# fast-repo update

5/29/2019

# original motivation

- slide from 10/10/2018:
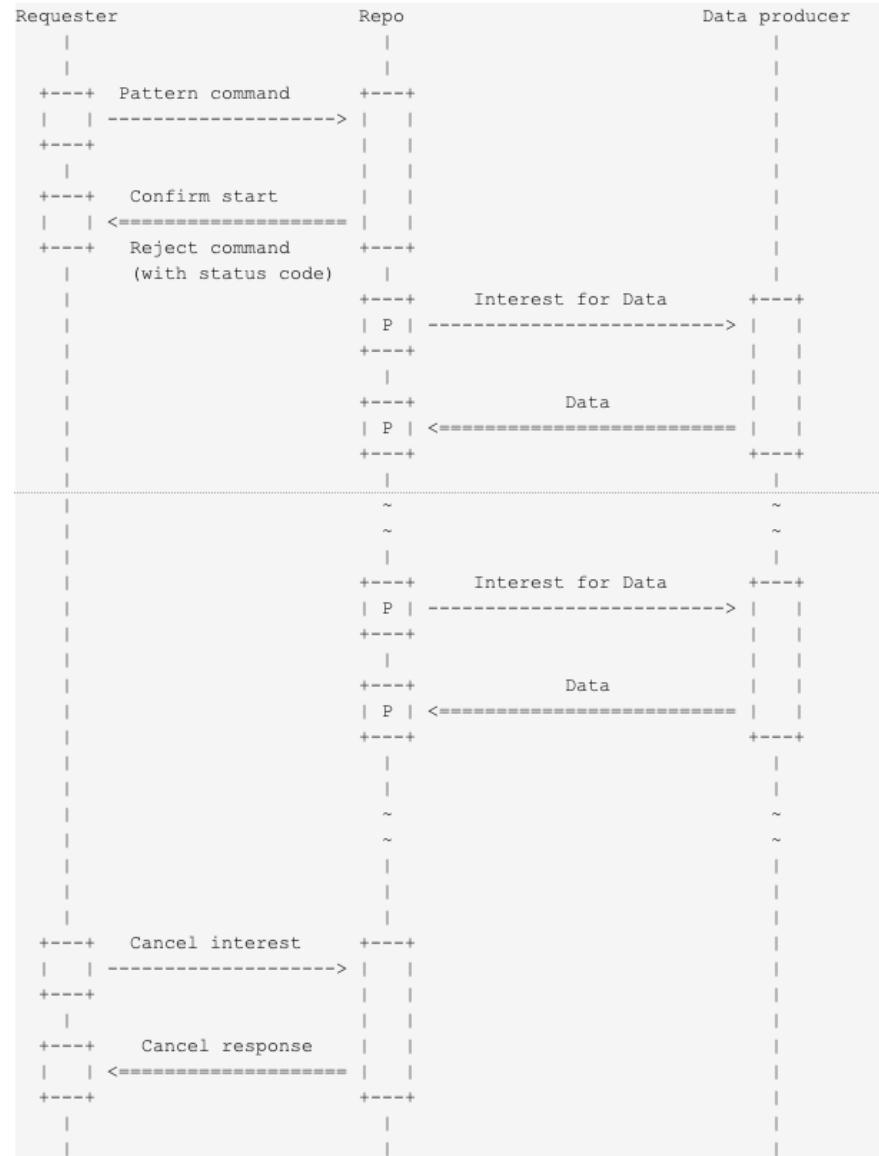
## what is needed

- store generalized objects in persistent storage
- store generalized object **streams** in persistent storage
- store **ndnrtc streams** in persistent storage
- serve stored data **immediately**

# how it was approached

- GObj, GObjStream and NDN-RTC are application-defined namespaces

    => requires custom fetching code

- fast-repo implements **pattern-fetching**
    - if fast-repo **supports** requested pattern, it'll fetch the custom namespace
    - patterns are implemented as subclasses in the codebase
    - right now, we only have NDN-RTC v3 pattern implemented

# pattern fetching protocol ([by Xinyu](#))

```
Requester                      Repo                        Data producer
   |                             |                               |
   |                             |                               |
 +---+   Pattern command       +---+                             |
 |   | --------------------->  |   |                             |
 +---+                         |   |                             |
   |                           |   |                             |
 +---+    Confirm start        |   |                             |
 |   | <=====================  |   |                             |
 +---+    Reject command       +---+                             |
   |      (with status code)     |                               |
   |                           +---+   Interest for Data      +---+
   |                           | P | --------------------------> |   |
   |                           +---+                           |   |
   |                             |                             |   |
   |                           +---+           Data            |   |
   |                           | P | <=========================|   |
   |                           +---+                           +---+
   |                             |                               |
   |                             ~                               ~
   |                             ~                               ~
   |                             |                               |
   |                           +---+   Interest for Data      +---+
   |                           | P | --------------------------> |   |
   |                           +---+                           |   |
   |                             |                             |   |
   |                           +---+           Data            |   |
   |                           | P | <=========================|   |
   |                           +---+                           +---+
   |                             |                               |
   |                             |                               |
   |                             ~                               ~
   |                             ~                               ~
   |                             |                               |
   |                             |                               |
   |                             |                               |
 +---+   Cancel interest       +---+                             |
 |   | --------------------->  |   |                             |
 +---+                         |   |                             |
   |                           |   |                             |
 +---+   Cancel response       |   |                             |
 |   | <=====================  |   |                             |
 +---+                         +---+                             |
   |                             |                               |
   |                             |                               |
```

# pattern fetching protocol (cont.)

- pattern command:
  - /repo/pattern/<**RepoCommandParameter**>/<timestamp>/<random-value>/<SignatureInfo>/<SignatureValue>

- **Name** (required) should be /<PatternName>/<FetchPrefix>.
- **PatternName** is the name of FetchPattern.
- **FetchPrefix** is the prefix which will be fetched.
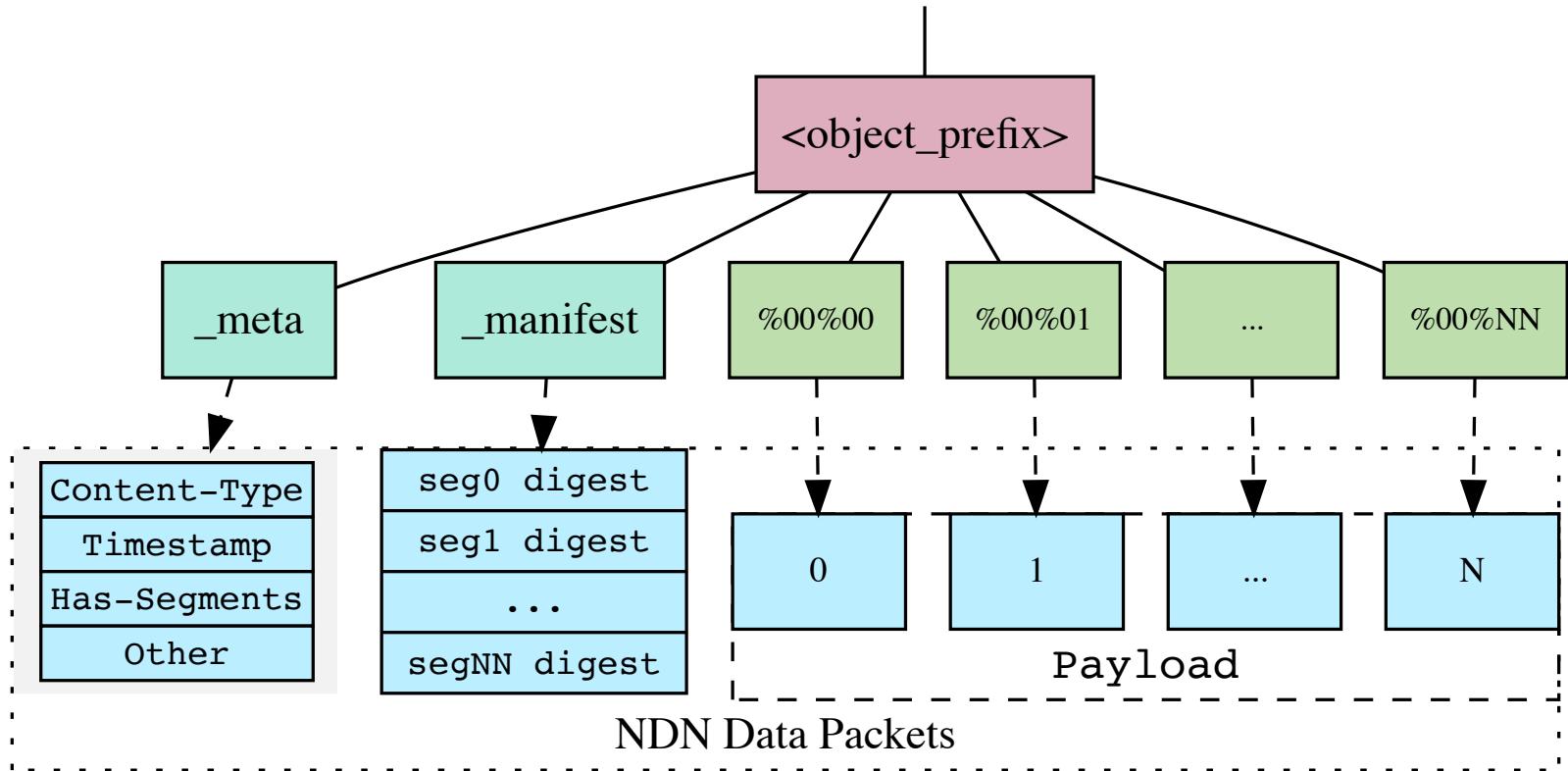
# fast-repo vs repo-ng

| **fast-repo** | **repo-ng** |
|---|---|
| *RocksDB* | *SQL DB (SQLLite?)* |

```
                          🚫  |✅ Basic Repo Insertion Protocol
                              |✅  - Watched Prefix Insertion
                              |✅ Tcp Bulk Insert
                              |✅ Repo Deletion Protocol
  ✅ Pattern Fetching         |🚫
  ✅  - NDN-RTC Stream        |🚫
  ✅  - Counter               |🚫
      - GObj                  |🚫
      - GObjStream            |🚫
```

🚫 - won't implement
❗ - TBD
✅ - implemented

# fast-repo requirements
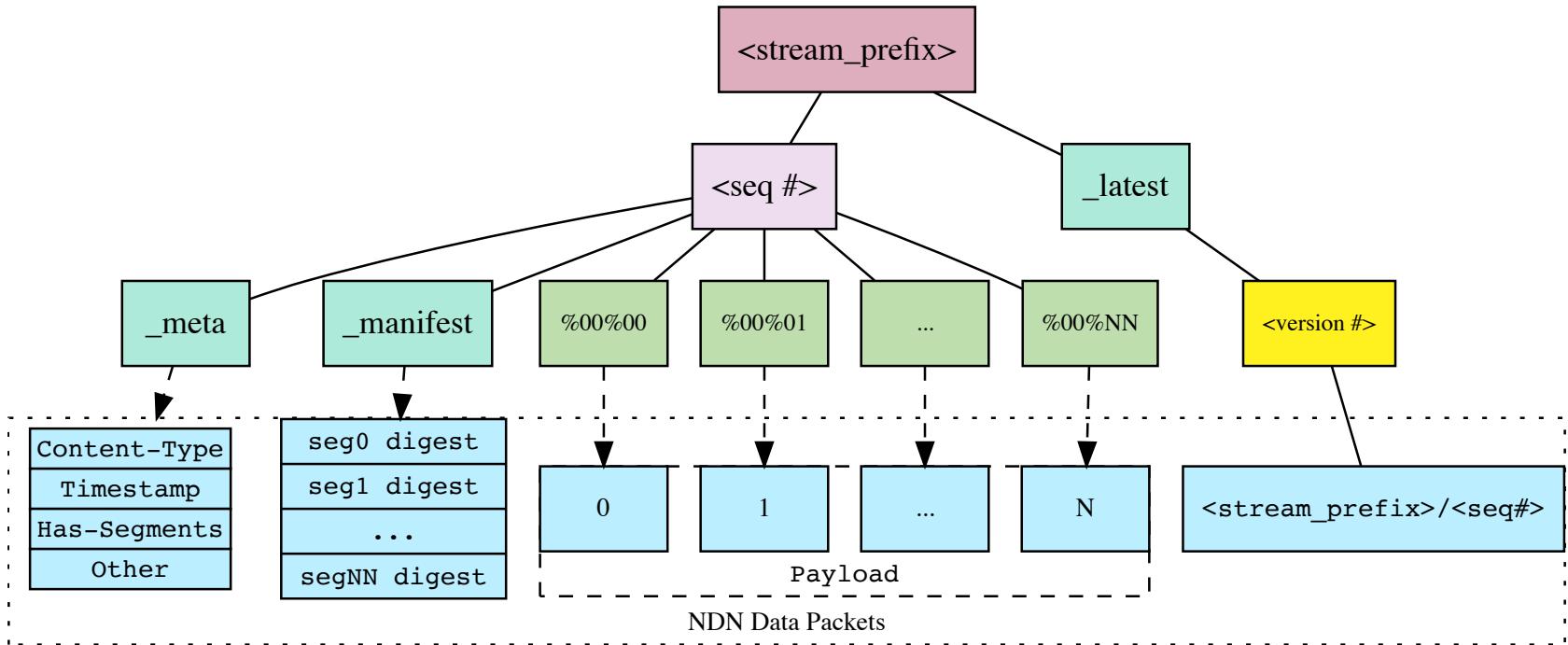
- https://github.com/remap/fast-repo
- C++ codebase is set up with the following dependencies:
    - NDN-CPP
    - NDN-CNL
    - Protobuf
    - RocksDB
    - Boost

# GObj namespace

# GObjStream namespace

<stream_prefix>

<seq #>

_latest

_meta

_manifest

%00%00

%00%01

...

%00%NN

<version #>

| Content-Type |
|---|
| Timestamp |
| Has-Segments |
| Other |

| seg0 digest |
|---|
| seg1 digest |
| ... |
| segNN digest |

| 0 | 1 | ... | N |
|---|---|---|---|

Payload

<stream_prefix>/<seq#>

NDN Data Packets

# NDN-RTC v4 namespace