

ALTO in wireless networks

[draft-rauschenbach-alto-wireless-access-00](#)

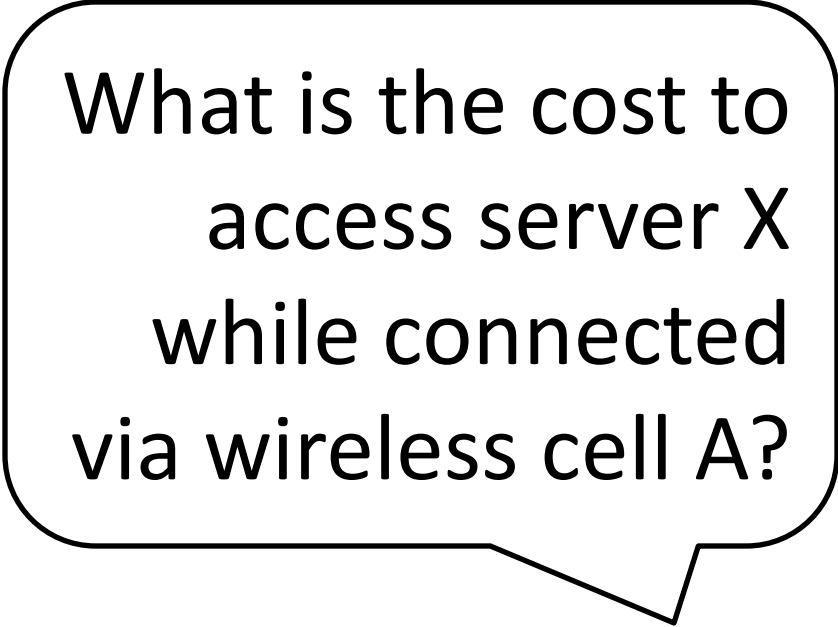
Uwe Rauschenbach

uwe.rauschenbach@nsn.com

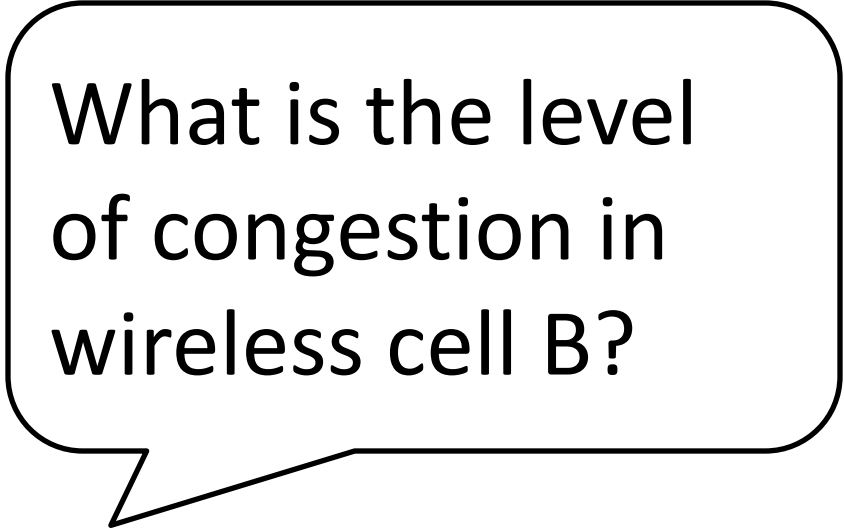
ALTO session, IETF91, Honolulu

Motivation

Applications on wireless nodes may ask, for example:

A speech bubble with a black outline and a tail pointing towards the bottom right. It contains the text: "What is the cost to access server X while connected via wireless cell A?"

What is the cost to access server X while connected via wireless cell A?

A speech bubble with a black outline and a tail pointing towards the bottom left. It contains the text: "What is the level of congestion in wireless cell B?"

What is the level of congestion in wireless cell B?

Can we use ALTO to answer?

Structure

- **Problem statement**
- **Use cases**
- **Requirements**
- **Way forward**

Problem statement

- **ALTO uses PIDs to group nodes, e.g. connected via the same POP.**
- **In ALTO, it seems POP assignment to PIDs is assumed to be rather static (fixed net focus?)**
- **In wireless networks**
 - **Handovers:** POP assignment changes frequently
 - **Cell IDs / SSIDs:** POPs are individually identifiable cells or access points
 - **Variability:** Fundamentally different costs / traffic conditions / metrics may be associated with neighboring cells
- **Need a way to include cell / access point information into the ALTO model to cater for this.**

Some use cases (1)

1) Cell as aggregation point

- Identifiable mobile network cell / access point to decrease map size

2) Connection management and traffic offload

- Make decisions based on traffic conditions in neighboring cells, not only radio signal strength

Some use cases (2)

3) Opportunistic reaction to handover

- Exploit information e.g. about congestion in cells that a terminal is connected to, or that it anticipates to be connected to in the future
- **Cost calendar to extend battery life**
 - use high bandwidth cells for background downloads to spend more time in idle modes
- **Cost calendar to optimize application sessions**
 - proactively adapt e.g. video bitrates to (anticipated) throughput changes, or proactively prefetch when drop in bandwidth is anticipated in near future

Requirements (1)

- **To query metrics between a cell and an endpoint:**
 - ALTO should allow queries of costs (metrics) between a certain cell / access point and an endpoint / set of endpoints
 - Today, the Endpoint Cost Service allows this between (sets of) endpoints
 - Extension needed, e.g.
 - Cell / access point as PID; may need to extend endpoint cost service to allow PID as source or destination
 - Cell / access point as dedicated “virtual” endpoint in a PID

Requirements (2)

- **To query metrics of a cell:**
 - ALTO should allow queries of metrics (such as congestion or available bitrate) of a certain cell / access point
 - Today, the Endpoint Property Service allows this for endpoints
 - Extensions needed, e.g.
 - Allow properties to include costs, and model cell / access point as dedicated “virtual” endpoint in a PID
 - Allow costs attached to PIDs

Requirements (3)

- **To identify a cell:**
 - ALTO should allow to identify a particular cell / access point as a (potential) grouping of endpoints
 - Today, PID is used to group endpoints. PID name is just a free string, modeled as an endpoint property. PID properties are under discussion.
 - Extensions needed
 - Identification should be based on information provided by the wireless network, such as Cell ID or SSID

Way forward

- **What is the right concept to map a wireless cell / access point to the ALTO model?**
 - PID?
 - Endpoint?
 - Something else?
- **Is the WG interested in working on this?**
- **Next steps?**