ARNOLD TO RADEON PRORENDER CONVERSION REPORT

Version 2.2, 1 February 2019 (all reports)

This report summarizes results of tests made to convert Arnold nodes to Radeon ProRender nodes.

- **Software**: Maya 2018, Arnold 3.1.1.1, ProRender 2.5.245
- **Hardware**: Ryzen 1700x, i5 7500, i7 6700k

SUMMARY

For the report, **108** Arnold nodes within **7** node groups has been tested in total. The results of conversion are as follows:

- CONVERTIBLE: **22 nodes** (**20%**), see details
- PARTIALLY CONVERTIBLE: **12 nodes** (**11%**), see details
- NOT CONVERTIBLE: **42 nodes** (**39%**), see details
- RESEARCH IS NEEDED: **32 nodes** (**30%**), see details

This week we focused on adding new Arnold materials and a few Utilities nodes to convert to Radeon ProRender. We also did some bug fixes for aiSkyDome intensity and bump/normal maps conversion.

We added support of aiCarPaint to the ProRender Uber material, aiFog and aiAtmosphere to ProRender Volume material, and aiShadowMatte to Shadow catcher. In future, we would like to research and investigate remaining bugs or aiNodes to be added to the script.

REPORT DETAILS

In this report:

HISTORY

v.1.0 - first version.

v.1.1 - aiStandartSurface support.

v.1.2 - displacement, bump2d conversion.

v.1.3 - aiSkyDomeLight and aiAreaLight support.

v.1.4 - Opacity reverse node, rotate IBL and aiPhysicalSky support.

v.1.5 - aiPhotometricLight support.

v.1.6 - Fix ies light position; aiStandartVolume, aiMixShader, aiFlat, aiSky, aiAdd, aiSubstract, aiDivide, aiMultiply support.

v.1.7 - Fix bug with channel converting, fix bug with creating extra materials.

v.2.0 - Rewritten to python, update material conversion.

v.2.1 - aiMath nodes support, aiImage and aiFacingRatio conversion support, aiAmbientOcclusion material conversion support, Improve metalness, coat, subsurface and normal map conversion in aiStandartSurface, improve displacement conversion, fixed issue with group of lights, fixed issue with unassigned materials with shadow catcher

v.2.2 - Fixes for aiSkyDome intensity, fixes for Maya 2d bump not being converted to correct ProRender Bump or Normal nodes, fixed thickness Values and color when converting aiStandardSurface material using Coat, added aiColor convert utility node, converts to Maya RGB to HSV and HSV to RGB utility nodes, added conversion of aiShadowMatte to ProRender shadow catcher, added aiFog and aiAtmosphere to ProRender Volume material (note a user may have to do some changes in Volume material to get correct results), added aiCarPaint to ProRender Uber material with exceptions of Flakes.

SCRIPT LINK

The latest version of the conversion script: download script.

KNOWN ISSUES

The following JIRA issues affecting the conversion process were identified:

- Passthrough brdf node is needed (RPRMAYA-893)
- Lights gets converted with Incorrect brightness (RPRTOOL-68)
- Render view doesn't conform to resolution gate in viewport (RPRMAYA-880)
- IES lights no longer work after adding a new more powerful IES light (RPRMAYA-216)
- Texture Data lost when using RGB to HSV or HSV to RGB maya nodes (RPRMAYA-938)
- Maya Photometric lighting has incorrect Positions in scene and renders way to bright (RPRTOOL-79)
- CarPaint material (RPRMAYA-887)
- (Standard nodes) Several standard nodes work only with maps (RPRMAYA-918)
- Add Min, Max, Mod, Floor and Abs operations into RPR Arithmetic node (RPRMAYA-920)
- Add support for Clamp node (or make a new node) (RPRMAYA-919)
- Maya Projection node gives incorrect render results (RPRMAYA-931)

Currently we are having issues when adding aiLightMesh to RPR Physical light mesh type. Probably, the issue is in the API. We also have issues with IES lights not showing when more powerful lights are in the scene. This is an old issue with in the plugin.

In addition, we have issues on the plugin side with some Maya standard nodes, such as Maya RGB to HSV and HSV to RGB where we lose texture data when rendering. For CarPaints, we won't be able to get the exact results without some kind of Flakes generator (work around is that users create their own custom flakes textures).

COMPLEX SCENES

Scene 1

Happy Buddha scene.

Happy Buddha scene using SSS material. For SSS, users may have to tweak the backscattering attributes to get a similar result. aiStandard material uses SSS without backscattering settings.

Arnold	Radeon ProRender v 2.2
	
Radeon ProRender v 2.1	**Radeon ProRender v 2.2**
	

Scene 2

Porsche car scene.

Porsche car scene with metal and roughness maps, aiSkyDome light, and aiShadowMatte material. With some Adjustments like Ray depth settings, the glass material gives closer results. Shadow matte now gets converted to the ProRender Shadow Catcher material. Added the New feature aiCarPaint to the scene. Ray Depths may need some tweaks to get the same results as glass materials.

Arnold	**Radeon ProRender v 2.2**
	
Radeon ProRender v 2.1	**Radeon ProRender v 2.2**
	

Scene 3

Gun scene.

Gun scene: using the newest addition of Arithmetic nodes. aiAbs, aiAtan aiDot, aiPow and aiTrigo, alongside with aiDivide, add subtract and Maya standard Multiply/Divide node.

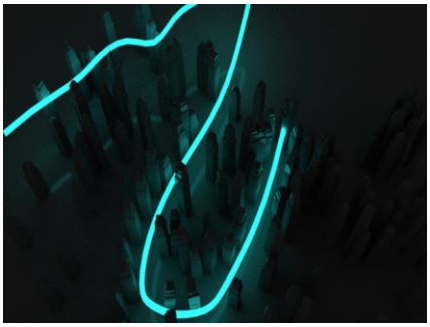
Arnold	Radeon ProRender v 2.2
	
Radeon ProRender v 2.1	**Radeon ProRender v 2.2**
	

Scene 4

Mesh-light scene.

The same issue with the camera as you could see in the RS converter (RPRMAYA-880).

We still have issues with the Intensity of IBL conversions being slightly off. The current workaround is to manually tweak the intensity (RPRTOOL-68).

Arnold	Radeon ProRender v 2.2
	
Radeon ProRender v 2.1	**Radeon ProRender v 2.2**
	

Scene 5

Laptop scene.

Issue - RPRMAYA-880.

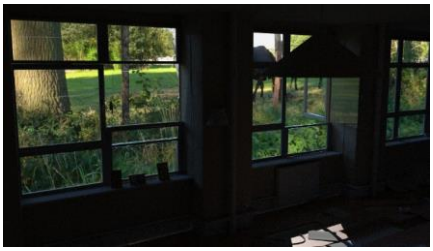
Arnold	Radeon ProRender v 2.2
	
Radeon ProRender v 2.1	**Radeon ProRender v 2.2**
	

Scene 6

Interior room scene.

Interior room using aiSky, aiSkyDome, Maya directional light with some Materials and textures aiStandardSurface Shader.

Tweaking Tone mapping in ProRender slightly helps with the brightness issue. But there's still a main issue that we are not converting the intensity brightness for all lights correctly. There is an issue with brightness between Arnold and ProRender, with Maya standard lights intensity. It seems Arnold handles these lights a bit differently with units (RPRTOOL-96).

Arnold	Radeon ProRender v 2.2
	
Radeon ProRender v 2.1	**Radeon ProRender v 2.2**
	

Scene 7

IES lighting scene.

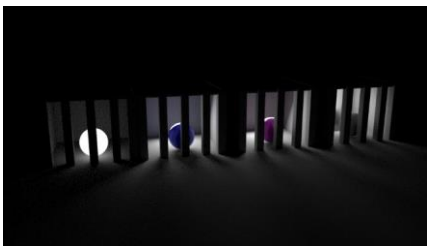
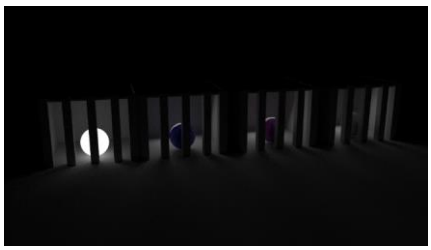
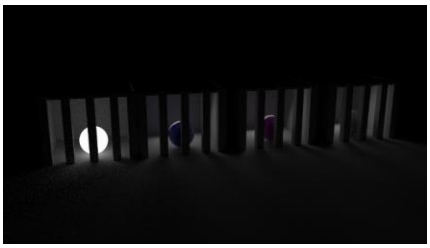
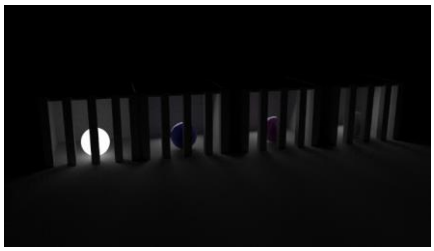
Scene using Photometric lighting with multiple IES lights.

Arnold	Radeon ProRender v 2.2
	
Radeon ProRender v 2.1	**Radeon ProRender v 2.2**
	

Scene 8

Light test Scene.

Scene with aiFLatMaterial, aiStandardSurface materials using SSS skin preset and Procedural math nodes aiAdd, aiSubtract, aiMultiply, and aiDivide.

Arnold	Radeon ProRender v 2.2
	
Radeon ProRender v 2.1	**Radeon ProRender v 2.2**
	

Scene 9

Dragon Scene.

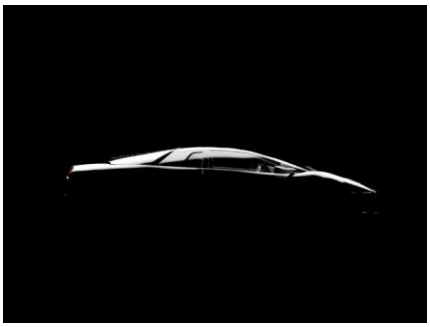
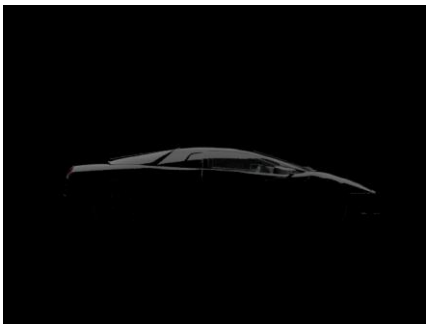
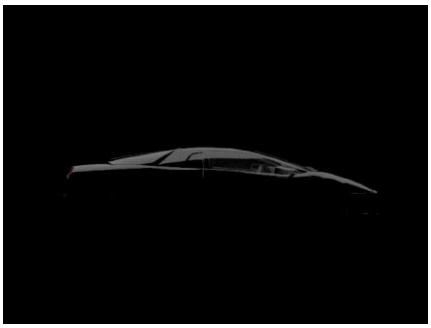
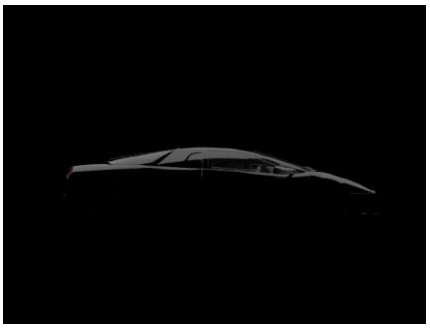
Dragon using aiImage, ai2dbump, aiSkyDome, as well as TIFF and TGA files types.

We still have issues with Intensity of IBL conversions being slightly off. The current workaround is to manually tweak the intensity (RPRTOOL-68).

Arnold	Radeon ProRender v 2.2
	
Radeon ProRender v 2.1	**Radeon ProRender v 2.2**
	

Scene 10

Studio-Side scene.

Arnold	Radeon ProRender v 2.2
	
Radeon ProRender v 2.1	**Radeon ProRender v 2.2**
	

Scene 11

Studio-Rear scene.

Light conversion error/invalid RPR parameters.

Arnold	Radeon ProRender v 2.2
	
Radeon ProRender v 2.1	**Radeon ProRender v 2.2**
	

Scene 12

Studio_Top scene.

Arnold	Radeon ProRender v 2.2
	
Radeon ProRender v 2.1	**Radeon ProRender v 2.2**
	

Scene 13

Mercedes car scene.

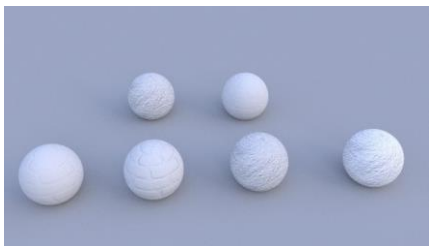
Using aiNormal and aiImage files nodes. Combination of Emissive, metal, and glass materials. Currently planning to change some materials when the aiCar paint becomes available in the script.

Arnold	Radeon ProRender v 2.2
	
Radeon ProRender v 2.1	**Radeon ProRender v 2.2**
	

Scene 14

Bump and Displacement scene.

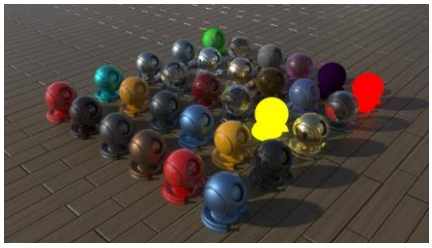
Bump and displacement scene using aiNormal, maya 2d bump, ai2dBump, and Displacement to SG node.

Arnold	Radeon ProRender v 2.2
	

Scene 15

Material test scene.

Material test scene, using aiCarPaint and aiStandardSurface. A variety of different material setups including SSS, glass and emissive materials.

Arnold	Radeon ProRender v 2.2
	

TEST REPORT LINK

For detailed comparison of rendered scenes, see Test Report. The report includes 155 scenes.

Note that this is still the Alpha version of the report. The render process was run on two machines, with AMD and Intel CPUs.

Commented [WU1]: Количество сцен поправить и ссылку

CONVERSION STATUS BY NODE GROUP

Node Group	Total Nodes	Convertible	Partially Convertible	Not Convertible	Research is Needed	Details
Environment	4	0	4	0	0	Link
Files	5	5	0	0	0	Link
Filters	4	0	0	4	0	Link
Lights	4	0	3	0	1	Link
Materials	16	3	3	4	6	Link
Textures	7	1	0	1	5	Link
Utilities	68	13	2	33	20	Link
Total	**108**	22	12	42	32	Link