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
  - GET /my_resource HTTP/1.1
    Range: bytes=99400000-9223372036854775807
  - HTTP/1.1 206 Partial Content
    Content-Range: bytes 99400000-9223372036854775807/*
  - 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:
  - Client provides “Large Number” (>>current representation len) to indicate it supports draft semantics
  - 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
  - GET /my_resource HTTP/1.1
    Range: bytes=99400000-9223372036854775807
  - HTTP/1.1 206 Partial Content
    Content-Range: bytes 99400000-99410000/*
    Transfer-Encoding: chunked

- Server instead returns the current length, as it did with the HEAD request:
  - Server returns the current length of the representation, per RFC7233
  - Indicates the representation length is unknown
  - 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