HTTP Random Access
and Live Resources

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Live + Random Access

- More use cases now exist where both live and random access may be desired on the same Resource.
    - Audio/video recording devices with on-board storage (e.g. security cameras)
    - Log files
    - Blockchains
    - Any Resource which is subject to aggregation
    - Any Resource where initial content presentation can be accelerated by acquiring content immediately preceding the live point
        - e.g. differentially-coded content, such as audio/video streams, can start playing sooner when the previous fully-coded audio/video stream can be retrieved
        - e.g. Content contained in large frames where header data is required

The bytes Range Unit (RFC 7233)

- bytes Range Unit request form (GET/HEAD request):

```
byte-range-spec = first-byte-pos "-" [ last-byte-pos ]
first-byte-pos  = 1*DIGIT
last-byte-pos   = 1*DIGIT
```

- Allows open-ended byte-range requests
- Defined to request "the remainder of the representation (i.e., the server replaces the value of last-byte-pos with a value that is one less than the current length of the selected representation)"

- bytes Range Unit response form (206 Partial Content):

```
byte-range-resp = byte-range "/" ( complete-length / "*" )
byte-range = first-byte-pos "-" last-byte-pos
unsatisfied-range = "*" / complete-length
complete-length = 1*DIGIT
```

- Allows signaling of indeterminate-length representations ("*")
- **Doesn't allow indeterminate-length response bodies**

Options for Consideration...

- Change ABNF for bytes Range Unit ("fix" RFC 7233)

  - Allow Range and Content-Range bytes to take a "*" for lastLbyteLpos to represent an "indeterminate end"

  - May cause interoperability issues for Clients, Servers, and Proxies

- New Range Unit for "live" to allow "*" in lastLbyteLpos

  - draft-pratt-httpbis-bytes-live-range-unit-01 (expired)

  - May reveal issues with Proxies and Clients that always expect "bytes" in Accept-Ranges header

- Use existing bytes Range Unit with "very large" numbers to represent "live"/"indeterminate end" point

  - draft-pratt-httpbis-rand-access-live

Use existing bytes Range Unit with "very large" numbers
(draft-pratt-httpbis-rand-access-live)

- Clients use existing Range semantics to determine accessible bytes:

```
HEAD /my_resource HTTP/1.1
Range: bytes=0-

HTTP/1.1 206 Partial Content
Content-Range: bytes 0-99408383/*
Content-Length: 99398384
```

> Server returns the current length of the representation, per RFC7233

> Indicates the representation length is unknown

- Servers use Very Large numbers to indicate indeterminate endpoint:

```
GET /my_resource HTTP/1.1
Range: bytes=99400000-9223372036854775807

HTTP/1.1 206 Partial Content
Content-Range: bytes 99400000-9223372036854775807/*
Transfer-Encoding: chunked
```

> Client provides "Large Number" (>>current representation len) to indicate it supports draft semantics

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> Request starts at point before "current length"

> Server returns the same "Large Number" the Client provided to indicate it's including "live" content

Interoperability with Servers that don't support draft semantics

- Clients use existing Range semantics to determine accessible bytes (as before):

```
HEAD /my_resource HTTP/1.1
Range: bytes=0-
```

```
HTTP/1.1 206 Partial Content
Content-Range: bytes 0-99408383/*
Content-Length: 99398384
```

> Server returns the current length of the representation, per RFC7233

> Indicates the representation length is unknown

- Server instead returns the current length, as it did with the HEAD request:

```
GET /my_resource HTTP/1.1
Range: bytes=99400000-9223372036854775807
```

```
HTTP/1.1 206 Partial Content
Content-Range: bytes 99400000-99410000/*
Transfer-Encoding: chunked
```

> Client provides "Large Number" (>>current representation len) to indicate it supports draft semantics

!=

> Request starts at point before "current length"

> Server returns the current representation length, indicating it doesn't do "live"

Questions

Comments

Discussion