At our June meeting Andrew Collins gave us an interesting talk on his progression through his hobby of digital photography

The Isle of Wight Personal Computer User Group

We welcome anyone who has an interest in computers and related technology and what you can do with them.
We are a group which seeks to exchange ideas and new information.
Membership is £12 per annum

Our meetings are normally held on the first Wednesday of each month at
The Riverside Centre, Newport from 7.30 to 9.30 pm
Visitors are always welcome.

A charge of £2 is made per meeting, which includes tea or coffee during the break.

If you would like to know more about us, you are most welcome to come along to one of our meetings, or you can contact one of our Committee Members listed on page 3.

The Club web site address is **www.iwpcug.org**
We also have an e-group discussion area on
Yahoo groups: **iwpcusers@yahoogroups.com.**

FUTURE MEETINGS

Date	Subject	Speaker
1 August	Summer BBQ (see page7)	Roger Skidmore
5 September	TBA	
3 October	Raspberry Pi as a cloud based File Server / Q &A	Mike Hoar / Jonathan Burt
7 November	Photography part 2	Andrew Collins

ISLE OF WIGHT PC USER GROUP COMMITTEE

Chairman : David Groom

Treasurer : Phil Rogers

Secretary : Susanne Bone

Membership and Database Secretary : Roger Skidmore

Committee Member : Steve Sutters
Committee Member : Soren Johanson
Committee Member : Mike Hoar

Note: Contact details removed prior to publishing on the internet.

Suggestions for new events, topics or speakers for talks are always welcome.
Please contact Steve Sutters, or any committee member, with your ideas.
If necessary we may be able to find a speaker for your subject.

Chairman's Report

Once again my apologies for not getting this out to you for the first week of July, two trips to the mainland towards the end of June, plus other commitments, ate into my time more than I had forecast.

Our next meeting is the August BBQ, details of which are on page 7, note the earlier start time of 6:30 pm. Having had nearly two months without rain it will be a great shame if this years event has to be cancelled due to poor weather.

We have had some interesting talks over the past quarter, and a glance at the calendar on page 2 shows what we have lined up for the next few months. We are currently working on finding a speaker for September so keep an eye on the web site and Egroup.

Talking of the Egroup, the calendar function continues to behave erratically, not sending out automatic email reminders for our meetings. From research I have undertaken on the internet this appears to be a common problem, without any obvious solution! But I shall persevere.

David Groom

Car Sharing / Lifts

It is possible that a number of our members do not attend our monthly meetings because they find transport to Newport difficult and the committee have wondered if it might be possible to arrange lifts for those members. With a membership as large as ours it is not always obvious who might like to attend but has difficulty with transport, and secondly, who might live nearby and be able to offer them a lift.

As a first step, if you would like to attend the meetings, currently can't get to the Riverside Centre on a Wednesday evening and would like to see if there is a nearby member who might offer you a lift, then could you please get in contact with me. We will then try and find a member who might be willing to give you a lift.

M.2 Interface and Storage

M.2 (pronounced M-dot-two), formerly known as the Next Generation Form Factor (NGFF), is a specification for internally mounted computer expansion cards and associated connectors.

It has a flexible physical specification allowing for different module widths and lengths, and is not limited to one specific interface, it can support PCI Express 3.0, Serial ATA 3.0, and USB 3.0. As a result, M.2 modules can integrate multiple functions, including the following device classes: Wi-Fi, Bluetooth, satellite navigation, near field communication (NFC), digital radio, Wireless Gigabit Alliance (WiGig), wireless WAN (WWAN), and solid-state drives (SSDs). It is up to the manufacturer of the M.2 host or device to select which interfaces are to be supported, depending on the desired level of host support and device type.

In addition to supporting legacy Advanced Host Controller Interface (AHCI) at the logical interface level, M.2 specification also supports NVM Express (NVMe) as the logical device interface for M.2 PCI Express SSDs. While the support for AHCI ensures software-level backward compatibility with legacy SATA devices and legacy operating systems, NVM Express is designed to fully utilize the capability of high-speed PCI Express storage devices to perform many I/O operations in parallel .

M.2 modules are rectangular, with an edge connector on one side (75 positions with up to 67 pins, 0.5 mm pitch, pins overlap on different sides of the PCB), and a semicircular mounting hole at the center of the opposite edge. The M.2 standard allows module widths of 12, 16, 22 and 30 mm, and lengths of 16, 26, 30, 38, 42, 60, 80 and 110 mm.

An M.2 module is installed into a mating connector provided by the host's circuit board, and a single mounting screw secures the module into place. Components may be mounted on either side of the module, with the actual module type limiting how thick the components can be; the maximum allowable thickness of components is 1.5 mm per side. Different host-side connectors are used for single- and double-sided M.2 modules, providing different amounts of space between the M.2 expansion card and the host's PCB.

One of the more common current uses for the M.2 interface is for Solid State Drives ("SSD's"). SSD's have been around for a while now, but historically have looked much like the 'old-fashioned' spinning disk drive, as they were designed to fit in the same drive bays and use the same connectors.

However there were two issues with making SSD's backwardly compatible. Firstly they took up more space than was actually needed for the components inside, and secondly by using the SATA interface the throughput of data was constrained. The SATA 3.0 specifications restricted real-world bandwidth of an SSD on the drive interface to around 600MB/s.

However, as I said in the third paragraph, a new M.2 card can either be based on the existing SATA 3.0 specifications and be restricted to the 600MB/s or it could instead be built to use PCI-Express that provides a bandwidth of 1GB/s. Now that 1GB/s speed is for a single PCI-Express lane. It is possible to use multiple lanes and under the M.2 SSD specification, up to four lanes can be used. Using two lanes would provide 2.0GB/s while four lanes can provide up to 4.0GB/s.

As was mentioned earlier, a M.2 card can come in a variety of sizes, but all are typically smaller than the 2.5 inch form factor of a traditional hard drive.
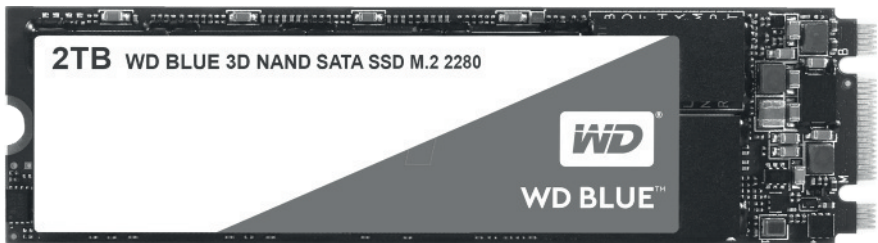
In order to use a M.2 card your computer must have an appropriate connector. For the last few years motherboards have been available which have an M.2 slot, often in addition to SATA connectors. It is also possible to buy an expansion card which fits into a PCI-Express slot on an existing motherboard and provides a number of M.2 connectors.

By now you may be wondering about the cost of these devices, and how they

might compare to 2.5 inch SSD's. On Novatech's website, the cost of a 500GB M.2 SATA SSD from Crucial is £97 (inc. VAT), while an identical specification 2.5 inch SSD also from Crucial is £94. On the same website identical specification 2TB SATA SSD's from Western Digital are priced at £463 (inc. VAT) for the M.2 model, but £525 for the 2.5 inch model.

Note however that if you want an M.2 SSD with a NVMe interface you will pay significantly more. Scan Computers are selling a 512GB Samsung M.2 card with NVMe interface for £247, while a Samsung 500GB M.2 SATA drive is priced at £119.

Before you all rush out to buy an M.2 drive, a word of caution. If you are planning to use the drive as a boot drive you need to ensure two things, does the OS support this, and does the motherboard support this? In particular if you are planning to use a faster NVMe interface drive you will need to ensure it is compatible with your proposed set up.

David Groom

Large amounts of this article were sourced from wikipedia and was available under a CC-BY-SA, source: https://en.wikipedia.org/wiki/M.2

The Annual Club BBQ on Wednesday 1 August

Please note that Roger Skidmore has kindly agreed to host this years BBQ at his house at 47 Quay Street Newport.

Starting at **6:30pm** (note the earlier start than normal meetings).

It would assist catering for the event if you could let me know if you are planning to come, no definite commitment needed, I just need some idea of the numbers expected. It would be appreciated if you could either call on 873853, or email david@vectis-webdesign.com before 29 July.

As usual the invite is extend to members' wives / husbands / etc.

David Groom

A Commentary on Jonathans Talk on the Dark Web

'Tor' is the name of the software you use to access the dark net (there are others). Easily available and nothing wrong with going on the dark net. Basically, people go on there to remain anonymous. We are all fed up with our whereabouts being tracked and our details being 'shared' so it makes some sense (see Facebook at present!).

You get routed round various servers and can't be tracked. (Jonathan says you ought to use a VPN as well – to keep things secure from your ISP).

On the dark net there is a search engine similar to Google, and it will find sites for you on the open web too, but you're incognito.

Loads of good stuff on there, and obviously loads of bad. 'Just be sensible and think' – says Jonathan, who was not promoting anything bad.

As for the bad stuff – you can buy weapons, drugs, adult stuff, even hire people to do nasty things. We were shocked at how available it all is. But we were also heartened to see what an unsafe business it is to start using there 'services'. Since it is anonymous, you don't know who you are dealing with and you can't track them. They can easily take your money and run.

Often payment it in BitCoins which is not convenient. If you give your credit card details to buy cloned credit cards, you might find your own card details on sale tomorrow!

You can buy fake passports, bank notes, driving licenses, do-it-yourself virus kits and the like – but again, such 'nice' people may just walk with your money, or give your PC a virus.

Encouragingly, the police do set up cloned sites – honey traps – and sting people who try to buy illegal goods or services from these. You get a knock on your door. They might even deliver the drugs, etc. and watch how the buyer distributes them and catch the whole lot of crooks in one go.

Jonathan doesn't like BitCoins or similar. He alluded to trading with them and said he'd do a talked about this at our July meeting.

So, the dark net isn't all bad. But many pitfalls for the unwary and, thankfully, traps for even the wary bad-guys.

That'll give you an idea. Think I'll stay off it!

Ron Keeler

Editors note: The above is a summary of the talk Jonathan Burt gave to us in April, the slides for that talk can be seen on our web site here: http://www.iwpcug.org/downloads/2018-04-04-TheDarkNet.pdf

<u>Inkscape</u>

One of the programs which I use infrequently, but which is indispensable when I do need it, is Inkscape - the vector image drawing program. I use it mainly for creating logos and small icons for incorporation into web projects and graphic design projects.

I am so used to programs telling me themselves that there is an update available that I hadn't bothered to check if I was using the most current version of Inkscape. The version I had been using for years was 0.48 which was released in 2010. When I looked a month or so ago I found that the latest version was 0.92.3. Not only had I'd missed the leap from 0.48 to 0.91 which occurred in 2015, I'd also not seen the subsequent updates. Its good to see the program appears to back in development again. Having no new releases between 2010 and 2015, it has now had version 0.91 in 2015, 0.92 and two minor updates in 2017, and in March this year an update to 0.92.3.

So what is new? As might be expected after a gap of five years version 0.91 gave us lots of changes including improved performance, it was quicker to render what you were drawing, and the program used less memory. There were new tools, and improvements to existing tools, and better import and export options.

So if you use Inkscape it would be worth checking you have the latest version, and if you don't use it then maybe its time to give it a try.

David Groom

Broadband Information

I wrote a few paragraphs in the January issue of Hotkey about how I could not expect much improvement in my broadband speed if I upgraded to fibre, since my nearest cabinet was so far away from the house.

One of our newer members, Andrew Collins, kindly supplied me with details of a web site which provides a great deal of information on broadband. **www.kitz.co.uk** , claims to be one of the UK's largest DSL broadband resource & information sites, and it certainly seems to have a lot of information on it. Looking at one of the pages on that site led me to **www.dslchecker.bt.com** which provided more information about my phone line, including confirmation that I was served from street Cabinet 4 in Bembridge. It also gave other details including the upload and download speeds which could be expected. Intriguingly it also stated that FTTP (Fibre To The Premises) on Demand was available. According to the Kitz website Fibre on Demand is when the customer contributes towards the cost of laying fibre optic cable from the nearest NGA aggregation mode to your home (the web site then goes on to say "Depending upon your distance from the nearest NGA node, Fibre on Demand could be quite expensive to install"). Looking at the BT Openreach web site I found there is a fixed connection fee of £700 plus a distance related fee; in my case for a distance of 650 metres* the cost would be £2,450 plus VAT. On top of that would be annual rental charges of £1,188 plus VAT! I don't think I'll bother. However, it should be pointed out that for a business, which might be looking to improve its' internet speeds, and maybe use multiple VOIP numbers, such a cost is not overly prohibitive.

David Groom

* The eagle eyed among you may have noted that in January I claimed the length of my phone line from the cabinet was 900 metres. In fact the current phone line is 900 metres long, but it takes a rather lengthy route to get to the house. If I were going to pay for FTTP I'd want the shortest possible route, which is 650 metres!

NVM Express

NVM Express (NVMe) or Non-Volatile Memory Host Controller Interface Specification (NVMHCIS) is an open logical device interface specification for accessing non-volatile storage media.

The older Advanced Host Controller Interface (AHCI) has the benefit of wide software compatibility, but has the downside of not delivering optimal performance when used with SSDs connected via the PCI Express bus. As a logical interface, AHCI was developed when the purpose of a host bus adapter (HBA) in a system was to connect the CPU/memory subsystem with a much slower storage subsystem based on rotating magnetic media. As a result, AHCI introduces certain inefficiencies when used with SSD devices.

The NVMe device interface has been designed from the ground up, capitalizing on the low latency and parallelism of PCI Express SSDs, and complementing the parallelism of contemporary CPUs, platforms and applications. At a high level, the basic advantages of NVMe over AHCI relate to its ability to exploit parallelism in host hardware and software.

Microsoft added native support for NVMe to Windows 8.1 and Windows Server 2012 R2. Native drivers for Windows 7 and Windows Server 2008 R2 have been added in updates.

David Groom

Sourced from https://en.wikipedia.org/wiki/NVM_Express available under CC-BY-SA

A Quarter Century of the Graphical Web

Twenty-five years ago, the world as we know it changed. In 1993 Mosaic was released, see image on back cover.

This was the first useful, and first widely used, program that let people more easily navigate this newfangled Internet service called the World Wide Web. Most importantly, you could see images on the same page as text. This caused the Web to explode in popularity.

Mosaic was developed by two graduate students with the National Center for Supercomputing Applications at the University of Illinois at Urbana-Champaign, Marc Andreessen and Eric Bina.

With Mosaic, not only could you see text and graphics on the same page and click your way from one site to another, you could do so ad infinitum. Mosaic was free for noncommercial use, with public funding provided by programs initiated by then Senator Al Gore of Tennessee, future U.S. vice president, future presidential candidate, and future Nobel Prize winner for his work on climate change.

The Web itself came into existence four years earlier. It was invented in 1989 by Tim Berners-Lee, a British physicist and computer scientist who was working at the time for CERN, the European Organization for Nuclear Research. CERN currently operates the Large Hadron Collider, the world's largest subatomic particle accelerator, which sits underground along the border between Switzerland and France. The first Web browser, text based, was released to the public in 1991.

And the Internet preexisted the Web, with the U.S. government building connected computer networks in the 1960s to support its research activities. This included ARPANET, the Advanced Research Projects Agency Network, created in 1969 and considered to be the founding of the Internet.

The Web was predicted earlier, by the science fiction writer Arthur C.Clarke in his groundbreaking novel 2001: A Space Odyssey, published in 1968. Much earlier than this, another science fiction writer, H. G.Wells, predicted a "World Brain" in a collection of essays between 1936 and 1938.

The year after Mosaic was released, in 1994, the World Wide Web Consortium was created at the Massachusetts Institute of Technology. It received funding from the U.S. Defense Advanced Research Projects Agency, an agency of the U.S. Department of Defense responsible for the development of new technology for use by the military and which had pioneered the Internet in the 1960s. The World Wide Web Consortium's purpose was, and still is, to create standards and recommendations to improve the quality of the Web.

In 1994 Marc Andreessen moved on and cofounded the for-profit Netscape Communications (originally known as Mosaic Communications Corporation),

which released an improved version of Mosaic, Netscape, also in 1994. Netscape dominated the Web browser market through the 1990s, and Mosaic, which originated it all, was discontinued in 1997. Netscape was eventually swept aside by Microsoft's Internet Explorer, and Internet Explorer was later swept aside by Google Chrome.

Netscape used original programming code, though Microsoft licensed Mosaic's code to create Internet Explorer. Microsoft's bundling of Internet Explorer with Windows, later determined by courts in the U.S. and Europe to be an illegal monopolistic practice, is what doomed Netscape. After being acquired by America Online in 1999, Netscape was discontinued in 2008. Mozilla Firefox, released in 2002 and still in existence, also used programming code from Mosaic.

Private companies began realizing the profit potential of having a Web presence beginning in 1996, and the commercialization of the Web kicked in between 1996 and 1998. This led to the dot-com boom and bust of 1999 to 2001 when trillions of dollars were made and lost as a result of what Federal Reserve Chairman Alan Greenspan at the time accurately termed "irrational exuberance."

Nonetheless, the Web transformed the business landscape. It eventually did in previous online services such as CompuServe, America Online, Prodigy, and Genie, forced many newspapers and several prominent encyclopedias out of business, and dramatically changed the television, music, radio, film, and travel industries, among others.

Multimedia offerings through the Web have been made possible with the popularization since 2000 of high-speed cable, fiber-optic, and satellite access to the Internet. The Web has also become even more interactive during these years with the introduction of social networking sites such as Facebook and Twitter, blogs at sites such as Blogspot, wikis such as Wikipedia, video-sharing sites such as YouTube, and photo-sharing sites such as Instagram, available now not only through computers but also smartphones and other devices.

The World Wide Web was key to the development of the Information Age, and Mosaic, released a quarter century ago, was key to the development of the Web.

Article supplied by Purchase Area Family Magazine, Paducah, USA.

Building an Electric Bike

After using an Ebike that I had bought from Wightbay I made up a wish list of what would be my ideal electric bike. I decided that a rear hub drive would be more practical for a number of reasons. One of the main ones was that power to the back wheel came from the wheel itself and avoided using the chain and sprockets which were only designed to take the power of a fit cyclist and wear out a lot quicker dealing with the motor as well.

The bicycle I chose was an ultra light full suspension mountain bike to give a me a comfortable ride and a high power to weight ratio. To cope with the extra torque from the hub motor I made up two 6mm thick steel plates which transferred the load from the dropouts to the welds of the chainstay and seatstay.

I chose a geared hub motor which was laced to a strong rim by TAV cycles of Ryde who did a fine job and all for £35. Also bought a Lithium battery, controller, thumb throttle and display (which I used to set up motor and bicycle parameters like wheel size). Not many of the components had matching electrical connectors as they were all from different manufacturers so I spent many hours soldering and crimping new compatible connectors. The biggest problem was soldering two thick gauge battery wires together. For this I wrapped the joint with many turns of solder (which meant I did not have to use one free hand to supply solder to the joint). Also used two solder guns to compress the joint. This meant twice the heat and very good heat transfer because the joint was being compressed by the soldering guns.

Before everything was fitted to the bike the set up was tested by holding the shaft of the hub motor in a vice which was clamped to a workmate with everything plugged in around it. Great to see the wheel whizz round when I pushed the throttle! I attached all the components by gaffa tape to the bike which was cheap, quick and easy but looked anything but smart and professional. I will find a better solution in the future perhaps using metal studding, tubes and strips.

On my first outing and after several adjustments to the controller the bike was set for full speed ahead and what fun! I Have had several motorbikes up to 500cc and although not nearly as fast, the experience of brisk acceleration with very little motor noise (a faint high pitched whirr) but a lot of wind noise was amazing. My sporty little bike is unlike any two wheeled machine I have ever ridden or cycled and it's great to pedal too.

There have been a couple of problems with the bike. One was the power cutting off occasionally and the other the power stuck on maximum speed. The second problem

was easily solved by removing a Molex connector block on the controller which disabled a feature called cruise function but I have yet to find a way to stop the power being cut off.

So far I have fallen off it twice. The first was when wearing toe cleats. I did not have the time to unclip my feet from the pedals so used my arm to soften the impact of my falling on the pavement with both legs still strapped to the pedals. Will stick to toe clips which are easier to get out of. So glad I always wear thick mittens and I urge everyone on two wheels to do the same. The other was when I lost balance when starting off. I pushed the throttle too hard and was then dragged along the road for a few feet by the bike. This gave me a graze on my knee to match the graze on my elbow from the previous accident. Still any new type of bike needs getting used too. I will be buying elbow and knee pads as well as wearing a cyclists crash helmet in future.

Has all the work and expense (build took 4 months and cost about £1,300 which includes £500 for the second hand bike) been worth it? Yes big time! I have ended up with exactly the bike I wanted which can travel about 20 miles between charges. There is no way to get the same type of bike other than to have paid someone else to build it. Then there would have been the cost of all the bits plus labour and I would not have learnt so much or had the satisfaction of doing the build myself.

An interesting question came up about torque and power at the talk I gave on Ebikes. Although maximum torque (or turning force) is present at 0 rpm a vehicle will only move forward if the turning force is enough to overcome the load that is opposing it. For instance if a trailer containing an elephant was attached to a standard electric bike there is no way it could pull the elephant up a steep hill even in first gear. If a gear box with a high enough ratio of drive gear to driven gear was used then it might be possible if there was enough traction between the tyres and road and if the mechanical losses in the gearing (there are always some) could be overcome by the motor. The speed would be very slow of course!

By Stephen Sutters

Many thanks to the bicycle experts at Tav Cycles of Ryde I.O.W. who supplied most of the bicycle parts plus many bike tips.

Ebay trader danielrlee1980who supplied the thumb throttle and useful advice about his and other components.

Also Anthony Tompkins from 'Electric bike conversions Cornwall' who has a vast knowledge of Ebikes and supplied the battery, controller, display and much valuable technical advice.
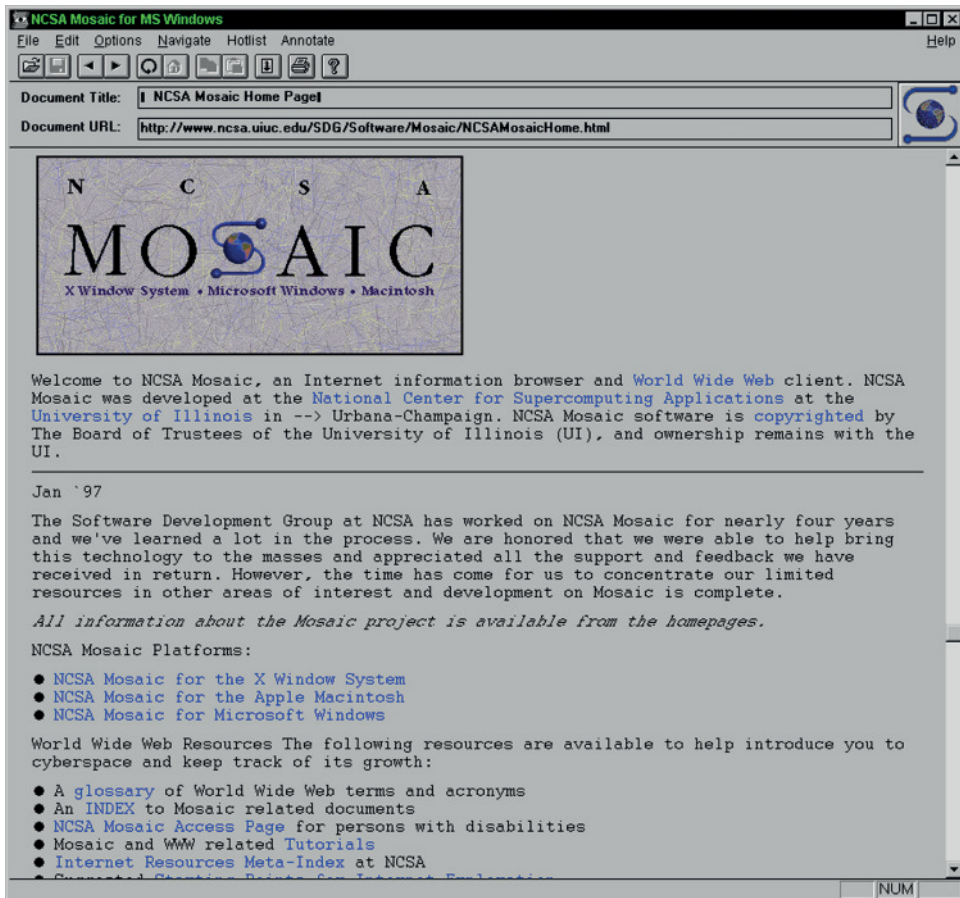
A screen shot of Mosaic v 1.0, though pretty basic it still has a few visual elements we recognise in todays web browsers