

Problem Statement for IP measurement in mobile networks

Lingli Deng: denglingli@chinamobile.com

Zhen Cao: caozhen@chinamobile.com

IETF88@Vancouver

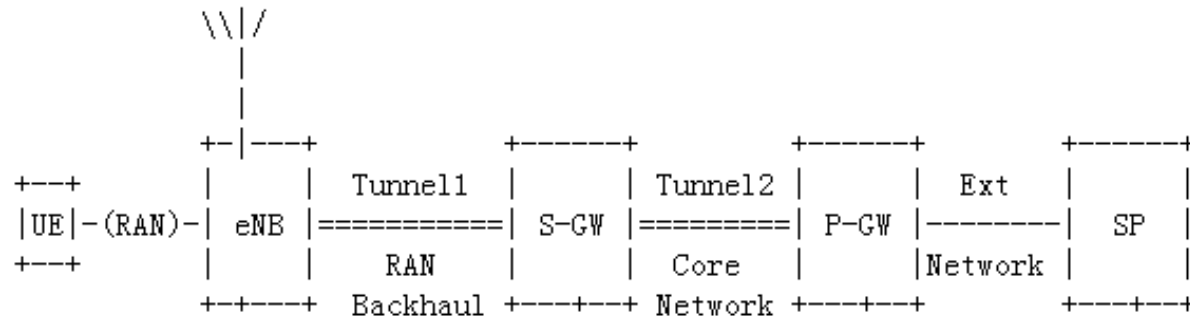
Outline

- Motivation
 - Use performance measurement stats for mobile network operator to monitor and manage end2end service quality.
- Use Cases
 - Dynamic Load balance
 - Radio Congestion Detection
 - Accurate Troubleshooting
- Discussion
 - ECN metric
 - segment measurement framework

Use case

Accurate Troubleshooting

- The hard question: Where is the fault?
- Segment Measurement
 - within an ISP, access networks are typically segmented
 - different segments are operated by different departments



- across ISPs, e2e data link's performance is tightly coupled
 - visiting ISP/intermediary ISP/virtual ISP

Summary

- Existing IP measurement metrics and protocols
 - **Challenge:** Active measurements inject extra traffic, which may traverse along a different path to the one used by the targeted traffic or even interfere with them.
Requirement: Passive measurement to ensure accuracy.
 - **Challenge:** There is considerable gap between IP measurement results to the performance evaluation and fault detection requirements in mobile-involved environment.
Requirement: Robust metric against transient wireless conditions.
 - **Challenge:** To enable accurate troubleshooting along a potentially multi-hop path across operation/management domains.
Requirement: Segment measurement, path discovery, security

Discussion: Congestion Ratio Metric

- ECN signal for congestion measurement
 - issues before actual congestion
 - an effective predictor to potential QoE degradation, irrespective to traffic pattern/wireless conditions
 - There is no proposal for passive measurement
 - [draft-hedin-ippm-type-p-monitor-02](#) proposes to echo ECN-flags into TWAMP-test feedback
 - packet-level echoing
 - not viable in passive mode
 - delivers 0-1 status for a single packet

Discussion: Framework for troubleshooting

- Multi-hop segment measurement framework
 - Option1: Fully passive-mode framework
 - monitors each flow's path as well as its end2end status
 - drills down to the faulty link by excluding shared parts with others
 - Option2: Hybrid-mode framework
 - monitors each flow's path as well as its status hop-by-hop
 - initiates active flows to exclude functioning links on the path
 - Interworking considerations
 - when different departments/ISPs be involved
 - intermediary discovery & authentication