



# AMD Linux Driver 2020.40

## Release Notes

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### 1. Overview

AMD's Linux® Driver's includes open source graphics driver for AMD's embedded platforms and other peripheral devices on selected development platforms.

New features supported in this release:

1. New LTS OS Ubuntu 20.04.1.
2. Bug fixes and driver updates.
3. OpenCL(ROCm 3.8) support on V1000 & Embedded dGPU's.
4. Watchdog timer (SP5100\_tco upstream version)

### 2. Linux® kernel Support

1. 4.19.8 LTS
2. 5.4.2 LTS

### 3. Linux Distribution Support

1. Ubuntu 20.04

### 4. Component Versions

The following table shows git commit details of the sources and binaries used in the package.

The patches present in patches folder of this release package has to be applied on top of the git commit mentioned in the below table to get the full sources corresponding to this driver release. The sources directory in this package contains patches pre-applied to these commit ids.

Component Name	Version	Commit ID	Source Link for git clone
Kernel	5.4.2	5f8bc2bb0e0f456e2217bbd1caac2acf211431c9	<a href="https://git.kernel.org/pub/scm/linux/kernel/git/stable/linux.git">https://git.kernel.org/pub/scm/linux/kernel/git/stable/linux.git</a>
	4.19.8	178574b66509c9ff7df4ad26c84a8884567e93b4	
Libdrm	2.4.102	77687f8d6ea321998b87f87433db1fea7518b8bf	<a href="https://github.com/freedesktop/mesa-drm.git">https://github.com/freedesktop/mesa-drm.git</a>
Mesa	20.1.0-dev	0d6019302eb772b1c399cecc3f5abf1940f0c0d0	<a href="https://github.com/mesa3d/mesa.git">https://github.com/mesa3d/mesa.git</a>
Ddx	19.1.0	cb27a5b1120266e4baaa3eb784ff041977ded43f	<a href="https://github.com/freedesktop/xorg-xf86-video-amdgpu.git">https://github.com/freedesktop/xorg-xf86-video-amdgpu.git</a>
Gstomx	1.0.0.1	5c4bff4a433dff1c5d005edfcea727b6214bb74	<a href="git://people.freedesktop.org/~leoliu/gstomx">git://people.freedesktop.org/~leoliu/gstomx</a>
Wayland	1.15.0	254bef7b4a32b52346bdcdf4b8a432b582a9ddb4	<a href="https://github.com/wayland-project/wayland">https://github.com/wayland-project/wayland</a>
libva	2.8	3cc2212c38630ffc6c6b38e0bd867845adee5ed9	<a href="https://github.com/intel/libva.git">https://github.com/intel/libva.git</a>
libvdpau	1.1.1	af517f56d64118520aa0c8456318dd9ec3307e94	<a href="https://github.com/freedesktop/libvdpau.git">https://github.com/freedesktop/libvdpau.git</a>
LLVM	9.0	c2f5309b216cb02a0aae17353549d985b5b05635	<a href="https://github.com/llvm-mirror/llvm">https://github.com/llvm-mirror/llvm</a>
Firmware	Master	74bd44fccd62b8330e96062b18720ef2367c7acd	<a href="https://git.kernel.org/pub/scm/linux/kernel/git/firmware/linux-firmware.git">https://git.kernel.org/pub/scm/linux/kernel/git/firmware/linux-firmware.git</a>
Vulkan	refs/tags/v-2020.Q3.5	7933159b1b0b7fde72d155cc52ca1ce0c5fb4b52	<a href="https://github.com/GPUOpen-Drivers/AMDVLK.git">https://github.com/GPUOpen-Drivers/AMDVLK.git</a>
<b>Supported Applications</b>			
LunarG Vulkan SDK	1.1.135	NA	<a href="https://vulkan.lunarg.com/sdk/home#linux">https://vulkan.lunarg.com/sdk/home#linux</a>
Vulkan CTS	1.2		<a href="https://github.com/KhronosGroup/Vulkan-CTS.git">https://github.com/KhronosGroup/Vulkan-CTS.git</a>
RGP	1.6	NA	<a href="https://github.com/GPUOpen-Tools/Radeon-GPUProfiler/tree/v1.6">https://github.com/GPUOpen-Tools/Radeon-GPUProfiler/tree/v1.6</a>

## 5. Features Supported on APU

Supported features are shown in the following table.

Feature Group	Feature supported	4.19.8				5.4.2			
		SE/BE	MF/BF/PF	V1000	R1000/LP	SE/BE	MF/BF/PF	V1000	R1000/LP
2D	2D acceleration	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
3D	EGL 1.4, 1.5, EGL extensions.	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
3D	OGL 4.5, OGL 4.6	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
3D	GLX 1.4	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
3D	DRI3 support	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
3D	DRI3 updates (VDPAU, VA-API)	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
3D	Vulkan Open Source	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
2D	10 bit Display	NA	NA	Yes	Yes	NA	NA	Yes	Yes
Audio	DP Audio supports for standard	No	Yes	Yes	Yes	No	Yes	Yes	Yes
Audio	I2S Audio	NA	NA	Yes	Yes	NA	NA	Yes	Yes
Display	EDID(Basic)	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Display support	X and Desktop support	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Display support	Tear Free Desktop	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Display support	Partial support RandR 1.4 capabilities	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Display support	Kernel Mode Setting	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Display support	4K60HZ display support	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Display support	Multi-GPU support (Refer table below for dGPU pairing)	No	MF(Yes), BF(Yes), PF (Yes-untested)	Yes	No	No	MF(Yes), BF(Yes), PF(Yes-untested)	Yes	No
Display support	No of Displays supported (Refer display support table below)	-	-	-		-	-	-	
Display support	4K cinema	No	Yes	Yes	Yes	No	Yes	Yes	Yes

Display support	DP MST	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Display Support	Single Large Surface (SLS)	No	Yes	Yes	Yes	No	Yes	Yes	Yes
Play back	Play back support MPV player using VAAPI / VDPAU	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Play back	Play back support for Gstreamer using VAAPI, gstomx (not recommended)	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Play back	1080p 24fps, 30 fps and 60fps video play back	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Play back	4k 30fps video play back	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Play back	4k 60fps video play back	NA	Yes	Yes	Yes	NA	Yes	Yes	Yes
Power Management	Power Play support to re-clock	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Power Management	initial GPU reset support	No	Yes	Yes	Yes	No	Yes	Yes	Yes
Power Management	Power Play sysfs interface for manually selecting clock speeds	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
VDPAU PostProcessing	Deinterlace	No	No	Yes	Yes	No	No	Yes	Yes
VDPAU PostProcessing	Edge Enhancement	No	No	Yes	Yes	No	No	Yes	Yes
VAAPI Postprocessing	Deinterlace	No	No	Yes	Yes	No	No	Yes	Yes
Transcode	4k Encode	No(1080p supported)	Yes	Yes	Yes No(LP)	No(1080p supported)	Yes	Yes	Yes No(LP)
Video Quality	Scaling and color space conversion (CSC)	No	Yes	Yes	Yes No(LP)	No	Yes	Yes	Yes No(LP)
Video Quality	Pull down detection and Deinterlacing	No	Yes	Yes	Yes No(LP)	No	Yes	Yes	Yes No(LP)
Video Quality	Support for software scaling	No	Yes	Yes	Yes	No	Yes	Yes	Yes
Video Quality	Support for hardware scaling	Yes	Yes	Yes	Yes	No	Yes	Yes	Yes

Video Quality	10-bit Decode with 10 bit render	NA	NA	Yes	Yes	NA	NA	Yes	Yes
Compute	OpenCL (ROCm 3.8)	NA	NA	Yes	No	NA	NA	Yes	No
dGMA – OpenGL		NA	NA	NA	NA	NA	NA	NA	NA
dGMA - OpenCL		NA	NA	NA	NA	NA	NA	NA	NA
fTPM		NA	NA	Yes *	Yes	NA	NA	Yes*	Yes
RJ45	1G	NA	NA	Yes (V1000 NPU also)	Yes	NA	NA	Yes (V1000 NPU also)	Yes
	10G	NA	NA	Yes* (V1000 NPU also)	Yes	NA	NA	Yes* (V1000 NPU also)	Yes
SFP+ (connector)	1G	NA	NA	Yes* (V1000 NPU also)	Yes	NA	NA	Yes* (V1000 NPU also)	Yes
	10G	NA	NA	Yes* (V1000 NPU also)	Yes	NA	NA	Yes* (V1000 NPU also)	Yes
eMMC	BC	NA	NA	Yes (V1000 NPU also)	Yes	NA	NA	Yes (V1000 NPU also)	Yes
	HS200	NA	NA	Yes (V1000 NPU also)	Yes	NA	NA	Yes (V1000 NPU also)	Yes
	HS400	NA	NA	Yes (V1000 NPU also)	Yes	NA	NA	Yes (V1000 NPU also)	Yes
SD Card	SD UHS I – SDR50	NA	NA	Yes (V1000 NPU also)	Yes	NA	NA	Yes (V1000 NPU also)	Yes
	SD UHS I – SDR104	NA	NA	Yes (V1000 NPU also)	Yes	NA	NA	Yes (V1000 NPU also)	Yes
	SD UHS I – SDR104	NA	NA	Yes (V1000 NPU also)	Yes	NA	NA	Yes (V1000 NPU also)	Yes
I2C		Yes	Yes	Yes (V1000 NPU also)	Yes	Yes	Yes	Yes (V1000 NPU also)	Yes
SPI Kernel Driver *		NA	NA	Yes	Yes	NA	NA	Yes	Yes

\*Bilby platform only

\*To make use of SPI kernel driver on Bilby Platforms, Required BIOS which has enabled SPI Entry in the ACPI table. Default BIOS doesn't have this. Please contact FAE for the required BIOS.

## 6. Features Supported on DGPU:

Supported features are shown in the following table.

Feature Group	Feature supported	Kernel 4.19.8						Kernel 5.4.2					
		E9390	E9560	E9260	E9550	E917X	E9565	E9390	E9560	E9260	E9550	E917X	E9565
2D	2D acceleration	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
3D	EGL 1.4, 1.5, EGL extensions.	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
3D	OGL 4.5	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
3D	OGL ES 3.2, 3.1, 3.0, 2.0, 1.1	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
3D	GLX 1.4	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
3D	DRI3 support	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
3D	OpenGL composited desktop(unt ested)	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
3D	DRI3 updates (VDPAU, VA-API)	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
3D	Vulkan Open Source	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
2D	10-bit render	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Audio	DP Audio supports for standard bitrates	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Display	EDID	NA	NA	Yes	Yes	Yes	Yes	NA	NA	Yes	Yes	Yes	Yes
Display support	X and Desktop support	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Display support	Tear Free Desktop	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Display support	Kernel Mode Setting	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Display support	4K60HZ display support	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes

Display support	Multi-GPU support	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Display support	No of Displays supported	Refer display support table below					Yes	Refer display support table below					Yes
Display support	4K cinema	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Display support	DP MST	NA	NA	Yes	Yes	Yes	Yes	NA	NA	Yes	Yes	Yes	Yes
Display Support	Single Large Surface (SLS)	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Play back	Play back support MPV player using VA-API / VDPAU	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Play back	Play back support for Gstreamer using VA-API, gstomx (not recommended)	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Play back	1080p 24fps, 30 fps and 60fps video playback	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Play back	4k 30fps video playback	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Play back	4k 60fps video playback	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Power Management	Power Play support to re-clock	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Power Management	initial GPU reset support	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Power Management	Power Play sysfs interface for manually selecting clock speeds	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
VDPAU Postprocessing	Deinterlace, Edge Enhancement	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
VA-API Postprocessing	Deinterlace	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes

Transcode	4Kx2K Encode	NA	NA	Yes	Yes	Yes	Yes	NA	NA	Yes	Yes	Yes	Yes
Video Quality	Scaling and color space conversion (CSC)	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Video Quality	Support for software scaling	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Video Quality	Support for hardware scaling	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Video Quality	10-bit Decode with 10-bit render	NA	NA	NA	NA	NA	NT	NA	NA	NA	NA	NA	NT
OpenCL (ROCm 3.8)	Compute	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes

**Display support:**

Platform	No of display(s)
R1000 LP	R1102G(B2): 1x4k@60HZ or 2x1080@60HZ R1305G(B4): 2x4k@60HZ or 3x1080@60HZ
R1000	3
V1000	4
Steppe Eagle	2
Bald Eagle	3
BF	2
MF	3
PF	2
G-Series LX	2
G-Series LX2	2
E9390	4
E9560	4
E9260	5
E9550	6
E9171	5
E9172	5
E9173	3
E9174	5
E9175	5
E9565	6



## 7. HW codec support

Codec	API	Middleware/framework
H.264 decode	VAAPI, VDPAU, OMX	ffmpeg-VAAPI, ffmpeg-VDPAU, gst-VAAPI, gst-OMX
H.265 decode	VAAPI, VDPAU, OMX	ffmpeg-VAAPI, ffmpeg-VDPAU, gst-VAAPI, gst-OMX
H.265 10bit->8bit decode (PF & V1000 only)	VAAPI	ffmpeg-VAAPI
MPEG2 decode	VAAPI, VDPAU, OMX	ffmpeg-VAAPI, ffmpeg-VDPAU, gst-VAAPI, gst-OMX
MPEG4 Part2 decode	VDPAU	ffmpeg-VDPAU
VC1 decode	VAAPI, VDPAU	ffmpeg-VAAPI, ffmpeg-VDPAU, gst-VAAPI
H.264 encode	VAAPI, OMX	gst-VAAPI, gst-OMX,
VP9 decode	VAAPI	Ffmpeg-VAAPI

## 8. Platforms Supported

1. R1000LP
2. R1000
3. V1000
4. V1000 NPU
5. Steppe Eagle
6. Bald Eagle
7. Merlin Falcon
8. Brown Falcon
9. Prairie Falcon
10. E9390 dGPU
11. E9560 dGPU
12. E9260 dGPU
13. E9550 dGPU
14. E9171 dGPU
15. E9172 dGPU
16. E9173 dGPU
17. E9174 dGPU
18. E9175 dGPU
19. E9565 dGPU

## 9. Tested platform configurations

The following tables show the system configuration that was used for testing the driver package.

<b>R1000 LP</b>	
APU	R1000 LP
APU Frequency	B2 6W, B4 8W/10W
BIOS version	RBB1205C
VRAM setting	4GB
RAM	16GB
Display Convertors / Dongles Used	DP to HDMI, HDMI
Storage disk	HDD, SSD, M.2

<b>R1000</b>	
APU	R1000
APU Frequency	B2 15W, B4 15W/25W
BIOS version	RBB1205C
VRAM setting	4GB
RAM	16GB
Display Convertors / Dongles Used	DP to HDMI, HDMI
Storage disk	HDD, SSD, M.2

<b>V1000/NPU</b>	
APU	V1000
APU Frequency	B10 45W (3350 MHz), B8 45W(3250 MHz), B8 15W(2000 MHz), B3 15W(2000 MHz)
BIOS version	RBB1205C
VRAM setting	4GB
RAM	16GB
Display Convertors / Dongles Used	DP to HDMI, DP to VGA, DP to DVI, mDP
Storage disk	HDD, SSD, M.2

<b>GX212JC</b>	
APU	Steppe Eagle
APU Frequency	CPU 1200 Mhz, GPU R1E 600 Mhz
BIOS version	ROP100J
VRAM setting	2GB
RAM	2x4GB DDR3 Non ECC
Display Convertors / Dongles Used	DP
Storage disk	HDD

<b>Merlin Falcon Based DB-FP4 Bettong Platform</b>	
APU Frequency	2400 MHZ
BIOS version	RBE130CB – Bettong BIOS
VRAM setting	2 GB
RAM	8 GB
Display Convertors / Dongles Used	DP to HDMI, DP to VGA, DP to DVI, mDP
Storage disk	SSD, HDD

<b>Brown Falcon Based DB-FP4 Pademelon Platform</b>	
APU Frequency	1000 MHz
BIOS version	RPD130CB – Pademelon BIOS
VRAM setting	2 GB
RAM	8 GB
Display Convertors / Dongles Used	DP to HDMI, DP to VGA, DP to DVI, mDP
Storage disk	HDD

<b>Prairie Falcon Based DB-FP4 Pademelon Platform</b>	
APU Frequency	2400 MHz
BIOS version	RPD130CB– Pademelon BIOS
VRAM setting	1 GB
RAM	4 GB
Display Convertors / Dongles Used	DP to HDMI, DP to VGA, DP to DVI, mDP
Storage disk	HDD

<b>eKaveri Based Bald Eagle Platform</b>	
APU Frequency	2700 MHz
BIOS version	TALAM142 – Bald Eagle BIOS
VRAM setting	2 GB
RAM	8 GB
Display Convertors / Dongles Used	DP to HDMI, DP to VGA, DP to DVI, mDP
Storage disk	SSD, HDD

## 9. Multi GPU Pairing

<b>APU</b>	<b>dGPU</b>
R1000	E9260, E9171, E9173, E9550, E9390, E9560, E8565
V1000	E9260, E9550, E9171, E9172, E9173, E9174, E9175, E9390, E9560, E9565
V1000 NPU	E9550, E9173, E9260, E9390, E9560
MF	E9260, E9550, E9171, E9172, E9173, E9174, E9175
BF	E9260, E9550, E9173

## 10. Issues fixed

1. Fixed OGL CTS failures.
2. Hard Hang observed on exiting Unigine heaven with 1080p resolution on 4k monitor(fullscreen).

3. Mouse cursor disappears when Unigine Heaven is run in fullscreen mode.
4. Video corruption observed while running UnigineHeaven.
5. Randomly S3 fails on R1000.
6. S3 fails due to CRTC flip\_done timed out.
7. System fail to boot with 5.4.2 kernel results in soft hang on Steepeagle platform.
8. System hard hang observed while exiting Unigine Heaven Benchmark @1080p resolution on 4k display.
9. Frame drop(>10) observed consistently while playing H.264@60fps video with vaapi/gpu decoder.
10. System hang observed on resumption from S3 with vaapi/vdpau video playback.
11. Randomly S3 fails on V1000/R1000/R1000LP with XHCI failures due to USB HW issue.
12. One of the monitor going blank after doing multiple S3 with MST Hub configuration.
13. Randomly S3 fails with reboot or hot plug of power cable.
14. Sporadically hard hang observed with S3 Video Playback in R1000LP.
15. Heavy stutters and frame drops observed after resuming from sleep.
16. Network is disabled after every suspend and resume.
17. SME is not enabled.

Note: SME is not functional with amdgpu driver. Please use nomodeset for SME functionality.

18. Less throughput observed with UDP compared to TCP.

Note: Able to achieve comparable bandwidth with UDP with IXChariot tool.

## 11. Known Issues/Limitations

### R1000 LP Issues:

1. Heavy stutter in slideshow presentation and Multimedia playback in dual monitor usecase.  
Note: Issue is happening due to hitting the power limit with the above use case.
2. Minor Tearing is observed while doing skype video calling in fullscreen.
3. Tearing and stutter observed in Multimedia playback of H265 1080p@60fps in dual monitor scenario along with PPT presentation in one monitor.

### R1000 Issues:

1. Not showing GPU Load in amdgpu\_pm\_info sysfs entry on V1000 and R1000/LP.
2. User experience is very poor after hotplug on mGPU config with more than 6 monitors.

### V1000 issues:

1. Disable the GFXOFF for OpenCL(ROCm 3.8) usage as below in the grub.  
Workaround: add "amdgpu.ppfeaturemask=0xffff3fff" in the grub.
2. More than 20 Frame drops are observed with H265 4k@60fps playback.
3. Failures observed in OpenCL Conformance test case execution.
4. Unigine Heaven-Extreme hang with 4x4k displays.

5. Few HSA conformance samples failed.
6. Few OpenCL with CPP tests failed.
3. On Intel CPU(I54690K) + AMD dGPU(E9260] HIP Sample- module\_api results in soft hang/failure.
4. OpenCL-GL sharing samples in AMDAPPSDK fail.

#### Steppe Eagle:

1. Observed amdgpu load failure with ECC memory.
2. WebGLConformance Tab Crashes while running Webglconformance.  
Workaround: Don't run all/conformance/textures/misc test cases.

#### Common Issues:

1. Randomly S3 fails with CRTC flip\_done timed out.
2. System hard hang observed while exiting Unigine Heaven with 1080p resolution on 4k Display.
3. Few of the display blank out with MST hub in 5.4 kernel.
4. Few of the VulkanCTS 1.2 test cases fails with error of VK\_ERROR\_OUT\_OF\_HOST\_MEMORY.  
[Workaround]: Vulkan CTS 1.1.3 works fine.
5. IO Page fault logs observed while loading the I2S module.
6. HP Z27s monitor resolution change does not take effect sometimes.  
*Recommendation:* Not to use the monitor since the monitor issues HPD pulse during Changing resolution causing to revert to previous/native resolution sometimes.
7. Hotplug root node of DP MST monitors in daisy chain or via Hub fails.  
*Workaround:* To always connect or disconnect monitors in MST configuration one by one and not at root node level.
8. sporadically soft hang observed while doing "capture profile" in Remote profiling of Hologram (RGP) on V1000/R1000.
9. white screen observed when running phoronix test cases(tropics,sanctuary).
10. Artifacts observed during video playback with multiple 4K monitors on E9173 dGPU.
11. Display artifacts while doing S3 with max 4k monitors on APU's.
12. Corruption on all four 4k monitors when resize the Video play back window to full screen and vice versa.  
*Workaround:* issue root caused to display underflow and GPU usage high indicating usage beyond hardware capability. A workaround is to disable window effects using command "gsettings set org.gnome.desktop.interface enable-animations false"
13. All MST displays goes blank while booting with MST Hub and MST off on the monitors.
14. Tearing/Stutter observed during 4k@60fps playback on 2x4k monitors.  
*Workaround:* Use zaphord Head configuration to play 4k@60fps video on multi monitor setup.
15. Hard hang observed for Piglit tests.  
*Workaround:* Piglit test passed without arb\_tessellation\_shader-tes-gs-max-output test cases.

16. Base mark Web3.0 failed.
17. Stuttering observed with glmark2 on mGPU config.  
*Workaround:* Use multi screen configuration to resolve the stutter.
18. [BE]: Observed Issues with HotPlug on Bald Eagle.
19. [BE]: S3 Fails randomly on BaldEagle with IOMMU enabled.
20. Issues with refresh rate change/rotate using xrandr command.
21. Export MESA\_GLES\_VERSION\_OVERRIDE=3.2 to run OGL ES 3.2 CTS.
22. Hot plug results in blank display of one of the monitors when using startx mode.
23. B-frame support is not available in vaapi encode.
24. MF has limitation of displaying 2 – 4K monitors, 3rd 4 K monitor will not get displayed.
25. Following OGL CTS test cases do not work
  - a. GL45-CTS.stencil\_texturing.functional
  - b. GL45-CTS.multi\_bind.dispatch\_bind\_textures
  - c. GL45-CTS.multi\_bind.dispatch\_bind\_image\_textures
  - d. GL45-CTS.arrays\_of\_arrays\_gl.SubroutineFunctionCalls2
  - e. GL45-CTS.sparse\_buffer\_tests.BufferStorageTest
  - f. GL45-CTS.shader\_atomic\_counters.basic-usage-fs
  - g. GL45-CTS.shader\_atomic\_counters.basic-usage-vs
  - h. GL45-CTS.shader\_atomic\_counters.basic-usage-gs
  - i. GL45-CTS.shader\_atomic\_counters.basic-usage-tes
  - j. GL45-CTS.shader\_atomic\_counters.basic-usage-cs
  - k. GL45-CTS.parallel\_shader\_compile.CompilationCompletionNonParallelTest
  - l. GL45-CTS.parallel\_shader\_compile.CompilationCompletionParallelTest
  - m. GL45-CTS.enhanced\_layouts.ssb\_member\_offset\_and\_align
  - n. GL45-CTS.enhanced\_layouts.vertex\_attrib\_locations
  - o. GL45-CTS.parallel\_shader\_compile.MaxShaderCompileThreadsTest

#### XGBE:

1. [XGBE]: Force mode(Auto negotiation disabled) is not supported in RJ45.
2. Sporadically 2.5G Network is established after a delay of more than 20 sec for SFP 2.5 on Port 0/1.
3. 10G SFP Hot plug(FC) is not working with NetGear switch(XS724EM model)
4. Can't concurrently enable SFP+ and RJ45 interfaces.
5. No IEEE 1588 Timestamp support.
6. No receive Split header support.
7. Following features should be functional but have not been fully validated: Priority and VLAN (VLAN Priority Control), RMON Counter, VLAN support and Receive-Side scaling, 2.5G TCP/IP offload (duplex) and 2.5G jumbo frames (duplex).

**Below is the type of SFP/RJ45 modules used in the XGBE validation of this release.**

Type	Model	Part Number
1G SFP - RJ45	BEL	SFP-1GBT-06
1G SFP - RJ45	Finisar	FCLF8521P2BTL
10G SFP+ passive direct cable	Finisar	F17CC004893
10G SFP optical	Finisar	FTLX8574D3BCL
10G SFP optical	Finisar	FTLX851D3BCL
10G SFP optical	Intel	E10G42BTDABLK
10G SFP optical	Intel	AFBR-709DMZ-IN2

### FreeSync:

1. Only one monitor should be attached to system.
2. The game should be running in fullscreen mode.
3. In case of mGPU, Xorg should be configured for multiscreen mode with only one monitor attached to the GPU where freesync is to be enabled. Please note that window managers should also have good support for multiscreen mode.
4. Supported only on DP.

### MultiGPU:

1. Maximum framebuffer / viewport size supported by the GFX engine is 16K. When more than 8 2K monitors are arranged horizontally, we hit this limitation and corruption is observed on a few monitors. To overcome this limitation, the monitors must be re-arranged in a way that 16K limit is not exceeded. Xrandr can be used for this.
2. Beyond 8 monitors, the display doesn't come up. Xrandr via ssh needs to be used to achieve the goal of not exceeding 16k limit.

### Third Party Issues/Limitations:

1. Terminal switching results in hard hang randomly. Issue root caused gnome which is third party component.  
<https://bugs.launchpad.net/ubuntu/+source/gdm3/+bug/1758512> .
2. Switching to console mode upon hotplug results in soft hang. Issue root caused gnome which is third party component.  
<https://bugs.launchpad.net/ubuntu/+source/gdm3/+bug/1758512> .

3. Stutter can be observed when stream framerate and monitor refresh rate are different. This is expected phenomenon. Stutter can be minimized with interpolation option in mpv. But it can introduce corruption and other side effects.

## Troubleshoot

This release supports the latest 2 Long Term Linux Kernels. The user-space components are selected with the best possible availability of stable components at the time of release.

The user-space components are available to the users through open source policy. Please be advised to upgrade the open source user-space components as per need and resolution through latest user-space.

The Embedded release for open source component is based on Ubuntu 18.04.1 distribution.

Here are a few troubleshoot pointers for resolution for non-amdGPU components.

1. In multi-GPU use-case, a monitor connected to APU doesn't come up while boot during multiscreen rendering. The monitor connect to dGPU loads correctly.  
This issue happens because of gnome desktop environment used by 18.04.1. The gnome desktop environment does not support multi-screen configuration. To fix this issue, use XFCE desktop environment.
2. dmesg points to "Bandwidth validation fails", one of the monitors gets blackout after connecting more than 2 - 4K monitors on MF  
When display load fails the bandwidth validation, there is no fallback mechanism provided through the Linux OS. Under such situation, customers can reduce the refresh rates or resolution of monitor for the getting the monitor lightup.
3. Unigine Heaven Pro shows white screen  
Follow the following steps to allow GLSL #extension directives in the middle of shaders

1. Install driconf (sudo apt-get install driconf)
2. Run driconf (sudo driconf)
3. In application settings add Unigine heaven if it does not exist (application name: Unigine Heaven, Executable name: heaven\_x64)
4. Add: Allow GLSL #extension directives in the middle of shaders: Yes (using "add setting" button. You can remove all other settings if present)
5. Retry unigine heaven

4. Suspend/Resume with and without playback  
Use systemctl suspend rather than pm-suspend.

Below link suggests the usage of systemctl suspend.

<https://askubuntu.com/questions/1792/how-can-i-suspend-hibernate-from-command-line>

More details on why systemd is preferred over other tools

<https://wiki.archlinux.org/index.php/Systemd>



## 12. Support

Please contact your Field Applications Engineer for support on this release.

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