MoWIE for Network Aware Applications

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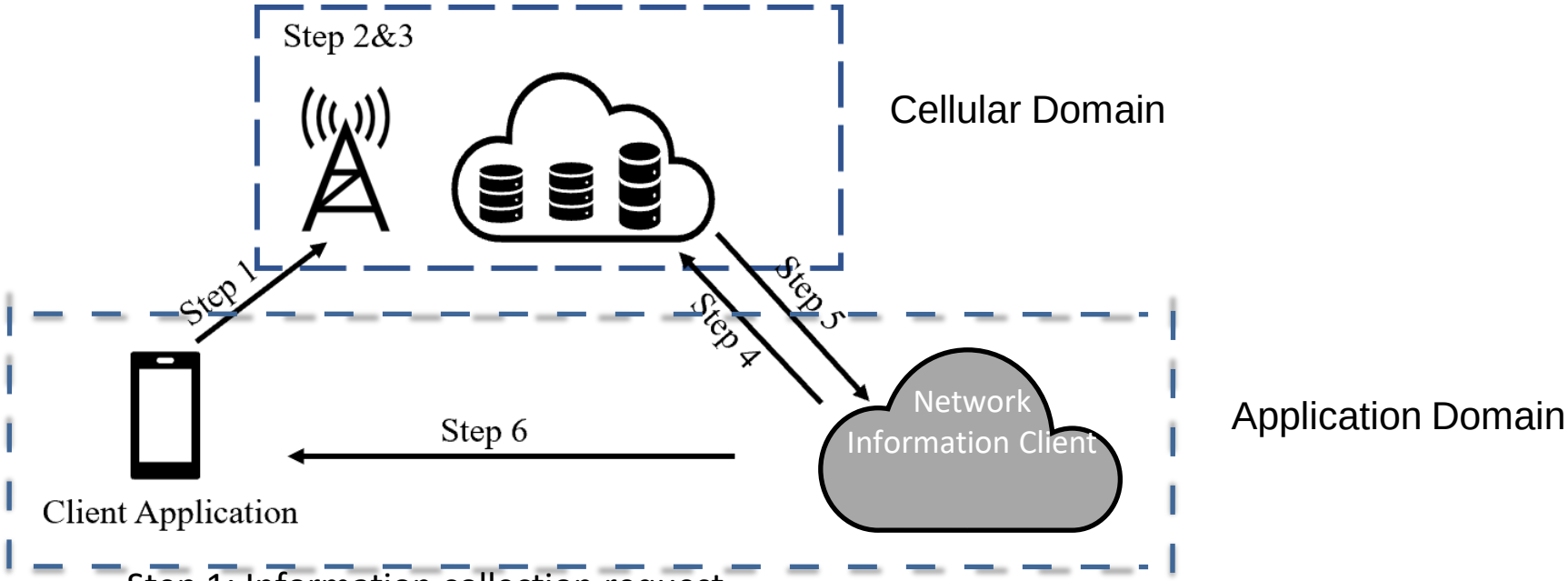
https://datatracker.ietf.org/doc/draft-mertus-scone-mowie-for-network-aware-app/

Some content derived from IETF 115 / ALTO WG: MoWIE for Network Aware Application

High Level Idea and Workflow

f MoWIE is to provide on-demand and cellular network information from the network to applications, enhancing policy con



Step 1: Information collection request
Step 2: Information collection
Step 3: Information processing
Step 4: Send network information request about UE/Cell level information
Step 5: Processed data provided to network information client
Step 6: Perform analytics and provide potential assistance to application

Potential Cellular Network Information

Targeted at 3GPP 5G network architecture

Cell Level	UE Level
Downlink MAC data rate	Downlink MAC data rate
Channel status and quality indicator	
Packet Data Convergence Protocol buffer status	Modulation & coding scheme
Load	Number of packets occupied in PDCP
Number of downlink PRBs occupied	Downlink signal to interference & noise ratio
	Number of downlink PDCP Service Data Unit pakckets
	Number of lost PDCP SDU packets

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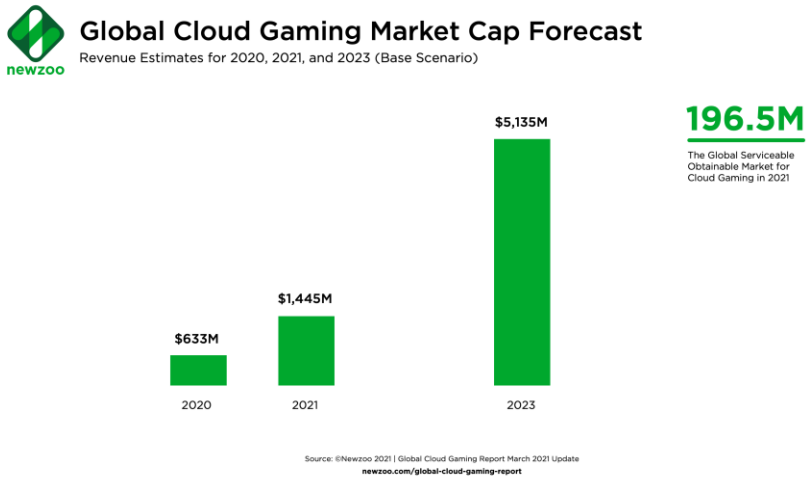
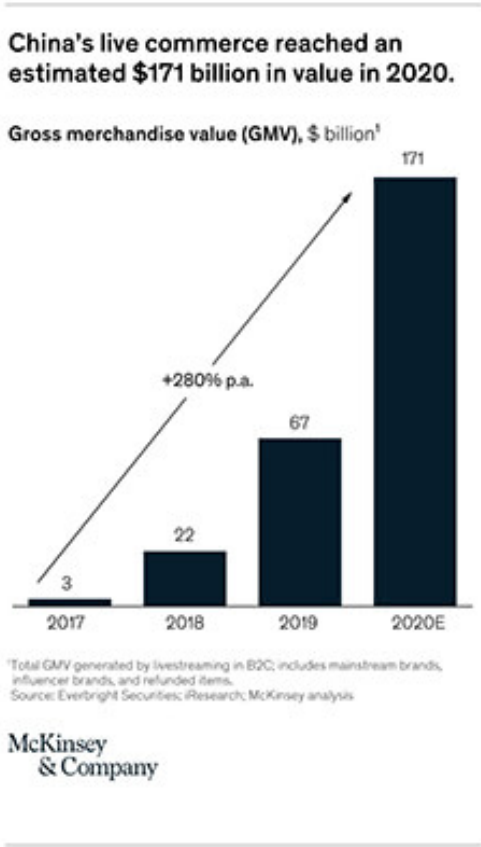
Use Cases

- Cloud gaming



- Cloud VR
  - Huge user base
  - Rapid growth
  - High network demand

- Live video content



Preliminary Application and Benefits

- MCS informed ABR

Network Condition	Lag Reduction
Restricted Bandwidth	46%
High User Load	21%
Random	41.6%

Lack control group

- Data rate informed ROI detection

Poor Network

ROI Method	QoE Score	Bandwidth Reduction
None	3.8	0%
10ms	3.8	5%
40-70ms	2.2	2.2%
Dynamic	3.6	9%

Good Network

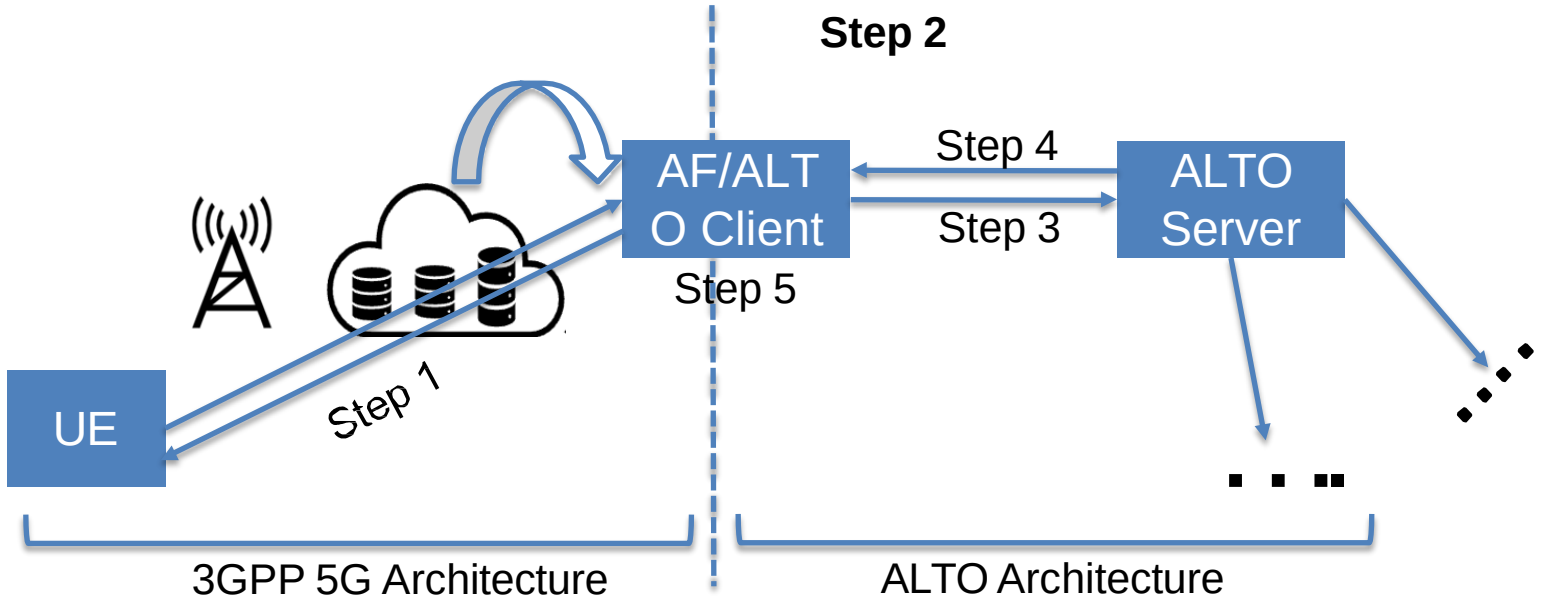
ROI Method	QoE Score	Bandwidth Reduction
None	4.8	0%
10ms	4.8	9%
40-70ms	4.6	38%
Dynamic	4.7	33%

Dynamic Network

ROI Method	QoE Score	Bandwidth Reduction
None	4.3	0%
10ms	4.3	7%
40-70ms	3.1	34%
Dynamic	4.3	25%

Signaling: Off-Path

Early potential off-path design



Step 1: PDU session establishment
Step 2: Send network information to AF/ALTO Client collected by cellular network
Step 3: ALTO server discovery
Step 4: Send ALTO information to AF/ALTO Client
Step 5: ALTO Client supports application adaptation using the exposed information
(note: the application server may be deployed separately)

Next Step: On-Path Signaling

- Benefits
  - Ease of association
  - Increased reliability from existing redundancy and failover mechanisms

- Potential designs
  - Integrate into QUIC signaling
  - Integrate into IP header options