MPEG Workshop

Next Generation Media Services and Technologies

Media Tech. R&D Center

Dr. Jongmin Lee (Center Leader)

- The time will soon come when ***everyone*** can ***create, deliver and consume*** video data ***everywhere*** based on ***5G*** network infra

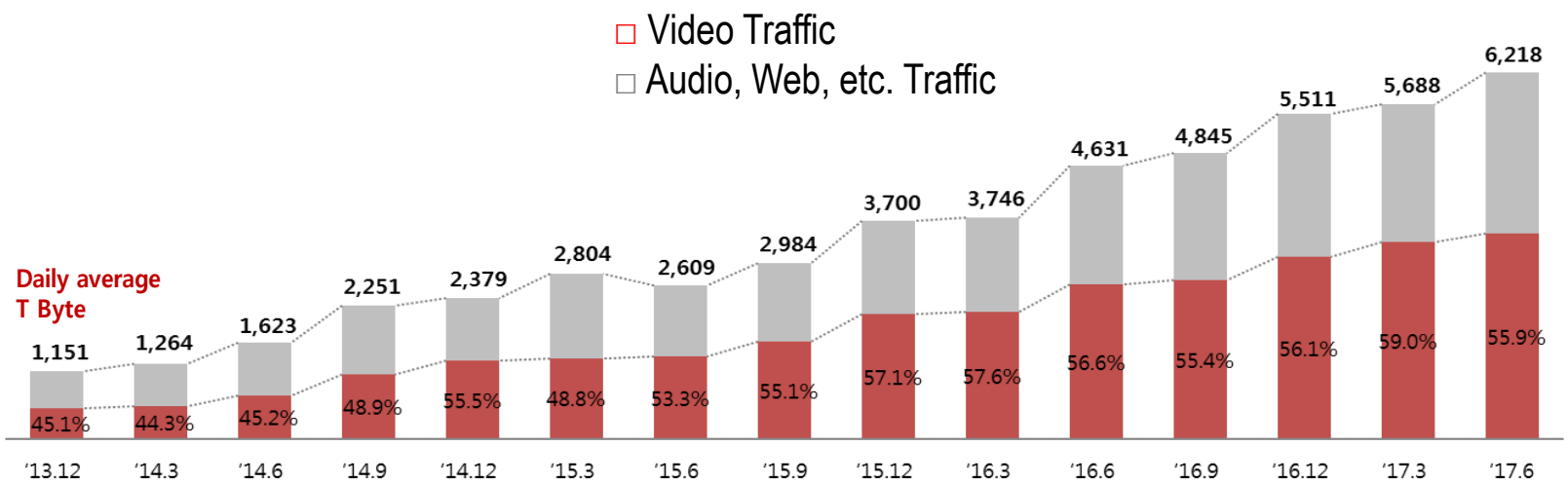
- Mobile video service is now ***rapidly evolving***
  - ✓ Main keyword: 4K/8K UHD, AR/VR, 3-D, N-screen

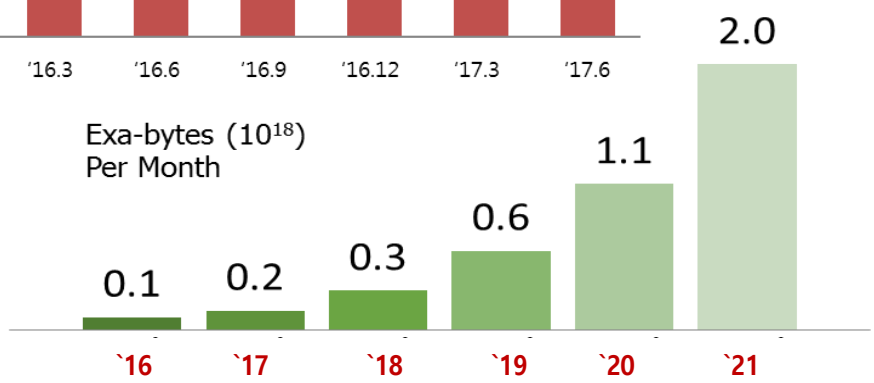
- Many SKT's multi-media services are developed / developing based on ***MPEG technologies and systems***
  - ✓ HEVC, AVC, MMT, etc.

Media Service Trend

Media Service Trend

- Mobile video traffic is ***rapidly*** increasing



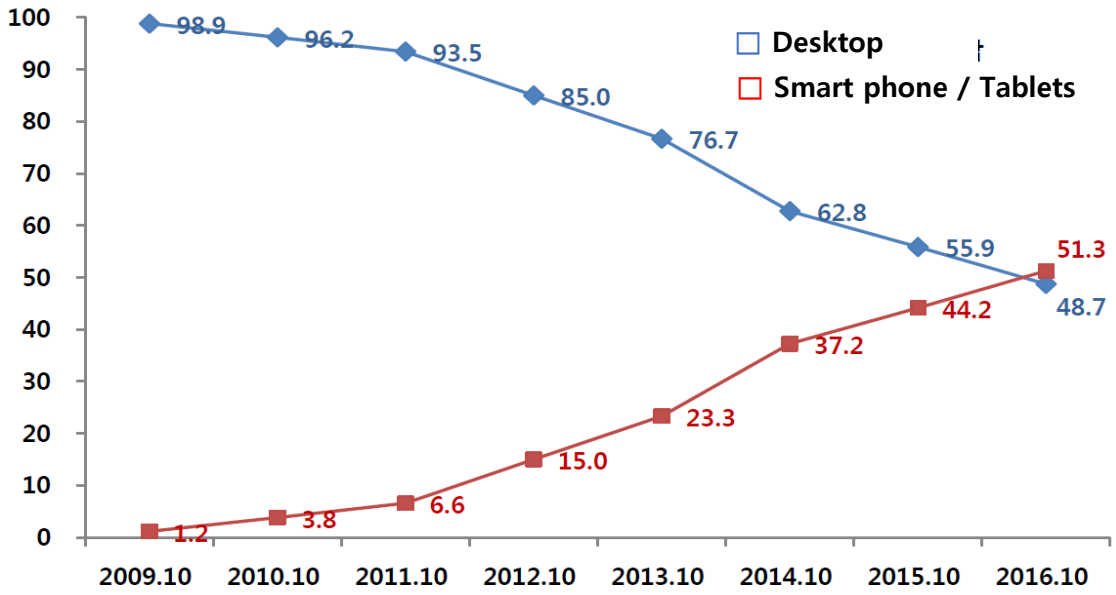


Global Mobile Live Broadcasting Traffic forecast, Cisco 2016

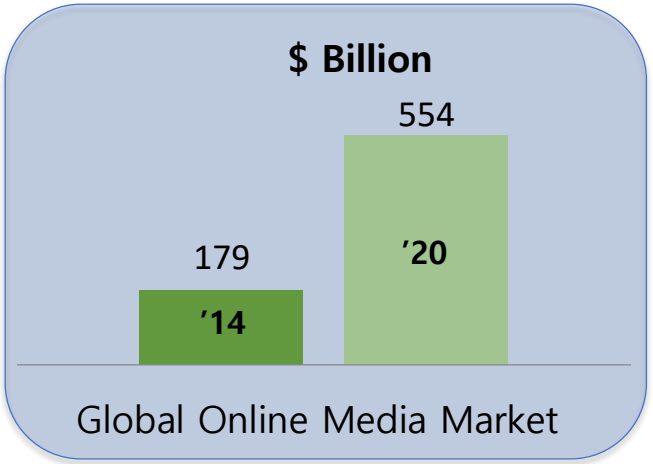
All these devices **increase** mobile video traffic !

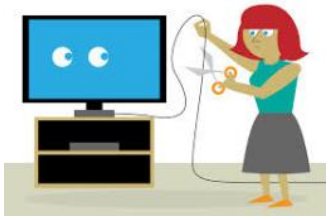
Media Service Trend

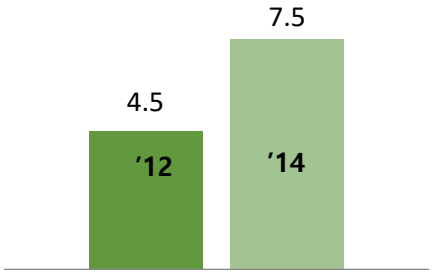
- Mobile Media Market Trend



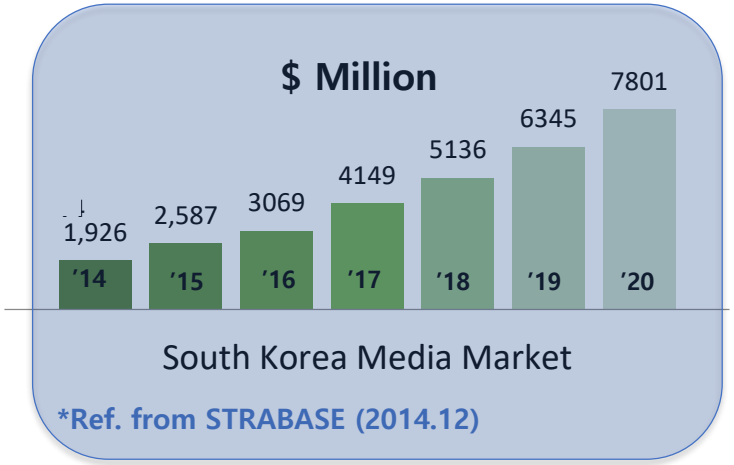
Media Devices (%), *Ref. from StatCounter (2016.10)







Cord-cutting ratio in US.



Media Service Trend

Live (Linear)	On-Demand	Semi-Live	Real-Live
Traditional TV 1926	***DVR / Streaming 1999***	***Snapchat Stories 2013***	***Periscope + Facebook Live 2015 / 2016***
Tune-In or Miss Out	Watch on Own Terms	Tune-In Within 24 Hours or Miss Out	Tune-In / Watch on Own Terms
Mass Concurrent Audience	Mass Disparate Audience	Mostly Personal Audience	Mass Audience, yet Personal
Real-Time Buzz	Anytime Buzz	Anytime Buzz	Real Time + Anytime Buzz

NETFLIX

Source: Mary Meeker, Internet Trends 2016

SKT's Media Services

- Fixed IPTV (Btv), Mobile IPTV (oksusu), 360 VR VoD / Live, etc

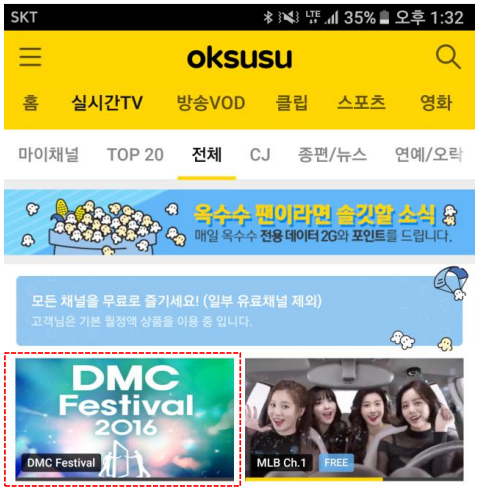
SKB '8K 슈퍼 UHD IPTV' 세계 첫 공개

SK브로드밴드가 21일 서울 상암동 DMC에서 미래창조과학부와 한국정보통신진흥원이 주최한 'DMC 페스티벌'에서 '8K 슈퍼 UHD(3,300만화소) IPTV(인터넷TV)'를 공개했다. 이 제품은 기존 4K UHD의 830만 화소보다 해상도가 4배 높은 3,300만화 화소로 화질이 매우 뛰어나며, 이를 인터넷TV에서 구현한 것은 SK브로드밴드가 세계 최초다.

/사진제공=SK브로드밴드

8K UHD IPTV Trial (`15.10),
4K IPTV Commercialization (`14.4)

UHD Multi-View (`16.9)



2016 DMC 페스티벌 VR

<콜로라도 : 샌프란시스코>메이저리그

Adaptive
Oksusu VR Streaming Service(`16.10)

Oksusu Mobile IPTV
Commercialization (`17.10)

SKT's Global Working

- Developing the next-generation TV platform for the U.S market
  - Various MPEG technologies were adopted into ATSC 3.0, especially, HEVC, DASH, and MMT.
  - Highly contributed to the MPEG, MMT standard activity.
  - Hybrid media delivery is the core function leads an enhanced UX of media consumption.
- Adopted the various MPEG technologies in SKT's media services
  - HEVC, and MMT (including mobile MMT) were integrated in 'Oksusu'

SK Telecom launches live-streaming tech

SK Telecom has commercialised the industry's fastest mobile live-streaming technology, dramatically reducing latency from 15 seconds to just three.

By Philip Iglauer | June 16, 2016 -- 02:40 GMT (10:40 GMT+08:00) | Topic: Te

SK partners Sinclair Broadcast to develop ATSC 3.0 platform

Friday 12 January 2018 | 11:59 CET | News

SK Telecom announced that the company will jointly explore the development of an ATSC 3.0 TV platform with Sinclair Broadcast Group, the largest TV broadcaster in the US, and its subsidiary ONE Media 3.0. The Korean operator signed a MoU with Sinclair and ONE Media at CES in Las

- Leads the MPEG project with global companies for preparing the 5G media infrastructures.

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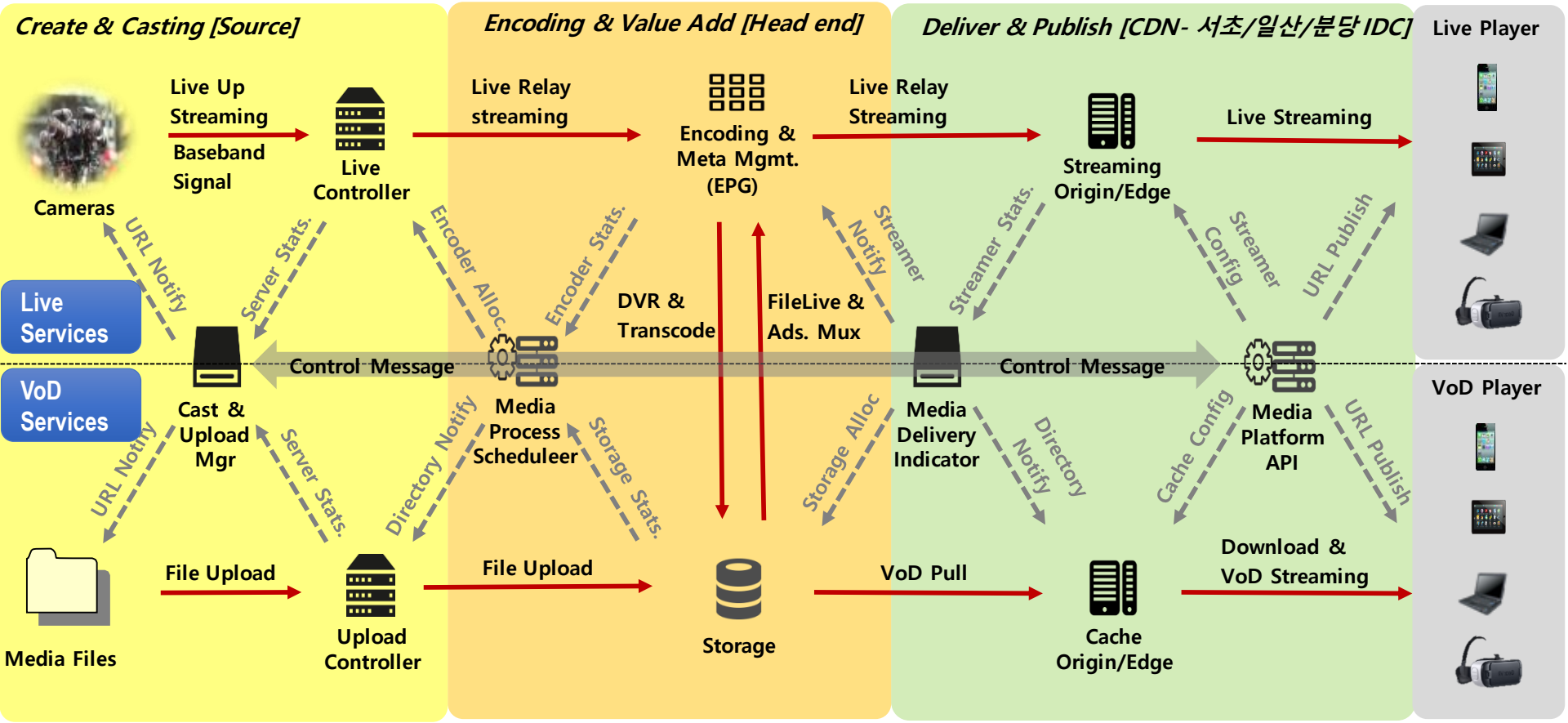
SK’s Media Integrated Platform and Services for 5G Network

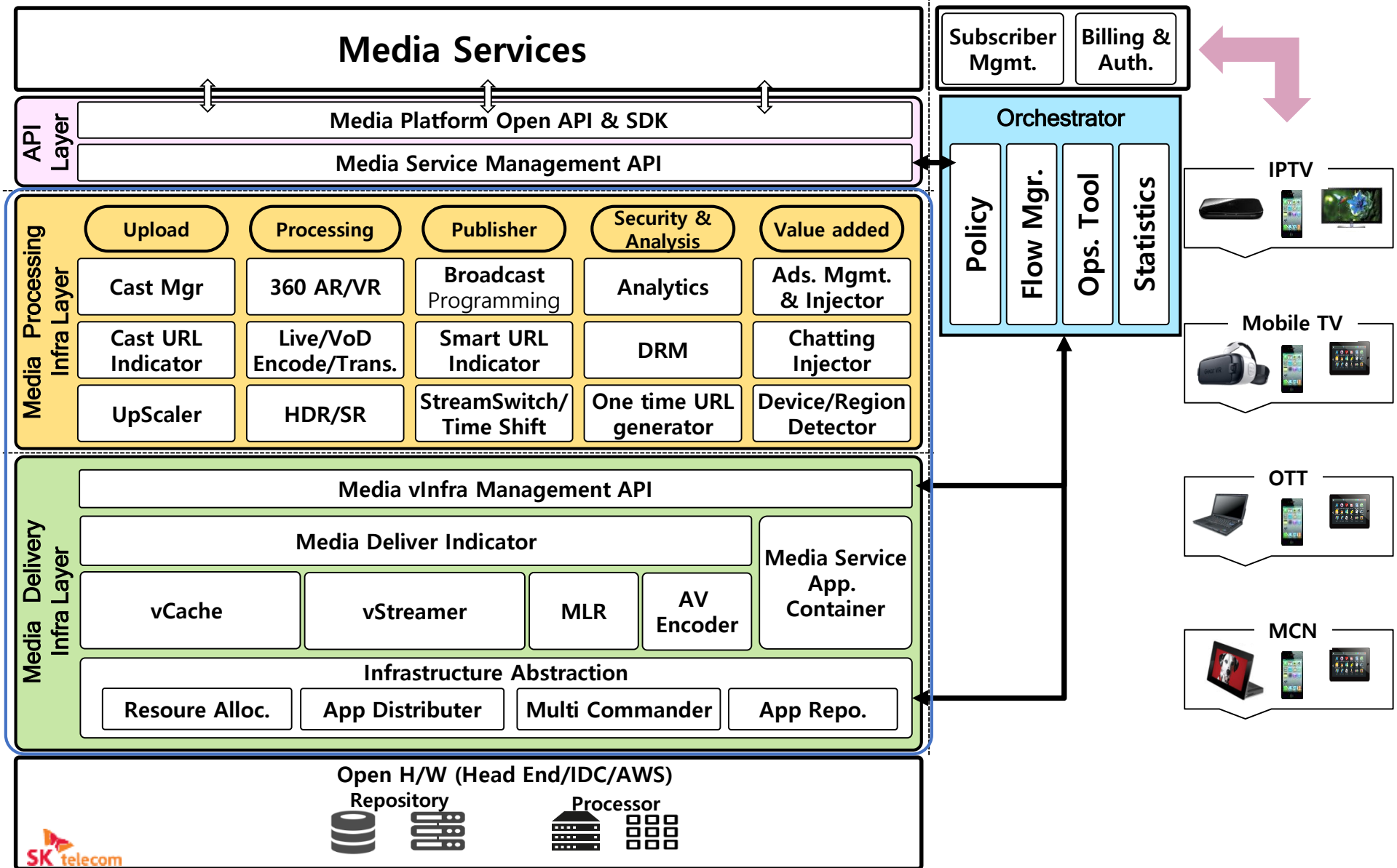
Architecture for SK's Media Services

- SK's Media Service Delivery System is configured as ⊖Create & Casting, ⊜Encoding & Value Add, ⊛Delivery & Publish with live and VoD types



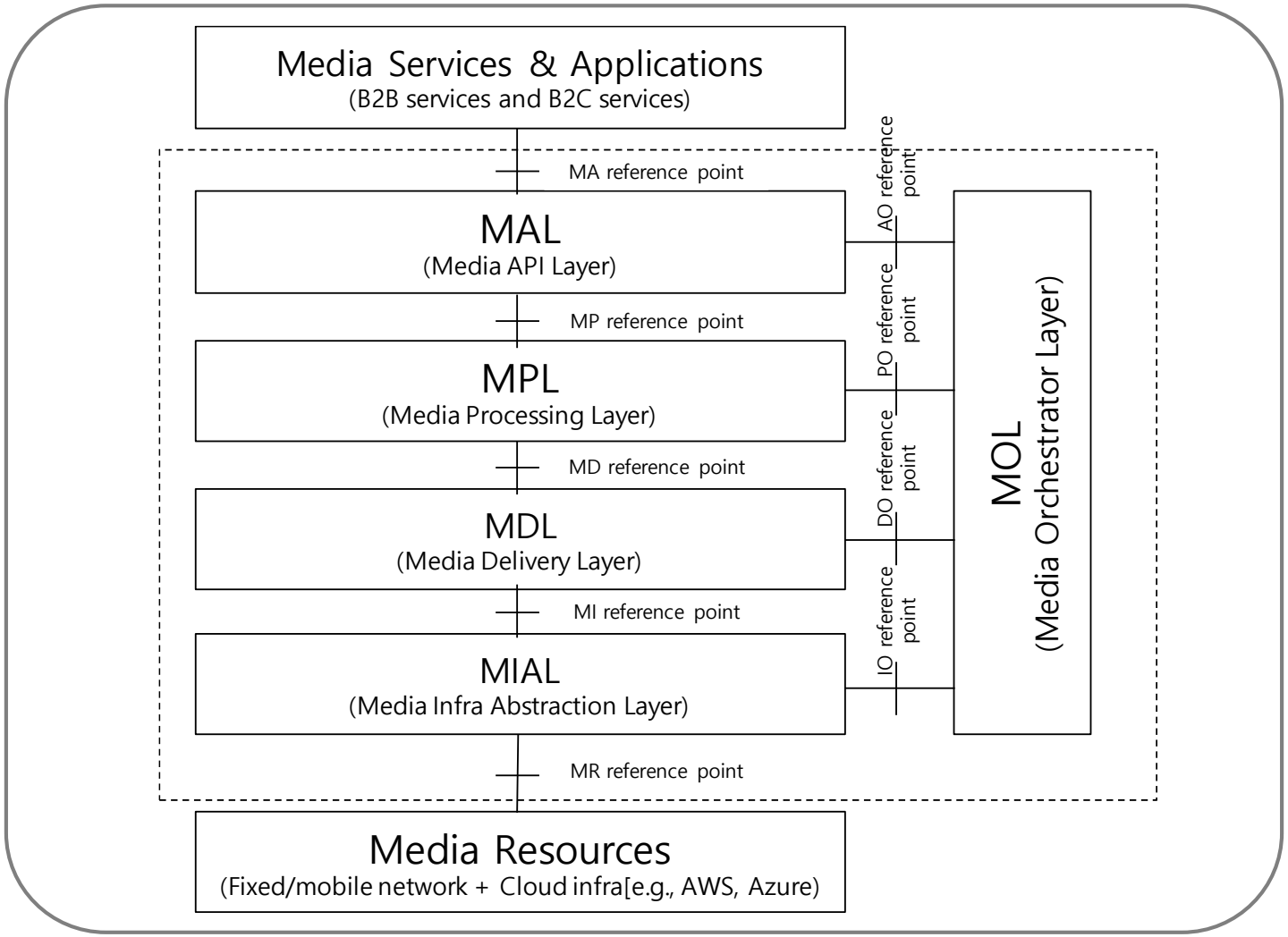
T-MIP: SKT – Media Integrated Platform

- Media Service Functional Architecture



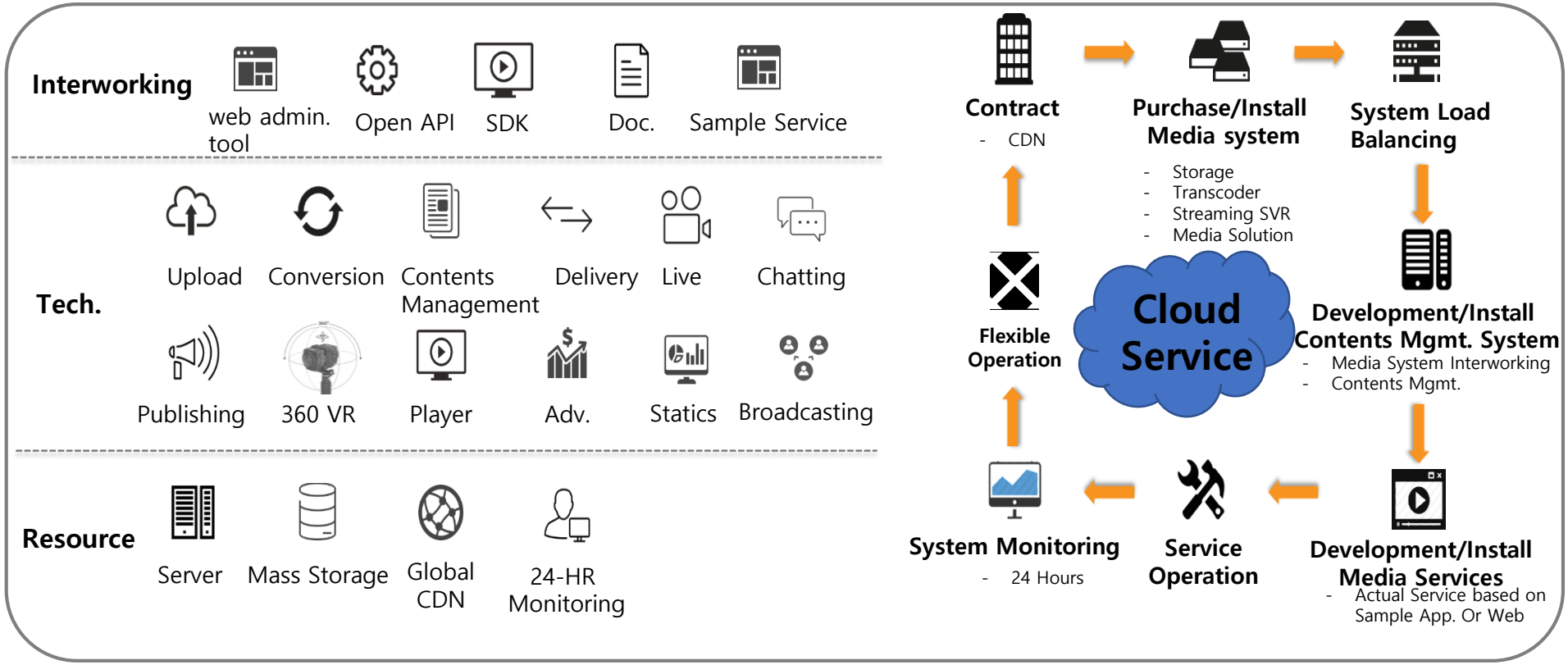
T-MIP: SKT – Media Integrated Platform

- Architectural Model for Media Service Entity Attachment



SKT-MIP based Solutions

- OVP-Online Video Platform



SKT Provides Media Services including resource and technology as Cloud Service

All Functions are provided with Open API / SDK

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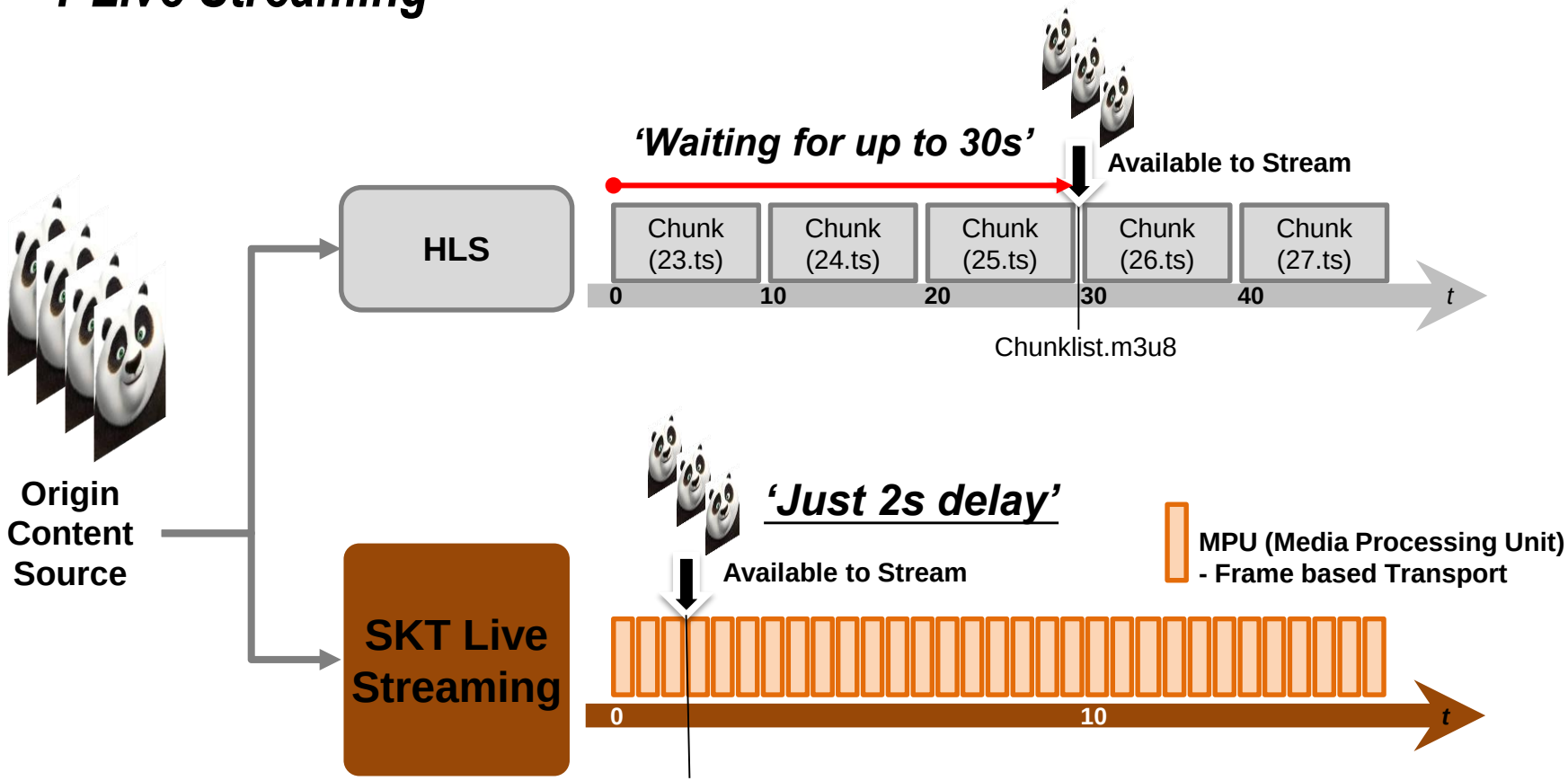
SKT-MIP based Solutions

- ***T-Live Streaming***

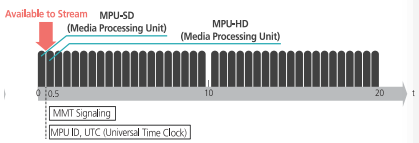


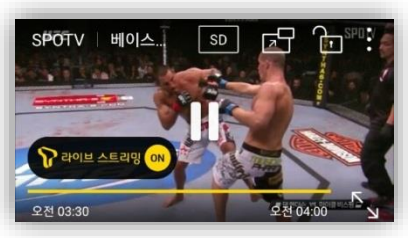
SKT-MIP based Solutions

T Live Streaming

live streaming

- Ultra Low Latency Guaranteed Mobile Streaming Tech.
- Latency: <3s, Sync: <0.1s, Bandwidth Saving: 10%



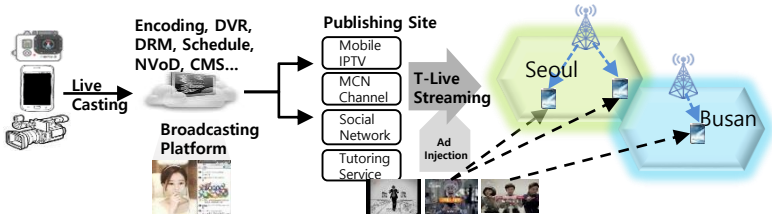


Value Proposition

✓ Latency decreases for mobile live streaming (15s→3s)

Cloud based Personal Broadcasting Platform

- Individual Participation Possible
- Low Latency Streaming, Chatting, Ads. Insertion



Value Proposition

✓ Provide Personal Broadcasting Tech. supporting Low Latency / High Visual Quality Supporting

✓ User Position Dependent Ads. Insertion

High Visual Quality / Low Latency 360 VR Streaming System

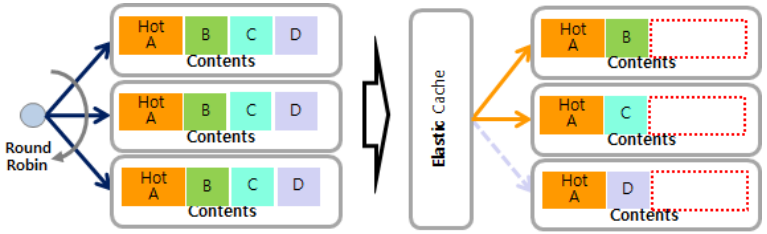
- Live Stitching supporting 4K/60fps
- 360 VR Live Broadcasting and Provide Player
- Adaptive View Port based on User Viewpoint

Value Proposition

✓ 65% Data Compression with Adaptive View Port Tech.

Unified Elastic Cache

- Optimization for Cache Storage and Processing



Value Proposition

✓ Cache Storage Performance Enhanced (>9 times)

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SKT-MIP based Solutions

Online Video Platform

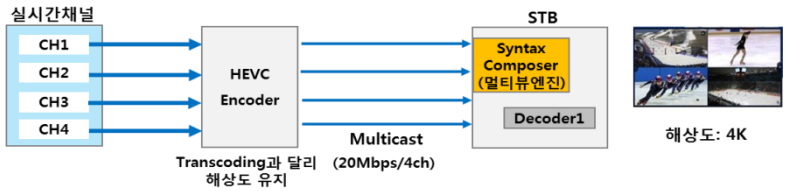
- Provide Infra and Solution with PaaS Type for Internet Broadcasting Services

Value Proposition

- ✓ Interworking with CDN for B2B (VoD, Live) Service
- ✓ Provides N-screen, Ads. Insertion, Programing, CMS

UHD Multi-Screen Solution

- Provide one UHD screen with 4 separate FHD screens
- HEVC Tile Syntax Used



Value Proposition

- ✓ High Visual Quality and STB Resource Saving with HEVC Tile Syntax

H/E HDR[High Dynamic Range] Conversion

- SDR(Standard Dynamic Range) Contents to HDR Contents at H/E (Head End) Side

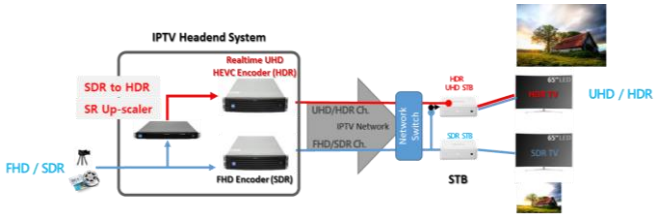
[non-HDR] [HDR]

Value Proposition

- ✓ Premium HDR IPTV Services Possible for Both VoD/Real-Time Streaming

Super Resolution (H/E Adoption)

- Video Up-scaling with AI DNN based Algorithm
- FHD to UHD at H/E with High Performance H/W



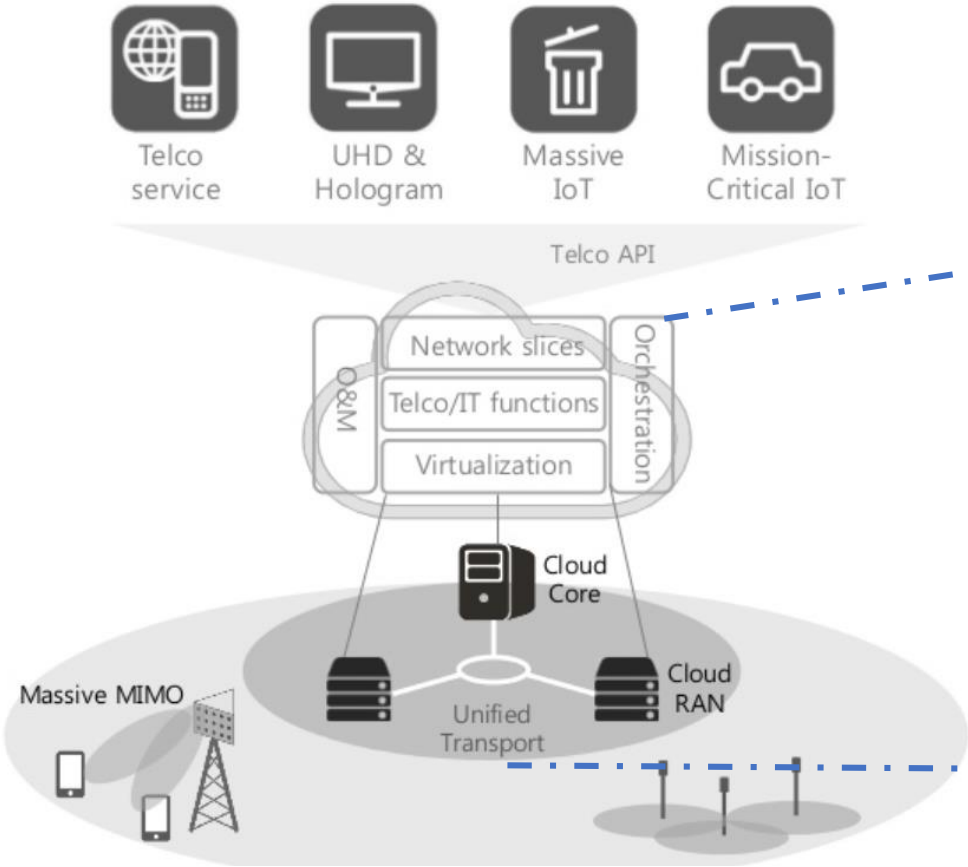
Value Proposition

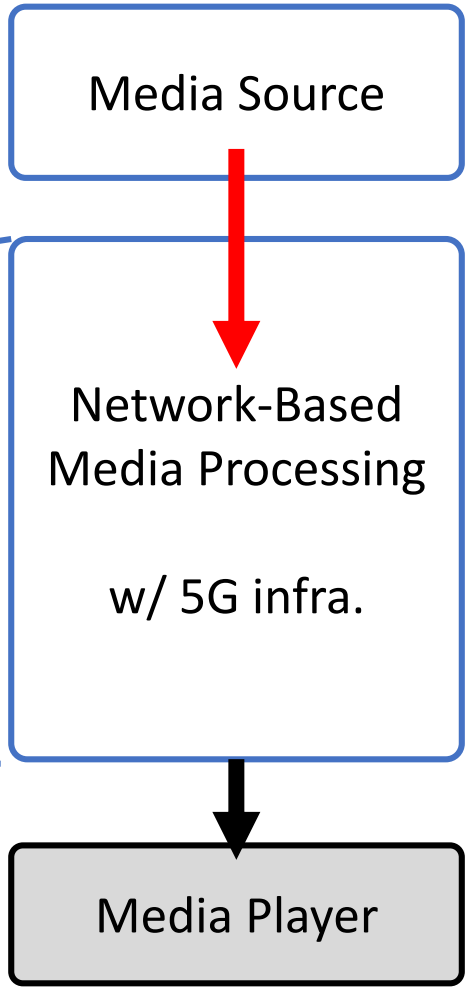
- ✓ Premium 4K IPTV Services Possible for Both VoD/Real-Time Streaming

Network Based Media Processing

- NBMP will be the dominant technology for future media service of 5G.

SKT's 5G Architecture





Key function : enhance the media quality using N/W resources

SK’s AR/VR Platform and Services for 5G Network

SKT's AR / VR Platform

- real is Total AR / VR Service Platform

Service

Education | Tourism | Advertisement | Museum

Contents

Text | Image | 3D Animation | Audio | Video | HTML5

real Platform

AR/VR Authoring	3D Avatar Framework	Realistic Rendering
AR/VR Browser	Spatial Recognition	Social Communication
Visual Recognition	Natural User Interaction	Contents/Service Server

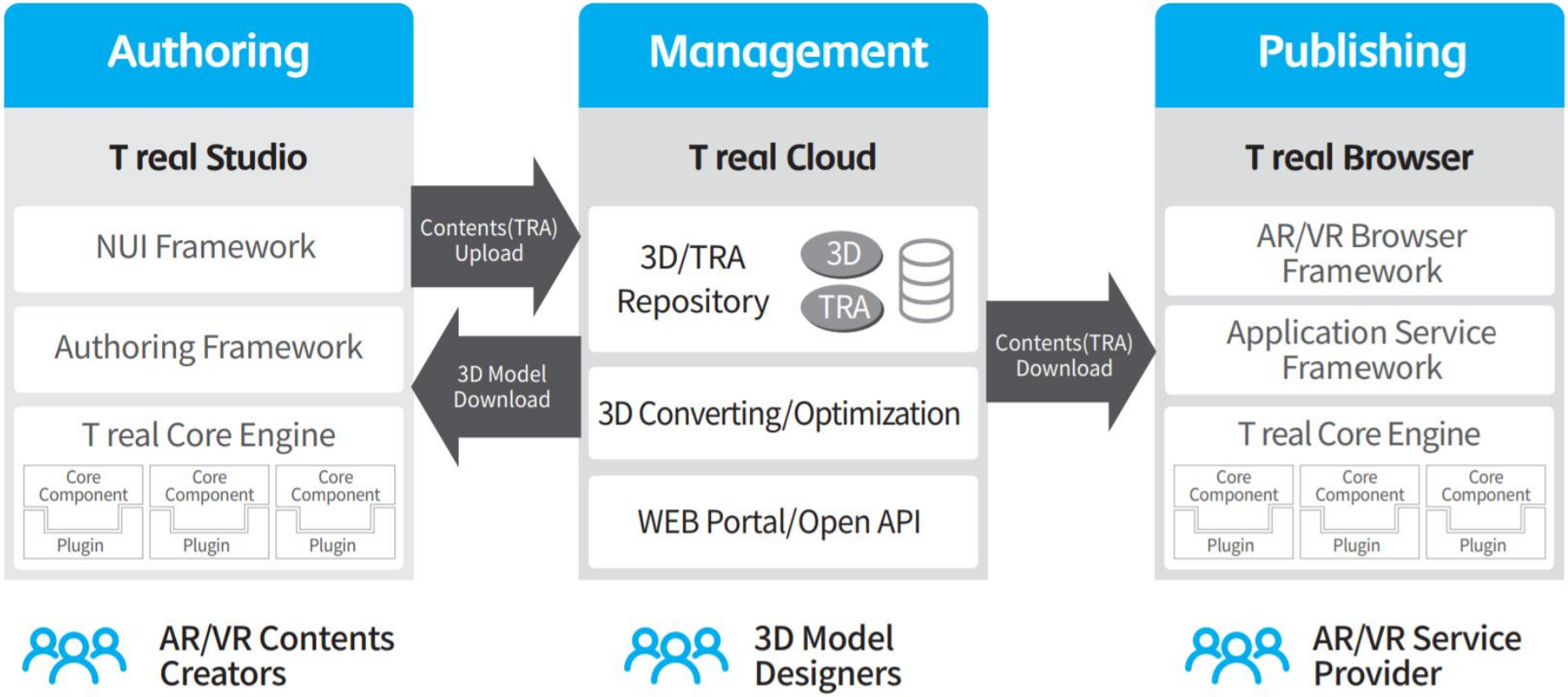
Smart Device | VR HMD | AR Glasses | Smart Helmet

OS

Windows | Android | iOS | Mac OS

SKT's AR / VR Platform

- real is Total AR / VR Service Platform



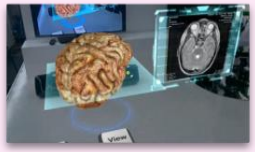
SKT's AR / VR Platform

- real VR Studio. You can create and play VR contents in ***there***

SKT's AR / VR Platform

- Developed Services Status

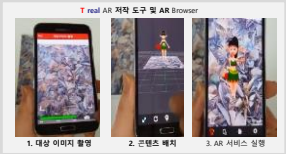
Collaboration



Remote AR Medical Service ('15.10)

T real Telepresence Remote Design ('17.1)

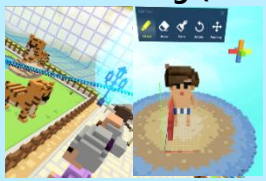
Social Service



AR Mobile Authoring ('15.1)

Google I/O 2015 AR Authoring ('15.1)

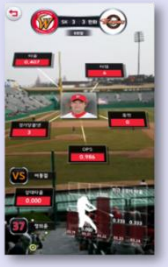
T real 3D System Unity VR Studio('15.1)



Google I/O 2017 Daydream VR Studio ('17.1)

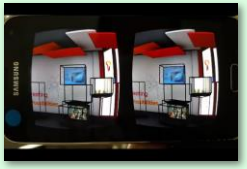
Game & Entertainment

T real AR Game ('16.6)



AR Baseball Game Play Adventure ('17.3)

Marketing & Event



T.um Theater ('15.3)

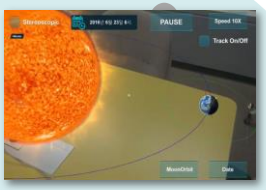
T real Adventure('15.3)

tvN Event ('16.10)

Mobile Symphony Orchestra AR ('15.10)

Education

EV Visualizer ('16.3)



Education AR/VR ('16.4)

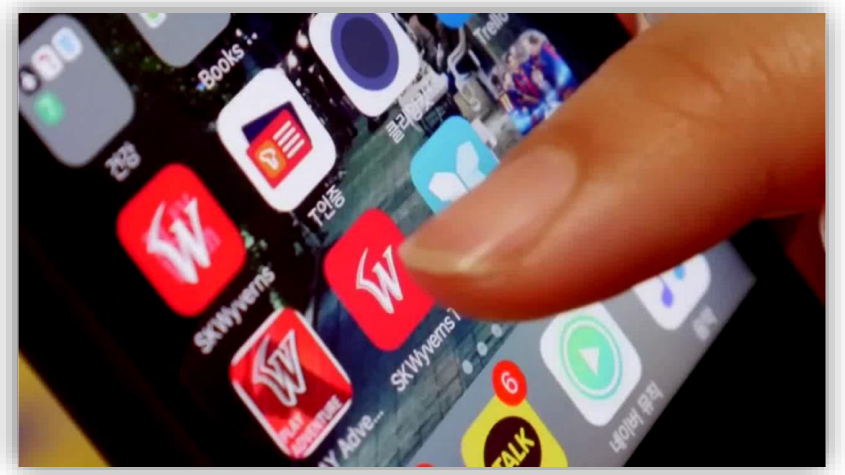
Productivity

AR City Demo ('15.8)

Remote Assist Prototype ('16.8)

SKT's AR / VR Services

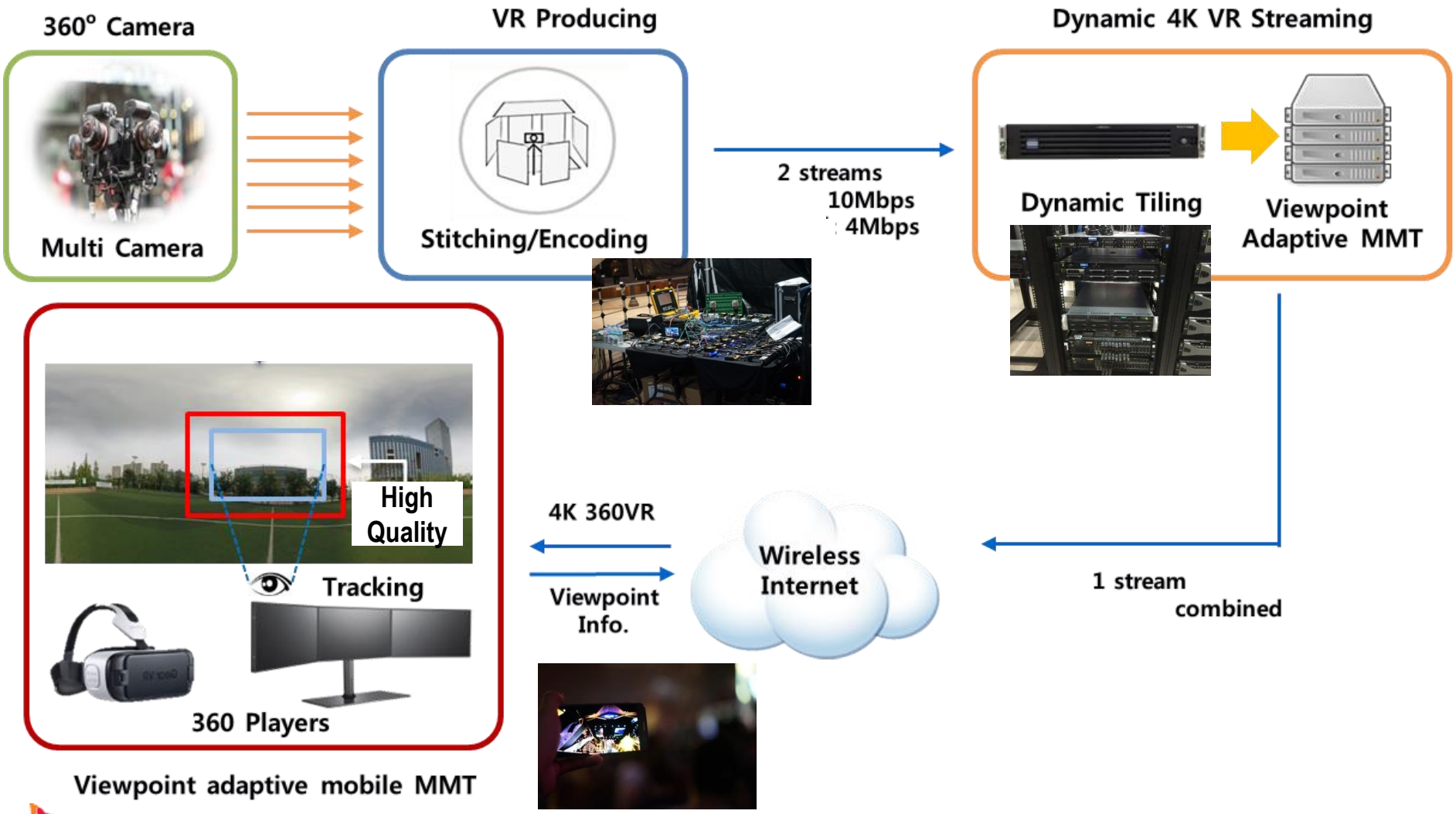
- AR Entertainment for Baseball Game



[redacted]

SKT's AR / VR Services

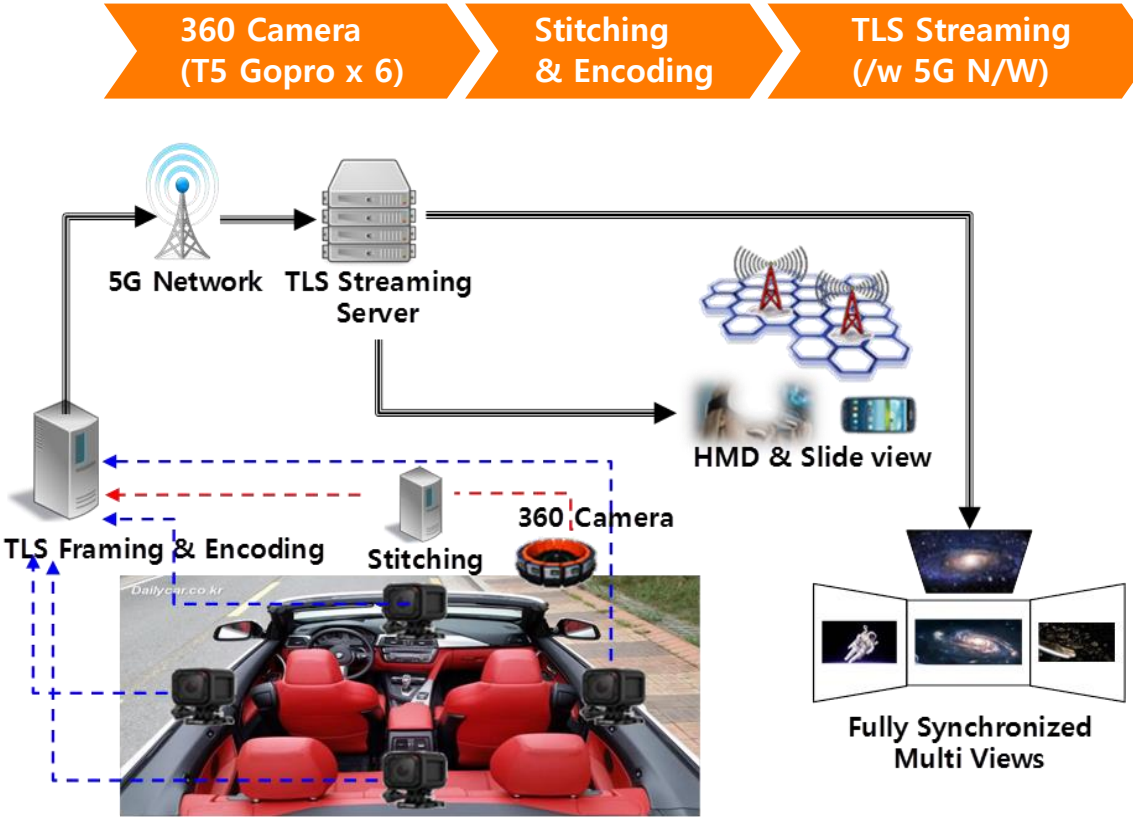
- 360 VR Live Trial Services (4K, Real-time)



SKT AR / VR Services

- 360 VR Streaming Services (BMW Driving Center)

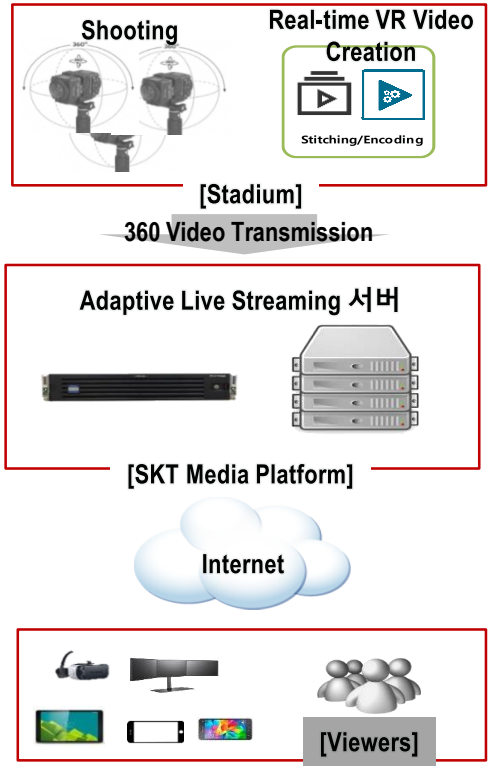
Functional Architecture

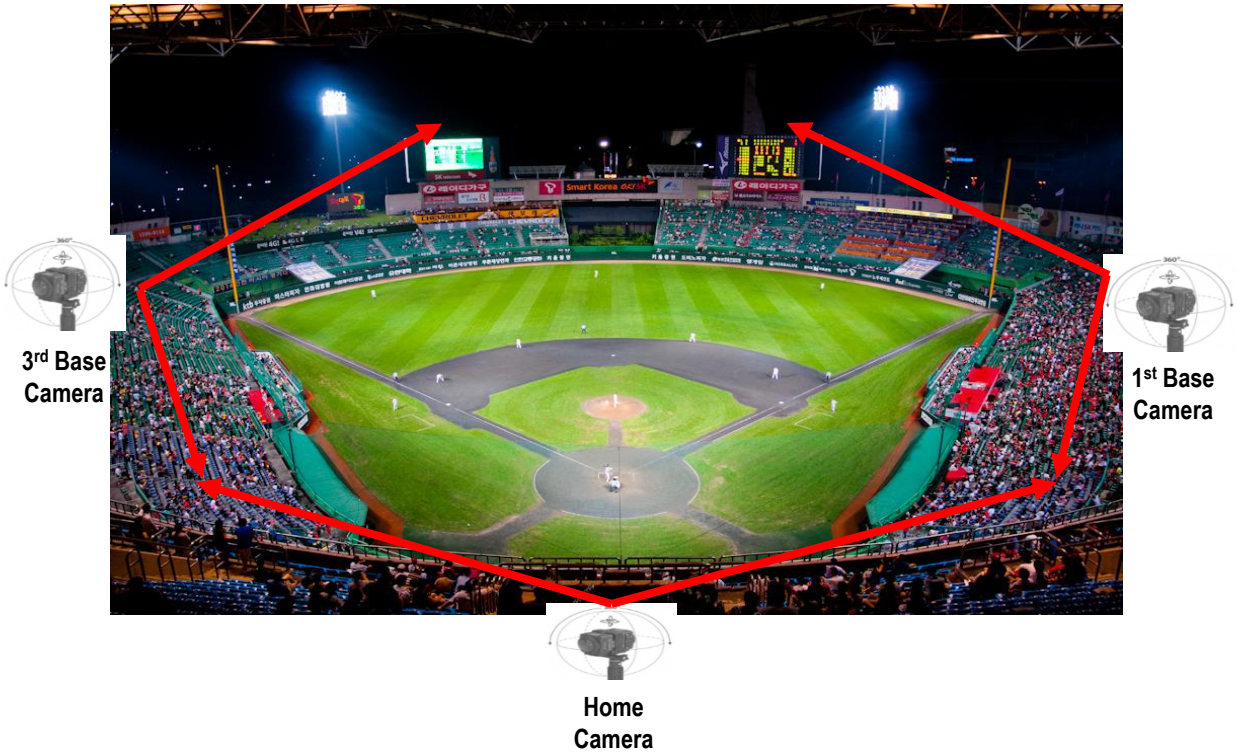


SKT AR / VR Services

- 360 VR Streaming Services (Korean Pro Baseball Game)

Strong Immersiveness is obtained via 360 VR Video with Multi-Cameras





SKT AR / VR Services

- 360 VR Streaming Services (CES2018)

- 360 VR Streaming Services (in Collaboration with Kia Motors@CES2018)
- Real-time Streaming via 5G Submarine Fiber-Optic Cables Between KOR-USA

Conclusion

- SKT is preparing ***5G revolution era*** with innovative service ***platforms*** and ***solutions***

- SKT is especially interested in ***technology*** for effective multi-media **processing** and fast ***delivery***

- SKT is also proposing these platforms and solutions to MPEG and hoping these solutions to ***be popularized*** soon

- Flexible standardization is required for ***faster and effective*** video processing and delivery
  - ✓ VR targeted video compression is being standardized in MPEG
  - ✓ ***T-MIP*** and ***T-Real*** can be standardized


ngiyabonga
danke
謝謝
teşekkür ederim
спасибо
dank je
thank you
gracias
tapadh leat
mauruuru
hvala
bedankt
mochchakkeram
dziękuję
go raibh maith agat
sagolun
sukriya
kop khun krap
obrigado
arigatō
takk
dakujem
grazie
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