

# New CoAP Block-Wise Transfer Options For Faster Transmission

[draft-bosh-core-new-block-04](#)

IETF CoRE Meeting, 28<sup>th</sup> July 2020

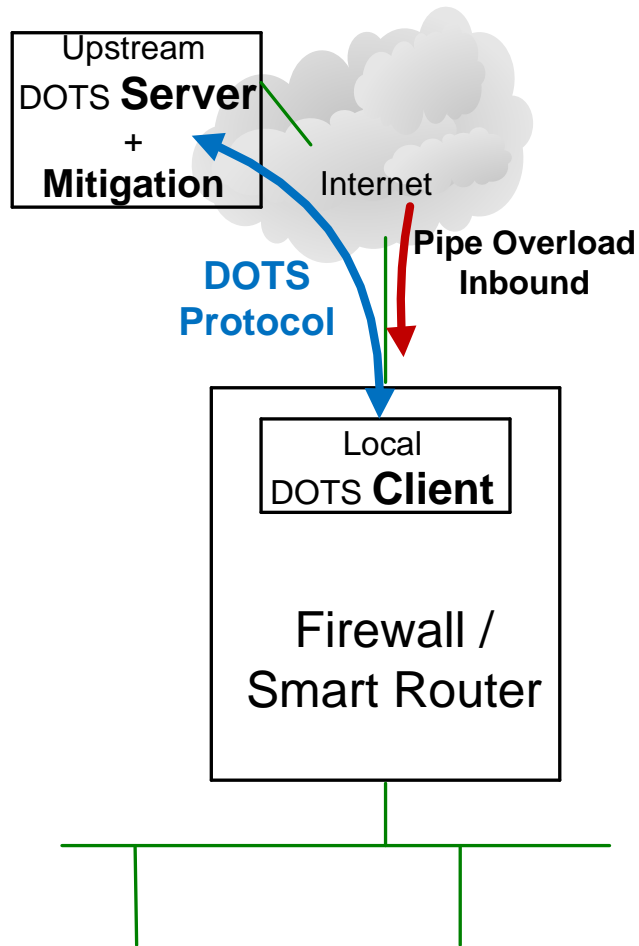
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# Agenda

- Handling blocks in lossy environments:  
The DOTS Case
- The Solution
  - Block3 Option
  - Block4 Option
- Next Steps

# Sample Target Deployment



- DDoS Open Threat Signalling (DOTS)
- DOTS: App – CBOR – CoAP – DTLS – IP
- Client requests mitigation (NON)
- Server updates with simple DOTS mitigation status (NON)
- Inbound Pipe Overload
  - Clients can still request mitigations
  - Mitigation should be able to control pipe overload
- See [RFC8782](https://www.rfc-editor.org/rfc/rfc8782) for more details

# DOTS-inferred CoAP Requirements

- Need to transfer body with ***multiple payloads***
- Handle packet loss
  - ***Need recovery*** mechanism
- Cannot rely on getting responses (***Pipe overload***)
  - Request/Response model lock-step fails
- ***Fast*** transfer for large bodies
  - Lock-step model slows things down (RTT)
  - Packet interchange reduction
- ***Utilize*** other CoAP options where possible
- ***Maintain existing CoAP*** ethos/methodology

# Solution

- BLOCK3 with BLOCK1 characteristics
- BLOCK4 with BLOCK2 characteristics

Number	C	U	N	R	Name	Format	Length	Default
TBA1	x				Block3	uint	0-3	(none)
TBA2	x			x	Block4	uint	0-3	(none)

- OSCORE Class E and Class U

# BLOCK3

- BLOCK3 has BLOCK1 characteristics
- *Individual payload 2.xx response not required*
  - *2.31 (Continue) not used*
- Use of NON (recommended) or increase of NSTART
- Requires CoAP Option Request-Tag unique per body
- Each request payload has unique Token
- New TBA3 4.xx (Missing Payloads) to indicate missing payloads
- Every MAX\_PAYLOAD (default 10) pause/check guard (ACK\_TIMEOUT or CON)
- Body subject to PROBING\_RATE

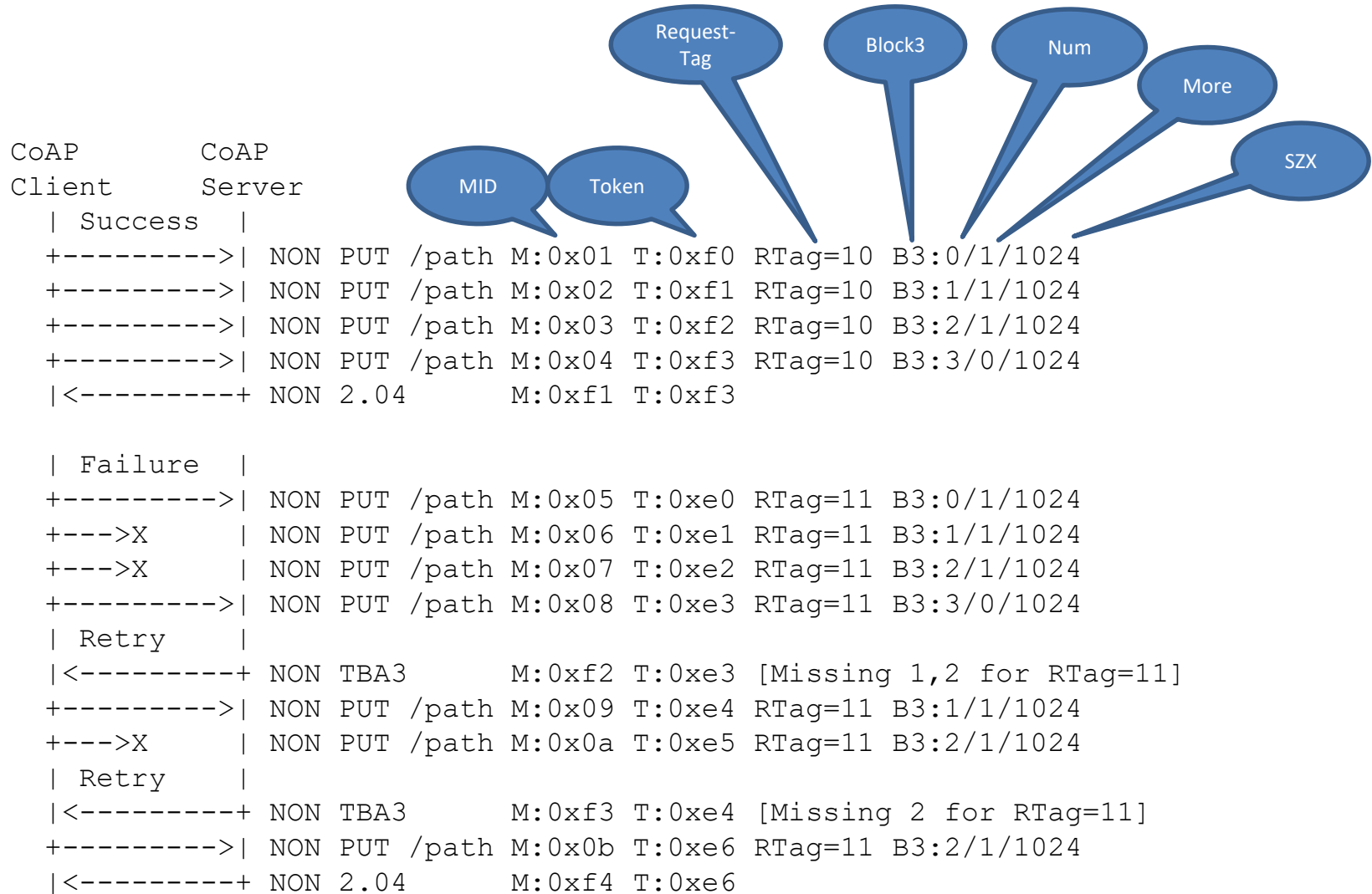
Congestion  
Control

# Response TBA3 4.xx (Missing Payloads)

- CBOR encoded diagnostic response
- Content-Format  
“application/missing-blocks+cbor-seq”
- CDDL

```
TBA3-payload = (request-tag, missing-block-list)
; A copy of the opaque Request-Tag value
request-tag = bstr
missing-block-list = [1 * missing-block-number]
; A unique block number not received
missing-block-number = uint
```

# BLOCK3 Example





# BLOCK4

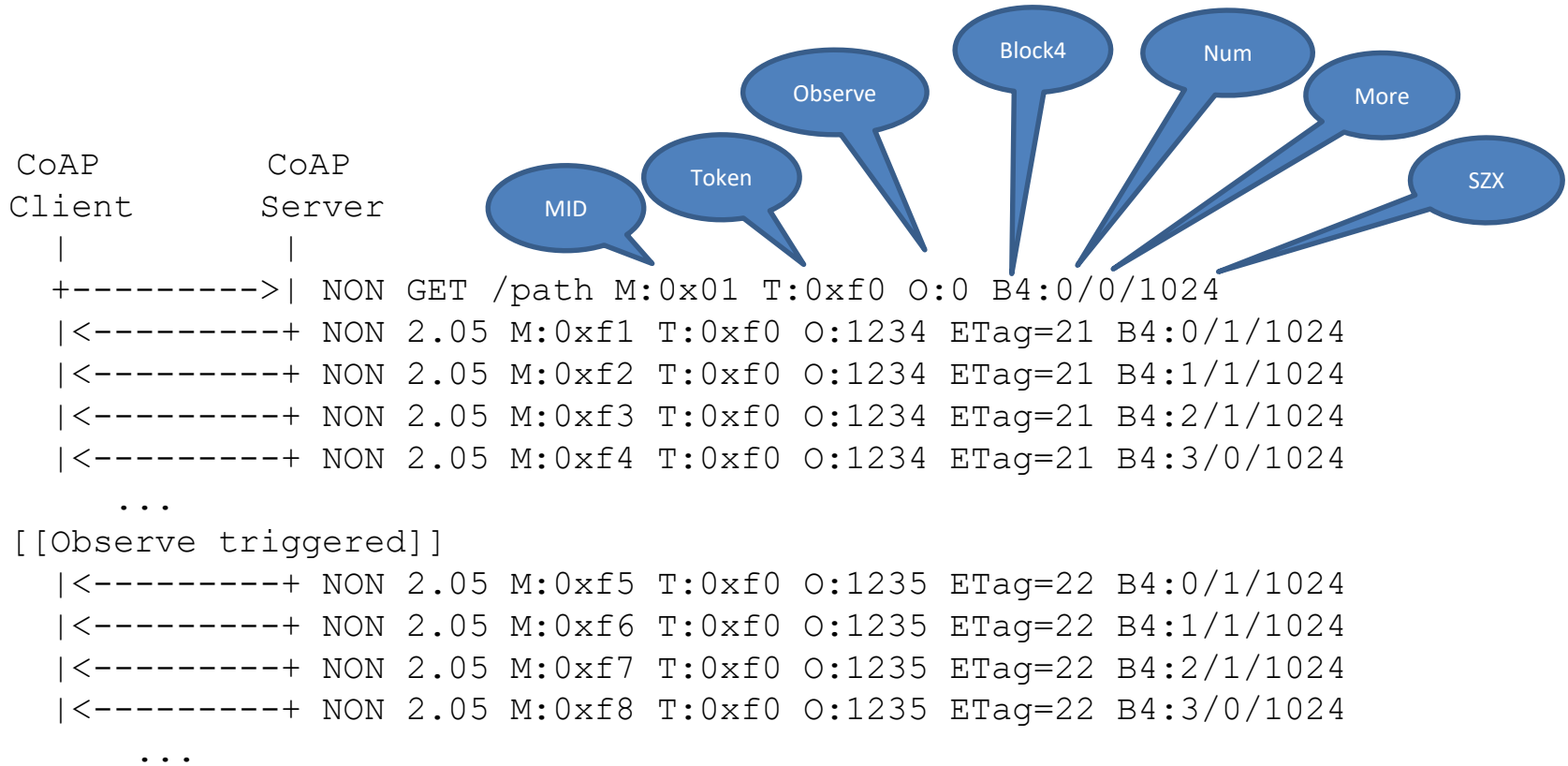
- BLOCK4 has BLOCK2 characteristics
- GET with BLOCK4 triggers BLOCK4 response instead of BLOCK2 if needed
  - Missing blocks indicated by GET with multiple BLOCK4
- Use of NON (recommended) or increase of NSTART
- Requires CoAP Option ETag unique per body
- Every MAX\_PAYLOAD (default 10) pause/check guard (ACK\_TIMEOUT or CON)
- Body subject to PROBING\_RATE

Congestion  
Control

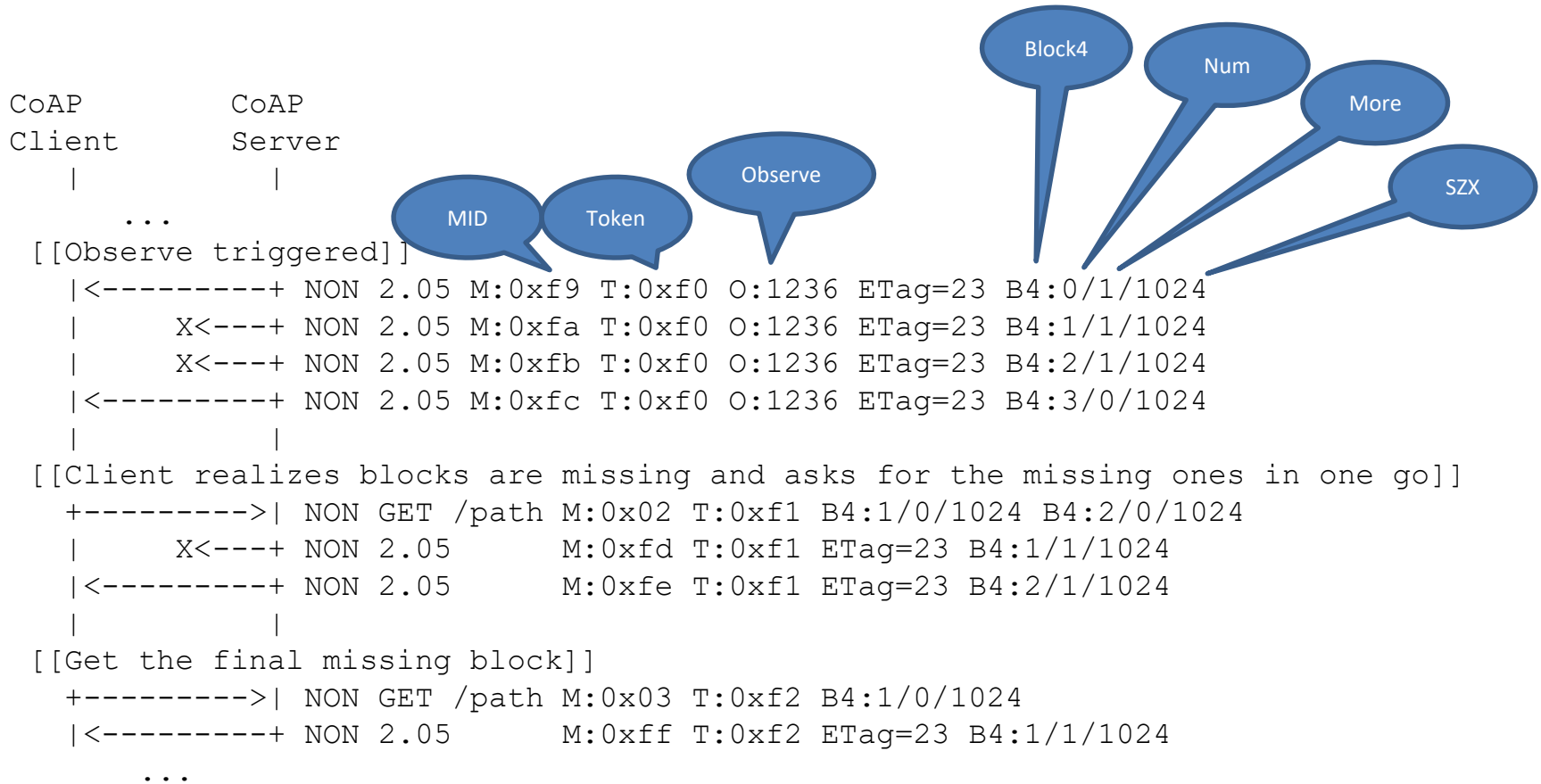
# BLOCK4 with Observe

- Same Observe value returned in all of the pseudo responses for the same body
  - Block Number 0 could get dropped
- Same Token is used in the set of pseudo responses
- New Token used for requesting missing blocks
  - Set of retry pseudo responses use new Token
- Next Observe pseudo response uses original Observe setup Token

# BLOCK4 Example 1



# BLOCK4 Example 2



# Status & Next Steps

- The draft was discussed in two dedicated interim meetings
  - All comments raised in these interims and also in the mailing list are addressed
  - Simplified design with reuse of existing CoAP options
- Request adoption as a WG Document

Thank You