



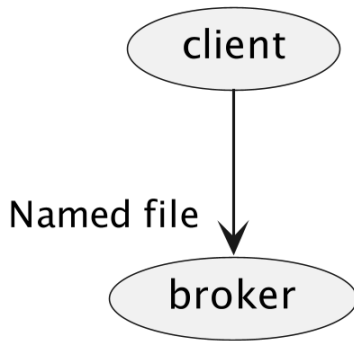
# EMQX File Transfer

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2023





# File Transfer Idea

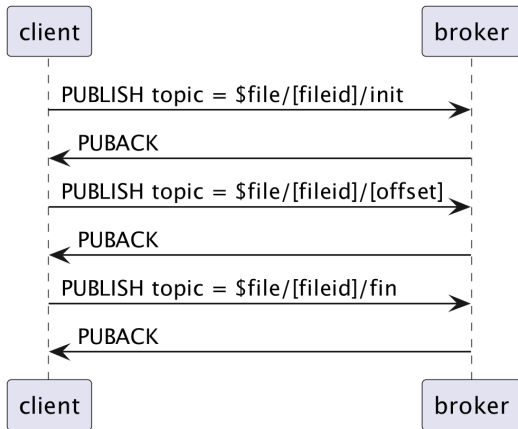




## File Transfer Constraints

- ▶ EIP 21
- ▶ Over MQTT
- ▶ Chunked
- ▶ No additional connections from client
- ▶ No subscription to special topics
- ▶ Resumable

# File Transfer Protocol





## File Transfer Challenges

- ▶ Avoid storing data and even metadata in Mnesia
- ▶ Deal with clients migrating between nodes
- ▶ Deal with potentially long-running operations (involving disk and network I/O)
- ▶ Be minimally invasive\*



## Challenge 1: Avoid Mnesia



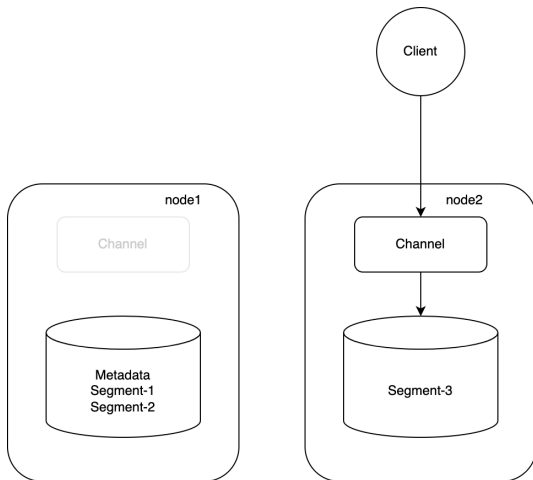
```
_build/emqx/rel/emqx/data/file_transfer
├─ client-2
│   └─ f-1
│       ├── frags
│       │   ├── MANIFEST.json
│       │   ├── SEG.0.100
│       │   └─ SEG.100.68
│       ├── result
│       │   └─ test-file.txt
│       └─ tmp
```

5 directories, 4 files





## Challenge 2: Migrating clients

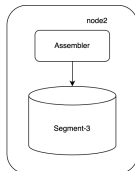




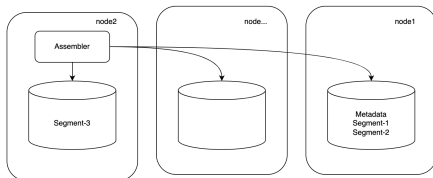
## Challenge 2: Migrating clients

### Approach 1: Two step assemble

Step 1



Step 2

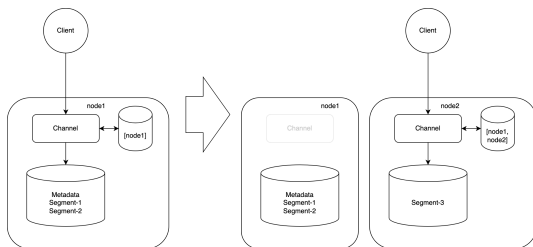






## Challenge 2: Migrating clients

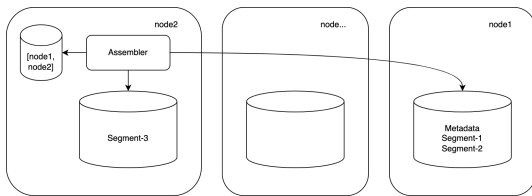
### Approach 2: Replicated data





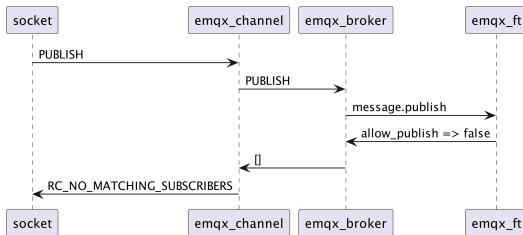
## Challenge 2: Migrating clients

### Approach 2: One step assemble



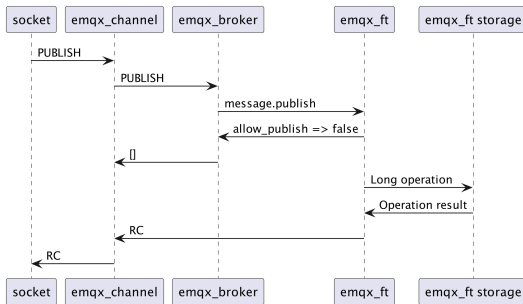


## Challenge 3: Long-running operations PUBLISH handling



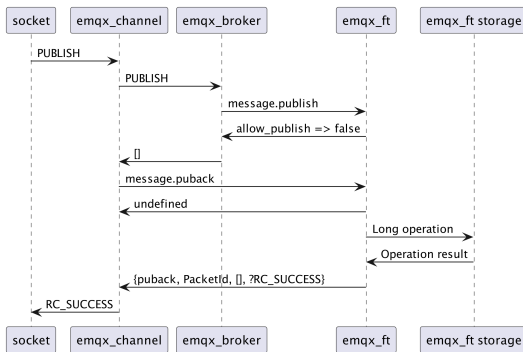
## Challenge 3: Long-running operations

PUBLISH handling: Desired





## Challenge 3: Long-running operations PUBLISH handling: Implemented





## File Transfer

TODO: Must have

- ▶ Ensure reliability of the storage part (testing, IO error handling, GC, etc.)
- ▶ Ensure reliability of the MQTT part (testing, MQTT client scenarios handling, etc.)
- ▶ Consider making all FT methods async, not only `fin`
- ▶ Improve observability (API)





## File Transfer

TODO: Should have

- ▶ Implement quotas: storage, bandwidth, tps
- ▶ Implement metrics



Thank you!

