

# HDMI FORUM



# HDMI 2.1 SPECIFICATION ANNOUNCEMENT

HDMI Forum  
and  
HDMI Licensing Administrator, Inc.



# HDMI FORUM

# THE HDMI FORUM MISSION



**Support and develop future versions of the  
HDMI Specification**

**Support the eco-system of interoperable  
HDMI-enabled devices**

**Foster broader industry participation  
in the development of future versions of  
the HDMI Specification**

# HDMI FORUM MEMBERS



**The organization brings together the world's leading  
manufacturers of consumer electronics,  
personal computers, mobile devices, cables  
and components**

# BROAD SPECTRUM OF 83 GLOBAL MEMBER COMPANIES



# HDMI FORUM MEMBERSHIP



**Membership in the HDMI Forum is open to any interested company wishing to become a member**

**Companies are encouraged to apply and help shape the future of HDMI technology**

# GROWING RANGE OF HDMI DEVICES



- Flat Panel TV
- DVD & Blu-ray player/recorder
- TV Set Top Box
- Media Stick
- Projector
- AV Receiver
- Video Game Console
- VR solution
- Digital Still Camera
- Digital Camcorder
- Wearable Camera



- Discrete Adapter Solution
- Desktop PC
- Notebook PC
- PC Tablet
- LCD PC Monitor
- Notebook PC Docking Station
- Smart Phone
- Media Tablet
- Karaoke Player
- Health Care AV

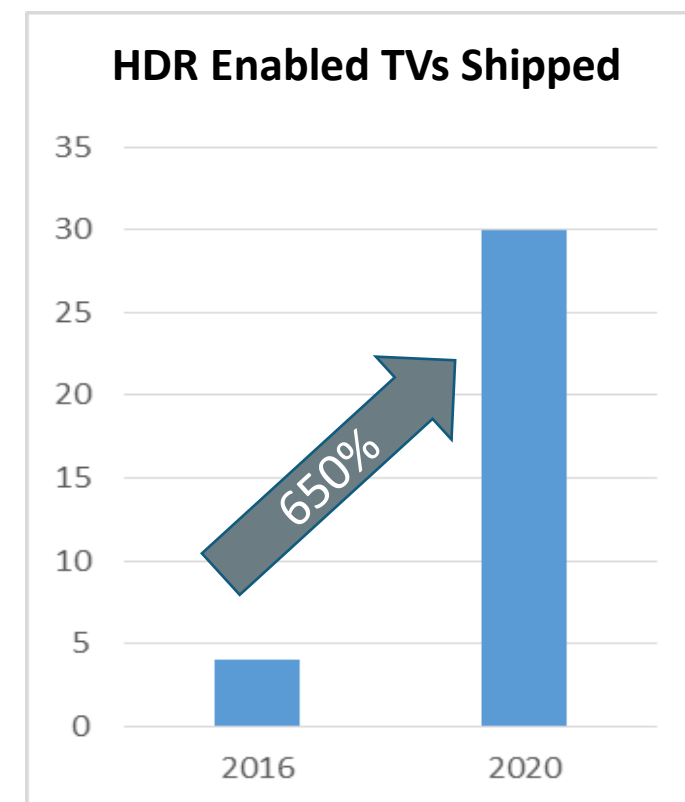
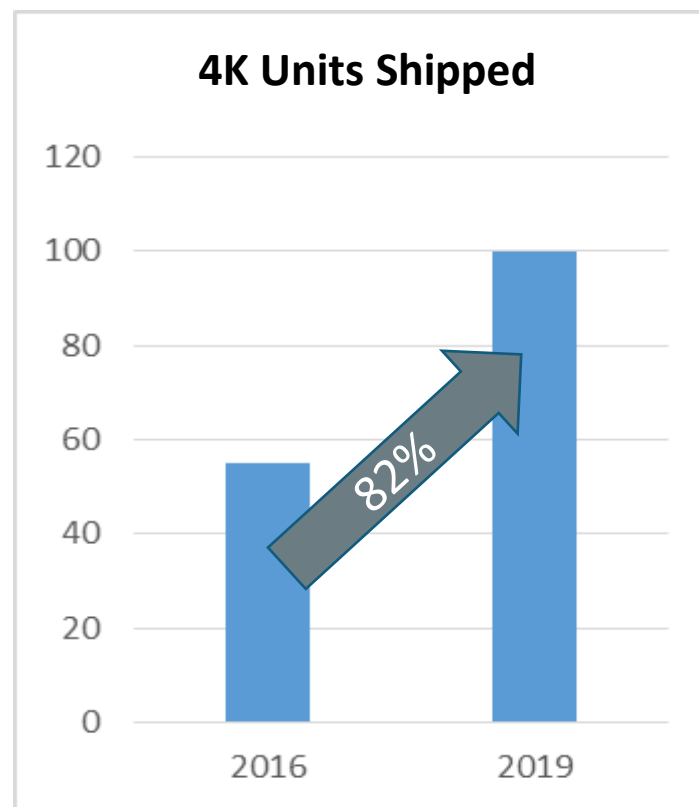
# THE GROWING HDMI Eco-SYSTEM



## HDMI-ENABLED DEVICES

6 billion HDMI-enabled devices have shipped since 2003

750 million HDMI-enabled devices are expected to have shipped in 2016



IHS Markit - Millions of Units



# HDMI 2.1





**HIGHER RESOLUTIONS**  
**FASTER REFRESH RATES**  
**48G CABLE**  
**DYNAMIC HDR**  
**eARC**  
**GAME MODE VRR**



**HIGHER RESOLUTIONS**  
**FASTER REFRESH RATES**

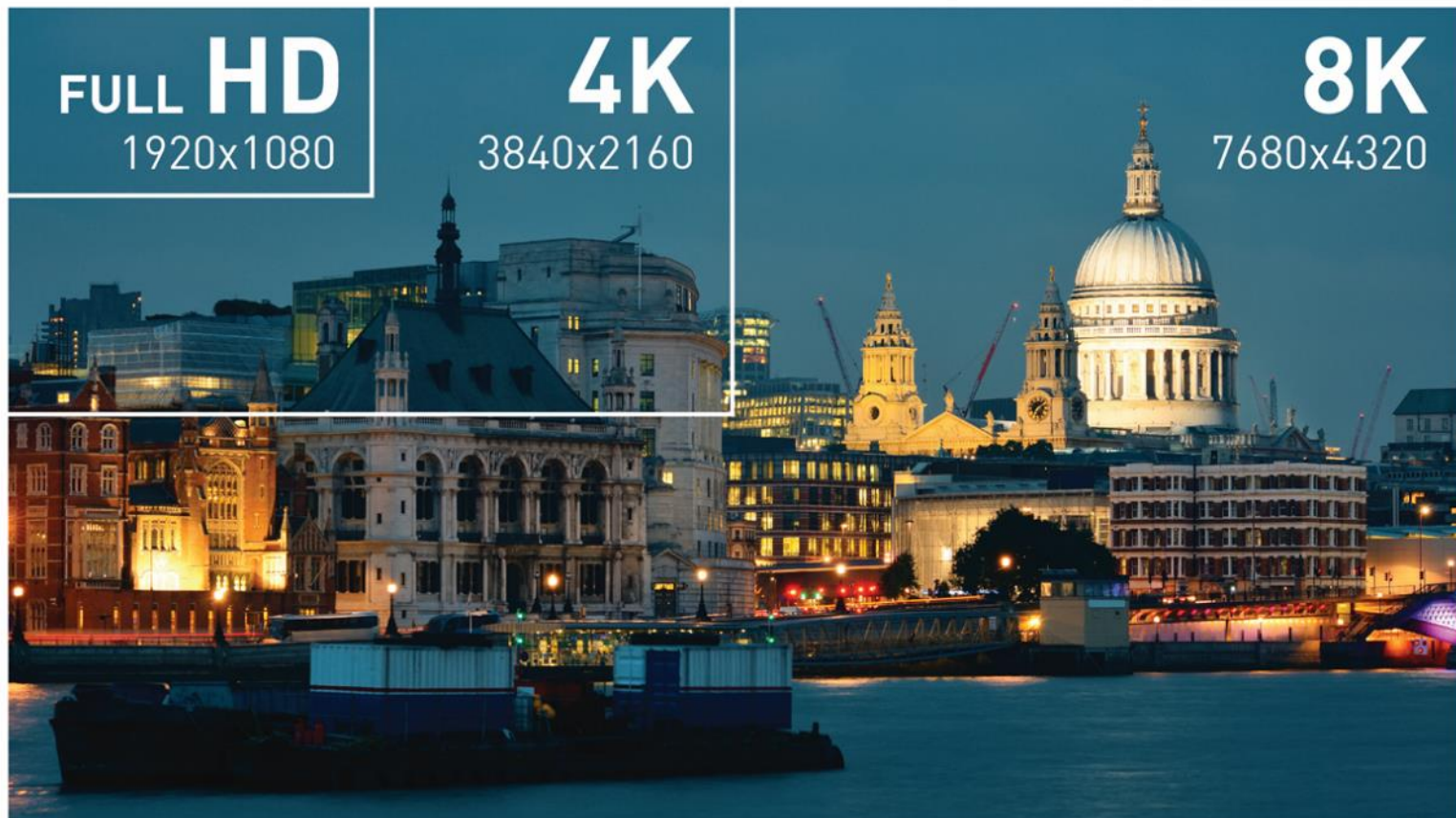
# HIGHER RESOLUTIONS AND FASTER REFRESH RATES



**HDMI technology enables  
end-to-end 8K and 4K solutions  
with higher refresh rates  
with a single cable for a seamless integration  
with the HDMI eco-system**



# HIGHER RESOLUTIONS AND FASTER REFRESH RATES



**8K60**

**8K delivers a  
super-immersive viewing  
experience**

**60Hz enables smooth  
and sharp viewing of  
content with high-speed  
action**

# HIGHER RESOLUTIONS AND FASTER REFRESH RATES



## 4K120

Ultra fast-motion UHD images are crisp and razor sharp - especially sports, action movies, high-performance gaming and VR



# SUPPORTED RESOLUTIONS AND REFRESH RATES

Multiple resolution support includes 5K and 10k resolutions for PC displays, digital signage, surveillance, and various commercial and industrial AV solutions

## Resolutions and Refresh Rates

4K50/60	4K100/120
5K50/60	5K100/120
8K50/60	8K100/120
10K50/60	10K100/120



# ADDITIONAL SUPPORTED FEATURES AND CAPABILITIES

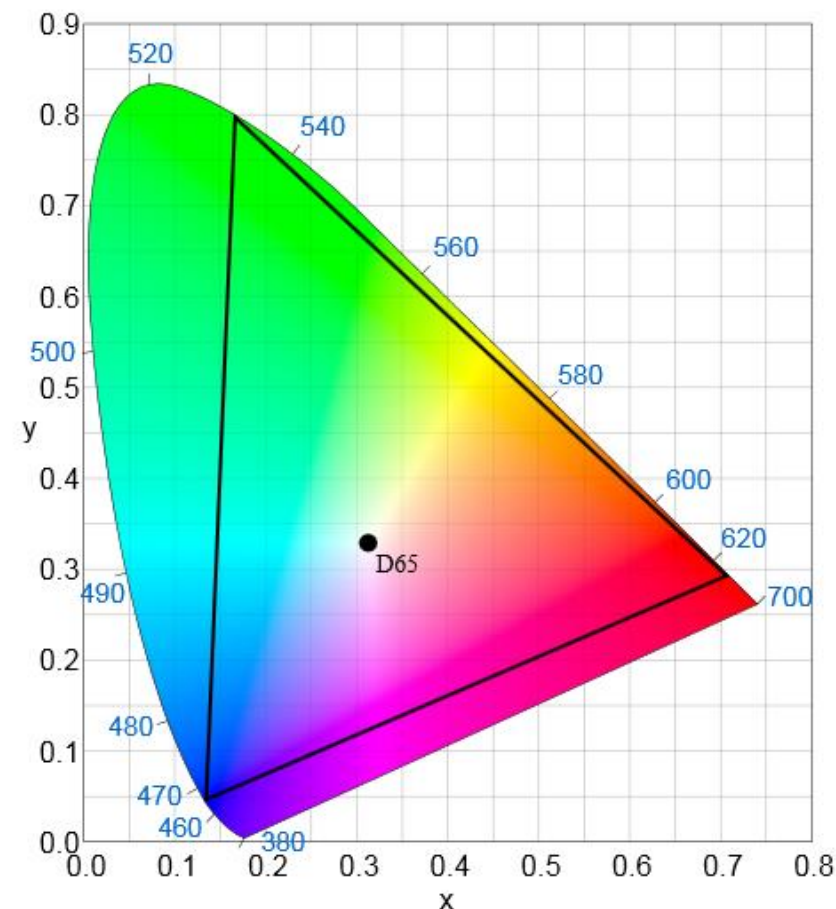


Both uncompressed and compressed bandwidth are supported and enabled to deliver a full range of features

Supports the latest color spaces such as BT.2020 with 10 or more bit colors now at higher frame rates, and also supports 12,14, and 16 bit color

CIE 1931 chromaticity diagram showing the Rec. 2020 (UHDTV) color space in the triangle and the location of the primary colors

By CIEy1931.svg: Sakuramboderivative work: GrandDrake (talk) – CIEy1931.svg, CC BY-SA 3.0, <https://commons.wikimedia.org/w/index.php?curid=21864661>







# DYNAMIC HDR

# DYNAMIC HDR SUPPORT



**The HDMI 2.1 specification supports multiple static and dynamic HDR solutions**

# HDR ENHANCED VIDEO



HDR enhances video images with an extended dark to bright contrast range for deeper blacks and brighter whites, greater detail in both the dark and bright parts in the same image, and greater detail within an extended color space



SDR



HDR

simulated images

# DYNAMIC HDR



SDR



Static HDR



Dynamic HDR

**Dynamic HDR enables a noticeable progression in overall video image quality from SDR to static HDR, and now static HDR to dynamic HDR**

simulated images



# THE DYNAMIC HDR ADVANTAGE



Movies and other content will be able to take advantage of HDR's expanded contrast ranges, brightness levels, and heightened levels of detail—and now have them optimized on a scene-by-scene or even a frame-by-frame basis



simulated images

# STATIC HDR – A TITLE-ONLY ENHANCEMENT



Static HDR uses a single image descriptor in metadata that is a compromise that applies to every scene and every frame of the whole movie



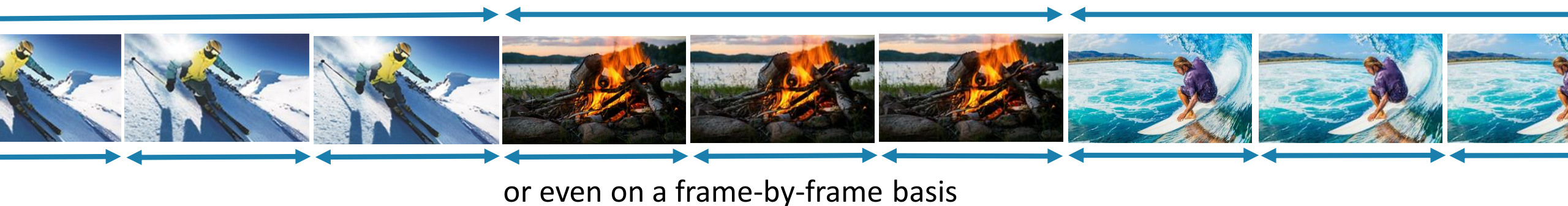
simulated images

# DYNAMIC HDR – SCENE OR FRAME SPECIFIC OPTIMIZATION



Dynamic HDR ensures every moment of a video is displayed at its ideal values for depth, detail, brightness, contrast, and wider color gamuts—on a scene-by-scene or even a frame-by-frame basis

Dynamic HDR image descriptor in metadata can be specific to each individual scene...



simulated images



# 48G CABLE



# 48G CABLE



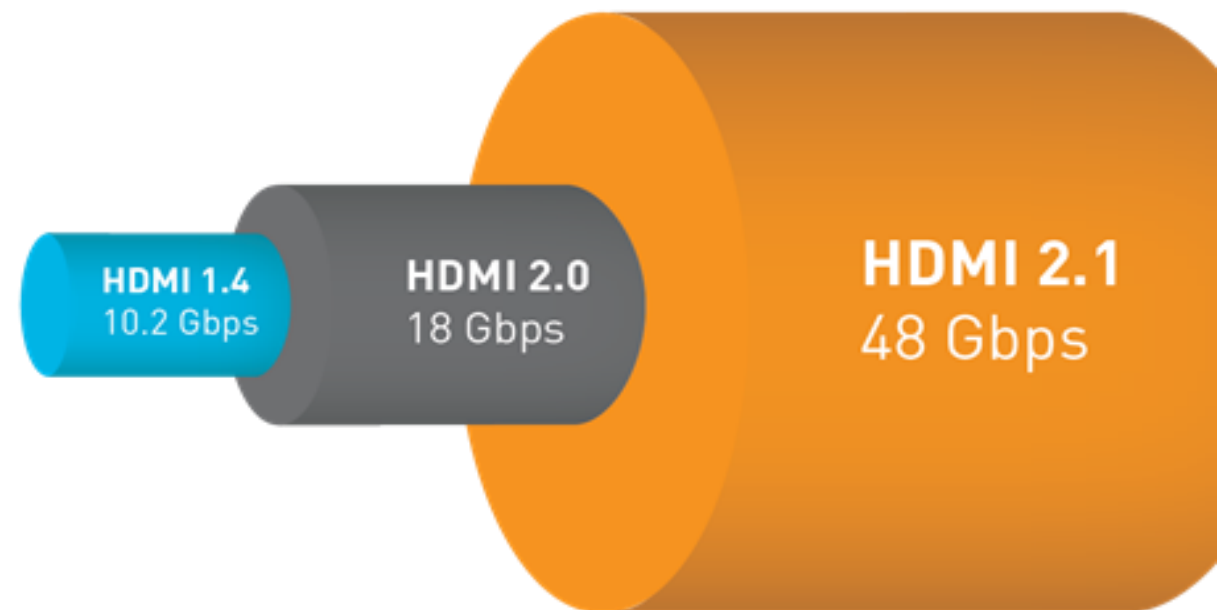
**Ensures high-bandwidth dependent features are delivered including enhanced video and audio performance, and accounting for new EMI characteristic**



# 48G CABLE SUPPORT FOR HDMI 2.1

Supports the full range of uncompressed HDMI 2.1 Specification features including 8K video with HDR

Enables up to 48Gbps bandwidth



# 48G CABLE ADVANTAGES



A more reliable high quality cable for robust, higher-bandwidth performance, and exceptionally low EMI

Utilizes existing HDMI connectors Types A, C and D

Includes the HDMI Ethernet Channel

Cable is backwards compatible and can be used with the existing installed base of billions of HDMI devices





**eARC**

# eARC (Enhanced Audio Return Channel)



**eARC supports the most advanced audio formats  
and enables advanced  
audio signal control capabilities**

# HDMI-Enabled Support for Highest Quality Audio



Home theater enthusiasts will have the ability to seamlessly utilize HDMI connectivity with AVRs and utilize a range of the highest quality audio formats available

Consumers that want to easily enhance their UHD viewing will now have access to the most advanced audio formats through a simple-to-setup HDMI-enabled sound bar system.

# eARC Object-Based Audio Support



**eARC supports the most advanced audio formats such as object-based audio**

**Object-based audio provides an immersive multi-dimensional experience and enhanced audio detail and depth**

# ADVANCED AUDIO SIGNAL CONTROL



Advanced control enables users to plug any HDMI-enabled device into an HDMI 2.1-enabled TV and audio device, and the TV will automatically detect and identify the device





# GAME MODE VRR

# GAME MODE VRR



Game Mode VRR  
produces a more fluid  
and better detailed  
gameplay experience

Features variable  
refresh rate (VRR), and  
synchs up source and  
display

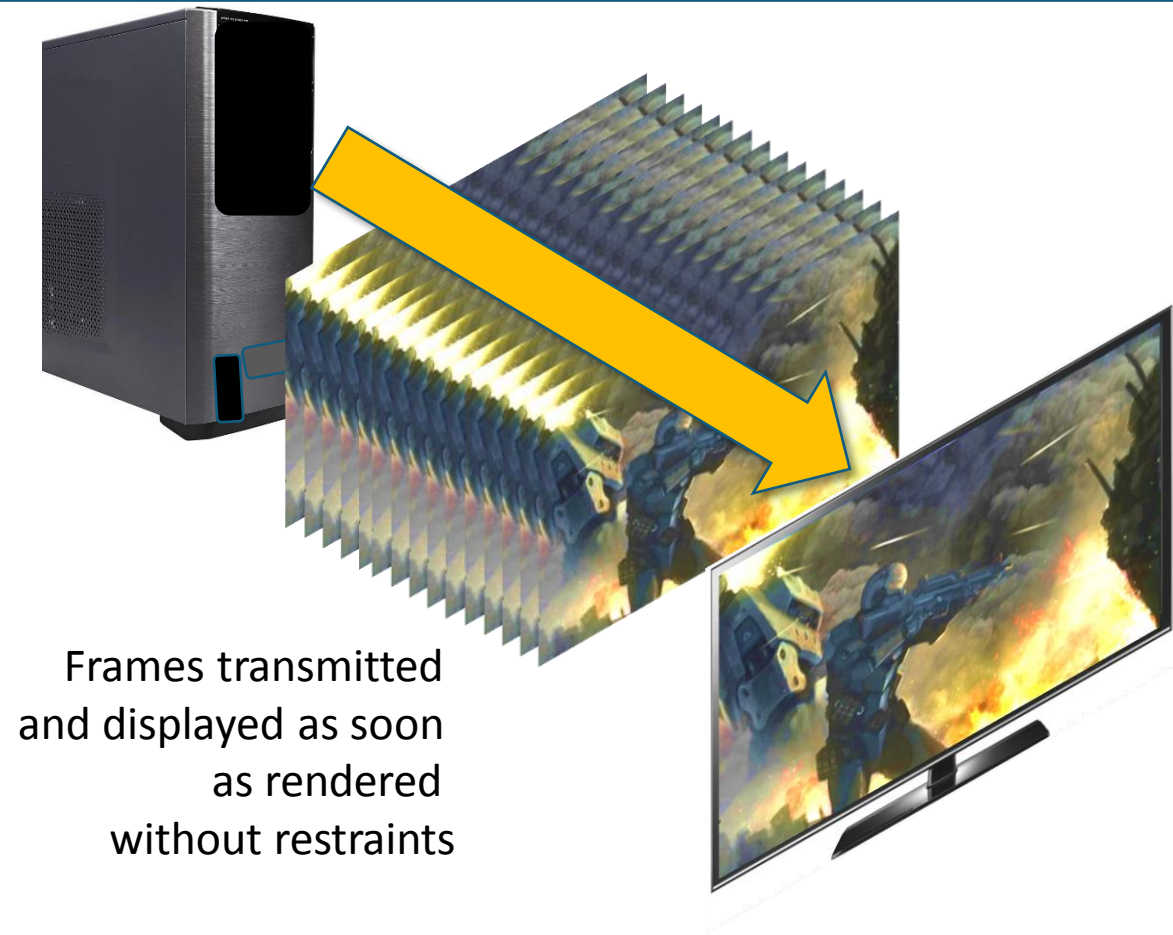


# GAME MODE VARIABLE REFRESH RATE ADVANTAGE



3D graphics processor transmits and displays video frames at the moment it is rendered, without being constrained to a fixed output or frame rate

Each frame is rendered, delivered and displayed at its optimal quality



# GAME MODE VRR ADVANTAGE



Reduces or eliminates...

- Game interaction lag
- Frame stutter, skipping, and freezing
- Frame tearing

Tear  
Point



# SUPPORTS THE ADVANCED GAME ECO-SYSTEM



Enables HDMI devices to support the most advanced extreme gaming features

More HDMI-enabled products can be utilized for advanced gaming

HDMI-enabled devices can include gaming consoles, PCs, laptops, PC monitors, VR gear, and UHD TVs



# HDMI FORUM

# HDMI FORUM MEMBERSHIP CONTACT



**For More Information: [www.hdmiforum.org](http://www.hdmiforum.org)**

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