

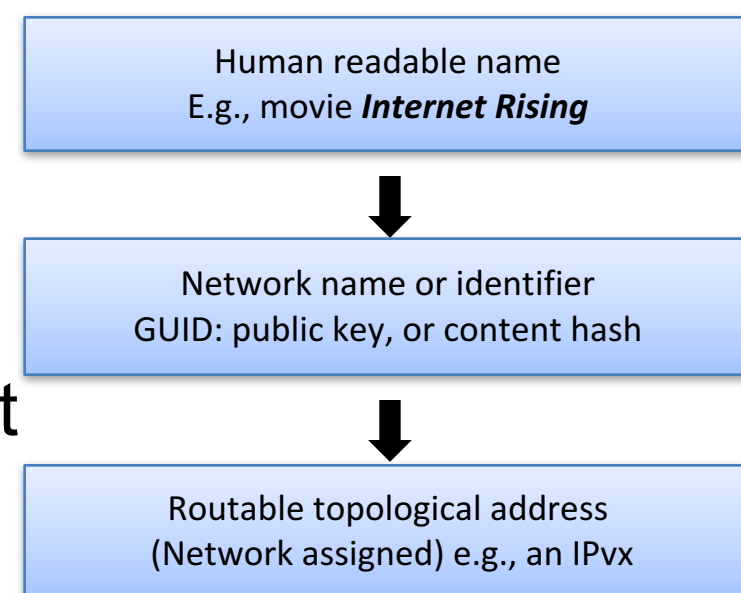
Demonstrating Context-Aware Services in the MobilityFirst Future Internet Architecture

Francesco Bronzino, Dipankar Raychaudhuri and Ivan Seskar

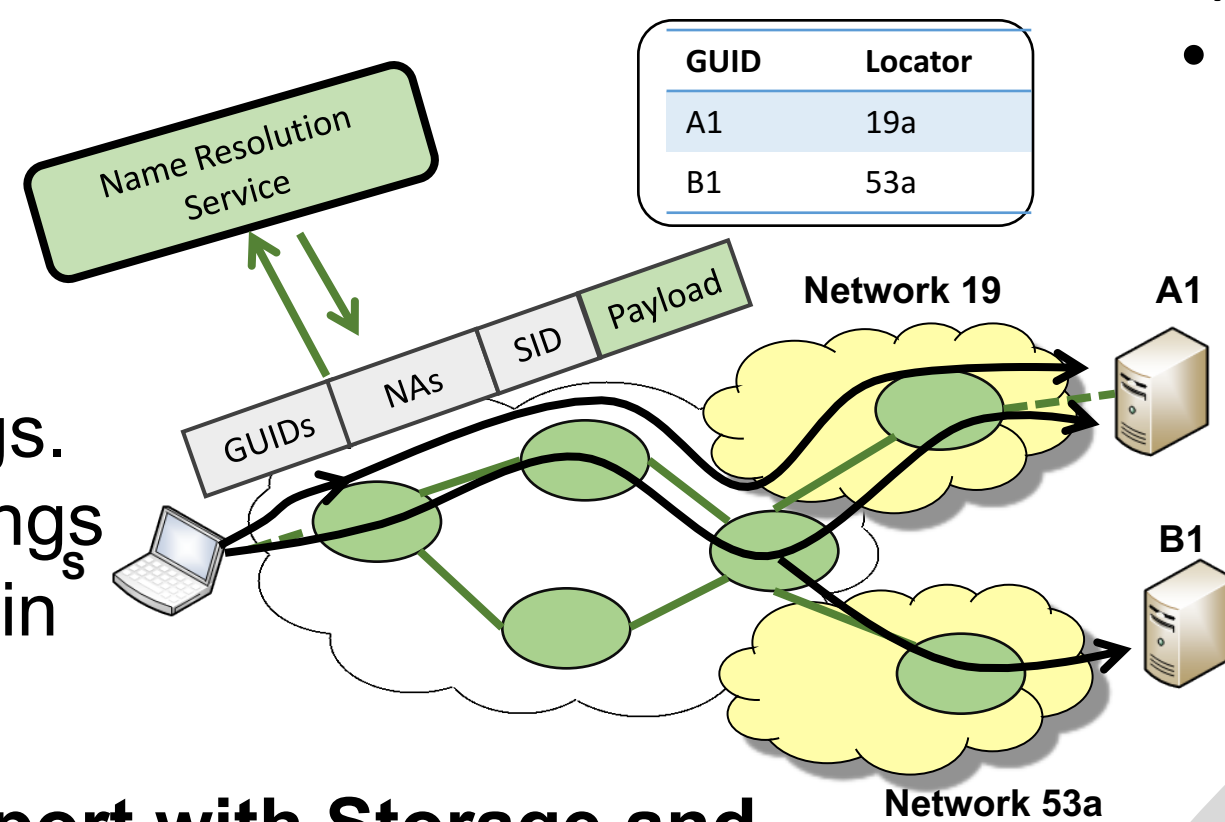
Further information and references are available at:
<http://mobilityfirst.winlab.rutgers.edu>
<http://mobilityfirst.orbit-lab.org>

MobilityFirst Overview

- Layered Names and Fast, Global Name Resolution for Mobility:** All objects including hosts, content, services and abstract context definitions can be assigned network names for direct addressability

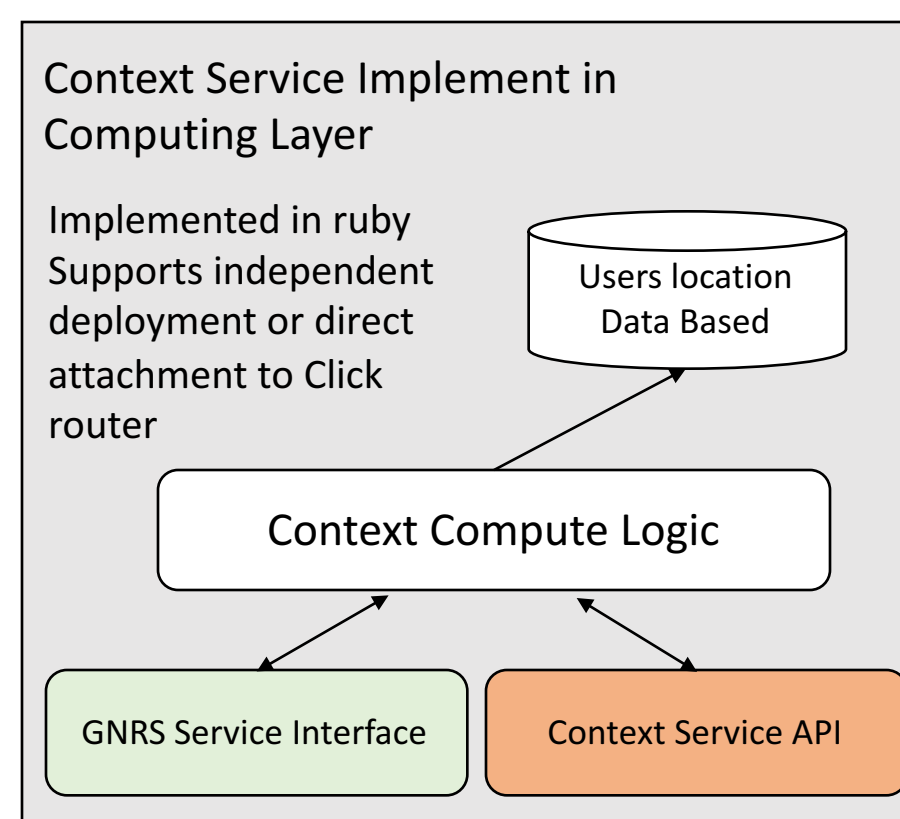
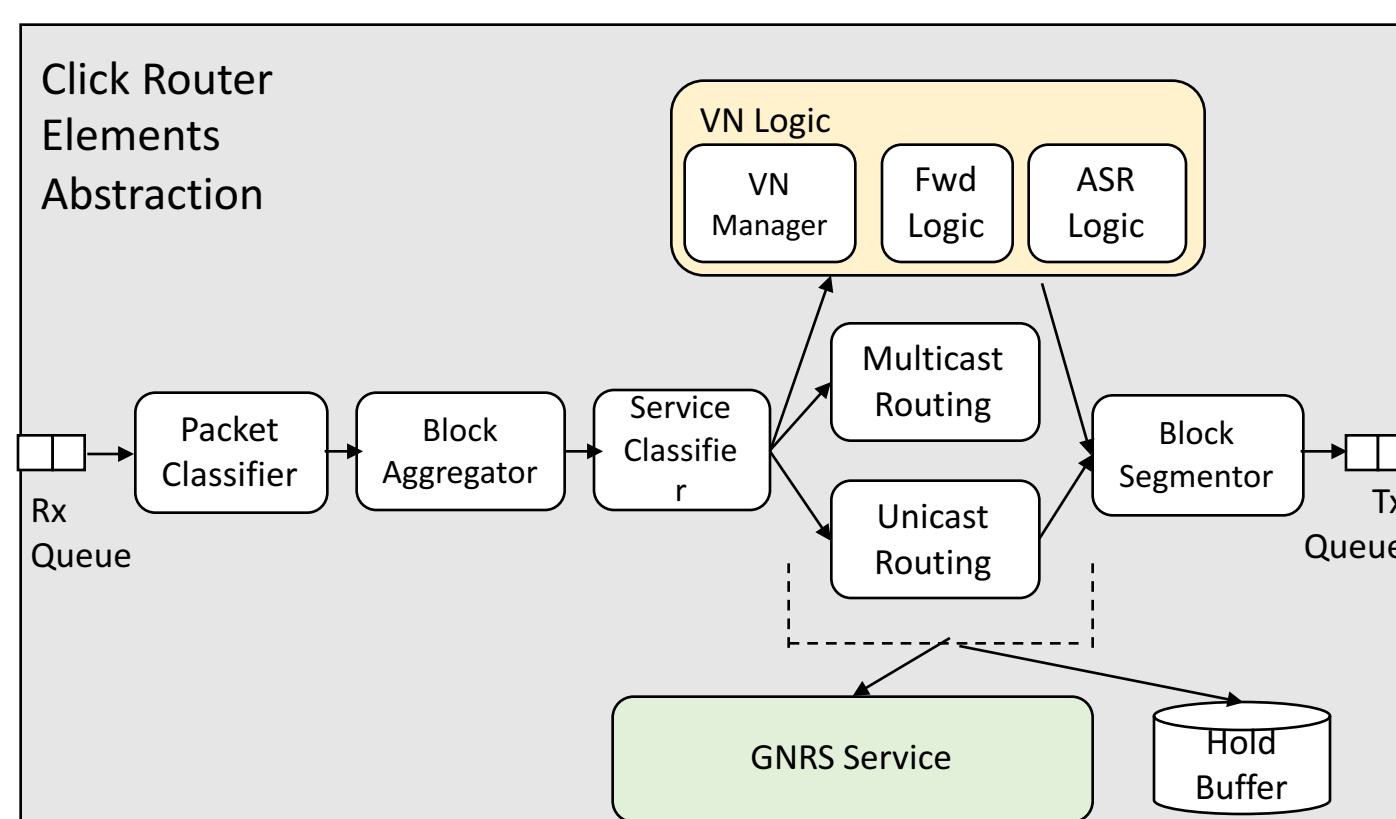
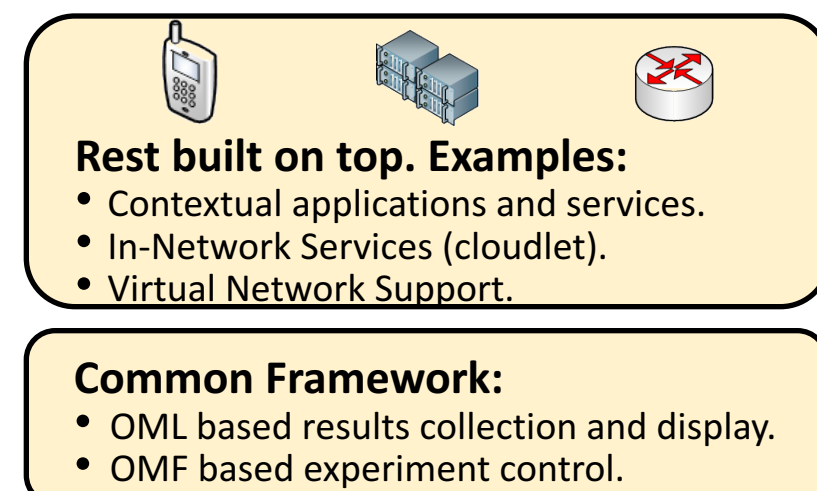
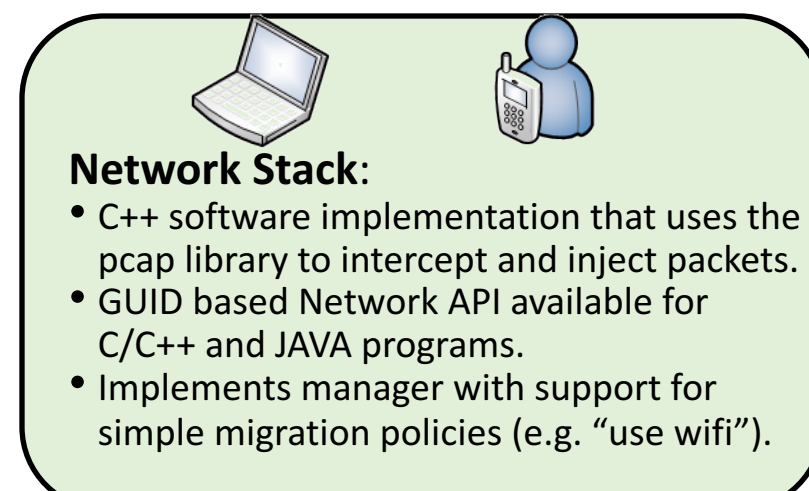
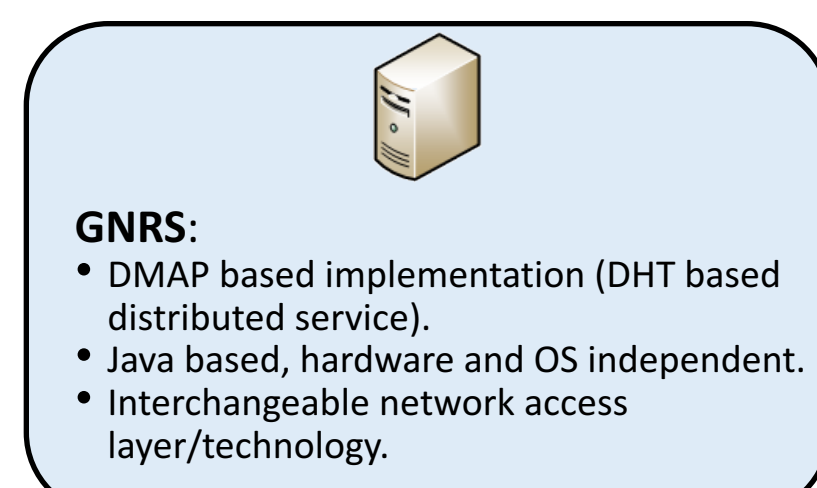
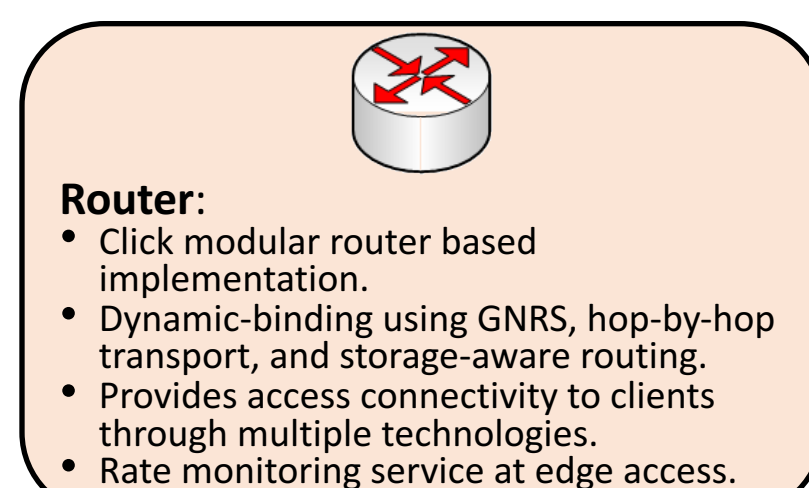


- Resolution is closely integrated with routing fabric** to enable fast and dynamic address bindings. Name-to-address mappings can be stored/looked up in the order of 10s of ms.

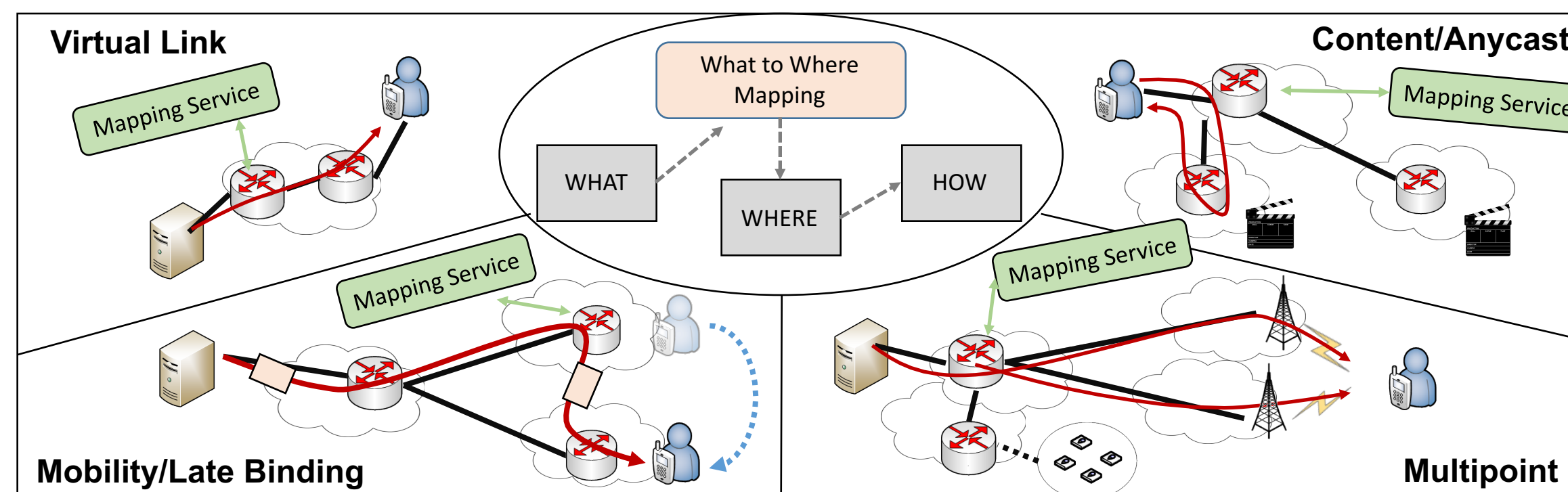


- Segmented Data Transport with Storage and Edge-Aware Routing:** Data is transported in a hop-by-hop manner leveraging in-network storage and information about edge network state to address variability in access/edge networks, particularly wireless.

Prototype Components



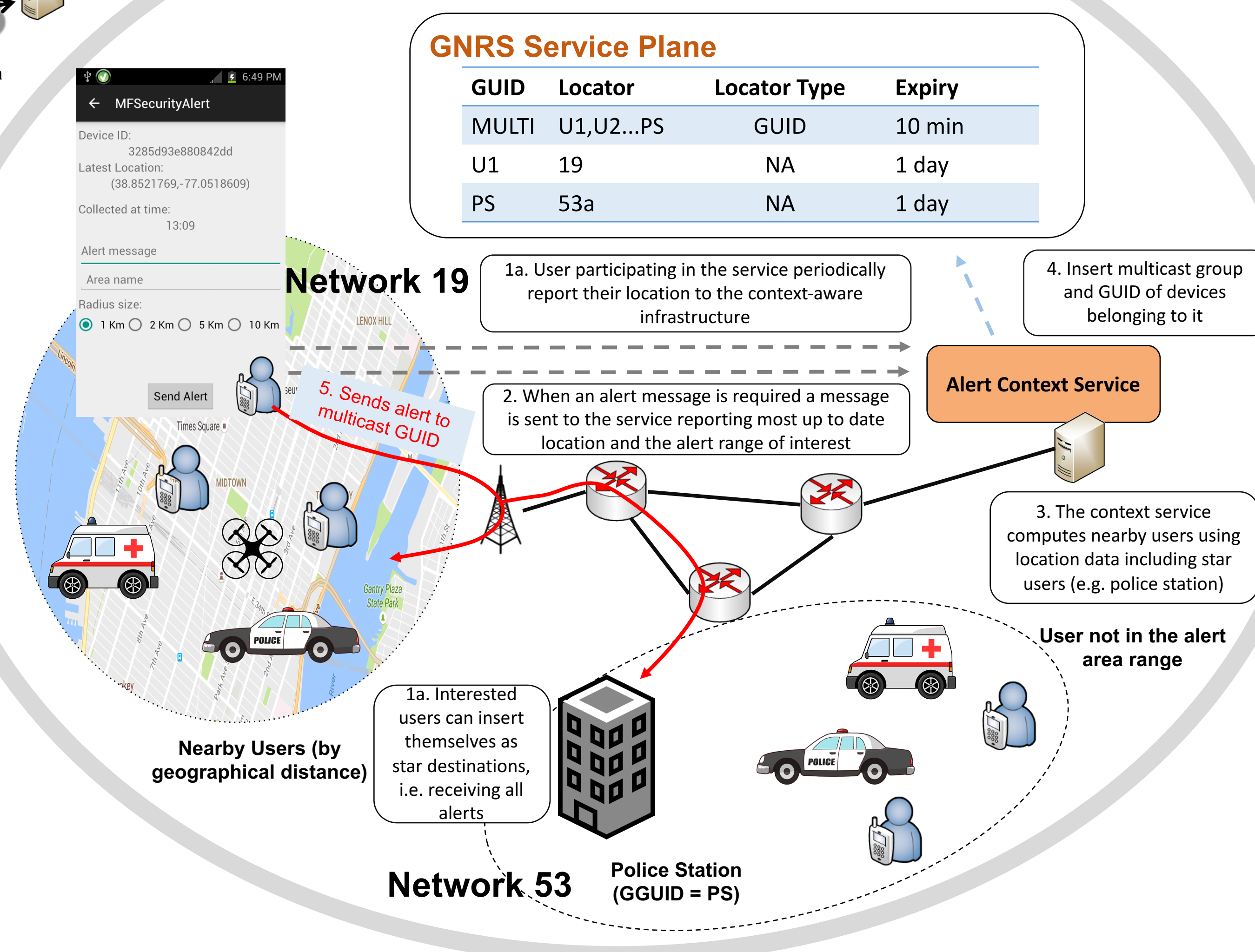
The Named-Object Abstraction



Separation of names from addresses creates the Named-Object abstraction

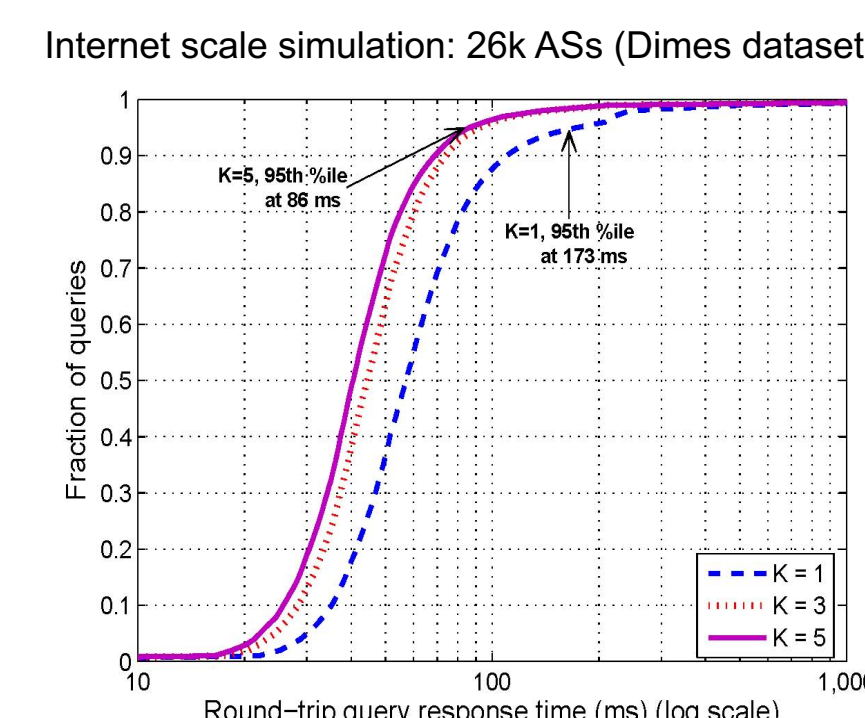
- Name identifies **WHAT**, that translates to current location(s) (**WHERE**) which are used to identify **HOW** to perform the network action

Context-Aware Services: Emergency Alert System

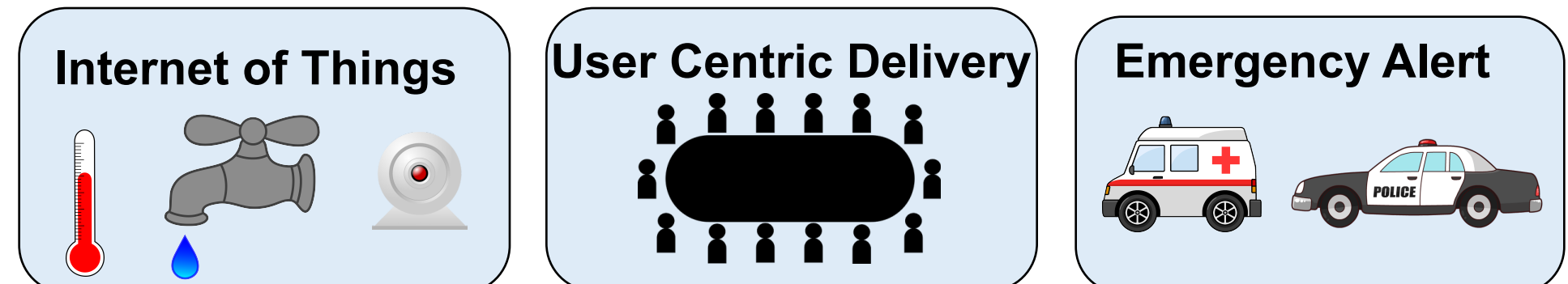


Demo Goals

- Implement a framework that exploiting a real-world large-scale testbed (GENI) can provide proof of the feasibility of the service designed.
- Provide a practical demonstration of the capabilities of the MobilityFirst Future Internet Architecture and its features.



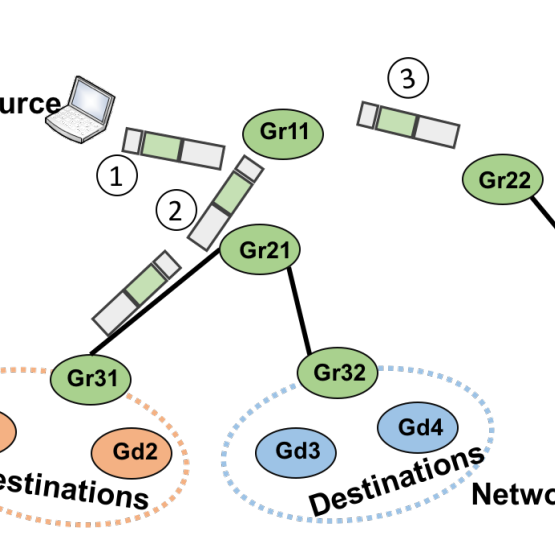
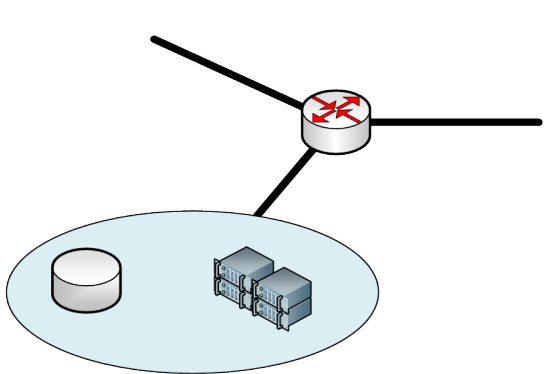
Context-Aware Services Opportunities and Key Components



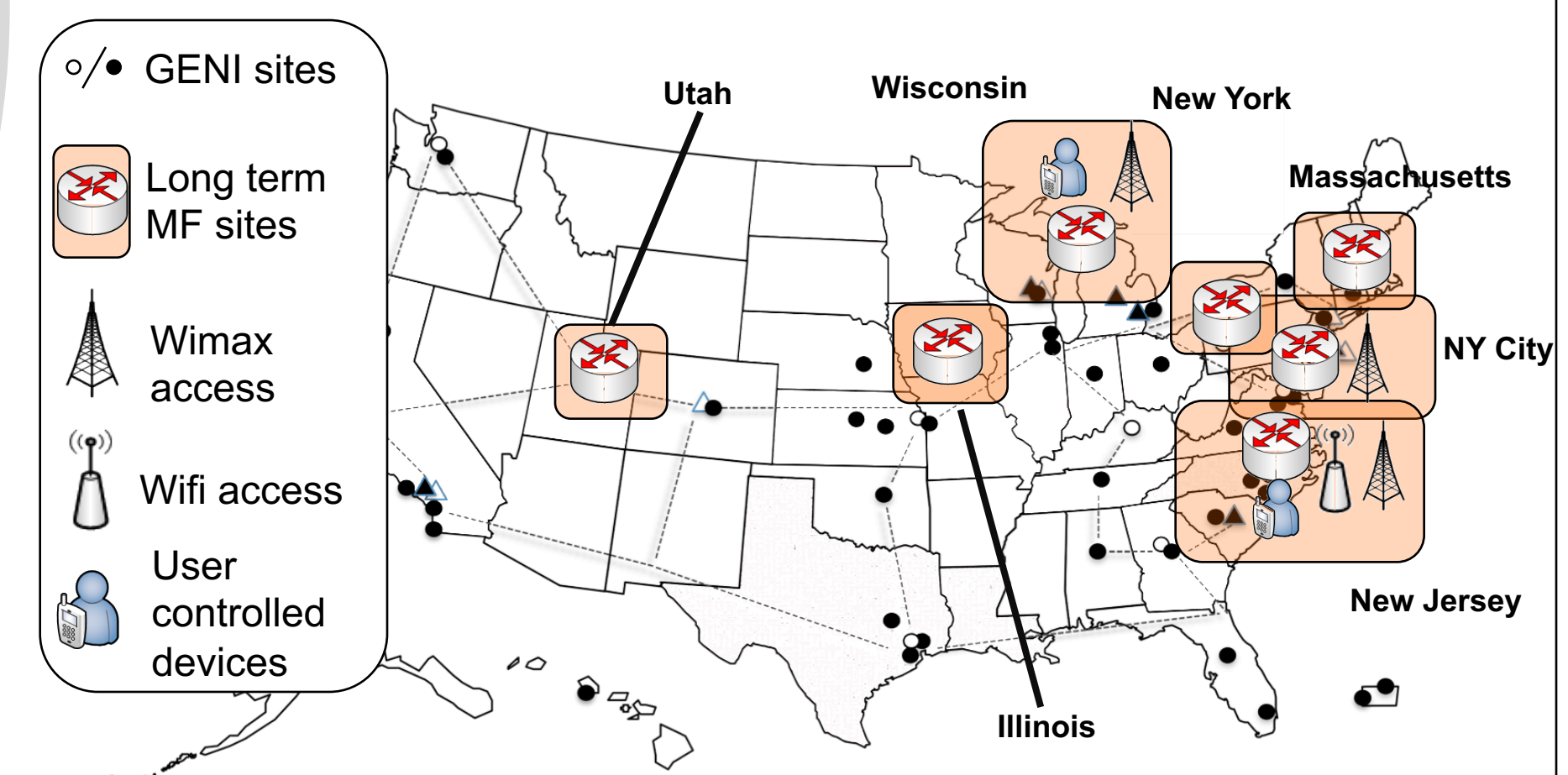
Key Components:

- Global Name Resolution Service:** Distributed service providing Named-Object abstractions.
- In Network Compute Capabilities:** Provide easy extensibility/upgrade options for data plane by allocating compute and storage resources in the network. ISPs can use in-network computing to provide value added services (e.g. context-aware service).
- Efficient Integrated Multicast:** Named-Object Multicast (NOMA) solution which relies on separation of names and addresses obtained through a globally distributed Name Resolution Service
- Additional support for push based multicast without requirement of tree structure

GUID	Locator
A1	19a
B1	53a



Demo Setup



- Multiple sites with InstaGENI, some with WiMAX*: Rutgers*, Wisconsin*, NYU/NYU-Poly*, Utah, NYSERNET, GPO, UIUC.
- Multipoint VLAN connects sites to enable layer-2 connectivity for non-IP MF protocol

References

- MobilityFirst: A Robust and Trustworthy MobilityCentric Architecture for the Future Internet. D. Raychaudhuri, K. Nagaraja and A. Venkataramani. MC2R October 2012
- In-Network Compute Extensions for Rate-Adaptive Content Delivery in Mobile Networks., F. Bronzino, C. Han, Y. Chen, K. Nagaraja, X. Yang, I. Seskar and D. Raychaudhuri. In CNERT 2014
- Achieving Scalable Push Multicast Services Using Global Name Resolution. S. Mukherjee, F. Bronzino, J. Chen and D. Raychaudhuri. GLOBECOM 2016