

# *UEFI Proof of Concept – Demonstration*

Arca Noae LLC



# *What is UEFI?*

- UEFI stands for *Unified Extensible Firmware Interface*
  - A long time coming – transition away from the BIOS and VGA.
  - Transition:
    1. UEFI-only systems still provide Compatibility Support Module (CSM).
    2. Intel will phase out CSM support by January 1st 2020.
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# *UEFI-only system and ArcaOS*

- Intel will not instantly cut off CSM support. (Windows 7 still needs CSM!)
  - ArcaOS does not depend fully on BIOS calls as DOS does.
  - Main issues:
    - INT10 (VGA hardware) going away
    - INT13 (disk I/O via BIOS) going away
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# *UEFI POC support for ArcaOS*

- **Remember: *Proof of Concept***
  - EFI loader with minimal BIOS support.
    - BIOS call needed for ACPI.PSD to load APCI tables.
    - INT10 and VESA support – Panorama loads without changes!
  - BVHVGA.DLL replaced with BVHEFI.DLL (VGA hardware going away).
  - Boot of ArcaOS preload files via UEFI disk services.
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# *What Works*

- Preloading OS/2 system files via UEFI disk services before ArcaOS boots (INT13 not used)
  - Display text output during ArcaOS boot.
  - Full screen and OS/2 text window works.
  - Example low level support: text TRAP screen
  - PMSHELL loads with DIVE support working.  
(Next screenshot)
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FC/2: vbe2grad

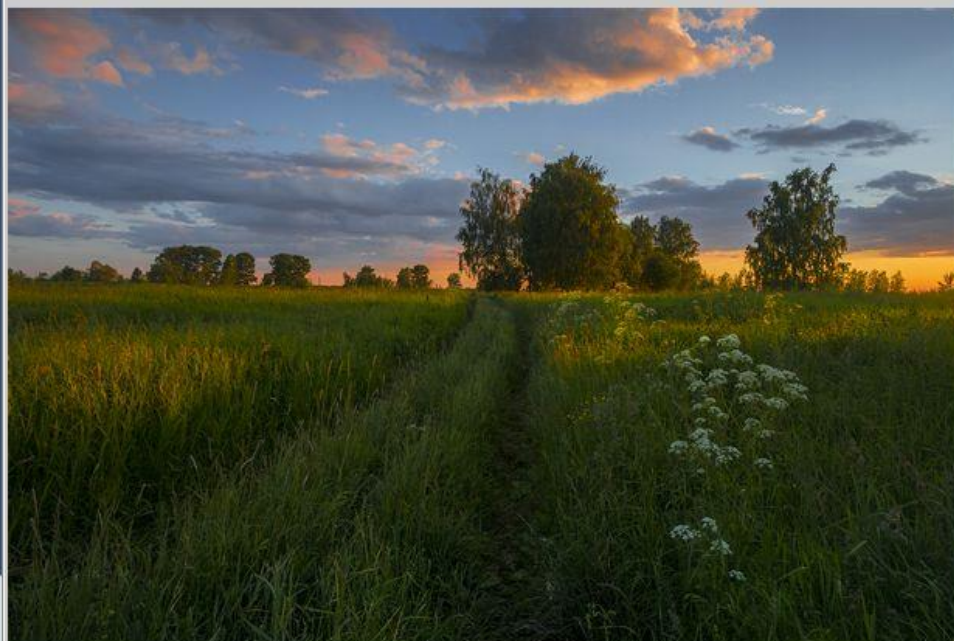
View: E:\var\log\vbe2grad.log

```

Panorama v1.13 log for GID=0 started at 20.4.2019 2
This copy of Panorama is licensed to Arca Noae for
Profile setting for Shadow...Disabled
VESA version is 201
BIOS-supplied information
OemVendorNamePtr   = 8E000022
OemProductNamePtr  = 8E000026
VideoModePtr       = 8E000034
TotalVramSize      = 500000
OemVendorName      = AOS
OemProductName     = UEFI boot
Get EDID failed
VBE VRAM Base=E0000000 Size=500000 (5120Kib) (round
Mode 0x140: 1280x1024x32bpp planes=1 Attr=0xDB
Video Aperture: Base=0xE0000000 Size=0x500000 Round
Shadow buffer is not defined! - 0

```

SP image viewer v1.29.5



Normal mode | 1400 x 907 | 45.14% | I:\Archive\Pics\natureB4.spl

SysBench 0.9.4e - Ready

File Graphics CPU-int CPU-float DIVE File I/O Memory Disk I/O CD-ROM I/O

Graphics		
BitBlt S->S copy	: 2.820	Million pixels/second
BitBlt M->S copy	: 682.889	Million pixels/second
Filled Rectangle	: 1250.122	Million pixels/second
Pattern Fill	: 561.062	Million pixels/second
Vertical Lines	: 80.443	Million pixels/second
Horizontal Lines	: 132.173	Million pixels/second
Diagonal Lines	: 88.466	Million pixels/second
Text Render	: 23.559	Million pixels/second
Total	: 354.742	PM-Graphics-marks

CPU integer		
Dhrystone	: --.---	VAX 11/780 MIPS equivalent
Hanoi	: --.---	moves/25 microseconds
Heapsort	: --.---	Million Instructions Per Second
Sieve	: --.---	Million Instructions Per Second
Total	: --.---	CPU integer-marks

CPU float		
Linpack	: --.---	MFLOPS
Flops	: --.---	MFLOPS
Fast Fourier Transfrm	: --.---	VAX FFT's
Total	: --.---	CPU floating point-marks

Direct Interface to video extensions - DIVE		
Video bus bandwidth	: 2837.102	Megabytes/second
DIVE fun	: 9669.039	fps normalised to 640x480x256
M->S, DD, 1.00:1	: 9688.372	fps normalised to 640x480x256
Total	: 3619.535	DIVE-marks

File I/O - Drive J:		
4Kb seq. Uncached w	: --.---	Kilobytes/second
4Kb seq. Uncached r	: --.---	Kilobytes/second
4Kb random Uncached w	: --.---	Kilobytes/second
4Kb random Uncached r	: --.---	Kilobytes/second
4Kb seq. Cached w	: --.---	Kilobytes/second
4Kb seq. Cached r	: --.---	Kilobytes/second
4Kb random Cached w	: --.---	Kilobytes/second
4Kb random Cached r	: --.---	Kilobytes/second
8Kb seq. Uncached w	: --.---	Kilobytes/second
8Kb seq. Uncached r	: --.---	Kilobytes/second
8Kb random Uncached w	: --.---	Kilobytes/second
8Kb random Uncached r	: --.---	Kilobytes/second
8Kb seq. Cached w	: --.---	Kilobytes/second
8Kb seq. Cached r	: --.---	Kilobytes/second
8Kb random Cached w	: --.---	Kilobytes/second
8Kb random Cached r	: --.---	Kilobytes/second

# *Potential further development*

List is subject to change (Proof of Concept)!

- Load system files from partition.
- VDM support (DOS/WIN-OS/2 support)
  - VSVGA.SYS accesses VGA hardware directly
- Memory dump support



# *Demonstration!*

- Remember: it is a proof of concept!
- Demonstration shows that:
  - ArcaOS can boot on systems running in UEFI only mode.
  - Major system components working.





# Questions!

- Questions?
- I am not the developer! Please be gentle :-)

