Do we need an ICMP for NDN

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The Value of Request-Response

NDN was designed from a strong security angle:

- Data transfer is always solicited
- No explicit addressing of nodes (except next hop)

→Makes DDoS difficult

Interest flooding?

- Interests small (without data)
- Bursts can be mitigated by rate control and backpressure
- State management is problem of infrastructure, not end node

We don’t want sender-controlled data flows to a remote node

Need for Pushme?

- How to bootstrap a network?
- How to disseminate control state efficiently?
- How to initiate a flow to the remote?
- How to manage alerts?

… without addressing remote network nodes!

Considered Harmful

- Push packet
  - This just breaks the paradigm
- Persistent Interest/persistent subscription (COPSS)
  - Implements a persistent data path (for DDoS)
  - Can cause broadcast disasters (the pushme-pullyou case)
- Interest notification (data in Interest, Ack in ‘data’)
  - ‘Push light’ packet
  - Again breaks the paradigm

Semantic Overloading

Interest-follows-Interest

- Obfuscates communication logic
- Inflicts with message semantics
- Fools the forwarders
  - Initiates hop-wise unwanted transactions with stale states
  - …?

Control Plane?

Wanted:

- A clean message design for
  - Control state transfer
  - Alerting of errors or informational
- Between neighboring hops
  - No new attack surface
  - No new routing or forwarding logic
- Dedicated (appropriate) processing in the stack
  - No unwanted transactional state
  - No intermingling with Interest-data communication logic