Global Name Resolution Service

Project Status Report

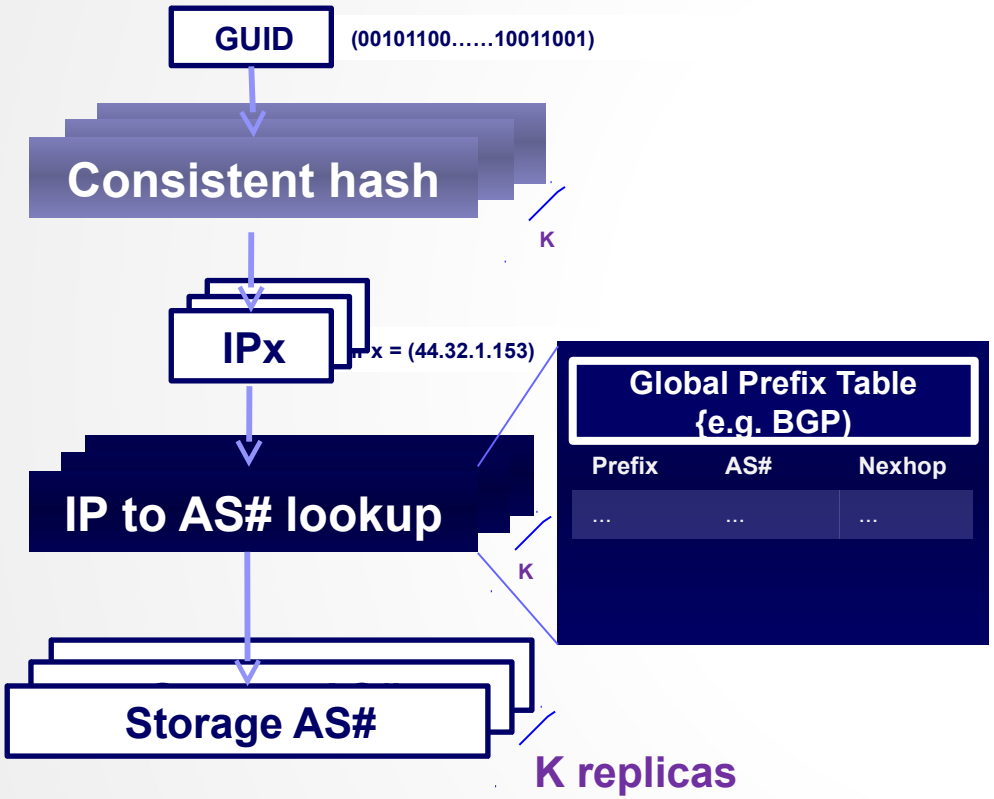
Jan 29, 2013

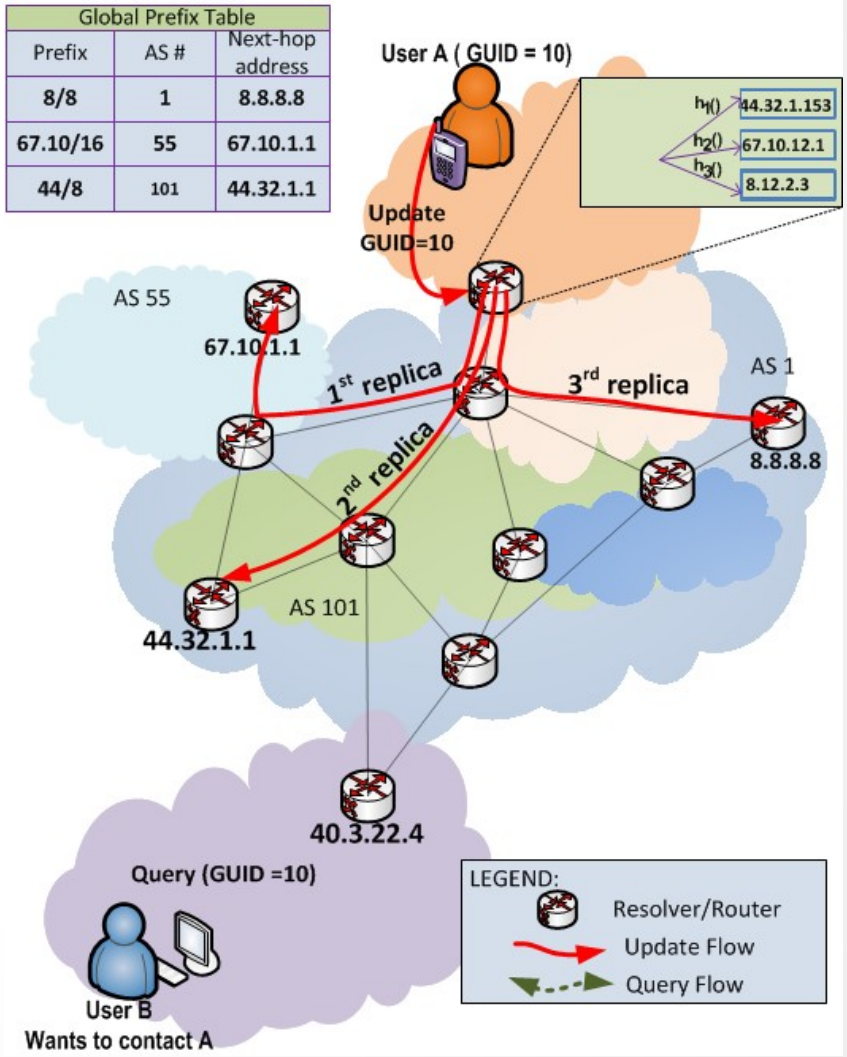
WINLAB

GNRS Concepts

- Distributed Hash Table for ID to Network Address bindings
- Low latency (sub-second) insert and retrieval
- Independent of underlying networking (overlay)

DMap Insert





Mapping Update

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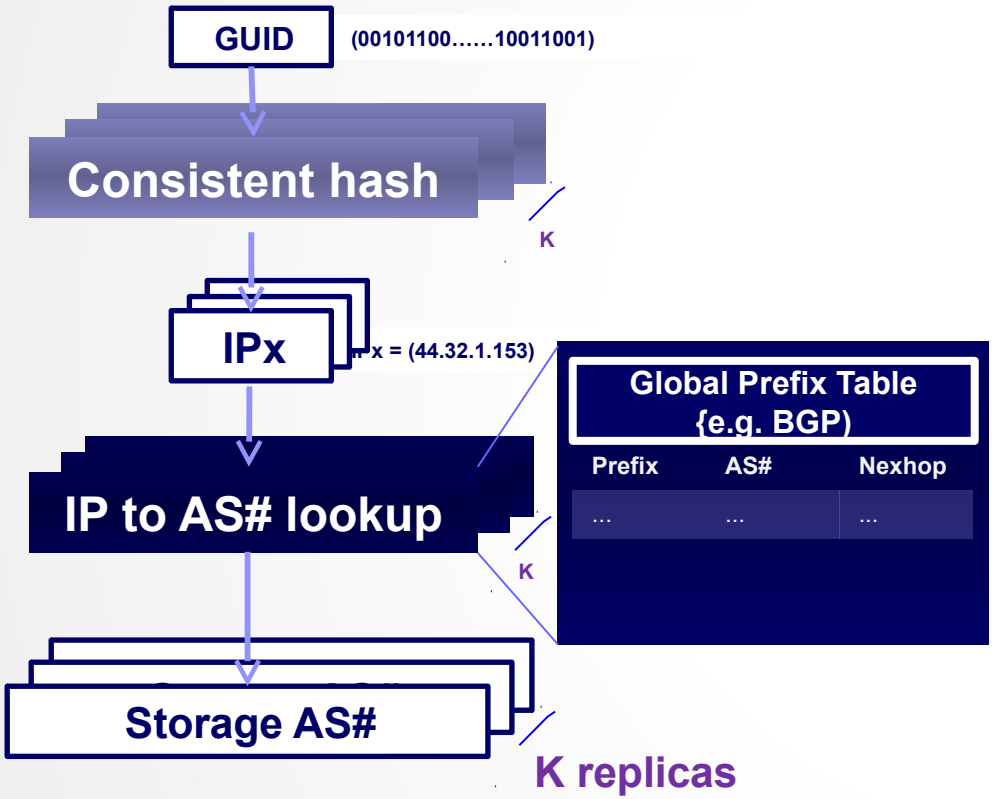
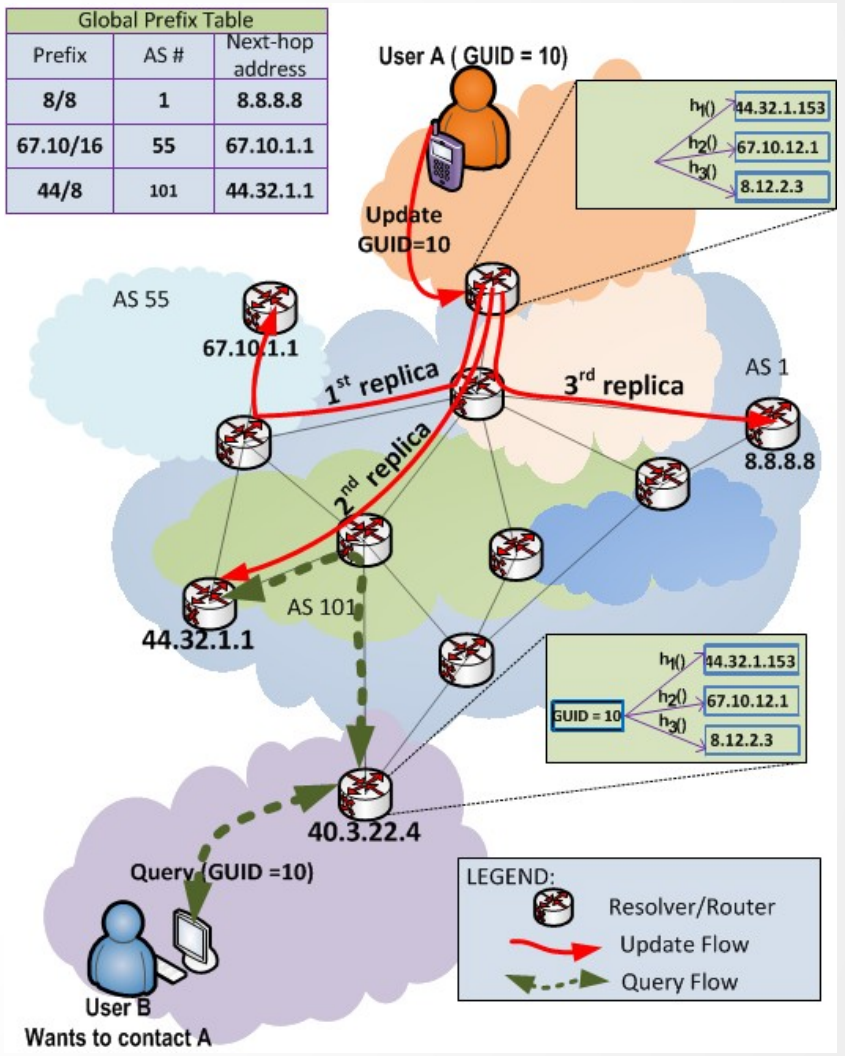
DMap Lookup





Mapping Lookup

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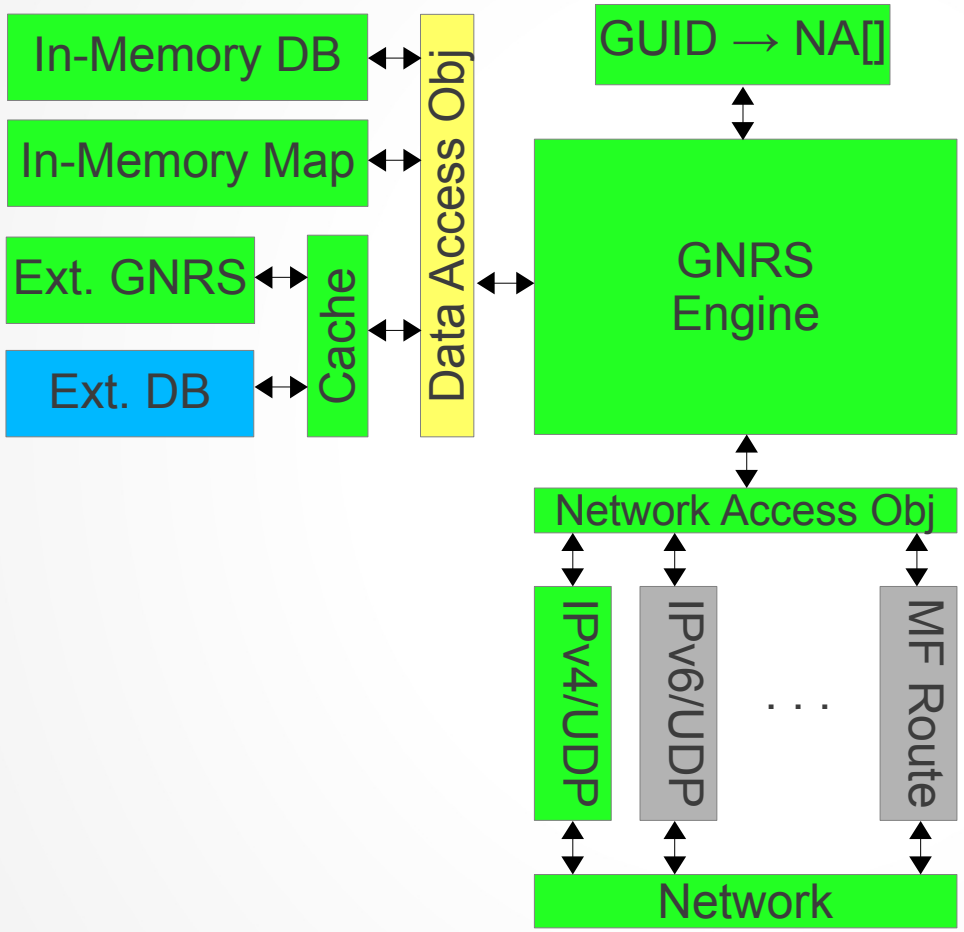
GNRS Prototype

- Server supports PUT and GET
- IPv4+UDP networking
- Configurable parameters
- All components modular

- Implemented in Java for portability
- Automated testing framework through OMF + ORBIT
- Initial results are promising

GNRS Server Components



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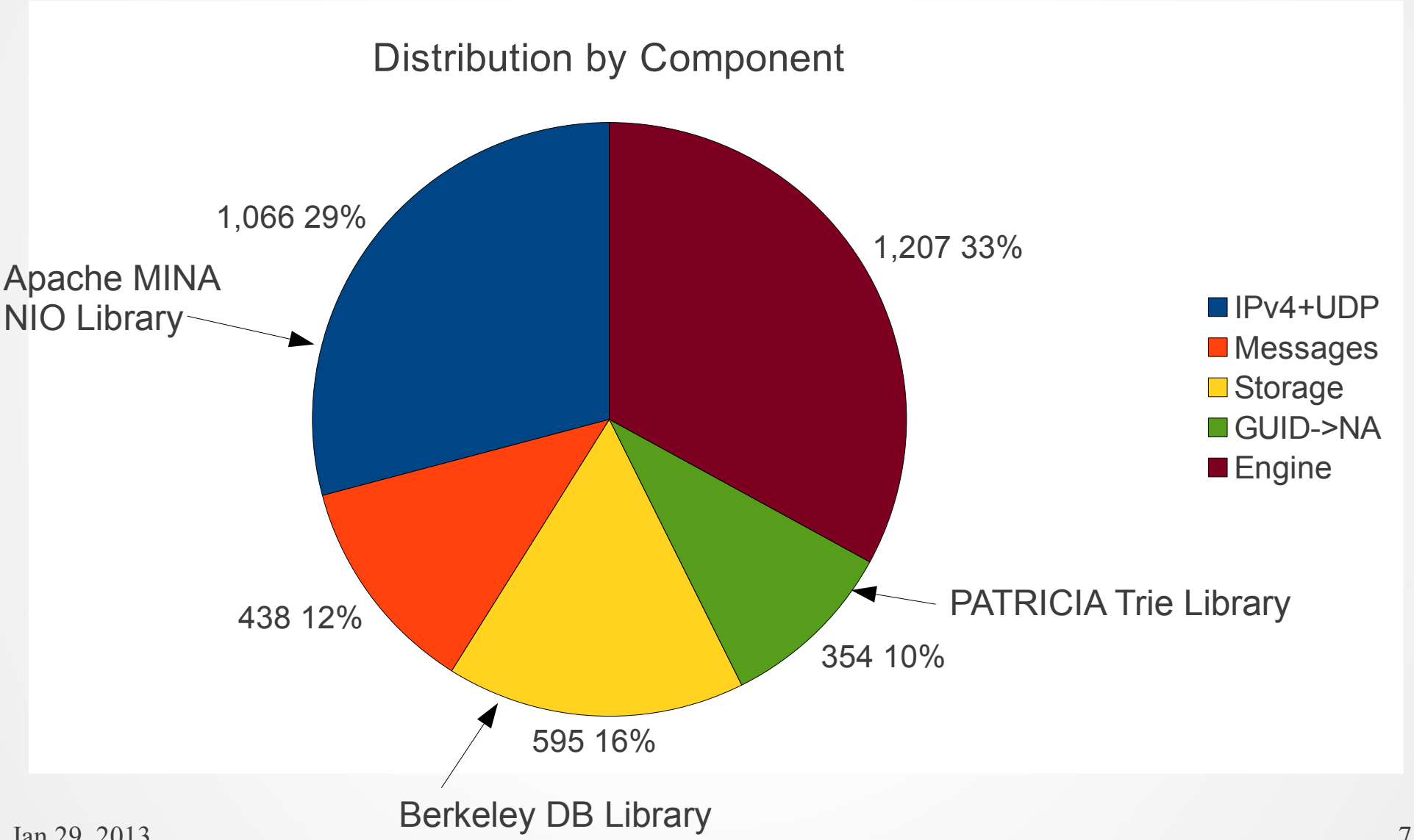
Lines of Code



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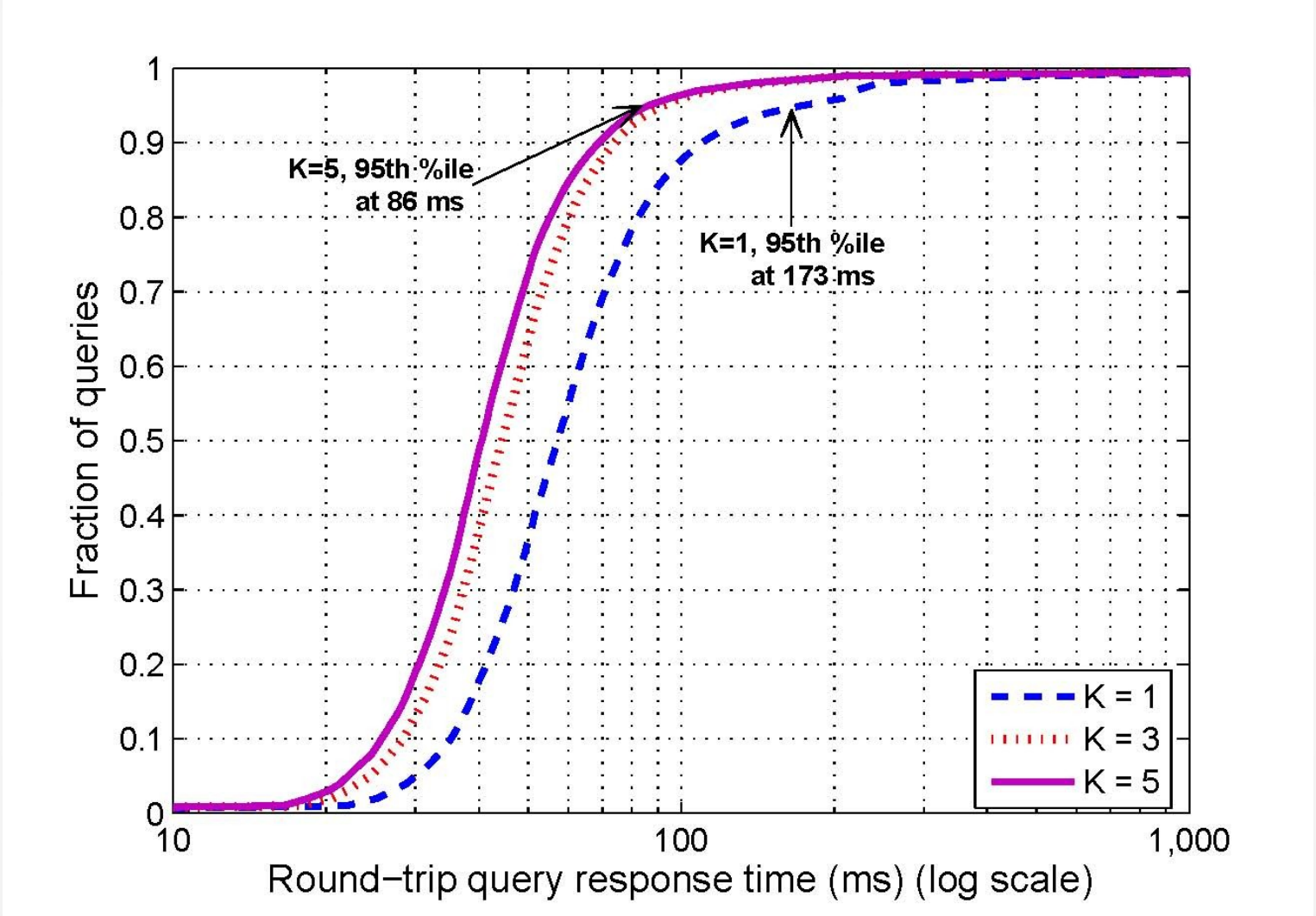
DMap Latency Predictions



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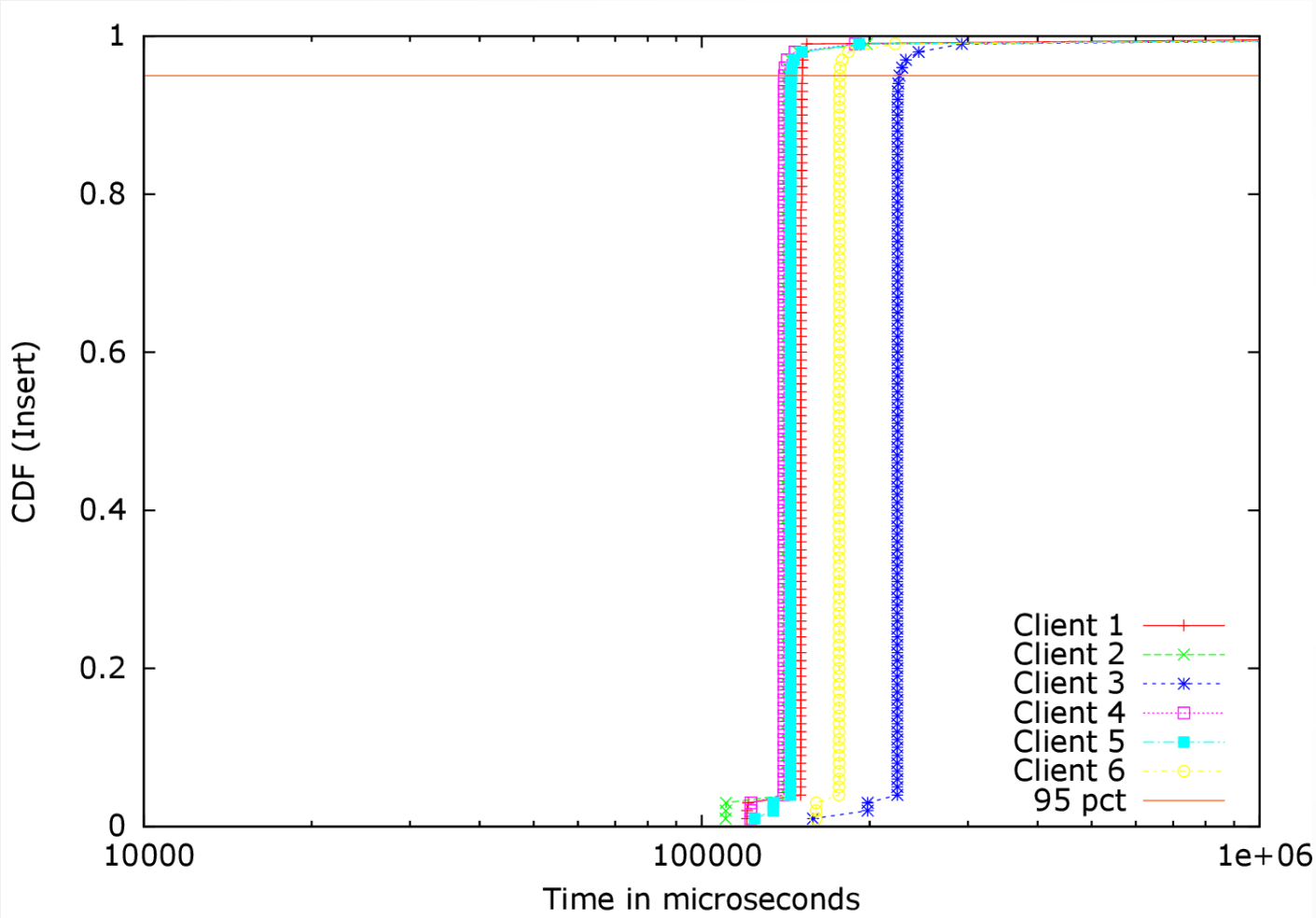
GNRS Latency Measurements



- Top-50 AS by degree
- 6 clients insert 100K GUID values (disjoint)
- 1000 msg/sec
- Wait for 5 replicas to ACK

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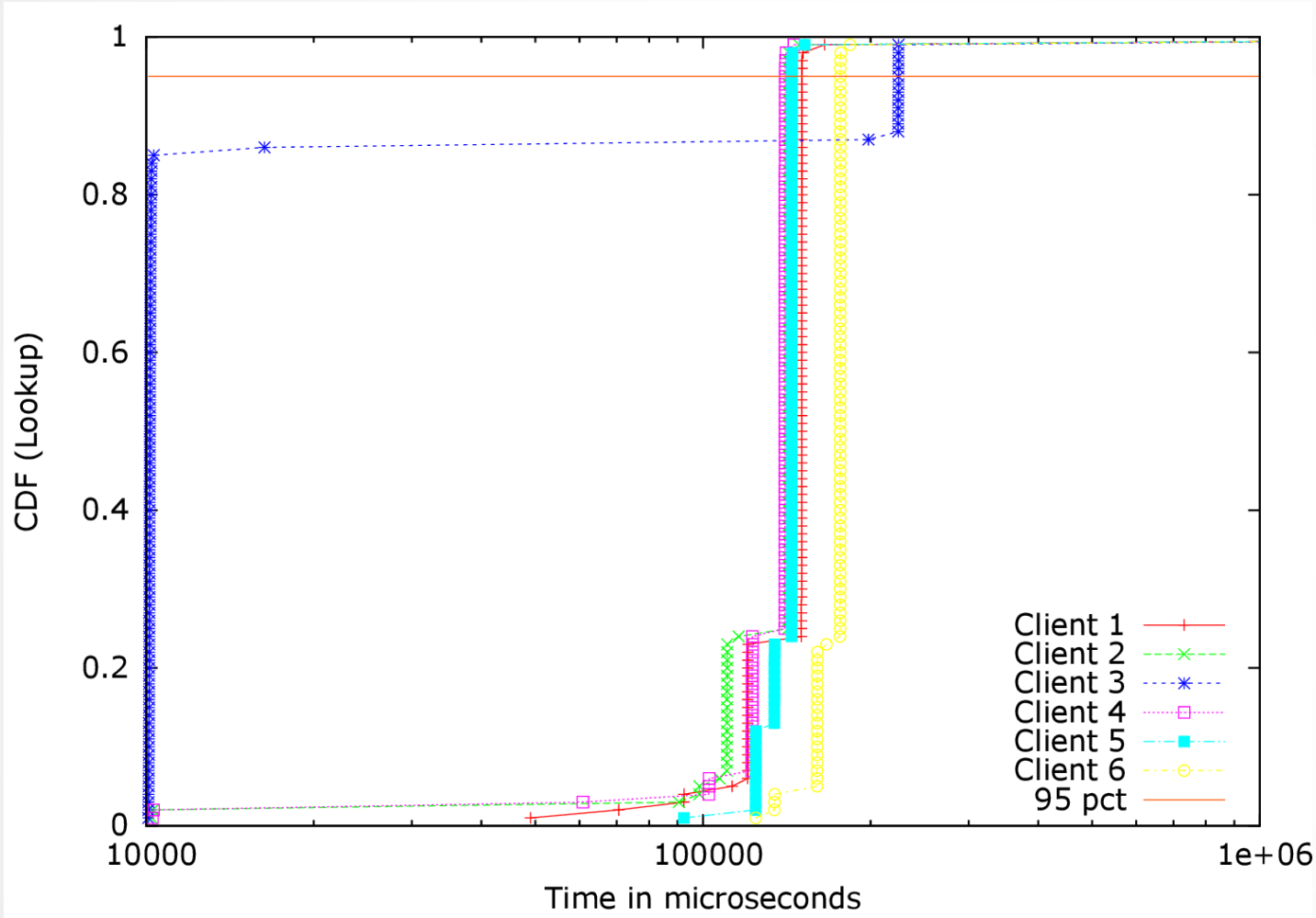
GNRS Latency Measurements



- Top-50 AS by degree
- 6 clients retrieve 100K GUID values (disjoint)
- 1000 msg/sec
- Select 2 replicas at random

Next Steps

- Scale to 200+ nodes
- Emulating 200 servers, 150+ clients
- Explore effect of caching and TTL
- Interaction with MF routing
- GUID “chaining”
- Coordinated client traces
- Automatic logging and analysis of statistics
- Workloads available for evaluation/replay
- AS emulation by degree, IP allocation, geography

Thank you!

Image courtesy of Portland Independent Media Center
http://portland.indymedia.org/en/2006/09/345821.shtml