

unleash

anytime

anywhere

connected technologies • immersive experiences • redefined revenue



MasterClass

End to end advocacy for next-generation A/V delivery



CHARTER



CONTRIBUTOR



ASSOCIATE



Ultra HD Forum MasterClass



9:00: Welcome and Forum Update: David Price, Ericsson; Vice-Chair, Ultra HD Forum

Perspectives:

9:05: Update on the Network Owners Perspective; Thomas Edwards, Fox Networks

9:20: Update on the SDO Perspective: Matthew Goldman, Ericsson

9:35: Update on the CE Vendors' Perspective: Nick Colsey, Sony Electronics

9:50: Update on the U.S. Broadcasters' Perspective: Lynn Claudy, NAB

Key Working Group Reports:

10:05: Introduction to the Ultra HD Forum Guidelines: Madeleine Noland, LG Electronics;
Chair, Ultra HD Forum Guidelines Working Group

10:20: Introduction to the Interoperability Test Results: Eric Grab, NeuLion;
Chair, Ultra HD Forum Interop Working Group

Roundtable and Q&A: Moderator: Thierry Fautier, Harmonic Inc.; Chair, Ultra HD Forum

10:35: Roundtable Discussion: *HDR deployment – When is it going to become a reality?*

- Stephan Heimbecher, Sky Deutschland
- Philip Goswitz, AT&T
- Akira Shimazu, Sky Perfect TV

10:55 Summary and Next Steps: David Price, Ericsson; Vice-chair, Ultra HD Forum

11:00: Close

Quick Thoughts on UHD

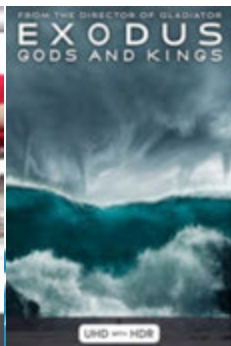


Thomas Edwards
FOX Networks Engineering & Operations

20th Century Fox & UHD



- CTO Hanno Basse, President of UHD Alliance
- All new 20CF movies will be in UHD:
 - 4K, HDR, WCG
 - Ultra HD Blu-ray, or
 - Vidity Download (through mgo.com)



Fox on UHD For TV...



- Backwards “derivable” HDR/WCG needed
 - Single-thread production is required
- Excited about 1080p60 HDR/WCG especially for OTA broadcast
- 4K needed as well of course!



MasterClass

Ultra HD Forum MasterClass



9:00: Welcome and Forum Update: David Price, Ericsson; Vice-Chair, Ultra HD Forum

Perspectives:

9:05: Update on the Network Owners Perspective; Thomas Edwards, Fox Networks

9:20: Update on the SDO Perspective: Matthew Goldman, Ericsson

9:35: Update on the CE Vendors' Perspective: Nick Colsey, Sony Electronics

9:50: Update on the U.S. Broadcasters' Perspective: Lynn Claudy, NAB

Key Working Group Reports:

10:05: Introduction to the Ultra HD Forum Guidelines: Madeleine Noland, LG Electronics;
Chair, Ultra HD Forum Guidelines Working Group

10:20: Introduction to the Interoperability Test Results: Eric Grab, NeuLion;
Chair, Ultra HD Forum Interop Working Group

Roundtable and Q&A: Moderator: Thierry Fautier, Harmonic Inc.; Chair, Ultra HD Forum

10:35: Roundtable Discussion: *HDR deployment – When is it going to become a reality?*

- Stephan Heimbecher, Sky Deutschland
- Philip Goswitz, AT&T
- Akira Shimazu, Sky Perfect TV

10:55 Summary and Next Steps: David Price, Ericsson; Vice-chair, Ultra HD Forum

11:00:Close



Update on the SDO Perspective

Matthew Goldman
Ericsson

ITU-R WP6C



- **HDR TV: Draft Proposed Rec. ITU-R BT.[HDR-TV]** – *Parameter values for high dynamic range television systems for production & international program exchange*
 - 2 methods of representing HDR-TV signals
 - **Perceptual Quantization (PQ)**: Achieves a very wide range of brightness levels for a given bit depth using a non-linear transfer function that is finely tuned to match the human visual system
 - **Hybrid Log-Gamma (HLG)**: Offers a degree of compatibility with legacy displays by more closely matching the previously established television transfer curves
- **Report ITU-R BT.2390** – *High dynamic range television for production and international programme exchange* (companion report to BT.[HDR-TV])
- **Colour Gamut Tailoring: Preliminary Draft Proposed Report ITU-R BT.[2020to709]** – *Color conversion from Rec. ITU R BT.2020 to Rec. ITU-R BT.709*

SMPTE

- **Drafts ST 2094-x** – *Content-Dependent Metadata for Color Volume Transformation of High Luminance and Wide Color Gamut Images* (aka dynamic metadata)
- New project: ***HDR and WCG Signaling on Streaming Interfaces*** (e.g., over SDI, SVIP)

MPEG HEVC HDR “Fast Track”

- **Call for Evidence for HDR/WCG**

- Input contributions showed that low bitrate applications did not perform as expected, including poor texture rendition, color shifts after compression, color boundary overflow & chroma sub-sampling issues
- CfE issued February 2015, with test results reviewed in July 2015

- **January 2016:** Decision made not to add new HDR tools to HEVC due to lack of significant improvements of candidate proposals over improved encode-side only techniques (no changes to bitstream syntax or reference decoder)

- 3 techniques improved the “anchors” (source images used in evaluation)

- Luma Adjustment (Ericsson)
 - Preprocessing before encoding
 - Removes subsampling artifacts
- Chroma QP Offset (Ericsson)
 - Encoder optimization
 - Removes chrominance artifacts
- Luma QP Offset (Ericsson & Sharp)
 - Encoder optimization
 - Increases detail

Other Current Standards Activities

- CTA
 - **Draft CTA-861-G** – *A DTV Profile for Uncompressed High Speed Digital Interfaces* (core of HDMI).
 - To add HDR dynamic metadata & HLG OETF to HDR support already in CTA-861.3
- UHD Alliance
 - *UltraHD Premium* specs and logo certification program
 - Broadcasting Sub-Group to consider the definition or recommendation of a reference display environment
- ATSC, DVB, SCTE, others ...
 - Standardizing the use of HDR/WCG in direct-to-home/consumer systems



MasterClass

Ultra HD Forum MasterClass



9:00: Welcome and Forum Update: David Price, Ericsson; Vice-Chair, Ultra HD Forum

Perspectives:

9:05: Update on the Network Owners Perspective; Thomas Edwards, Fox Networks

9:20: Update on the SDO Perspective: Matthew Goldman, Ericsson

9:35: Update on the CE Vendors' Perspective: Nick Colsey, Sony Electronics

9:50: Update on the U.S. Broadcasters' Perspective: Lynn Claudy, NAB

Key Working Group Reports:

10:05: Introduction to the Ultra HD Forum Guidelines: Madeleine Noland, LG Electronics;
Chair, Ultra HD Forum Guidelines Working Group

10:20: Introduction to the Interoperability Test Results: Eric Grab, NeuLion;
Chair, Ultra HD Forum Interop Working Group

Roundtable and Q&A: Moderator: Thierry Fautier, Harmonic Inc.; Chair, Ultra HD Forum

10:35: Roundtable Discussion: *HDR deployment – When is it going to become a reality?*

- Stephan Heimbecher, Sky Deutschland
- Philip Goswitz, AT&T
- Akira Shimazu, Sky Perfect TV

10:55 Summary and Next Steps: David Price, Ericsson; Vice-chair, Ultra HD Forum

11:00:Close

2016 Sony Television



4K HDR

HIGH DYNAMIC RANGE

Transcend Reality



SONY

NABSHOW
Where Content Comes to Life

#NABShow

unleash

The HDR Industry Leader from Lens to Living Room



SONY

NABSHOW
Where Content Comes to Life

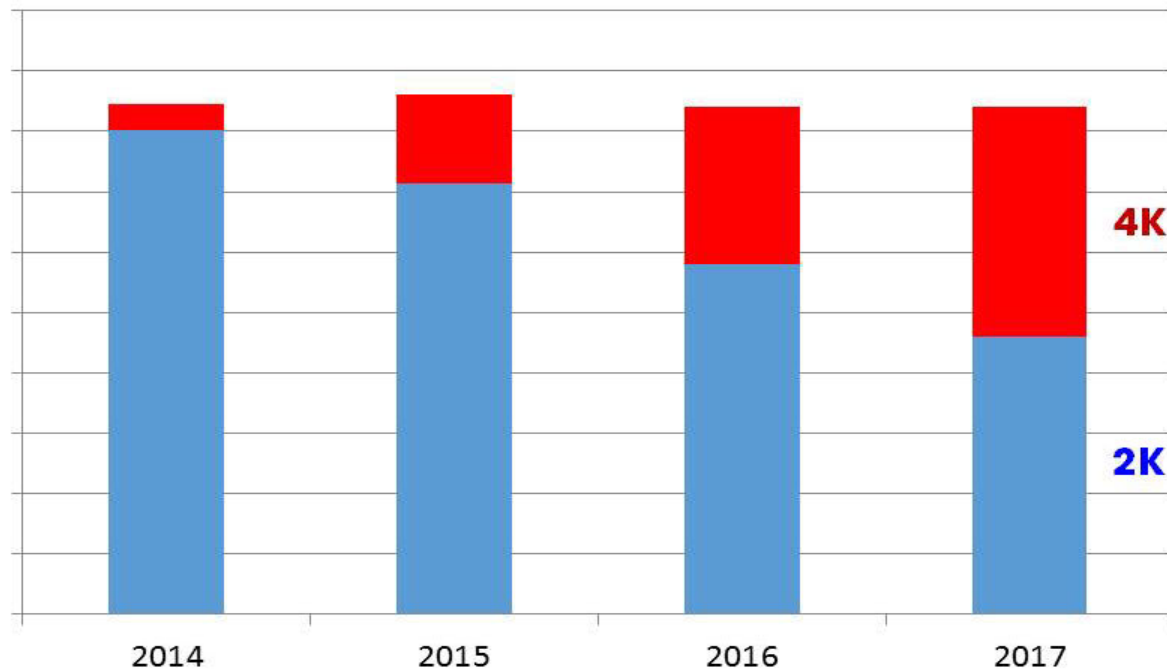
#NABShow

unleash

4K TV Industry Insight



Unit Market Trend



Picture Quality remains the #1 purchase decision criteria when choosing a new TV

4K & HDR are the natural choice for large screen TV customers

SONY

Based on Display Search, NPD, Sony analysis

NABSHOW
Where Content Comes to Life

#NABShow

unleash

3 Keys Area of Picture Quality



Color

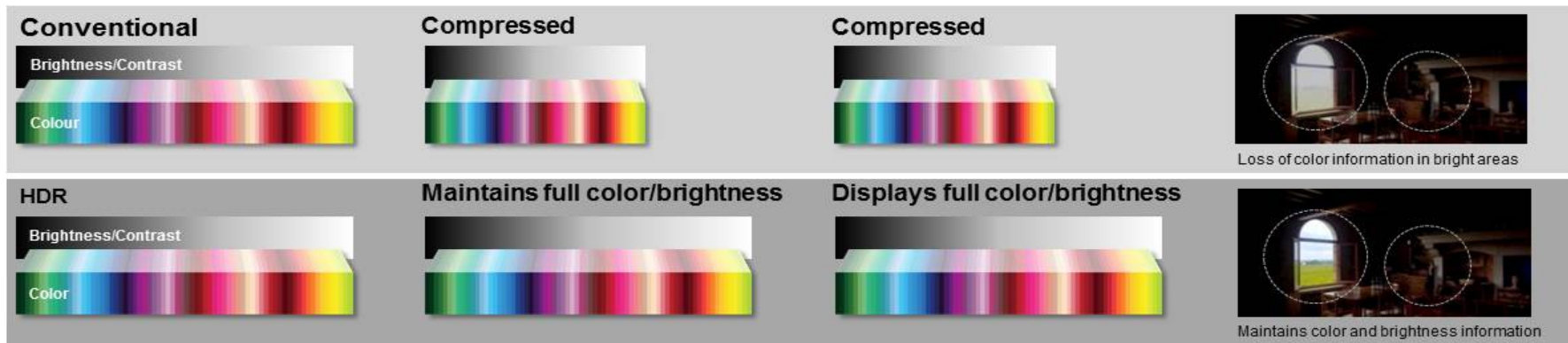
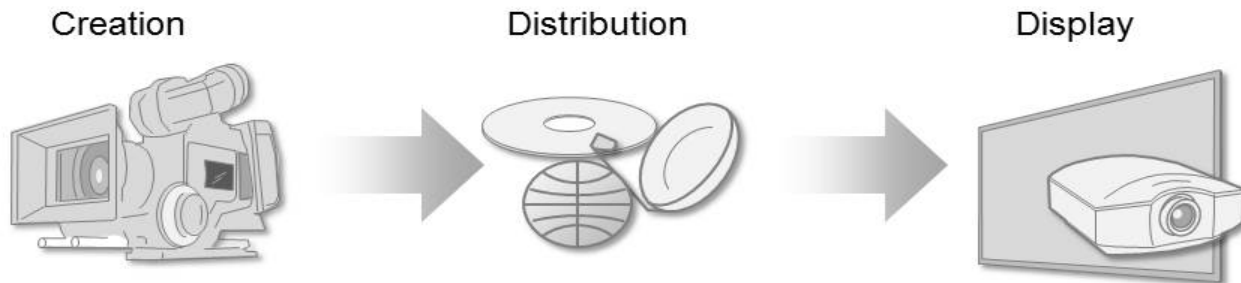


Contrast



Clarity

4K HDR – Why do we need HDR?



4K HDR – Where will we get it from?



Internet Streaming

amazon video

NETFLIX



Sony Pictures

Packaged Media



SONY



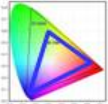
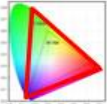
NABSHOW
Where Content Comes to Life

#NABShow

unleash

How Does a CE Company Differentiate & Compete?



PQ Element	Old Standard	New Standard	Sony's Technology
C larity		4K	4K X-Reality PRO Powered by 
C olor	BT.709 	BT.2020 	TRILUMINOS DISPLAY Powered by 
C ontrast	SDR Standard Dynamic Range	HDR High Dynamic Range	X-tended Dynamic Range PRO Powered by 

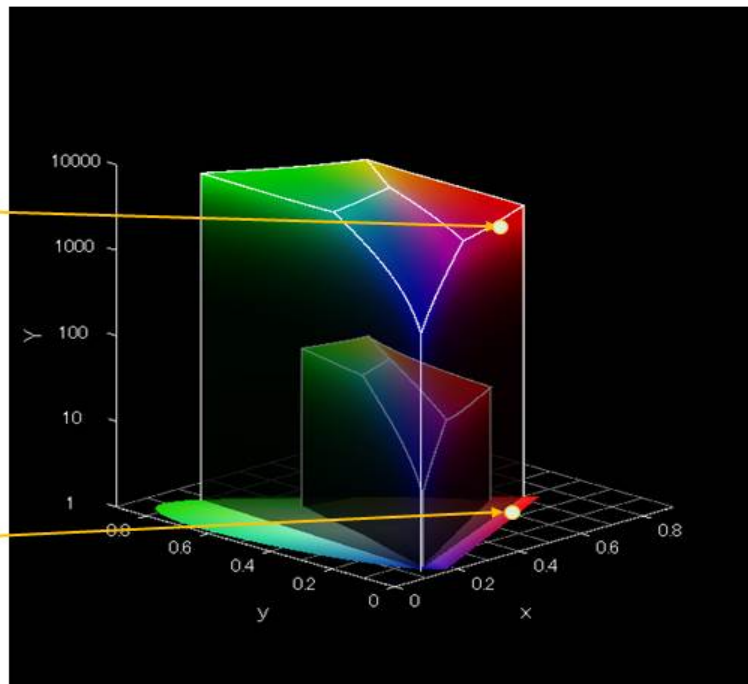
SONY

NABSHOW
Where Content Comes to Life

#NABShow

unleash

TRILUMINOS™ powered by X-1 Processor



- Accurate Colors throughout the HDR brightness range

SONY

NABSHOW #NABShow
Where Content Comes to Life

unleash

4K HDR – Slim Backlight Drive

The performance benefits of a local dimming Direct LED with the slim profile of an Edge Lit LED TV

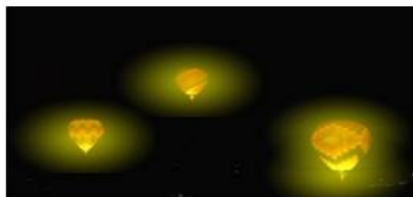


X-tended
Dynamic Range PRO

SLIM Backlight
Drive



Then how do we get



with Edge-lit LEDs?

SONY

NABSHOW
Where Content Comes to Life

#NABShow

unleash

4K HDR – Slim Backlight Drive

Slim Backlight Drive with



X-tended
Dynamic Range PRO



Simulated images

Conventional Local Dimming



Slim Backlight
Drive

X-tended
Dynamic Range PRO

**Sony's Slim Backlight Drive
with X-tended Dynamic Range PRO**

Simulated images

SONY

NABSHOW
Where Content Comes to Life

#NABShow

unleash

4K HDR - Slim Backlight Drive



X-tended Dynamic Range Pro
Slim Backlight Drive



X-tended Dynamic Range Pro
Full Array Backlight



SONY

NABSHOW
Where Content Comes to Life

#NABShow

unleash

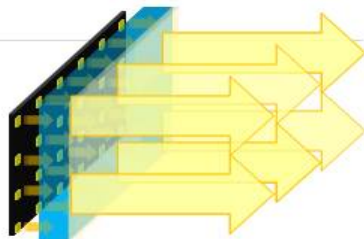
The 75X940D - Beautifully designed for brilliant pictures



75" | 65X940D

Key Features

- 4K HDR
- 4K Processor X1
- 4K X-Reality PRO
- TRILUMINOS Display
- X-tended Dynamic Range PRO
- **Full Array Local Dimming**
- Floating Style
- Android TV
- New Voice Remote
- Cable management



Full Array LED



Cable Management



SONY

NABSHOW #NABShow
Where Content Comes to Life

unleash



MasterClass

Ultra HD Forum MasterClass



9:00: Welcome and Forum Update: David Price, Ericsson; Vice-Chair, Ultra HD Forum

Perspectives:

9:05: Update on the Network Owners Perspective; Thomas Edwards, Fox Networks

9:20: Update on the SDO Perspective: Matthew Goldman, Ericsson

9:35: Update on the CE Vendors' Perspective: Nick Colsey, Sony Electronics

9:50: Update on the U.S. Broadcasters' Perspective: Lynn Claudy, NAB

Key Working Group Reports:

10:05: Introduction to the Ultra HD Forum Guidelines: Madeleine Noland, LG Electronics;
Chair, Ultra HD Forum Guidelines Working Group

10:20: Introduction to the Interoperability Test Results: Eric Grab, NeuLion;
Chair, Ultra HD Forum Interop Working Group

Roundtable and Q&A: Moderator: Thierry Fautier, Harmonic Inc.; Chair, Ultra HD Forum

10:35: Roundtable Discussion: *HDR deployment – When is it going to become a reality?*

- Stephan Heimbecher, Sky Deutschland
- Philip Goswitz, AT&T
- Akira Shimazu, Sky Perfect TV

10:55 Summary and Next Steps: David Price, Ericsson; Vice-chair, Ultra HD Forum

11:00:Close

U.S. Broadcasters' Perspective

Lynn Claudy

Senior Vice President, Technology



Ultra HD is a very attractive service to broadcasters...

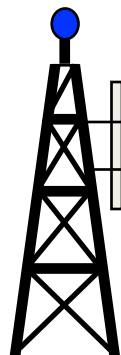
...but it's at the end
of a long, unpaved,
unpopulated and
difficult road



The DTV transition was straightforward

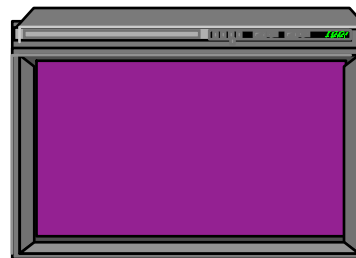


NTSC Signal

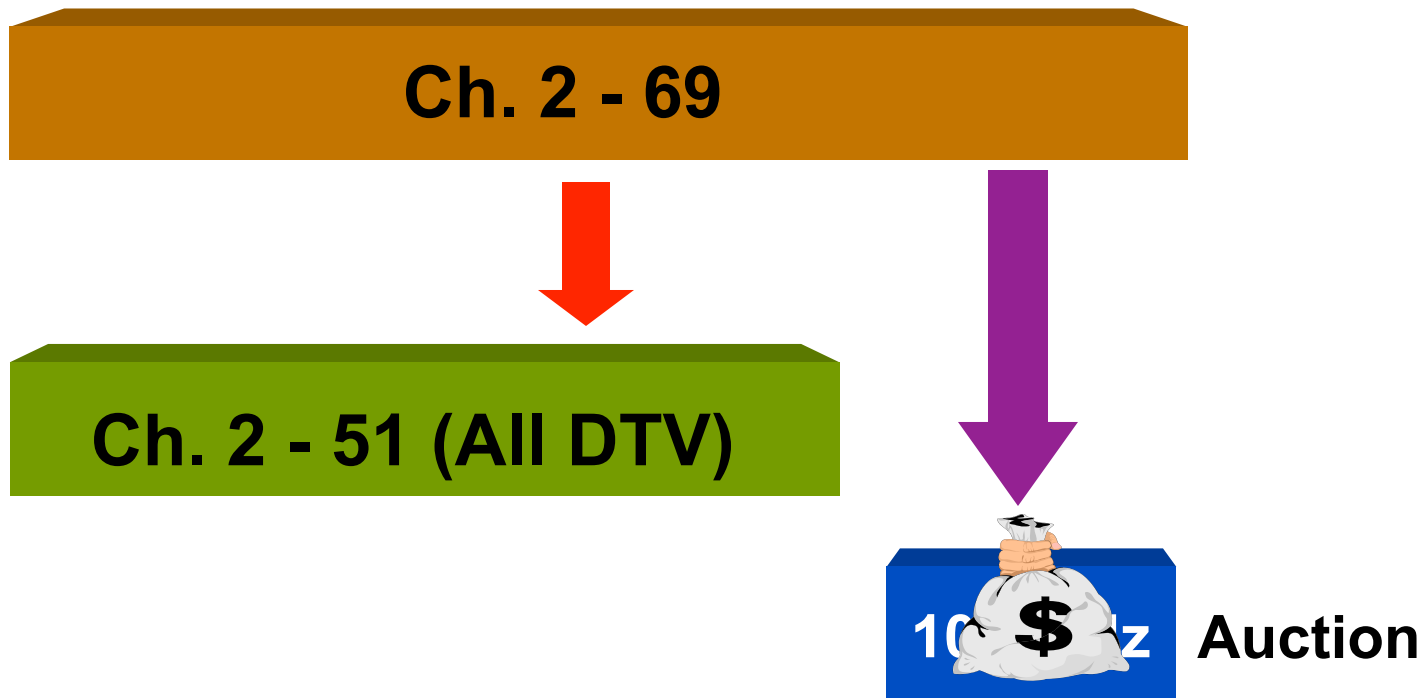


DTV Signal

0110010111011011010
1101110011010100010



Television Spectrum Reallocation in the DTV Transition



The broadcast path to Ultra HD is ATSC 3.0



- MPEG-2 → HEVC
- 19.3 Mbps → 23 Mbps? 25 Mbps? More?
- AC-3 5.1 audio → AC-4 immersive audio



→ But ATSC 3.0 is not backward compatible with ATSC 1.0 ←

A very hypothetical case
for a transition to ATSC 3.0

Today
ATSC 1.0



UNIVISION



A very hypothetical case
for a transition to ATSC 3.0

Today
ATSC 1.0



UNIVISION



**AUCTION
TODAY**
→



Today
ATSC 1.0



**AUCTION
TODAY**
→



Next-Gen Transition Period
ATSC 3.0 Flash Cut



ATSC 1.0 Simulcast



Today
ATSC 1.0



**AUCTION
TODAY**
→



Next-Gen Transition Period
ATSC 3.0 Flash Cut



ATSC 1.0 Simulcast



Move
to
ATSC
3.0

**Today
ATSC 1.0**



**AUCTION
TODAY**
→



**Next-Gen Transition Period
ATSC 3.0 Flash Cut**



ATSC 1.0 Simulcast



ATSC 1.0



Move
to
ATSC
3.0

Next-Gen ATSC 3.0



Cleared & Repacked

3 stations sold with 1 station electing to shut down and 2 channel sharing.

Widespread broadcast of 4K/HDR/HFR/ WCG may be elusive during the ATSC 3.0 transition period



- There aren't likely to be enough broadcast bits available to cover the coding rates needed for 4K/HDR/HFR/WCG and maintain service to legacy receivers
- Which features have the most “bang for the bit?”
- 1080P60 with HDR/WCG may be the “sweet spot” for some broadcasters
- What are the optimum code rates? 6Mbps? 8Mbps? 10Mbps?

Broadcasters are facing a number of challenges



- Participation in FCC Reverse Auction
- Channel repacking post-auction
- ATSC 3.0 transitional configuration
- Final ATSC 3.0 Services
- More to come, but...



U.S. Broadcasters' Perspective on Ultra HD



We have been here before...



*“...[Y]ou will have a higher audience because it’s going to be more dramatic, you’re going to be more involved in it, the sound’s going to be better, the picture’s going to be better -- it’s going to be better. **And better is better.**”*

James Goodmon, CEO, Capitol Broadcasting
Interview in Broadcasting and Cable, September 29, 1997

U.S. Broadcasters' Perspective on Ultra HD



Better is Better





MasterClass

Ultra HD Forum MasterClass



9:00: Welcome and Forum Update: David Price, Ericsson; Vice-Chair, Ultra HD Forum

Perspectives:

9:05: Update on the Network Owners Perspective; Thomas Edwards, Fox Networks

9:20: Update on the SDO Perspective: Matthew Goldman, Ericsson

9:35: Update on the CE Vendors' Perspective: Nick Colsey, Sony Electronics

9:50: Update on the U.S. Broadcasters' Perspective: Lynn Claudy, NAB

Key Working Group Reports:

10:05: Introduction to the Ultra HD Forum Guidelines: Madeleine Noland, LG Electronics;
Chair, Ultra HD Forum Guidelines Working Group

10:20: Introduction to the Interoperability Test Results: Eric Grab, NeuLion;
Chair, Ultra HD Forum Interop Working Group

Roundtable and Q&A: Moderator: Thierry Fautier, Harmonic Inc.; Chair, Ultra HD Forum

10:35: Roundtable Discussion: *HDR deployment – When is it going to become a reality?*

- Stephan Heimbecher, Sky Deutschland
- Philip Goswitz, AT&T
- Akira Shimazu, Sky Perfect TV

10:55 Summary and Next Steps: David Price, Ericsson; Vice-chair, Ultra HD Forum

11:00:Close

Phase A Guidelines Contents



- Phases, Timeframes, Use Cases
- Real-time Linear Services
 - End-to-end Workflow
- HDR/WCG Technologies
 - PQ, HLG
 - BT.709, BT.2020
 - Peak Brightness
 - SDR<>HDR Conversions
- Security Recommendations
- Production & Post Production
 - Pre-recorded Content
 - Live Content
- Distribution Supply Chain
 - Contribution
 - Primary Distribution
 - Final Distribution
 - Ad Insertions, Crawl Overlays
- Decoding & Rendering
- Backward Compatibility

Guidelines
coverage

UHD Phase A Definition



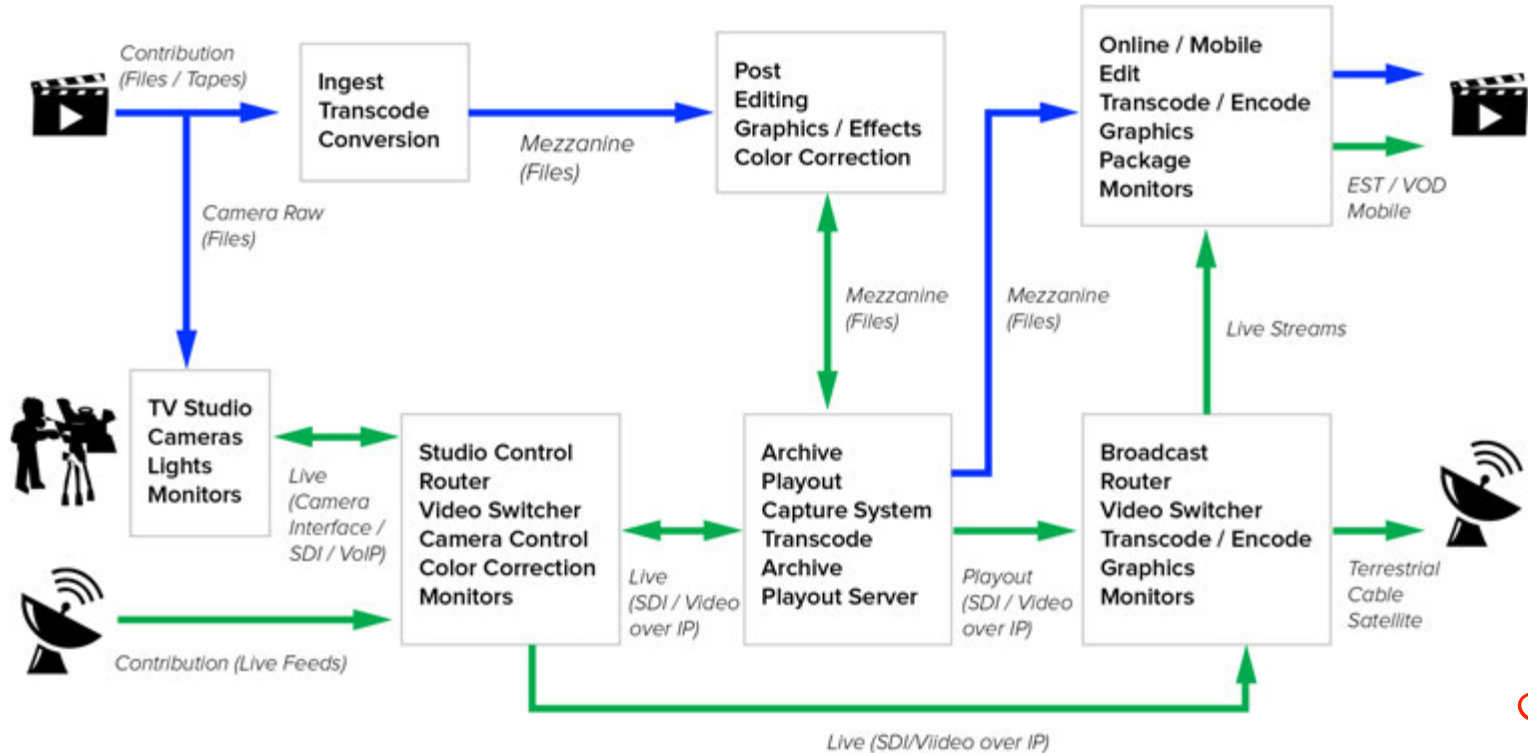
Spatial Resolution	1080p* or 2160p
Color Gamut	BT.709, BT.2020
Bit Depth	10-bit
Dynamic Range	SDR, PQ, HLG
Frame Rate**	24, 25, 30, 50, 60
Video Codec	HEVC, Main 10, Level 5.1 (single lyr)
Audio Channels	Stereo or 5.1 multi-channel audio
Audio Codec	AC-3, EAC-3, HE-ACC, AAC-LC
Captions/Subs Coding (in/out formats)	CTA-608/708, ETSI 300 743, ETSI 300 472, SCTE-27, IMSC1

*1080p together with WCG and HDR fulfills certain use cases for UHD Phase A services and is therefore considered to be an Ultra HD format for the purposes of these guidelines. 1080p without WCG or HDR is considered to be an HD format. The possibility of 1080i or 720p plus HDR and WCG are not considered here. HDR and WCG for multiscreen resolutions may be considered in the future.

**Fractional frame rates for 24, 30 and 60 fps are included, but not preferred. Lower frame rates may be best applied to cinematic content.

Guidelines coverage

Production



Guidelines coverage

UHD Phase A HDR and WCG



- HDR10 CTA definition
- PQ SMPTE ST 2084 definition
- PQ10 Ultra HD Forum definition
PQ EOTF, BT.2020 color gamut, 10-bit depth
- HLG Draft New Rec. BT.[HDR-TV] definition
- HLG10 Ultra HD Forum definition
HLG OETF, BT.2020 color gamut, 10-bit depth

Guidelines
coverage

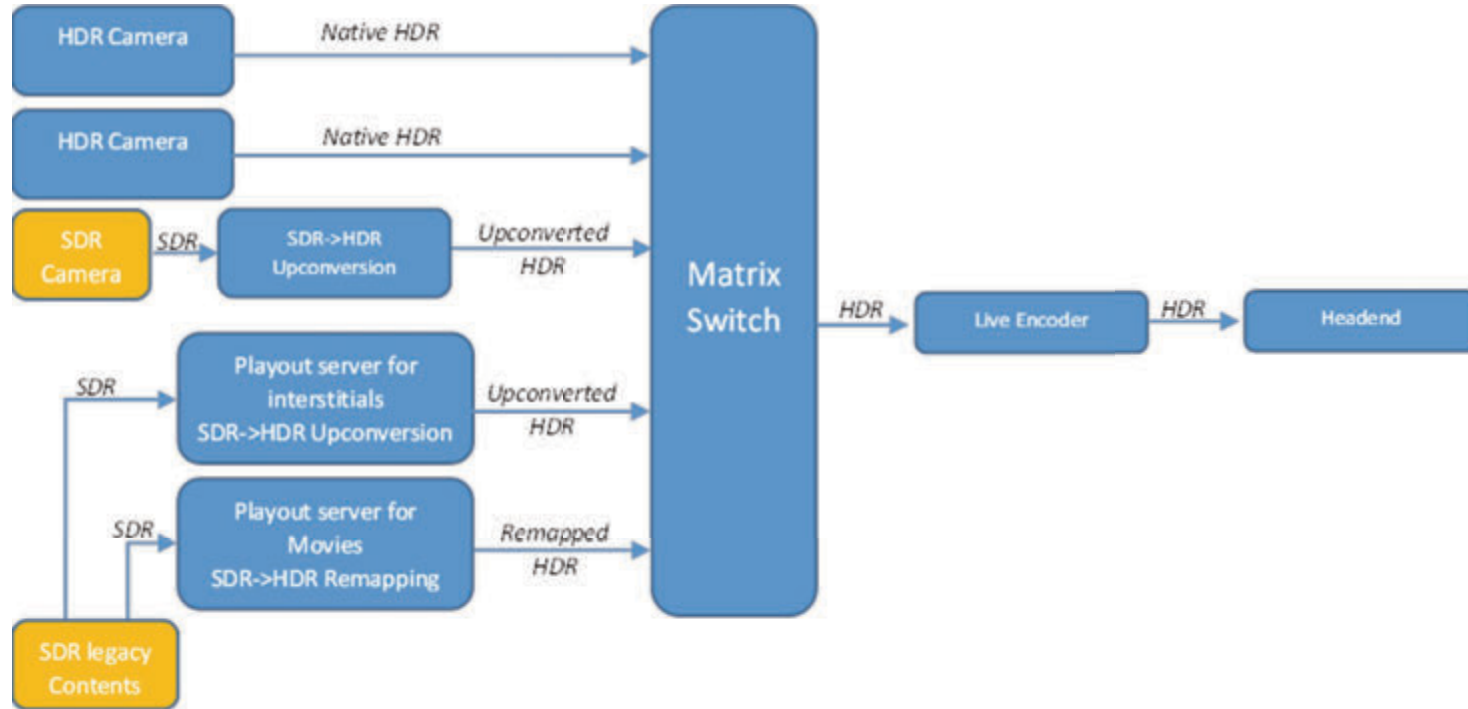
SDR<>HDR and PQ<>HLG



- Mechanisms used to convert or map
 - between SDR and HDR
 - between HDR technologies
- Use cases to illustrate
 - where in the distribution chain to convert
 - which conversion method to choose
 - peak brightness considerations

Guidelines
coverage

Mixing HDR with SDR



Guidelines coverage

Signaling and Metadata Carriage



- HDR10 metadata carriage
 - work-a-rounds where standards do not yet exist in the workflow
 - e.g. compensate for lack of HDR metadata carriage over SDI
- Signaling
 - transfer function
 - color container

Guidelines
coverage

“Glass to glass” Distribution Chain



- End-to-end workflow for real-time linear service
 - live and/or pre-recorded content
- Production > Broadcast Center > Service Provider > Consumer
- At each point in the chain describe:
 - compression technologies and bitrate ranges
 - metadata carriage options
 - audio
 - captions and subtitles
 - content manipulation: ad insertion, graphic overlays, etc.

Guidelines
coverage

Security



- Security requirements are evolving and solutions need to stay ahead of piracy techniques
- The Guidelines contain recommendations for a secure system in 2016, including
 - key size
 - encryption technologies

Guidelines
coverage

Decoding and Rendering



- Consumer decoding and rendering devices
- Key parameters to process UHD Phase A content
- Displays, STBs and Interfaces
 - identify UHD parameters not carried over HDMI 2.0a
 - timeline of standards development, equipment upgrade possibilities
- Rendering closed captions or graphic overlays

Guidelines
coverage

Backward Compatibility



- Address UHD displays that are SDR only
 - Some process BT.2020, others only BT.709
- Various backward compatibility options explained
 - Simulcast, Unicast, Down-conversions
- Options described in context depending on, e.g.:
 - PQ or HLG
 - Type of service provider
 - Quality requirements
 - STB footprint

Guidelines
coverage



MasterClass

Ultra HD Forum MasterClass



9:00: Welcome and Forum Update: David Price, Ericsson; Vice-Chair, Ultra HD Forum

Perspectives:

9:05: Update on the Network Owners Perspective; Thomas Edwards, Fox Networks

9:20: Update on the SDO Perspective: Matthew Goldman, Ericsson

9:35: Update on the CE Vendors' Perspective: Nick Colsey, Sony Electronics

9:50: Update on the U.S. Broadcasters' Perspective: Lynn Claudy, NAB

Key Working Group Reports:

10:05: Introduction to the Ultra HD Forum Guidelines: Madeleine Noland, LG Electronics;
Chair, Ultra HD Forum Guidelines Working Group

10:20: Introduction to the Interoperability Test Results: Eric Grab, NeuLion;
Chair, Ultra HD Forum Interop Working Group

Roundtable and Q&A: Moderator: Thierry Fautier, Harmonic Inc.; Chair, Ultra HD Forum

10:35: Roundtable Discussion: *HDR deployment – When is it going to become a reality?*

- Stephan Heimbecher, Sky Deutschland
- Philip Goswitz, AT&T
- Akira Shimazu, Sky Perfect TV

10:55 Summary and Next Steps: David Price, Ericsson; Vice-chair, Ultra HD Forum

11:00:Close

Ultra HD Forum Plugfest #1 Overview

By Eric Grab

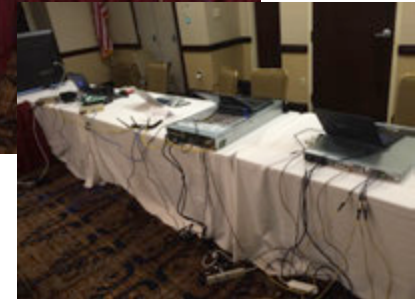
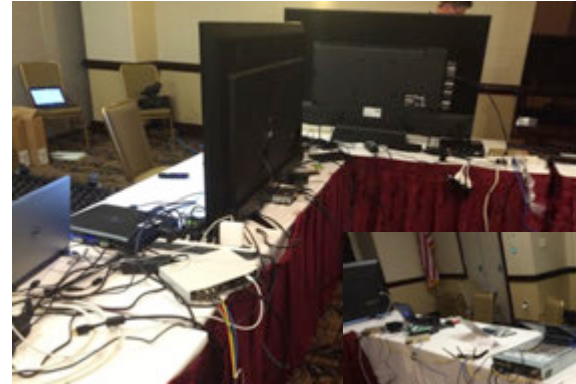


Ultra HD Forum Board Member and
Interoperability Working Group Chair

Plugfest #1 Overview



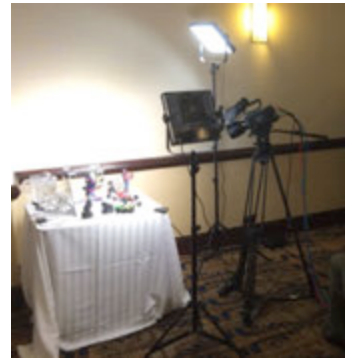
- The Ultra HD Forum held an in-person event, Plugfest #1, in Washington D.C. on March 29-30, 2016.
- Doing events such as this are part of the mission of the Ultra HD Forum and its Interoperability Working Group.
- Plugging together real Ultra HD products and seeing how they work, or not work, together. This helps accelerate adoption of Ultra HD.



Plugfest #1 Participants and Scope

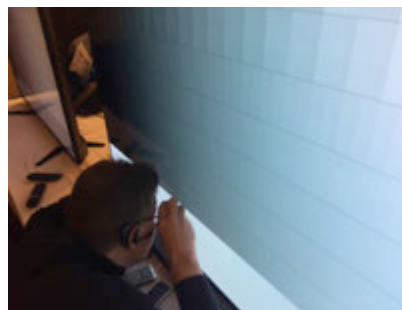
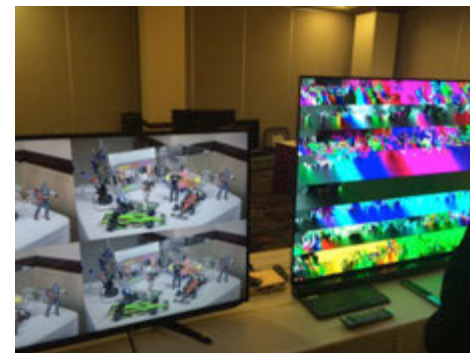
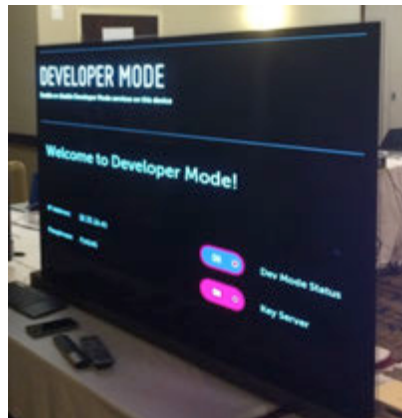


- It included 9 member companies, each bringing various equipment to test Ultra High Definition technology from professional capture to consumer display.
- It included HDR via HLG and PQ, live capture from camera, and various devices and displays.

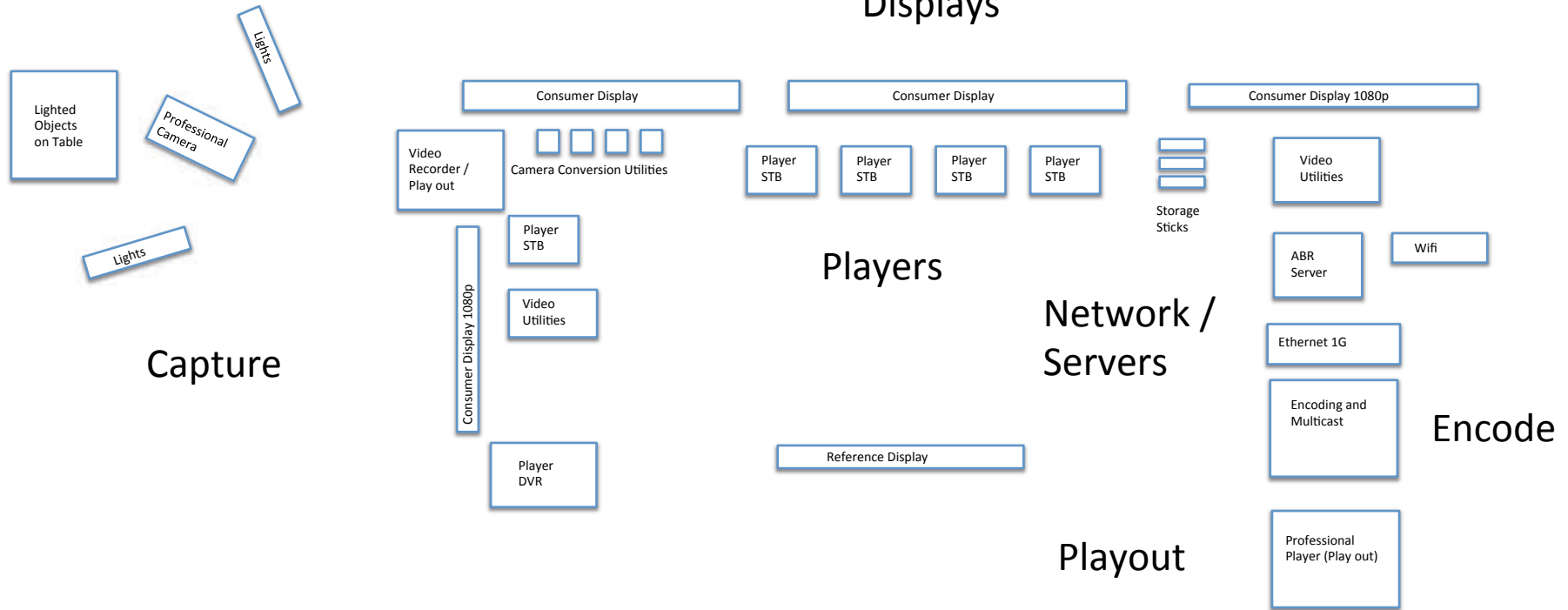


Plugfest #1 Focused on Action

- A confidential event for members. It was not a demo, it was about finding issues as well as confirming success.
- Due to Plugfest #1 some real products got updates.

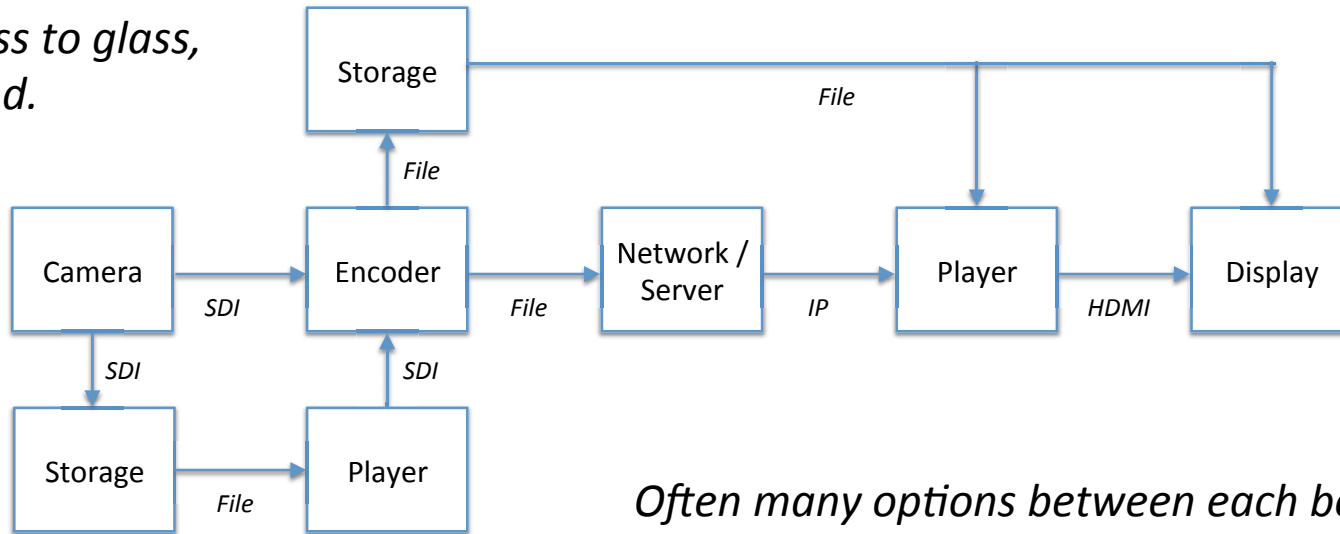


Plugfest #1 Equipment Layout



Plugfest #1 General Workflow

*Goal: Glass to glass,
end-to-end.*

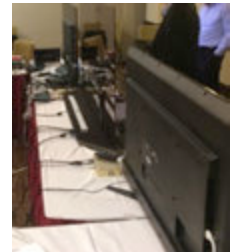


Often many options between each box.

Plugfest #1 Points to Share



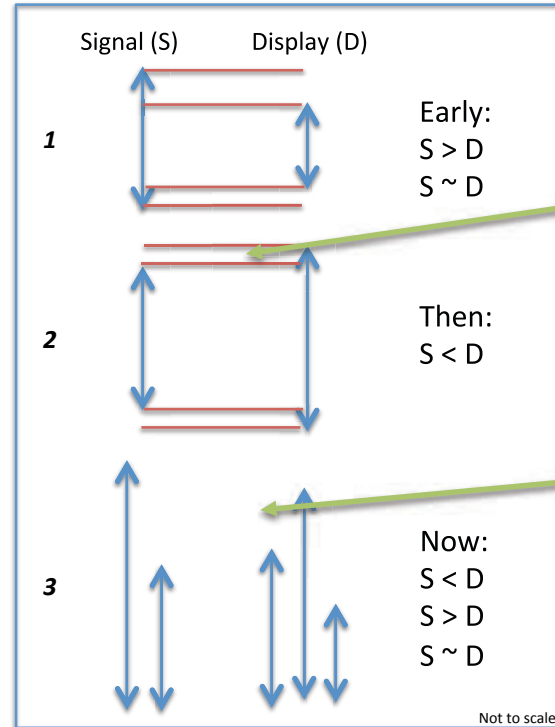
- Former video constants are now variables with Ultra HD; and they ripple through the end-to-end workflow. It is more than a resolution increase.
 - 8 bit to 10 bit depth.
 - 709 to 2020 color space.
 - HDR signalling.
- If you can see the picture, it does not mean it is correct.
 - Important to understand your content.
 - Recognize meaningful areas.
 - Test signal usage.



Plugfest #1 More to Share

- TV processing and modes have significant impact on the final picture.
 - Some dramatic changes, even more so then turning on HDR processing.
 - See sidebar on different quality gaps over time. It makes senses for this modes to exist, but now more complex, hence signaling is important.
- A broad content repository is important for testing.
 - The combinations have to be organized.
 - We came up with 12 content variations and 12 display variations to test. Still more to do.

Different Quality Created Gaps



Pressure to fill the gap, it does make the picture look better.

Now variable gaps, and we need to handle the complexity.

Plugfest #1 Learning Together



- In addition to testing there were plenty of great discussions.
- In many ways it was also a workshop, and the event fostered more expertise in Ultra HD technology.
- Real world testing is invaluable at this stage to understand all the dynamics of Ultra HD technologies.



Plugfest #1 What is next?



- Plugfest #2, #3, ..., #n.
- A more formal testing framework and more complete clip repository.
 - Tracking the profiles/settings through the workflow.
 - Report cards / results statistics.
- Continued integration with the end-to-end Ultra HD Forum Guidelines for Phase A, B, and beyond.
- Find patterns of Ultra HD trouble spots, and help members get through them.
- Work with industry liaisons to share the broader issues.
- **Overall contribute to acceleration of Ultra HD products and services.**





MasterClass

Ultra HD Forum MasterClass



9:00: Welcome and Forum Update: David Price, Ericsson; Vice-Chair, Ultra HD Forum

Perspectives:

9:05: Update on the Network Owners Perspective; Thomas Edwards, Fox Networks

9:20: Update on the SDO Perspective: Matthew Goldman, Ericsson

9:35: Update on the CE Vendors' Perspective: Nick Colsey, Sony Electronics

9:50: Update on the U.S. Broadcasters' Perspective: Lynn Claudy, NAB

Key Working Group Reports:

10:05: Introduction to the Ultra HD Forum Guidelines: Madeleine Noland, LG Electronics;
Chair, Ultra HD Forum Guidelines Working Group

10:20: Introduction to the Interoperability Test Results: Eric Grab, NeuLion;
Chair, Ultra HD Forum Interop Working Group

Roundtable and Q&A: Moderator: Thierry Fautier, Harmonic Inc.; Chair, Ultra HD Forum

10:35: Roundtable Discussion: *HDR deployment – When is it going to become a reality?*

- Stephan Heimbecher, Sky Deutschland
- Philip Goswitz, AT&T
- Akira Shimazu, Sky Perfect TV

10:55 Summary and Next Steps: David Price, Ericsson; Vice-chair, Ultra HD Forum

11:00:Close



MasterClass

unleash

anytime

anywhere

connected technologies • immersive experiences • redefined revenue