

# R A D E O N

SOFTWARE

# R A D E O N

SOFTWARE

Redesigned. Refined. Supercharged.

Total Driver Releases

29

WHQL Driver Releases

8

Games Supported and Optimized

28+

Downloads

85M+

From AMD.com

Source: AMD internal data  
as of November 10<sup>th</sup>, 2016.

# Radeon Software User Satisfaction



**4.5/5 User Approval Rating**

Source: AMD internal data. 4.4/5 approval rating indicates most recent user satisfaction. internal data obtained November 7<sup>th</sup>, 2016.



"More gamers play on  
Radeon graphics than  
Intel and NVIDIA  
combined."

**JPR**  
Jon Peddie Research

According to Jon Peddie Research, in an AMD-sponsored report dated November 16, 2016 and based on the installed base of x86 based machines used for gaming (i.e., consoles, notebooks, and desktops, and excluding tablets).

For details, see full report at <http://gfxspeak.com/2016/11/16/balance-power-gaming>

# How Developers Create

## DirectX®12 is the Fastest Growing API Ever

**15+ Titles Available Now**

Expected Over 50 DirectX®12 Titles in 2017

QUANTUM  
BREAK

ASHES OF THE  
SINGULARITY

DEUS EX  
MANKIND DIVIDED™

BATTLEFIELD 1

TOTAL WAR:  
WARHAMMER

FORZA  
HORIZON 3

HIT MAN

HALO 5  
FORGE

CIVILIZATION VI

Source: August Steam Hardware & Software Survey: 2016 <http://store.steampowered.com/hwsurvey>, obtained September 29<sup>th</sup>, 2016. See endnotes for details.

# Rediscovering Everything

## Work. Play. Create.



Gaming



VR



Deep Pixels

## Technologies

DirectX 12

Vulkan™



Low level APIs

Game Engines

Millions of  
open source  
projects\*

Open Source

# R A D E O N

## SOFTWARE

Catalyst Omega



2014

Crimson Edition



2015



2016

Third Annual Big Software Release



# R A D E O N

SOFTWARE

# R A D E O N P R O

SOFTWARE

## Crimson ReLive Edition

AMD's advanced graphics software for enabling high-performance gaming, professional grade stability and engaging VR experiences

# How Developers Collaborate

The Ever Increasing Community of Open Standards Developers

VLC Media Player

LibreOffice

Mozilla Firefox®

WordPress

CentOS®

MySQL®

Blender™

ubuntu

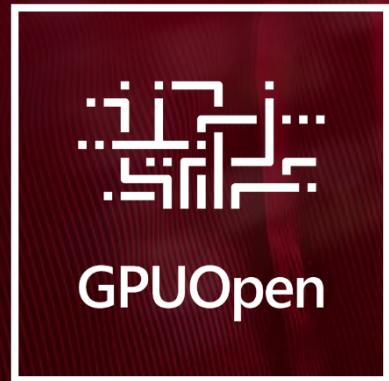
GIMP

Notepad++

Bugzilla

Mozilla Thunderbird™

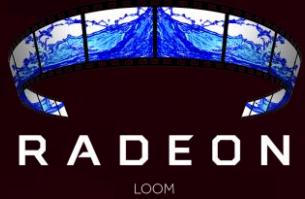
and Over a Million Other Open Source Projects\*



Create. Collaborate. Share.

```
321  
322 {  
323     for (int j = 0; j < (quadCount - 1); j++)  
324     {  
325         vertices.push_back(static_cast<float>(0));  
326         vertices.push_back(static_cast<float>(1));  
327         vertices.push_back(0);  
328     }  
329 }  
330  
331     for (int i = 0; i < fullColumns; ++i)  
332     {  
333         for (int j = 0; j < rows; ++j)  
334         {  
335             indices.push_back(j + i * (rows + 1));  
336             indices.push_back(j + 1 + i * (rows + 1));  
337             indices.push_back(j + 1 + (i + 1) * (rows + 1));  
338             indices.push_back(j + 1 + (i + 1) * (rows + 1));  
339             indices.push_back(j + 1 + (i + 1) * (rows + 1));  
340             indices.push_back(j + 1 + (i + 1) * (rows + 1));  
341         }  
342     }  
343 }  
344  
345     for (int i = 0; i < fullColumns - 1; i++)  
346     {  
347         for (int j = 0; j < rows - 1; j++)  
348         {  
349             indices.push_back(j + i * (rows - 1));  
350             indices.push_back(j + 1 + i * (rows - 1));  
351             indices.push_back(j + 1 + (i + 1) * (rows - 1));  
352             indices.push_back(j + 1 + (i + 1) * (rows - 1));  
353             indices.push_back(j + 1 + (i + 1) * (rows - 1));  
354             indices.push_back(j + 1 + (i + 1) * (rows - 1));  
355         }  
356     }  
357 }
```

Radeon Loom



Radeon Rays



OCAT



Depth of Field

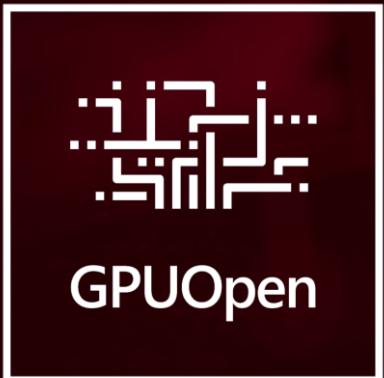


TressFX 4.0



AMF 1.4





[www.GPUOpen.com](http://www.GPUOpen.com)

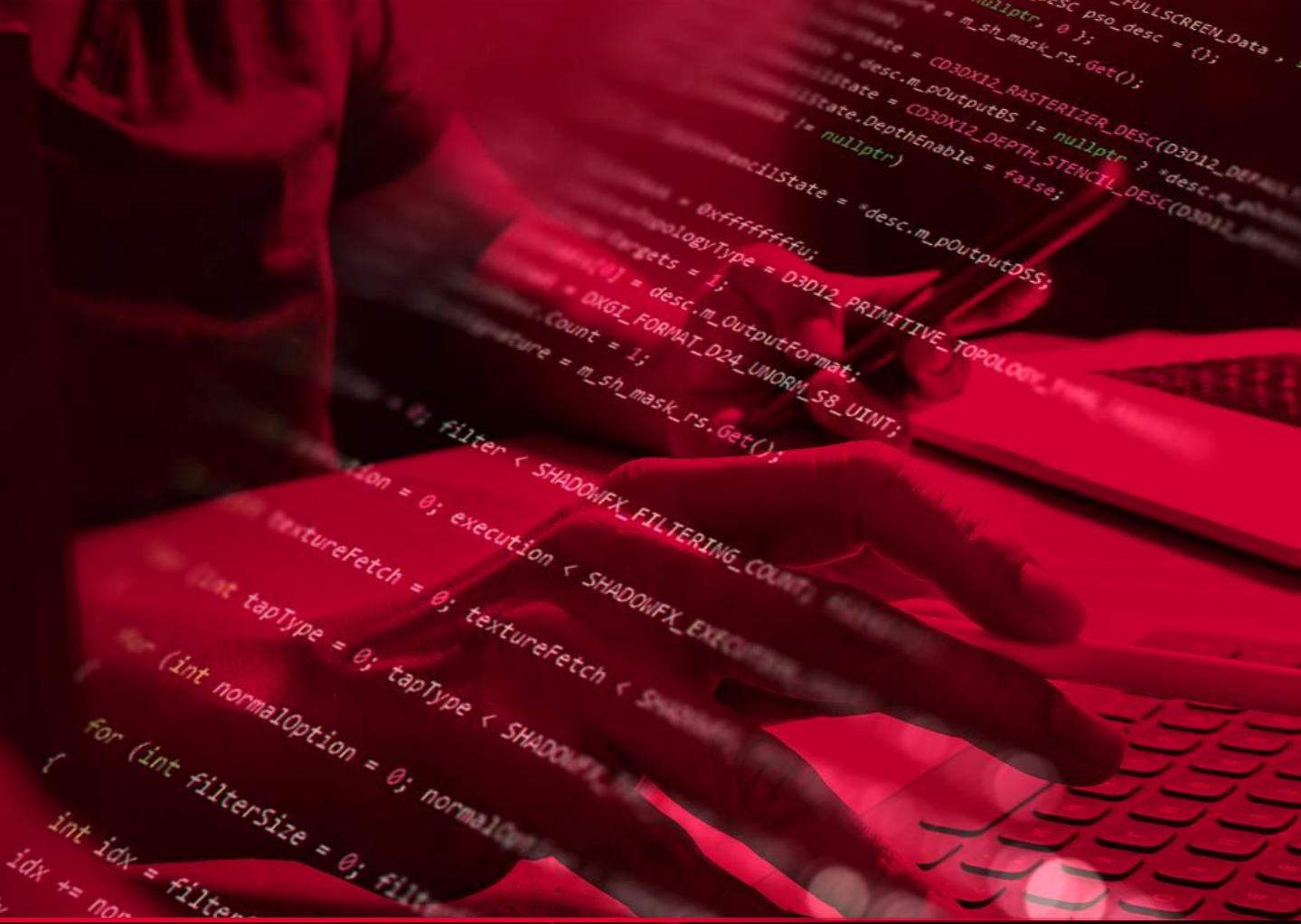
Enabling Developers through  
Open Source

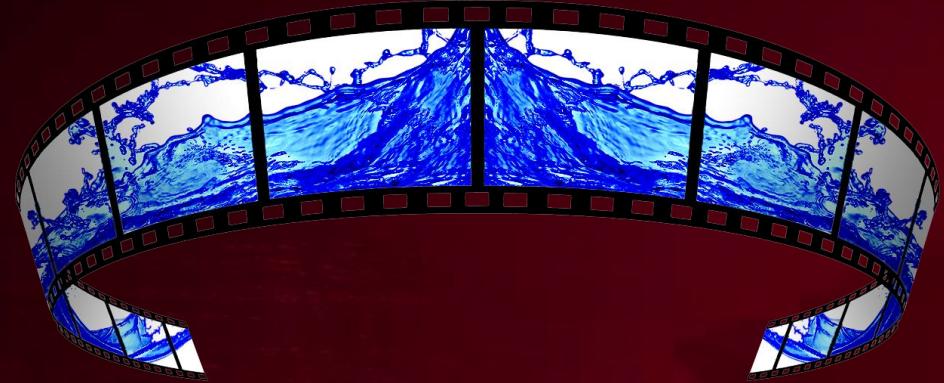
70

SDKs/Samples/Libraries/Tools

82

Developer Blogs





# R A D E O N

## LOOM

A Stitch In Real-time

**Beta Preview Available on GPUOpen Now**



360°

to **4K x 2K**

Stitched output in Real-Time using DirectGMA

24



360°

to **8K x 4K**

Stitched offline output

31

Uses AMD's open source implementation of

**OpenVX™**



# Open Capture and Analytics Tool (OCAT)

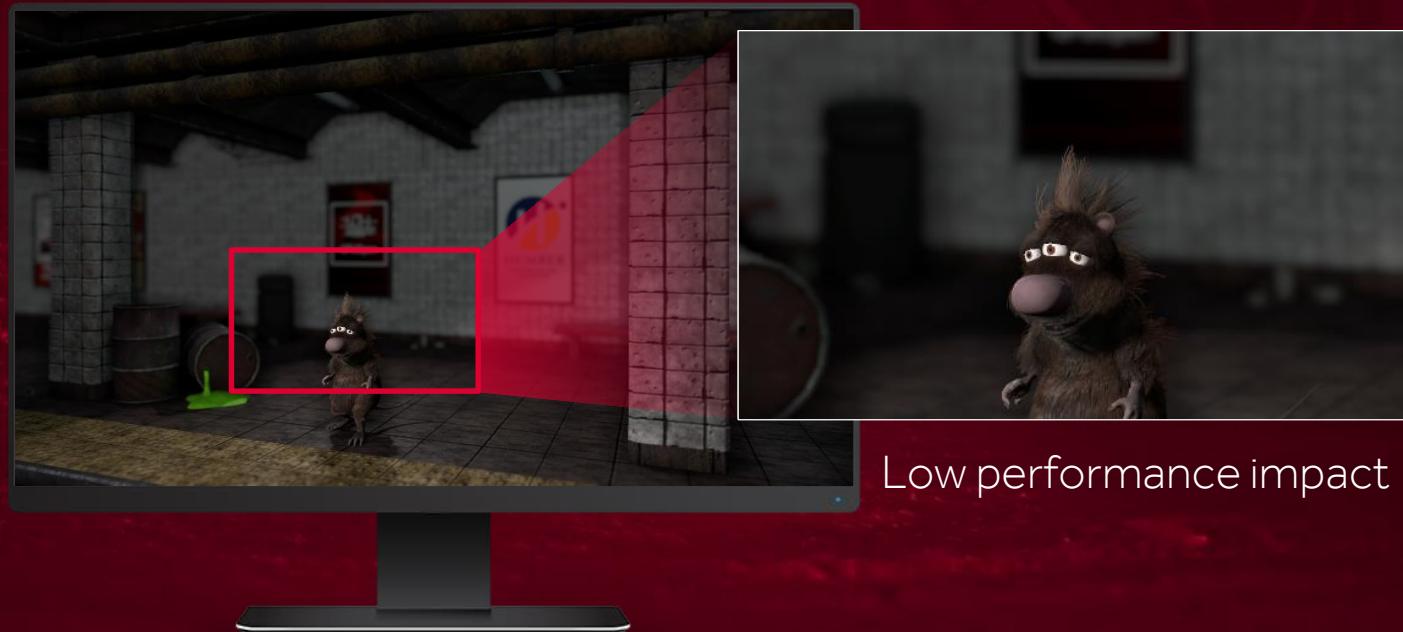
## Third Party Open Source Benchmarking Tool



User Friendly Interface, Exportable CSV Files, Support for DirectX®11, DirectX®12 and Vulkan

# Depth of Field

## Powerful Cinematic Focus Tool



For Illustrative Purposes Only

Support for DirectX®12, Source Code Available Now

# TressFX 4.0

## Adding High Fidelity Hair Interaction



For Illustrative Purposes Only

Increase Developer Control, Scalable Rendering and Supported in DirectX®12

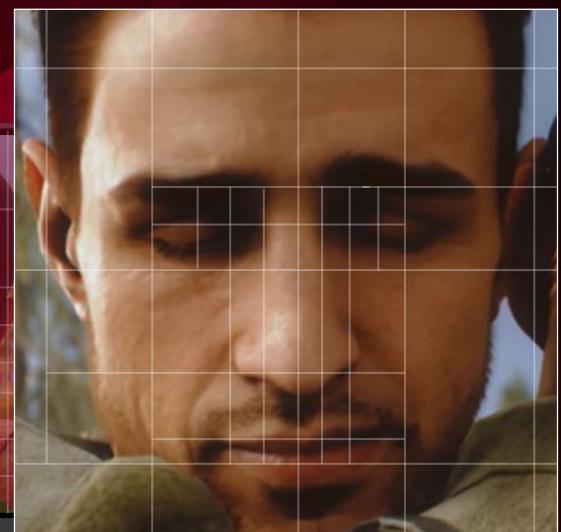
# Advanced Media Framework 1.4

## Expanding AMF H.265 Encoding

H.264



H.265



# How We Engage

## VR is Quickly Becoming Mainstream



2016

2.5M  
VR HMDs

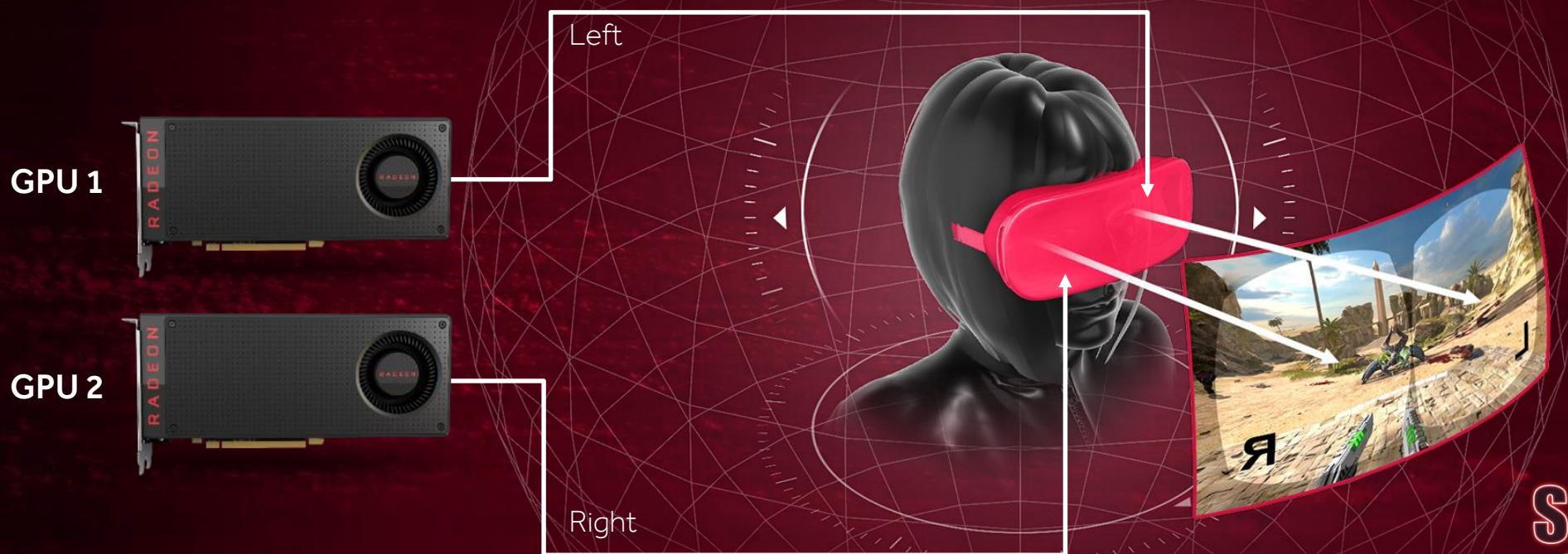
600+  
VR Games

250 000  
360° Videos on Facebook

Source: IDC, Steam, Sony, Facebook, obtained September 29<sup>th</sup>, 2016. See endnotes for details.

# LiquidVR: Affinity Multi-GPU

## Scalable Experience with Multiple GPUs



Up to 20x

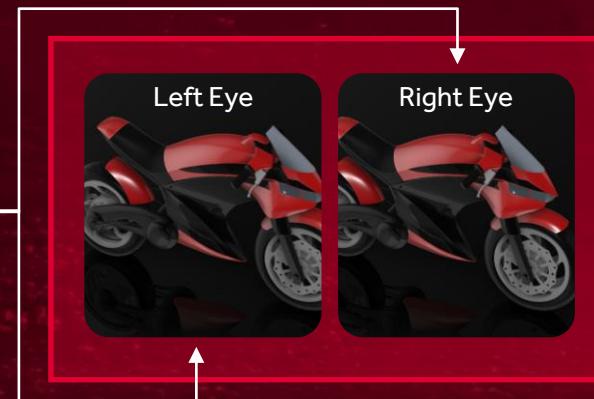
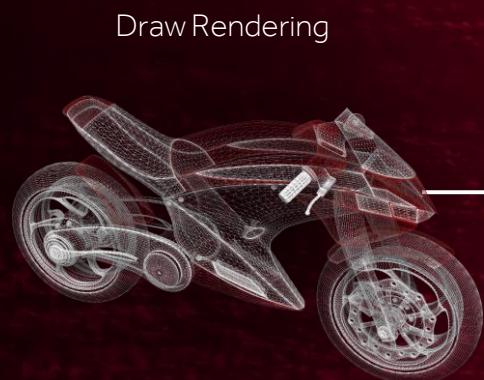
Lower frame re-projection  
rate on dual vs. single  
Radeon RX 480's<sup>1</sup>

SERIOUS SAM VR  
THE LAST HOPE



Supported by Radeon VR Ready Premium & VR Ready  
Creator graphics cards. See endnotes for details.

# LiquidVR: MultiView & MultiRes Rendering



Optimized Rendering  
for Low Processing Overhead

High Pixel  
Density

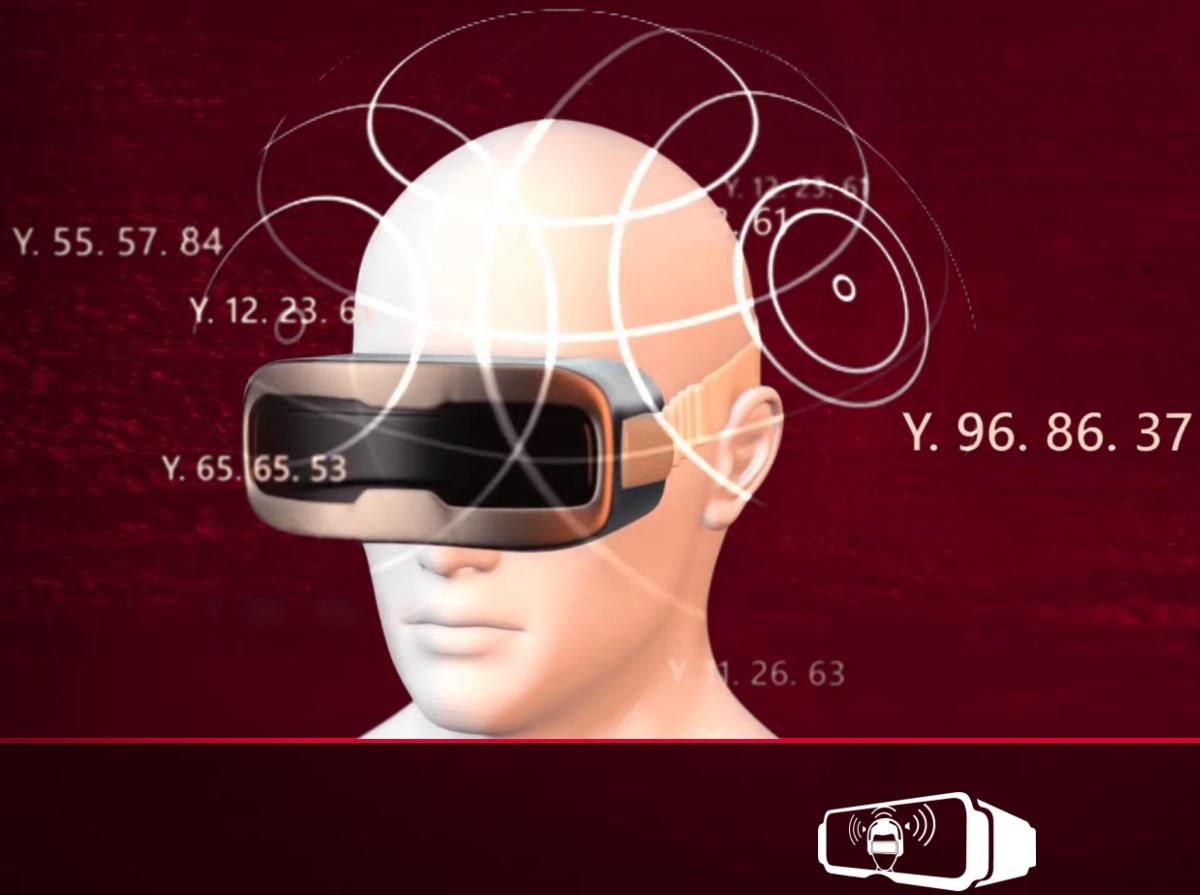


Optimized rendering resolution  
for enhanced performance



# LiquidVR: TrueAudio Next

## Truly Immersive Audio



Dynamically-derived  
Real-time Physics

# AMD LiquidVR™ Technology

Intuitive. Immersive. Interactive.



MultiView & MultiRes  
Rendering



Affinity Multi-GPU



TrueAudio Next



Radeon Technologies Group is Fully Behind

# R A D E O N P R O

SOFTWARE

R

# R A D E O N P R O

SOFTWARE

Powerful. Reliable. Certified.

# R A D E O N

## PRORENDER

A powerful physically-based rendering engine that helps enable creative professionals to produce stunningly photorealistic images



**Plug-ins** and **Native Integration** with a selection of leading 3D content creation tools

AUTODESK  
**3DS MAX**



Rhino (beta)

**MAXON**  
CINEMA 4D\*

**SOLIDWORKS**  
(beta)

AUTODESK  
**MAYA**

**blender**  
(beta\*)

\*Blender plug-in beta availability in Q4. Cinema 4D integration coming in 2017.

Supports: Windows®, macOS, Linux®

# Game Engine Integration

## Adopting New Technologies into Professional Workflows

### Real-time CAD Visualization



### Building Information Modeling (BIM)



**Low-level APIs** are empowering **Game Engines** for real-time professional content creation

Compatible with: Radeon™ Pro WX series, Radeon Pro Duo, AMD FirePro™ W series products.

# LiquidVR™ Support

New AMD LiquidVRTM Technology  
for Professional Graphics



Compatible with: Radeon™ Pro WX 7100, Radeon Pro Duo, AMD FirePro™ W9100. Supports: Windows® 7/10



# Enabling VR Workflows

## With Professional VR Applications

### VR Design & Engineering

VR CAD Visualization Software



### VR Animation & Filmmaking

VR Viewer Software and 360 Video Tools



Use of third party marks/products is for informational purposes only and no endorsement of or by AMD is intended or implied.

Compatible with: Radeon™ Pro WX 7100, Radeon Pro Duo, AMD FirePro™ W9100. Supports: Windows® 7/10

### VR Game Engines

Unreal Engine and Unity VR Editors



# Radeon Pro Software Linux Driver

Combines the Best of Both Worlds  
for Linux® Professional Graphics

Open-Source Core Linux Driver  
Proprietary Radeon Pro Linux Driver



FreeSync 1.0



DirectGMA



Vulkan™ for RHEL



Performance



CentOS



Compatible with: Radeon™ Pro WX series, Radeon Pro Duo, AMD FirePro™ W series products. Supports: Ubuntu, Red Hat Enterprise Linux®, CentOS®

# Commitment to Updates for Enterprise

Quarterly Feature, Performance  
and Stability Improvements

4<sup>th</sup>

Thursday of Each Quarter



Longevity, Stability and Performance



Prioritized Support\*

Compatible with: Radeon™ Pro WX series, Radeon Pro Duo, AMD FirePro™ W series products. Supports: Windows® 7/10, Linux®

\*AMD will work with ISV & OEM partners to provide top of the queue engineering support for Enterprise users.

# Stability

Unprecedented Driver  
Quality and Reliability

2x

More OEM Platform Testing\*

3x

More ISV Certification Testing\*

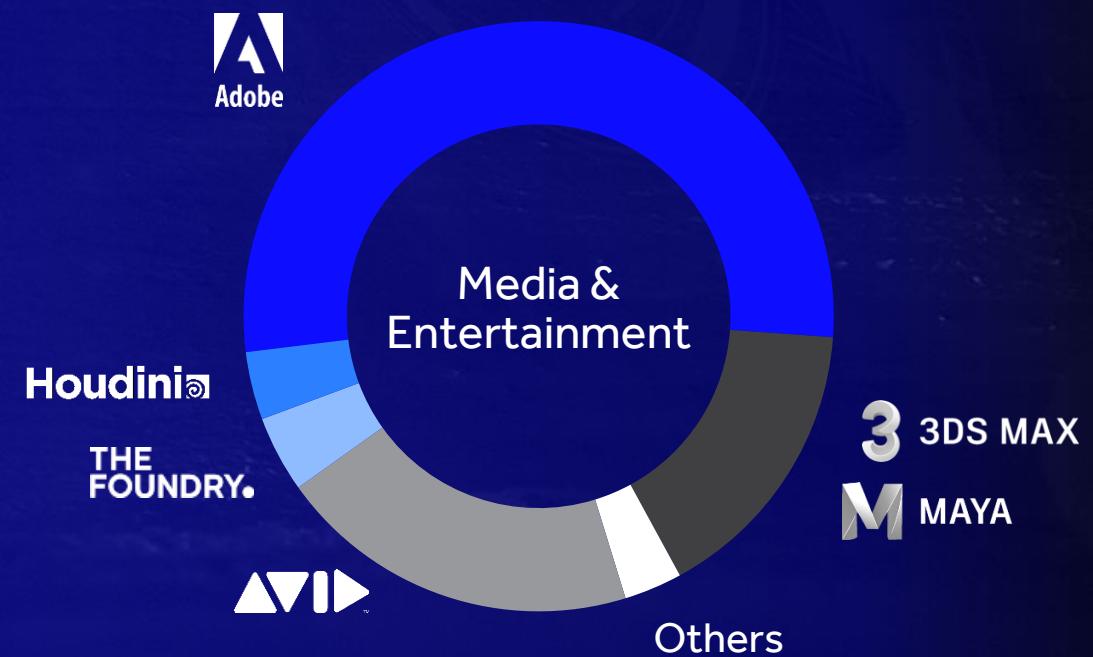
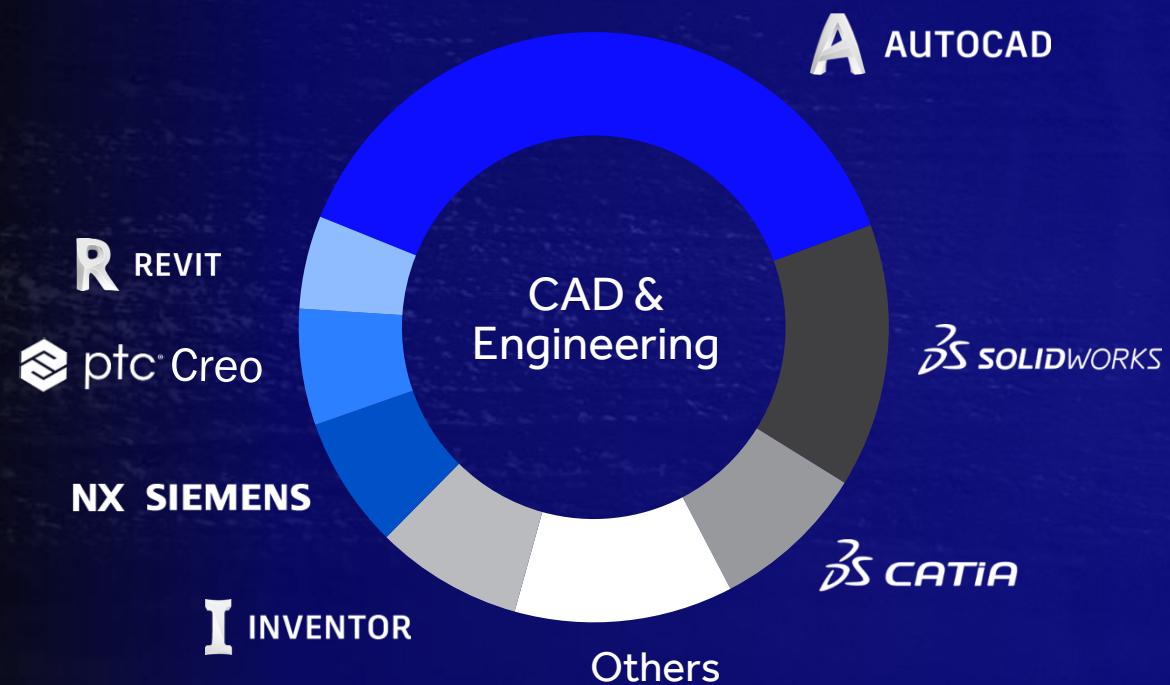
1.5x

More Stress Testing\*

\*AMD internal data, testing of Radeon Pro 16.Q4 Enterprise Driver compared to FirePro™ 14.502.1019 driver.

# Radeon Pro Software Certifications

AMD is Certified on The Leading ISV Applications Professionals Use

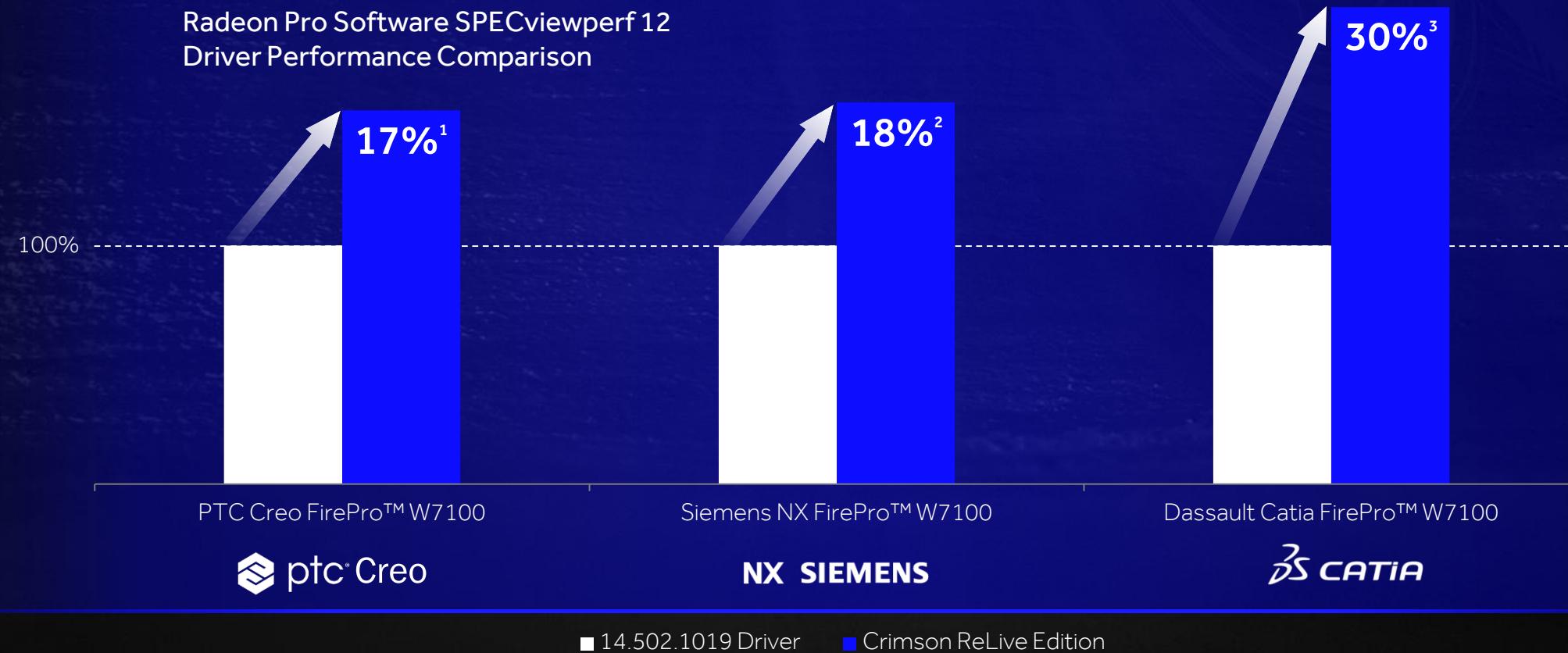


Use of third party marks/products is for informational purposes only and no endorsement of or by AMD is intended or implied.

# Performance

## Year Over Year Performance Leads in Key Applications

Radeon Pro Software SPECviewperf 12  
Driver Performance Comparison



Results are based on November 2016 internal testing of preliminary driver and may vary with use of final driver. See endnotes for details.

# Performance

## WX Series Performance Leads in Key Applications

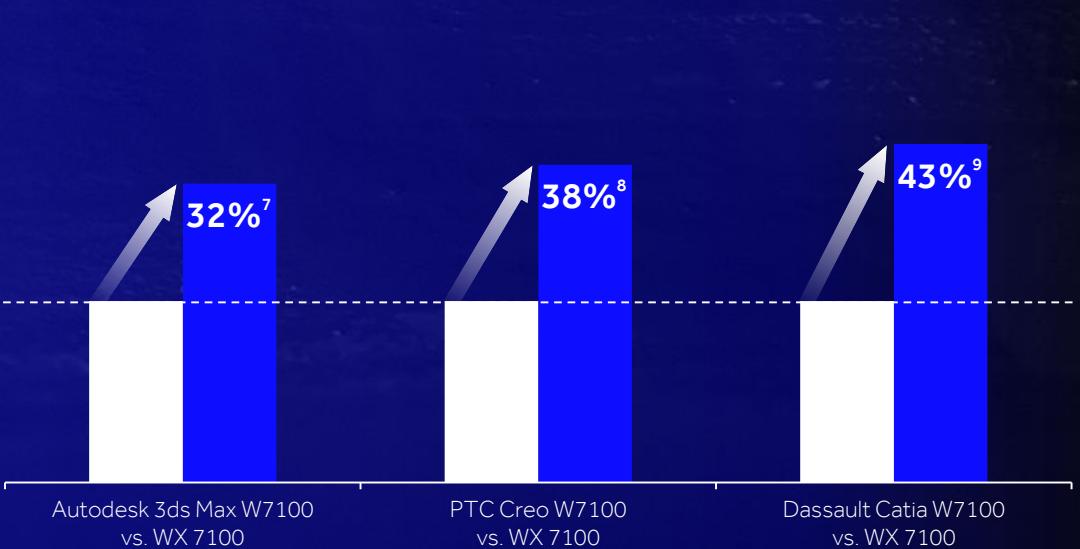
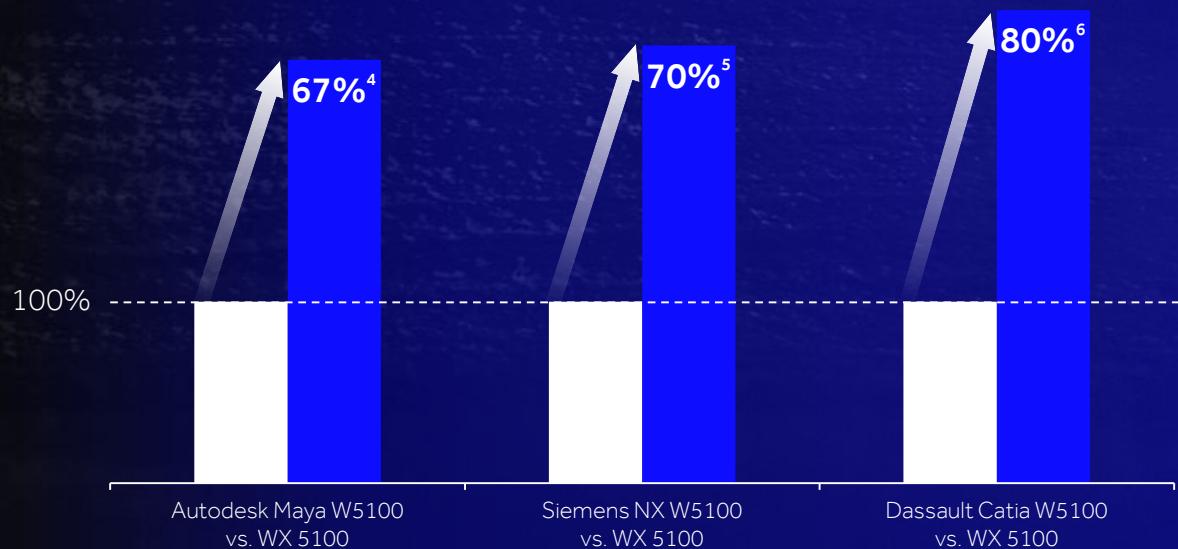


Radeon™ Pro WX 5100 Graphics



Radeon™ Pro WX 7100 Graphics

Radeon Pro Software SPECviewperf 12 Hardware Performance Comparison



■ FirePro™ W5100 16.12

■ Radeon™ Pro WX 5100 16.12

■ AMD FirePro™ W7100 16.12

■ Radeon™ Pro WX 7100 16.12

Results are based on November 2016 internal testing of preliminary driver and may vary with use of final driver. See endnotes for details.

# Virtualized Graphics

## Now With **vmware vSphere 6.5** Support

One Driver for All



Certifications



No Licensing Fees



Deterministic Performance  
Across Multiple VMs



Use of third party marks/products is for informational purposes only and no endorsement of or by AMD is intended or implied.

Compatible with: AMD FirePro™ S7100X, S7150, and S7150x2 products.

# Radeon Open Compute (ROCm)

Modern Heterogeneous HPC and Ultra-scale Platform  
for Large Scale Systems



## Performance

Rich Foundation built for Latency  
Reduction and Throughput Optimization



## Open

First Fully Open Source Professional  
GPU Computing Solution



## Forward Looking

Foundation to Explore the  
Boundaries of GPU Computing

# R A D E O N P R O

SOFTWARE

Powerful. Reliable. Certified.

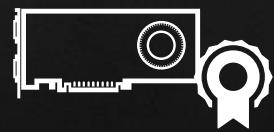
Performance



VR



Certifications



Radeon ProRender

**R A D E O N**  
PRORENDER

Game Engines



# R A D E O N

SOFTWARE

Crimson ReLive Edition

FEATURES

PERFORMANCE

STABILITY

# Top Bug Fixes

## Improved Stability in Radeon Software Crimson ReLive Edition

| Bugs/Issues  | Status   |
|--|----------|
| The Division™ may experience an application freeze or hang when running in AMD CrossFire™ Technology mode after extended periods of play | Resolved |
| Game quality or performance may be degraded when launching multimedia content on a secondary display before running a game               | Resolved |
| CIM folder retains under program files even after complete driver uninstallation   | Resolved |
| Radeon Settings may experience an intermittent crash when accessing Radeon WattMan   | Resolved |
| Display tab with virtual super resolution may be removed or missing in Radeon Settings   | Resolved |
| The Radeon WattMan feature may intermittently display a Radeon Software popup error regarding Radeon WattMan for non-supported products. | Resolved |
| Random crashes may be experienced on Mozilla Firefox   | Resolved |
| DirectX®12 content may be unable to launch on some older CPUs that do not support popcnt instruction                                     | Resolved |
| "Pixel Format" options may be missing in Radeon Settings with RX480  | Resolved |
| Intermittent Mouse Cursor corruption may be experienced on RX480   | Resolved |

Using User Feedback to Improve Radeon Software

# Software Quality Assurance

Rigorous testing of Radeon Software Crimson ReLive Edition

# 25%

More overall QA manual and automation test effort\*

## Implemented New Test Procedures

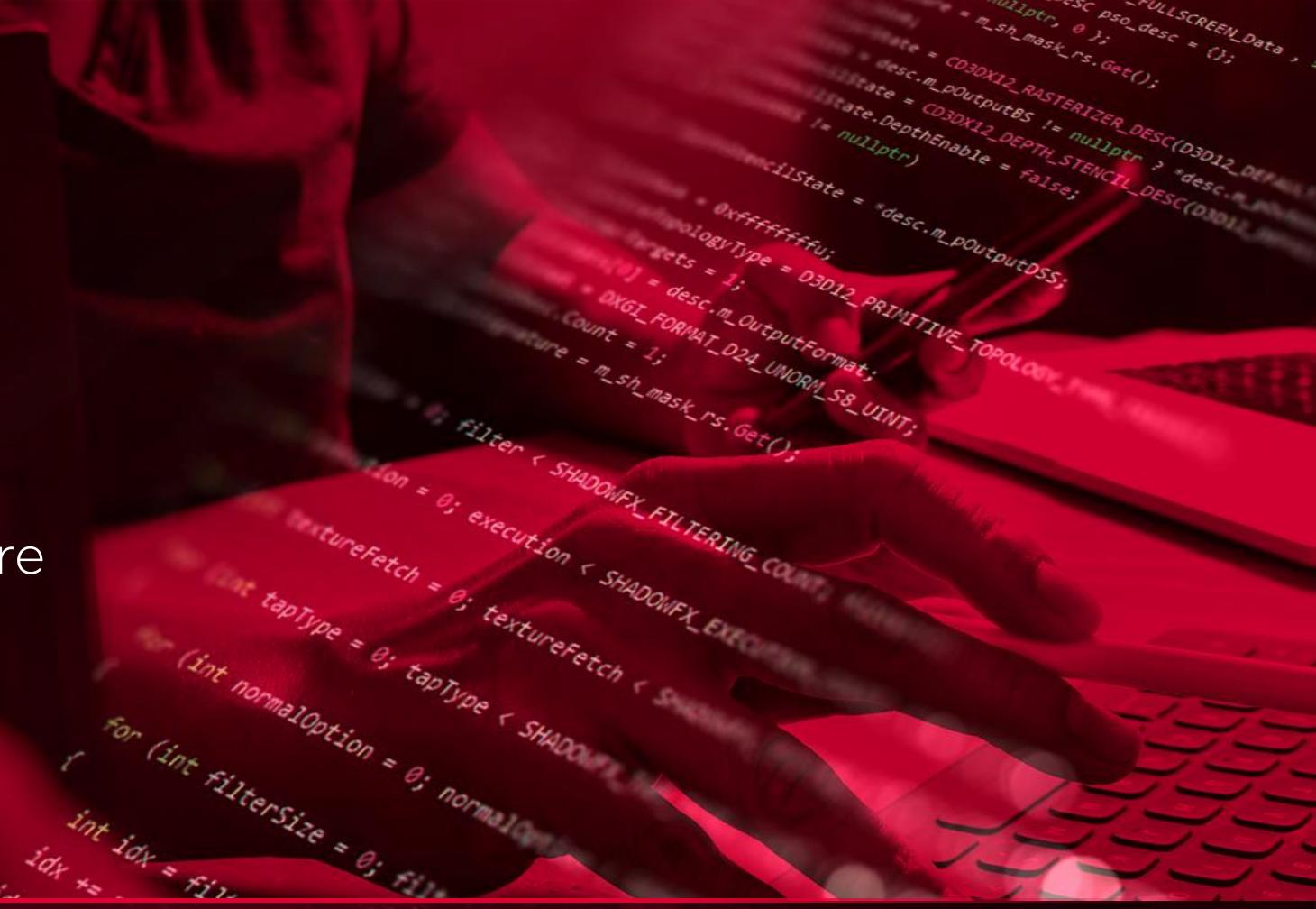
Simulated real-world/  
end-user environment

Tracked  
critical VR  
data points

Re-projected  
frames

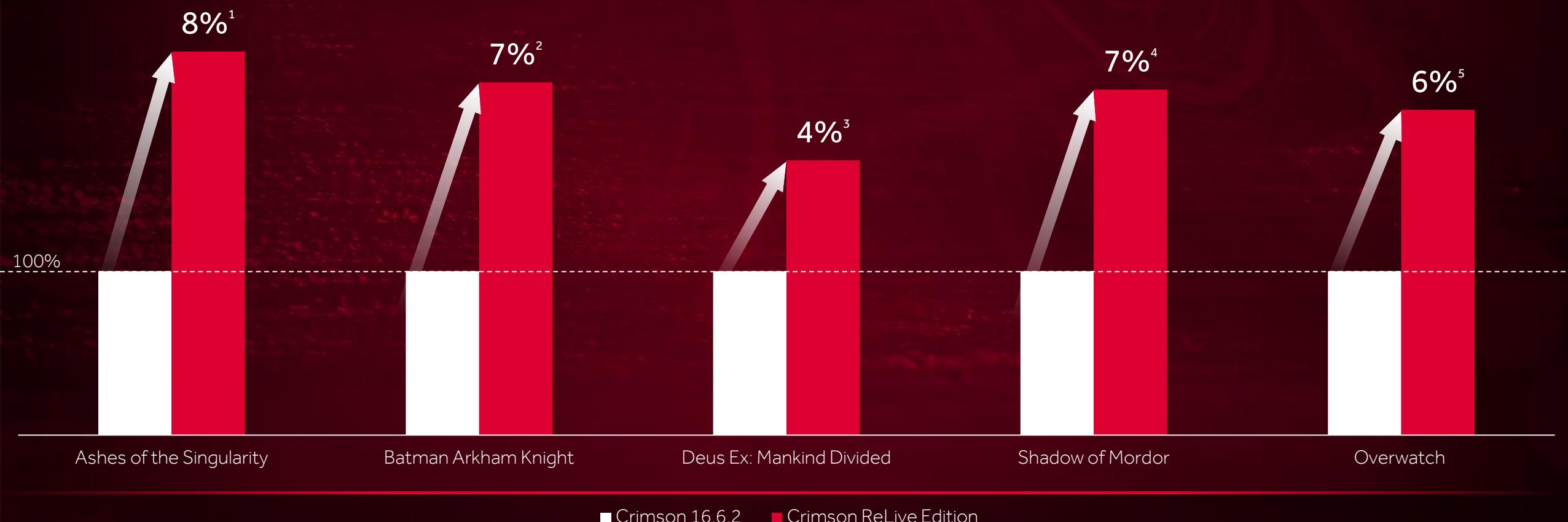
Dropped  
frames

Average loading  
of frame time



# Performance

## Performance Gains Since Radeon™ RX 480 Launch



Results are based on November 2016 internal testing of preliminary driver and may vary with use of final driver. See endnotes for details.

# How We Experience Content

## Stepping Into the Deep Pixel Era

**16x More**  
Pixels\*

Stunning 8K  
Resolution



\*When compared to 1080p

**100+ AMD FreeSync™  
Technology**  
Monitors Now Available

Smooth  
Gameplay



**10x More**  
Luminance and Contrast

Beautiful HDR  
Contrast



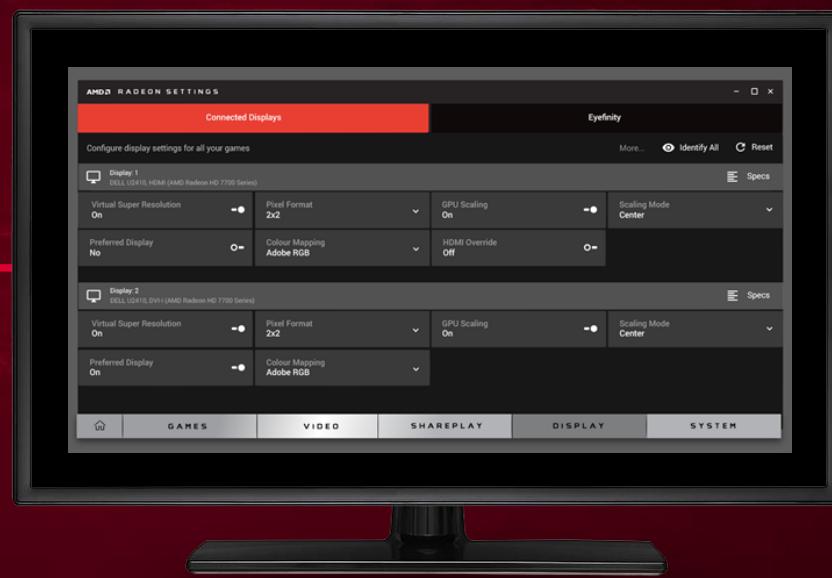
# Display Connectivity

## Improved End-to-end User Experience



**Automatic** Bad HDMI® Cable and  
Signal Detection and Fallback

**Advanced** Display Settings  
and Diagnostics



Compatible with: AMD APUs codenamed "Kabini" and newer, Radeon™ GCN and CG Polaris enabled products. Supports: Windows® 7/8.1/10

# VP9 Decode Acceleration

## 4K 60 Hz GPU-Accelerated Video Streaming

**Without** VP9 Decode Acceleration



**With** VP9 Decode Acceleration



Enabling Stunning Visuals

Compatible with: AMD APUs codenamed "Stoney", Radeon™ GCN and CG Polaris enabled products. Supports: Windows® 7/8.1/10

# HDR Gaming

## Dolby Vision™ and HDR 10 Support



For Illustrative Purposes Only

**Increased** Brightness,  
Contrast and Color

Compatible with: AMD Radeon™ R9 Fury series, R9 380, R9 390 series, and RX 400 series products. Supports: Windows® 7/8.1/10

# AMD FreeSync™ Technology

## Borderless Fullscreen Mode



### Switch Easy

Effortlessly switch between applications

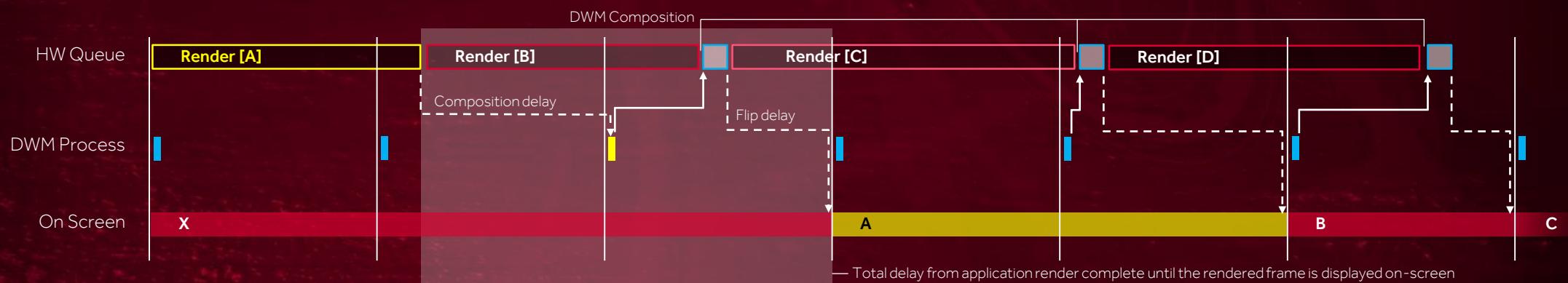
Use of third party marks/products is for informational purposes only and no endorsement of or by AMD is intended or implied.

Compatible with: AMD Radeon™ R7 260, 260X, 360, R9 285, 290, 290X, 380, 390, 390X, R9 Fury series, and RX 400 series products. Supports: Windows® 7/8.1/10

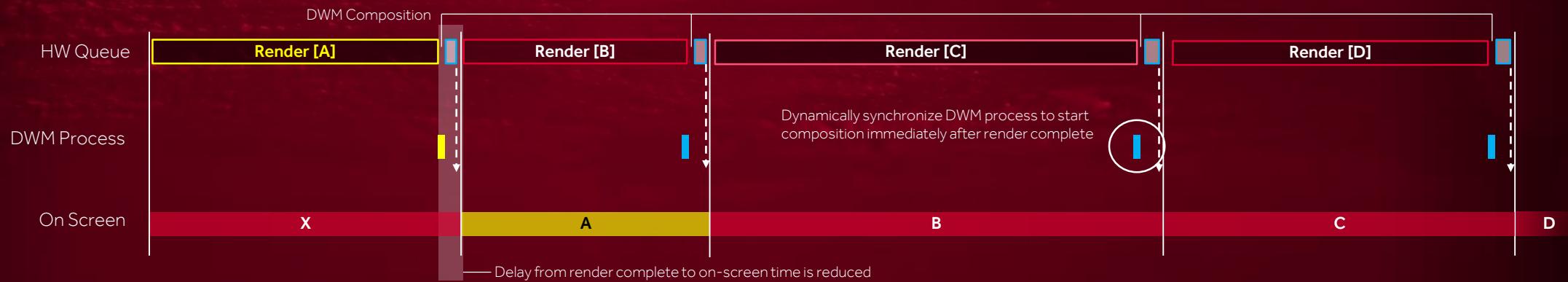
# AMD FreeSync™ Technology

Up to 24% Lower Click-to-Response Time with Borderless Fullscreen Mode<sup>1</sup>

FreeSync™  
**OFF**



FreeSync™  
**ON**



For Illustrative Purposes Only

Compatible with: AMD Radeon™ R7 260, 260X, 360, R9 285, 290, 290X, 380, 390, 390X, R9 Fury series, and RX 400 series products. Supports: Windows® 7/8.1/10

# AMD FreeSync™ Technology

## Gradual Refresh Ramp



For Illustrative Purposes Only

### Save Power

Smooth decrease or increase in FPS

Compatible with: AMD Radeon™ R7 260, 260X, 360, R9 285, 290, 290X, 380, 390, 390X, R9 Fury series, and RX 400 series products. Supports: Windows® 7/8.1/10

# Skype Performance Enhancements

## Low APU Usage during Skype Calls



Increase Productivity

Use of third party marks/products is for informational purposes only and no endorsement of or by AMD is intended or implied.

Compatible with: AMD® APU's Codenamed "Bristol", "Carrizo" and "Stoney Ridge". Supports: Windows® 7/8.1/10

# DisplayPort™ HBR3 Support

Single Cable 4K 120Hz, 5K 60Hz, 8K 30Hz



## See More

Support for future monitors

Technology present in GPUs requires ecosystem enablement for full functionality

Compatible with: AMD Radeon™ RX series products. Supports: Windows® 7/8.1/10

# Display Experience

Smooth. Seamless. Stunning.



## Skype Enhancements



## Connectivity



## AMD FreeSync™ Technology



## HDR Gaming



## VP9 Decode



Use of third party marks/products is for informational purposes only and no endorsement of or by AMD is intended or implied. See endnotes for details.

# R A D E O N

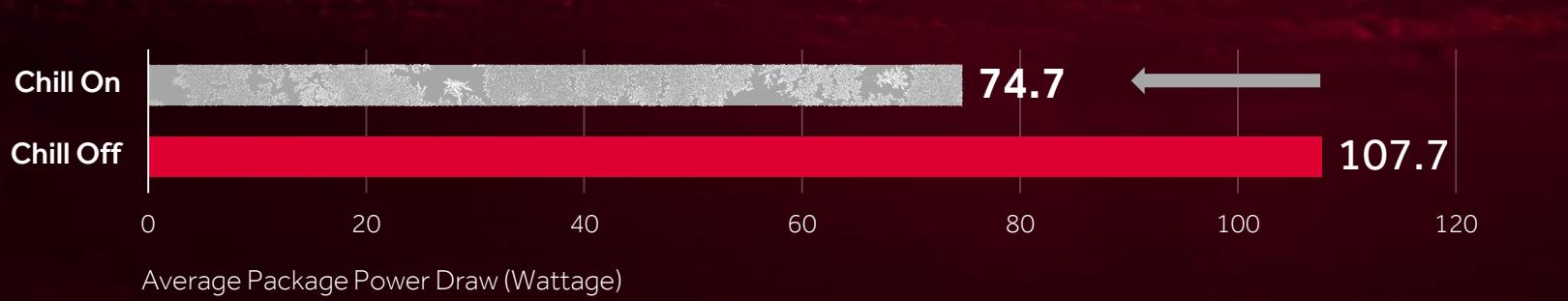
## CHILL

Saving Power, While Chilling

A power-saving feature that dynamically regulates  
framerate based on your in-game movement

# Radeon Chill

## Improving Power Efficiency



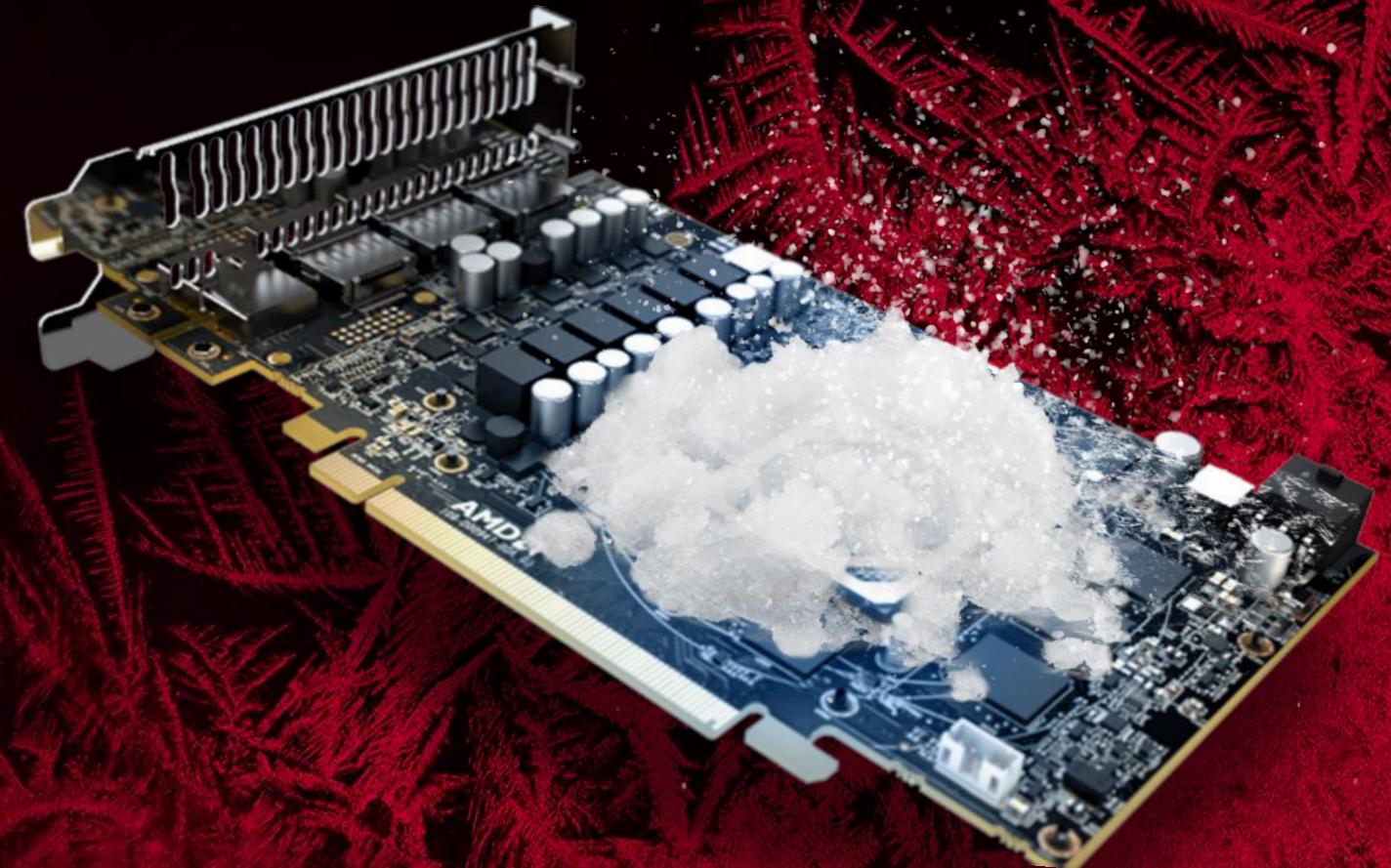
Up to  
**31%**<sup>1</sup>

Lower Average GPU Package Power  
in Watts, With Radeon Chill ON

Compatible with: AMD Radeon™ GCN and CG Polaris enabled products in supported DirectX®9 and DirectX®11 games for Windows® 7/8.1/10. Results are based on November 2016 internal testing of preliminary driver and may vary with use of final driver. See endnotes for details.

# Radeon Chill

## Lowering Temperatures



For Illustrative Purposes Only



Up to  
**13%**

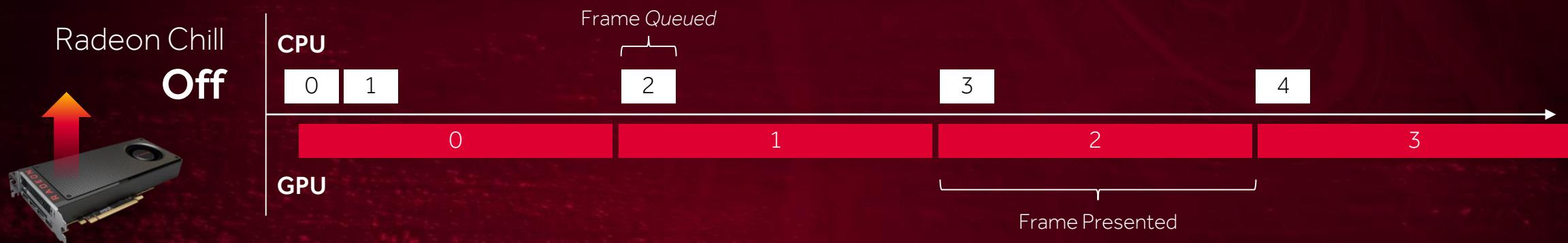
Lower Average GPU Temperature  
in Celsius, with Radeon Chill ON

Compatible with: AMD Radeon™ GCN and CG Polaris enabled products in supported DirectX®9 and DirectX®11 games for Windows® 7/8.1/10. Results are based on November 2016 internal testing of preliminary driver and may vary with use of final driver. See endnotes for details.

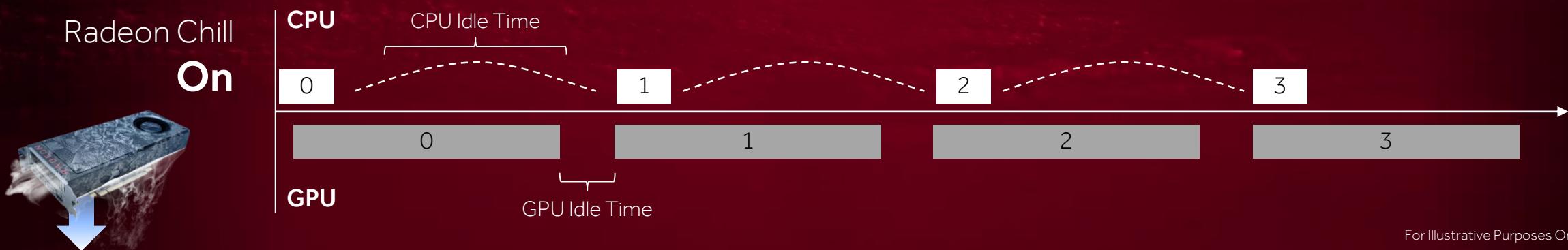
# Radeon Chill

## Frames Presented in Synchronous

Frames Presented at Unequal Times



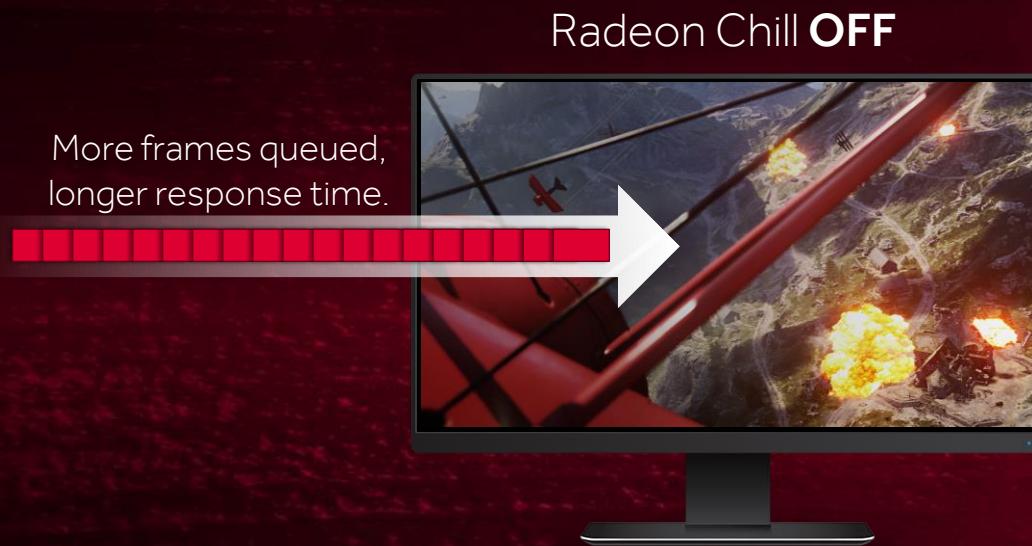
Frames Presented in Synchronous



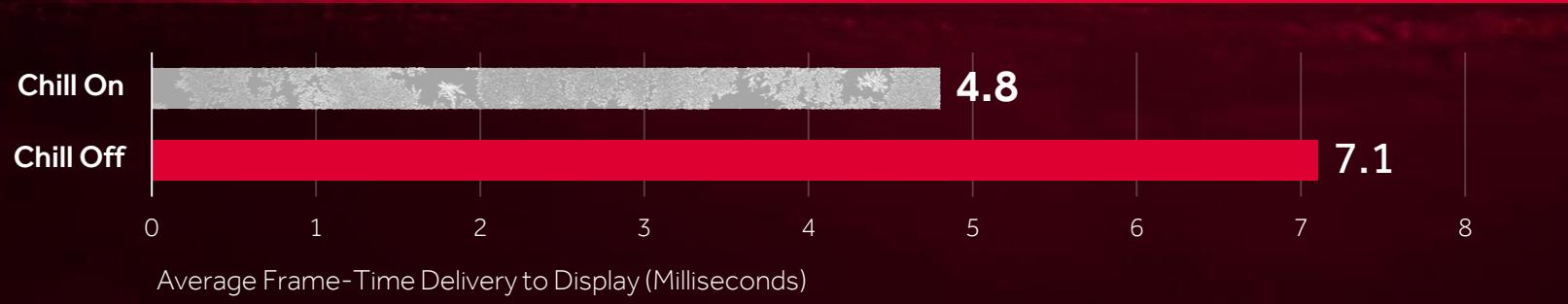
Compatible with: AMD Radeon™ GCN and CG Polaris enabled products in supported DirectX®9 and DirectX®11 games for Windows® 7/8.1/10. Results are based on November 2016 internal testing of preliminary driver and may vary with use of final driver. See endnotes for details.

# Radeon Chill

## Lowering Frame-Time Delivery to Display



For Illustrative Purposes Only



Up to  
**32%**<sup>3</sup>  
Lower Average Frame-Time Delivery  
to Display, in Milliseconds

Compatible with: AMD Radeon™ GCN and CG Polaris enabled products in supported DirectX®9 and DirectX®11 games for Windows® 7/8.1/10. Results are based on November 2016 internal testing of preliminary driver and may vary with use of final driver. See endnotes for details.

# Radeon Chill

## Features and Details

- Default OFF
- Whitelisted games are manually selected

| No | Game Title Whitelist          | API      |
|----|-------------------------------|----------|
| 1  | Team Fortress 2               | DX9      |
| 2  | Overwatch                     | DX11     |
| 3  | Counter Strike                | DX9      |
| 4  | Paragon                       | DX11     |
| 5  | CrossFire                     | DX9      |
| 6  | Fallout 4                     | DX11     |
| 7  | Far Cry Primal                | DX11     |
| 8  | Call of Duty Infinite Warfare | DX11     |
| 9  | Deus Ex: Mankind Divided      | DX11     |
| 10 | Warframe                      | DX11     |
| 11 | Dark Souls III                | DX11     |
| 12 | The Witcher 3                 | DX11     |
| 13 | Far Cry 4                     | DX11     |
| 14 | PlanetSide 2                  | DX9      |
| 15 | World of Warcraft             | DX9/DX11 |
| 16 | Rise of the Tomb Raider       | DX11     |
| 17 | Tomb Raider (2013)            | DX9/DX11 |
| 18 | The Elder Scrolls V: Skyrim   | DX9      |

Compatible with: AMD Radeon™ GCN and CG Polaris enabled products in supported DirectX®9 and DirectX®11 games for Windows® 7/8.1/10. Results are based on November 2016 internal testing of preliminary driver and may vary with use of final driver. See endnotes for details.

# Radeon WattMan: Extended Product Support

## Power Management Available for more GCN Products

**RX 4 8 0**



**RX 4 7 0**



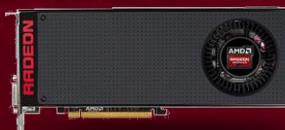
**RX 4 6 0**



## Now Supported



AMD Radeon R9 Fury Series



R9 390 Series



R9 380 Series



R9 290 Series



R9 285 Series



R9 260 Series



R7 360 Series



R7 260 Series

Compatible with: dGPU AMD Radeon™ R9 Fury series, R9 390 series, R9 380 series, R9 290 series, R9 285, R9 260 series, R7 360, and R7 260 products. Supports: Windows® 7/8.1/10. AMD's product warranty does not cover damages caused by overclocking, even when overclocking is enabled via AMD hardware and/or software.

# AMD XConnect™ Technology

Support for Thunderbolt™ Certified Laptops, Thin Clients and All-In-One's

On-the-go



For Work



Small Spaces



External GPU Enclosure



For Portable Power

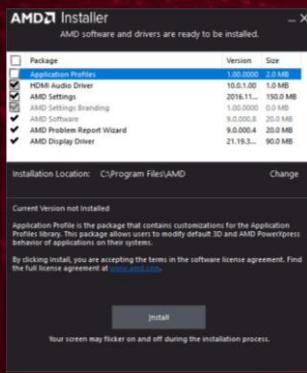
Compatible with: AMD Radeon™ RX series, R9 Fury series, R9 Nano, R9 300 series, R9 290X, R9 290, R9 285. Supports: Windows® 7/8.1/10

# Radeon Software Installer

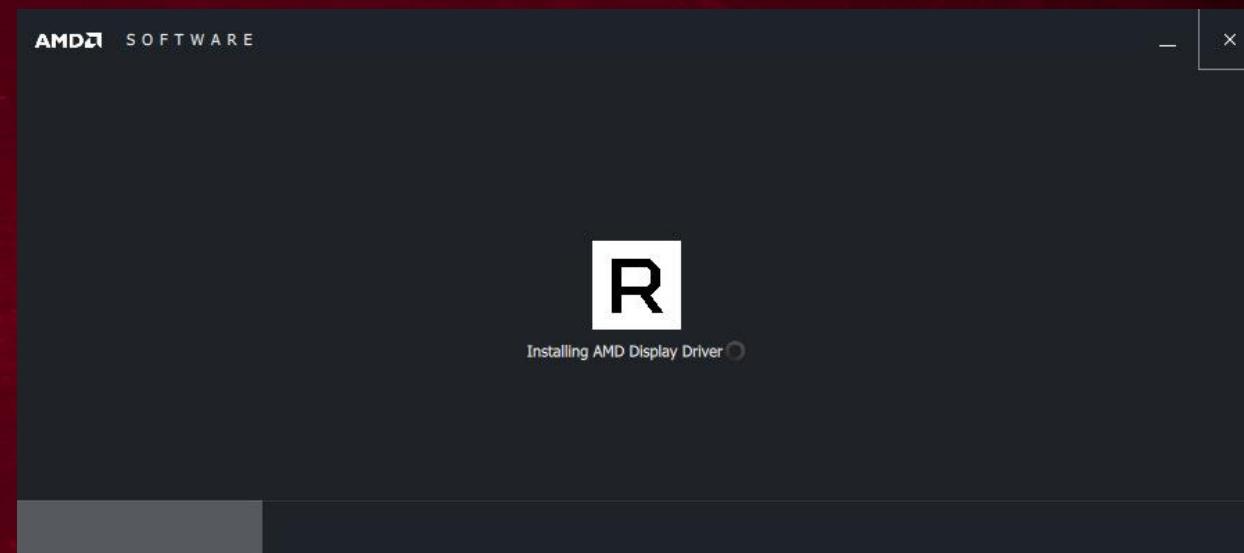
## Redesigned with Radeon Settings Methodology



Step 1



Step 2



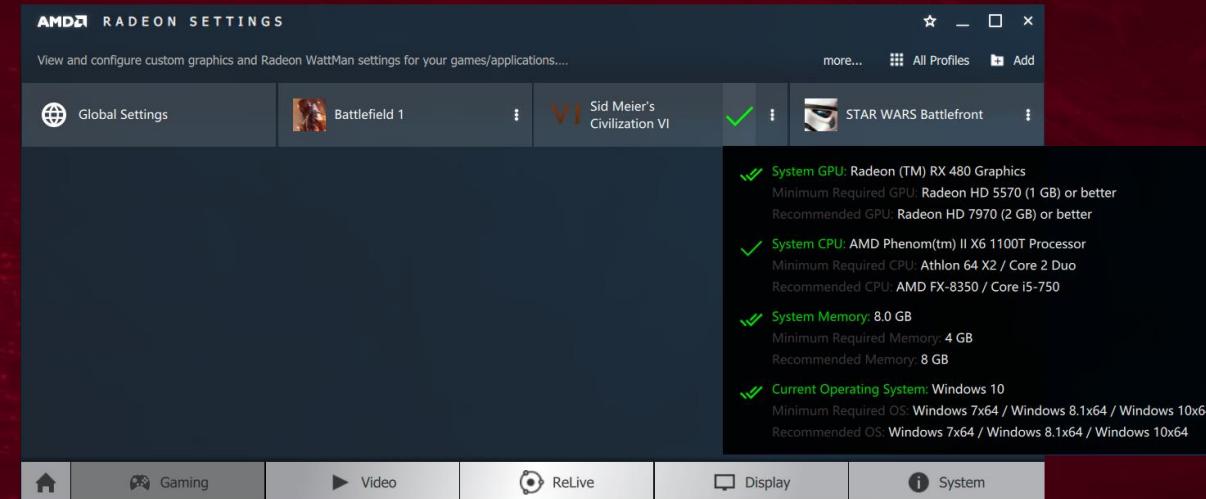
Intuitive Software Installs, Custom clean install option

Compatible with dGPU AMD Radeon™ GCN products and CG Polaris enabled products, Radeon™ Pro WX series, Radeon Pro Duo, and AMD FirePro™ W series products.

Supports: Windows® 7/8/10 (Radeon™ 7/10 (Radeon™ Pro and AMD FirePro™)

# Upgrade Advisor

## System Requirement Evaluation Made Easy



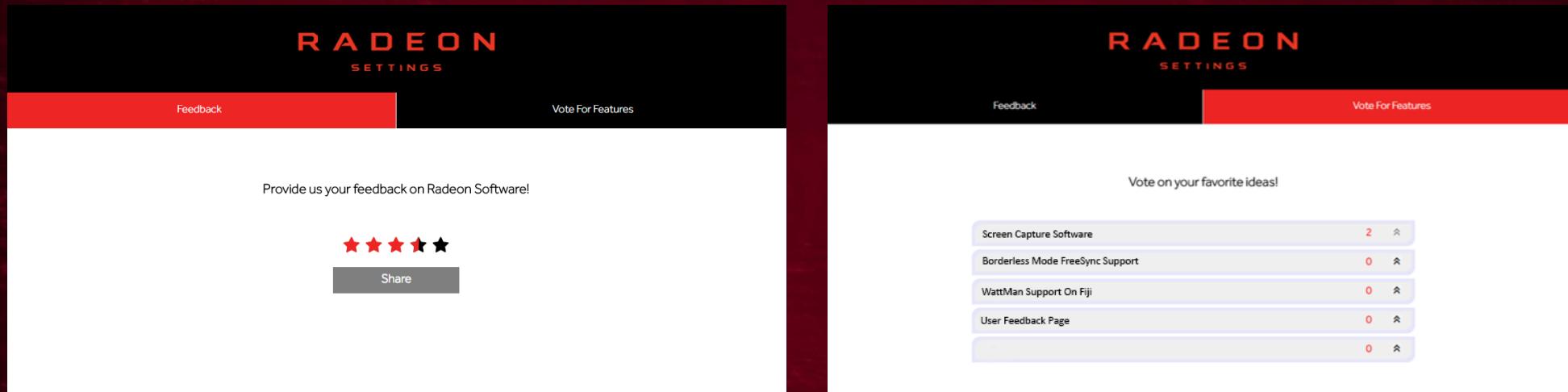
Available for Steam® games, within North America

Discover Radeon graphics components that deliver  
the recommended gaming experience

Compatible with: AMD APUs codenamed "Kabini" and newer, Radeon™ GCN and CG Polaris enabled products. Supports: Windows® 7/8.1/10

# User Feedback

Enabling a Direct-Link to the Radeon Software Team

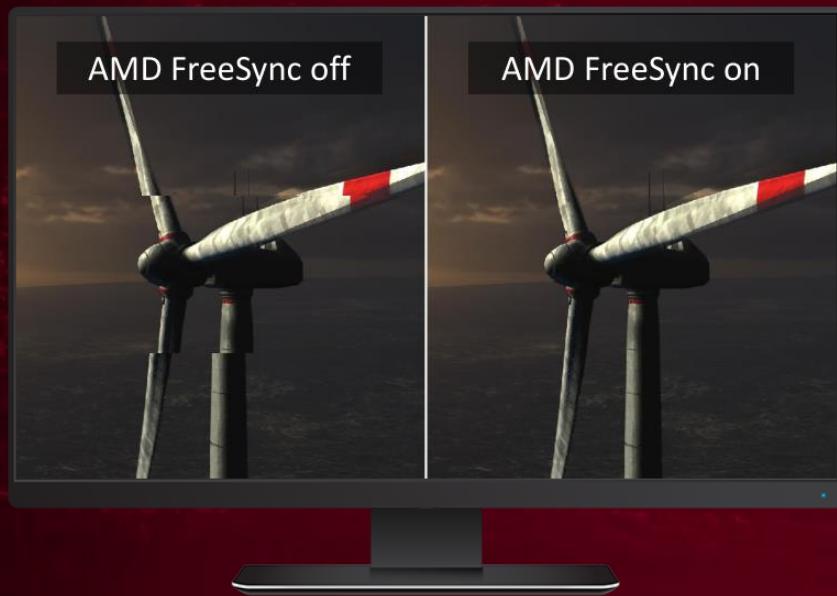


Real-time pulse of the community's  
**Radeon Software user experience**

Compatible with: AMD Radeon™ GCN and Polaris enabled products. Supports: Windows® 7/8.1/10

# Radeon Software Linux Driver

## FreeSync and Extended Product Support



Linux FreeSync 1.0 Support



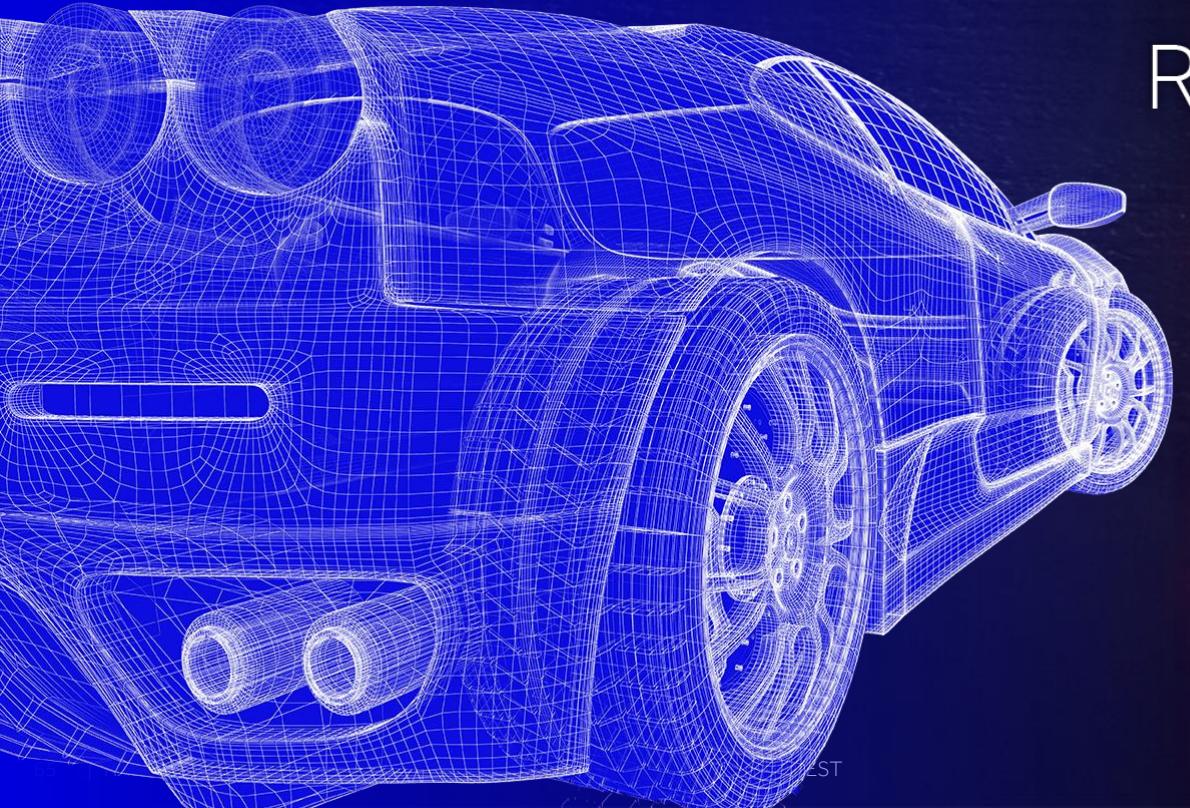
Expanded Support to all AMD dGPU  
GCN Products

Compatible with: AMD Radeon™ GCN and CG Polaris enabled products. Supports: Ubuntu 16.04, RHEL 7.2, RHEL 6.8, Ubuntu 14.04, RHEL 7.3, SLED/SLES 12 SP2 Linux®

Last But Not Least

R A D E O N

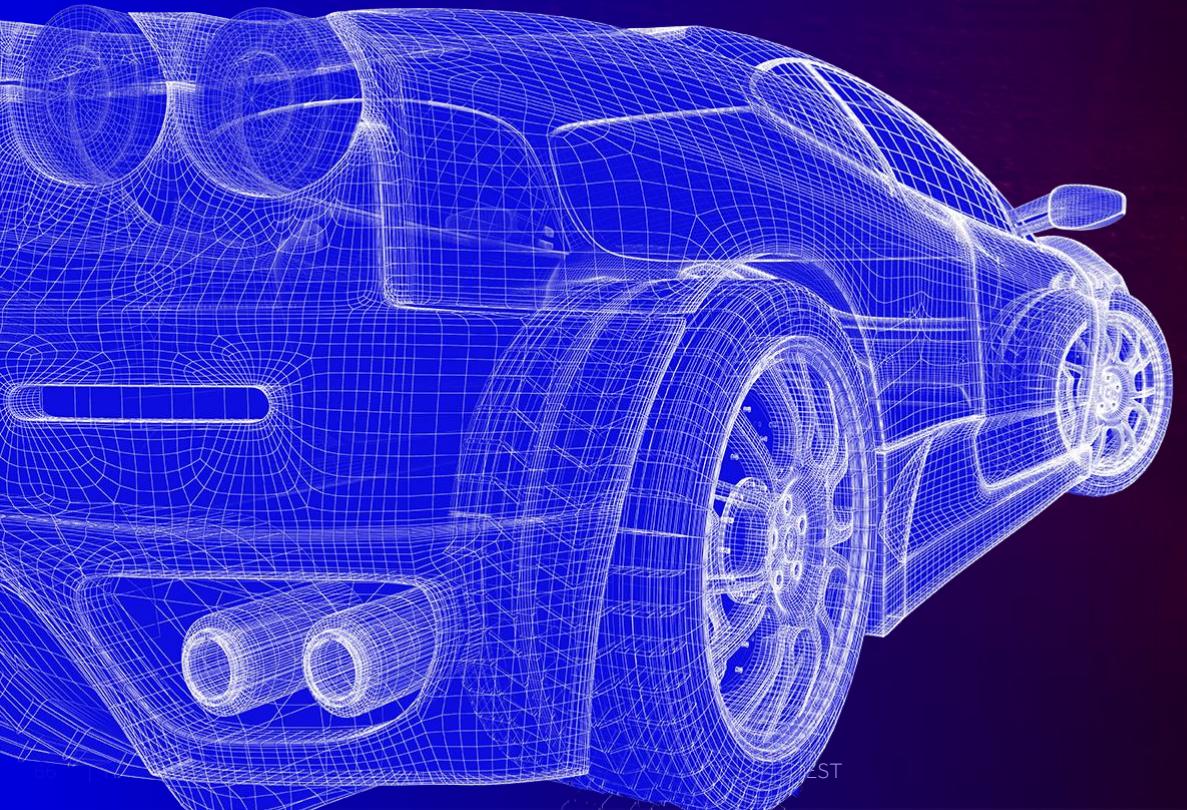
ReLive



# R A D E O N

ReLive

Capture. Customize. Share.





# How We Entertain Ourselves

## Gaming Has Gone Social



100M  
Monthly Users

1M  
Monthly Streamers



STEAM

125M  
Active Users

12.6M  
Concurrent Users



900M  
Monthly Users

50M  
Active Creators



200M  
Monthly Users

15M  
Daily Users

Source: 3rd party estimates.

# How Professionals Work

## Modern Workflows Are Changing



### Workplace Mobility

103%

Growth since 2005 of workers regularly working remotely



### Decision Making

90%

Say seeing a video is helpful in the decision process



### Enterprise Training

13.5M

Loss to a business due to ineffective training per year, per 1000 employees



### Customer Communication

1min = 1.8M

Estimates that one minute of video is equal to 1.8 million words

# Radeon ReLive

## Lightweight. Minimal Impact.



Up to  
**3%**<sup>1</sup>

impact to average Frames Per Second  
while recording in World of Warcraft  
with Radeon ReLive ON vs. OFF.

Up to  
**3%**<sup>2</sup>

impact to average Frames Per Second  
while recording in Overwatch®  
with Radeon ReLive ON vs. OFF.

Up to  
**4%**<sup>3</sup>

impact to average Frames Per Second  
while recording in Battlefield 1  
with Radeon ReLive ON vs. OFF.

Up to  
**3%**<sup>4</sup>

impact to average Frames Per Second  
while recording in H1Z1: King of the Kill  
with Radeon ReLive ON vs. OFF.

Compatible with dGPU AMD Radeon™ GCN and CG Polaris enabled products, AMD FirePro™ W series and Radeon Pro™ WX series graphics cards. Supports Windows® 7/8/10 (Radeon™ 7/10 (Radeon™ Pro and AMD FirePro™))  
Results are based on November 2016 internal testing of preliminary driver and may vary with use of final driver. See endnotes for details.

# Radeon ReLive

## Major Streaming Platforms

Build and grow your online community  
anytime, on virtually any platform



Use of third party marks/products is for informational purposes only and no endorsement of or by AMD is intended or implied.

Compatible with dGPU AMD Radeon™ GCN and CG Polarisenabled graphics cards. Supports: Windows® 7/8.1/10

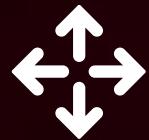
# Radeon ReLive

## In-App Toolbar

Modify settings conveniently and play seamlessly



Repositionable



Instant Replay up to 1 hour



1-Click Record, Stream, Screenshot



Custom Hotkey Support



Compatible with dGPU AMD Radeon™ GCN and CG Polaris enabled products, AMD FirePro™ W series and Radeon Pro™ WX series graphics cards. Supports Windows® 7/8.1/10 (Radeon™) 7/10 (Radeon™ Pro and AMD FirePro™). Results are based on November 2016 internal testing of preliminary driver and may vary with use of final driver. See endnotes for details.

# Radeon ReLive

## Custom Overlay

Express yourself in bold new ways



Packaged Radeon Software Overlay



Add Custom Overlay Images



Repositionable and Custom Size Webcam



System Info Overlay



Compatible with dGPU AMD Radeon™ GCN and CG Polaris enabled products, AMD FirePro™ W series and Radeon Pro™ WX series graphics cards. Supports Windows® 7/8.1/10 (Radeon™ 7/10/Radeon™ Pro and AMD FirePro™). Results are based on November 2016 internal testing of preliminary driver and may vary with use of final driver. See endnotes for details.

# Radeon ReLive

## Features and Details



For Work  
and Play



Seamless integration  
in Radeon Settings



Free, with no  
registration required



Highly  
optimized



Constant frame-rate for  
synchronized audio and video



Compatible with dGPU AMD Radeon™ GCN and CG Polaris enabled products, AMD FirePro™ W series and Radeon Pro™ WX series graphics cards. Supports Windows® 7/8.1/10 (Radeon™ 7/10/Radeon™ Pro and AMD FirePro™). Results are based on November 2016 internal testing of preliminary driver and may vary with use of final driver. See endnotes for details.

# Radeon Pro ReLive

## Easy In-App Capturing\* of Professional Workflows



\*Streaming available upon customer request in Radeon Pro Software Crimson ReLive Edition.

Compatible with: Radeon™ Pro WX series, Radeon Pro Duo, AMD FirePro™ W series. Supports: Windows® 7/10

# R A D E O N

## SOFTWARE

### Crimson ReLive Edition

#### CONSUMERS



Radeon Chill. Radeon ReLive. FreeSync.  
Display Connectivity. Upgrade Advisor.  
User Feedback. Linux Driver.

Up to

**8%**

Performance Gains since  
Radeon™ RX 480 Launch<sup>1</sup>

**25%**

More QA Manual and  
Automation Test Effort<sup>2</sup>

**70**

SDKs/Samples/  
Libraries/Tools<sup>3</sup>

**82**

Developer  
Blogs<sup>3</sup>

#### PROFESSIONALS



LiquidVR. Radeon Pro ReLive. Linux Driver.  
Vmware® vSphere 6.5 support.  
Radeon ProRender.

Up to

**30%**

Year over Year  
Performance Gains<sup>4</sup>

**3X**

More ISV Certification  
Testing<sup>5</sup>

See Endnotes for Details

R  
A D E O N

SOFTWARE

Crimson ReLive Edition

Our Biggest Software  
Release Ever



The background of the image is a dark, almost black, space. A massive, vibrant red paint splash dominates the center and upper half of the frame. The paint is captured in mid-explosion, with thick, glossy streams and numerous smaller droplets of varying sizes scattered across the dark surface. The texture of the paint is highly reflective, showing highlights and shadows that emphasize its three-dimensional form and the energy of the splash.

# R A D E O N

SOFTWARE

# Endnotes

Slide 16:

HEVC acceleration is subject to inclusion/installation of compatible HEVC players. GD-81

Slide 18:

Testing by AMD Performance Labs October 25, 2016 on the ASUS ROG Strix RX 480 on a test system comprising an Intel Core i7-6700K CPU, 8GB (DDR4-2667 MHz) memory and Windows 10, Radeon Software Crimson Edition driver 16.10.2. PC manufacturers may vary configurations, yielding different results. Serious Sam VR: The Last Hope (Early Access, Build 1413122, DirectX 11), Level: Earth Planet – Level 1 was run using the following settings: CPU Speed = High, GPU Speed = High, GPU Memory = High, Level Caching = High, Interleaved Projection = Off, Always Reprojection = Enabled, Always On Reprojection = Disabled. The ASUS ROG Strix RX 480 had 87.71% reprojected frames vs. total number of frames (average of 5663 frames reprojected of 6531 frames in total, over three runs). Dual ASUS ROG Strix RX 480 had 3.90% reprojected frames vs. total number of frames (average of 477 of 11516 frames in total, over three runs). Note that "Reprojection" is part of SteamVR and is not an AMD product feature. Performance may vary based on use of latest drivers. RX-75

Slide 18-21:

Radeon VR Ready Premium Products are select Radeon GPUs that meet or exceed the Oculus Rift or HTC Vive recommended specifications for video cards/GPUs. Other hardware (including CPU) and system requirements recommended by Oculus Rift or HTC Vive should also be met in order to operate the applicable HMDs as intended. As VR technology, HMDs and other VR hardware and software evolve and/or become available, these criteria may change without notice.

Radeon VR Ready Creator Products are select Radeon Pro and AMD FirePro GPUs that meet or exceed the Oculus Rift or HTC Vive recommended specifications for video cards/GPUs. Other hardware (including CPU) and system requirements recommended by Oculus Rift or HTC Vive should also be met in order to operate the applicable HMDs as intended. As VR technology, HMDs and other VR hardware and software evolve and/or become available, these criteria may change without notice.

# Endnotes

Slide 26, 27:

## Radeon VR Ready Creator

Radeon VR Ready Creator Products are select Radeon Pro and AMD FirePro GPUs that meet or exceed the Oculus Rift or HTC Vive recommended specifications for video cards/GPUs. Other hardware (including CPU) and system requirements recommended by Oculus Rift or HTC Vive should also be met in order to operate the applicable HMDs as intended. As VR technology, HMDs and other VR hardware and software evolve and/or become available, these criteria may change without notice.

Slide 32:

1. Up to 17% faster performance using 16.50 and PTC Creo on AMD FirePro™ W7100 than with 14.502.1019. Testing conducted by AMD Performance Labs as of November 7th, 2016 on a test system comprising of Intel E5-1650 v3 3.50GHz, 16GB RAM, Win7 64-bit SP1, AMD FirePro™ W7100, software drivers 16.50 and 14.502.1019 for SPECviewperf benchmark. Benchmark Application: SPECviewperf 12.1 under official run. Subtest: creo-01. FirePro W7100 (with 16.50) score: 58.30. FirePro W7100 (with 14.502.1019) score: 49.63. Performance Differential:  $58.30/49.63 = \sim 17.4\%$  higher score on FirePro W7100 with 16.50. PC manufacturers may vary configurations, yielding different results. Performance may vary based on use of latest drivers. FS-5
2. Up to 18% faster performance using 16.50 and Siemens NX on AMD FirePro™ W7100 than with 14.502.1019. Testing conducted by AMD Performance Labs as of November 7th, 2016 on a test system comprising of Intel E5-1650 v3 3.50GHz, 16GB RAM, Win7 64-bit SP1, AMD FirePro™ W7100, software drivers 16.50 and 14.502.1019 for SPECviewperf benchmark. Benchmark Application: SPECviewperf 12.1 under official run. Subtest: snx-02. FirePro W7100 (with 16.50) score: 75.10. FirePro W7100 (with 14.502.1019) score: 63.53. Performance Differential:  $75.10/63.53 = \sim 18.2\%$  higher score on FirePro W7100 with 16.50. PC manufacturers may vary configurations, yielding different results. Performance may vary based on use of latest drivers. FS-7
3. Up to 30% faster performance using 16.50 and Catia on AMD FirePro™ W7100 than with 14.502.1019. Testing conducted by AMD Performance Labs as of November 7th, 2016 on a test system comprising of Intel E5-1650 v3 3.50GHz, 16GB RAM, Win7 64-bit SP1, AMD FirePro™ W7100, software drivers 16.50 and 14.502.1019 for SPECviewperf benchmark. Benchmark Application: SPECviewperf 12.1 under official run. Subtest: catia-04. FirePro W7100 (with 16.50) score: 74.48. FirePro W7100 (with 14.502.1019) score: 57.33. Performance Differential:  $74.48/57.33 = \sim 29.9\%$  higher score on FirePro W7100 with 16.50. PC manufacturers may vary configurations, yielding different results. Performance may vary based on use of latest drivers. FS-6

# Endnotes

Slide 33:

4. With 16.50 driver, Radeon™ Pro WX5100 delivers up to 67% faster performance on Autodesk Maya than FirePro™ W5100. Testing conducted by AMD Performance Labs as of November 7th, 2016 on a test system comprising of Intel E5-1650 v3 3.50GHz, 16GB RAM, Win7 64-bit SP1, AMD FirePro™ W5100/AMD Radeon™ Pro WX5100, software drivers 16.50 for SPECviewperf benchmark. Benchmark Application: SPECviewperf 12.1 under official run. Subtest: maya-04. Radeon™ Pro WX5100 (with 16.50) score: 59.22. FirePro™ W5100 (with 16.50) score: 35.55. Performance Differential:  $59.22/35.55 = \sim 66.58\%$  higher score on Radeon™ Pro WX5100 with 16.50. PC manufacturers may vary configurations, yielding different results. Performance may vary based on use of latest drivers. RPW-64
5. With 16.50 driver, Radeon™ Pro WX5100 delivers up to 70% faster performance on Siemens NX than FirePro™ W5100. Testing conducted by AMD Performance Labs as of November 7th, 2016 on a test system comprising of Intel E5-1650 v3 3.50GHz, 16GB RAM, Win7 64-bit SP1, AMD FirePro™ W5100/AMD Radeon™ Pro WX5100, software drivers 16.50 for SPECviewperf benchmark. Benchmark Application: SPECviewperf 12.1 under official run. Subtest: snx-02. Radeon™ Pro WX5100 (with 16.50) score: 79.01. FirePro™ W5100 (with 16.50) score: 46.33. Performance Differential:  $79.01/46.33 = \sim 70.54\%$  higher score on Radeon™ Pro WX5100 with 16.50. PC manufacturers may vary configurations, yielding different results. Performance may vary based on use of latest drivers. RPW-63
6. With 16.50 driver, Radeon™ Pro WX5100 delivers up to 80% faster performance on Catia than FirePro™ W5100. Testing conducted by AMD Performance Labs as of November 7th, 2016 on a test system comprising of Intel E5-1650 v3 3.50GHz, 16GB RAM, Win7 64-bit SP1, AMD FirePro™ W5100/AMD Radeon™ Pro WX5100, software drivers 16.50 for SPECviewperf benchmark. Benchmark Application: SPECviewperf 12.1 under official run. Subtest: catia-04. Radeon™ Pro WX5100 (with 16.50) score: 74.66. FirePro™ W5100 (with 16.50) score: 41.42. Performance Differential:  $74.66/41.42 = \sim 80.25\%$  higher score on Radeon™ Pro WX5100 with 16.50. PC manufacturers may vary configurations, yielding different results. Performance may vary based on use of latest drivers. RPW-62
7. With 16.50 driver, Radeon™ Pro WX7100 delivers up to 32% faster performance on Autodesk 3ds Max than FirePro™ W7100. Testing conducted by AMD Performance Labs as of November 7th, 2016 on a test system comprising of Intel E5-1650 v3 3.50GHz, 16GB RAM, Win7 64-bit SP1, AMD FirePro™ W7100/AMD Radeon™ Pro WX7100, software drivers 16.50 for SPECviewperf benchmark. Benchmark Application: SPECviewperf 12.1 under official run. Subtest: 3dsmax-05. Radeon™ Pro WX7100 (with 16.50) score: 98.37. FirePro™ W7100 (with 16.50) score: 74.32. Performance Differential:  $98.37/74.32 = \sim 32.36\%$  higher score on Radeon™ Pro WX7100 with 16.50. PC manufacturers may vary configurations, yielding different results. Performance may vary based on use of latest drivers. RPW-61
8. With 16.50 driver, Radeon™ Pro WX7100 delivers up to 38% faster performance on PTC Creo than FirePro™ W7100. Testing conducted by AMD Performance Labs as of November 7th, 2016 on a test system comprising of Intel E5-1650 v3 3.50GHz, 16GB RAM, Win7 64-bit SP1, AMD FirePro™ W7100/AMD Radeon™ Pro WX7100, software drivers 16.50 for SPECviewperf benchmark. Benchmark Application: SPECviewperf 12.1 under official run. Subtest: creo-01. Radeon™ Pro WX7100 (with 16.50) score: 80.19. FirePro™ W7100 (with 16.50) score: 58.30. Performance Differential:  $80.19/58.30 = \sim 37.55\%$  higher score on Radeon™ Pro WX7100 with 16.50. PC manufacturers may vary configurations, yielding different results. Performance may vary based on use of latest drivers. RPW-60
9. With 16.50 driver, Radeon™ Pro WX7100 delivers up to 43% faster performance on Catia than FirePro™ W7100. Testing conducted by AMD Performance Labs as of November 7th, 2016 on a test system comprising of Intel E5-1650 v3 3.50GHz, 16GB RAM, Win7 64-bit SP1, AMD FirePro™ W7100/AMD Radeon™ Pro WX7100, software drivers 16.50 for SPECviewperf benchmark. Benchmark Application: SPECviewperf 12.1 under official run. Subtest: catia-04. Radeon™ Pro WX7100 (with 16.50) score: 106.75. FirePro™ W7100 (with 16.50) score: 74.48. Performance Differential:  $106.75/74.48 = \sim 43.32\%$  higher score on Radeon™ Pro WX7100 with 16.50. PC manufacturers may vary configurations, yielding different results. Performance may vary based on use of latest drivers. RPW-59

# Endnotes

Slide 40:

1. Testing conducted by AMD Performance Labs as of November 14th, 2016 on the 8GB Radeon RX 480, on a test system comprising of Intel i7 5960X CPU (3.0 GHz), 16GB DDR4-2666 Mhz system memory, pre-release Radeon Software driver 16.50 or 16.6.2 and Windows 10 x64 using the game Ashes of the Singularity DirectX®12 on the extreme preset. PC manufacturers may vary configurations, yielding different results. At 1920x1080, Radeon Software driver 16.6.2 and 8GB Radeon RX 480 running Ashes of the Singularity DirectX®12 scored 42.8 and pre-release Radeon Software driver 16.50 and 8GB Radeon RX 480 running Ashes of the Singularity DirectX®12 scored 46.2, which is 8% faster performance. Performance may vary based on use of final driver. RS-86
2. Testing conducted by AMD Performance Labs as of November 14th, 2016 on the 8GB Radeon RX 480, on a test system comprising of Intel i7 5960X CPU (3.0 GHz), 16GB DDR4-2666 Mhz system memory, pre-release Radeon Software driver 16.50 or 16.6.2 and Windows 10 x64 using the game Batman Arkham Asylum. PC manufacturers may vary configurations, yielding different results. At 1920x1080 16xAF, Radeon Software driver 16.6.2 and 8GB Radeon RX 480 running Batman Arkham Asylum scored 104.3 and pre-release Radeon Software driver 16.50 and 8GB Radeon RX 480 running Batman Arkham Asylum scored 111.5, which is 7% faster performance. Performance may vary based on use of final drivers. RS-87
3. Testing conducted by AMD Performance Labs as of November 14th, 2016 on the 8GB Radeon RX 480, on a test system comprising of Intel i7 5960X CPU (3.0 GHz), 16GB DDR4-2666 Mhz system memory, pre-release Radeon Software driver 16.50 or 16.6.2 and Windows 10 x64 using the game Deus Ex: Mankind Divided DirectX®12 on the Very High preset. PC manufacturers may vary configurations, yielding different results. At 1920x1080, Radeon Software driver 16.6.2 and 8GB Radeon RX 480 running Deus Ex: Mankind Divided DirectX®12 scored 53.4 and pre-release Radeon Software driver 16.50 and 8GB Radeon RX 480 running Deus Ex: Mankind Divided DirectX®12 scored 55.6, which is 4% faster performance. Performance may vary based on use of final drivers. RS-88
4. Testing conducted by AMD Performance Labs as of November 14th, 2016 on the 8GB Radeon RX 480, on a test system comprising of Intel i7 5960X CPU (3.0 GHz), 16GB DDR4-2666 Mhz system memory, pre-release Radeon Software driver 16.50 or 16.6.2 and Windows 10 x64 using the game Shadow of Mordor on the Max preset. PC manufacturers may vary configurations, yielding different results. At 1920x1080, Radeon Software driver 16.6.2 and 8GB Radeon RX 480 running Shadow of Mordor scored 75.8 and pre-release Radeon Software driver 16.50 and 8GB Radeon RX 480 running Shadow of Mordor scored 80.9, which is 7% faster performance. Performance may vary based on use of final drivers. RS-89
5. Testing conducted by AMD Performance Labs as of November 14th, 2016 on the 8GB Radeon RX 480, on a test system comprising of Intel i7 5960X CPU (3.0 GHz), 16GB DDR4-2666 Mhz system memory, pre-release Radeon Software Crimson Edition driver 16.50 or 16.6.2 and Windows 10 x64 using the game Overwatch on the Epic preset. PC manufacturers may vary configurations, yielding different results. At 1920x1080, Radeon Software driver 16.6.2 and 8GB Radeon RX 480 running Overwatch scored 101.8 and pre-release Radeon Software driver 16.50 and 8GB Radeon RX 480 running Overwatch scored 107.8, which is 6% faster performance. Performance may vary based on use of final drivers. RS-90

Slide 42: HDMI, the HDMI logo and High-Definition Multimedia Interface are trademarks or registered trademarks of HDMI Licensing, LLC in the United States and other countries. GD-45

# Endnotes

Slide 46:

1. Testing conducted by AMD Performance Labs as of November 11<sup>th</sup>, 2016 in Overwatch® DirectX®11 on a test system comprising of Intel i7 5960X CPU (3.0 GHz), 16GB DDR4-2666 Mhz system memory, pre-release Radeon Software driver 16.50 and Windows 10 x64 on the 1920x1080 Epic preset. PC manufacturers may vary configurations, yielding different results. Pre-release Radeon Software driver 16.50 running Overwatch® DirectX®11 with AMD FreeSync Technology delivers a 76ms click-to-response time versus AMD FreeSync Technology disabled, which delivers a 100ms click-to-response time, lowering click-to-response time with FreeSync by 24%. Performance may vary based on use of final driver. RS-91

Slides 53:

1. GPU Package Power refers to the amount of power (in Watts) being delivered to the GPU package; the GPU chip and substrate. Testing conducted by AMD Performance Labs as of November 14th, 2016 on the 8GB Radeon RX 480, on a test system comprising of Intel i7 5960X CPU (3.0 GHz), 16GB DDR4-2666 Mhz system memory, pre-release Radeon Software driver 16.50 and Windows 10 x64 using the game World of Warcraft on graphics preset 10 with Radeon Chill OFF or ON. PC manufacturers may vary configurations, yielding different results. At 1920x1080, pre-release Radeon Software driver 16.50 and 8GB Radeon RX 480 running World of Warcraft and Radeon Chill OFF scored 107.72 Watts and pre-release Radeon Software driver 16.50 and 8GB Radeon RX 480 running World of Warcraft and Radeon Chill ON scored 74.75 Watts, which is 31% lower Average GPU Package Power in Wattage. Performance may vary based on use of final driver. RS-92

Slide 54:

2. Testing conducted by AMD Performance Labs as of November 14th, 2016 on the 8GB Radeon RX 480, on a test system comprising of Intel i7 5960X CPU (3.0 GHz), 16GB DDR4-2666 Mhz system memory, pre-release Radeon Software driver 16.50 and Windows 10 x64 using the game World of Warcraft on graphics preset 10 with Radeon Chill OFF or ON. PC manufacturers may vary configurations, yielding different results. At 1920x1080, pre-release Radeon Software driver 16.50 and 8GB Radeon RX 480 running World of Warcraft and Radeon Chill OFF scored 88.38 Celsius and pre-release Radeon Software driver 16.50 and 8GB Radeon RX 480 running World of Warcraft and Radeon Chill ON scored 77.26 Celsius, which is 13% lower average GPU temperature. Performance may vary based on use of final driver. RS-93

Slide 56:

3. Testing conducted by AMD Performance Labs as of November 14th, 2016 on the 8GB Radeon RX 480, on a test system comprising of Intel i7 5960X CPU (3.0 GHz), 16GB DDR4-2666 Mhz system memory, pre-release Radeon Software driver 16.50 and Windows 10 x64 using the game World of Warcraft on graphics preset 10 with Radeon Chill OFF or ON. PC manufacturers may vary configurations, yielding different results. Average frame time delivery is the latency it takes for the GPU to display an image after it is rendered. Radeon Chill reduces display latency by rendering frames in real time. At 1920x1080, pre-release Radeon Software driver 16.50 and 8GB Radeon RX 480 running World of Warcraft and Radeon Chill OFF scored 7.13 milliseconds and pre-release Radeon Software driver 16.50 and 8GB Radeon RX 480 running World of Warcraft and Radeon Chill ON scored 4.83 milliseconds, which is 32% lower average frame-time delivery to display in milliseconds. Performance may vary based on use of final driver. RS-94

# Endnotes

Slide 69:

1. Testing conducted by AMD Performance Labs as of November 15th, 2016 on the 8GB Radeon RX 480, on a test system comprising of Intel i7 5960X CPU (3.0 GHz), 16GB DDR4-2666 Mhz system memory, pre-release Radeon Software driver 16.50 with Radeon ReLive, and Windows 10 x64 using the game World of Warcraft DirectX®11 on the Highest preset at 1920x1080. PC manufacturers may vary configurations, yielding different results. Pre-release Radeon Software driver 16.50 with 8GB Radeon RX 480 running World of Warcraft and Radeon ReLive recording OFF scored 133.3 and 129.6 with Radeon ReLive recording ON, which is a 3% impact to average Frames Per Second. Performance may vary based on use of final driver. RS-102
2. Testing conducted by AMD Performance Labs as of November 15th, 2016 on the 8GB Radeon RX 480, on a test system comprising of Intel i7 5960X CPU (3.0 GHz), 16GB DDR4-2666 Mhz system memory, pre-release Radeon Software driver 16.50 with Radeon ReLive, and Windows 10 x64 using the game Overwatch® DirectX®11 on the Epic preset at 1920x1080. PC manufacturers may vary configurations, yielding different results. Pre-release Radeon Software driver 16.50 with 8GB Radeon RX 480 running Overwatch® and Radeon ReLive recording OFF scored 95.1 Frames Per Second (FPS) and 92.4 FPS with Radeon ReLive recording ON, which is a 3% impact to average Frames Per Second. Performance may vary based on use of final driver. RS-100
3. Testing conducted by AMD Performance Labs as of November 15th, 2016 on the 8GB Radeon RX 480, on a test system comprising of Intel i7 5960X CPU (3.0 GHz), 16GB DDR4-2666 Mhz system memory, pre-release Radeon Software driver 16.50 with Radeon ReLive, and Windows 10 x64 using the game Battlefield 1 DirectX®11 on the Ultra preset at 1920x1080. PC manufacturers may vary configurations, yielding different results. Pre-release Radeon Software driver 16.50 with 8GB Radeon RX 480 running Battlefield 1 and Radeon ReLive recording OFF scored 92.1 and 88.4 with Radeon ReLive recording ON, which is a 4% impact to average Frames Per Second. Performance may vary based on use of final driver. RS-104
4. Testing conducted by AMD Performance Labs as of November 15th, 2016 on the 8GB Radeon RX 480, on a test system comprising of Intel i7 5960X CPU (3.0 GHz), 16GB DDR4-2666 Mhz system memory, pre-release Radeon Software driver 16.50 with Radeon ReLive, and Windows 10 x64 using the game H1Z1: King of the Kill DirectX®11 on the Ultra preset at 1920x1080. PC manufacturers may vary configurations, yielding different results. Pre-release Radeon Software driver 16.50 with 8GB Radeon RX 480 running H1Z1: King of the Kill and Radeon ReLive recording OFF scored 79.9 and 77.5 with Radeon ReLive recording ON, which is a 3% impact to average Frames Per Second. Performance may vary based on use of final driver. RS-103

# Endnotes

Slide 75:

1. Testing conducted by AMD Performance Labs as of November 14th, 2016 on the 8GB Radeon RX 480, on a test system comprising of Intel i7 5960X CPU (3.0 GHz), 16GB DDR4-2666 Mhz system memory, pre-release Radeon Software driver 16.50 or 16.6.2 and Windows 10 x64 using the game Ashes of the Singularity DirectX®12 on the extreme preset. PC manufacturers may vary configurations, yielding different results. At 1920x1080, Radeon Software driver 16.6.2 and 8GB Radeon RX 480 running Ashes of the Singularity DirectX®12 scored 42.8 and pre-release Radeon Software driver 16.50 and 8GB Radeon RX 480 running Ashes of the Singularity DirectX®12 scored 46.2, which is 8% faster performance. Performance may vary based on use of final driver. RS-86
2. Testing conducted by AMD Performance Labs as of November 22<sup>th</sup>, 2016 on AMD Radeon™ GCN and Polaris enabled products on various configurations using the pre-release Radeon Software driver 16.50. Radeon Software Crimson ReLive Edition was subjected to 25% more test effort than Radeon Software Crimson Edition. Data based on AMD internal data.
3. As of November 9<sup>th</sup>, 2016
4. Up to 30% faster performance using 16.50 and Catia on AMD FirePro™ W7100 than with 14.502.1019. Testing conducted by AMD Performance Labs as of November 7th, 2016 on a test system comprising of Intel E5-1650 v3 3.50GHz, 16GB RAM, Win7 64-bit SP1, AMD FirePro™ W7100, software drivers 16.50 and 14.502.1019 for SPECviewperf benchmark. Benchmark Application: SPECviewperf 12.1 under official run. Subtest: catia-04. FirePro W7100 (with 16.50) score: 74.48. FirePro W7100 (with 14.502.1019) score: 57.33. Performance Differential:  $74.48/57.33 = \sim 29.9\%$  higher score on FirePro W7100 with 16.50. PC manufacturers may vary configurations, yielding different results. Performance may vary based on use of latest drivers. FS-6
5. AMD internal data, testing of Radeon Pro 16.Q4 Enterprise Driver compared to FirePro™ 14.502.1019 driver

# Disclaimer

The information presented in this document is for informational purposes only and may contain technical inaccuracies, omissions and typographical errors.

The information contained herein is subject to change and may be rendered inaccurate for many reasons, including but not limited to product and roadmap changes, component and motherboard version changes, new model and/or product releases, product differences between differing manufacturers, software changes, BIOS flashes, firmware upgrades, or the like. AMD assumes no obligation to update or otherwise correct or revise this information. However, AMD reserves the right to revise this information and to make changes from time to time to the content hereof without obligation of AMD to notify any person of such revisions or changes.

AMD MAKES NO REPRESENTATIONS OR WARRANTIES WITH RESPECT TO THE CONTENTS HEREOF AND ASSUMES NO RESPONSIBILITY FOR ANY INACCURACIES, ERRORS OR OMISSIONS THAT MAY APPEAR IN THIS INFORMATION.

AMD SPECIFICALLY DISCLAIMS ANY IMPLIED WARRANTIES OF MERCHANTABILITY OR FITNESS FOR ANY PARTICULAR PURPOSE. IN NO EVENT WILL AMD BE LIABLE TO ANY PERSON FOR ANY DIRECT, INDIRECT, SPECIAL OR OTHER CONSEQUENTIAL DAMAGES ARISING FROM THE USE OF ANY INFORMATION CONTAINED HEREIN, EVEN IF AMD IS EXPRESSLY ADVISED OF THE POSSIBILITY OF SUCH DAMAGES.

# Attribution

Ashes of the Singularity images and logos Copyright © 2015 Oxide Games. Ashes of the Singularity is a trademark of Stardock Entertainment. All rights reserved.

Battlefield 1 images and logos ©2016 Electronic Arts Inc. Battlefield, Battlefield 1 and the DICE logo are trademarks of EA Digital Illusions CE AB. EA and the EA logo are trademarks of Electronic Arts Inc.

©2016 Take-Two Interactive Software and its subsidiaries. Sid Meier's Civilization, Civilization, Civ, 2K, Firaxis Games, Take-Two Interactive Software and their respective logos are all trademarks of Take-Two Interactive Software, Inc. All other marks and trademarks are the property of their respective owners. All rights reserved.

Deus Ex: Mankind Divided™ images and logos © 2015 Square Enix Ltd. All Rights Reserved Deus Ex: Mankind Divided, Square Enix and Eidos are trademarks of the Square Enix Group.

Forza Horizon® 3 images and logos © 2016 Microsoft Corporation. All rights reserved. Forza Horizon® is a registered trademark of Microsoft Corporation in the US and other jurisdictions.

Halo® 5 Forge images and logos © 2016 Microsoft Corporation. All rights reserved. Halo® is a registered trademark of Microsoft Corporation in the US and other jurisdictions.

Hitman ©2015 IO-Interactive A/S. All rights reserved. IO-INTERACTIVE and the IO logo are trademarks of IO-Interactive A/S. HITMAN and the HITMAN logo are trademarks of Square Enix Limited. SQUARE ENIX and the SQUARE ENIX logo are registered trademarks or trademarks of Square Enix Co. Holdings Ltd.

© Copyright Games Workshop Limited 2015. Warhammer, the Warhammer logo, GW, Games Workshop, The Game of Fantasy Battles, the twin-tailed comet logo, and all associated logos, illustrations, images, names, creatures, races, vehicles, locations, weapons, characters, and the distinctive likeness thereof, are either ® or TM, and/or © Games Workshop Limited, variably registered around the world, and used under license. Developed by Creative Assembly and published by SEGA. Creative Assembly, the Creative Assembly logo, Total War and the Total War logo are either registered trade marks or trade marks of The Creative Assembly Limited. SEGA and the SEGA logo are either registered trademarks or trademarks of SEGA Holdings Co., Ltd. or its affiliates. All rights reserved. SEGA is registered in the U.S. Patent and Trademark Office. All other trademarks, logos and copyrights are property of their respective owners.

Quantum Break™ images and logos © 2016 Microsoft Corporation. All rights reserved. Quantum Break™ is a trademark of Microsoft Corporation in the US and other jurisdictions.

© 2016 Advanced Micro Devices, Inc. All rights reserved. AMD, the AMD Arrow logo, LiquidVR, Radeon and combinations thereof are trademarks of Advanced Micro Devices, Inc. in the United States and/or other jurisdictions. Windows and DirectX are registered trademarks of Microsoft Corporation in the US and other jurisdictions. OpenCL is a trademark of Apple Inc. used by permission by Khronos. OpenVX and OpenGL are trademarks or registered trademarks of Khronos Group, Inc. Vulkan and the Vulkan logo are trademarks of Khronos Group Inc. Other names are for informational purposes only and may be trademarks of their respective owners.