seafarers can communicate with family and download movies and, importantly, also stay up to date on the current COVID-19 status and information in the country they are travelling to and their home countries.

"Health advice and COVID-19 updates at each geography go through a chain of communications and is then translated for the crew onboard, which means delays and gaps in relaying important and timely information. Connectivity to the outside world means seafarers can get direct and current information in their native language," said Bernie Farrelly, Project Manager, Tas Bull Seafarers Foundation.

Robert Coombs, TBSF Chair, and Mike Gallacher, Ports Australia CEO, inspect the Cradlepoint unit.

Tas Bull Seafarers Foundation is now looking at providing internet connectivity at ports around the world. The organisation chose to work with Cradlepoint technology because not only does it satisfy global compliance requirements, it's also reliable and secure. Especially as countries around the world move towards 5G, Cradlepoint is deemed as a secure solution with global LTE and 5G modems and multi-country certifications.

"The other key benefit of Cradlepoint for us is that often when we receive funding to provide connectivity at individual ports, that funding needs to be used quickly. The ability to deploy Cradlepoint solutions fast has been instrumental to the success of these projects," Farrelly said.

"It's very rewarding to see firsthand how these incredible organisations like Tas Bull Seafarers Foundation use technology to truly improve people's lives," said Gavin Wilson, Managing Director APAC, Cradlepoint. "This is one example of how Cradlepoint helps customers with many unique challenges and needs. Cradlepoint's NetCloud Service, the software at the heart of our solution, enables customers to make changes to the network centrally and remotely with ease. It also reduces the time and cost to deploy new services."

Tas Bull Seafarers Foundation aims to expand the Seafarer Connect Initiative globally, working closely with the International Transport Workers' Federation Seafarers Trust (ITFST) to protect seafarers' rights and health.

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for industry and business professionals

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