You are Not Alone – YANA 0318

March 2018, London.

Sponsored by

NBCUniversal

Hosted by

BBC | Research & Development

Summary

Nearly 50 industry experts participated in the day-long discussion of modern networked video technologies, raising awareness of issues and progress in each others' areas of the industry, showcasing new technology developments, and building important connections for onward work.

Participants represented diverse corners of the IP video industry:

- Content developers
- Content providers
- Digital & Broadcast Network operators
- Equipment manufacturers
- Researchers

YANA – Purpose

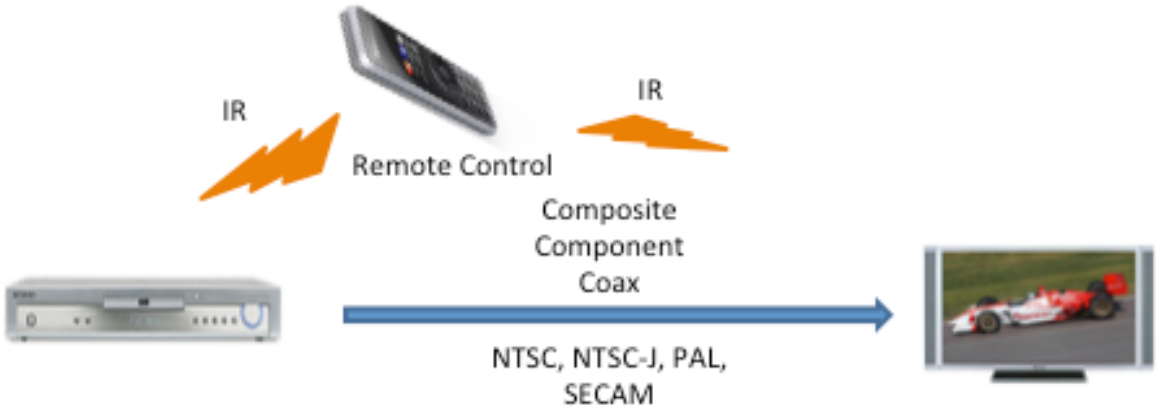
New ideas for creating, delivering, and consuming video content often leverage and repurpose existing standards while cutting across traditional standards organization boundaries and leaving proponents feeling isolated and unheard. Meanwhile traditional standards organizations can be limited to developing standards within the boundaries defined by their scopes, and they may not even be aware of the ways their work is being used and extended, or of the unique needs of these new adopters.

YANA was conceived to bring together a diverse group of experts from a wide swath of the (IP-based) video industry, to build new connections, strengthen relationships, and lay the groundwork for improved coordination in developing technologies and standards going forward.

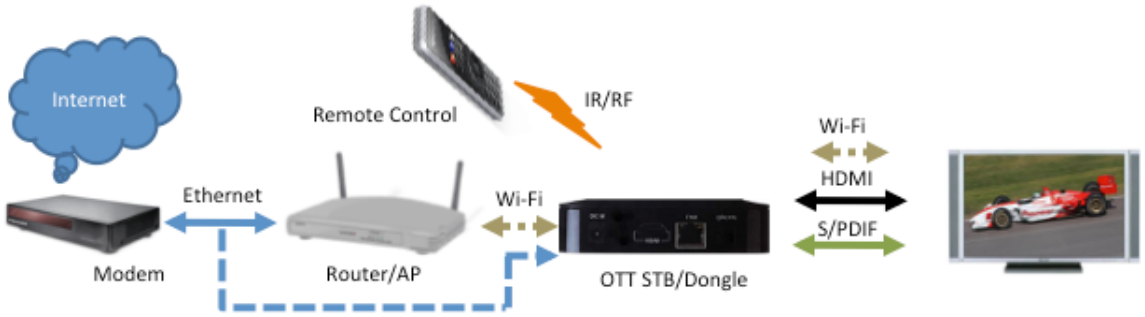
Evolving Industry Complexity

Video technology encompasses much more today than it did 25 years ago. As a result, the industry is much broader, and the standards landscape is much more complex.

Television, circa 1994



Home video viewing, today



And, the standards landscape has grown commensurately.

1994

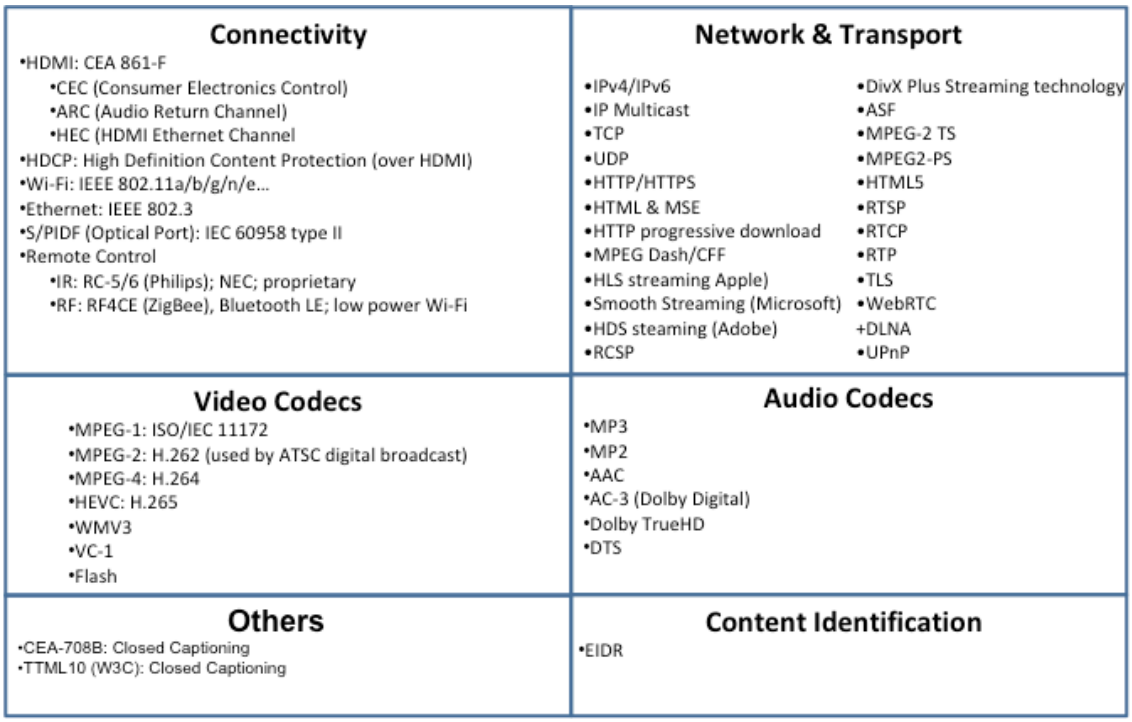
Connectivity

- **Component**: EIA-770.1 (analog NTSC typically using 3 wires - YP_BP_R)
- **Composite**: EIA/RS-170A (analog baseband NTSC composite video)
- **Coax**: 75 ohm modulated RF NTSC
- **Remote Control**: IR - Proprietary

Encoding

- **NTSC**: Broadcast standard for analog TV
- **NTSC-J:** Broadcast standards for analog TV in Japan
- **PAL:** Broadcast standard for analog 625 line/50 Hz systems used in most of Europe and parts of Asia, South America and elsewhere
- **SECAM:** Broadcast standards for analog TV originating in France but used in other areas as well.

Today



Discussion through the day focused in 3 main topic areas:

- Technology
- Current Standards Work
- Industry Uptake and Projections

The following sections outline some of the highlights from the day. Many of the presentations are available publicly online – you can find them from the thumbnail sketches in the Available Meeting Materials section at the end of this report.

Technology

The meeting featured demonstrations and discussions of new technologies for packaging and delivering video.

New creations are feasible with multiple concurrent video sources (e.g., phones) and by blending parts of the process from creation to storage to delivery of a "production". Richard Cartwright presented an Agile Media Blueprint, leveraging an Internet technology mindset for supporting such collaboration and provided a demonstration.

Further leveraging Internet technologies, Gaurav Naik and Éric Vyncke demonstrated two separate proposals using IPv6 addresses for content addressing and dynamic routing for content delivery. Chief points of discussion focused on the impact of

encryption (not an issue if manifests are not rewritten), privacy and most efficient integration with caching. In advanced research, Giovanna Carofiglio discussed and demonstrated the delivery of mobile video over hybrid ICN (Information Centric Networking implemented on non-disruptive technology).

Current Standards Work

Several updates on standards work from participants in different fora were offered.

Chris Needham outlined the current work on media APIs being developed at the W3C, as well as that organization's extensive roadmap for web support of video – from live linear content media source extensions to cloud browsers, and everything in between.

Ori Finkelman provided an update on the SVA Open Caching work, which is focused on writing specs and working with the IETF to extend CDNI for standards. A goal is to see ISP edge caching become a reality.

Ali Begen outlined the work of DASH and the Content Media Application Format (CMAF) – both ISO standards work. The room discussed uptake of CMAF, and Ali outlined upcoming priorities of the DASH/CMAF work.

Industry Uptake and Projections

Several of the discussion topics focused on industry uptake of technologies and general industry perspective on requirements.

As web-based delivery of video becomes more popular, more efficient delivery is imperative. Richard Bradbury outlined BBC's work with multicast HTTP over QUIC, especially for use in high popularity realtime events. Lucas Pardue demonstrated their implementation, highlighting its value in low latency situations.

Matt Green outlined some of the challenges of a large ISP delivering video content through multicast, while using 3rd party caching services.

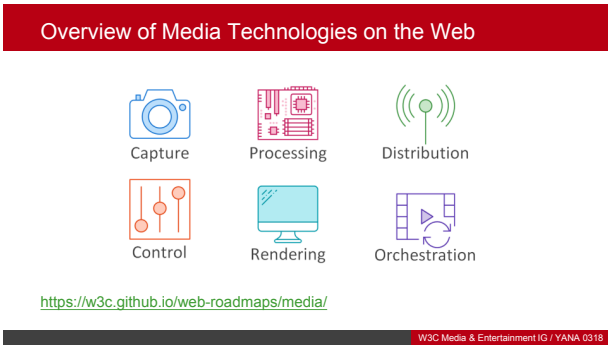
Looking forward in the industry, Guillaume de St Mark and Peter Brightwell provided complementary perspectives on requirements for the future – bringing together the disparate groups focused on standards and technology development to meet the needs of this burgeoning use of the Internet. Usage of the Internet is only going to increase, and we must work together to find solutions to the scaling issues faced today.

Wrap up

Key takeaways for participants included perspective and insight on aspects of video industry beyond their normal scope of observation and engagement.

There was general support for, and interest in, a follow on meeting to delve into topic areas more deeply and continue developing the relationships established at the meeting.

Available Meeting Materials

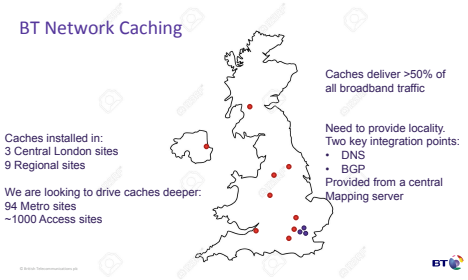


Current Audio and Video Media Topics at W3C

Chris Needham (BBC)

Current media topics and roadmap for development at the W3C.

https://yana.techark.org/wp-content/uploads/2018/04/2018-03-16-Chris-Needham-W3C.pdf

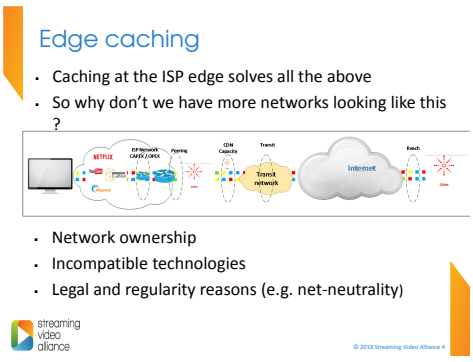


BT Content Delivery

Matt Green (BT)

Overview of content caching and multicast video delivery within the BT network

https://yana.techark.org/wp-content/uploads/2018/03/BT-Caching-and-Multicast.pdf

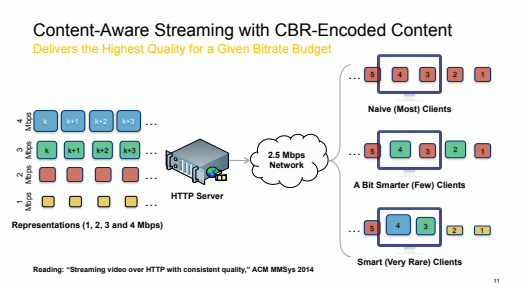


Open Caching

Ori Finkelman (Qwilt)

Highlights and status of Streaming Video Alliance work to develop open caching services for better ISP-Content delivery

https://yana.techark.org/wp-content/uploads/2018/03/yana0318-open-caching.pdf

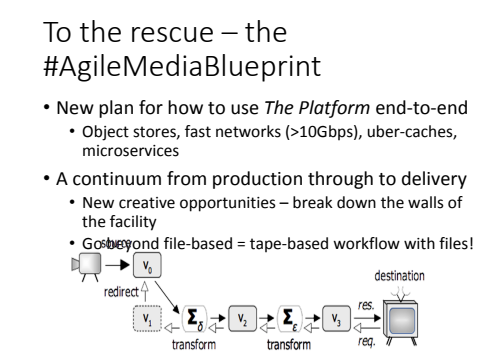


DASH/CMAF Activities

Ali C. Begen

Provides an update on DASH and CMAF developments; evolving Content Aware Streaming (variable bit rates / clients and conditions)

https://yana.techark.org/wp-content/uploads/2018/03/YANA0318_DASH_2018_03.pdf

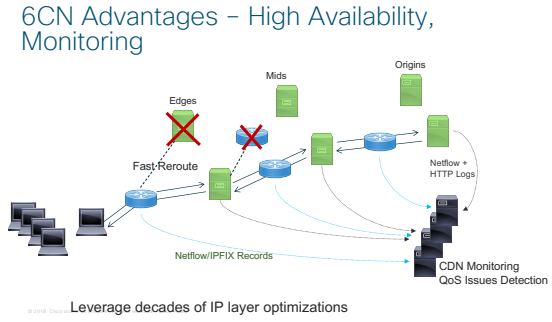


Agile Media Blueprint

Richard Cartwright (StreamPunk)

Describes a new approach: breaking media into many very small pieces that can be handled separately but synchronized – builds off film concept, but digital.

https://yana.techark.org/wp-content/uploads/2018/03/AMB_small.pdf

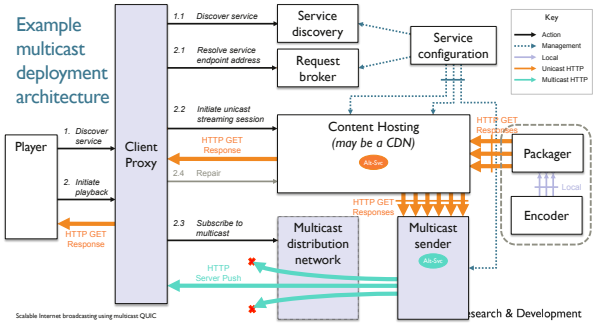


6CN: Content Networking with IPv6, http://6cn.io

Eric Vyncke (Cisco)

Using IPv6 addresses to label chunks of video, leveraging network routing to improve performance

https://yana.techark.org/wp-content/uploads/2018/03/20180316-Cisco-6CN-YANA.pdf



Scalable Internet broadcasting using multicast QUIC

Richard Bradbury and Lucas Pardue (BBC)

Discussion and demo of using multicast QUIC over HTTP for building a scalable IP-based TV distribution system

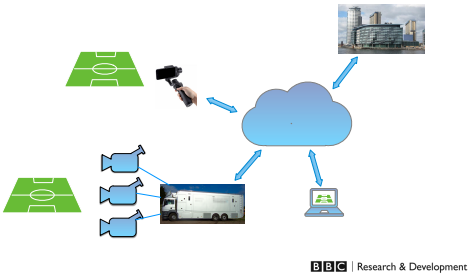
https://yana.techark.org/wp-content/uploads/2018/03/YAN0318-Scalable-Internet-broadcasting-using-multicast-QUIC-2018-03-16.pdf

MPEG standards: successes and threats

Leonardo Chiariglione (presented by Ali C. Begen)

Challenges with MPEG standards development, funding and IPR policies.

https://yana.techark.org/wp-content/uploads/2018/04/MPEG_Chiariglione.pdf



IP for live production – Migration and Interoperability

Peter Brightwell (BBC R&D)

Evolving production from traditional to IP-based, with standards and new use cases.

https://yana.techark.org/wp-content/uploads/2018/03/IP-for-live-production-YANA-0318-for-PDF.pdf