NABSHOW EXPRESS

Statistical multiplexing of DASH segments in ATSC 3.0 system

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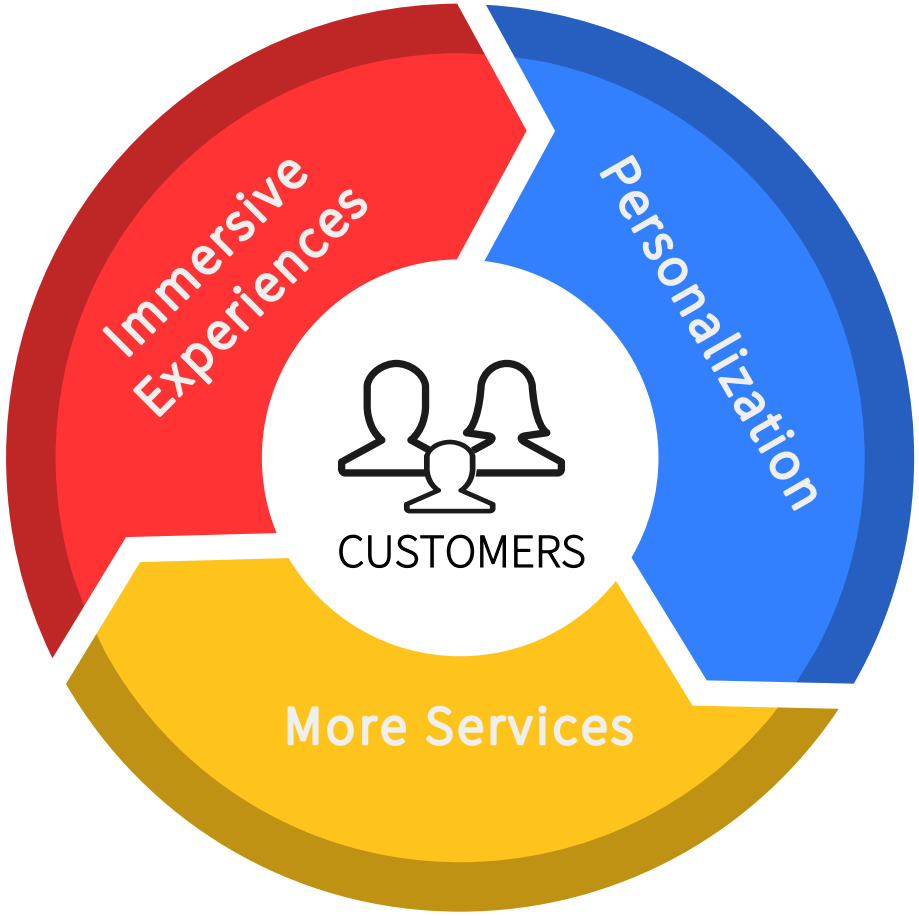
NEXT GEN TV?

New Broadcast TV standards (ATSC 3.0)

Hybrid Over The Air and Broadband

Voluntary adoption

No new spectrum



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The Journey

ATSC 1.0

Road Ahead

Channel Sharing &
Lighthouse Concept

ATSC 3.0
NEXTGEN TV

Challenges

1. No new spectrum
2. Mandatory Simulcast of ATSC 1.0 & 3.0 during 5 years (equivalent experience!)

Goals

1. Build consumer interest and excitement in ATSC 3.0
2. Maintain consumer satisfaction throughout the simulcast period

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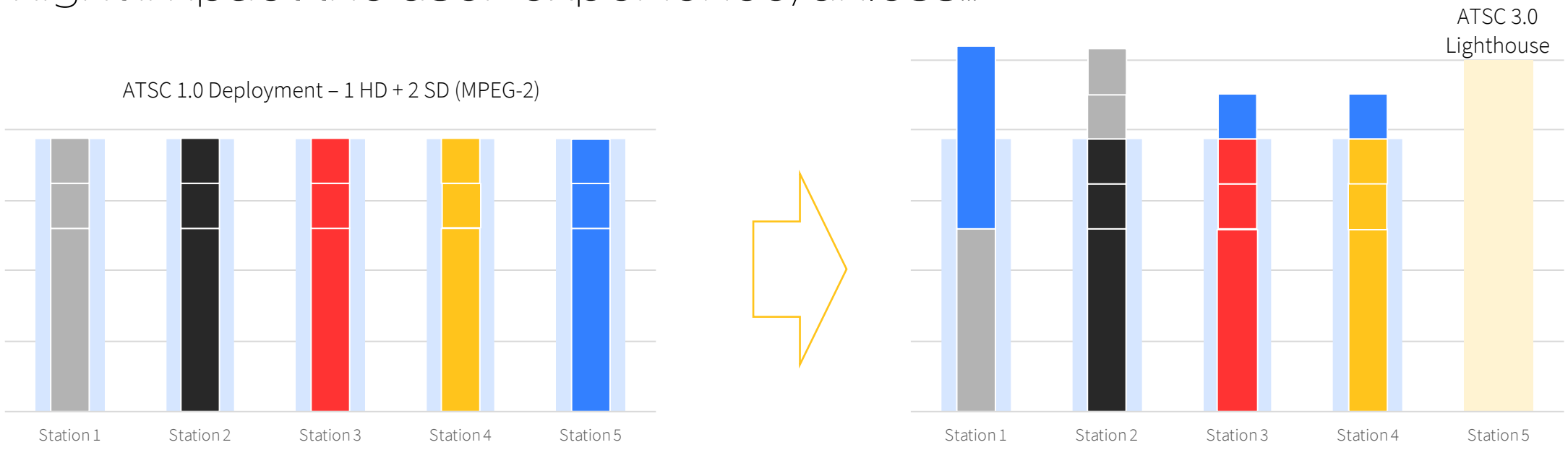
Finding the right balance

might impact the user experience, unless…

ATSC 1.0 bandwidth

ATSC 3.0 bandwidth



Adjust ATSC-1.0 service bit rates

Eliminate some ATSC-1.0 sub-channels

Use extra data capacity not currently being used in some ATSC-1.0 channels

Employ latest modern compression and statistical multiplexing algorithms

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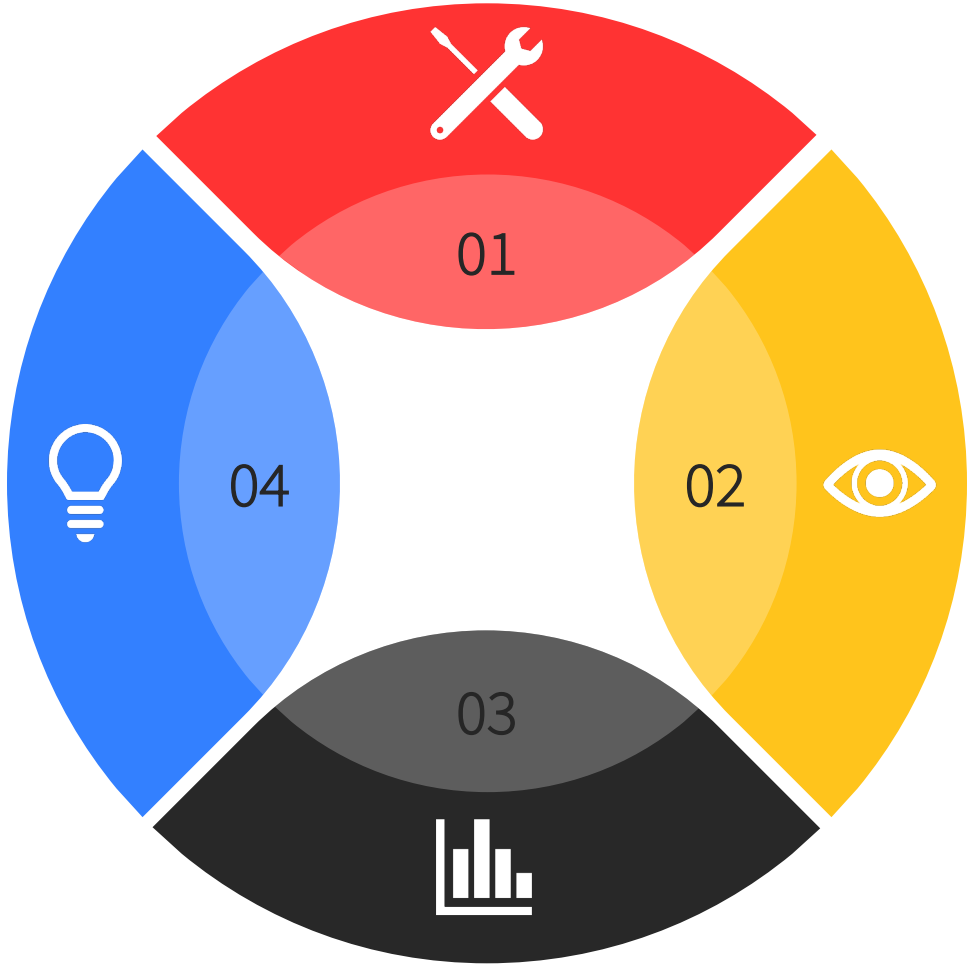
… you have the right tools in the toolbox

Innovation

Statistical multiplexing in the DASH domain requires new generation features.

Rate Control

Core codec optimizations to be combined with maximum benefits of bit conservation of **statistical multiplexing** where, not all statistical multiplexors are alike



Coding Efficiency

Core to clearing capacity for the lighthouse deployments is ATSC-1 stations to leverage best practices for **core codec** compression optimization

Picture Quality

Optimization based on picture quality is most efficient means to also adhering to FCC guidelines for **maintaining consumer experience**.

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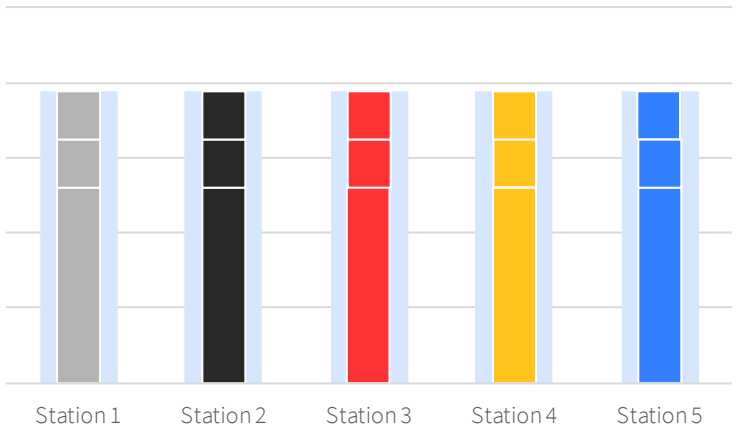
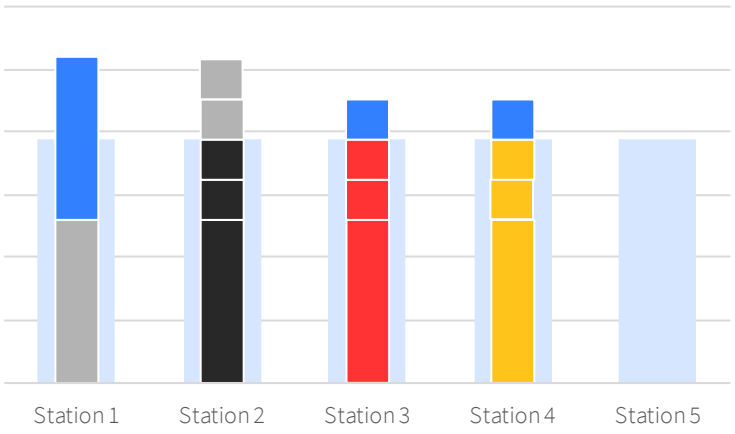
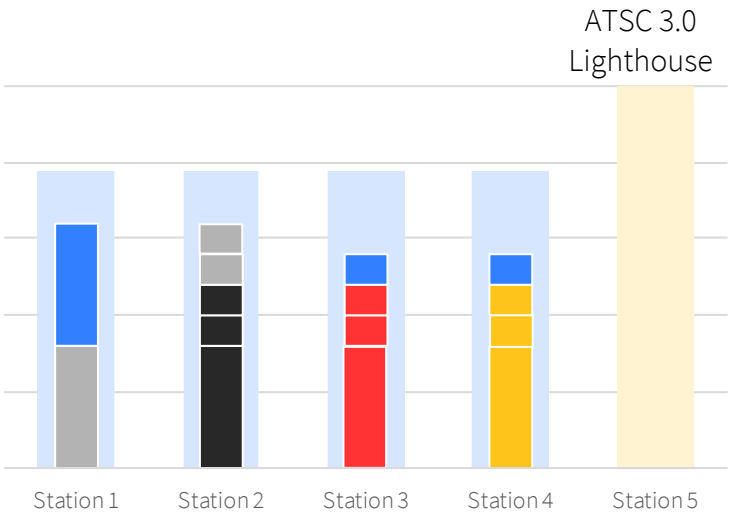
Optimize ATSC 1.0 Channels







to free up spectrum for the ATSC 3.0 Lighthouse

Advances in MPEG-2 core codec + Benefit from the latest Statistical Multiplexing techniques

up to 50% bandwidth savings while keep the same viewing experience

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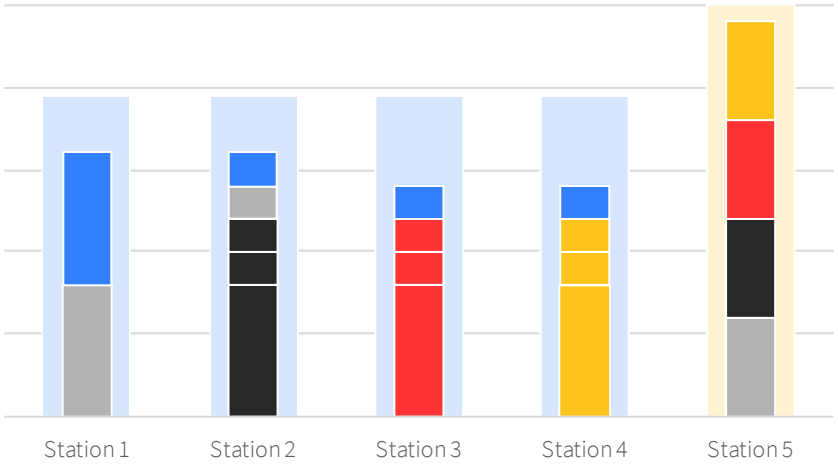
ATSC 3.0 Lighthouse

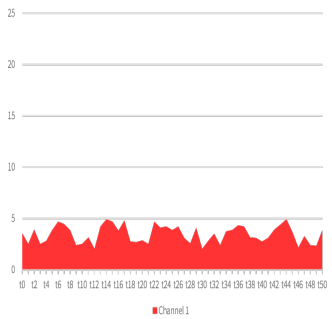
More channels, better experience, interactive and personalized

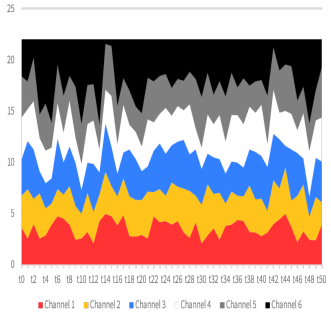
Up to 4 sports channels using a traditional Constant Bitrate Encoding approach

HEVC DASH Statistical Multiplexing for ATSC 3.0

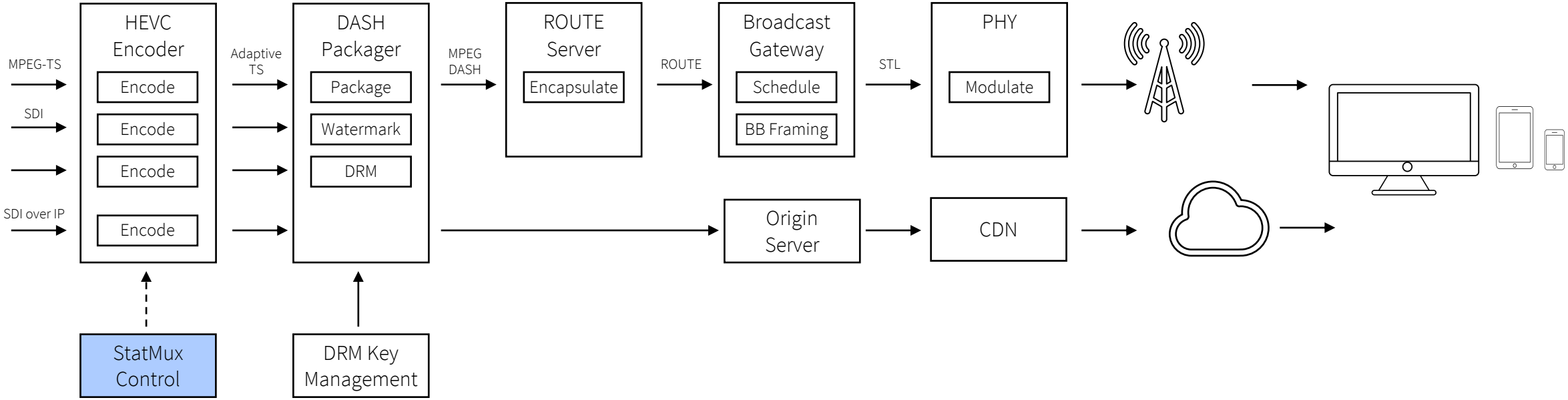


ATSC 3.0 Statistical Multiplexing – HEVC DASH





1080p60 services In 22Mb/s	Constant Bit Rate	Variable Bit Rate Statistical Multiplexing
2019	4	5
Now	4	6



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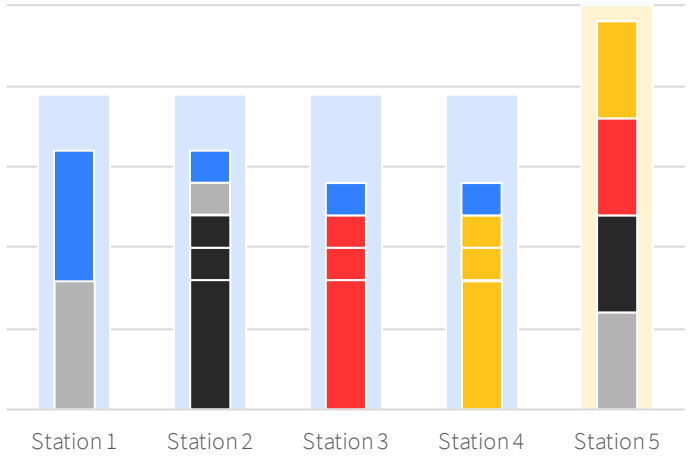
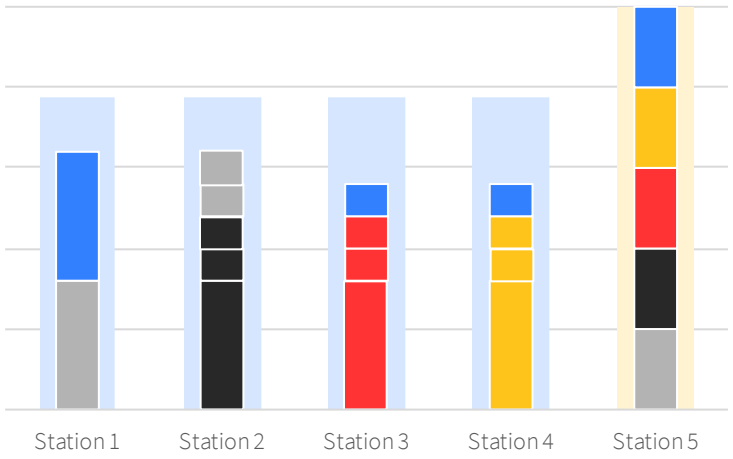
ATSC 3.0 Statistical Multiplexing – Outcome

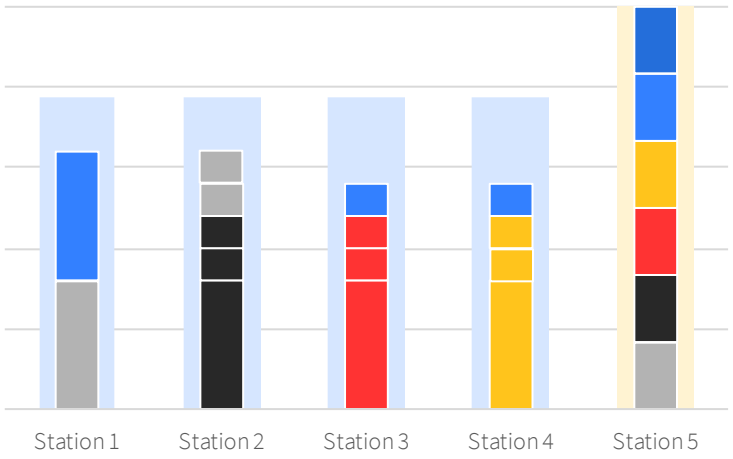
1080p60 services In 22Mb/s	Constant Bit Rate	Variable Bit Rate Statistical Multiplexing
2019	4	5
Now	4	6

Migrate all main channels to ATSC-3.0
Stunning experience with HEVC HD and AC-4 audio

Launch new ATSC 3.0 services to attract more viewers







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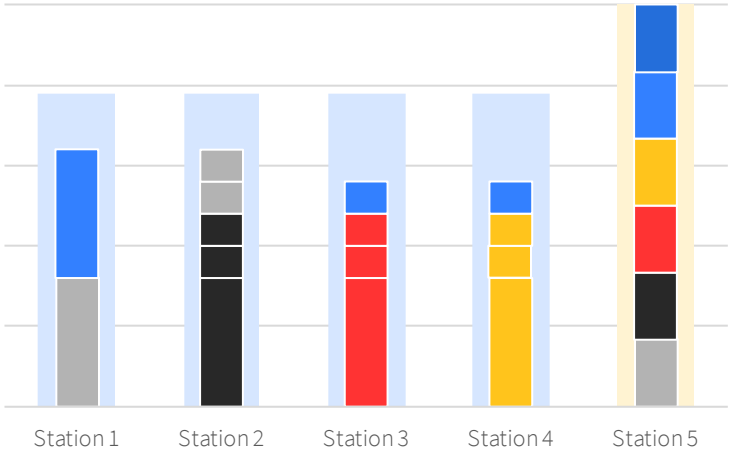
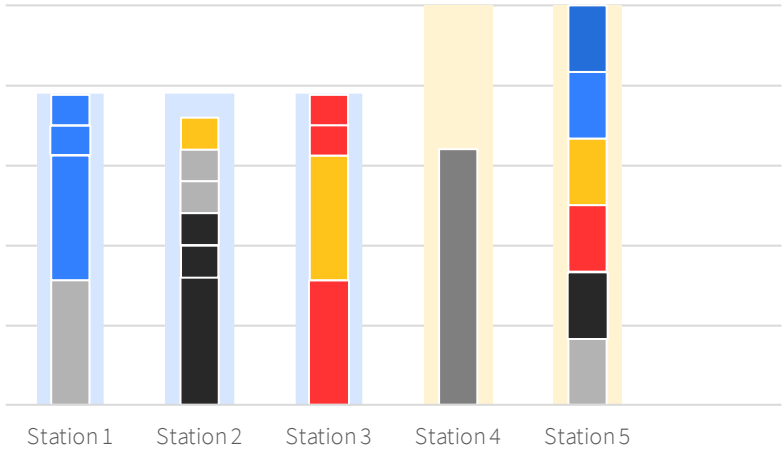
ATSC 3.0 Statistical Multiplexing – Outcome

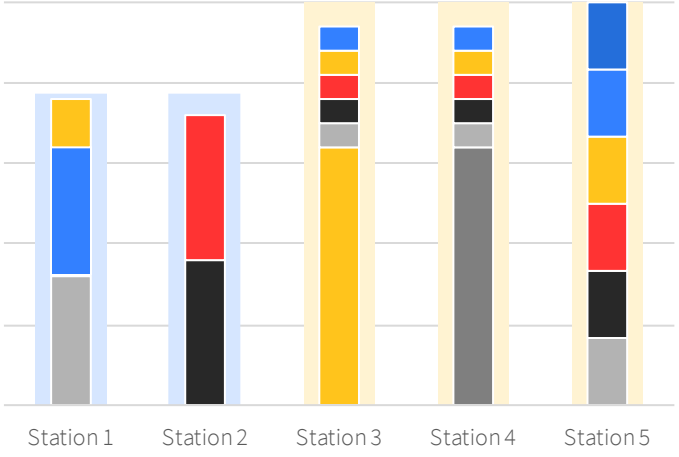
Launch new ATSC 3.0 services to attract more viewers



Accelerate 3.0 deployment



ATSC 3.0 tipping point



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Business Outcome

Maintain ATSC 1.0 experience

Increase customer experience

Accelerate time to ATSC 3.0 revenue

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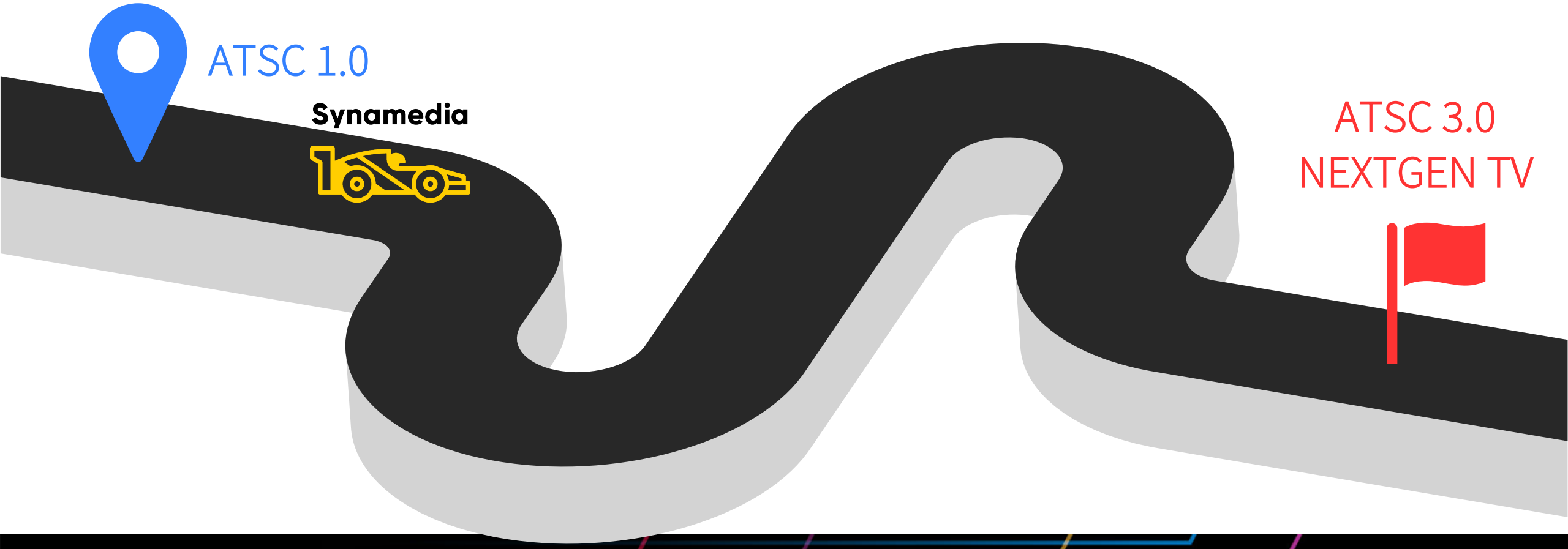
Conclusions



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