

Proposals to RELOAD for Client Promotion and Peer Demotion

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Motivation

- **Reload**
 - a uniform protocol for both clients and peers,
 - only active client promotion is provided
- **User-owned Clients (UNs)**
 - collectively make the majority of overlay population and the under-exploited vast resource pool
 - individually featured with more restrictive resource limits, considerable capability heterogeneity, and diverse interest groups
- **Problem**
 - We want to promote UNs to peers.
 - in order to reduce service operator's CAPEX
 - But only in a cautious manner.
 - for imprudent peer behavior causes undesirable implications in P2P networks

Problem Statement - Overview

- **Functionalities:**
 - Passive promotion instead of active promotion
 - passive demotion as well as active demotion
- **Security Considerations**
 - Explicit authorization for promoted clients
 - Timely revocation for misbehaving peers

Passive Promotion instead of Active Promotion

- A UE may be malfunctioning in serving others
- A moderate network size may be preferred to remain efficient overlay routing
- The current join-update method allows for active promotion only
- The promoter (e.g. an overloading peer) rather than the UE in
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- Extensions to Reload messages

Passive Demotion as well as Active Demotion

- User ceases being a peer if he/she perceives a considerable decrease in user experience
- Passive demotion decision from the overlay side to get rid of unnecessary UE-promoted peers:
 - Case 1: Overlay decides to shrink its peer group to maintain a tolerable routing delay;
 - Case 2: Admin decides to exclude the peer(s) for unsatisfactory service provision
- **Proposals**
 - For active demotions:
 - ungraceful/graceful demotion procedure
 - For passive demotions:
 - Case1: graceful demotion procedure;
 - Case2: pushed authorization revocation
- **Extensions to Reload**
 - Extensions to **Leave** method to enable graceful demotion
 - Pushed authorization revocation

Separate Authorization & Timely Revocation

- Considerations
 - Considerations
 - Explicit authorization to distinguish a UE's potential to serve as a peer as well as a client
- Timely revocation to limit the impact of a misbehaving peer
 - Proposals
 - Qualified UE acquires a separate peer certificate to attest its capabilities and willingness to serve as a peer.
 - A UE-promoted peer's certificate is revoked if it fails to deliver expected performance while remaining its client certificate intact.
 - Active certificate revocation

THANK YOU!