ZimaBlade Benchmarking

First as caveat.

This is based on a preproduction ZimaBlade, full mass production may see changes to the hardware, these may only be slight but could see different results.

Apologies for the moire noise in the images when taken by a phone.

Hardware Used.

ZimaBlade ZBB001-BK400032 (aka ZimaBlade Quad Core 7700)

8GB Memory (supplied by IceWhale with the Blade)

500GB Crucial SSD, fresh Windows install can take 25-30GB so I didn't use the eMMC. This is shown as **Windows Boot Manager** in the BIOS images as it had a copy of Windows son it that was erased.

64GB USB Flash Drive This appear as a **UEFI: Generic Mass Storage** in the BIOS Images.

There are "lite" builds that can reduce the requirements of Windows, but this test was using a Stick Windows install. The lightweight builds often trim out components that maybe put back later by updates.

The aim of the tests was to give an idea what the stock hardware was capable of as a lightweight desktop. In both cases I took the Win 10/11 Pro version. Please remember this is on the bare metal, if you were to virtualise Windows the virtualisation software would need to use some CPU and memory for its own use..

IMPORTANT: ZimaBlade hardware is not sold with a licence for Windows, if you wish to use Windows long term you will need to purchase a licence.

There are many sources of "cheap" licences often claiming to be from OEM PC's that have been disposed of by corporations. The cost of Windows 11 is about £120 for Windows 11 Home, and around £220 for Windows 11 Pro. Websites where cheap Windows keys are available are unlikely to be genuine. These "cheap" usually come from different sources with common sources being grey imports, MAK or KMS keys, OEM key, Used keys, Keys for Student & other groups and of course pirated / KeyGen versions.

Without dwelling on the legality of these keys, be aware that Microsoft can (and do) periodically block entire ranges of keys known to have been leaked online or sold many times over forcing the Windows install to de-activate. If you use a key sourced from one of these cheaper sellers, it may work for years, but could easily fail in a few months.
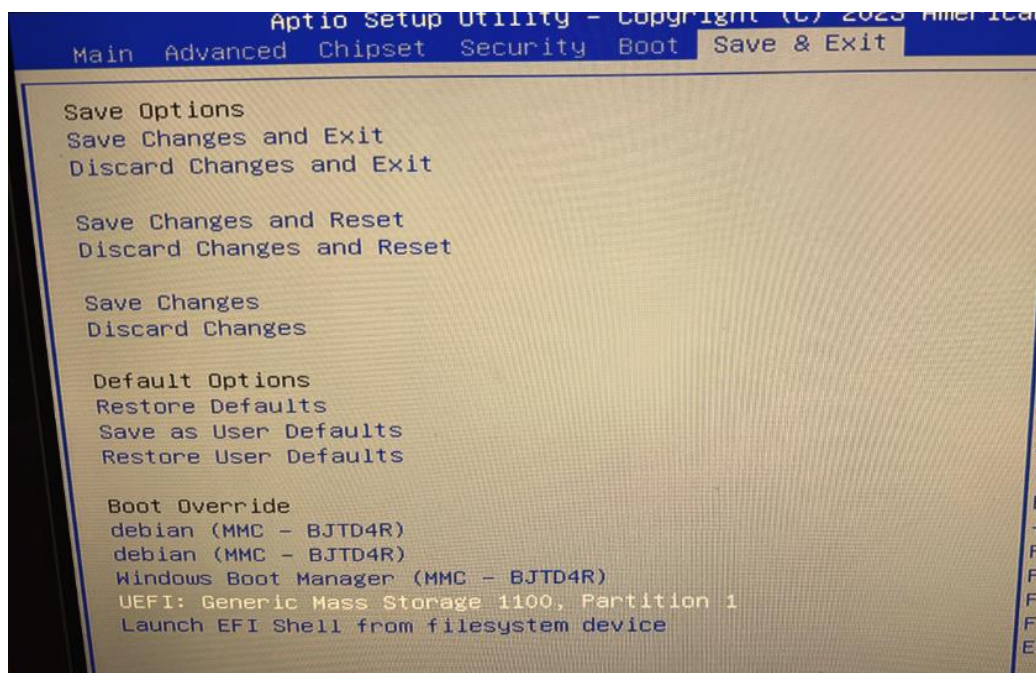
Windows 10.

Install:

Windows 10 was installed by creating a boot USB using the Microsoft Windows Creation tool. My USB was 64GB and known to work to boot. Not all USBs will be bootable on ZimaBlade / Board, if you cannot boot from the USB you use, try a different one. Generally branded ones are more reliable than generic USB devices to boot but this isn't always the case.

The USB was plugged onto the USB A socket and ZimaBlade was booted into the BIOS (press and hold **DEL** on power on to get into the BIOS) and the boot order changed so it booted to the SSD not the eMMC - Highlighted in Red, This Configuration was then saved (F10 - Green Box) but the BIOS NOT exited.
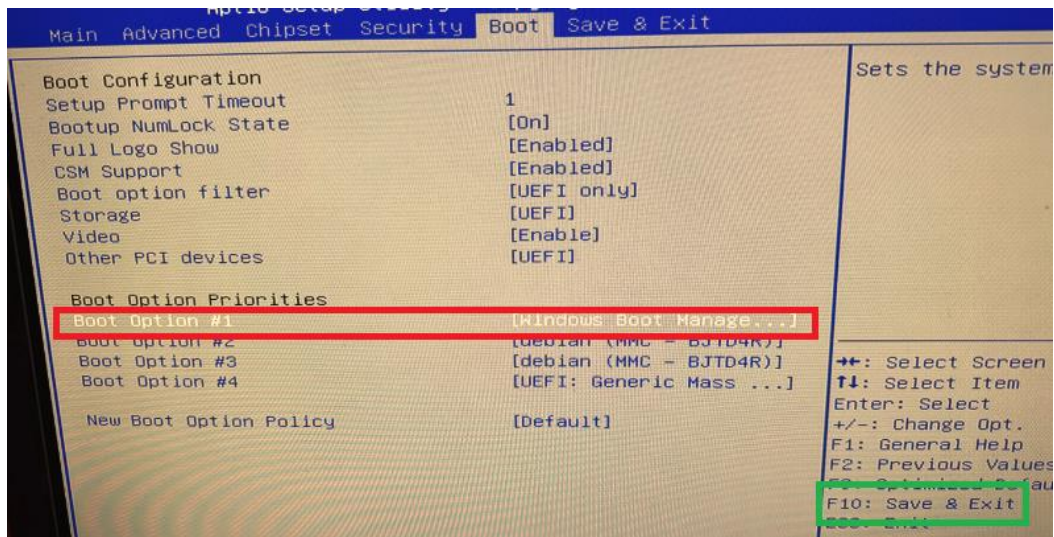

The ZimaBlade was then told to do a one-time boot to the USB device in white so we can proceed with the install.

Installation proceeded like a normal Windows Install, and I opted to do a Clean Install erasing the prior content of the SSD.   Installation took 20-30 minutes from a USB stick to a SSD.

Nothing was needed to be done to the install to ensure that it proceeded other than a usual install so that means selecting the W10 build type, entering a key if you have one, and specifying username, password, country and so on.

Once booted System About and Device Manager were opened and the status of the install reviewed. There were three Yellow indicators where hardware was not in the build.
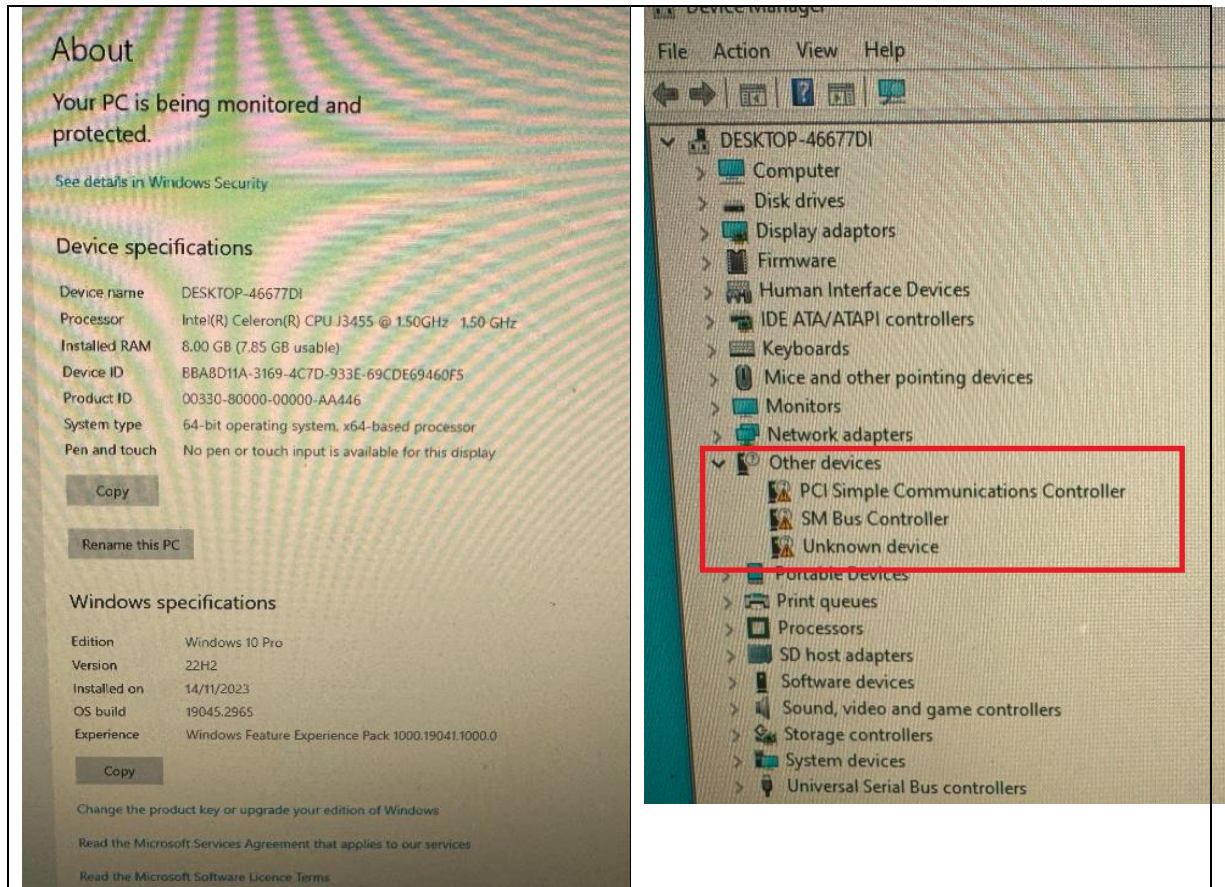
The Undetected Devices were:

- PCI Simple Communication Controller VEN 8086 PCI 5A9A
    - Intel Trusted Execution Engine
- SM Bus Controller VEN 8086 PCI 5AD4
    - Intel SMBus Controller
- Unknown Device VEN ANX PCI 7447
    - USB C Controller Chip

I had already decided to perform a Windows Update to bring the device right up to date before running PassMark. I opted to take all updated including the optional ones, and as part of that all drivers were installed by Windows Update. The update needed two reboots however depending on when you do this and how old the W10 image is, you may need more or less reboots.
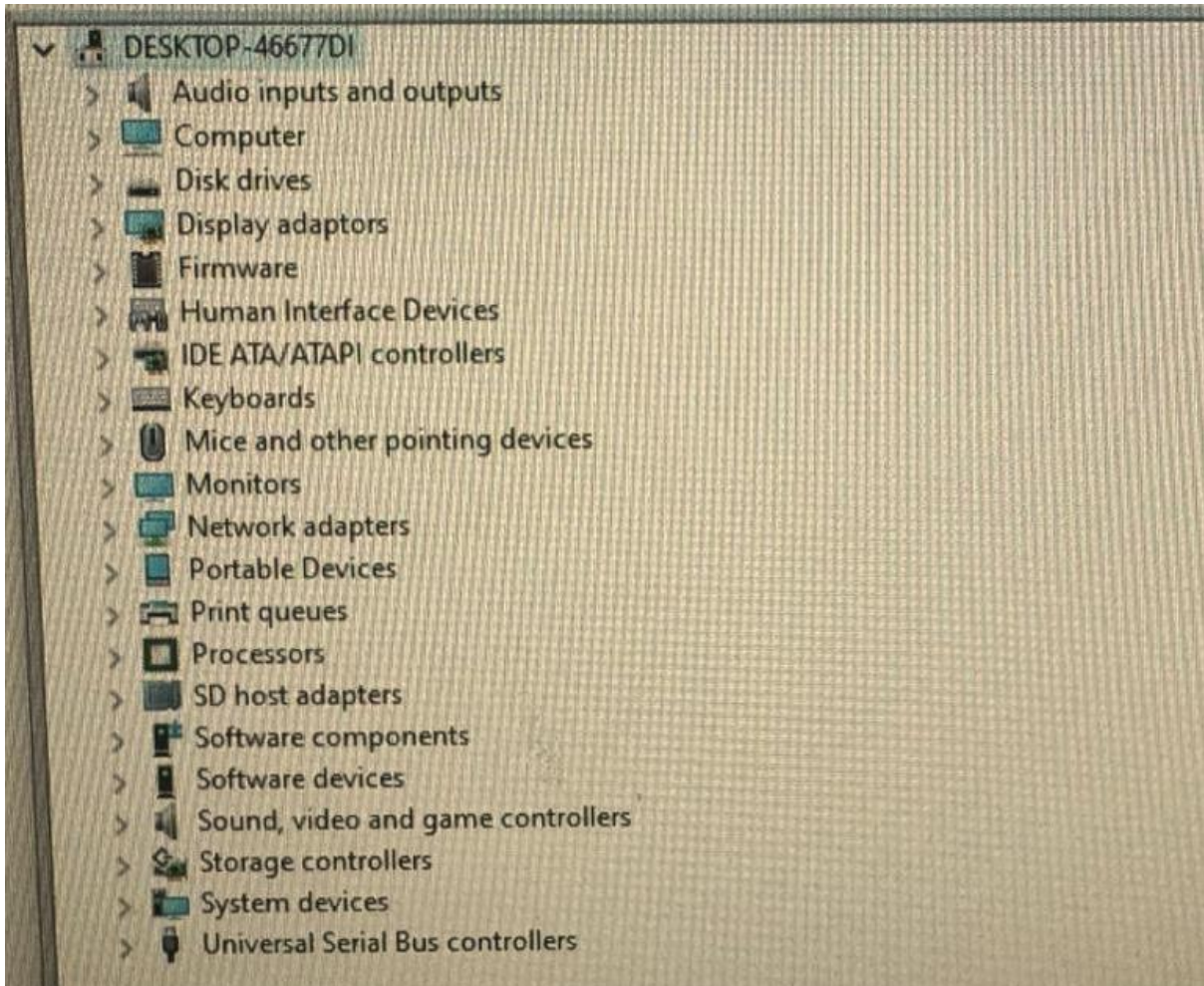
The final steps were to install PassMark Software,(https://www.passmark.com/) and CoreTemp (https://www.alcpu.com/CoreTemp/) to test and help with the testing and monitoring
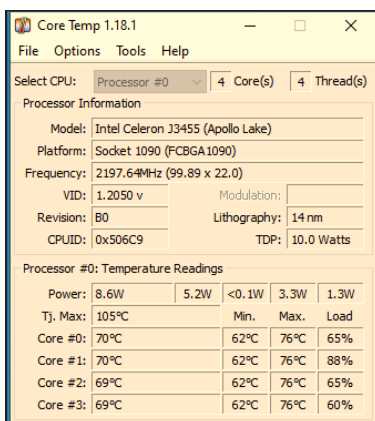
Testing

CoreTemps was installed as The Windows Update was running and allowed me to record a range of temps as the updates installed.

As can be seen the system topped out at about 76*C while updates were installing.

After that PassMark was allowed to run and CoreTemp was asked to log the temperatures power and CPU speed. As you may expect as PassMark ran the CPU cores switched states (Grey line Left Axis) mainly in the 2200Mhz mode, but dropping to 800Mhz at times, temperature (Blue Line Right Axis) spiked as the test was run and Power (Orange Line Right axis) varied as test were run. Nothing out of the ordinary was really seen.

W10 CPU Temp, Power and Speed

Legend: Average Mhz — Ave Temp — CPU Power
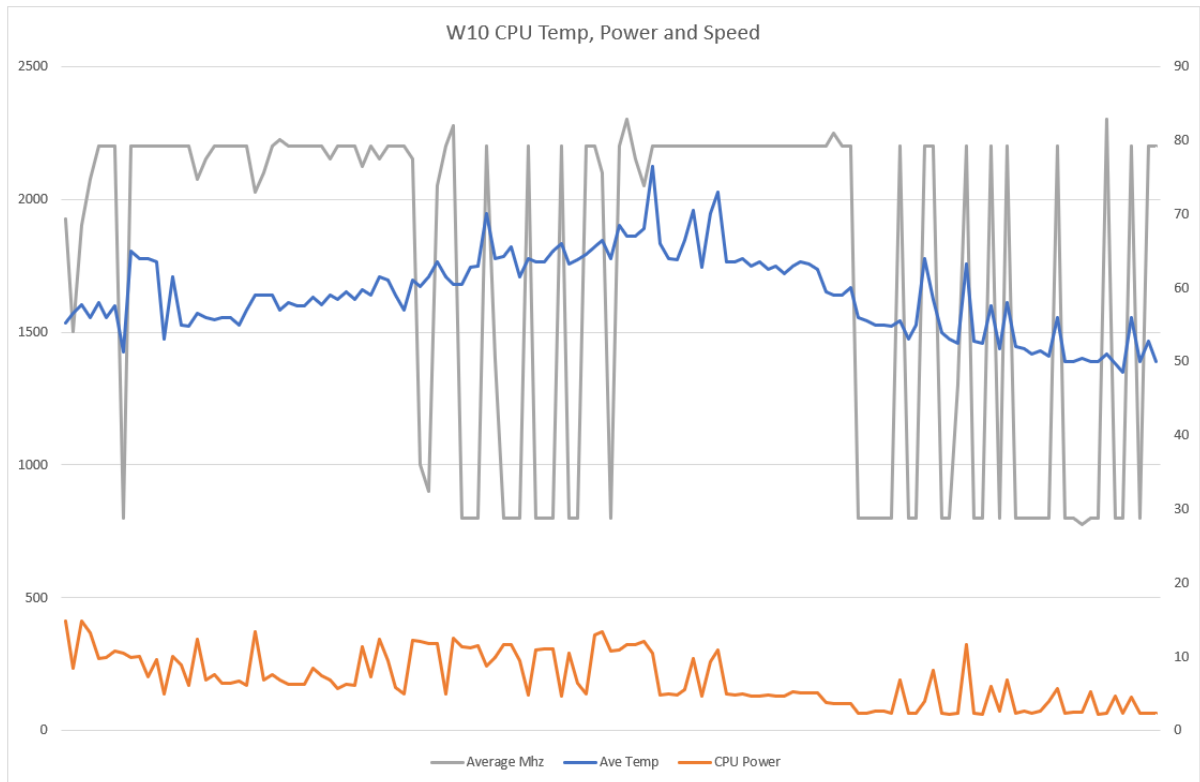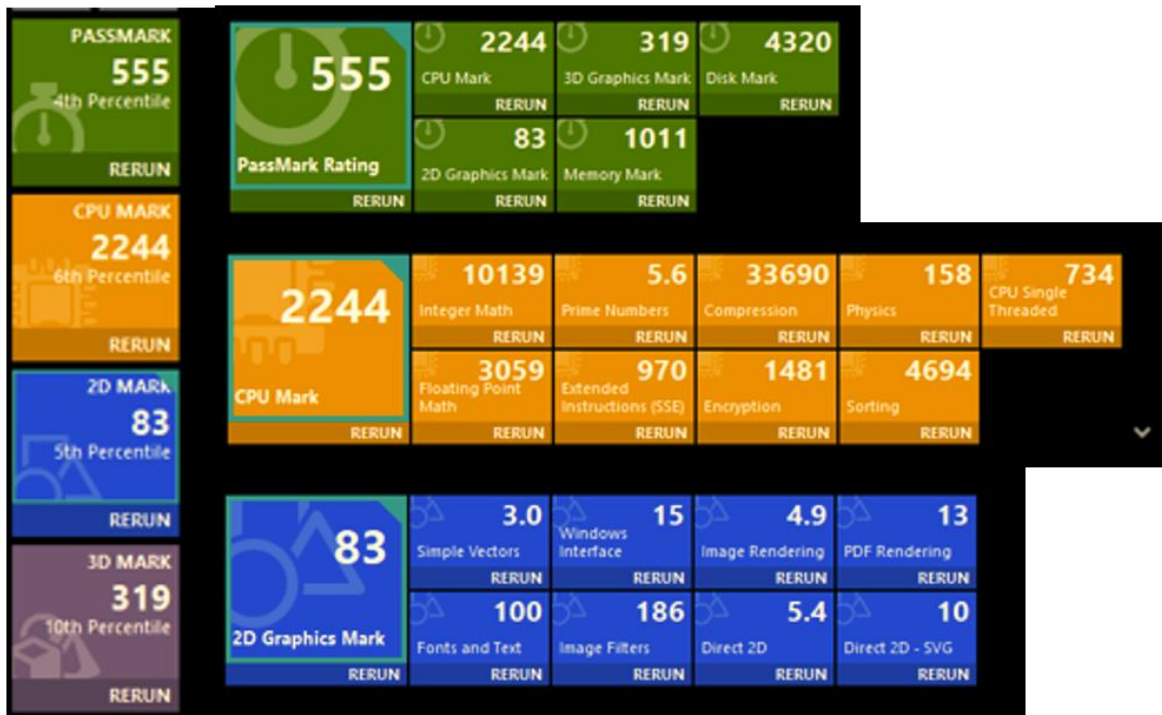
Pass Mark results

ZimaBlade IS NOT a hardcore gaming device and it would be unrealistic to expect high PassMark scores, this is after a small cheap single board computer. In addition, I have not included the 3D Graphics, Memory or Hard Drive scores.

The CPU is an intel Embedded GPU and while can do basic 3d operation. It can handle light "work" type roles such as CAD spreadsheets and presentations but is not intended for gaming or advanced graphics.

The CrowdSupply kits came in different options, some had no memory, some 8GB and some 16GB, the memory in my sample may not be the same model as the memory sent to crown supply backers, or future orders.
The SSD is also not part of any kit, and disk access times will vary according to the type of hard drive you use.

IceWhale had advertised a Passmark CPU Mark of 2238 points and mine is slightly higher bit that may be experimental error.

PASSMARK	
555	
4th Percentile	
RERUN	

CPU MARK	
2244	
6th Percentile	
RERUN	

2D MARK	
83	
5th Percentile	
RERUN	

3D MARK	
319	
10th Percentile	
RERUN	

PassMark Rating

555 PassMark Rating	**2244** CPU Mark RERUN	**319** 3D Graphics Mark RERUN	**4320** Disk Mark RERUN
RERUN	**83** 2D Graphics Mark RERUN	**1011** Memory Mark RERUN	

CPU Mark

2244 CPU Mark	**10139** Integer Math RERUN	**5.6** Prime Numbers RERUN	**33690** Compression RERUN	**158** Physics RERUN	**734** CPU Single Threaded RERUN
RERUN	**3059** Floating Point Math RERUN	**970** Extended Instructions (SSE) RERUN	**1481** Encryption RERUN	**4694** Sorting RERUN	

2D Graphics Mark

83 2D Graphics Mark	**3.0** Simple Vectors RERUN	**15** Windows Interface RERUN	**4.9** Image Rendering RERUN	**13** PDF Rendering RERUN
RERUN	**100** Fonts and Text RERUN	**186** Image Filters RERUN	**5.4** Direct 2D RERUN	**10** Direct 2D - SVG RERUN

Windows 11.

No Hardware changes, other than the USB now has W11 install software on it.

Install:

Windows 11 was installed by creating a boot USB using the Microsoft Windows Creation tool. The same 64GB USB was used as it was known to work to boot.

As before the USB was plugged onto the USB A socket and ZimaBlade was booted into the BIOS (press and hold **DEL** on power on to get into the BIOS) and the boot order changed so it booted to the SSD not the eMMC - Highlighted in Red, This Configuration was then saved (F10 - Green Box) but the BIOS NOT exited.
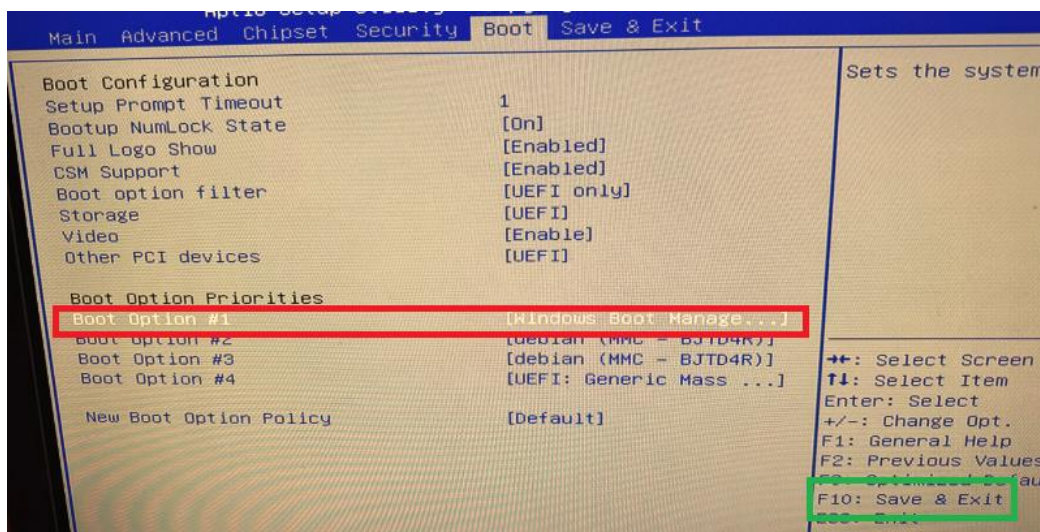
The ZimaBlade was then told to do a one-time boot to the USB device highlighted in White so we can proceed with the install.
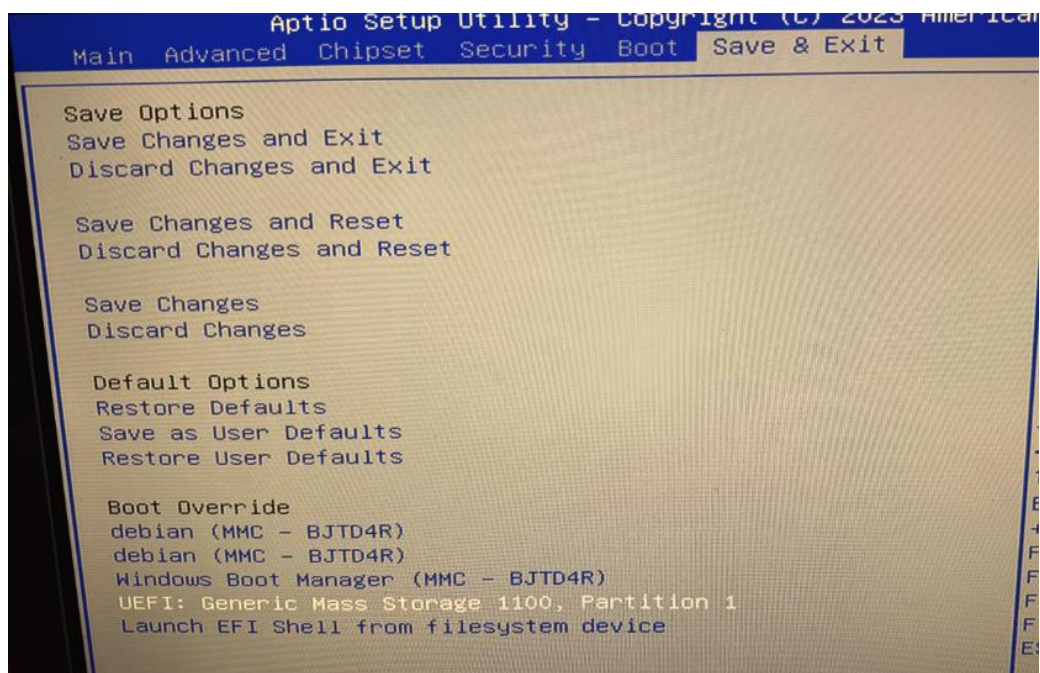
Bypassing TPM

Windows 11 has stricter requirements than Windows 10 and to ensure an install they needed to by bypassed. There is more detail on the web, but to do this we need to add a few files to the registry to bypass checks.

When W11 is booted, and you get to the initial screen asking about Language press **SHIFT and F10** to get a command prompt and then type **regedit.**

Navigate to **HKEY_LOCAL_MACHINE\SYSTEM\Setup.**

Create a new registry key under Setup and name it **LabConfig**. To do this right click in the right Windows and select **NEW** > **KEY**)

Double Click on the new Key to go into the LabConfig key , and create **DWORDs** values called **BypassTPMCheck** , **BypassSecureBootCheck** , **BypassRAMCheck**. Again this is done by right clicking in the right windows and selecting NEW . DWORD (32-Bit) Value.

Once created double click each key and set the value to **1** The example below shows one set and a new **DWORD** being created.
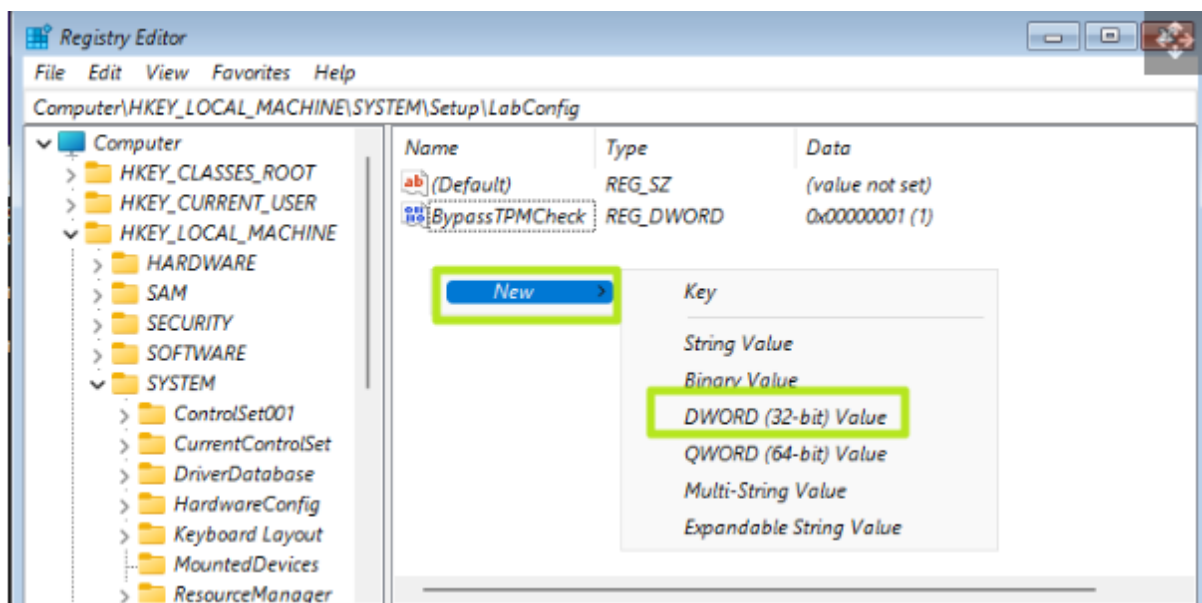
Close regedit and the command prompt. Then continue with the Windows 11 installation as normal, so that means selecting the W11 build type, entering a key if you have one, and specifying username, password, country and so on.

I again opted to do a Clean Install erasing the prior content of the SSD.   Installation again took 20-30 minutes from a USB stick to a SSD.

Using a local account with Windows 11 as part of the Initial Setup.

Windows 11 likes to be online and tied to a Microsoft Online Account. This has good and bad sides that are beyond this testing.

If you wish to use a Microsoft account, just continue the setup.

If you do not wish to create or use a Microsoft account and would prefer a local account, we need to bypass a few more checks.

When you get to the Windows 10 screen asking for your region remove the ethernet cable.

Once again press **SHIFT and F10** to get a command prompt and then type **OOBE\BYPASSNRO** (note that is oneword) and when you hit return the system will reboot.

Follow the instructions and when you get to the option to connect to a network there will be a small option to the left of NEXT saying "I don't have Internet" click this to continue.

NOTE: This option **DOES NOT** appear if you have not run the **OOBE\BYPASSNRO** command and the install will not continue without a network connection.

Follow the rest of the instructions to create your account and finish the install.

Once booted System About and Device Manager were opened, and the status of the install reviewed. Again, there were three Yellow indicators where hardware was not in the build   I'm not going to include images, but the same three components were without drivers.

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To keep the test the same as possible I performed a Windows Update to bring the device right up to date before running PassMark. I again opted to take all updates including the optional ones, and again all required drivers were installed by Windows Update. The update did one reboot however depending on when you do this and how old the W11 image is, you may need more reboots.

The final steps were to install the same software as before namely PassMark Software,(https://www.passmark.com/) and CoreTemp (https://www.alcpu.com/CoreTemp/) to test and help with the testing and monitoring
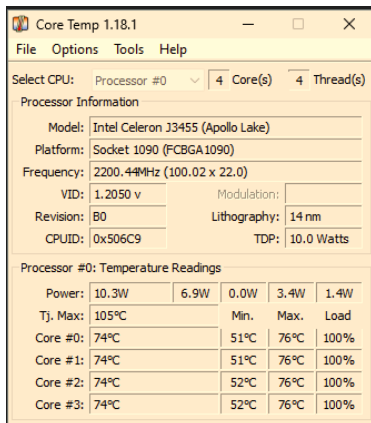
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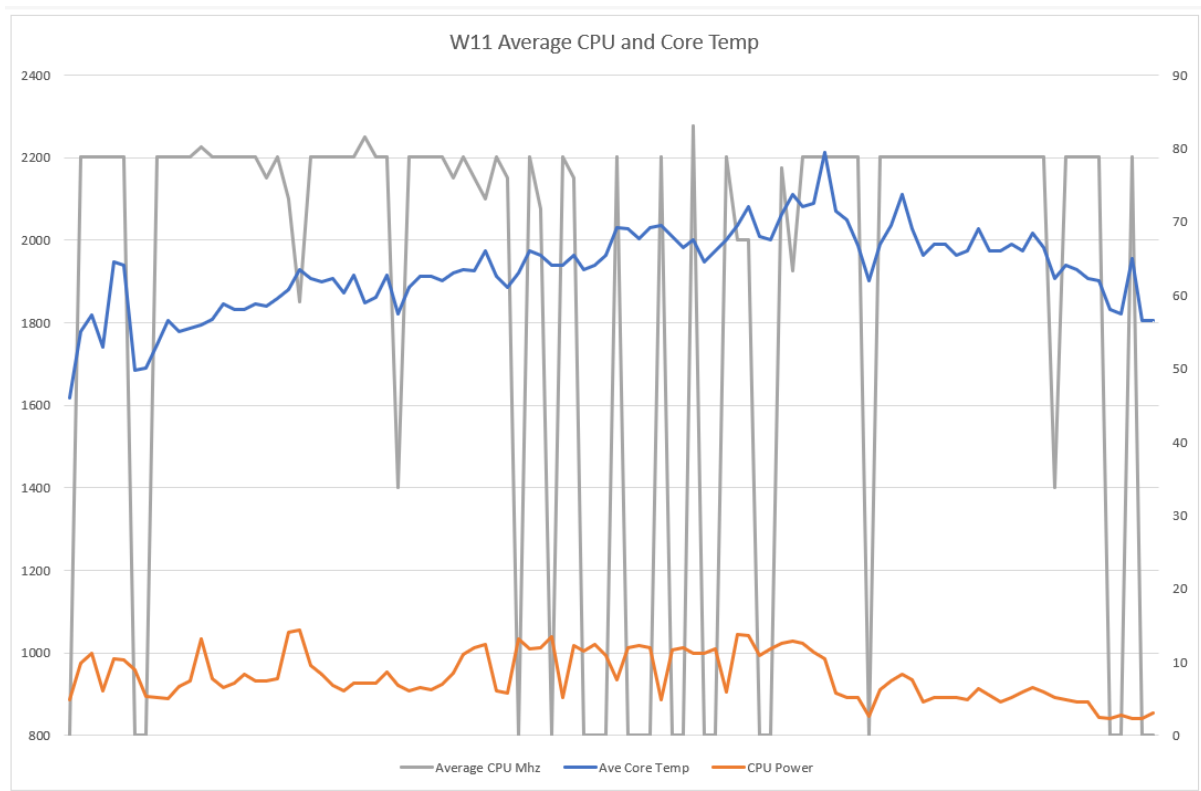
Pass Mark results

ZimaBlade as mentioned IS NOT a hardcore rig and it would be unrealistic to expect high PassMark scores, again I have not included the 3D Graphics, Memory or Hard Drive scores for reasons mentioned before.

What did surprise me was that the hardware results were identical, and I did check twice, I expected the CPU result to be the same, but the 2D/3D tests rely to a part on drivers. This may imply that intel didn't re-write driver for W11, merely altered existing ones to un under the new OS.
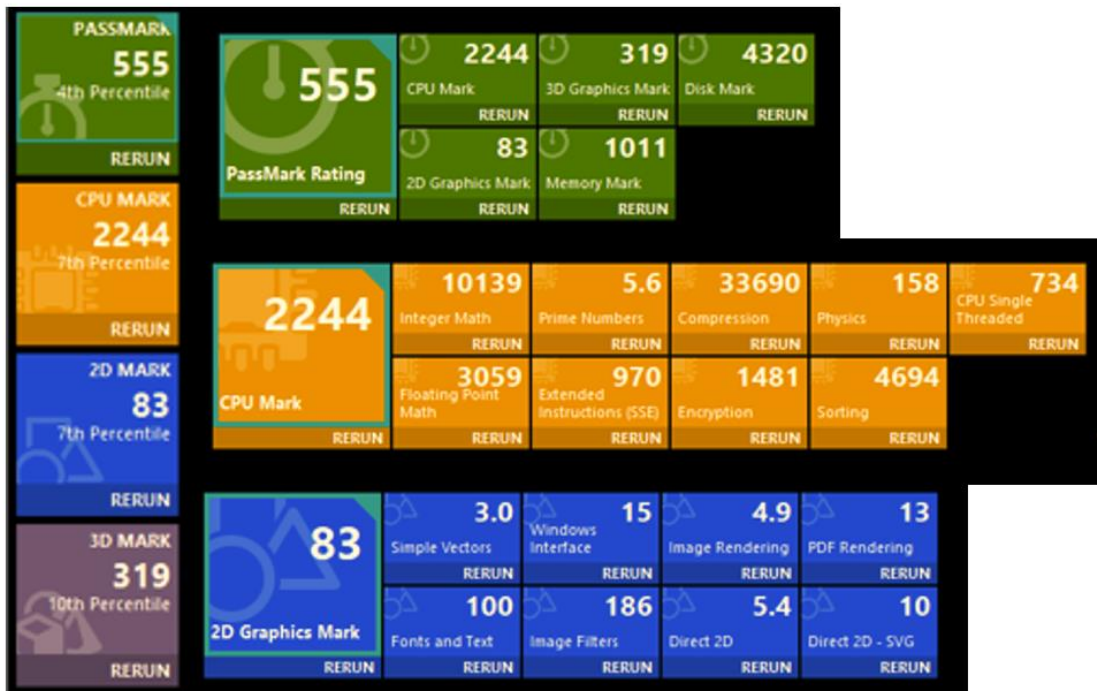
System Config Report by Belarc

This is from W11 but W10 is almost identical.