

Issue 219

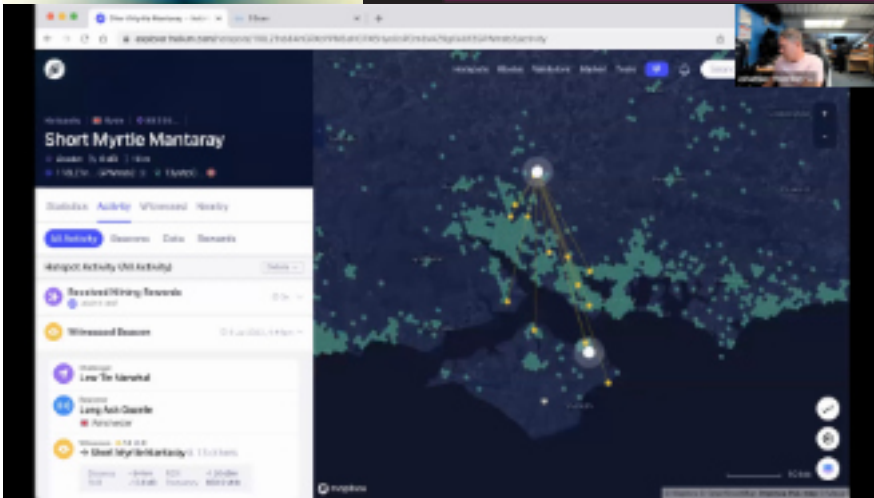
AUTUMN 2022

ISLE OF WIGHT PC USER GROUP



HOT KEY

October 2022

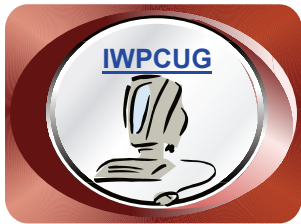


In July Jonathan Thornton introduced us to the Helium network, the image to the left shows helium hotspots in our local area.

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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 from 7.00 to 9.00 pm. Until further notice these will be held online via Zoom.

Visitors are always welcome.

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

Groups.io: <https://groups.io/g/iwpcug>

Details of how to join are on page 4.



FUTURE MEETINGS

<u>Date</u>	<u>Subject</u>	<u>Speaker</u>
2 November	Internet Maps	David Groom
7 December	Christmas Meeting	Denny Linzmaier
4 Jan	TBA	
1 February	AGM followed by Q & A session	
1 March	NFTs & Blockchain	Jonathan Burt
5 April	TBA	

ISLE OF WIGHT PC USER GROUP COMMITTEE

Chairman : David Groom

Secretary : Susanne Bone

Treasurer : Mike Hoar

Membership and Database Secretary : Roger Skidmore

Committee Member : Steve Sutters

Treasury Supervisor : Phil Rogers

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

Since the last issue of HotKey we have had the summer BBQ, the weather was good, and I think an enjoyable time was had by those who turned up.

A look at the calendar on page two will show that we have many of the next few months already arranged, and I think we have something planned for January 2023, but it's not yet firm enough to put in the calendar!

At the AGM in February we set the subscription for 2023, but did note that we may decide not to collect it. The committee have reviewed our current finances and have determined that it is not necessary to collect the 2023 subscription.

I apologize that this edition of HotKey is approximately three weeks late. I was really struggling to think of articles to write, or to find and source from elsewhere, and with the exception of a last minute contribution from Steve there were no other contributions.

Lastly we should offer congratulations to Jonathan Thornton, MD of PC Consultants, who has become the new President of the Isle of Wight Chamber of Commerce.

David Groom

Joining the Email Discussion Group

Send an email to: iwpcug+subscribe@groups.io, you will receive a confirmation email, follow the instructions in that email, and then wait for your approval request to be approved by one of the moderators.

All members are encouraged to join this group (it's free and private to club members) so you can keep in touch with events and join in with the discussions.

You can also keep in touch by regularly visiting www.iwpcug.org

Two-factor authentication and a cautionary tale

It's becoming increasingly common for various web services to require, in addition to a username and password, a third form of identification such as a passcode sent via SMS to your phone or alternatively a code generated by an app on your phone. This is what is known as two factor authentication (2FA). Two-factor identification works by using two unrelated authentication methods to secure an account.

There are three factors that can be used for authentication: something you know (like a username and password), something you have (like a phone), and something you are (like face ID, or a fingerprint). 2FA requires two of these three factors. This means that even if a hacker has somehow managed to identify your username and password they will not be able to log into your account because they don't have the required second factor to prove that they are the valid account holder.

Google, Facebook, PayPal and a multitude of other services all now support 2FA. A number of years ago I set up 2FA on some of these accounts, with the extra layer of security being that I needed to input a code generated by an app on my phone. This code, once requested by the website, will only be valid for 30 seconds, after which the app on my phone generated another six digit code.

To set this up you need to download an app to your phone. Among the most popular of these apps are an authenticator provided by Google, one provided by Microsoft, and another called Authy. I had decided to use the Microsoft authenticator.

I downloaded the Microsoft authenticator app and then in the settings of the various websites on which I wanted to use it I turned on two-factor authentication. The website displayed QR code, which I had to scan with the app in order to register this app as providing the 2FA for the website. The next time I logged in to the website I had to provide my username and password, and after I clicked "log in" a box came up asking for the 6-figure code which my authenticator app provided, which I then typed into the website in order to gain access.

Technically what is happening is this. When you first set up 2FA on a web site the service generates a secret key and stores a copy in your account, and when you by scan the QR code it adds the same secret key to the authenticator app on the phone. When you want to sign into the account, you enter your ID and password, the service provider then knows who you are and can lookup the

secret key that they stored for you. The service then asks for a string of digits, generated by the authenticator app. That string is generated from the time of day to the nearest 30 seconds, cryptographically hashed by your secret key. The service provider also uses your secret key to hash the time to the nearest 30 seconds. You type in your generated Time-based One-Time Password (TOTP) at the service and they compare it to the TOTP they generated. If it matches, you get in. It's essential that your device has the correct time (or close to it) for this all to work, but smartphones are usually synchronised with time services anyway.

Now to be cautionary tale mentioned in the title of this article. Earlier this summer my mobile phone refused to boot up, and nothing I could do would get it working. I borrowed another phone, downloaded the various apps that I had on my previous phone, plugged in the SIM card from the old phone and I was back working. However when I set up two-factor authentication I either haven't considered what would happen if I lost my phone, or I had assumed that if I set up my Android phone with the same Google account settings that were on my old phone the authenticator app would somehow have the settings for the accounts for which I had enabled 2FA. However this was not the case!

Although the app was now on my new phone there were no services registered with it. So when I tried to login into the accounts for which I had enabled 2FA I had no way of providing the authentication code and thus no way of logging in to those websites. The good news was that I had only set up 2FA on 4 web sites. One of them required a call to customer services, I provided my date of birth, the postcode I had registered with the service, and the method of payment that I usually use for that service, after which they were sure they were talking to the correct account holder and deleted the 2FA requirement from my account, allowing me to log in. The second web site was equally easy to have 2FA removed. The third service was my password manager containing the only record of passwords for hundreds of websites that I use! An email to customer services led to a series of exchanges where they required various pieces of information - the last of which was the exact day that I started using the password manager! This had me stumped, and I was facing the possibility that I might not be able to use my password manager - as you might understand this was somewhat alarming. Luckily I had signed up for the password manager using a rarely used email address, and because I rarely use this email account I never delete old emails from it. I searched back and found the welcome email sent by the password app on the day I first registered it - this piece of information confirmed to the support staff that I was in fact the rightful account holder and they removed 2FA from the account. The last service on which I had activated 2FA was my login for

groups.io, the email mailing list we use for IWPCUG. Despite two emails to the support department I have yet to receive any support on how to get round the problem of logging in, and in fact have had to create another account with groups.io using a different email address in order to send emails to our mailing list.

All these problems could have been avoided if I had understood in the first place how the authenticator app works, and importantly the fact that it did not automatically link to my phone's Google account enabling me to quickly recover things in the event of needing to load the app on another phone. It turns out there were one of two things which I should have done.

Firstly I could have also installed the authenticator app on a second device (e.g. my Samsung tablet). Then when registering two factor authentication with the websites, when they provided the QR code if I had scanned the same QR code with both the authenticator app on my phone and the authenticator app on my Samsung tablet then both would store the same cryptographic key, and would both produce the same 6-figure number for authentication to the website. Then, when my phone stopped working, all I had to do would be to open my Samsung tablet and use the authenticator app there to allow me to access the websites.

The second thing which I should have done would have been to enable the setting in the authenticator app to backup to the cloud. Then if I needed to reinstall the app I would have had the option of downloading the backup from the cloud and reinstall app, and it would now have the relevant cryptographic keys for the services needed.

The moral of this story is that whilst two factor authentication is a very good thing to set up you do need to understand how you can recover your credentials if, for whatever reason, you no longer have access to the phone on which 2FA is set up.

David Groom

Geekbench

A few months ago I was given a second-hand PC. Now I won't tell you how many computers I have in my house, suffice to say it's rather a large number, and the new machine was given to me on the proviso that I would throw out one of my other machines.

There were two obvious candidates, one which is the main computer on which I play around with Linux, the other also a Linux machine (an Acer Veriton bought second hand from eBay last year) on which I run all the local copies of the websites which I am developing. Which one of these should I replace? The obvious solution was to find out which was the slowest of the machines and to replace that one, but how should I determine which was the slowest? Should I base it on my observations, or was there a more scientific way to go about it. The obvious solution was to use some form of benchmarking software, ideally something which was free, and importantly something which would run on Linux. After a little research I discovered Geekbench 5.

This is a relatively small download available for Windows, Apple, Linux, and Android. There is a free trial version, and a relatively cheap paid for version, but to be honest the free version seemed to do all I needed. I first downloaded this to a Linux machine. In Linux Geekbench runs from the command line, and when run first displays some information about the specification of my computer and then it proceeded to run a series of 21 tests first using a single core of the CPU and then repeating those 21 tests using multiple cores. The testing ran for 5 minutes after which the only response in the terminal was a link to a website where I might view the results. Clicking on this link brought up my web browser showing a score for the single core



tests and the separate score for the multi core tests, clicking on on the result for these tests gave further analysis of the results of each of the 21 tests performed. I also had the option to to create a free account and to save the results of my test, which I duly did. I downloaded and ran the same tests on on my two existing machines, and the new one which I had been donated. The Acer Veriton has a dual boot into both Windows and Ubuntu so I rebooted that machine into Windows and downloaded Geekbench 5 which added itself to my main menu. Clicking on that menu item brought up the window you can see to the left. As you can see the program once again gives some detail on the machine on which it's

running. You will note from the image that on the Windows version of Geekbench there is the option to run CPU benchmarking and compute benchmarking while the Ubuntu version only appears to do CPU benchmarking. I clicked run CPU benchmark, and again 4 minutes later the tests were finished with the option to view the results in my web browser.

The results of all of the benchmarking can be seen in the image on the back cover, you can also view this online at browser.geekbench.com/user/438231 where you will be able to click on the ID of each test and see the detailed results for the five tests that I conducted spread over the four computers. One point to note is that on the Acer Veriton, which as I said earlier dual boots, while the single core score is identical for both Windows and Linux there is a marked difference in the multicore score. Reading online this actually may be to the different versions of the benchmarking software rather than any actual difference in speed of the computer under two different operating systems. It's also interesting to see how close together the scores for the two tests on the new computer which I was donated and my office Ubuntu computer are, although when you look at the processor in both machines it's an AMD Phenom IIX4, the only difference being the clock speed.

The most interesting result from my point of view was that under Linux the Acer Veriton which I bought off eBay showed much better performance on the single score result than any of my other computers, and a better multi core score than any of my other Linux machines. This was quite a surprise to me as I have to confess I had been rather disappointed with the apparent performance of this Acer Veriton.

I mentioned earlier that the results of my testing is available online, in fact the results of all the tests undertaken by Geekbench are available online at <https://browser.geekbench.com>. It was rather surprising to see that the fastest multicore system had a scoring of 96,590 compared to my humble scoring of 1,697, and I wondered what sort of machine could produce this result. Clicking on the detail of this particular test shows a Linux machine with a CPU name of 'AMD Eng Sample: 100-000000997-01' apparently a 192 core processor, and the machine had 755GB of RAM. A little bit of research online seems to indicate that this is a new AMD processor in testing stage. While it is understandable that AMD might want to benchmark their CPUs it seems surprising to me that they would upload the results to a publicly available site.

David Groom

Common Image File Formats

There are many different file formats used for storing images, in this article I intend to look at some of the more common ones. However before we look at the various type of image file format we need to understand the differences between the two types of compression algorithms which might be used.

Lossless compression algorithms reduce file size while preserving a perfect copy of the original uncompressed image. Lossless compression generally, but not always, results in larger files than lossy compression. Lossless compression should be used to avoid accumulating stages of re-compression when editing images.

Lossy compression algorithms preserve a representation of the original uncompressed image that may appear to be a perfect copy, but is not a perfect copy. Often lossy compression is able to achieve smaller file sizes than lossless compression. Most lossy compression algorithms allow for variable compression that trades image quality for file size.

Image File Formats

The original **JPEG** (Joint Photographic Experts Group) specification was published in 1992, it is a lossy compression method, which can result in a significant reduction of the file size. The JPEG filename extension is JPG or JPEG. Nearly every digital camera can save images in this format, which supports eight-bit grayscale images and 24-bit colour images (eight bits each for red, green, and blue). Applications can determine the degree of compression to apply, and the amount of compression affects the visual quality of the result. When not too great, the compression does not noticeably affect or detract from the image's quality, but JPEG files suffer generational degradation when repeatedly edited and saved.

The **TIFF** (Tagged Image File Format) was created as an attempt to get desktop scanner vendors of the mid-1980s to agree on a common scanned image file format. It is a flexible format usually using either the TIFF or TIF filename extension. The tagged structure was designed to be easily extendible, and many vendors have introduced proprietary special-purpose tags – with the result that no one reader handles every flavour of TIFF file. TIFFs can be lossy or lossless, depending on the technique chosen for storing the pixel data. Some offer relatively good lossless compression for bi-level (black&white) images. TIFF remains widely accepted as a photograph file standard in the printing business.

CompuServe introduced **GIF** (Graphics Interchange Format) on 15 June 1987 to provide a color image format for their file downloading areas. In normal use it is limited to an 8-bit palette, or 256 colours (while 24-bit colour depth is technically possible). GIF is most suitable for storing graphics with few colours, such as simple diagrams, shapes, logos, and cartoon style images, as it uses LZW lossless compression, which is more effective when large areas have a single colour, and less effective for photographic or dithered images. Due to GIF's simplicity and age, it achieved almost universal software support. Due to its animation capabilities, it is still widely used to provide image animation effects, despite its low compression ratio compared to modern video formats.

The **BMP** file format (Windows bitmap) handles graphic files within the Microsoft Windows OS, and first came into use in the early to mid 1980's. Typically BMP files are uncompressed, and therefore large and lossless; their advantage is their simple structure and wide acceptance in Windows programs.

The **PNG** (Portable Network Graphics) file format was created as a free, open-source alternative to GIF in the late 1990's. The PNG file format supports 8-bit (256 colours) paletted images (with optional transparency for all palette colours) and 24-bit truecolour (16 million colours) or 48-bit truecolour with and without alpha channel – while GIF supports only 8-bit palettes with a single transparent colour. Compared to JPEG, PNG excels when the image has large, uniformly coloured areas. Even for photographs – where JPEG is often the choice for final distribution since its lossy compression typically yields smaller file sizes – PNG is still well-suited to storing images during the editing process because of its lossless compression. PNG provides a patent-free replacement for GIF (though GIF is itself now patent-free) and can also replace many common uses of TIFF. Indexed-colour, grayscale, and truecolour images are supported, plus an optional alpha channel.

WebP is an open image format released in 2010 that uses both lossless and lossy compression. It was designed by Google to reduce image file size to speed up web page loading: its principal purpose is to supersede JPEG as the primary format for photographs on the web. It didn't get major support in web browsers until 2019/20.

Some example images in different formats can be seen on the back cover.

Based on https://en.wikipedia.org/wiki/Image_file_format and published under the [Creative Commons Attribution-ShareAlike License 3.0](https://creativecommons.org/licenses/by-sa/3.0/)

Google Meet

Google Meet (<https://meet.google.com>), formerly known as Hangouts Meet, is a video-communication service developed by Google. It is one of two apps that constitute the replacement for Google Hangouts, the other being Google Chat. It will replace the consumer-facing Google Duo by the end of 2022, with the Duo mobile app renamed Meet and the original Meet app set to be phased out.

On a desktop computer Meet runs in your web browser (all major browsers are supported), and there are also dedicated apps for download for both Android & iPhones. To start a meeting you simply put the following URL in your web browser <https://meet.google.com>, and then click the “New meeting” button, and a window will pop up, there is an option to create a meeting for later, or to start an instant meeting, clicking either results in the display of a link in the form of <https://meet.google.com/xxx-xxx-xxx> which you then share with anyone who you wish to join your meeting.

After being invite-only and quietly releasing an iOS app in February 2017, Google formally launched Meet in March 2017. The service was unveiled as a video conferencing app for up to 30 participants, described as an enterprise-friendly version of Hangouts. It has launched with a web app, an Android app, and an iOS app.

During the COVID-19 pandemic, the use of Meet grew by a factor of 30 between January and April 2020, with 100 million users a day accessing Meet, compared to 200 million daily uses for Zoom as of the last week of April 2020.

While Google Meet introduced features to upgrade the original Hangouts application, some standard Hangouts features were deprecated, including viewing attendees and chat simultaneously. The number of video feeds allowed at one time was also reduced to 8 (while up to 4 feeds can be shown in the "tiles" layout), prioritizing those attendees who most recently used their microphone. Additionally, features such as the chatbox were changed to overlay the video feeds, rather than resizing the latter to fit. Hangouts was scheduled to cease operation in the first half of 2021. Google suspended its usual 60-minute limit for unpaid accounts.

In August 2020, it was reported that Google was planning to eventually merge Google Duo with the business-oriented Google Meet. The merge began in August 2022, with the Duo mobile app renamed Meet and the original Meet intended to be phased out. The Google Duo web app will also be redirected

to the Google Meet web app.

Features of Google Meet include:

- Two-way and multi-way audio and video calls with a resolution up to 720p
- An accompanying chat
- Call encryption between all users
- Noise-canceling audio filter
- Low-light mode for video
- Ability to join meetings through a web browser or through Android or iOS apps
- Integration with Google Calendar and Google Contacts for one-click meeting calls
- Screen-sharing to present documents, spreadsheets, presentations, or (if using a browser) other browser tabs
- Ability to call into meetings using a dial-in number in the US
- Hosts being able to deny entry and remove users during a call.
- Ability to raise and lower hand
- Video filters, effects and augmented reality masks.

Google Meet uses proprietary protocols for video, audio and data transcoding. However, Google has partnered with the company Pexip to provide interoperability between Google Meet and SIP/H.323-based conferencing equipment and software.

The features available differ slightly depending on whether you have a Google Workspace [1] account or a Gmail account.

1) Google Workspace accounts

Features for users who use Google Workspace accounts include:

- Up to 100 members per call for Google Workspace Starter users, up to 150 for Google Workspace Business users, and up to 250 for Google Workspace Enterprise users.
- Ability to call into meetings with a dial-in number from selected countries.
- Password-protected dial-in numbers for Google Workspace Enterprise edition users.
- Real-time closed captioning based on speech recognition.

- Background blurring and virtual backgrounds.

In March 2020, Google temporarily extended advanced features present in the enterprise edition to anyone using Google Workspace or G Suite for Education editions.

2 Gmail accounts

In March 2020, Google rolled out Meet to personal (free) Google accounts.

Free Meet calls can only have a single host and up to 100 participants, compared to the 250-caller limit for Google Workspace users and the 25-participant limit for Hangouts. Unlike business calls with Meet, consumer calls are not recorded and stored, and Google states that consumer data from Meet will not be used for advertisement targeting. While call data is reportedly not being used for advertising purposes, based on an analysis of Meet's privacy policy, Google reserves the right to collect data on call duration, who is participating, and participants' IP addresses.

Users need a Google account to initiate calls and like Google Workspace users, anyone with a Google account is able to start a Meet call from within Gmail.

[1] Google Workspace is a collection of cloud computing, productivity and collaboration tools, software and products developed and marketed by Google, aimed at businesses and available on a subscription basis starting at £4/month.

Based on an article at https://en.wikipedia.org/wiki/Google_Meet and published under a [Creative Commons Attribution-ShareAlike License 3.0](https://creativecommons.org/licenses/by-sa/3.0/)

Battery Boding

I advertised a large (52v 30 Ah) ebike battery for a friend. I put it in my rear carrier box, swapped the terminals over from my normal battery and went faster and further than I'd ever done with that bike. Unfortunately there was something odd about the final charge and discharge voltages. It only charged to 56v rather than 58v that the charger was giving out. Also the battery only going down to 51v when it should have gone down to 50v or less before the BMS (battery management system) cut the supply. The BMS keeps the cells operating in their designed voltage ranges. My friend and I agreed that it

would not be safe to sell it with possible cell, wiring or BMS faults and the best thing was to take it apart to salvage the cells. I'm glad a high enough bid was not given before inspection!

I've never felt more like dismantling an unexploded bomb, as even a partly discharged battery of that size could give rise to an explosion if a short for any length of time occurred. It is important not to cut 2 wires at the same time as electricity can travel along the cutter jaws. I always wear safety specs when doing any battery work. Even just putting cells in a charger in case a spark went in my eye. I did get a small spark as I used scissors to cut the outer plastic covering. Then cut the thick high current wires followed by the thin balance wires. No drama this time, and we both felt relieved with the cells disconnected. The only shock I got was an emotional one when some of the 18650 packs came apart in my hands. Some of the spot welds were weak or non-existent. After taking apart hundreds of laptop and power tool packs I've never come across such dodged connections. Normally it's a tug of war - with the Nickel strips being held in a vice one end and me tugging on the battery the other end. If there is an air gap between connections this can cause arcing with sparks etc! No wonder the builder of that battery got the sack from his last job.

We now have a large stock of high power cells and I'm thinking of building a 40 mph bike (only for use on private land and with the owners permission of course).

My eBike is going as well as they day I built it, apart from slightly less range because the cells are 3 years old now. It only costs 10p of electric to get from Ryde to Bembridge with present charges of 34p per Kw hour. As Roger wisely pointed out that is not the only cost of electric vehicles. Depreciation is the main one. In my case the battery cost £300 and assuming I get 800 charges out of it that means it costs 38p in dep. for the trip. At under 50p a lot cheaper than the bus (£3.50) and if one uses salvaged cells potentially no battery cost but a lot of time spent testing batteries. There is also the standing charge for supplying electricity but we all pay that anyway. The costs scale up considerably with cars which is why I think we need more micro electric cars.

Stephen Sutters

ID	Name	Platform	Architecture	Single-Core Score	Multi-Core Score
1388311	New Computer - Gigabyte Technology Co., Ltd. B460I AORUS PRO (12) (12)	Linux 64	x86_64	395	1417
1379611	ASUS ZenBook 14 (2020) (12) (12)	Windows 64	x86_64	627	1324
1379411	ASUS ZenBook 14 (2020) (12) (12)	Linux 64	x86_64	627	1500
1379311	Dell Latitude 7420 (12) (12) (12) (12) (12) (12)	Windows 64	x86_64	446	1697
1379211	Dell Latitude 7420 (12) (12) (12) (12) (12) (12)	Linux 64	x86_64	389	1327

The Geekbench scores for my computers, see pages 8-9.



The image to the left is 2,244px by 1,222px. It was saved in four different image formats:
 TIFF (13,808Kb),
 PNG (13,572Kb),
 JPG at 65%Quality (252Kb),
 WEBP (101Kb).

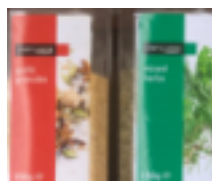
There was very little discernible difference in the image quality as can be seen from the expanded sections of the images below, despite the quite substantial differences in the file sizes of those four original images. (see pages 10 & 11).



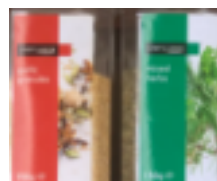
[TIFF](#)



[PNG](#)



[JPG 65%Quality](#)



[WEBP](#)

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