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Robust Delivery Services and Multi-homing in MobilityFirst Future Internet Architecture

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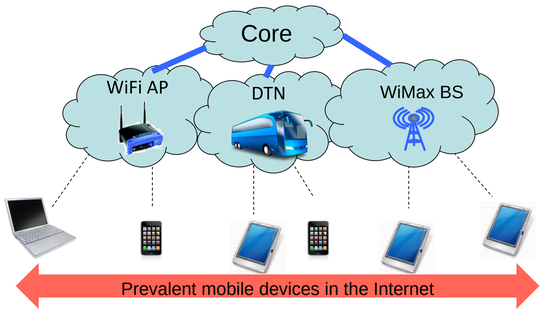
Introduction to MobilityFirst

Motivation
- Historic shift from PCs to mobile devices
  - ~4 B Cell phones vs. ~1 B PCs in 2010.
- Mobility is the central characteristic of future Internet.

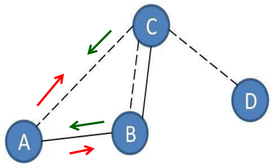


Challenge
- Host and network mobility
- Varying level of wireless connectivity
- Multi-homing

MobilityFirst approach
- Separation of naming and addressing: GNRS
- Hop-by-hop data transfer and storage aware routing
- Multi-homing support

Storage Aware Routing

- Up-to-date connection state of nodes in the partition
- Computed by exchanging the following messages:

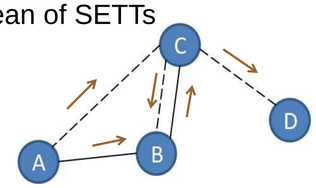


- - link probe(→)
- - ACK (→)

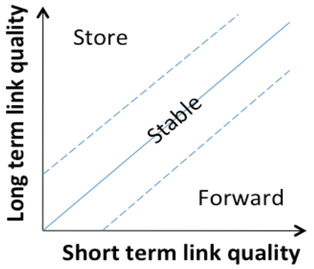
SETT=short term transmission time

LETT=long term transmission time =mean of SETTs

Node A floods link quality estimates of its neighbors

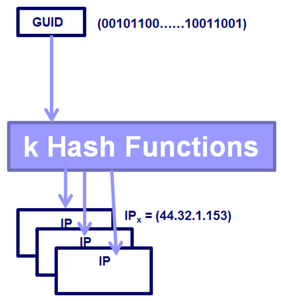


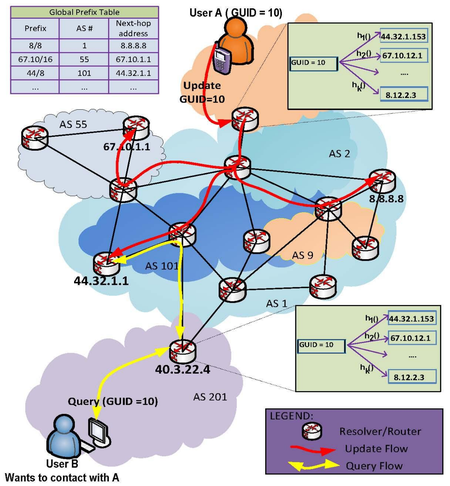
•For intra-partition graph,
if (LETT of path > 1.1 * SETT of path)
-Store the message
else
-Forward



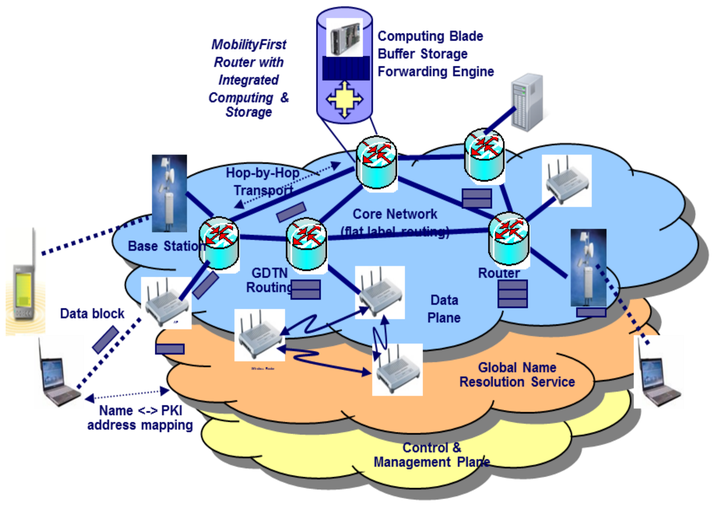
Global Name Resolution Service (GNRS)

- A Global Unique ID (GUID) is hashed to address space.
- The <GUID-Address> stored by the organization that announces chunks of address containing the hash result.
- Every mapping is replicated at K random Locations
- Requesters select the closest mapping





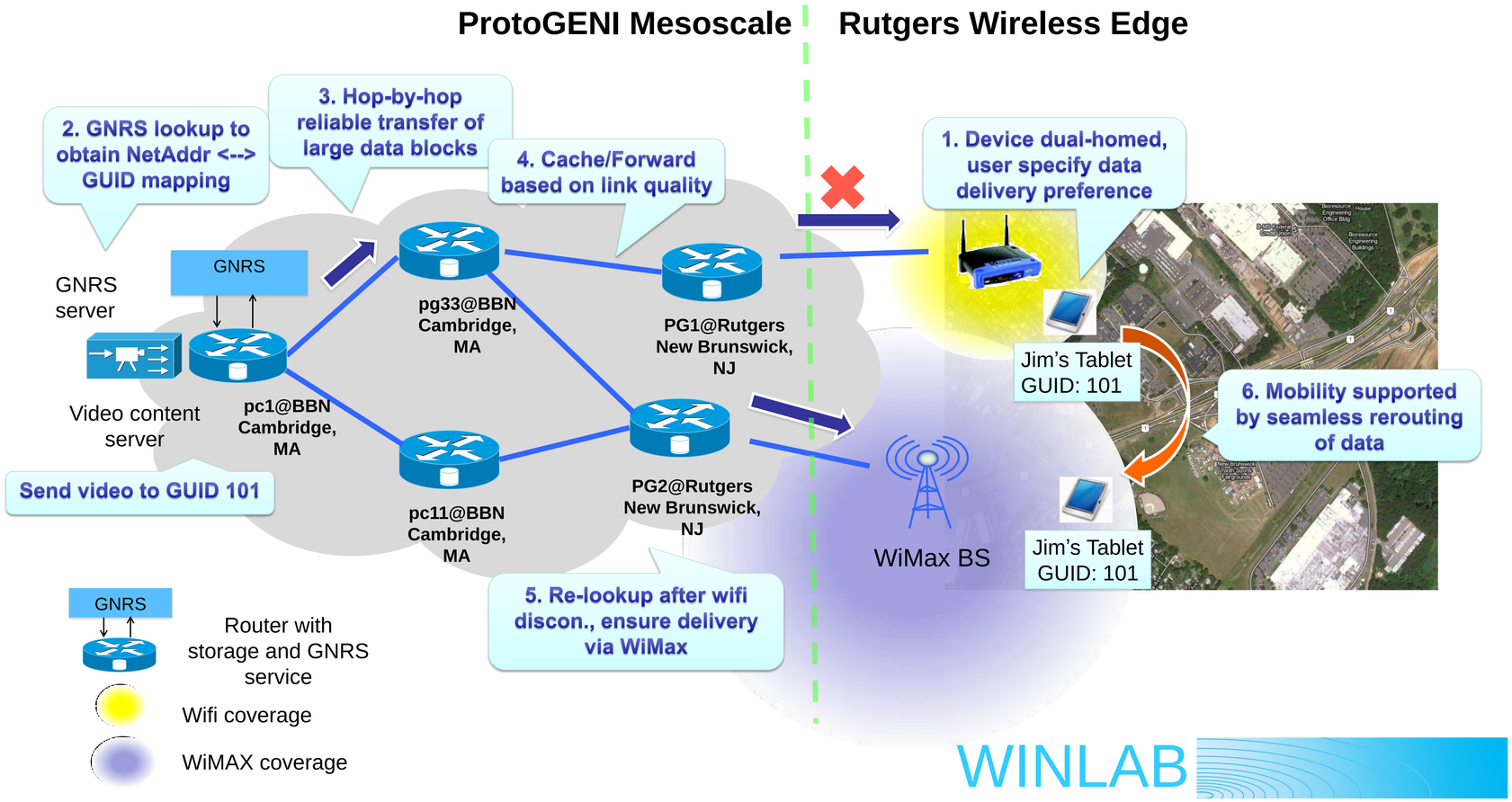
MobilityFirst Architecture



Demo Goals

- GUID based data delivery in the presence of mobility (varying link quality, disconnection)
- Storage aware and GNRS supported routing
- Client stack for multi-homing support

Mesoscale GENI Demo Deployment



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