ALTO Incremental Updates Using Server-Sent Events (SSE)

draft-ietf-alto-incr-update-sse-13

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Updates Overview (v10-v13)

- Fix issues in reviews during WGLC (mainly typos and writing issues)
- Terms
  - New terms “update stream server” and “stream control server”
  - State the relationship between “update stream server”, “stream control server” and “ALTO server” used in this document.
- Updates of Control Update Message Format
- A modular design of Update Stream Service and Stream Control Service
- Response of Update Stream Service/Stream Control Service
  - Procedure
  - Standard ALTO error response
Updates of Control Update Message Format

6.3. ALTO Control Update Message

Control update messages have the media type "application/alto-updatestreamcontrol+json", and the data is of type UpdateStreamControlEvents:

```json
object {
    [String control-uri;]
    [String remove<1..*>;]
} UpdateStreamControlEvents;
```

- **Started:** a list of client-ids of resources that the server will start to send updates.
- **Stopped:** a list of client-ids of resources that the server will stop sending updates.
- **Description:** texts providing explanation for the event.
Modular Design: Decoupling the Update Stream Service and the Stream Control Service

Basic Model of Incremental Updates
Modular Design: Decoupling the Update Stream Service and the Stream Control Service

- Remove the tight relationship between the update stream service and control stream

7. Update Stream Service

An update stream service returns a stream of update messages, as defined in Section 6. An ALTO server’s IRD (Information Resource Directory) MAY define one or more update stream resources, which clients use to request new update stream instances.

When a server creates a new update stream, it also creates a new update stream control service for that update stream. A client uses the update stream control service to remove resources from the update stream instance, or to request updates for additional resources. A client cannot obtain the update stream control service through the IRD. Instead, the first event that the server sends to the client has the URI for the associated update stream control service (see Section 6.3).

Section 8 describes the update stream control service.

- Introduce a new field “support-stream-control” in the Capabilities of update stream service

7.4. Capabilities

The capabilities are defined by an object of type UpdateStreamCapabilities:

```json
object {
  IncrementalUpdateMediaTypes incremental-change-media-types;
}
```

The capabilities are defined as an object of type UpdateStreamCapabilities:

```json
object {
  IncrementalUpdateMediaTypes incremental-change-media-types;
  Boolean support-stream-control;
}
```
Response of Update Stream/Stream Control Service: Procedure

**Update Stream Service**
- Invalid request:
  - Standard ALTO error response
- Valid request:
  - Data Update message
  - Control update message

**Stream Control Service**
- Invalid request
  - Standard ALTO error response
- Valid request with invalid associated update stream
  - HTTP “404 Not Found” response
- Valid request successfully processed by the stream control server
  - HTTP “202 Accepted” response
  - HTTP “204 No Content” response (the update stream server has also successfully processed the request)
Response of Update Stream/Stream Control Service: Standard ALTO Error Response

7.6. Response

The response is a stream of update messages. Section 6 defines the update messages, and [SSE] defines how they are encoded into a stream.

An ALTO server SHOULD send updates only when the underlying values change. However, it may be difficult for a server to guarantee that in all circumstances. Therefore, a client MUST NOT assume that an update message represents an actual change.

There are additional requirements on the server’s response, as described below.

Example

Invalid request to remove client-id “properties”

POST /updates/streams/2718281828459
Host: alto.example.com
Accept: text/plain,application/alto-error+json
Content-Type: application/alto-updatestreamparams+json
Content-Length: ###

{  
  "remove": [ "properties" ]
}

Standard ALTO error response

HTTP/1.1 400 Bad Request
Content-Length: [TBD]
Content-Type: application/alto-error+json

{  
  "meta":{  
    "code": "E_INVALID_FIELD_VALUE",  
    "field": "remove",  
    "value": "properties"
  }
}
Backup Slides
Response of Stream Control Service

- If the request has any errors, an ALTO error response has the format:

```
HTTP/1.1 400 Bad Request
Content-Length: [TBD]
Content-Type: application/alto-error+json
Connection: Closed

{
    "meta": {
        "code": "***",
        "field": "***",
        "value": "***"
    }
}
```

Note: According to [RFC7285], “field” and “value” are optional fields. If “field” exists, “value” MUST exists.

Take an example:
- If an update stream request does not have an “add” field:
  - Error code: “E_MISSING_FIELD”
  - Field: “add”
- If the “resource-id” field is invalid, or is not associated with the update stream:
  - Error code: “E_INVALID_FIELD_VALUE”
  - Field: “resource-id”
  - Value: the name of the invalid “resource-id”