



# IETF Hackathon

**Optimizing XR Flows in the Edge Cloud Using ALTO and Bottleneck Structure Graphs**  
Point of contact: Jordi Ros Giralt - [jros@qti.qualcomm.com](mailto:jros@qti.qualcomm.com) (see full team in the last slide)

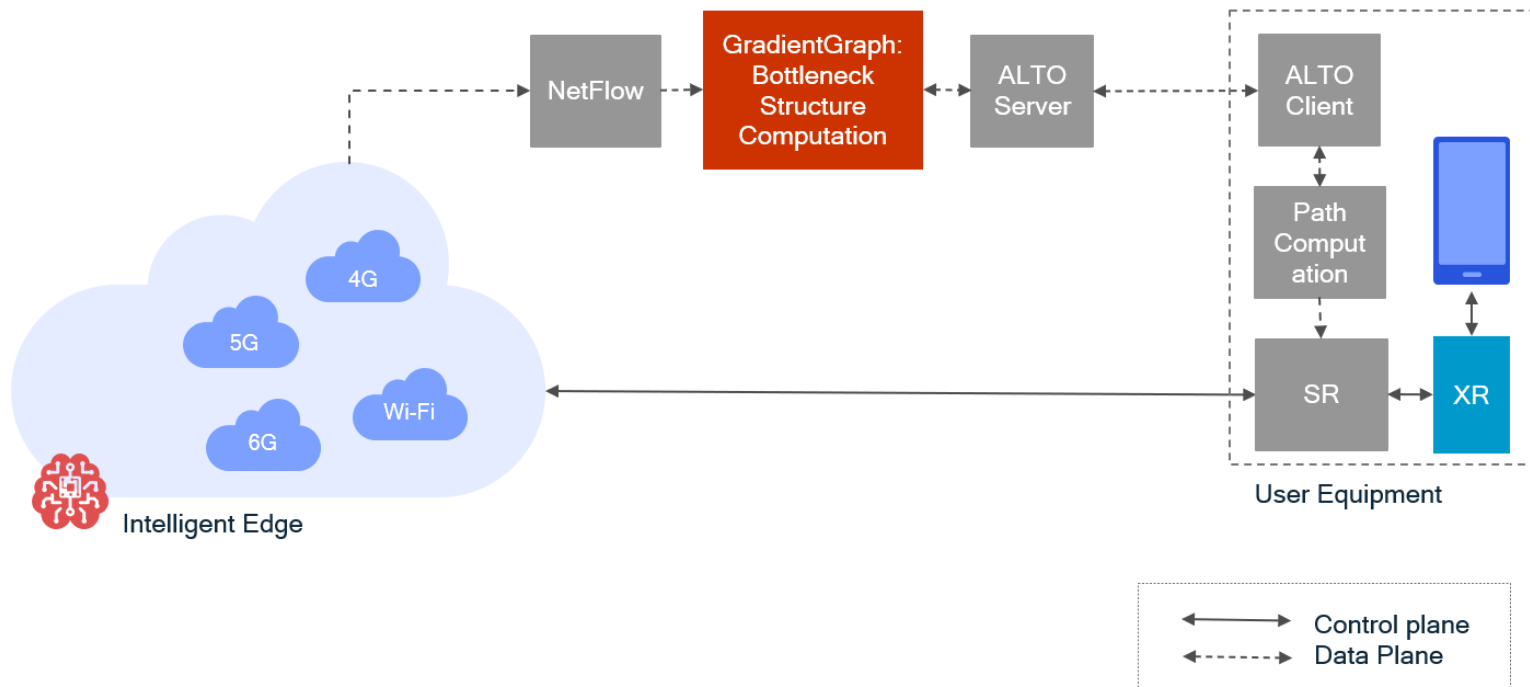
**IETF 115**  
**5-6 November 2022**  
**London, UK**



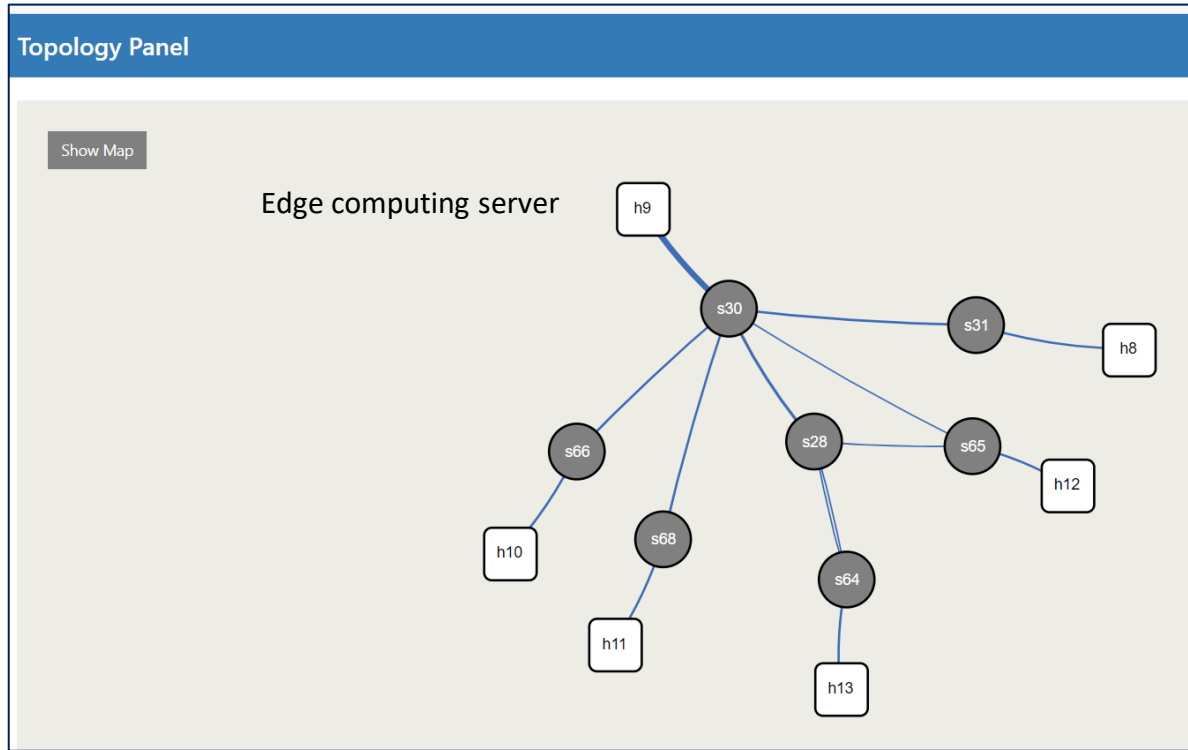
# Hackathon Plan

- **Goal:** Optimizing XR Flows in the Edge Cloud Using ALTO and Bottleneck Structure Graphs
  - <https://datatracker.ietf.org/doc/rfc7285/>
  - <https://datatracker.ietf.org/doc/draft-giralt-yellamraju-alto-bsg-requirements/>
  - <https://datatracker.ietf.org/doc/draft-ietf-alto-path-vector/>
  - <https://datatracker.ietf.org/doc/draft-ietf-alto-unified-props-new/>
  - <https://datatracker.ietf.org/doc/draft-ietf-alto-performance-metrics/>
- **Challenge:** End-to-End Integration of ALTO, Source Routing, XR application and Bottleneck Structure Analysis to dynamically steer the XR flow through the edge cloud.

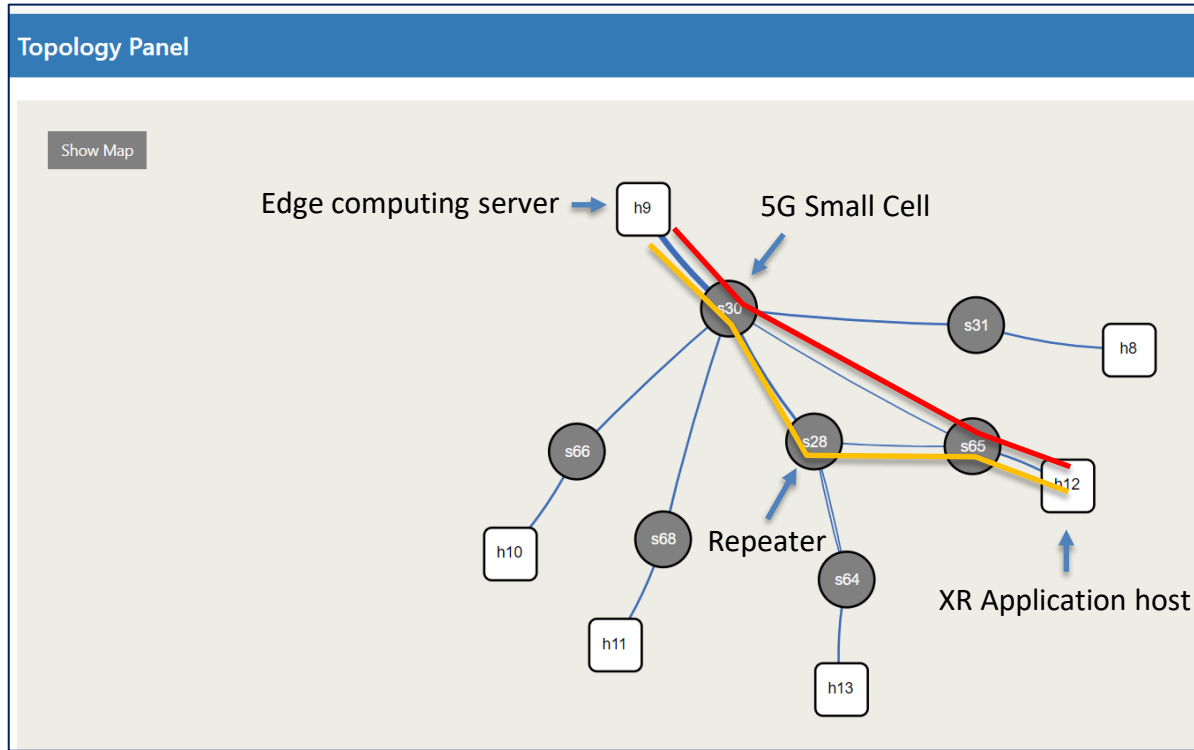
# Optimized XR flow steering using IETF ALTO and GradientGraph (demo available in emulation mode)



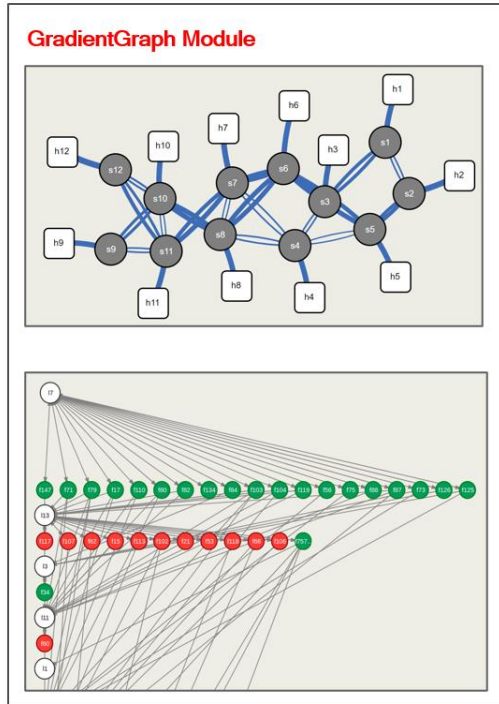
# Demo: Optimized XR Flow Steering through a 5G Edge Cloud



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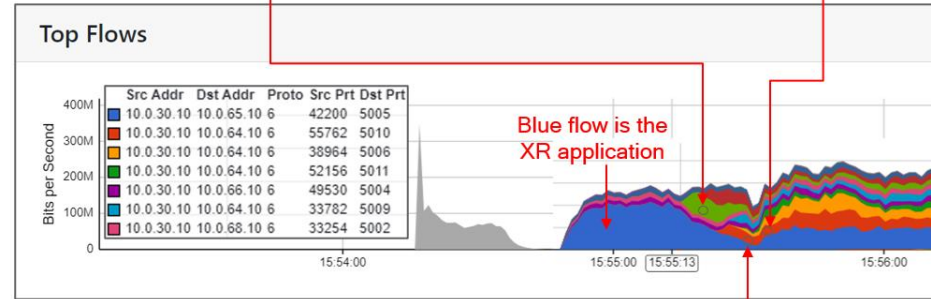


# Demo: Optimized XR Flow Steering through a 5G Edge Cloud



1 Congestion → performance degradation

3 Rerouting: IETF SR



2 Detection: GradientGraph AI → IETF ALTO → XR

# What we learned

- Bottleneck structure graphs (BSGs) are currently being discussed in the context of the ALTO WG.
- This hackathon demo showed feasibility to integrate BSGs in a full-stack protocol solution (NetFlow/sFlow, BSGs, ALTO Server/Client, PCE, SR) to optimize flow steering in the edge cloud.
- This demo provides practical feedback into the ALTO WG:
  - BSGs provide a compact and scalable approach to incorporate traffic engineering information into the ALTO standard.

# Wrap Up

## Team members:

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