

IETF 115 [Hybrid]  
ALTO  
Working Group



# **MoWIE for Network Aware Application**

draft-huang-alto-mowie-for-network-aware-app-05

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IETF 115

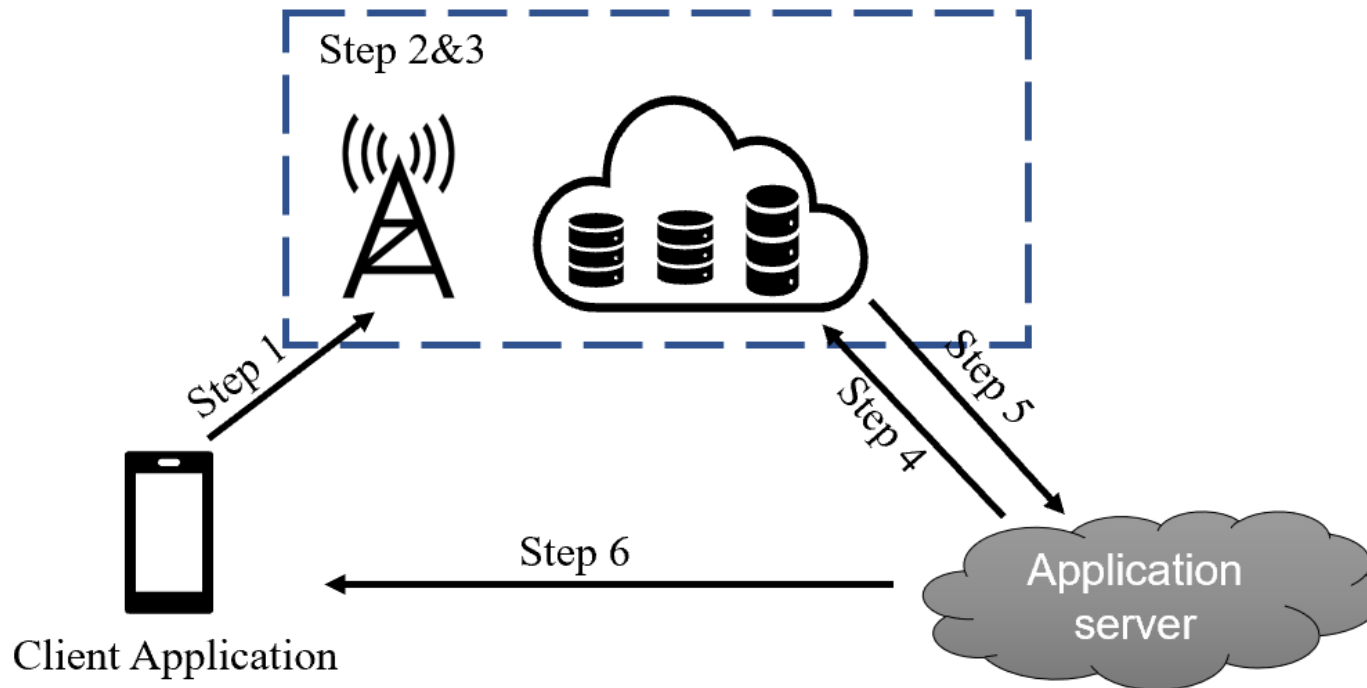
ALTO WG Session

11/11/2022

# Content

- MoWIE framework
- Standardization Landscape
- MoWIE Update
  - Comments received in IETF 114
  - Convergence of MoWIE and IETF ALTO
- Next step

# MoWIE framework



Step 1: Information/data collection request

Step 2: Information/data is collected

Step 3: Information/data is processed

Step 4: Send network information request about UE/Cell level information

Step 5: Processed data is provided to the application server

Step 6: Perform analytics and provide potential assistance to applications

# MoWIE framework

- Network information provided by MoWIE

Cell level Information:

- \* The number of Downlink PRBs (Physical Resource Blocks) occupied during sampling period;
- \* the cell load;
- \* the downlink (DL) MAC data rate per cell;
- \* the channel status (e.g. RSRP (Reference Signal Received Power) and CQI (Channel Quality Indicator));
- \* the DL data rate;
- \* the PDCP (Packet Data Convergence Protocol) buffer status;

Cell-level Information	Data type/Range
PRB	Uint16
CQI	Uint8
RSRP	Uint8
RSRQ	Uint8
Cell load	[0,1]

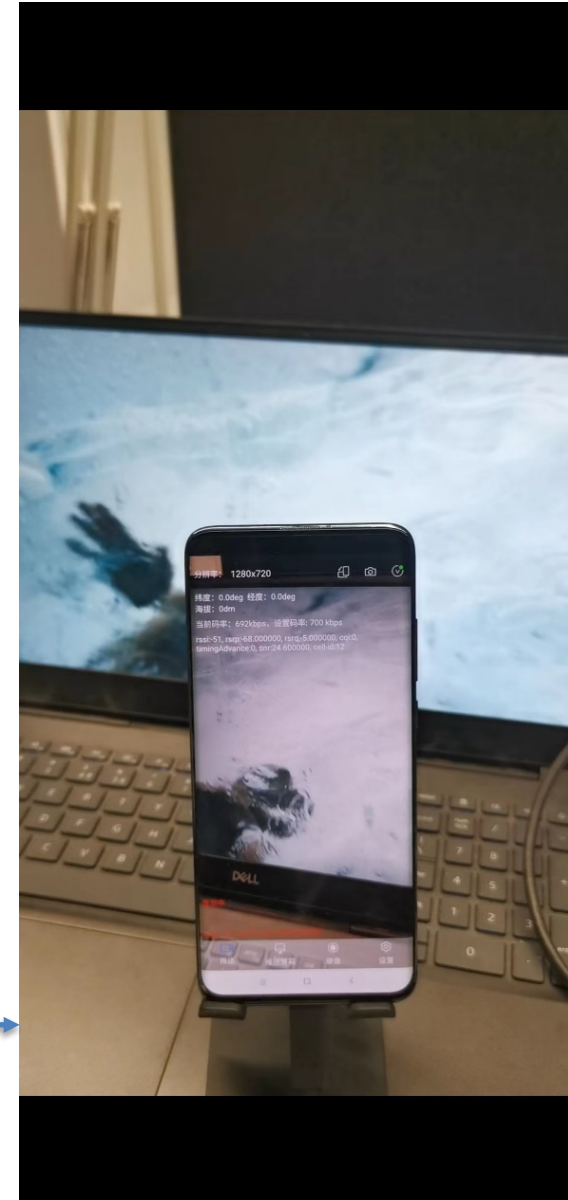
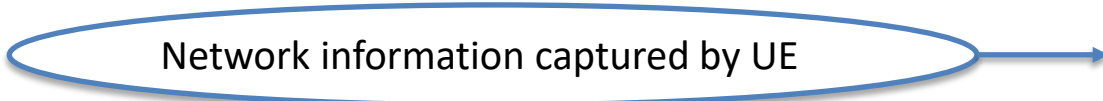
Figure 4-1: Cell level data type

UE level information (without privacy information):

- \* The Downlink Signal to Interference plus Noise Ratio (SINR);
- \* MCS: The index of Modulation and Coding Scheme (MCS);
- \* The number of packets occupied in PDCP buffer;
- \* The number of downlink PDCP Service Data Unit (SDU) packets;
- \* The number of lost PDCP SDU packets;
- \* The per UE downlink MAC data rate;
- \* the per-UE channel status (e.g. RSRP (Reference Signal Received Power) and CQI (Channel Quality Indicator));
- \* the per-UE DL data rate;
- \* the per-UE PDCP (Packet Data Convergence Protocol) buffer status;

UE-level Information	Data type/Range
Downlink SINR	Uint16
MCS	Uint8
Downlink PDCP SDU packets	Uint8
PDCP SDU packets lost	Uint8
Packets occupied in PDCP buffer	[0,1]
CQI	Uint8
RSRP	Uint8
RSRQ	Uint8

Figure 4-2: UE level data type



# Standardization Landscape



- 3GPP

- 3GPP R17 5G\_AIS (Advanced Interactive Services) focuses on QoS enhancements for interactive services including cloud gaming, XR, remote driving and real-time digital twin
- Release 18 XRM (XR and media services) focuses on strengthening the interaction and collaboration between applications and networks by improving the ability of the by improving the ability of the network information exposure especially for XR and multimedia services

- 5GAA/Predictive QoS



- Use network information exposure to predict the future network changes to the application layer in order to be prepared for such changes and make adaptations in application layer to improve the QoE of users

- ETSI

- RNIS has proposed to expose physical layer, Layer 2 and higher layer parameters including 4G and 5G



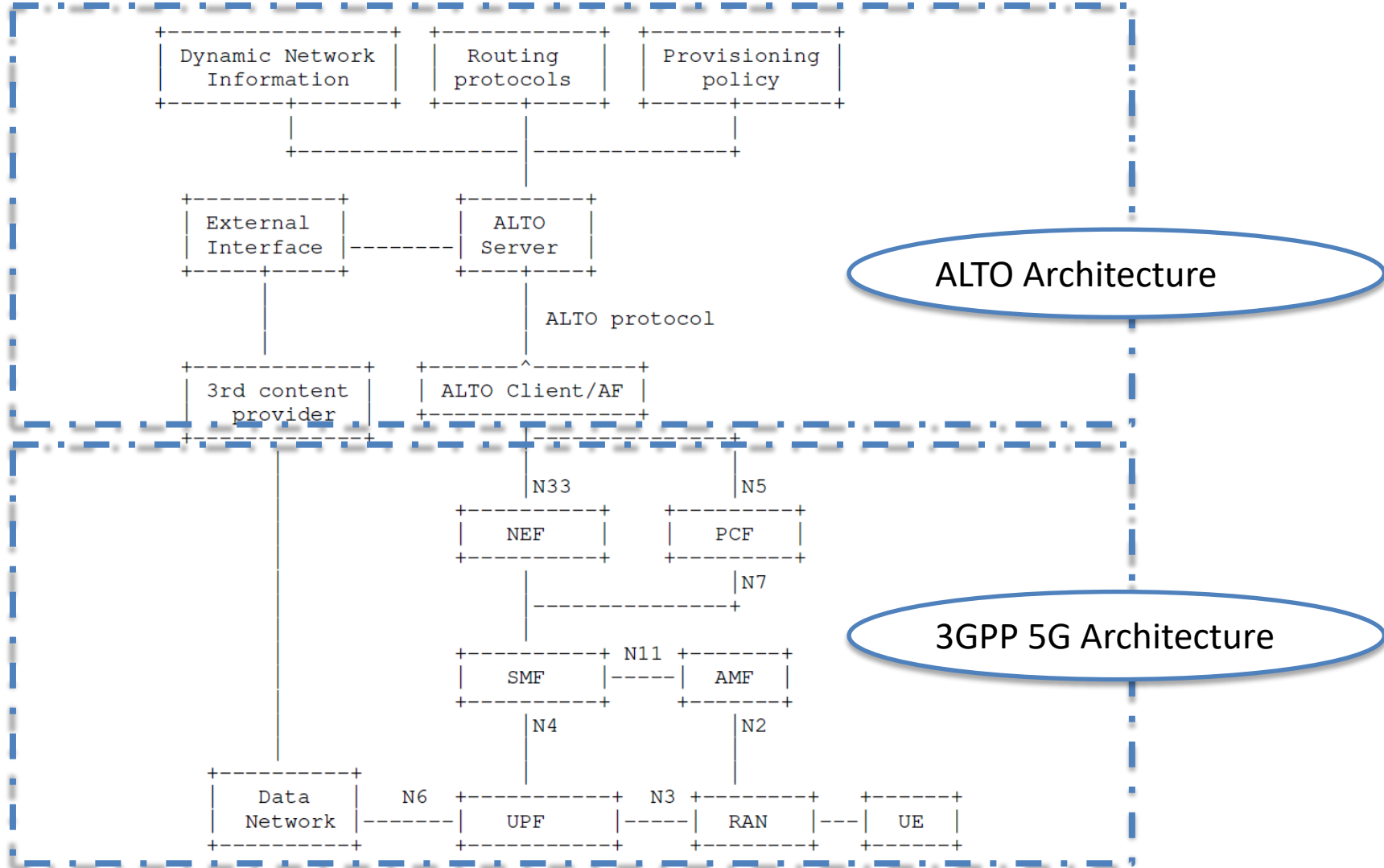
# Update Summary

- Some substantial updates based on some comments from experts during the 114 IETF meeting:
  - Further clarification about the motivations for predicting the network instead of responsiveness measuring.
  - Add some related work that is relevant, we also updated some progress in 3GPP and 5GAA, which are related to MoWIE framework.
  - The proposed changes received by experts are very good and we almost accept all of them.
- Some further updates based on our further research and practice, e.g., convergence of 5G network architecture and IETF ALTO

Link: <https://datatracker.ietf.org/doc/draft-huang-alto-mowie-for-network-aware-app/05/>

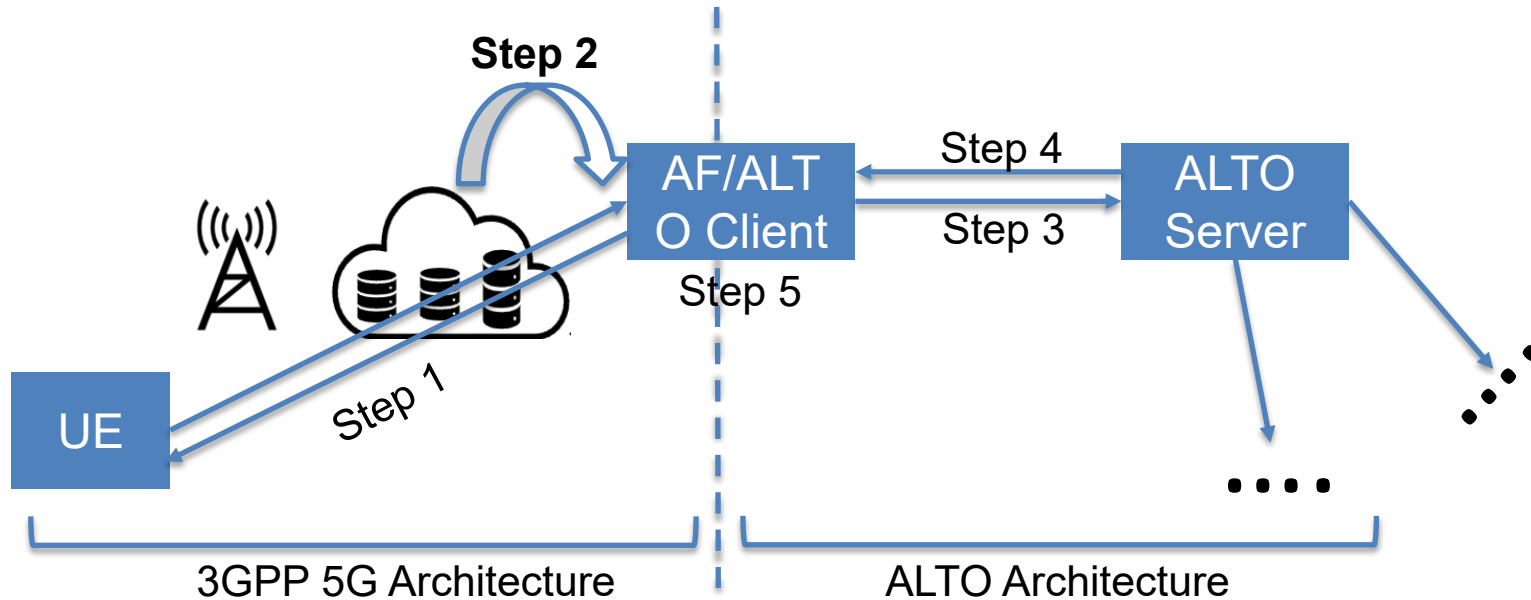
# MoWIE Update

- Convergence of 5G network architecture and IETF ALTO



# MoWIE Update

- Convergence of 5G network architecture and IETF ALTO



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)



# Conclusion & Next steps

- MoWIE architecture has been proposed and refined in several versions and convergence of ALTO and MoWIE framework is proposed in r05.
- Any suggestions on whether/how/when to incorporate this work as the chartered item?

# **Discussion Q&A**

**Thank you**