EMQX File Transfer Response Duplication

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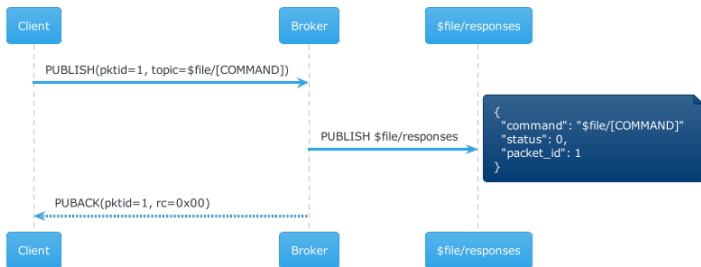2023

Response Duplication
Why Needed?

▶ Not suitable for all cases, like MQTT bridging
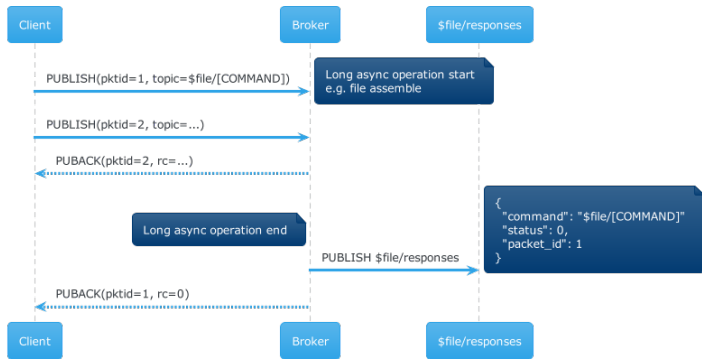▶ Not all client libraries have or have good support for QoS 1
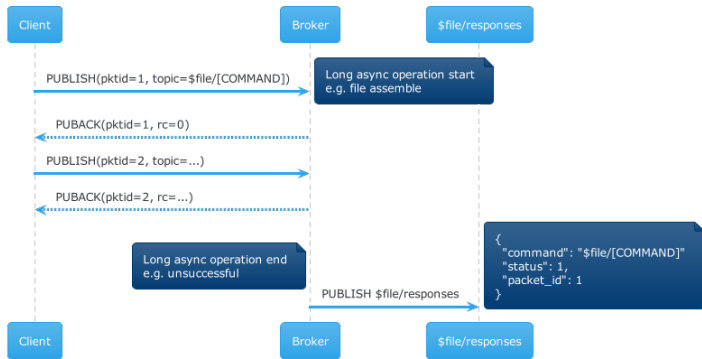PUBACKs

Response Duplication
Simple Case


```
Client                                    Broker              $file/responses

   ──PUBLISH(pktid=1, topic=$file/[COMMAND])──▶

                                    ──PUBLISH $file/responses──▶    { 
                                                                      "command": "$file/[COMMAND]"
                                                                      "status": 0,
                                                                      "packet_id": 1
                                                                    }

   ◀·····PUBACK(pktid=1, rc=0x00)·····

Client                                    Broker              $file/responses
```

Response Duplication
Async Case, Variant 1

Client — **Broker** — **$file/responses**

Client → Broker: PUBLISH(pktid=1, topic=$file/[COMMAND])

Long async operation start e.g. file assemble

Client → Broker: PUBLISH(pktid=2, topic=...)

Broker ⇢ Client: PUBACK(pktid=2, rc=...)

Long async operation end

Broker → $file/responses: PUBLISH $file/responses

```
{
  "command": "$file/[COMMAND]"
  "status": 0,
  "packet_id": 1
}
```

Broker ⇢ Client: PUBACK(pktid=1, rc=0)

Response Duplication
Async Case, Variant 2

Client | Broker | $file/responses

PUBLISH(pktid=1, topic=$file/[COMMAND])

Long async operation start
e.g. file assemble

PUBACK(pktid=1, rc=0)

PUBLISH(pktid=2, topic=...)

PUBACK(pktid=2, rc=...)

Long async operation end
e.g. unsuccessful

PUBLISH $file/responses

```
{
  "command": "$file/[COMMAND]"
  "status": 1,
  "packet_id": 1
}
```

Response Duplication
Multiple Async Case, Variant 1

Response Duplication
Multiple Async Case, Variant 2
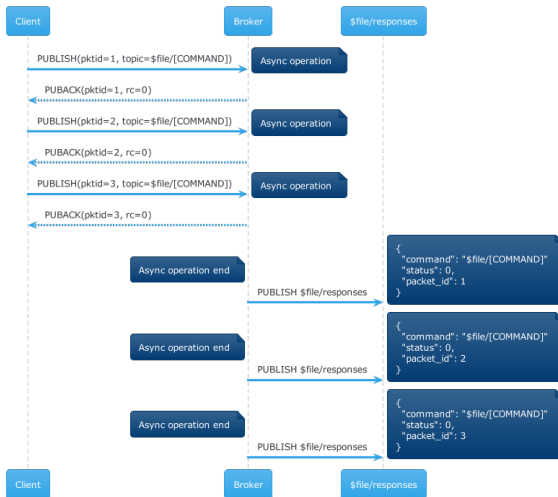
Response Duplication: Q
Flow Options

Which flow options should we support?

- ▶ Async PUBACK (implemented)
- ▶ Async PUBACK + PUBLISH to Topic
- ▶ Sync PUBACK ($rc = 0$) + PUBLISH to Topic

Response Duplication
Async PUBACK

▶ The Variable Header component of many of the MQTT
  Control Packet types includes a Two Byte Integer
  Packet Identifier field

▶ For "AWS-friendly" FT we may have thousands of async
  PUBLISHes

▶ We have only 65536 packet identifiers

Response Duplication: Q
Default topic scheme for responses

- ▶ $file/[FILEID]/response
- ▶ $file/response
- ▶ Other variant?

For custom topics, we support REQUEST/RESPONSE topic scheme. Should we support custom default response topic scheme in config?

Thank you!