

5G Media Action Group

Together we shape the future of media

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Chair CP-T working group



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5G for Media

- **Production** – What you do on location
- **Contribution** – Moving it around
- **Distribution** – Getting it to our audiences

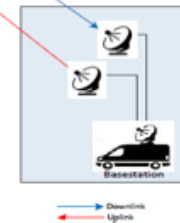
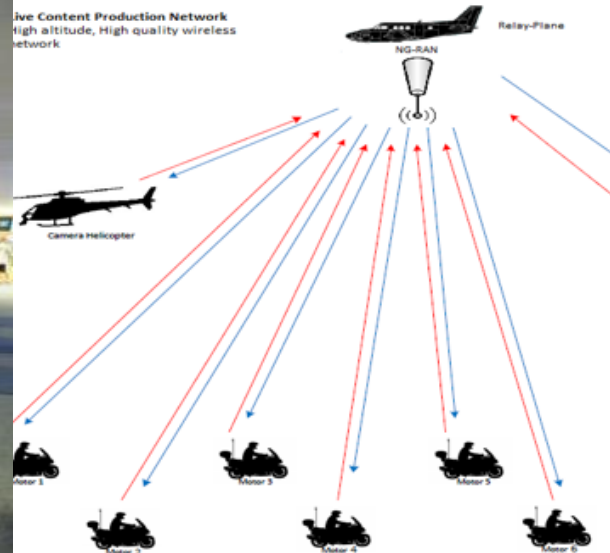
5G for Media

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At first we had analogue.....



And then we went digital...



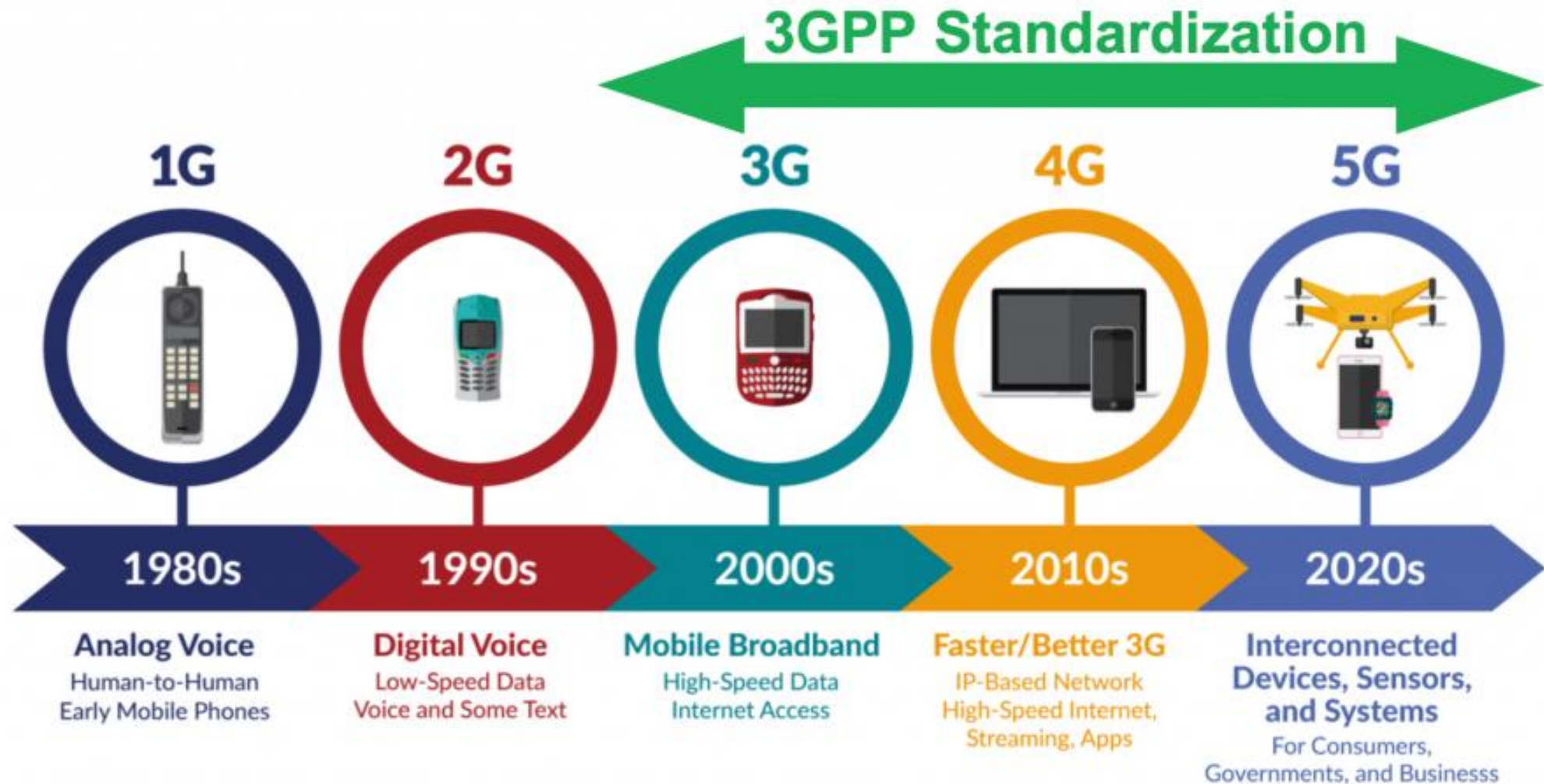
And now we have IP



And it's not just us



And it's not just us

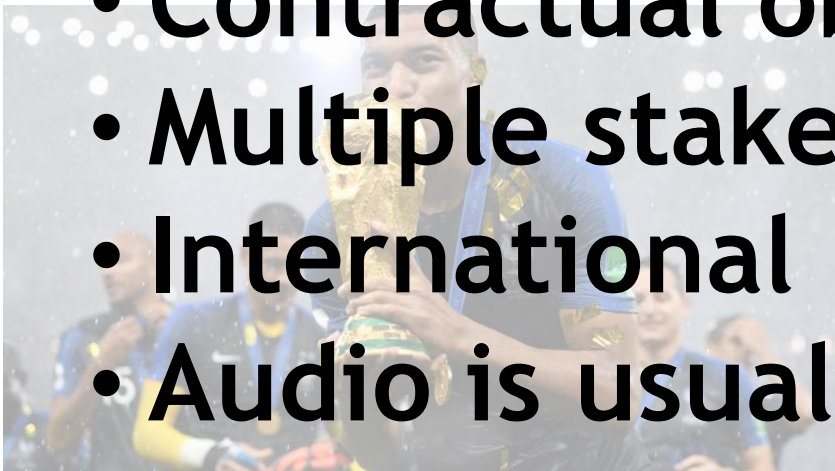


Types of Production - Tier One



Types of Production - Tier One

- Well planned
- Significant resources
- Statutory obligations
- Contractual obligations
- Multiple stake-holders
- International Interest
- Audio is usually a separate workflow

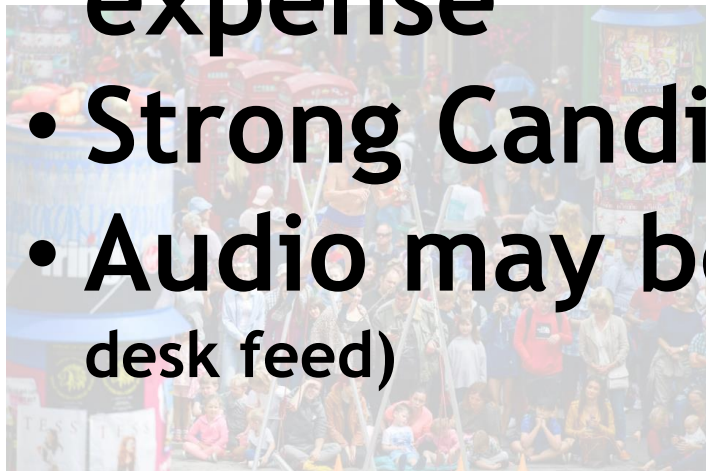
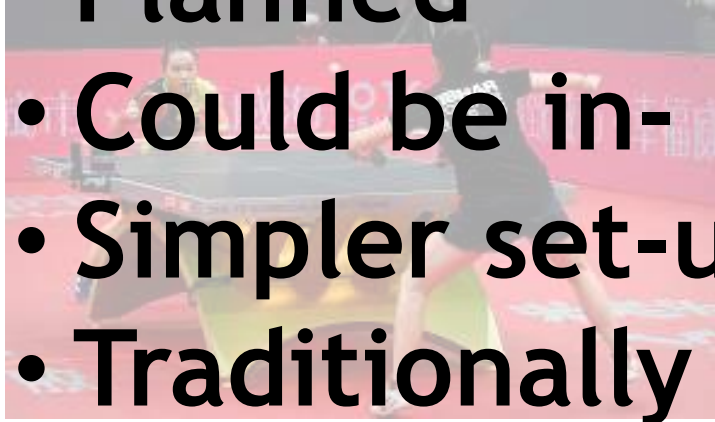


Types of Production - Tier Two



Types of Production - Tier Two

- Planned
- Could be in-house production
- Simpler set-up
- Traditionally hard to cover or justify expense
- Strong Candidate for remote production
- Audio may be combined with video (eg event desk feed)



Types of Production - Tier Three



Types of Production - Tier Three

- Unplanned
- In- House resource
- Scaleable at speed from MJ to full crew
- Difficult locations
- Multiple outlets
- Audio may be combined



3GPP work to date

Study on AV Production TR 22.827
Sets out user stories and requirements

Specifications for Video, Imaging and Audio TS 22.263 Normative requirements

3GPP TSG-SA WG1 Meeting #87
Suzhou, China, 6 - 10 May 2019

S1-192374
(revision of S1-19xxxx)

Title: Cover Sheet for Presentation of TS 22.263v0.1.0 to TSG SA#85 for Information

Agenda Item: x

Source: Rapporteur BBC

Contact: Ian.Wagdin@bbc.co.uk

Abstract: This document provides a revision of the consolidated potential requirements of AVPRD. The changes include a revision of the performance consolidated requirements and the service consolidated requirements.

The changes for the performance consolidated requirements are:

- the packet error ratio is shown now as a ratio and not as a percentage
- improvement the quasi-error free formula for determining the video packet error ratio

The changes regarding the consolidated service requirements are:

- text revision to make it more generic
- Revision of requirement regarding a list of core network connectivity
- Moving requirement on core network connectivity to the NPN subclause from the service continuity subclause
- Propagating service requirement changes of use case in section 5.12 from contributions S1-191359 and S1-191560

8 Consolidated potential requirements

8.1 Performance requirements

Every line in which table shall be considered as an independent requirement.

Table 8.1-1: Performance requirements of low latency periodic deterministic communication service

Profile	Effective URLLC	UE Speed	Service Area	E2E Delay (Node 1)	Transfer Interval (Node 1)	Packet error rate (Node 1)	Data rate (UL)	Data rate (DL)
Active	30	5 km/h	100 m x 100 m	1 ms	1 ms	10 ⁻⁵	100 Mbps	-

Abstract of document:
This document describes the service and performance requirements for the operation of professional video, audio and imaging via a 5G system, including a UE, NG-RAN and 5G Core network.

The aspects addressed in this document include:

- Network service requirements specific for the operation of professional video, imaging and audio for PLMN and non-public networks (NPN)
- Network performance requirements specific for the operation of professional video, imaging and audio for PLMN and non-public networks (NPN)

Changes since last presentation to TSG Meeting:
This is the initial presentation for information.

Outstanding Issues:

SA1 AVProd (22.827) Use Cases

- On-site Live Audio Presentation
- Audio Streaming in Live Performances
- Live production with integrated audience services
- Intercom system for large live events
- Single- Source uncompressed Outside Broadcast Contribution
- Single- source compressed Outside Broadcast Contribution
- Professional TV Production Contributions from an Off-Site &
- Remotely-Produced, Multi-Camera Outside Broadcast
- Simple Live Sports Commentary
- Video streaming of live events using an airborne relay
- Live Immersive Media Service
- Video Streaming in Professional Coverage of Live Performances
- Authentication of devices on a shared non-public network

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Service Requirements (VIAPA 3GPP 22.263)

- Non-public network requirements (also in 22.261)
- Support for open broadcast standards
- Clock Synchronization
- Network Exposure
- Service Continuity
- Multi-network connectivity and service delivery

General Performance Requirements (VIAPA 3GPP 22.263)

Profile	# of active UEs	UE Speed	Service Area	E2E latency	Packet error rate (Note 1)	Data rate UL	Data rate DL
Uncompressed UHD video	1	0 km/h	1 km ²	400 ms	10 ⁻¹⁰ UL 10 ⁻⁷ DL	12 Gbit/s	20 Mbit/s
Uncompressed HD video	1	0 km/h	1 km ²	400 ms	10 ⁻⁹ UL 10 ⁻⁷ DL	3.2 Gbit/s	20 Mbit/s
Mezzanine compression UHD video	5	0 km/h	1000 m ²	1 s	10 ⁻⁹ UL 10 ⁻⁷ DL	3 Gbit/s	20 Mbit/s
Mezzanine compression HD video	5	0 km/h	1000 m ²	1 s	10 ⁻⁹ UL 10 ⁻⁷ DL	1 Gbit/s	20 Mbit/s
Tier one events UHD	5	0 km/h	1000 m ²	1 s	10 ⁻⁹ UL 10 ⁻⁷ DL	500 Mbit/s	20 Mbit/s
Tier one events HD	5	0 km/h	1000 m ²	1 s	10 ⁻⁸ UL 10 ⁻⁷ DL	200 Mbit/s	20 Mbit/s
Tier two events UHD	5	7 km/h	1000 m ²	1 s	10 ⁻⁸ UL 10 ⁻⁷ DL	100 Mbit/s	20 Mbit/s
Tier two events HD	5	7 km/h	1000 m ²	1 s	10 ⁻⁸ UL 10 ⁻⁷ DL	80 Mbit/s	20 Mbit/s
Tier three events UHD (Note 2)	5	200 km/h	1000 m ²	1 s	10 ⁻⁷ UL 10 ⁻⁷ DL	20 Mbit/s	10 Mbit/s
Tier three events HD (Note 2)	5	200 km/h	1000 m ²	1 s	10 ⁻⁷ UL 10 ⁻⁷ DL	10 Mbit/s	10 Mbit/s
Remote OB	5	7 km/h	1000 m ²	6 ms	10 ⁻⁸ UL 10 ⁻⁷ DL	200 Mbit/s	20 Mbit/s
NOTE 1: Packets that do not conform with the end-to-end latency are also accounted as error. The packet error rate requirement is calculated considering 1500 B packets, and 1 packet error per hour is $10^{-5}/(3 \times x)$, where x is the data rate in Mbps.							
NOTE 2: Could use either professional equipment or mobile phone equipped with dedicated newsgathering app							

Key Themes

- High Bandwidth support up to 1GB/s
- Open IP broadcast standard support
- QoS (low PER)
- Timing for synchronisation
- Low latency
- Audio for radio mics, In ear monitoring etc
- Requirements for NPNs
- Managed networks
- 'Roaming' for PLMN and NPN

It won't be one size fits all

Public network

Contractual agreement

Owned or
operated

PLMN

Traffic
Prioritisation

Slice

PNI-NPN

SA-NPN

Less control

More control

Ad-hoc

Planned

Global

Local



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