



**IABM 2022 Award
Winning Solution**

**5G MEDIA
STREAMING**
DUTCH GUILD 2023

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5G Media Streaming Solutions Director

ATEME
Captivate your audience

AGENDA

- > Who is Ateame
- > Ateame in 5G Broadcast
- > A Look Into The Future
- > Conclusion

Who We Are

WE HELP BILLIONS OF VIEWERS TO WATCH CONTENT ANYWHERE, ANYTIME

Streaming platforms
SVOD, AVOD, virtual video distributor



OTT streaming services to
multiscreen



Viewers



Contribution

Content provider
Content owner, broadcaster



Distribution

Service Provider
Cable/Satellite/IPTV



Pay-TV services
to set-top box



UNIQUE INVOLVEMENT IN STANDARDIZATION

Ateme working on NextGen audio/video standards

VVC: Successor of HEVC enabling bandwidth to be divided by 2, enabling 4K/8K transmission



AV1: Internet leaders partnering in 2017. a royalty-free alternative to HEVC, looking for AV2



Ateme working on innovations for enhancing delivery

ATSC 3.0: The new US broadcast standard combining over-the-air & OTT, expanding in Brazil & India



Open Caching: Interconnection of caches, so content is closer to end-viewers, CDN monetization enabled



Ateme active member of:



WINNING THE TV, MEDIA AND STREAMING MARKET

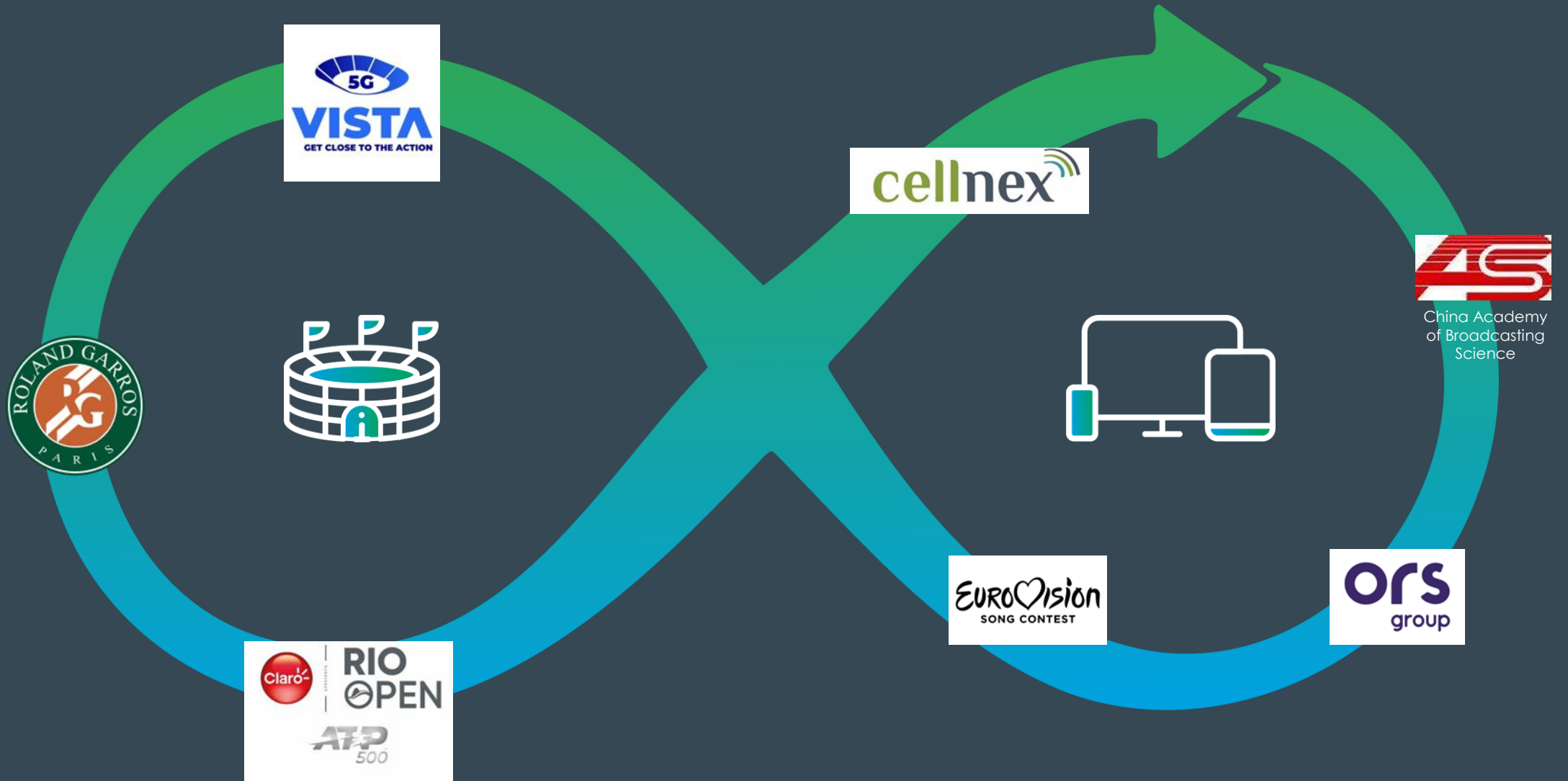


Hardware Infrastructure | On Prem & Private or Public Cloud environment

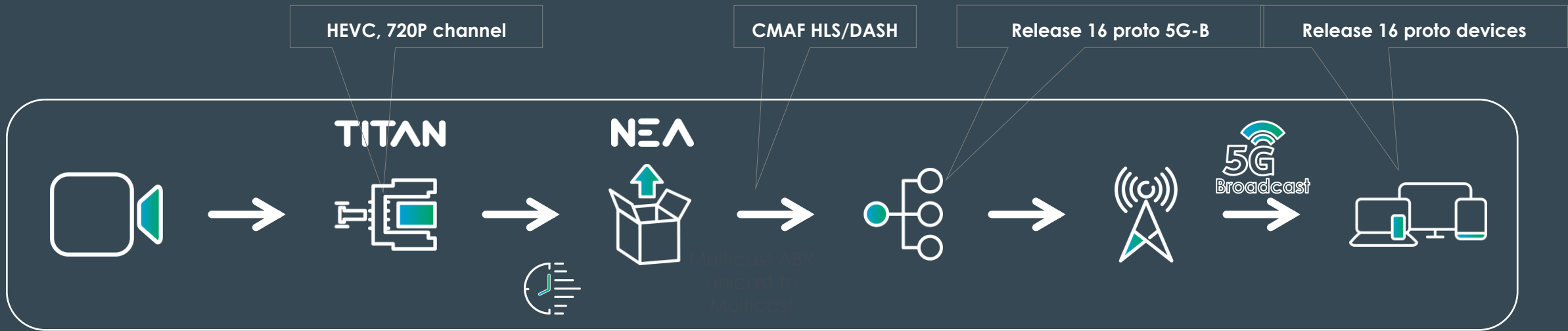


5G Broadcast Trials

ATEME IN 5G BROADCAST TRIALS



TRIALS ARCHITECTURE



5G BROADCAST TRIALS LESSONS LEARNT

> Scalability

- > Management of peaks/popular events



> Quality of Service vs number of users

- > Video Quality is very good for all



> Open new business possibilities

- > Collaboration Broadcasters/MNO's



5G BROADCAST TRIALS LESSONS LEARNT

> 5G Broadcast is one-way

> Looking for interactivity



> Low Latency

> is required to match Broadcast



> Monetization

> Would increase interest



> Spectrum

> Efficiency is key



A Look Into The Future

OPTIMIZING BIT RATE/LOW LATENCY

Reduce bit rate:

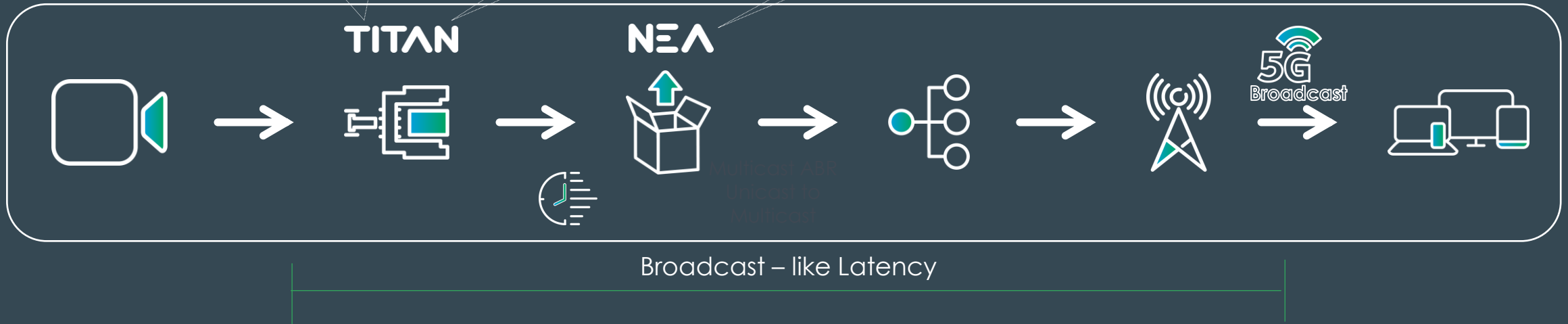
- High Density Codecs (VVC)
- Constant Quality Rate (reduce avg bit rate)

Reduce energy consumption:

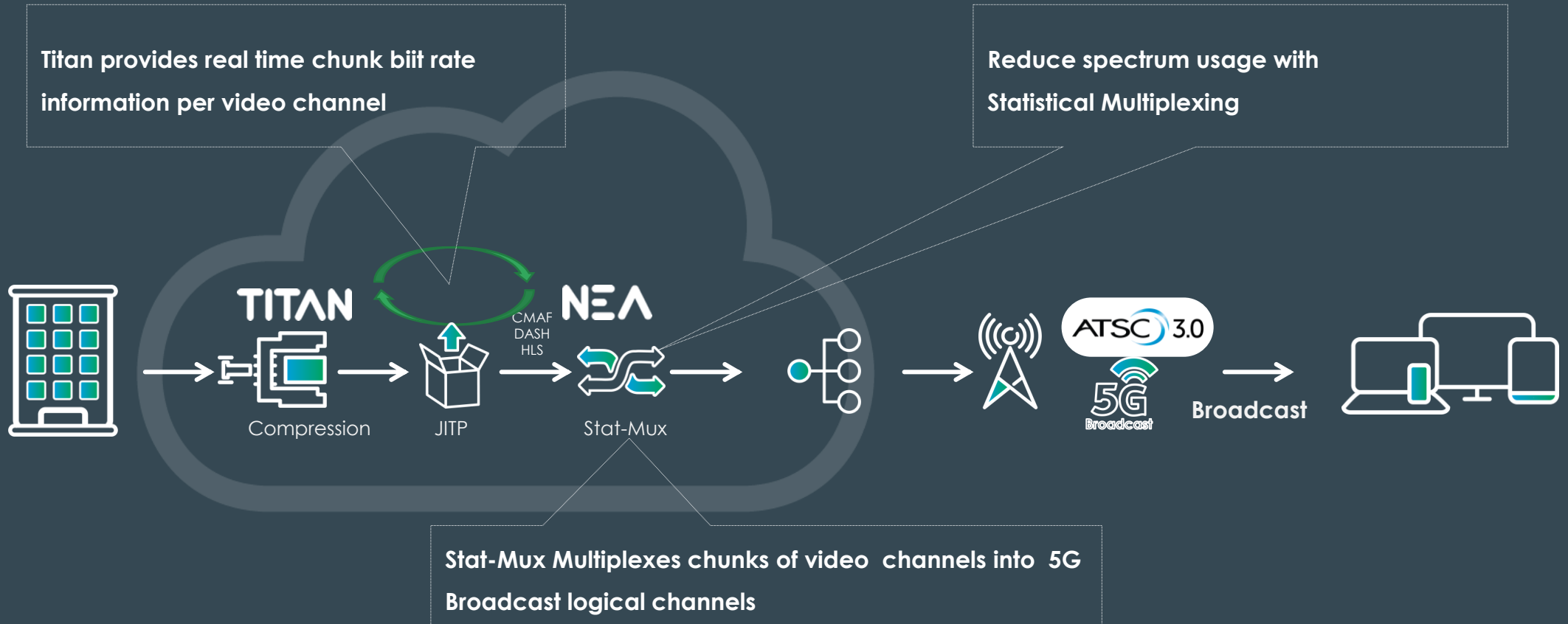
- Audience Aware Encoding

Match Broadcast latency:

- CMAF Ingest
- CMAF Low Latency



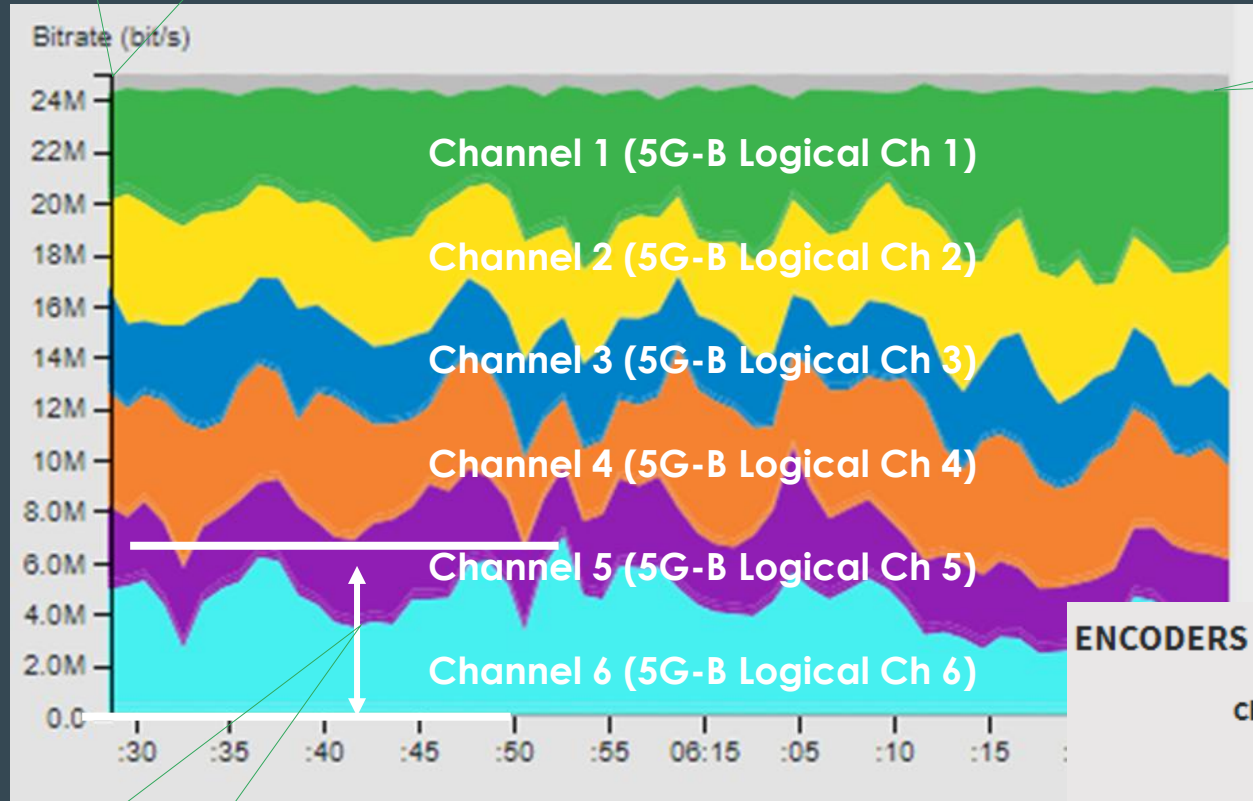
FURTHER SPECTRUM OPTIMIZATION WITH STAT-MUX



STAT-MUX FOR 5G-B OUTCOME

2- Resulting in ~25Mbps max traffic peak instead of ~36 Mbps

3- Measurements show an average savings of 20% in Spectrum



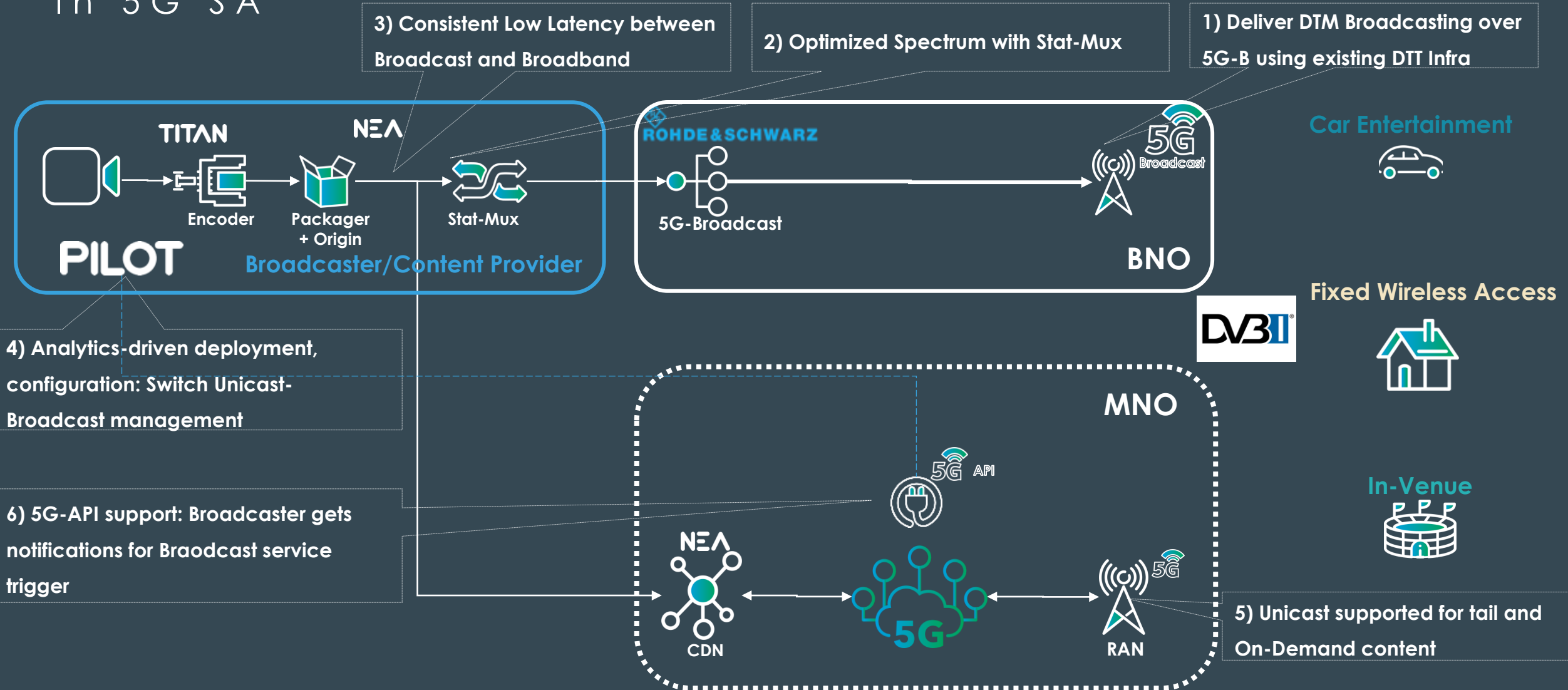
1- Avoid reserving CBR of 6 to 9Mbps for channel peak permanently

ENCODERS STATISTICS

| Channel | Service | average bitrate | min. bitrate | max. bitrate |
|---------|-------------|-----------------|--------------|--------------|
| | TF1 | 3.05 Mbit/s | 1.88 Mbit/s | 4.77 Mbit/s |
| | NRJ12 | 3.78 Mbit/s | 2.61 Mbit/s | 6.53 Mbit/s |
| | TMC | 3.76 Mbit/s | 2.06 Mbit/s | 8.34 Mbit/s |
| | TFX | 5.54 Mbit/s | 3.16 Mbit/s | 8.58 Mbit/s |
| | LCP | 2.7 Mbit/s | 1.54 Mbit/s | 4.11 Mbit/s |
| | Pitchoun TV | 3.46 Mbit/s | 2.79 Mbit/s | 4.86 Mbit/s |

DIRECT TO MOBILE BROADCASTING

In 5G SA



INTERACTIVITY AND DELIVERY WITH 5GMBS

Save Bandwidth/Spectrum/Energy with

- Elastic CDN
- Byte Range support
- Unified Delivery CMAF



UHD p50
HDR10



TITAN



NEA



NEA



5G

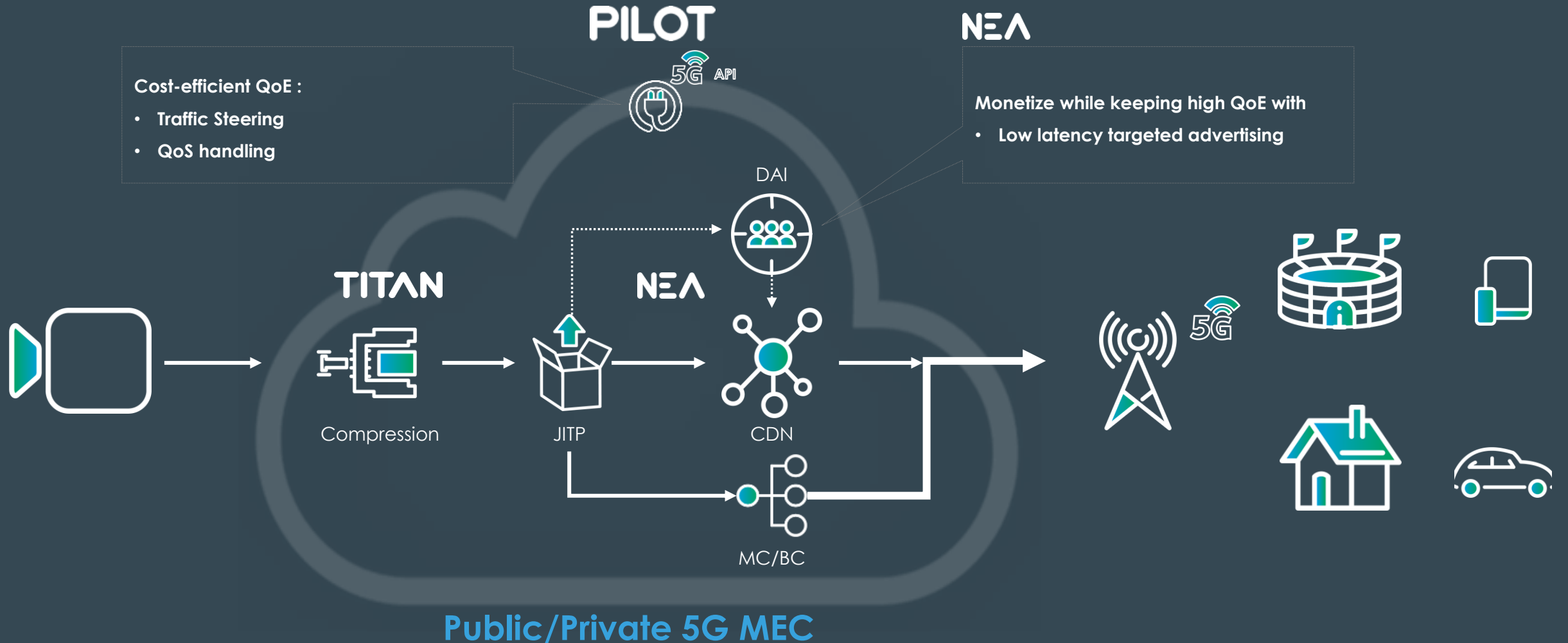


HDR VVC

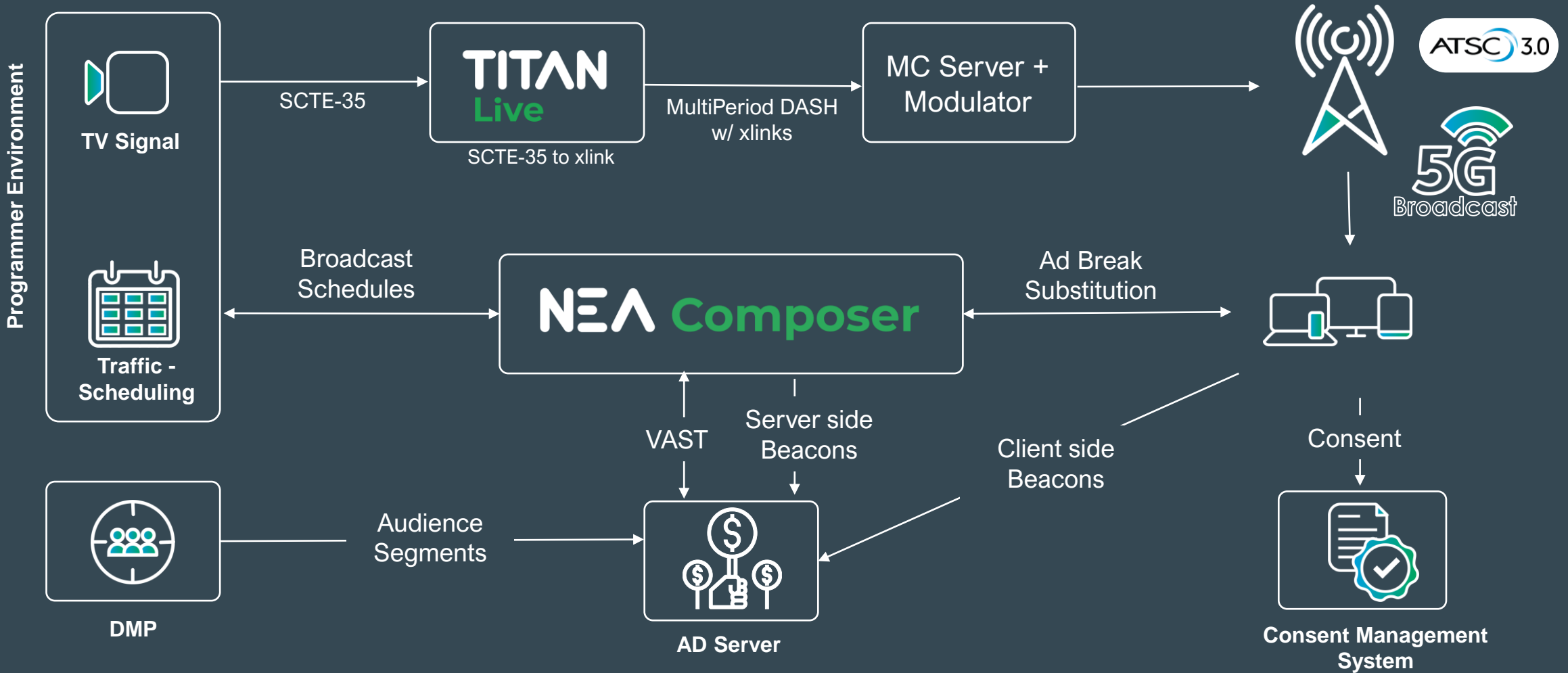


Saving Bandwidth/Spectrum/Energy while maintaining high QoE with
5G Multicast/Broadcast

LOW LATENCY STREAMING AND MONETIZATION



ADVERTISING ARCHITECTURE FOR ATSC 3 AND 5G-B



IN A NUTSHELL

5G Solution Benefits

Increased
Monetization



Broadcast/Broadband
Consistent Latency



Further Spectrum
Optimization

New MNO /BNO
Business Models



ATEME
Captive your audience

THANK YOU.