Support for Multi-Homing and Robust Delivery Services Within MobilityFirst Future Internet Architecture

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Introduction

Historic shift from PC’s to mobile computing and embedded devices
~4 B Cell phones vs. ~1 B PC’s in 2010
MobilityFirst Arch designed to meet emerging mobile/wireless service requirements at scale (Very distinct from today’s TCP/IP)

- Separation of naming and addressing
- Storageware routing
- Hop-by-hop link level data transfer
- Client multi-homing support

Demo Scenario

Reliable Delivery Services to Multi-Homed Host
- Storage aware routing - exploits in network storage and adapts across wired, wireless and DTN-type networks
- Multi-homing support – (receiver)weighted routing to multiple endpoints

Storage Aware Routing

- Up-to-date connection state of nodes in the partition
- Computed by exchanging the following messages:
  - link probe (→)
  - ACK (→)

Node A floods link quality estimates of its neighbors

Global Name Resolution Service

- GUID is mapped to address space using consistent hashing function following algorithm 1
- The <GUID-Address> mapping is then stored by the organization that announces chunk of address containing the hash result.
- Every mapping is replicated at K random locations
- Requesters select the closest mapping

Demo Scenario Diagram

- Router bifurcates PDU to NA1 & NA7 (Routing based on client policy)
- DataPlane 
- GNRS query
- GNRS update
- NetAddr NA1.PA22
- NetAddr NA7.PA13

Mobility-Oriented Host Stack

Android/Linux MF Protocol Stack
- Network API
- Hop Protocol
- Dual homing (Wifi/WiMAX)
- Interface Usage Policy

- One-hop performance comparison with TCP
- Best Performance policy with Wifi&WiMAX