Encrypted IPv6 Performance and Diagnostic Metrics Version 2 (EPDMv2) Destination Option

draft-elkins-ippm-encrypted-pdmv2-00

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Setting the stage

- We need performance data
- Metadata can be misused
- We need encryption
- We propose a light-weight, scalable methodology
- Maybe can be used by: IOAM? other packet headers? IPv6 extension headers? PING? Traceroute?

PDM: Misuse

- **Passive Attacks**
  - Learn possible weak points
    - e.g., to launch a DoS attack,
- **Active Attacks**
  - Trigger inappropriate network management operations.

PDMv2 (How does it work? - Overview)

- PDMv2 provides an option for encrypted as well as unencrypted data flow.

For the encrypted flow:

- PDMv2 consists of a registration phase and data transfer.

- The registration phase consists of "SharedSecret" negotiation.
  - How will this negotiation take place?
  - What about the large enterprises having many servers and client?

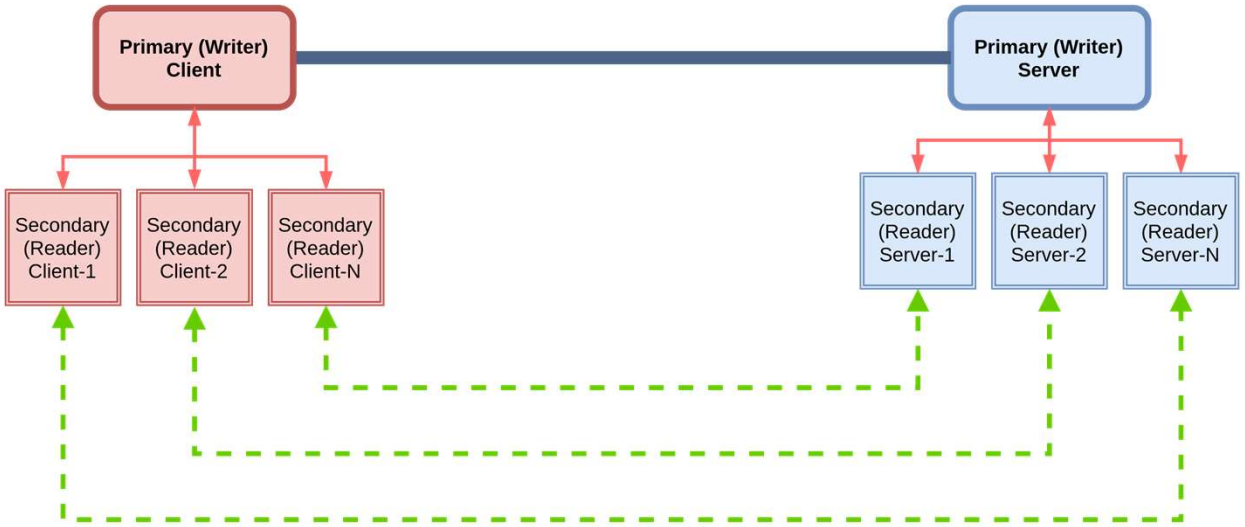
- The registration phase is "one time" process done before PDM data transfer.

- In a PDM data flow, there will encryption-decryption and occasional KDF taking place.

For the unencrypted flow:

- Similar to PDM

PDMv2 Scenario and Secured paths



Links	Entity-A	Entity-B	Security Model
	Primary (Writer) Client	Primary (Writer) Server	Yes
	Primary (Writer) Client & Server	Secondary (Reader) Client /Server	<tbd>
	Secondary (Reader) Client-N	Secondary (Reader) Server-N	Yes

Why Primary Client / Primary Server Scenario?

- Enterprises typically have multiple servers and many, many clients
- These clients and servers may be in multiple locations
- It may be less overhead to have a secure location (ex. Shared database) for every server / client to share keys
- Otherwise, each client needs to keep track of the keys for each server

HPKE in PDMv2

1. **Registration Phase**
   - KEM -> Shared master secret

2. **Online Phase -> Every $2^{\wedge 15}$ packets**
   - KDF -> Temporary Session Key
   - PRSEQ (Pseudo-random non-repeating sequence) -> Nonce
     - Runtime generation or pre-generation (tbd)

3. **Online Phase -> Every packet**
   - AEAD-> Encryption & Decryption

QUESTIONS ???????