

# > PC Update

## September 2021

```
def __init__(self, path):
    self.file = None
    self.fingerprints = set()
    self.logdupes = True
    self.debug = debug
    self.logger = logging.getLogger('pcupdate')

    if path:
        self.file = open(path, 'w')
        self.file.seek(0)
        self.fingerprints.update([
            ''])

    @classmethod
    def from_settings(cls, settings):
        debug = settings.getbool('debug')
        return cls(job_dir(settings), debug)

    def request_seen(self, request):
        fp = self.request_fingerprint(request)
        if fp in self.fingerprints:
            return True
        self.fingerprints.add(fp)
        if self.file:
            self.file.write(fp + os.linesep)

    def request_fingerprint(self, request):
        return request_fingerprint(request)
```

Publishing Information _____	2
From The Editor September 2021 _____	3
Presidential Musings September 2021 _____	4
Monthly Meeting September 2021 _____	6
CitSciOz 2021 _____	8
In Search of Backup Utopia _____	10
Thanks To The Ancient Greeks _____	12
Digital tech is the future, but a new report shows Australia risks being left in the past _____	13
'What is my IP address?' Explaining one of the most Googled questions in the world _____	16
DOTW Winners August 2021 _____	20
East SIG Report August 2021 _____	21
Yammer Highlights August 2021 _____	30

# Publishing Information



## **The newsletter of**

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*Melbourne PC User Group Inc. is a member of the Association of Personal Computer User Groups*

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Online membership form

**Responsibility for content in this newsletter lies with individually named authors**

**Please remember to always bring your membership card to meetings**

SIG Listings and up to date calendar are available on our homepage

# From The Editor September 2021

**Hugh Macdonald**

Last month in PC Update we celebrated the fortieth anniversary of the IBM PC with an article. This month, if I'd had more time, I would have done a similar article on another momentous anniversary in the history of computing that occurred this past month. On September 17 2021, it was thirty years since Linus Torvalds first released his Linux kernel.

Compared to the fanfare of the IBM PC, the Linux kernel was released inauspiciously on an Internet newsgroup back in 1991. But in some ways its contribution has been almost as significant. As well as the many distributions of Linux that are made for the desktop (of which some such as Linux Mint and Ubuntu are occasionally reviewed in PC Update), it's also gone onto power a number of other things. A significant percentage of the servers on the Internet are running a Linux distribution, so when you're viewing your favourite website or downloading your email, chances are it's happening thanks to Linux. Linux is also the kernel for Android, and although there is debate over whether this makes Android a Linux distribution, it is inarguable that Android is the most widely used smartphone operating system in the world. On the supercomputing front, 100% of them are powered by Linux, meaning that important scientific discoveries are happening thanks to Linux.

So we have almost as much to thank Linux Torvalds for as we do IBM, and if he hadn't wanted to run Unix on his 386 thirty years ago, we might be in a very different situation today computing wise.

Elsewhere in PC Update this month, you'll find Harry Lewis's thoughts on MacOS Time Machine, more fiction from George Wright, the East SIG Report from Neil Muller, DOTW Winners from Roger Brown, Yammer Highlights from Dennis Parsons and Presidential Musings from David Stonier-Gibson. Thanks as always, to all our contributors.

Enjoy the issue!

# Presidential Musings September 2021

David Stonier-Gibson

This may be the last PC Update you read before submitting your proxy votes for the November AGM. That meeting will be online only, so votes will have to be done by email or snail mail. You should already have received an email notice about all that a week or two ago. If you missed it it's all here:

<https://www.melbpc.org.au/committee/committee-documents/2021-agm-notices/>

## Proposed rules change

We (committee) have drafted a small but significant change to the Rules of Association for you to vote on. Essentially we are formally broadening the purpose of the club from PC-centric to technology in general. While it changes nothing in practice, it simply acknowledges the process that is taking place, and must take place for Melb PC to survive and prosper for many, many years to come.

## Proposed membership fee increase

Membership fees have not increased for 6 years, but our costs have been rising inexorably. While Covid has reduced the cost of hall hire for non-Moorabbin SIGs, every other cost has gone up. The people we lease the big office printer/copier/scanner from even increased the contract payments well beyond CPI in the middle of Covid, when the printer was getting virtually no use. If I told you what I honestly think of BBC Digital and their business methods they would sue me. The 5-year contract is watertight, so we can't get out of it. It expires next September and needless to say I would not expect the committee to renew again.

Owners' Corporation fees at Moorabbin have gone up 37% to \$22K.

Membership fee income has declined by \$47K over the last 3 years.

We have had no monthly raffle income for ages.

Overall we have gone backwards by over \$24K this last year.

In the longer term my vision is that by transforming the club into something attractive to younger people, with equipment/tool library, maker space and other offerings (all suggestions welcome!), that we can derive extra income from those facilities. Maker spaces elsewhere typically cost more per month than we charge per year. I hasten to add that existing members will not see fee increases due to those initiatives. But it's been a little bit hard to do much towards that during Covid!

So it brings me no pleasure to ask you vote in support of a modest increase in membership fees.

## Some more general stuff

Overall I see Melb PC as a club that, thanks to the heydays of being a dial up ISP, is asset rich but cash flow challenged. We have about \$500K in the bank, we own our premises, informally valued pre-Covid at ~\$1.3M. But we lose some money every year, at an accelerating rate - \$24K this last year. But right now, with Covid, the value of Moorabbin is likely greatly reduced. Heck, office space in the CBD is going begging at the moment!

When I was brought onto the committee in 2017, and given the marketing "portfolio", I did a presentation with the following graphic (I had been told we would hit rock bottom in 2023, which was grossly pessimistic!). Remarkably, when I called for a show of hands for one future or the other, one committee

member voted for entropy.

So it seems to me the path to long term survival is to exploit our natural advantages - our premises and our cash. Hence the drive to make Moorabbin more exciting, to set up Maker Spaces for a younger audience, to create a Library of Things. That said, the committee and I remain fully committed to providing for the needs of members who only ever attend non-Moorabbin SIGs. The transformations I aspire to will be gradual, and in addition to the more traditional activities such as iHelp.

*Speaking of iHelp: If you are able and willing to make a contribution to helping out with supporting other members, please let the iHelp team know - [iHelp@melbpc.org.au](mailto:iHelp@melbpc.org.au)*

# Monthly Meeting September 2021

The September 2021 Monthly Meeting was held online on Wednesday 1st September 2021, with about 70 members in attendance via Zoom. This was the program for the evening:

**Guests : Dr Alice Motion and Michelle Neil**

**Topic: Citizen Science**

**Dr Alice Motion** is a chemist and science communicator based at The University of Sydney. Her research focuses on open science and Science Communication, Outreach, Participation and Education (SCOPE). Finding ways to connect people with science and to make research more accessible is the overarching theme of Alice's interdisciplinary research. Alice is the founder of the Breaking Good project - a citizen science project that aims to empower high school and undergraduate students to be active researchers in projects that will improve human health. She has a strong commitment to Citizen Science and is the Co-Chair of the University of Sydney's Citizen Science Node, which aims to enhance Citizen Science in Australia through research and practice. Alice will work with ACSA to strengthen participation in, and the impact of, Citizen Science in our region.

In 2011 **Michelle's** young son presented her with a spider. A redback spider. After convincing her son not to pick up spiders but to take pictures of them instead Michelle soon found she had over 7000 photos of all sorts of creatures and no idea what any of them were called. Thus a citizen scientist is made. In May 2014 Michelle was invited by Earthwatch to attend the Australian Citizen Science Associations Inaugural Workshop in Brisbane. She found herself co-chair of the Communications Working Group. Michelle and Jessie Oliver co-developed ACSA social media (Twitter, Facebook, & LinkedIn). Since then Michelle, with her orange coloured ipad clutched firmly in one hand, has been an active social media moderator, poster and tweeter for the ACSA social media platforms. Having worked in analytical chemistry for over a decade Michelle finds herself in an interesting place - a scientist as well as a citizen scientist, with a passion for science communication

## Meeting Agenda

Meeting begins at 7pm. MC is Peter Bacon.

Guest speakers: Alice Motion and Michelle Neil

Interval: Music

Presidents Report: David Stonier-Gibson

iHelp Online with Harry Lewis. Please submit questions to [ihelp-questions@melbpc.org.au](mailto:ihelp-questions@melbpc.org.au) before the segment.

Meeting concludes at 9pm. Informal iHelp Online will continue after the meeting.

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If you missed out the first time and would like to view any of these presentations, you can do so at <http://services.melbpc.org.au/videos/>

The username is videos and the password is drum286.



# CitSciOz 2021

*If you enjoyed the September 2021 monthly meeting on citizen science, then you might be interested in attending the annual conference which is coming up,*

Please join us in October 2021 for “**CitSciOz21: Celebrate, Communicate, Co-create**” in a brand-new event format.

## **The 4th conference of the Australian Citizen Science Association**

**27 - 29 October, 2021**

Recent events have awoken a nation to the importance of science and the strength of citizens uniting together to achieve a common goal. Between the Australian bushfires and a global pandemic, citizen science has never been more important.

Join us for **CitSciOz21** - an online citizen science conference experience from **27 - 29 October 2021**. Centred around the themes of **Celebrate, Communicate, and Co-Create**, our virtual experience will ensure a highly interactive and engaging event, with the capacity to network with your fellow attendees, speakers, and sponsors as well as providing you with the learning outcomes and benefits you would come to expect from an in-person event.

## **Themes**

### **Celebrate**

**Explore, investigate and showcase successful citizen science projects from Australia and the rest of the world.**

Citizen science is leading to amazing developments across the world. From the tiny to the huge, and from the personal to local, national and global. It's important for our communities to take time to recognise how far we've come and what we've achieved. How do you celebrate your citizen science success?

### **Communicate**

**Showcase citizen science communication techniques for maximum impact.**

The successful communication of citizen science and its outcomes is so important when it comes to educating the community about what we do, sharing knowledge and results with a diverse array of people and the ability to influence change at many levels. But successful communication is a science within itself. With whom and how do you communicate your citizen science data and outcomes so it will make an impact?

### **Co-Create**

**Encourage inclusiveness and bring together a diverse array of people to discover better science.**

Co-creation is at the heart of citizen science, fostering the participation of end-users by actively involving them in the research process. But it's still considered a challenging and sometimes risky approach for

policymakers. Do you have a great co-creation example? Did the co-creation process lead to new and innovative ideas? How can we encourage co-creation for science policy, including UNESCO? How can we make better co-created citizen science?

Full details can be found at <https://citizenscience.org.au/citscioz21/>

# In Search of Backup Utopia

Harry Lewis

In his intriguing article 'Elephobia' in last month's PC Update we were transported to Planet Wright where George (of that ilk) introduced us to folk with interesting traditions regarding backup. The standout for me was the practice of backing up to the same hard drive as the one that holds the data you are backing up.

As a Windows user I have wrestled with several backup programs over the years. I can remember when a disk image backup required an Open File Manager add-on to permit backup while you were at work. For some years I used, and was abused by, Acronis (over time I returned two different versions and got my money back). These days I use the paid version of Macrium Reflect. I have done serious whole-disk restores from both those products, but the user interfaces in both cases leave much to be desired.

Backup is a basic and important function, and it's regrettable that Windows users have to struggle with often unfamiliar jargon and confusing interfaces.

All this led me to dream of another backup world with these features:

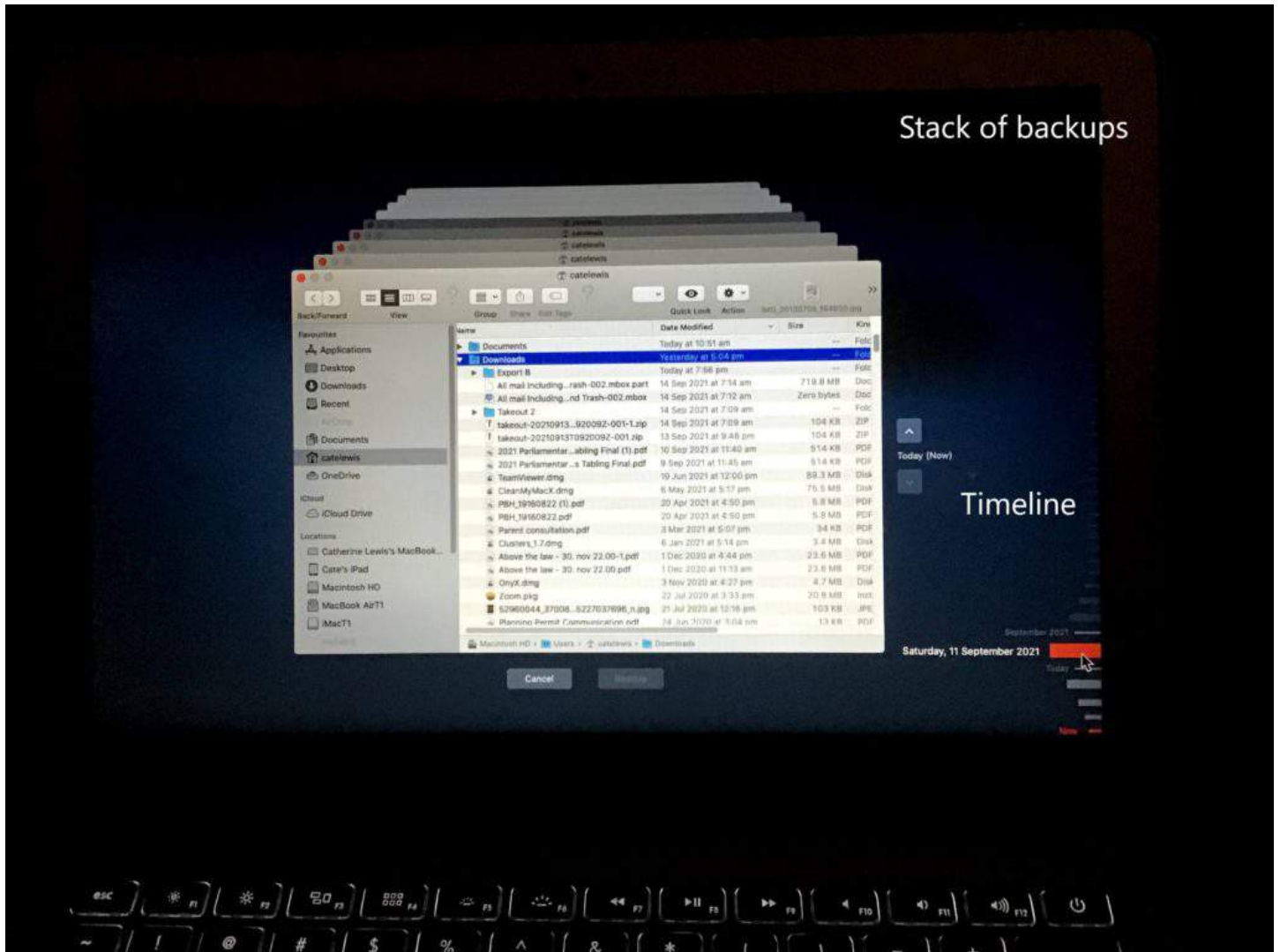
- Your operating system comes with a built-in backup program that's capable of image backups. There's no need to shop around in a confusing marketplace.
- You plug in an external drive (via USB port) and click an icon, and a backup begins.
- Backups take place regularly and automatically using the grandfather-father-son method, without your needing to set up a schedule yourself.
- There's no need to create 'restore media' because your backup disks are bootable.
- Searching past backups, whether for a full restore or a file backup, is intuitive, needing no more skills than are needed to search your current working disk.
- You can backup to multiple disks so that you can store one or more offsite.
- You can attach two (or more) disks to your computer at the same time and both will be used in turn, in updating backups.

A planet on which backups could meet those requirements (you say) is of course fictional. Just as fictional as would be working time machines (because you're sure the planet is in the future).

There is one big difference between that planet and Planet Wright. That planet is Earth and the time is now. However, it represents an alternative possible world from the Windows world. The denizens of this other world use macOS, which for many years has bundled Time Machine, its resident backup program. Time Machine meets the listed requirements with one small deviation.

- When you first plug in your backup disk, you need to ask Time Machine to use it, and you may be prompted to allow a reformat of the disk. If you do that TM arranges it for you, you don't need to make your own way to the Disk Utility. This is the main (low) hurdle to cross when starting up with Time Machine.
- The reformat is required to enable your backup disk to be bootable. Booting from an external drive has been a Mac feature for many years. It can be used to initialise a new Mac from an old one. (I have done that several times for the Mac user in our household.)
- The interface to backups is a simple and beautiful feature of Time Machine. It uses an apt visual metaphor. As you invoke Time Machine, it presents past backups in a stack, with a date-list to the right for all the retained backups. (Did I mention that Time Machine does its own housekeeping, deleting older backups when necessary to make space for new ones?)
- If you attach two backup disks to your computer Time Machine will alternate between them as it performs its hourly incremental backups. This is automatic and needs no extra setting by the user.

I am not alone in believing that if someone has an open choice between purchasing a Windows computer or an Apple Mac computer, they should choose the Mac because of Time Machine.



# Thanks To The Ancient Greeks

**George Wright (with maths advice from Ann Lawry)**

Humans can identify complex relationships with each other and their habitats. I've come to think that the ancient Greeks who invented numerical theories were actually laying the groundwork for a study into the context of how we interact. They identified Prime Numbers which were divisible only by each number itself, and one. Examples are 1, 2, 3, 5, 7, 11, 17, 19.... Also there are twin prime numbers that occur with only one whole number separating a couple of prime numbers such as (3&5), (5&7), (11&13)... With the exception of 3 and 5 all the others can be generalised as follows:  $(6n-1)$  or  $(6n + 1)$ . Similarly you can have Triple Primes generalised as  $(n)$ ,  $(n+2)$  or  $(n+6)$ .

This raises the possibility that we have ignored some links between human characteristics. Numbers are inanimate but humans have more complex interactions. Could our egocentric approaches hide the objective information about ourselves and our relationships, actual or potential?

The possibilities become more enticing when we explore further. Primes can be divided into two groups:  $(4n + 1)$  or  $(4n - 1)$ . For example, 13 is  $(4 \times 3 + 1)$  and 79 is  $(4 \times 20 - 1)$ . The first group can always be expressed as the sum of the squares of two numbers (For example,  $2^2 + 3^2 = 13$ ) but the second group can never be so expressed. Only two groups? It's a bit like political parties: Liberal or Labor, Republican or Democrat, Conservative or Labour. Although we claim to be diverse, perhaps we are more similar to clusters of numbers after all.

But it doesn't stop there. An Amicable Pair is comprised of two whole numbers each of which is comprised of the whole number divisors of the other. Consider 220 and 284. The sum of the proper divisors of 220 (I.e., those divisors less than 220 itself) is 284 ( $1 + 2 + 4 + 5 + 10 + 11 + 20 + 22 + 44 + 55 + 110 = 284$ ). The corresponding sum for 284 is 220 ( $1 + 2 + 4 + 71 + 142 = 220$ ). You can see that each is the sum of the other's proper divisors.

We live in a societal mess but are there ways to simplify our relationships? I could think of no better outcome for our community if all our amicable pairs got together to provide a stable government. But alas, in the numerical community the Amicable Pairs are not interested in politics and in our society the politicians could hardly be described as amiable let alone amicable.

Ah well, let's just thank the ancient Greeks who somehow managed to explore the universe and explain what a diverse and interconnected world we live in that includes people, animals, things, deities and numbers which they demonstrated by capturing the dichotomy in their artistic works. At least we can relax when we look at their art, even if it's difficult to do so while attempting to understand their numerical theories and what we've done (or haven't done) with them.

# Digital tech is the future, but a new report shows Australia risks being left in the past

Shazia Sadiq, *The University of Queensland* and Thas Ampalavanapillai Nirmalathas, *The University of Melbourne*

Digital technologies are now at the heart of our everyday lives, as anyone who has swapped their office for a videoconferencing screen, or downloaded a contact-tracing app, knows only too well.

This trend is set to continue even in a post-COVID world. Australia is at a crossroads in developing a strong digital economy to meet this changing world head-on.

In the words of the computing pioneer Alan Kay, “the best way to predict the future is to create it”. Australia too needs to grab the opportunity to leverage its research and development strengths in emerging digital technologies, and create a “digital future” by amplifying the opportunities for growth in this important sector and strengthen our sovereign capabilities. But Australia is lagging behind many other nations in shaping this digital future.

In a new report released today, the Australian Academy of Science and the Australian Academy of Technology and Engineering have jointly issued an urgent call to action, asking the government and industry to recognise the importance of emerging digital technologies.

The report makes several key recommendations:

1. elevate emerging digital technologies as a national science and innovation priority
2. include research and innovation in emerging digital technologies in the 2021 Research Infrastructure Roadmap
3. recognise emerging digital technologies as an independent growth sector.



## **What technologies should be encouraged?**

The report focuses on emerging digital technologies such as artificial intelligence (AI), the internet of things (IoT), augmented and virtual reality, blockchain and 5G networks.

These innovations are already starting to transform industries such as manufacturing, agriculture, waste management, transport, finance, education and health. But they are still considered “emerging technologies” because they have not yet realised their full commercial potential, unlike more established technologies such as 3D printing, mobile computing or GPS.

The next wave of emerging digital technologies, such as self-driving vehicles, smart microgrids, 6G networks and quantum computing, will further disrupt and transform many sectors of the economy.

Of course, it is hard to predict exactly what innovations will arise in the future. But by ensuring a strong national focus on fundamental science and engineering in this fast-evolving area, Australia can ensure it stays ahead of the curve, no matter what the future brings.

## **What are other nations doing?**

The problem is that Australia is currently doing the opposite. It is falling behind countries such as the United States, United Kingdom, France, Canada and China, all of which are prioritising digital technologies as a strategy to bolster their global competitiveness.

Digital innovation accounts for only 7.4% of Australia’s gross domestic product (GDP), compared with an OECD average of 11.2%.

The applications of emerging digital technologies will continue to diversify and grow. Research and innovation in emerging digital technologies should not be artificially bound to specific application areas nor overly focus on today’s needs, as doing so limits innovation potential that could otherwise create entirely new industries and jobs.

At the same time, emerging digital technologies continue to outpace social expectations and regulatory frameworks. Australia’s digital divide continues to widen, and individuals with lower income, employment and education continue to fall behind. This challenge is likely to compound our looming shortage of digitally skilled workers and widen existing inequalities.

Achieving digital literacy and inclusion through education and workforce development are essential for Australia to meet its commitments to the United Nations’ Sustainable Development Goals, and to ensure the development of a digitally literate, highly skilled workforce.

Australians are early adopters and avid users of technology — a trend that has been accelerated by the COVID pandemic. And the federal government’s Digital Economy Strategy is already putting A\$1.2 billion into key digital capabilities such as artificial intelligence and drone technologies.

This investment is welcome, but the government must also clearly recognise the importance of building scientific and engineering capabilities in ways that underpin the entire digital economy, not just particular technologies.

Elevating emerging digital technologies as a national science priority will lift their importance, both in investment and in narrative, develop research and development strengths, deliver critical research infrastructure, and be a catalyst for creating new tech businesses and supporting existing businesses through enhanced linkages between research and industry. Through recognition of a growth sector, it can help to attract talent and address future skill needs of the nation.

A highly digitised society will demand world-class leadership in developing digital technologies, and reduce our reliance on overseas technology and expertise. Coordinated and strategic support of this crucial sector of our economy will help create a digital future for Australia that is aligned with our social and economic aspirations.

Shazia Sadiq, Professor, *The University of Queensland* and Thas Ampalavanapillai Nirmalathas, Professor of Electrical and Electronic Engineering, *The University of Melbourne*

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# 'What is my IP address?' Explaining one of the most Googled questions in the world

Paul Haskell-Dowland, *Edith Cowan University* and Bogdan Ghita, *University of Plymouth*

*What is my IP?* It's an odd question in most people's minds, yet it's one of the top ten most-searched questions on Google.

Those who know what an IP address is will already know most of these searches are coming from people who understand what they're searching for. But for the rest of us a more relevant question might be: *what is an IP address?*

Across the globe there are billions of computing devices that connect to the internet. To communicate, each device needs an address, just like our homes.

Our home address is typically structured along the lines of "number, street, city, postcode, country". And our entire postal delivery network is based on this system.

Our digital world is similar, and has an address system that allows network traffic to move around the internet. So, an IP (internet protocol) address — which also has its own implicit structure — is fundamentally a numeric address for an endpoint on the internet.

## An online content delivery system

Akin to postal addresses, IP addresses are assigned to each recipient in a worldwide infrastructure. The recipient could be a single device such as a laptop, phone, tablet or even your air-conditioner controller — but could also be a network entry point to a large organisation.

Since its inception, IP was designed with simplicity and efficiency in mind. That's why it has remained effective at handling internet traffic, starting on a network with four nodes in the late 1960s, to billions of devices today.

An IP address is a number in binary format, which means it has 32 digits (or bits) comprising 1s and 0s. The address is typically grouped as four 8-bit numbers, so each number is eight digits that are either a 1 or 0.

But we usually view IP addresses in a decimal format, wherein the value between 00000000-11111111 becomes a number between 0 and 255. So the complete IP address space ranges from 0.0.0.0 through to 255.255.255.255.

See an example below, using the IP address of one of the servers that hosts [theconversation.com](http://theconversation.com).

32bit	100101111011001011000001010000101
4x8bit	10010111.01100101.10000010.10000101
Decimal	151.101.130.133


Examples of the same IP address in three different notations.

Author provided

IP addresses are centrally managed by the Internet Assigned Numbers Authority, which delegates to one

of five regional registries: Africa, America, Asia-Pacific, Latin America and Europe-West/Central Asia.

Not all addresses are available for use by anyone. Many are reserved for specific purposes. For example, three ranges of addresses (10.0.0.0—10.255.255.255, 192.168.0.0—192.168.255.255 and 172.16.0.0—172.31.255.255) are reserved for private networks such as your home.



There's no place like  
127.0.0.1

For an IT geek, *there's no place like your local loopback address.*  
Author provided

Other large blocks of addresses are assigned to specific organisations. The US Department of Defense “owns” the “6” prefix (6.x.y.z), as well as 11 others.

## **IPv6: a new frontier**

IPv4 (version 4) is the most widely used version of IP in the world right now. Dating back to the 1980s, it has a capacity of more than four billion unique addresses — which was considered enough back then.

But a combination of wasteful use (such as organisations being allocated larger IP address spaces than they need), and the exponential increase of users, is causing this space to run out.

For now, IPv4 is still here. But its demise has long been predicted and it will eventually no longer be fit for purpose. There are technical solutions, however.

The most useful ones are Network Address Translation (more on this later) and a newer version of IP: version 6. Although IPv6 is newer than IPv4, it isn't really “new”. It was originally proposed some 25 years ago.

The shift to IPv6 brings a range of benefits, even if they are basically transparent as far as consumers are concerned. The most significant change with IPv6 is the increase in the size of IP addresses from 32 bits to 128 bits.

Version 6 also boosts the total number of unique IP addresses on offer, up to some 340,282,366,920,938,463,374,607,431,768,211,456. Even with the rapid rise in device usage, this address pool should last us a long time.



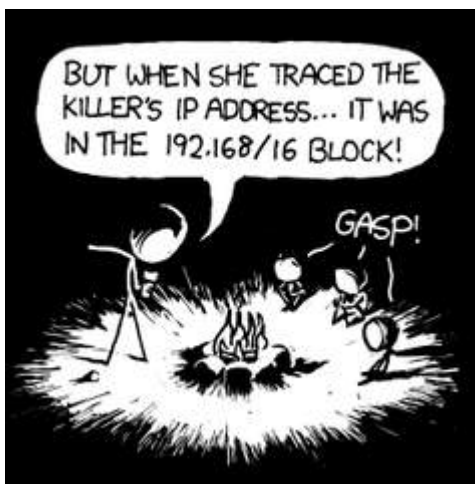
While IPv6 contains an unimaginable number of assignable addresses, as technology evolves we may well reach address exhaustion again!

xkcd

## Making efficient use of addresses

As mentioned above, private addresses can be used for individual devices inside an organisation (or home). But private addresses can't be used on the internet, so these devices "hide" behind one public/external IP address.

This public address is capable of supporting up to hundreds of thousands of devices for a large organisation. But a router is needed to connect the network to the internet. The router translates the many internal private addresses which are hiding behind the public IP address (or several of them).



Private address spaces often use the 192.168 prefix. You cannot trace an address to this network remotely!

xkcd

When data is delivered to a private organisation or home network, the router forwards the traffic to a specific internal computer using that computer's private IP address.

The process of routing many devices through a single IP address is called "nesting" networks. And the technique it uses is referred to as Network Address Translation (NAT).

## IP and download speeds

You probably won't be using IP addresses in your daily life. But in order to access a website our computers need to "look up" the IP address for that site. This all happens in the background.

```
>nslookup www.theconversation.com
Server:          192.168.20.1
Address:        192.168.20.1#53

Non-authoritative answer:
www.theconversation.com    canonical name = theconversation.com.
Name: theconversation.com
Address: 151.101.2.133
Name: theconversation.com
Address: 151.101.194.133
Name: theconversation.com
Address: 151.101.130.133
Name: theconversation.com
Address: 151.101.66.133
```

An example DNS lookup, the web address 'www.theconversation.com' is converted to the shorter form 'theconversation.com' and returns four distinct IP addresses.

Author provided

Once our computer has retrieved the website's IP address, our browser will connect to the address, request the website data from the server and load the page.

In the image above, you'll notice four different addresses. This allows the servers delivering the content to distribute the workload between four servers. Some websites go further and use Content Delivery Networks (CDNs).

CDNs host copies of web content in servers around the globe. This means the content requested can be delivered from a location that is geographically closer to the user trying to access it. This reduces the time it takes to load the page.

## The future of IP

IPv6 may be slowly rolling out in ISP networks and large organisations, but home users and smaller companies will still be using IPv4 for the foreseeable future.

The increased number of devices connected to the internet will certainly test our home routers - with predictions of 25 billion devices expected globally within the next decade. Fortunately, even with this predicted explosion, IPv4 at home will be able to cope.

In the meantime, if you want to know your public IP address, simply search "what is my IP address" and Google (as well as several other search engines) will deliver your public IP address. If you want to check your private IP address, this will take a little more effort.

Paul Haskell-Dowland, Associate Dean (Computing and Security), *Edith Cowan University* and Bogdan Ghita, Associate dean (International), Faculty of Science and Engineering, *University of Plymouth*

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# DOTW Winners August 2021

*DOTW is a lighthearted look at some of the sillier events of the week. Don't take it too seriously and do pop over to Chit Chat and vote each week. Thanks to those of our members who occasionally 'feature' for taking the gentle humour in such good part.*

August winners were:

- Former urban infrastructure minister Alan Tudge for his (halting) statement that the all sites chosen for the \$660 million National Commuter Car Park Fund were based on need. The Australian National Audit Office found that site selection was actually based on a 'top 20 marginals' list - the existence of which Tudge denied
- Prime Minister Scott Morrison who has again refused to commit to a target of net zero emissions by 2050, after an international "code red" warning on climate change was issued by global leaders.
- Those involved in an illegal church gathering where NSW Police issued \$35,000 in COVID-19 fines after around 60 people were on Sunday sprung gathering at a Western Sydney church, where the pastor declared "the lockdown is over".

# East SIG Report August 2021

Neil Muller

Host Paul Woolard opened the August meeting, again with all members back at home joining the meeting via Zoom. The first presentation of the night was **George Skarbek** presenting his normal Q&A segment.

Q. On John Hall's recommendation, I bought a Synology NAS box (Network Attached Storage) and I want to back it up to Acronis. I have 3 computers and I can enter the network credentials into 2 of them and everything works well. However, on my main computer its doesn't connect to the NAS box. I've been into credential manager, ethernet adapter, checked for the client in Windows but nothing seems to work. The NAS box tells me it's the wrong password and credentials, but these are the same that work on the other 2 computers.

A. [John Hall] One problem you can have with certain computers is an add-on called Samba or abbreviated to SMB. Some computers will not connect with SMB and there is a trick you have to use on certain Windows computers.

[George] John is on the right track. There are several versions of the SMB file. In Windows you will need to check what version of SMB you have. You may have the latest SMB3, but its SMB2 or 2.1 you need. As its your main computer you may have the latest version of SMB installed. On some computers the latest version however doesn't work, so you have to go back to an older version for some NAS boxes.

2 Bay Wd My Cloud Ex2  
Ultra Diskless



Synology DiskStation  
DS218play 2 Bay NAS



Synology

Figure 1 - Synology NAS Boxes

Q. Two days ago, Google Chrome updated to the latest version and deleted all the bookmarks on my favourite bar. I had to copy then all over from Firefox. I found Chrome no longer had an option to download favourites from Firefox. The screen also changed from the one I normally use. Has anyone else experienced these problems?

A. [Neil Muller] I recently installed Chrome's experimental feature called Tab Groups Collapse. A few days ago, I found all the tab groupings had disappeared. This may be related to the problem you encountered.

[George] I use Chrome as my main browser on 2 of my computers and they've upgraded several times recently and I've lost nothing. Sorry I can't help.

Your experience shows why it's worth having more than one browser you can use. This is especially true if your browser is disabled from some nasty malware you may have downloaded. That would stop you downloading a fix such as Malwarebytes. I suggest you have 2 or preferably 3 browsers on your computer that you can use.

Q. I have a problem sending one of my computers, a Ryzen 7000 to sleep. Sometimes it works and sometimes it doesn't. I'm thinking Team viewer or maybe Outlook with its periodic checking for mail may be keeping it awake. Has anyone got any ideas?

A. You're on the right track, its Wake-on-LAN. If you don't need it, you can switch it off. If "Wake-on-LAN" is on, as soon as there's any networking it will wake the computer up. Whereas if you turn it off, if it wants to get something it won't wake the computer up.

You'll find Wake-on-LAN in Windows Setting.

Open Settings □ Click on Network & Internet □ Click on Status □ Under the "Advanced network settings" section, click the Change adapter options button □ Right-click the active network adapter □ select the Properties option □ Click the Networking tab □ Click the Configure button and scroll down to "shut down Wake-on-LAN".

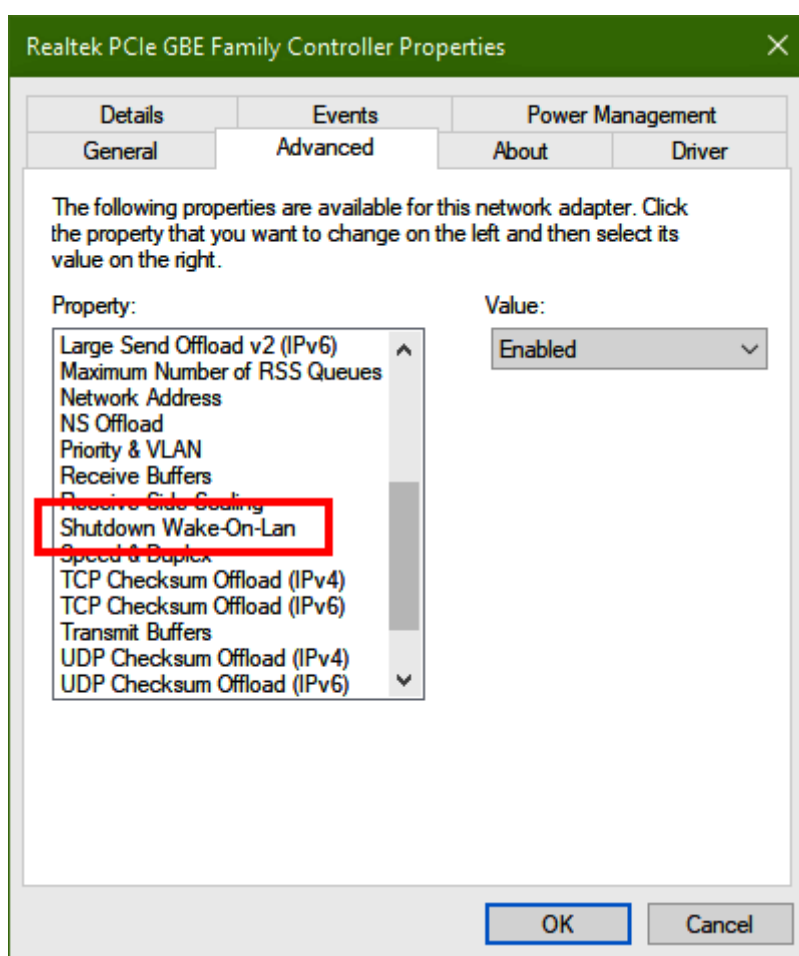


Figure 2 - Wake-on-LAN

Q. I'm considering loading Microsoft Office 2019. I've read that some say you should remove earlier versions of Office first, while other posts don't mention it at all. I'm concerned if you remove the earlier version, that I may lose all my emails out of Outlook and all my documents? I imagine that's not the case, but thought I needed to check first.

A. You don't lose your data, your emails or settings by upgrading to Office 2019. Unless you have a very old version of Office 2003 or earlier, there shouldn't be any problems. That's because Office 2007 was a complete rewrite of the Office kernel. If you're still concerned, do a full image backup then uninstall the old version of Office before installing Office 2019, then you shouldn't have any problems.

[David King] I think I'd make a straight copy of all the Outlook files and put them somewhere first. Then you've got all your emails and contacts if you need them. Search for the .pst or .ost file.

Q. One of my Windows machines with a UEFI Bios comes up with the incorrect time, which can be out by several hours. I have to then manually correct the time. However, if I boot the same computer up with my Nomad UNIX stick, the time comes up correctly. What is the association of the time on the machine and Windows?

A. Unless its changed in one of the recent Windows 10 upgrades, Windows synchronises your computer with an atomic clock, either once or twice a week. But if your battery in the computer is almost dead, you could lose an hour a day. You may have to go a few days before Windows synchronises again. That is most likely the cause of the time error. You could go to "Task Scheduler" in Windows and set a task to check the clock at say a set time every day. I suspect that the reason your UNIX disk has the correct time is that it synchronises the time on bootup.

Following Q&A, **Trevor Hudson** played a video he'd prepared showing how to "Reduce background noise using Audacity", a free and powerful audio editing program.

In a test audio file, Trevor showed how 30 decibels (db) of background noise was reduced in stages to 0db. The technique used was to select a portion of audio that only contained the background noise. This section of the audio file is then used to create a noise profile, which is later used to subtract the background noise from the original audio. This is done from Audacity's main menu by selecting "Filter", then "Noise reduction" from the drop-down menu.

Using the selected noise profile created, Trevor showed how background noise was reduced or removed completely by entering various db levels in the "Noise Reduction" window. Trevor has updated the video he showed at the meeting. The updated video can be found on YouTube by searching "Reduce Background Noise Using Audacity" or use the following link [https://www.youtube.com/watch?v=Y6C\\_BAyheas](https://www.youtube.com/watch?v=Y6C_BAyheas)

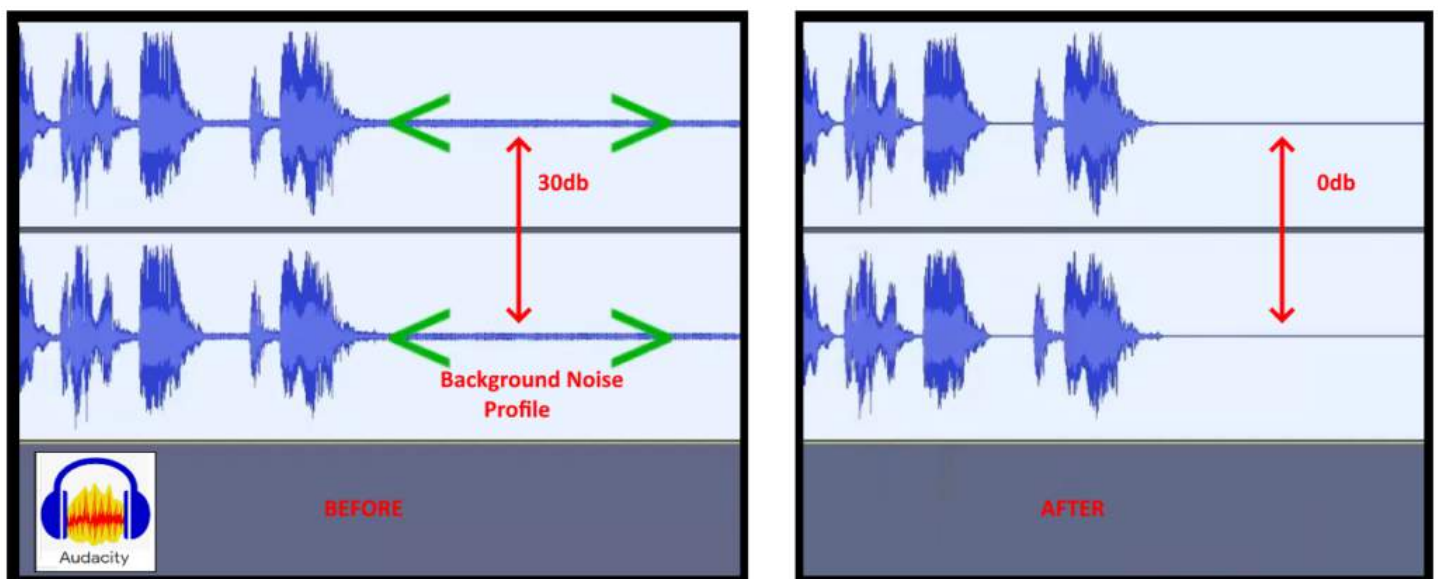


Figure 3 - Audacity Background Noise Removal

Trevor would like to advise members of the following: "Trevor's proper HX7V channel still isn't active because he breached YouTube copyright. He's now uploaded the updated video to another YouTube Channel called Trevor Hudson. Therefore, members are advised to ignore the mention of links to other



sound videos or to subscribe to his old channel.”

The nights next presentation was by **Dave Botherway** on “Back-up Software, Macrium Reflect and EaseUS-ToDo”. Macrium Reflect and EaseUS-ToDo are both backup programs that have both free and paid for versions. When the free versions of both are used together, they complement one another by providing all the tools needed for backing up a PC, as Dave demonstrated. Macrium Reflect provides a full image backup, while EaseUS-ToDo will backup files and folders, something that the free version of Macrium Reflect won’t do.

Before looking at the 2 software programs for backing up a PC, Dave commenced by explaining the terminology used and how they differ. This is important as these are the terms you’ll come across when using both Macrium Reflect and EaseUS-ToDo.

There are two backup styles:

- Clone Backup – Used when copying the whole disk to a second device. This could be when a hard drive is failing and needs to be replaced or when moving from a mechanical HDD to a SSD.
- Image Backup – Creates a copy of a partition or partitions, to either a separate partition or external drive.

There are 3 type of Image backups:

- Full backup – copies everything
- Differential backup – copies the change since the last full backup. Here you need a Full backup plus the last differential backup to restore your PC.  
If you have multiple differential files, you can restore a PC to the date of the differential backup file in a similar way as you would use Windows “System Restore”.
- Incremental backup – copies the change since the last incremental backup. Here you need a Full backup plus **all** incremental backups to restore your PC. The free version of Macrium Reflect doesn’t allow Incremental backups.

Figure 4 below from Dave’s presentation, graphically represents the differences between Differential and Incremental backups. To restore a PC in Figure 4 using a Differential backup, you need only the week 1 (full Backup) & the week 4 backup file, while using Incremental backups, you need all of the weeks 1 to 4 backup files.

# Differential vs Incremental

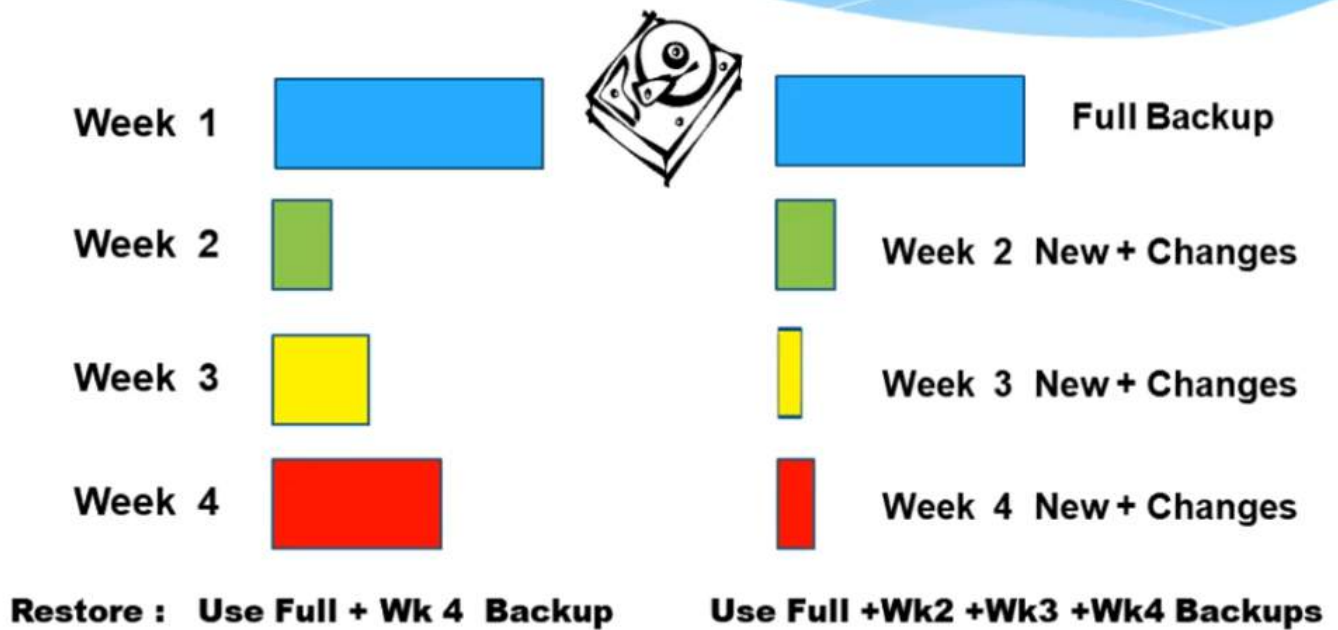


Figure 4 – Differential versus Incremental Backup

When downloading Macrium Reflect and EaseUS-ToDo Dave recommends using the owner's website. For Macrium Reflect download from <http://www.macrium.com/Reflectfree>

When creating a backup plan the following process is followed. After completing each step, a new window opens for entering selections for the next step:

- Select the style of backup (Clone or Image)
- Select whether the backup is the whole disk or one or more partitions
- Select the destination of the backup files
- Select the type of backup (Full, Differential or Incremental)
- Select a backup schedule (Monthly, weekly, daily etc.)

When opening Macrium Reflect, the window shown in Figure 5 is where the first selections are made. Area 1 from Dave's screen capture shows the partitions on the PC's hard drive that can be backed up. Here you can select whether to backup the whole drive or selected partitions. This is done by ticking the appropriate

boxes as shown. In Figure 5 only the partition for the C Drive is selected to be backed up.

The “Actions” panel (labelled area 2) is where the selection is made to either “Clone this disk”, or “Image this disk”. In this example, when selecting “Image this disk” a window opens where you enter the destination to store the backup file. Once making that selection, a new window opens asking for the type of backup, either Full or Differential. Finally, a Windows summarising options nominated is displayed, which if correct, you confirm by selecting “Finish”. You then have the option to run the backup or store the settings to run at a later time.

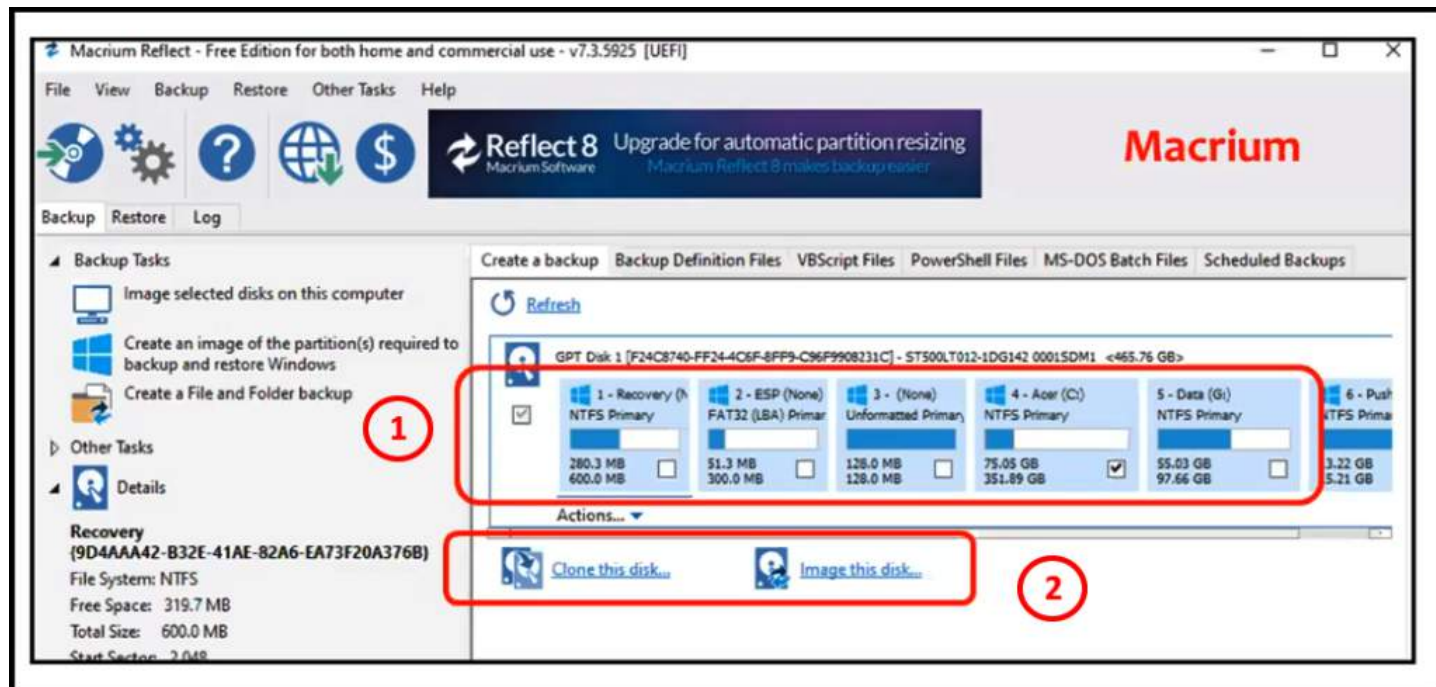


Figure 5 – Macrium Reflect home screen

After an image has been created, it is a good safety measure to verify that the backup has been successful. This is done by mounting the image, a process where Windows chooses another drive letter to display an exact copy of the back-up file. When double clicking on the Macrium Reflect image file (a file with a .mring file extension), Windows recognises the file as a Macrium Reflect file. Macrium Reflect opens then mounts the image file so that all the files and folders in it can be viewed in Windows File Explorer. Here you can restore individual files or folders and copy them back to your PC. This is a good method to prove the validity of the backup. In Dave’s presentation he showed the various windows for mounting a drive and then how the drive is displayed in File Explorer.

Both Macrium Reflect and EaseUS-ToDo both offer an option to create a rescue disk. This is an important option to have if Windows won’t boot. To create a rescue disk in Macrium Reflect, select the “Other Tasks” option shown in Figure 5, then select “Create Rescue Media”. Dave showed screen captures of the process of creating a rescue file. Then how the rescue file can then be burnt to a CD/DVD, or as an ISO file, which can then be written to a USB stick. The rescue media then allows you to boot back into Macrium Reflect to restore the C drive, should Windows not boot.

To conclude, Dave highlighted the difference between the free and paid Pro versions of Macrium Reflect. The main difference being the Pro version allows incremental backups, can backup individual folders or files, can redeploy a backup to different hardware, but costs around US\$70.

The second backup program Dave presented was “EaseUS-ToDo” free version. To overcome the deficiencies of the free version of Macrium Reflect, “EaseUS-ToDo” free will do scheduled incremental back-ups of individual files and folders. Dave then demonstrated how to backup files and folders, by again using screen captures of the processes involved. Next Dave highlighted the other options available in “EaseUS-ToDo” free and the differences between the free and paid for versions. The paid for version includes options

to backup emails and clone a disk.

An alternate to backing up files and folders with “EaseUS-ToDo “, is a program Dave demonstrated at East in 2016 called “FreeFileSync”. This program allows 2-way syncing and mirroring of files and folders and can do incremental back-ups. Dave indicated he still uses FreeFileSync due to its ease of use to sync his Eudora email files on his Laptop from his main PC.

Following his PowerPoint presentation, Dave gave an excellent live demonstration of both Macrium Reflect and EaseUS-ToDo’s free versions.

The final presentation of the night was titled “What’s Involved in Flying a Drone” by **George Skarbek**. George’s presentation commenced with the legal requirement involved in flying a drone, followed by the hardware and techniques involved in flying a DJI Spark drone.

### **Legal requirements**

For drones under 2 kg, a licence is not required, but the drone’s user needs to be registered with CASA (Civil Aviation Safety Authority). Registration is no simple matter, requiring your name, Passport or Birth Certificate number, Medicare number, address and phone number, all to confirm your identity. Registration is free if the drone is under 2 kg and is used for private use. There are restrictions that must be adhered to. You can’t fly within 5km of an airport (with fines up to \$11k if you do), you can’t fly at night, in National Parks, near a goal, over people, above 120 metres above ground level and the drone needs to be kept in visual sight at all times. A commercial licence is required to fly above 120 metres and is expensive.

### **Features of the DJI Spark**

The Video production SIG has recently acquired a DJI Spark drone and this is the drone referred to in George’s presentation. The DJI Spark (<https://www.dji.com/au/spark/info>) is now a discontinued model but is still an excellent drone as George demonstrated. A feature missing that some newer drones have is a “follow me” option, where the drone will follow the controller.

The Spark is small in size and weight, with dimensions of 143×143×55 mm (excluding the propellers) and weight of only 300g. It has a 1480 mAh rechargeable battery, can fly for a maximum of 15 minutes and connects to both GPS & Glonass (Russian) satellites for position.

The Spark uses a smart phones screen to display the view from its camera. The camera shoots video in high definition 1920×1080 30p and images at 3968×2976 pixels. The drone’s camera has a pitch of 0° to -85°, so is able to shoot at near vertical photos or videos. Images George displayed of his house taken at 120 metres were so sharp that individual tiles on houses and powerlines were clearly visible. Photos and videos can be taken from buttons on the phones screen.



Figure 6 - DJI Spark drone

A smart phone is clamped to the bottom of the Spark's controller and is connected to the phone with a cable. There are 2 rotatable antennas on the top of the controller unit, as visible in Figure 7. The phone's screen is used to display the view from the drone's camera. Other relevant data displayed on screen includes a map of the area below the drone (derived from its position data), whether the drone is locked onto GPS & Glonass (Russian) satellites, battery level, height plus other flight data.

The drone has horizontal sensors so it won't fly into anything solid and a sensor below used when descending so it lands very softly. When in flight, a warning appears when the maximum height set is reached and an oral warning when the battery has reached 30% charge remaining.

If the Spark is kept in sight of the controller, the drone will automatically return to home when that option is selected. When pressing home, the drone flies to its maximum height, to avoid obstacles such as trees and powerlines, then turns around to land where you took off from.

### **Controlling the DJI Spark**

Before using the DJI Spark, you will need to download the DJI Spark app to your smart phone and user manual. George found the Spark easy to fly and very stable, except in strong winds. It flies horizontally and is controlled by 2 joysticks on a hand-held controller.

The Spark has 3 flight modes, Beginners (which must have a GPS signal), Advanced (that doesn't need GPS, but the controls are more sensitive) and Sports. When learning to use the drone, George recommends using Beginner's mode in an open area where a GPS signal is available



Figure 7 – The DJI Spark's Controller

The controller has 2 joy sticks and attaches to a smart phone which displays the view from the drone's camera. The left joy stick controls the drone's height up and down. When the joystick is moved sideways, the drone yaws or rotates on its axis, to the left or right depending on the direction the joystick is moved. The drone remains horizontal at all times. When moving the joystick at 45°, the drone moves up and to the right. When moving the joystick up or down, the drone can go up or down vertically up to 3 m/sec.

If the right joystick is moved forwards the drone will go straight ahead. If the joystick is moved backwards (i.e. toward you when holding the controller in front of you) causes the drone to fly backwards. When moving the joystick sideways, the drone rolls (in an aviation sense) to the left or right according to the joystick movement. Moving the joystick at 45° the drone flies forwards and at 45° as it flies, but the drone does not turn on its axis.

George commented that the fact that he has a pilot's licence hasn't helped him one bit in mastering the controls. In fact, it's almost the opposite as you don't have any preconceived ideas as what pitch will do.

After this introduction to the DJI Spark's features and controls, George played a short video he took of a drone flight around a mural on a cylindrical concrete water tower in central NSW. Following the video, George took a number of questions before wrapping up the meeting for the evening.

# Yammer Highlights August 2021

Dennis Parsons

## Technology News

While last month saw the 30<sup>th</sup> anniversary of the announcement of Linux, this month marks 30 years since the first actual kernel (0.01) was released. Linux has come a long way since, from its humble origins as a DIY project for a Finnish uni student, to being used ever day by the billions of people who use Android based phones.

Bill has memories of the early days of Linux:

“That sends me down the nostalgia lane. My memory is a bit fuzzy and I don’t remember exactly how or when I installed it the first time, but as near as I can tell from the scrappy records I have it was a little over 29 years ago now. It probably meant that the version was around 0.95. Needless to say, there were many fewer users back then!

“By that time, I’d already been using computers for about 29 years. Linus’ project had created a bit of buzz in 1991/92 and it looked like it was worth a try. I’m not sure where I first heard about it but by May ’92 it looks like I was subscribed to Linux-Activists@BLOOM-PICAYUNE.MIT.EDU. Back then I was using MS-DOS at home and although it appeared to be much superior, UNIX was too expensive to consider. Linux was developing fast and appeared to give a light-weight UNIX-like experience at much less cost. So I joined the effort, making one or two contributions, and went along for the ride. Things were to say the least very rough around the edges but it was all good fun and a very productive time for me.”

Not sure I’ve come across anyone who was involved earlier – I was definitely late to the show in 1999!

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## **Coronavirus Discussion & Comments**

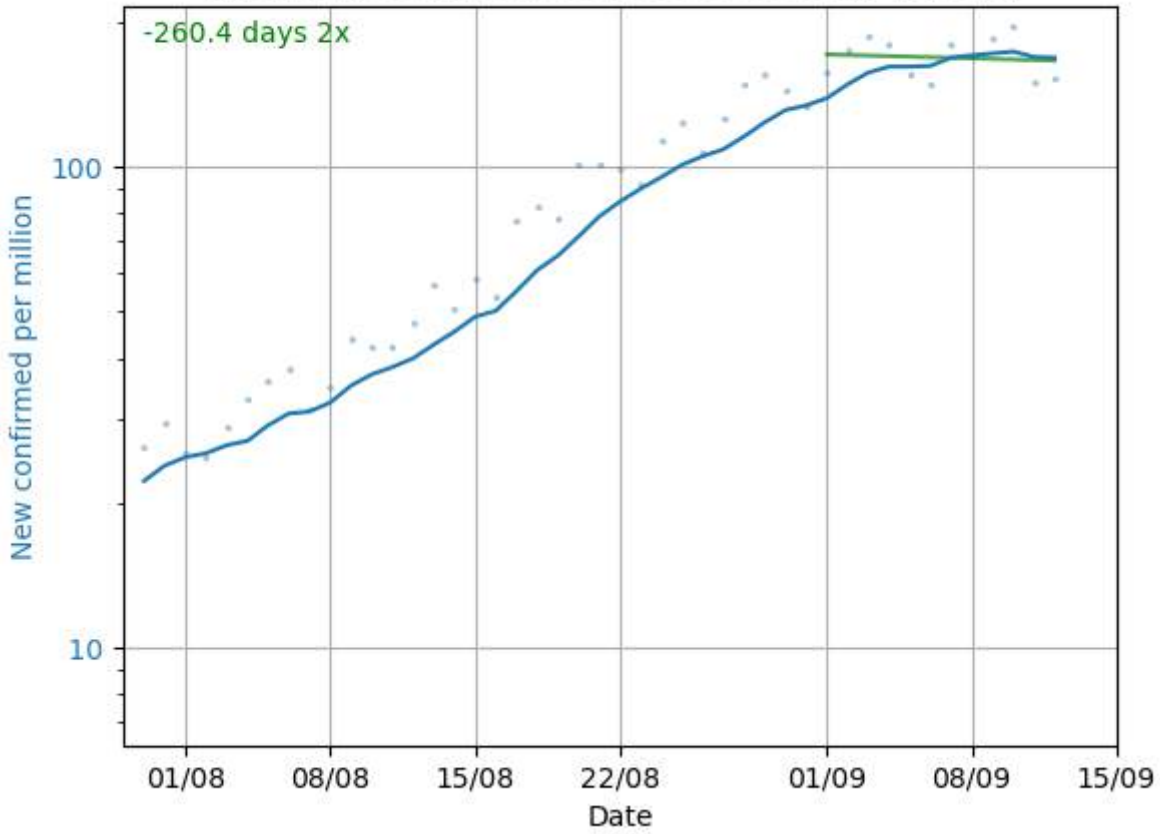
Bill has been doing his usual excellent job of keeping us informed of the progression of the coronavirus infections in Victoria, looking at trend lines and doubling times. A bit scary when it shows hitting 1000 cases within a week. He’s also been looking at vaccination rates and comparing the situation in NSW with that here, again scarily we’re doing worse when you match the infection curves to reflect the stages of the outbreak.

Fortunately the situation in NSW seems to have stabilised, presumably due to the increasing number being fully vaccinated so hopefully the same will be true here.

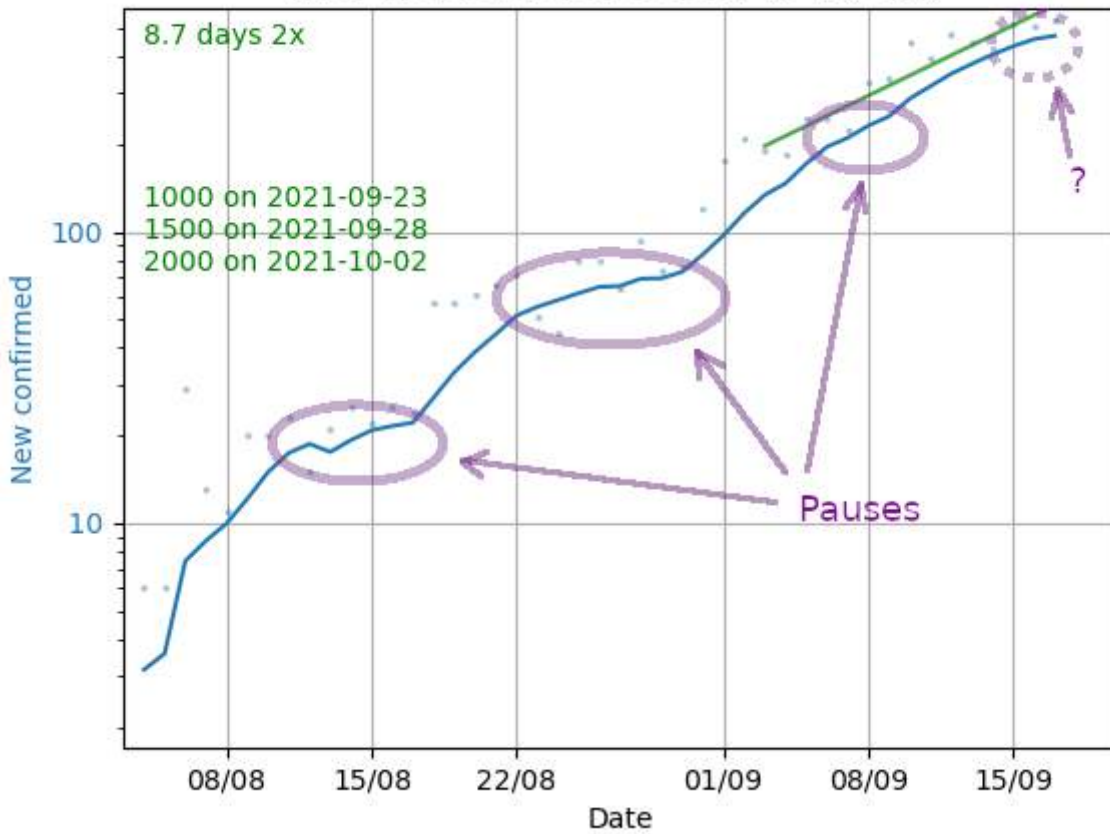
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JHU: New South Wales to 2021-09-12 (7 day av.)



JHU: Victoria to 2021-09-17 (7 day av.)





Merv had a long standing problem that he managed to finally solve with the help of suggestions provided by fellow members and a good dose of sheer bloody minded determination. For some time he'd been trying to identify a country pub from a magazine photo - he was sure he'd seen it on his travels around the country but just couldn't remember where. He'd contacted the photographer who wasn't able to provide the location and he didn't want to post the pic online due to possible copyright issues so couldn't "crowd source" an answer. The one solid clue he had was the first three letters of a street name visible on a sign, but not knowing the state made searching rather difficult.

Trying to use Google image search revealed there were lot's of pubs with the almost identical design - the archetypal double storey country pub with wide full length verandahs. Various other techniques for searching were suggested such as entering the three letters in a GPS unit to bring up a list of possibilities but it was thought too cumbersome to try. Searching through a list of licensed premises seemed good, except the pub was on a corner and the listing might be for the other street.

The suggestion that worked was searching through a list of street names downloaded from the WA Electoral Commission along with a large dose of persistence. As it turns out Merv was caught out by the common design of the pub as he's never been to Cue in WA.

<<https://www.yammer.com/melbpc.org.au/#/Threads/show?threadId=1386039542538240>>

### Computer Help

The information surrounding the pending release of Windows 11 has been somewhat confusing causing more than a little speculation, particularly around the stringent hardware requirements.

This lead us onto a discussion of possible alternatives such as installing Linux on older hardware but also getting a bit of extra life out of an old system by adding extra RAM or replacing a hard drive with an SSD. Even adding 2GB of RAM to a 4GB system would make a significant difference and for many systems is dead easy - there are plenty of guides and YouTube videos on-line to show you how. If you can use a screwdriver you have the necessary skills to add RAM, although it must be noted that with some laptop models the RAM is soldered in place and there is no spare RAM slot. The important things are to make sure you have a spare slot available, or are replacing an installed module with a larger one, and that you obtain the right module type for your system.

Regardless, Windows 10 will be supported for another four years so you don't have to rush out and replace your system now, but if you're using a system with only 4GB of RAM it's worthwhile adding more today.

<<https://www.yammer.com/melbpc.org.au/#/Threads/show?threadId=1362621425213440>>