

NDN – Why bother?

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NDN Tutorial – SIGCOMM17

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Tools are our bridge
from problem to solution.

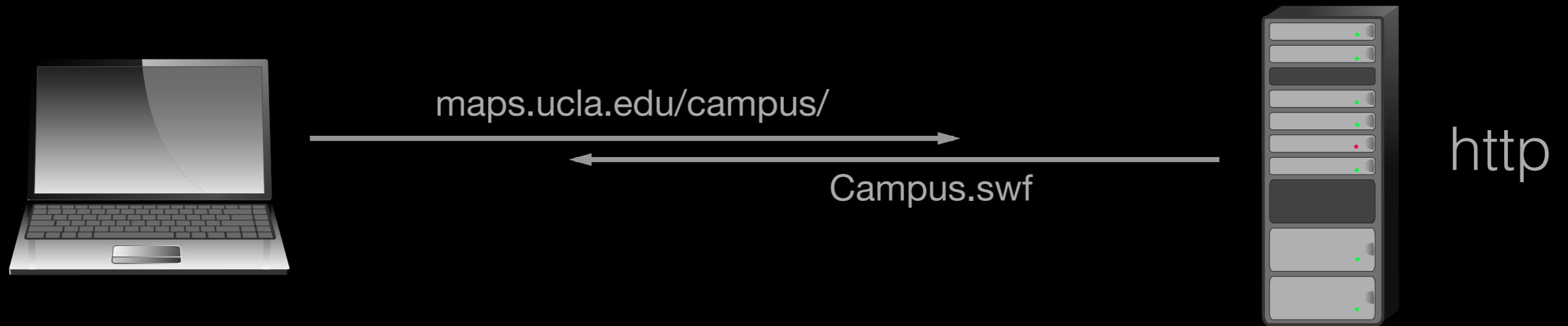
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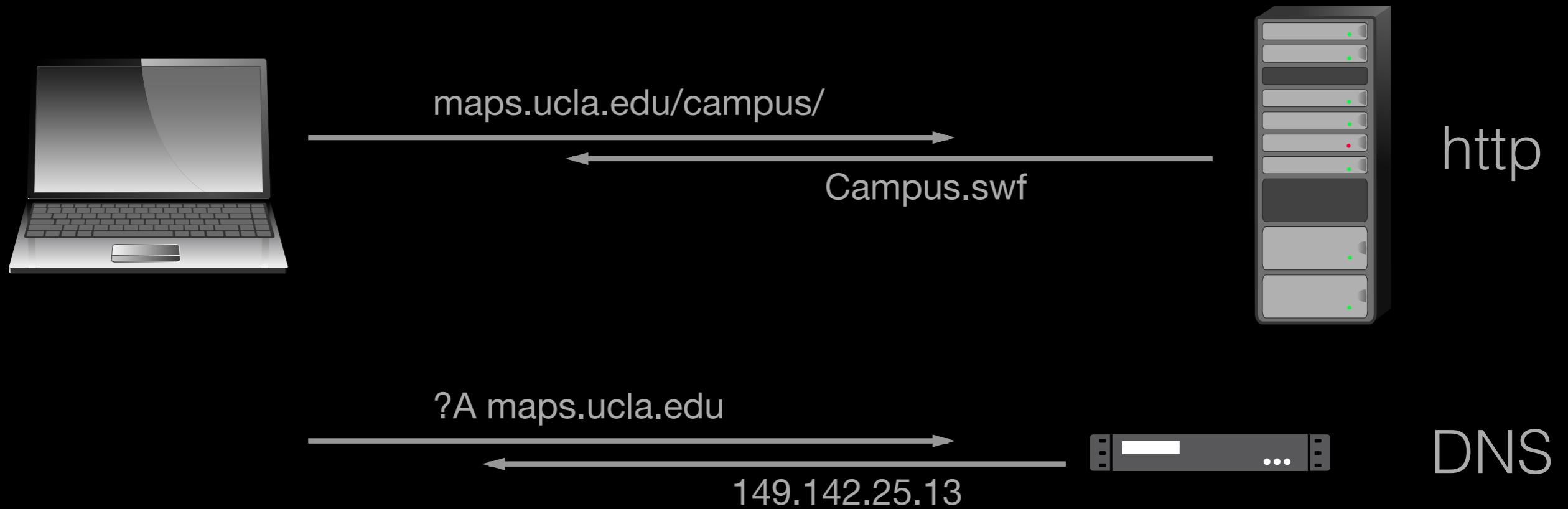
Sometimes a tool isn't up to the job

Is IP the best tool for every job?

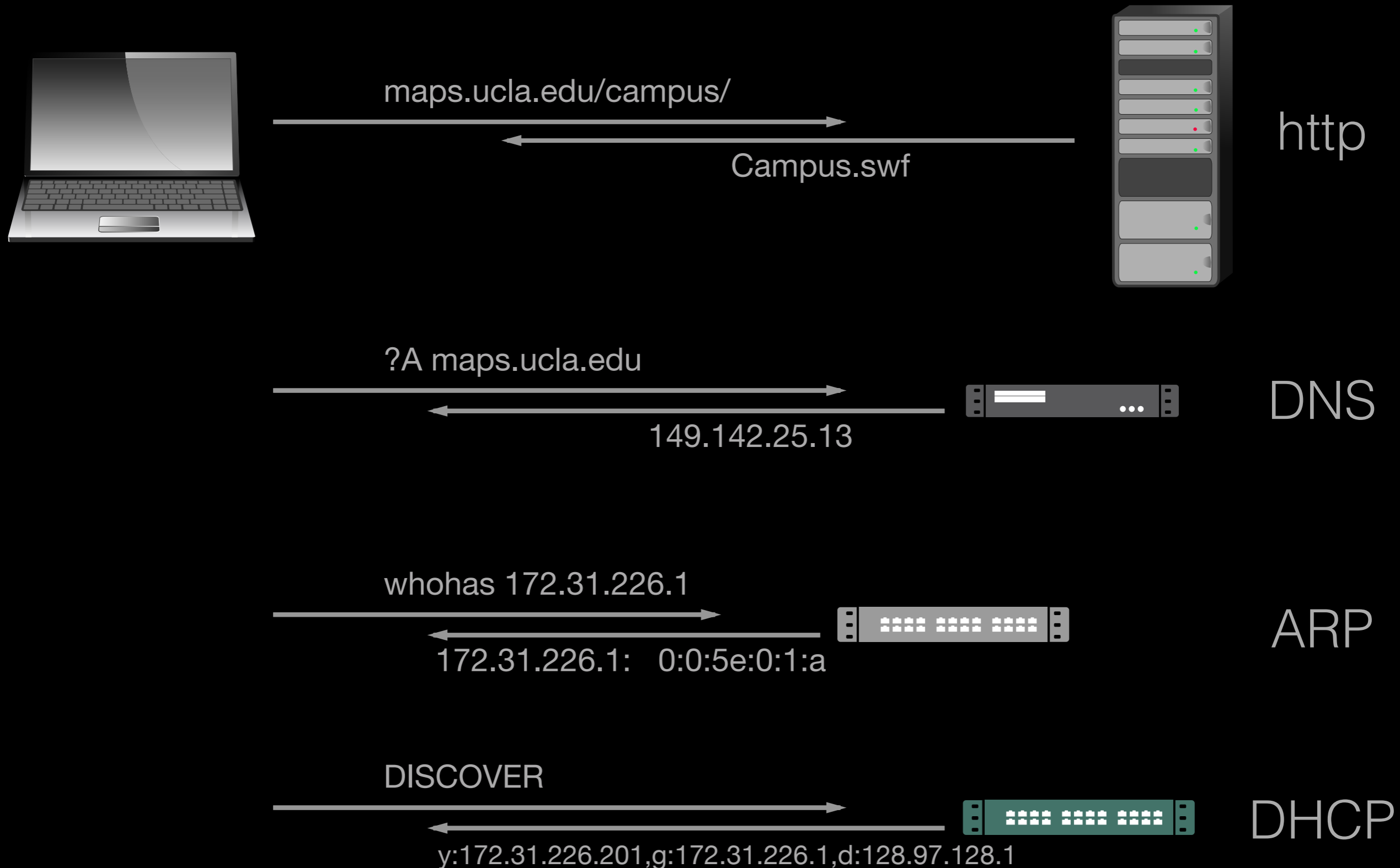
Is IP the best tool for every job?



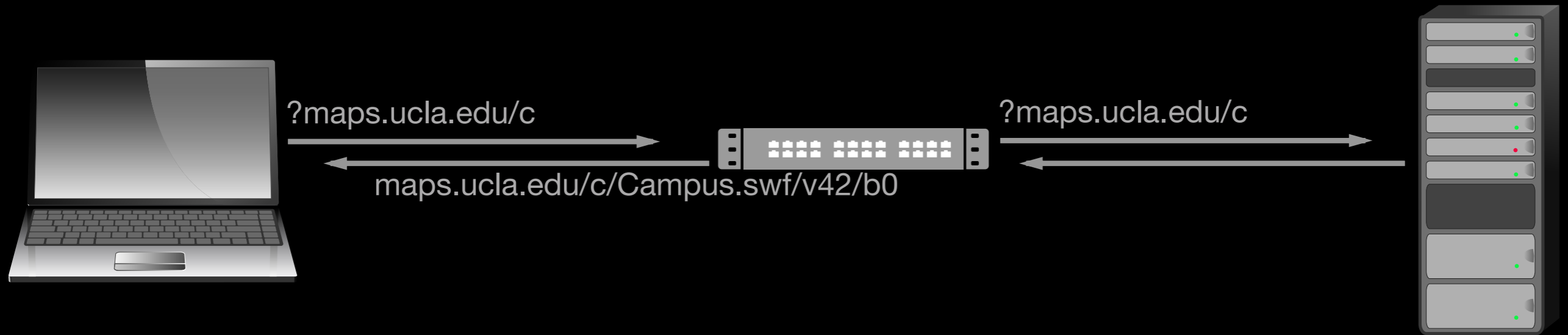
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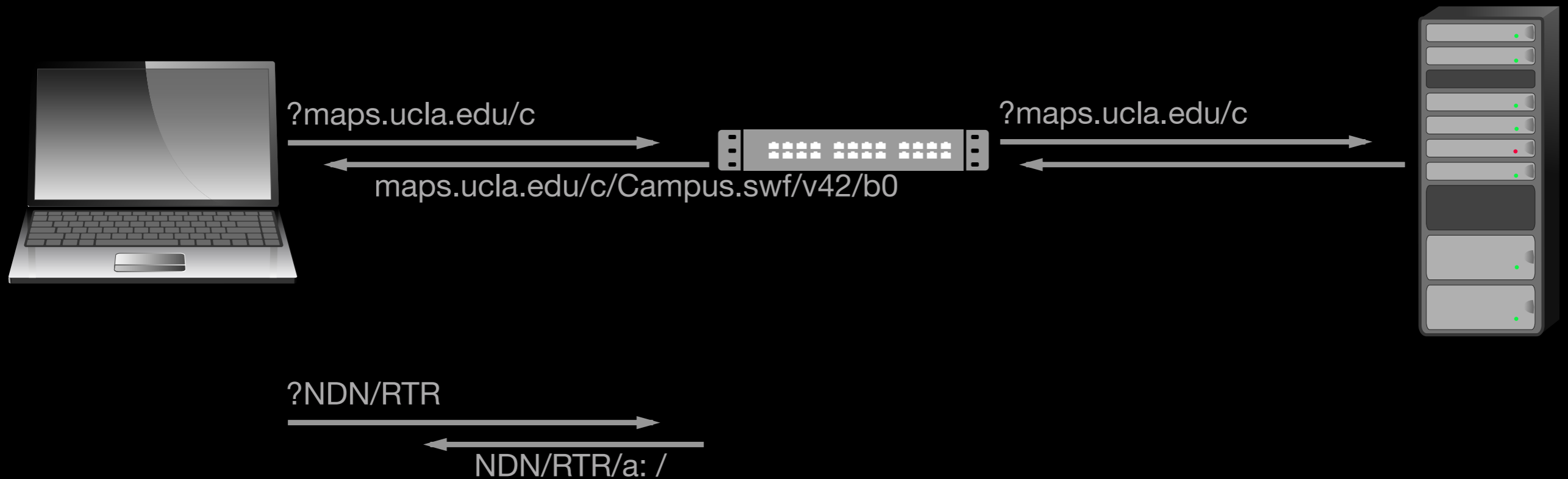
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How does NDN do this?



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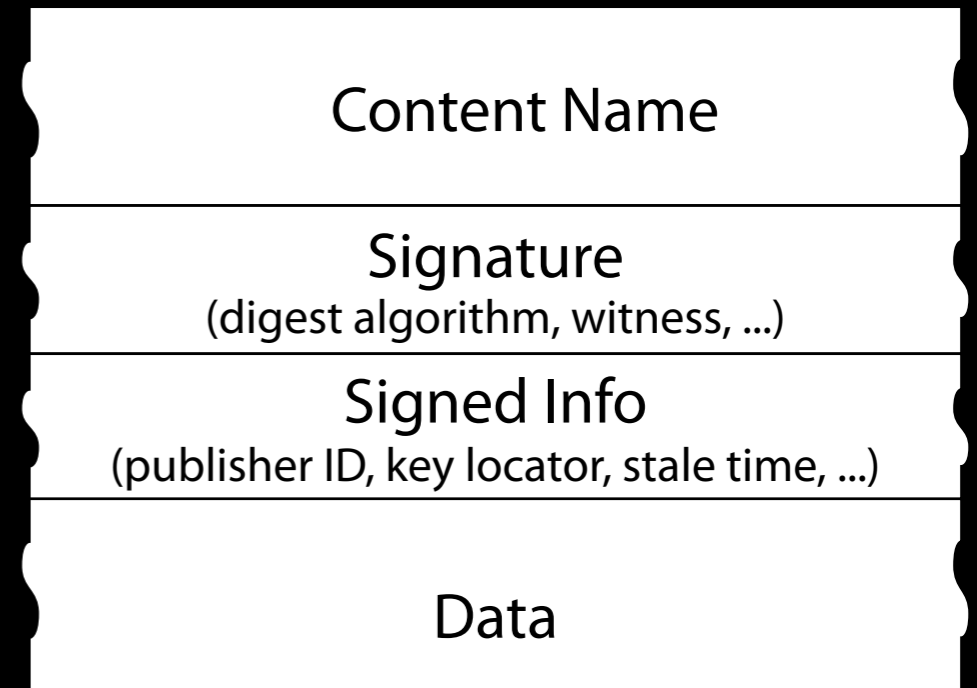


Note: No ARP
No DHCP
No addresses

NDN packets

NDN Data packets are structured objects with three parts:

- (opaque) data bytes
- A name for the data
- A signature over the name and data together with the name of the signing key (another NDN packet).



NDN Interest packets have only a name.

	IP	NDN
Entities	Interfaces (wire endpoints)	(Named) collections of data
Channel model	Point-to-point	Broadcast
Connectivity requirement	Fully connected	Eventually connected
Roles	Two: End system & Router	One: Information Supplicant

	IP	NDN
Communication model	Two-party Conversation	Any-to-any
Transport	Statefull	Stateless
Security model	Perimeter (protect the path)	Content-based (protect the data)
Trust models	NA	Any

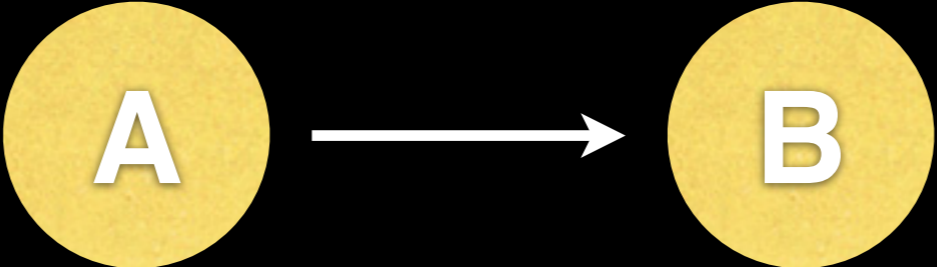
Routing differences

- IP routing must provide a globally consistent, loop-free, sink tree to every end-node.
 - ⇒ IP routing's goal to is remove choice.
- NDN packets can't loop so routing uses local choice of alternative data sources to maximize information delivery.
 - ⇒ NDN routing's goal is to provide choice.

NDN offers entirely new
ways to think about:

- Transport
(set reconciliation vs. conversation)
- Routing
(geography vs. paths)
- Security
(trust vs. identity)





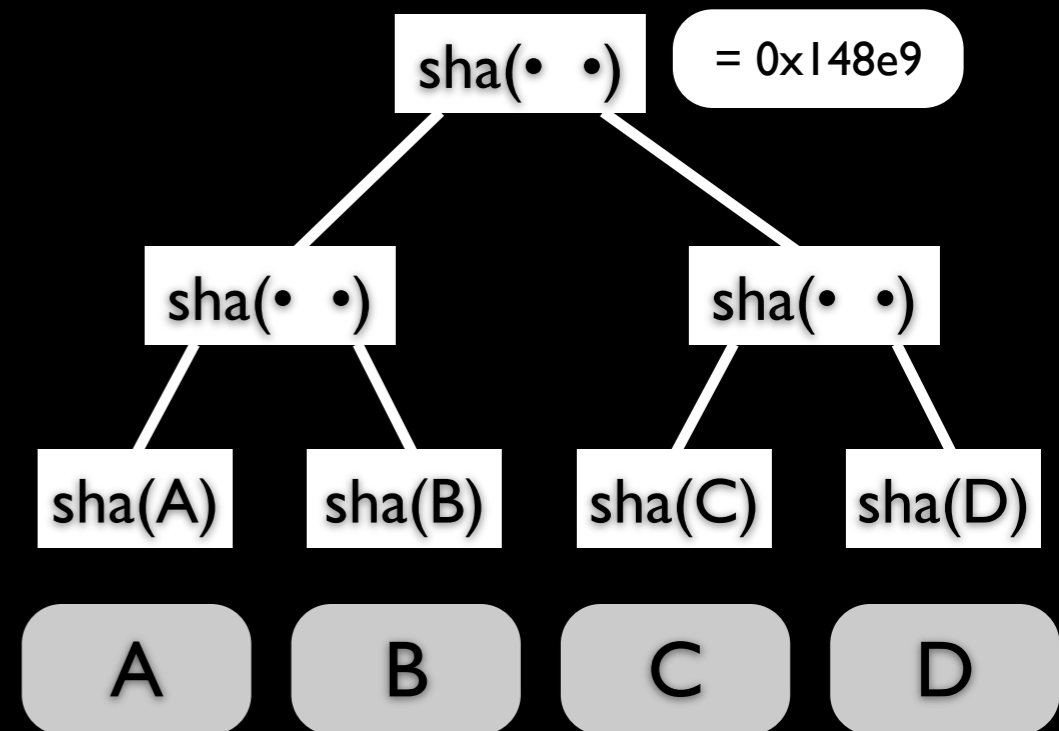
Stuff to send



Sequence number

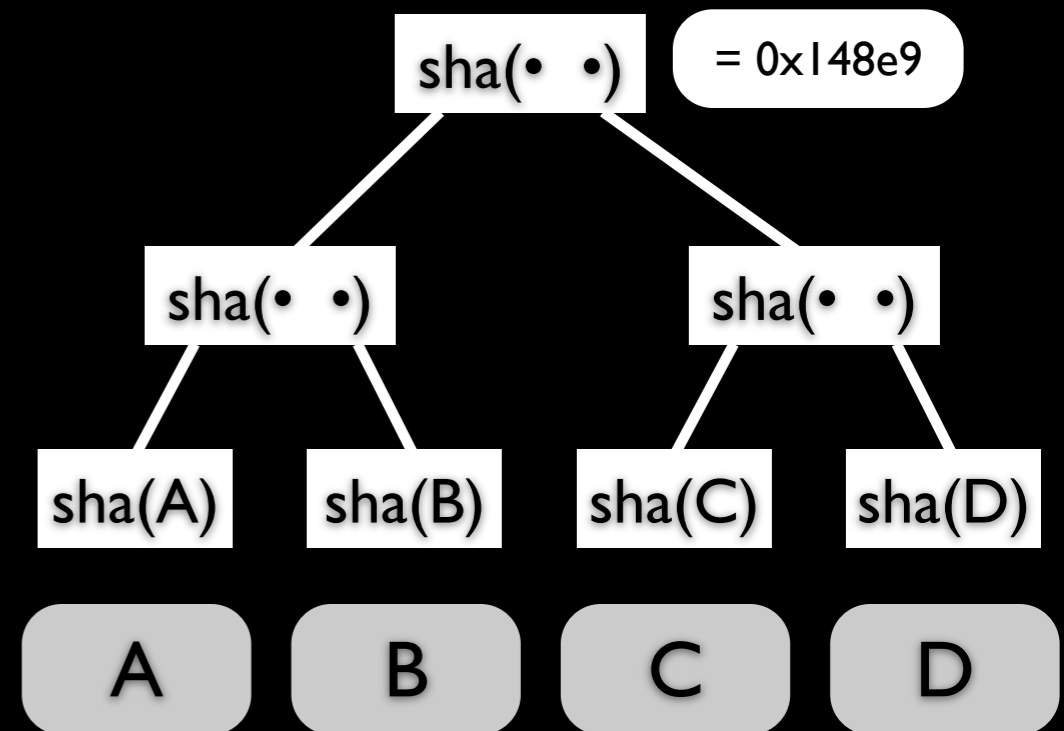


Bob's /foo/bar collection



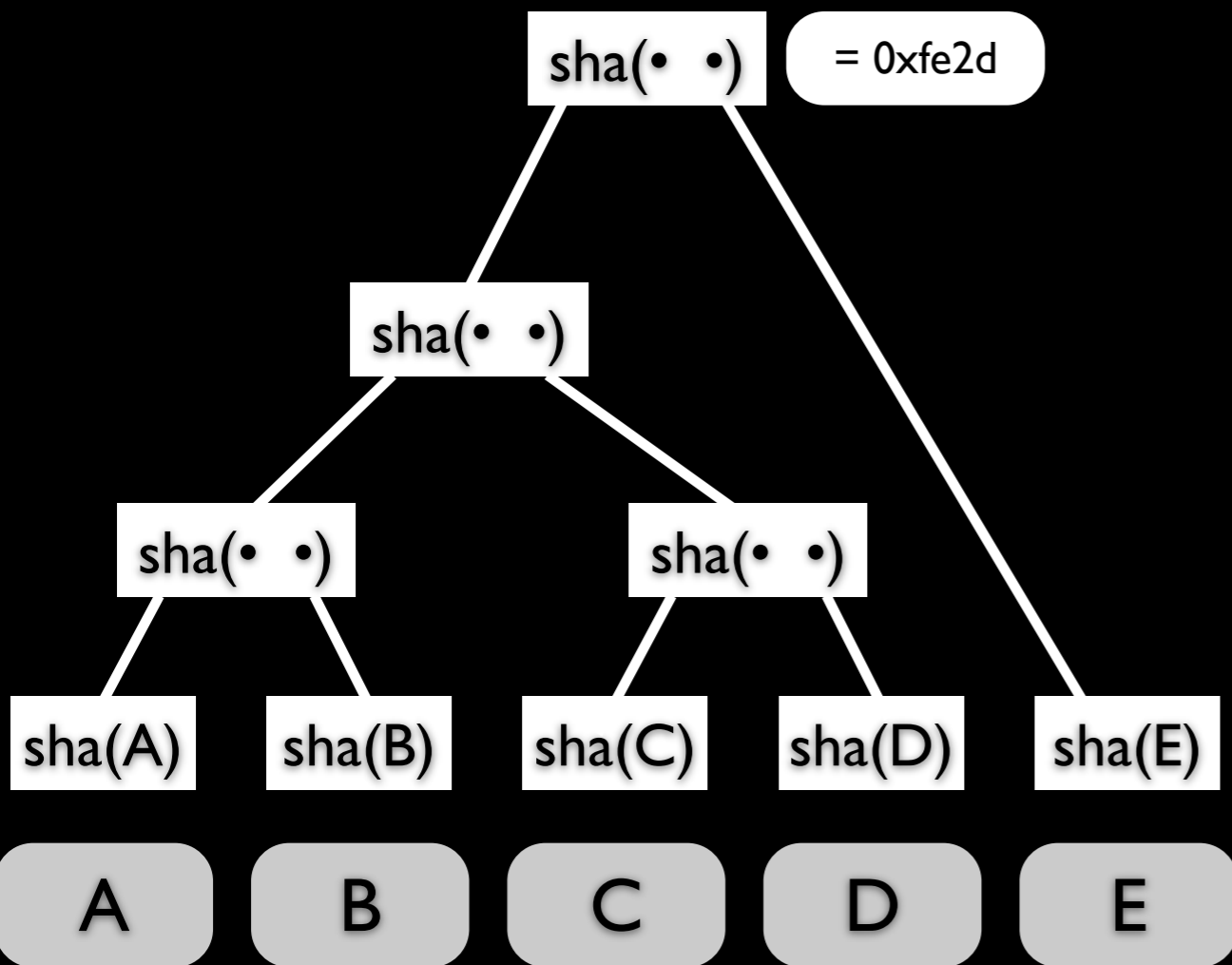
Bob's /foo/bar collection

? /ndn/broadcast/sync/
foo/bar/0x148e9



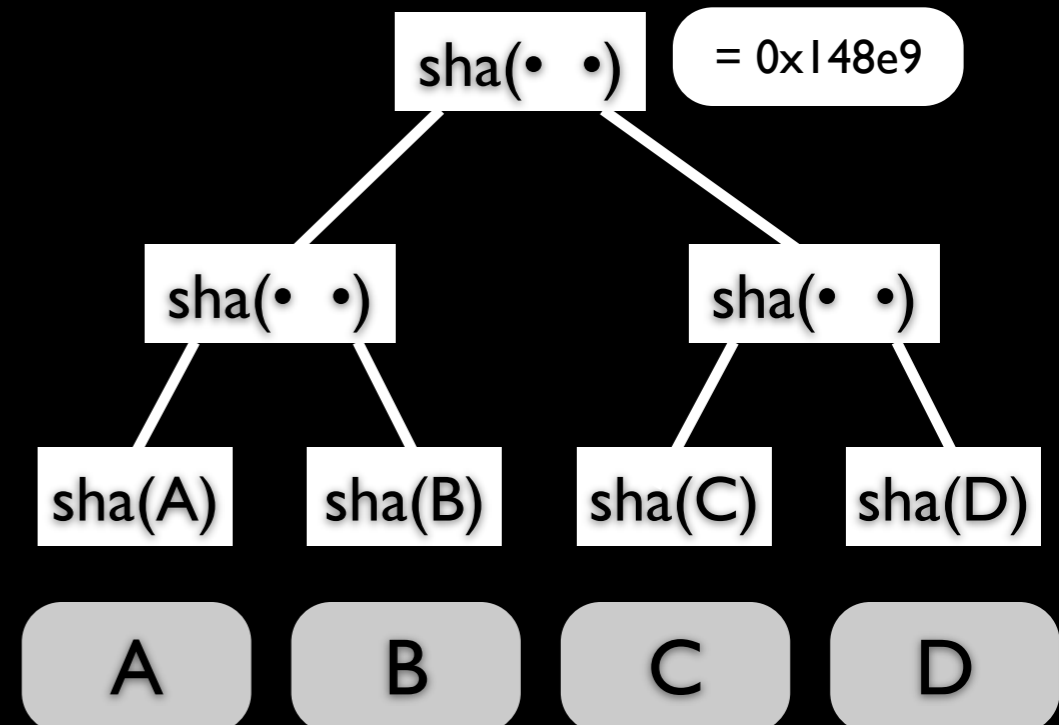
Bob's /foo/bar collection

/ndn/broadcast/sync/foo/bar/
0x148e9/0xfe2d: E



Alice's /foo/bar collection

? /ndn/broadcast/sync/
foo/bar/0x148e9



Bob's /foo/bar collection

Hyberbolic Greedy Geographic Routing

Geographic = route to location, not path following

Greedy = send to adjacent node closest to dest

Hyperbolic = distances calculated in hyperbolic
plane

So what?

- No routing protocols; no routing chatter
- ‘Reachability’ is binding names to locations, not names to paths(a DNS problem, not OSPF/BGP).
- Locations have ‘global’ meaning so nodes can configure / assist one another.