



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 (see full team in the last slide)

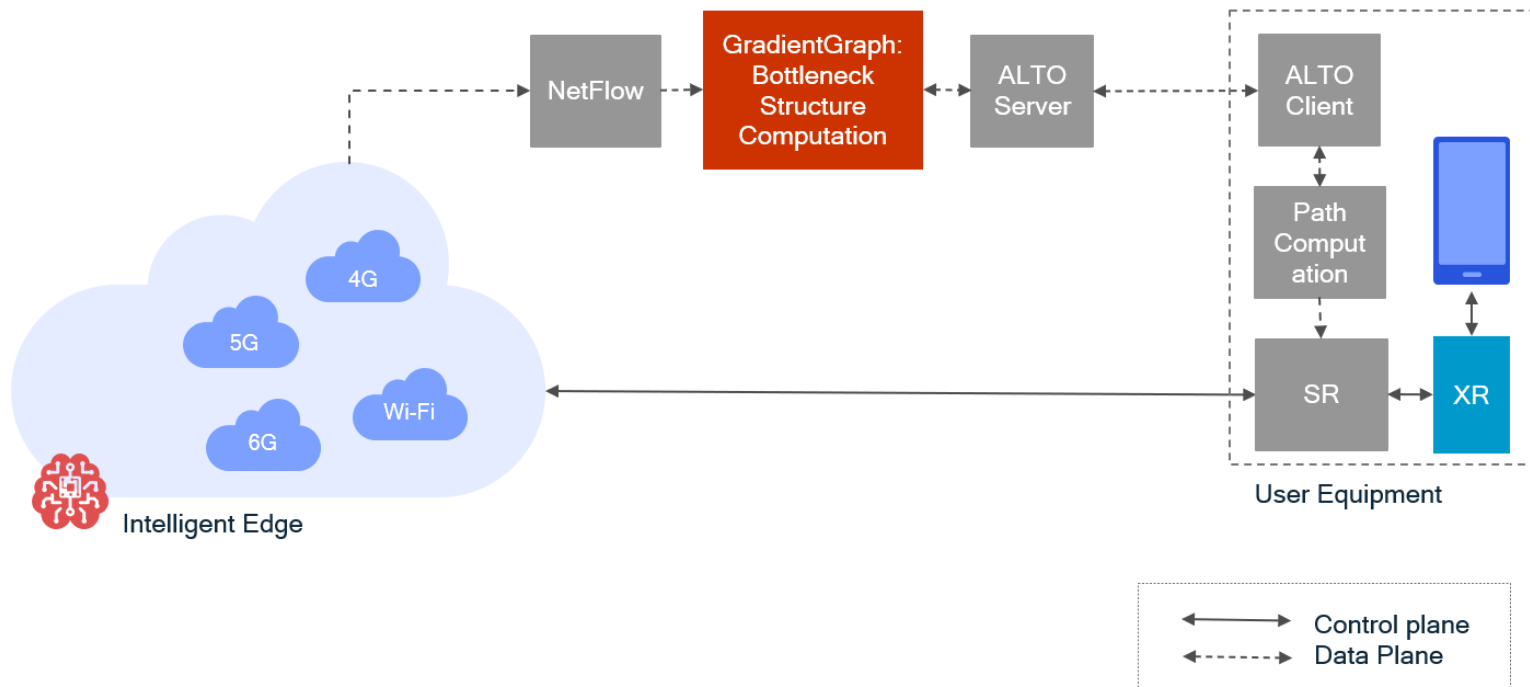
IETF 115
5-6 November 2022
London, UK



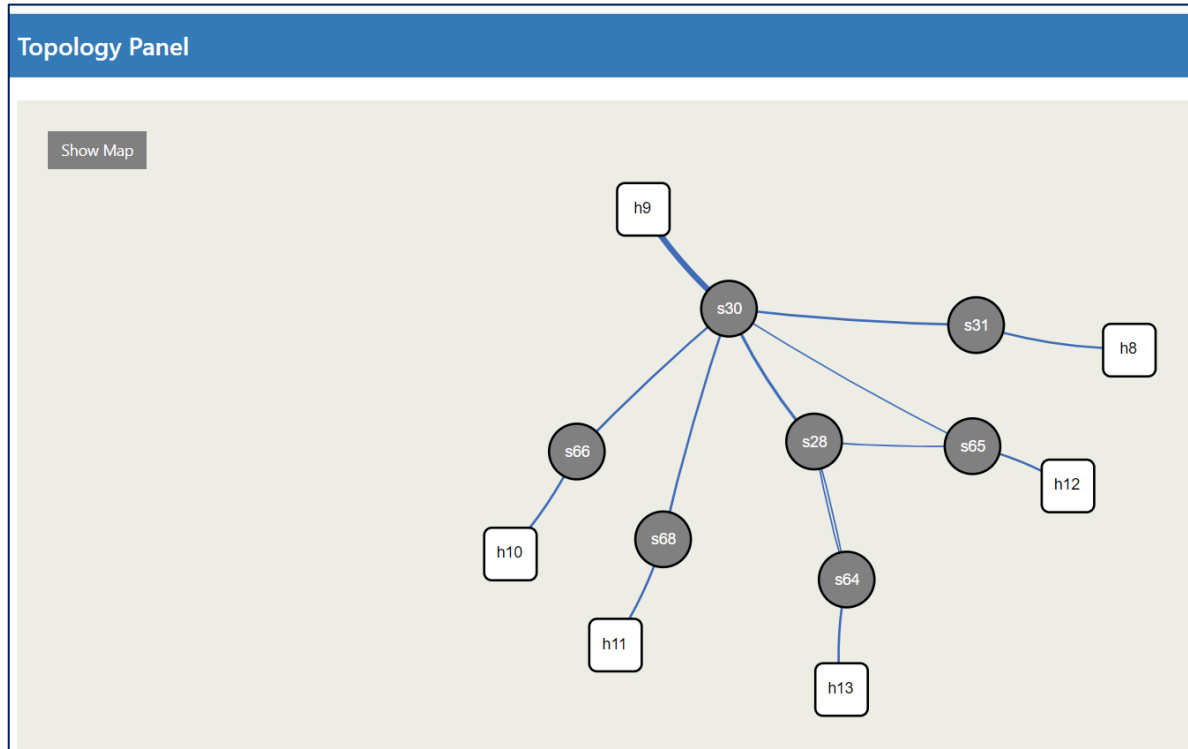
Hackathon Plan

- **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.

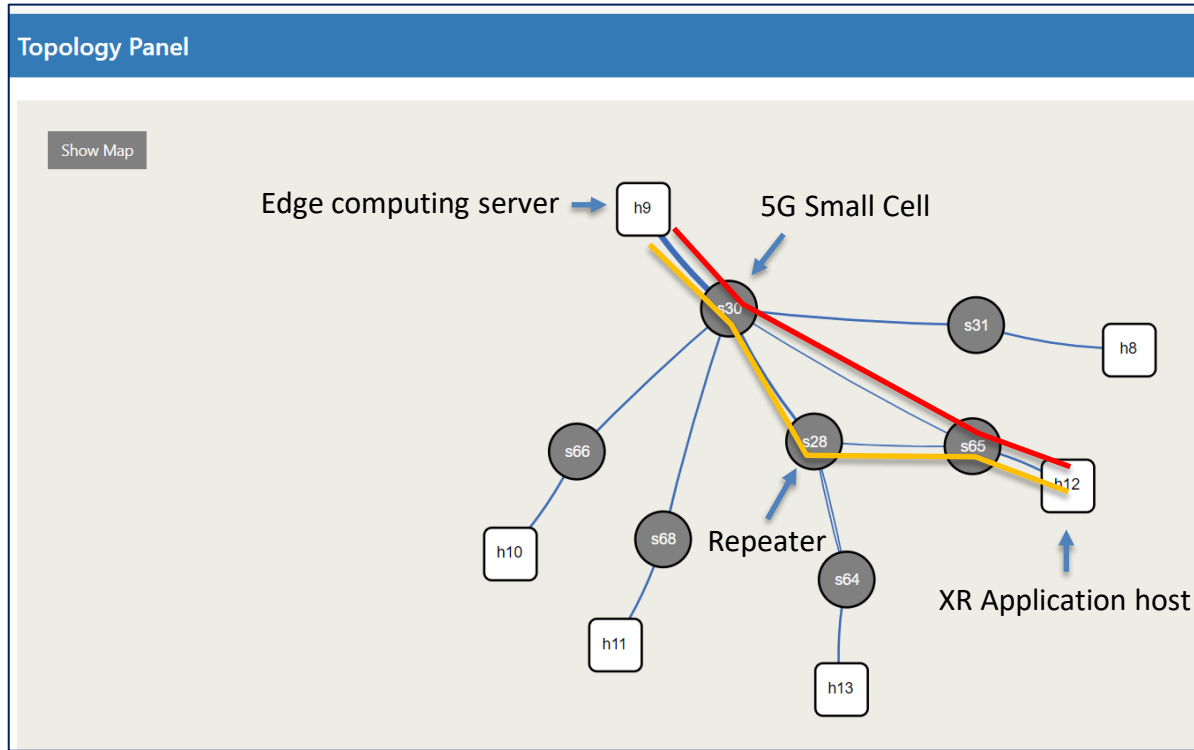
Optimized XR flow steering using IETF ALTO and GradientGraph (demo available in emulation mode)



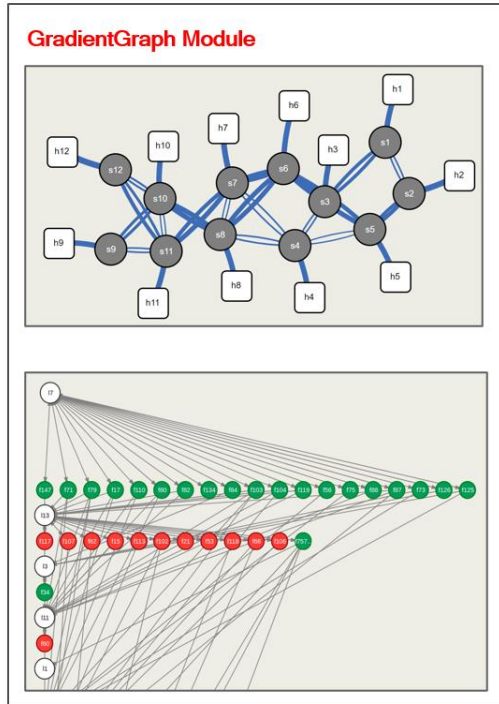
Demo: Optimized XR Flow Steering through a 5G Edge Cloud



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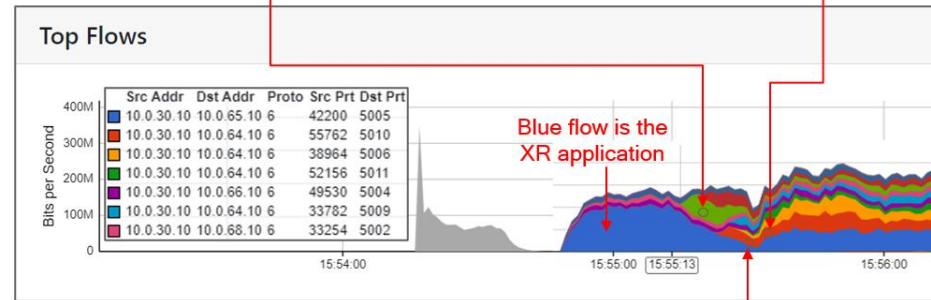


Demo: Optimized XR Flow Steering through a 5G Edge Cloud



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.
 - <https://datatracker.ietf.org/doc/draft-giralt-yellamraju-alto-bsg-requirements/>
 - <https://datatracker.ietf.org/doc/draft-giralt-yellamraju-alto-bsg-multidomain/>
 - Drafts will be presented during the IETF 115 PANRG and ALTO sessions.
- 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.
- Production deployment in the National Research Platform: <https://nationalresearchplatform.org/>
- 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

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