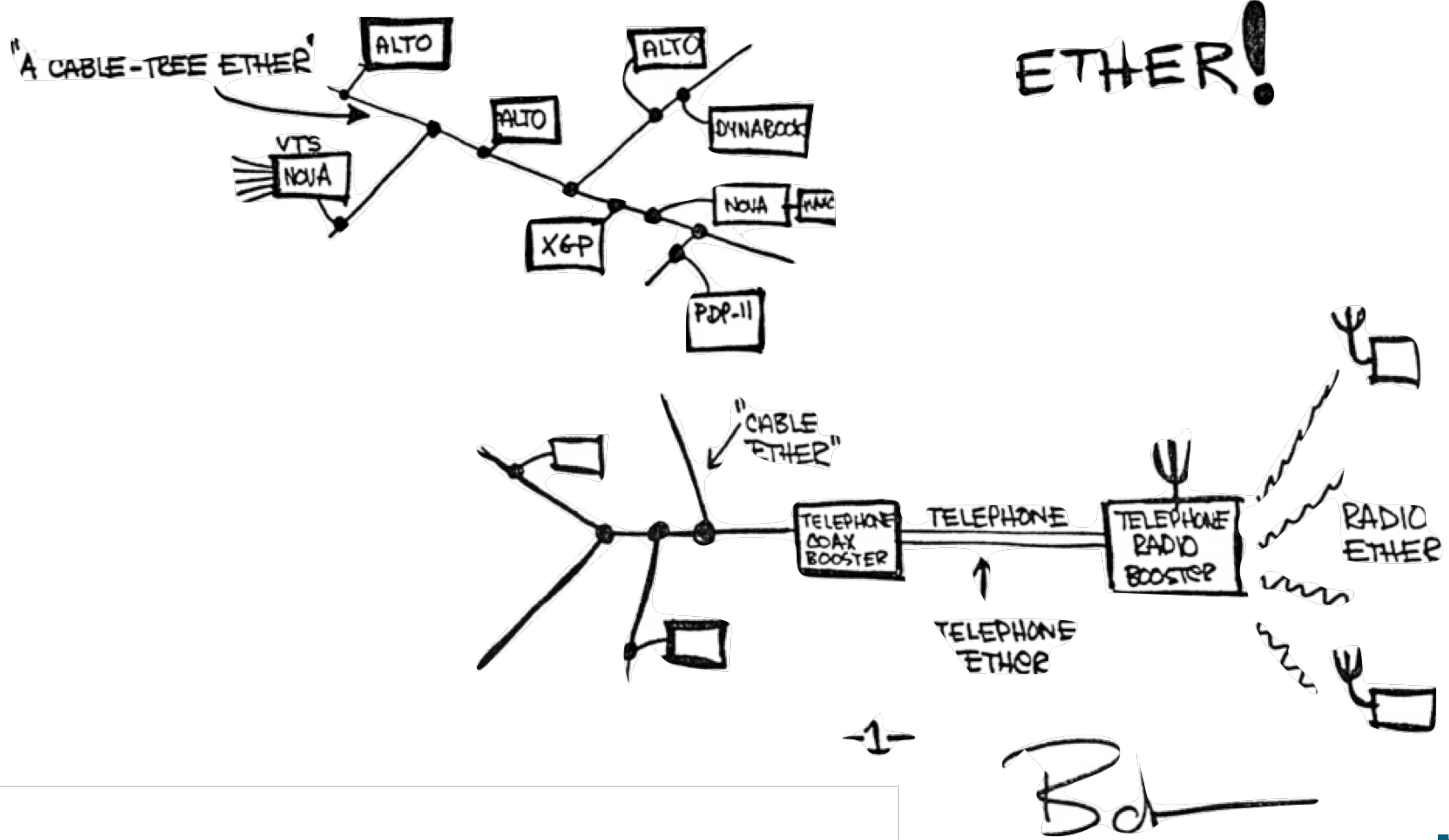


CCN Overview

Glenn Edens, Vice President





A future Internet architecture: CCN

We have a proposal that

- Is secure

- Provides high availability

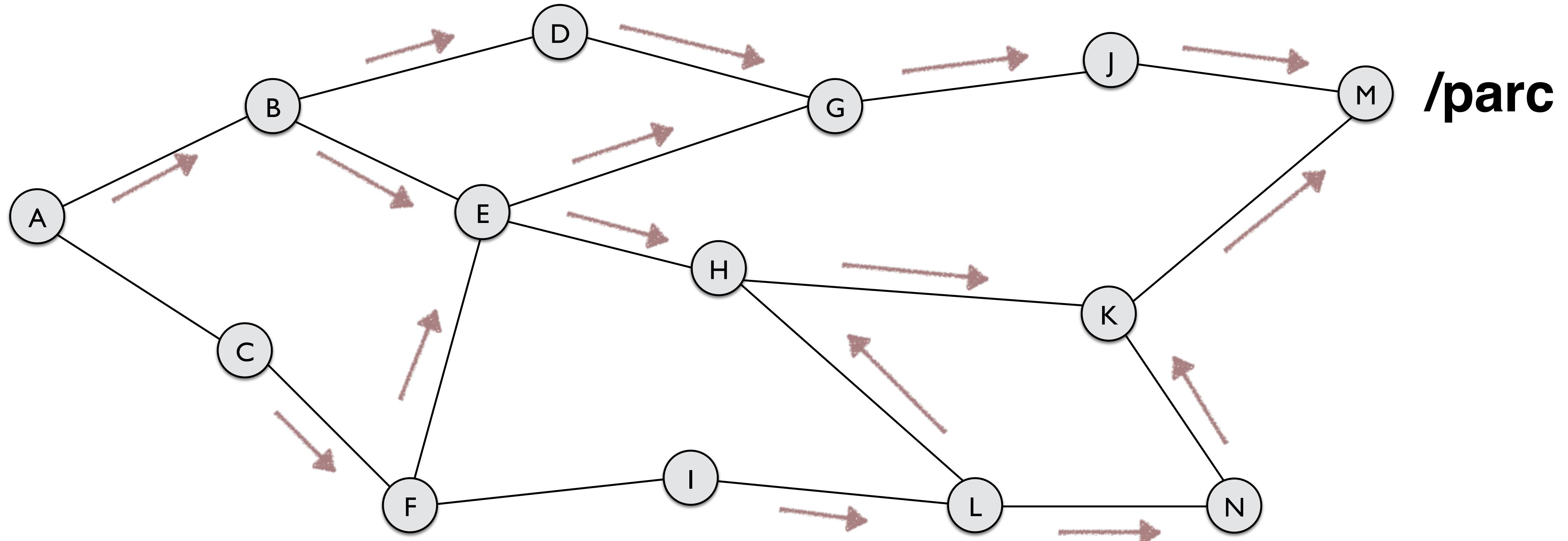
- Transfers data independent of location

- Leverages storage and processing

It does this by

- Naming all data, securing all data and communicating based on name

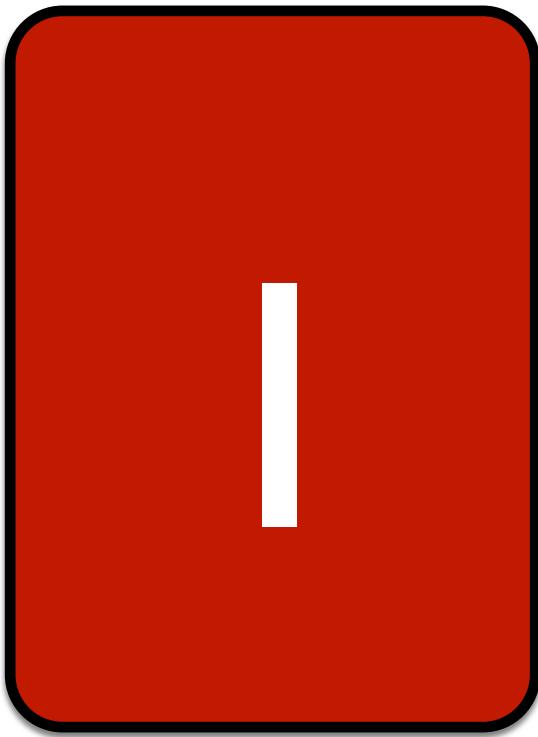
Names are advertised via routing



Routes are set up pointing to M for prefix /parc

Core protocol

An Interest Message



A request for a
named piece of
content

A Content Message



A reply with a
named piece of
content



CCN names

/parc/ccnx/presentation/slides7/v=2/c=0

globally routable
name segments

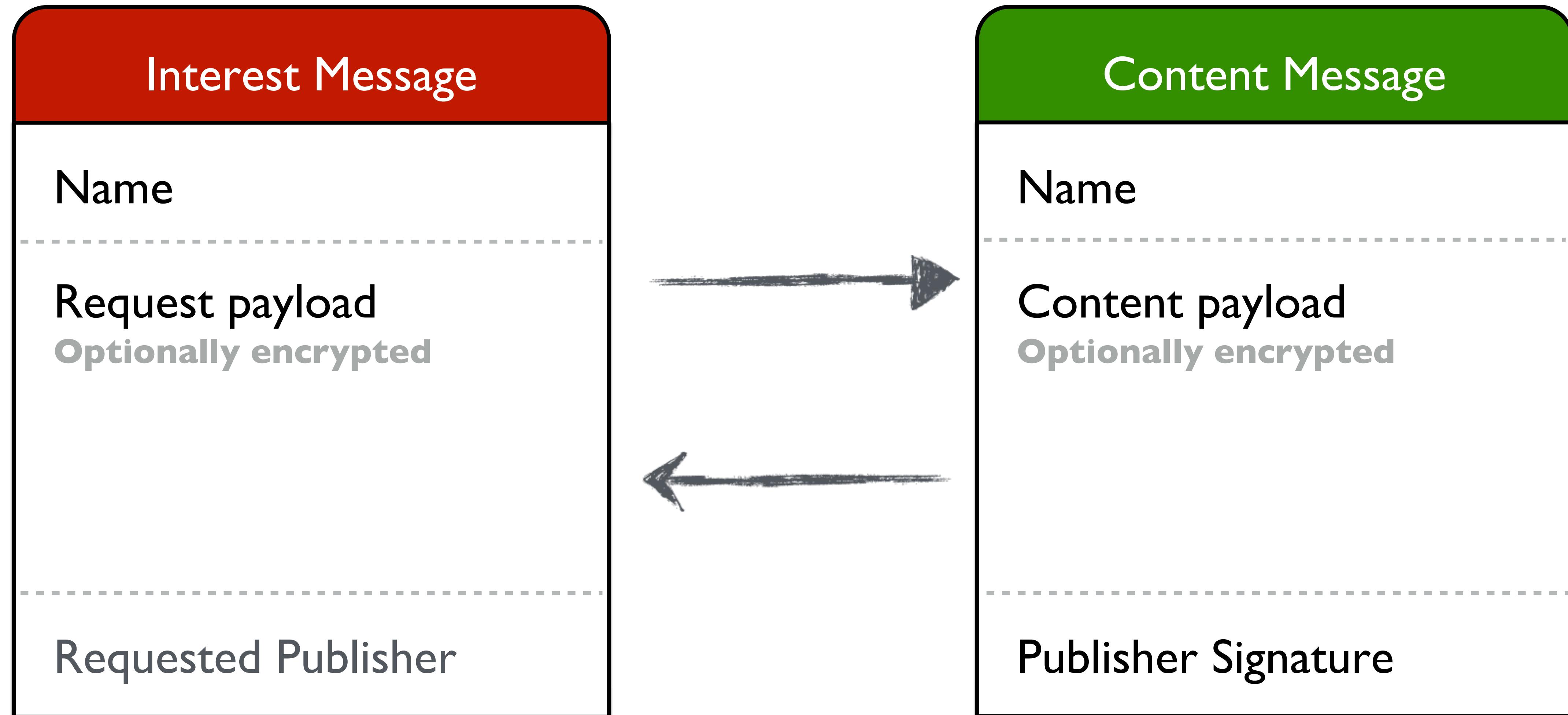
system / application
dependent name segments

protocol dependent
name segments

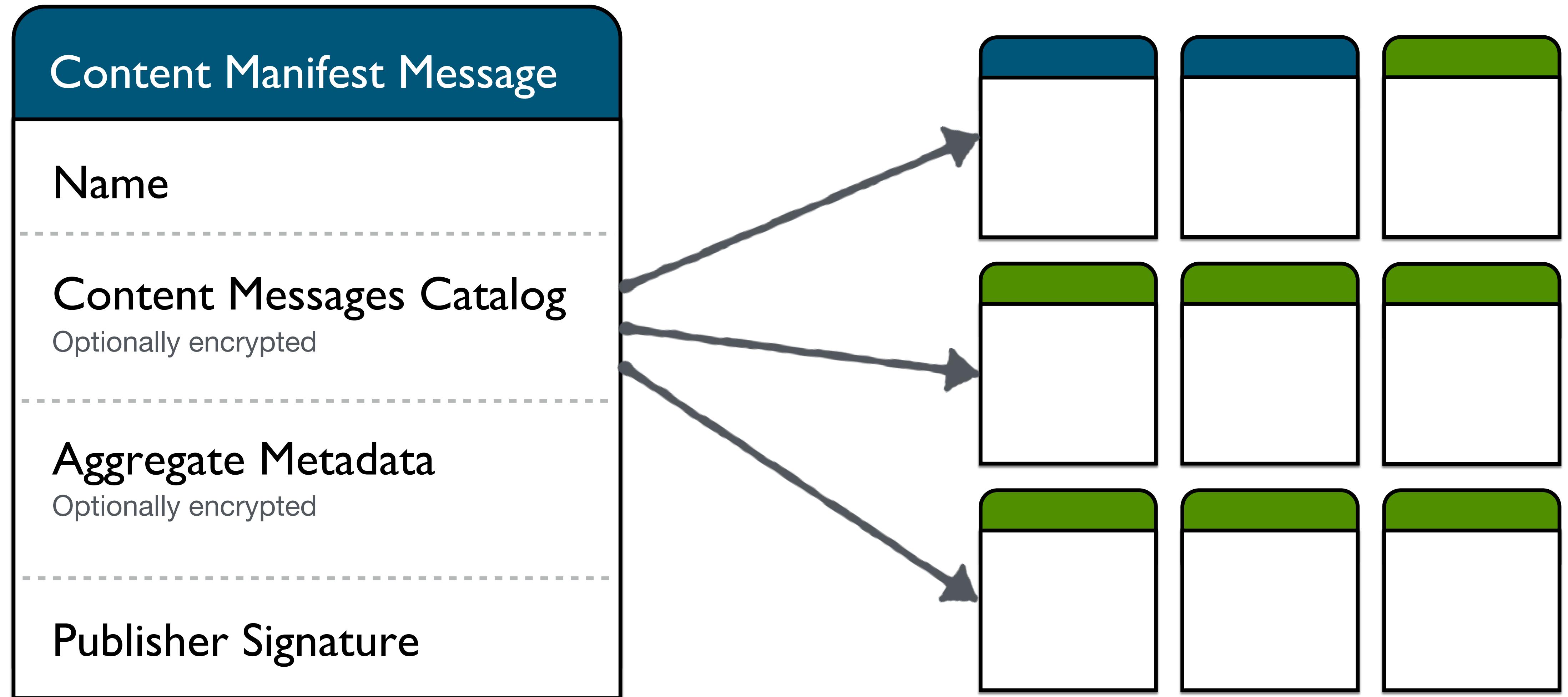
Everything has a name
Hierarchical

Don't have to be human readable
Replaces IP addresses and ports

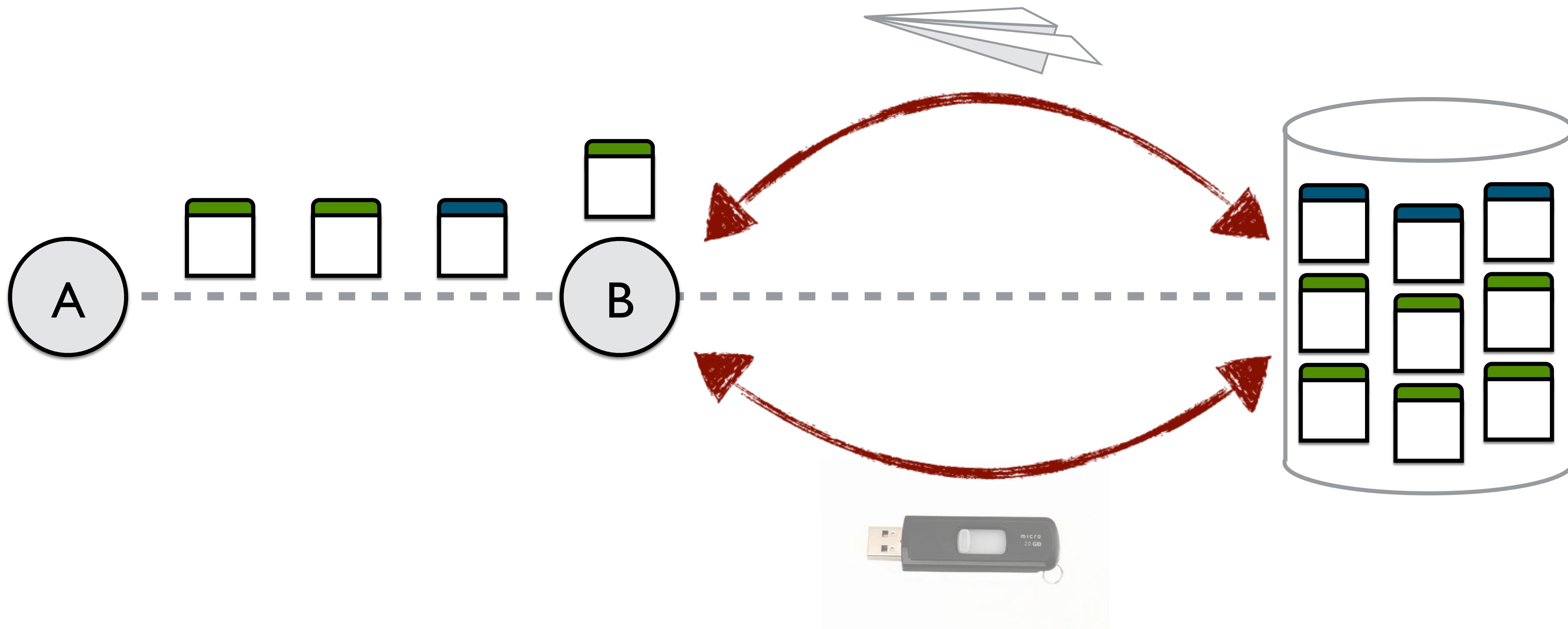
Core messages



Network data structures



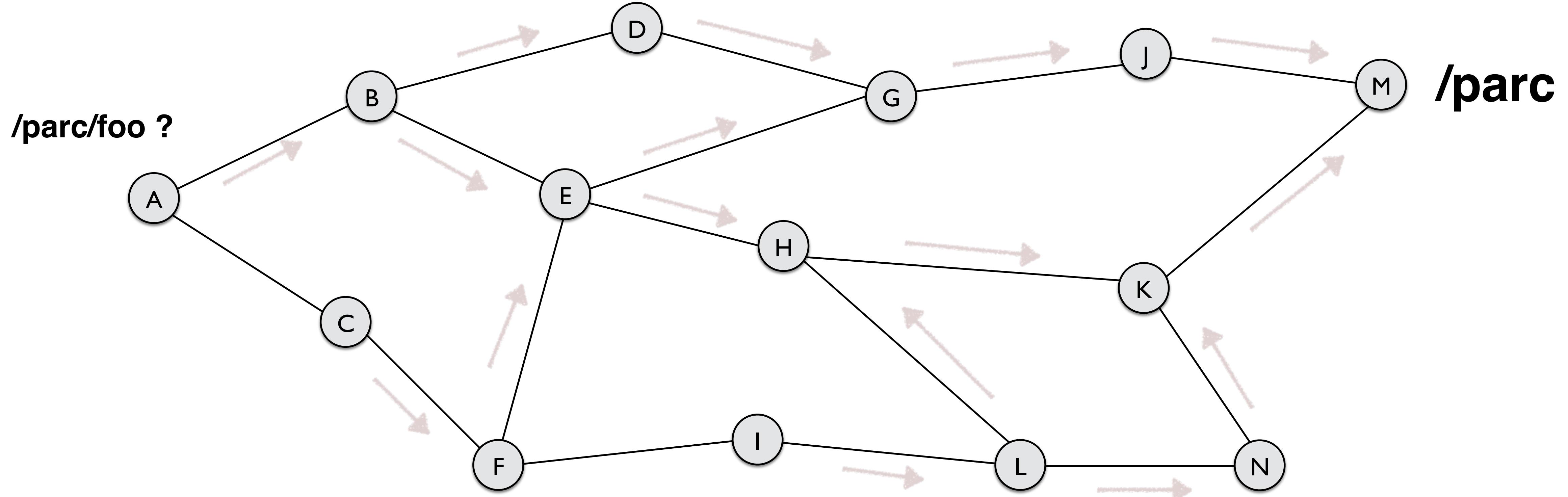
Unifying network and storage



Messages are secure
(in motion and at rest)

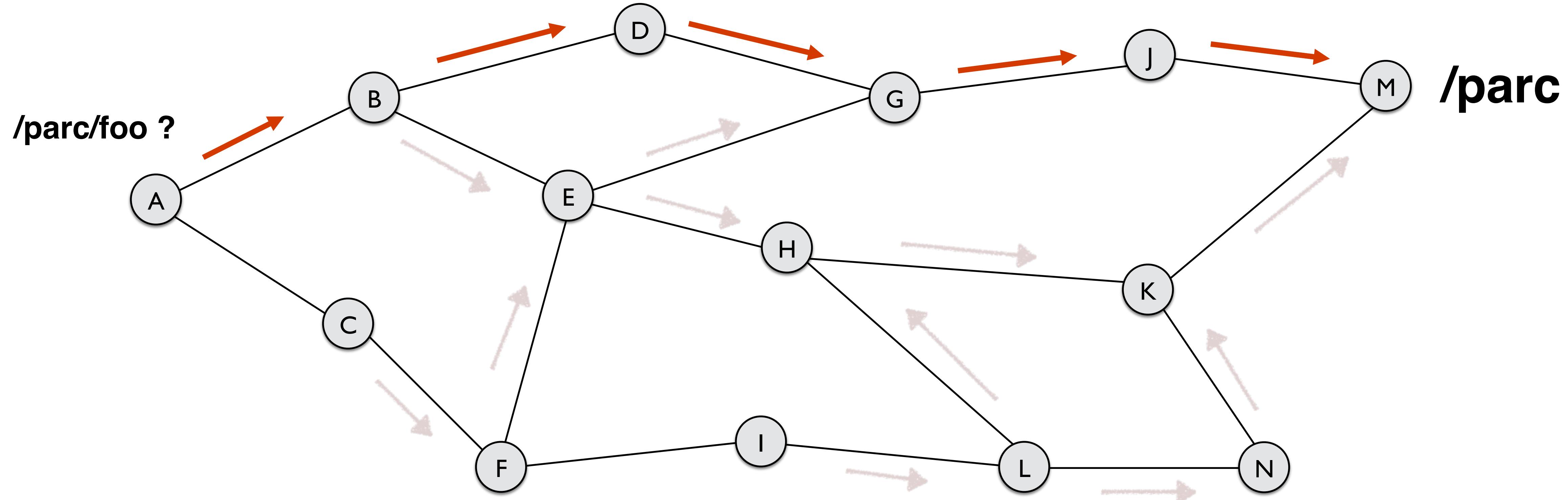
Messages are the same
(in network and in storage)

A simple example



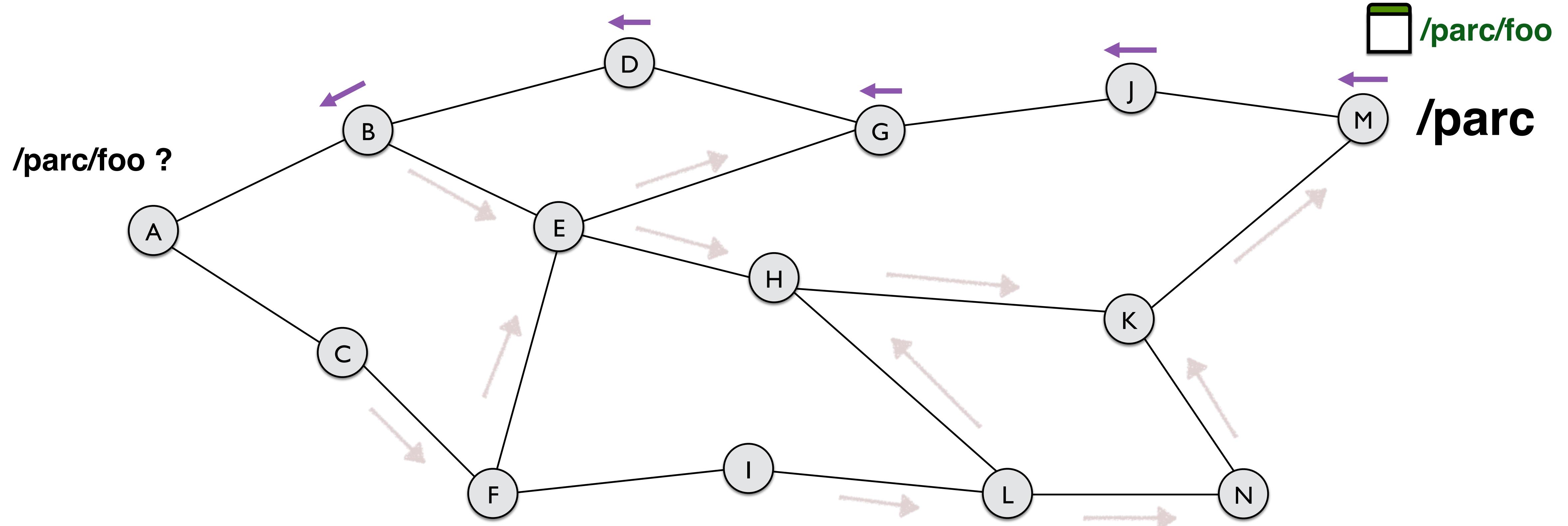
Node A has a request for /parc/foo - issues an interest

Interests follow the advertised route



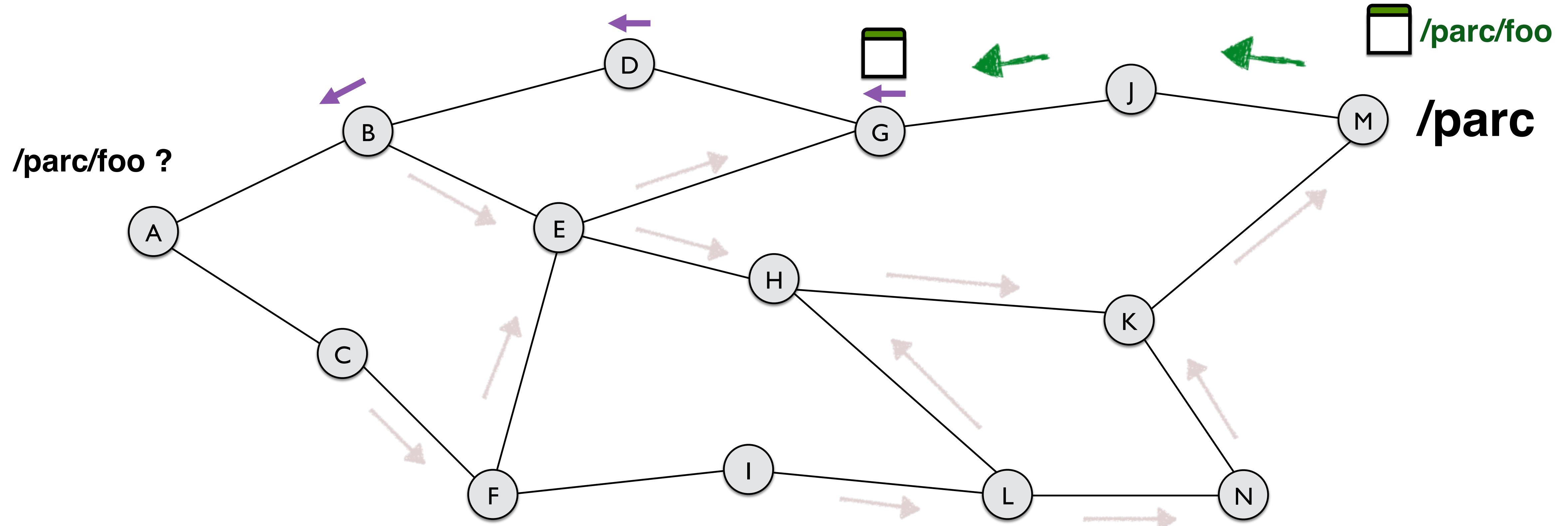
Interests are forwarded towards the node that advertised the name /parc

Interests leave state along the path



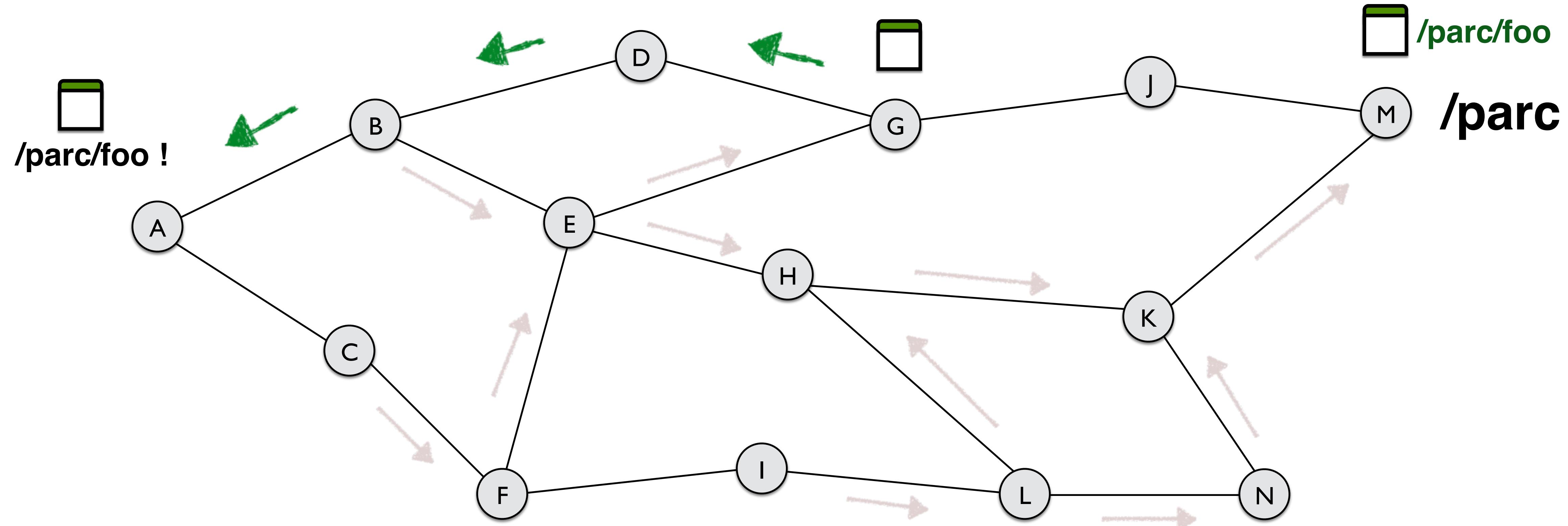
Routers keep information about the reverse path of the request

Content Messages follow reverse path



Reverse path state gets consumed as Content Messages flow

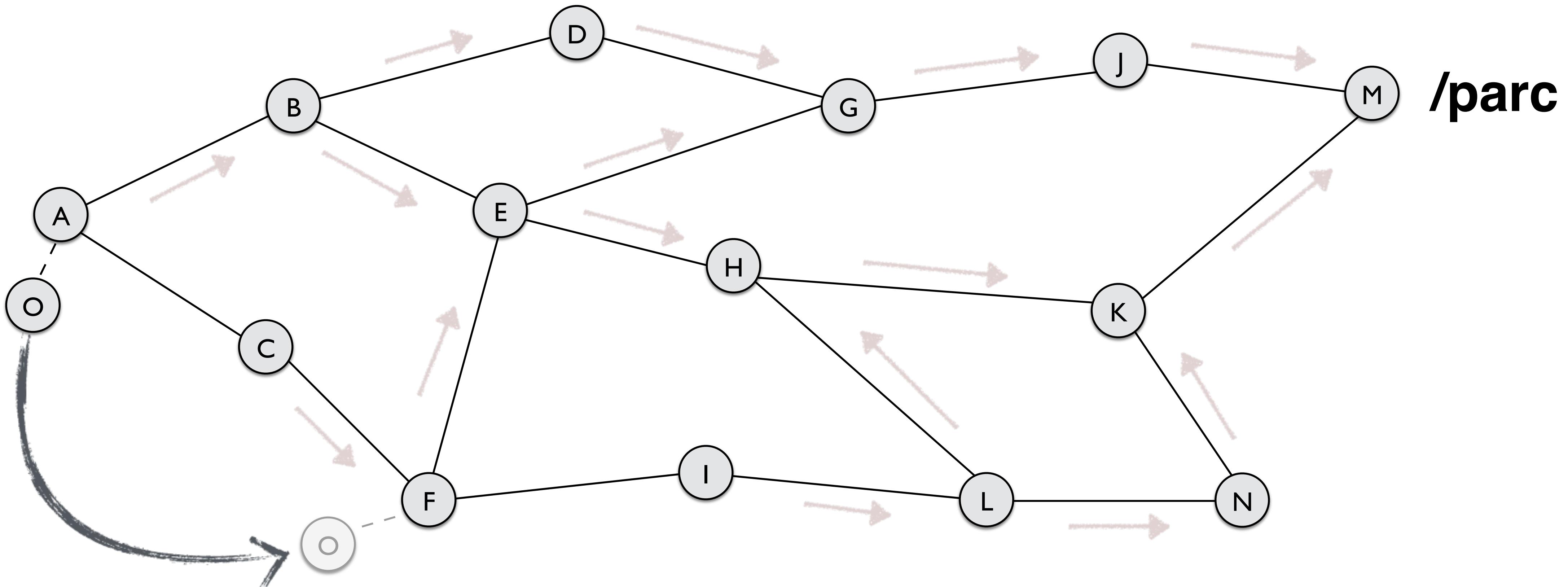
Nodes can cache Content Messages



Caching reduces load on network

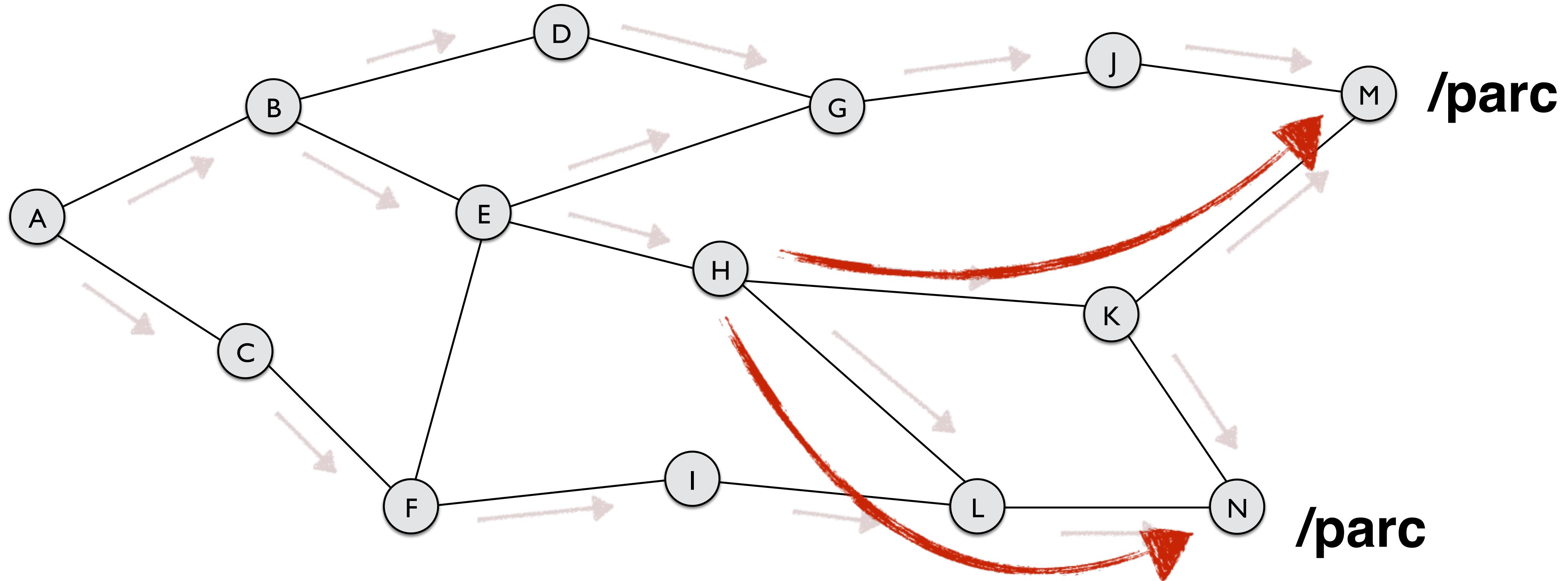
Caching makes error recovery more efficient

Simple mobility



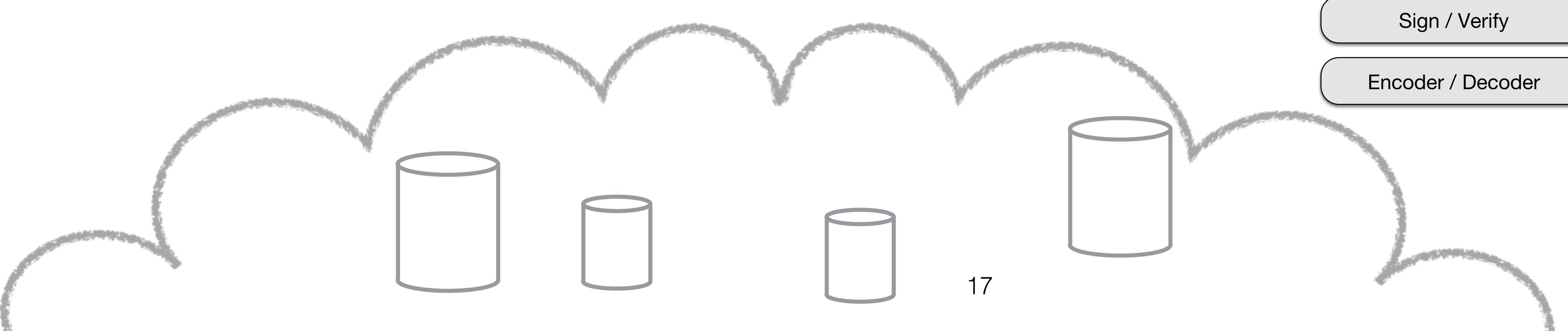
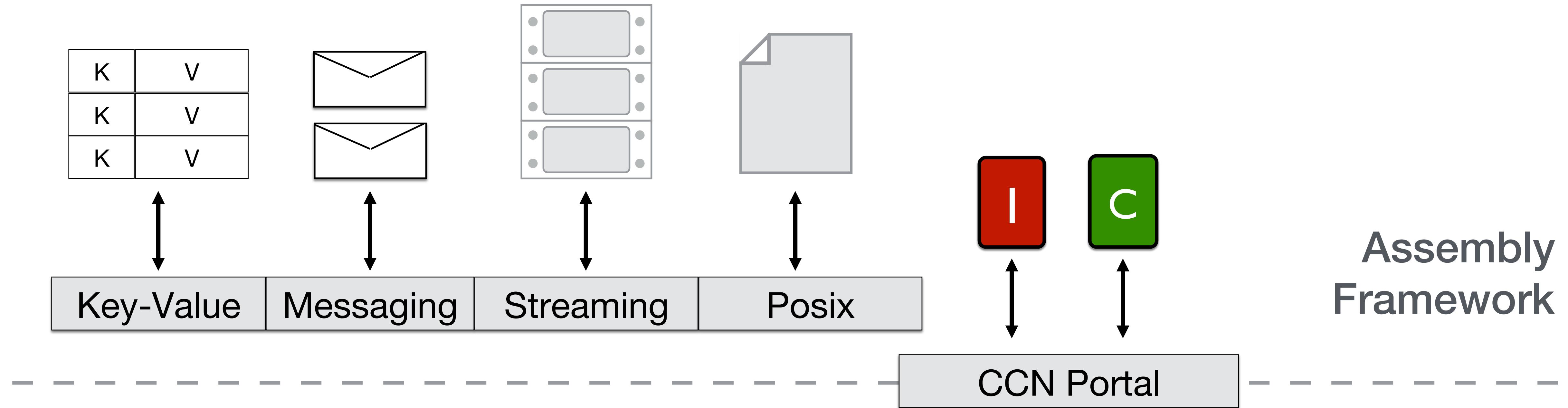
Reverse path routing allows for seamless reattachment

Load-balancing, redundancy and failover



With multi source, the core protocol allows the network to deliver load balancing, transport redundancy and automatic failover

Network abstraction



Benefits

Secure and Resilient

Individual content objects secure in motion and at rest

Network not susceptible to IP style network attacks

Flexible and Efficient

Base network offers load balancing, redundancy and failover

Can handle heavy loads and perform local repair

Core protocol and messages scale up and down

Extensible and Comprehensive

Modular APIs to access network functions and services

Common data structures between network, APIs and applications

Adoption

Progress...

Networks are becoming even more software based
enabling the introduction of new protocols in the ‘fast path’

We are at a major inflection point - 5G, IoT, ‘Cloud’

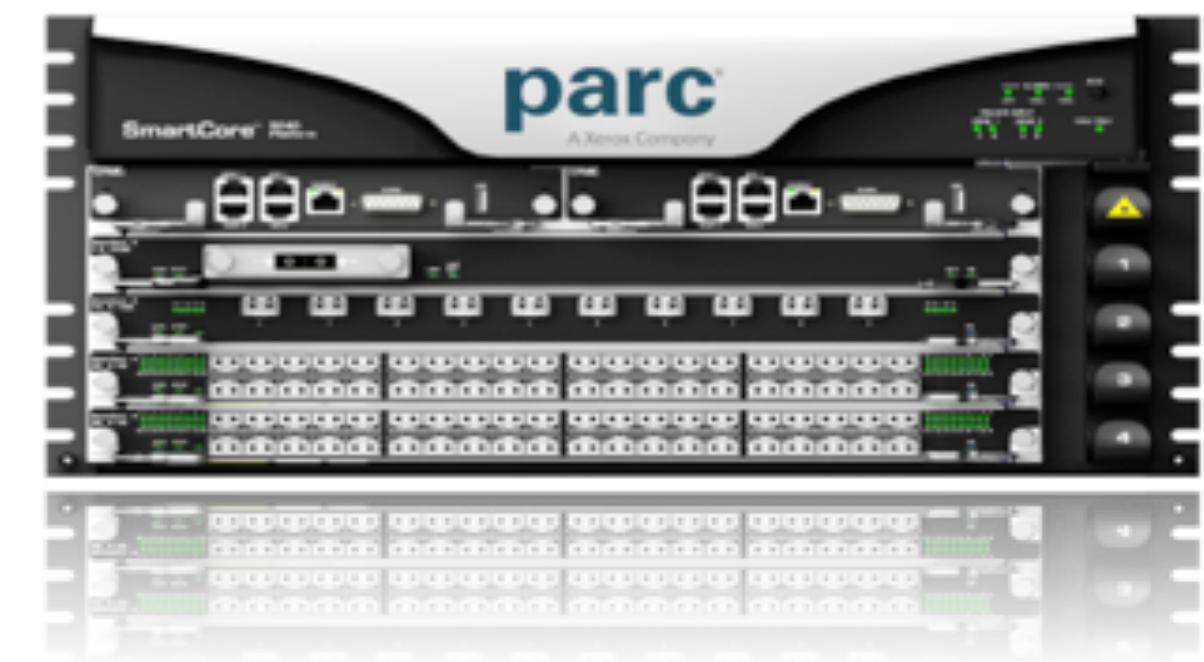
Key features like security, and flexibility have a huge economic value

Incremental...

CCN can work with IP, as an overlay on IP or as middleware.

Applications and services can operate through CCN-gateways

Smart phones, servers to spaceships



Change, disruption, innovation

www.ccnx.org



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Thank you