List Pagination Mechanisms for NETCONF and RESTCONF

draft-ietf-netconf-list-pagination-00
draft-ietf-netconf-list-pagination-nc-00
draft-ietf-netconf-list-pagination-rc-00

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Motivation and Goal

- To better support user-facing client interfaces to retrieve large number of entries from lists or leaf-lists.
  - Applicable to both config data and operational data.
  - Examples: traffic logs, interfaces, ACLs, etc.
- Server-side processing reduces latency, bandwidth, and client-resources.
- Enables servers to leverage indexes maintained by their backend storage system.

List Pagination Suite Overview

- List Pagination for YANG-driven Protocols (LP)
  - draft-ietf-netconf-list-pagination-00
  - A standard mechanism to control the filtering, and retrieval of entries of list or leaf-list.
- NETCONF Extensions to support List Pagination (LP-NC)
  - draft-ietf-netconf-list-pagination-nc-00
- RESTCONF Extensions to support List Pagination (LP-RC)
  - draft-ietf-netconf-list-pagination-rc-00

Current status

- Drafts are stable and no change has been published since IETF 114
- A few questions has been raised
  - Cursor based pagination (without snapshots)
  - Paginating a snapshot of the datastore

Cursor based pagination

- Query parameters
  - “cursor”
    - A base64 encoded position
    - Start position? Empty or sentinel value?
  - “limit”
    - The amount of posts in the requested page

Cursor based pagination

- Base64 encoded position cursors
  - Opaque value but will generally be a unique address in the list or leaf-list; e.g. an instantiated key.
  - Opaque cursor brings some value to what the underlying database can encode and use, opposed to just using the actual key directly.

Cursor based pagination

```
GET /restconf/data/example-social:members/member?\
cursor=YWxpY2UK&limit2
```

```
 {“example-social:member”:
    [{“member-id”: “alice”, ...},
     {“member-id”: “lin”, ...}],
  “@example-social:member”:
    {“ietf-list-pagination:remaining”: 1,
     “ietf-list-pagination:previous”: [null],
     “ietf-list-pagination:next”: “am9lCg==” // joe
    }}
```

Snapshot pagination

- Take a snapshot of the queried datastore and traverse that snapshot.
- Snapshots can be very costly when used.

Thank you!

Questions?