REDSHIFT TO RADEON PRORENDER CONVERSION REPORT

Version 2.10, 18 December 2018 (all reports)

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

- **Software**: Maya 2018, Redshift 2.6.29, RPR 2.5.245
- **Hardware**: GTX 980/GTX 1080TI (for autotests)

SUMMARY

For the report, **54** Redshift nodes within **7** node groups has been tested in total. The results of conversion are as follows:

- **CONVERTIBLE**: **10** nodes (**18%**), see details
- **PARTIALLY CONVERTIBLE**: **7** nodes (**13%**), see details
- **NOT CONVERTIBLE**: **22** nodes (**41%**), see details
- **RESEARCH IS NEEDED**: **15** nodes (**28%**), see details

Our approach to convert nodes is – we preserving original information as is. When possible we are trying to propagate input values from Redshift to RPR features.
For example:
Architectural, rsMaterial, Incadescent, VolumeScatter, PhysicalLights and IBL (Dome and Environment) – most of their parameters are similar in RS and RPR, so they were copied.

This is a continuous process of refining the formulas, to better match render results, as more testing provides more sample data. Conversion for some of the nodes is yet to be implemented, such as lens and tonemapping effects, as well as proper SSS effects in rsMaterial.

Metal color conversion is currently updated to the working order, using additional blend nodes, that store both reflection (or diffuse for metalness 1) colors, and Reflectivity, giving user means to preserve original colors unchanged, and adapt for RPR Ubermaterial.

REPORT DETAILS

In this report:

WHAT'S NEW

What's new between versions 2.9.4 > 2.10:

1. Intensity conversion in dome light
2. Intensity conversion in Redshift Environment
3. Update conversion of fresnel modes in RedshiftMaterial

SCRIPT LINK

The latest version of the conversion script: download script.

KNOWN ISSUES

The following JIRA issues affecting the conversion process were identified:

- Render view doesn't conform to resolution gate in viewport (RPRMAYA-880)
- Shadow catcher render with a lot of noise and sometimes gets bad results (RPRMAYA-801)
- Textures are being downscaled by supported standard Maya nodes (RPRMAYA-848)
- [Core] Artifacts when using Displacement (RPRMAYA-329)
- [Core]Sky System issue (RPRMAYA-147)

Currently, we have several issues with how some of the values get converted. Mostly, this concerns SSS effects in rsMaterial and SubsurfaceScatter materials.

RPR handles color brightness and saturation differently, we are developing an approach how to convert these settings

VolumeScatter needs further refinement, to compensate for difference between RPR and RS scatter algorithms.

Area light shapes, PhysicalSky conversion, Displacement node value conversions still needs to be implemented.

COMPLEX SCENES

Scene 1

Office interior. Small scene with Sun and Sky, refractive materials, and procedural maps for bump and roughness.

Known issues:

1. Noise procedural for roughness and bump got lost.
2. Area light is dimmer, but most of the brightness is lost due to Tonemapper, and dimmer reflection from materials. Needs more research, is that how RPR handles energy conservation, or something else.

Redshift	**Radeon ProRender (script v.2.10)**
	
Radeon ProRender (script v.2.9.4)	**Radeon ProRender (script v.2.10)**
	

Scene 2

Tank. Object render with displacement ground.

Known issues:

1. Ground Material. Currently, the color layer node is being converted in suboptimal way. To better implement it via series of arithmetic nodes, more complex algorithm is needed.
2. Displacement got lost in conversion. It was supposed to be added into Uber material slot, instead of the shading group slot due to one of the RPR bugs (RPRMAYA-675).

Redshift	**Radeon ProRender (script v.2.10)**
	
Radeon ProRender (script v.2.9.4)	**Radeon ProRender (script v.2.10)**
	

Scene 3

Mustang. Object scene with MatteShadow, VolumeScatter and Carpaint.

Known issues:

1. Car paint doesn't store the edge falloff color for now. Color mixing through the Fresnel node will be needed, with additional testing for map mixing.
2. RPRVolume is not dense enough for this scene, and it isn't visible against the shadow catcher, with very hard border between what's covered with RPRVolume, and what's outside with ShadowCatcher. Possible RPR bug needs investigation.

Redshift	**Radeon ProRender (script v.2.10)**
	
Radeon ProRender (script v.2.9.4)	**Radeon ProRender (script v.2.10)**
	

Scene 4

Complex baked maps.

Known issues:

1. DoF needs to be implemented with the default camera parameters. Possible tonemapper needs to compensate for bokeh.

Redshift	Radeon ProRender (script v.2.10)
	
Radeon ProRender (script v.2.9.4)	**Radeon ProRender (script v.2.10)**
	

Scene 5

Simple interior, part 1

Known issues:

1. Physical sky needs to have more brightness with conversion.
2. Portal lights are converted to area light with white color.
3. DoF, as above.

Redshift	Radeon ProRender (script v.2.10)
	
Radeon ProRender (script v.2.9.4)	**Radeon ProRender (script v.2.10)**
	

Scene 6

Simple interior, part 2

Known issues:

1. Metal for Architectural material gets converted into too dark reflection color.
2. Reflections for Architectural non-metals needs compensation for more effect.
3. DoF and Portal lights as above.

Redshift	Radeon ProRender (script v.2.10)
	
Radeon ProRender (script v.2.9.4)	**Radeon ProRender (script v.2.10)**
	

Scene 7

Shoes

Known issues:

1. Tonemapper as above.
2. Issue with brightness and saturation of the SSS material. Needs more research to determine how to transfer values from RS to RPR with compensation for brighter colors in RS.

Redshift	Radeon ProRender (script v.2.10)
	
Radeon ProRender (script v.2.9.4)	**Radeon ProRender (script v.2.10)**
	

Scene 8

Small object render, lit by Physical Sun and arealights.

Known issues:

1. Translucency->Backscatter conversion issue, need to find more accurate formulas to convert.
2. Area lights shapes reverted to rectangle, while it should've been sphere.
3. Grey color gets too light. Needs investigation.
4. Sun currently doesn't convert to the Directional light, TBD.
5. Maya tonemapping in render view seems to be broken, and intense noise appears in render. Possible, original Redshift scene needs to be redone.

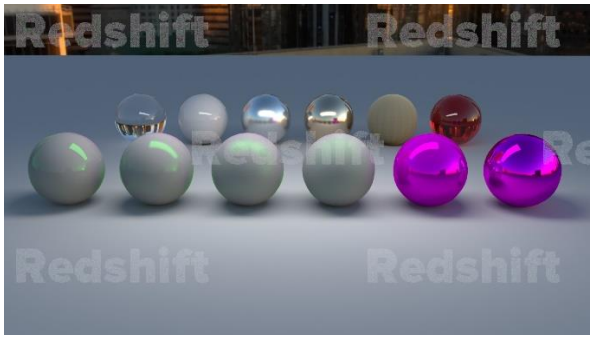
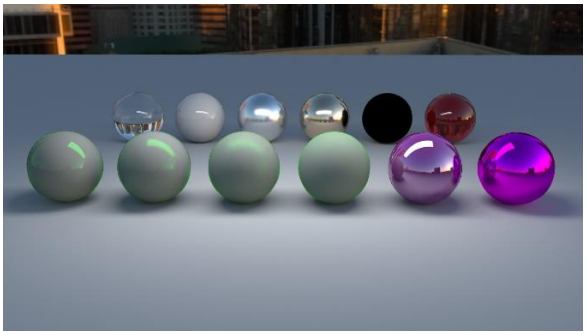
Redshift	Radeon ProRender (script v.2.10)
	

Radeon ProRender (script v.2.9.4)	Radeon ProRender (script v.2.10)
	

Scene 9

Shaderballs scene with set of rsMaterials, CarPaints, Incadescents and Subsurface scatter materials, including materials from previous scene.
Known issues:

1. Diffuse weight 0.5 gives more saturated color in Redshift. Possibly expected behaviour?
2. Material with milky coffee preset is currently unsupported. We are looking for the solution to properly preserve colors and values for extinction mode

Redshift	Radeon ProRender (script v.2.10)
	

Scene 10

Shaderballs scene with set of rsMaterials, CarPaints, Incadescents and Subsurface scatter materials, including materials from previous scene.
Known issues:

1. Same as above, extinction mode is not supported.
2. Subsurface materials have darker colors than they should, needs research for proper formula.
3. Anisotropic effects in RS are more prominent, than in RPR. Either an expected behaviour, or we need value adjustment beyond inputs from RS. Research is needed.

Redshift	Radeon ProRender (script v.2.10)
	

TEST REPORT LINK

For detailed comparison of rendered scenes, see Test Report.

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Login: rpruser
Password: rpruser2017
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Note that this is still the Alpha version of the report. The report includes 306 scenes.

CONVERSION STATUS BY NODE GROUP

Node Group	Total Nodes	Convertible	Partially Convertible	Not Convertible	Research Is Needed	Details
Environment	1	1	0	0	0	Link
Lens	3	0	0	1	2	Link
Lights	7	2	2	1	2	Link
Materials	11	2	2	2	5	Link
Physical Sky	1	0	0	0	1	Link
Utility Nodes	29	5	3	17	4	Link
Volume Scattering	2	0	0	1	1	Link
Total	**54**	**10**	**7**	**22**	**15**	Link