

# Ack Messages for ICN

Mark Stapp, Cisco  
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# Introduction

- Application service time vs network RTT
- Application-scale Interest ttls
  - Block retransmissions (from *all* clients)
  - Impact on PIT size
  - May be correct for *first* Interests, where server has to retrieve and/or compute
- Network RTT Interest ttls
  - May lose PIT path before server/peer can respond
  - Short ttls as DoS vector?
    - PIT entry exhaustion/turnover/churn
  - May be correct for *subsequent* Interests, where server has results available
- What should the Interest ttl be?
- Could explicit signalling help applications and routers?
  - Cue the InterestAck...

# InterestAck Properties

- Follow but do not consume the PIT path
- Compact message; try to avoid disrupting flow balance
- Ack multiple Interests for different segments/chunks
  - Use a list of segment numbers, or a base value + bitmap
  - Server processing is often 'batched'
- Can have a TTL, can be cacheable
  - Benefits multiple clients
- Can convey info useful to application, like server load, estimated service time
  - Can help tune subsequent Interests' TTLs
- Coordination between stack/OS and application
  - Distinct from TCP Ack

# InterestAck Packet



- Explicit Packet/Message Type
- Name
  - Match Interest name
  - Hash form for compression; use flag, or dedicated name prefix: */intack/[HASH]*
- Multi-Interest Ack using list or bitmap of segment numbers

# InterestAck Packet (2)



- Service Time hint
  - Example of additional info in TLVs: Server Load, e.g.
  - Support alternate/redirect a la "thunk" ?
- Expiration or TTL
- Signature block
  - May be pre-generated?
  - Unsigned form also permitted if useful?

# InterestAck ... Is Not Enough

- If clients' Interests share names and meet, they may still share (ttl) fate
  - Long PIT entry ttls block retransmissions
- PIT processing needs to allow retransmissions at some interval
  - Still difficult to determine a value that will not lead to blocking of ordered traffic
  - May need to be dynamic, incorporating policy, load, redundancy status, prefix-specific info

# Summary

- Difference between application service time and network RTT is a problem
- InterestAck allows for explicit signalling
  - Can also convey info of use to application and/or network stack
- Still need enhancements to PIT processing – simplistic version is not adequate
- Futures: relationship with NFN "thunk," manifests