Server Functional Spec

Release 0.7

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# Connections

Connections represent a logically persistent, non-expiring communication channel between a client address space and the server. Client must take measures to avoid connection leak.

Server is configured with a fixed number of allowable connections:

variant.max.connections = 100 // default

After this many active connections, a 400 BAD REQUEST will be sent with a more descriptive message in body.

When a connection is closed by the client:

* Client is expected to expire all ClientSessions and not to send any requests associated with that session. If it does, an internal error will be returned.
* Server marks all ServerSessions as expired and lets the vacuum thread to clean them out.
* Removes the connection object from the connection table.

When a connection is closed by the server, either due a restart or, in the future, a recreation of the schema,:

* All requests, associated with this connection, will receive a 400 BAD REQUEST with the further text indicating that “connection does not exist.” Upon receiving such response, client is expected to destroy its side of the connection.

# Schema Management

## General

Schema files are read once during server startup from a file located inside the schema deploy directory. If a fatal error is encountered, the server must be restarted after it is corrected. Until then, all subsequent connection request will receive HTTP status 503 “Service Unavailable.”

Only a single schema file per server, e.g. per deploy directory, is supported at this time.

The schema file must start with the meta section:

{

"meta": {

"name": schema-name::String,

"comment": schema-comment::String?

},

“states”: {...},

“tests”: {...)

}

## Schema deploy directory location

Schema files are located in the OS directory specified by, in the order of significance

* -Dvariant.schemas.dir system property
* variant.data.dir configuration property
* (/schemas classpath directory — future improvement?)

Value is treated the same as Java’s File(String), i.e. if starts with slash is understood as absolute path, otherwise as relative to the applicatioin’s running directory.

# Extension Management

# API Reference

## General

* Property names are case insensitive, i.e. createDate is the same as CreateDate.
* Sessions are stored on the server as serialized JSON strings and are deserialized lazily, if server needs them.

## Methods

Notation:

"name": <Number?=NOW>

* **"name":** name to the left of colon is the literal property name. (
* **<Number?=NOW>** information inside the angle brackets is the data type (String/Number/Boolean/Array/Object), optionally followed by the question mark, indicating that this field is optional, optionally followed by the equal sign and the default value. If no question mark, this field is required. If question mark, but no equal sign, the field is optional with no default.
* Note, that the type specification

### /connection

#### POST /connection/:schema-name

Open a new connection to an XDM schema.

|  |  |  |  |
| --- | --- | --- | --- |
| Request Headers | | | |
| Content-Type | text/plain; charset=utf-8 | | |
| Request Body | | | |
| None. | | | |
| Response Headers | | | |
|  | | | |
| Response body | | | |
| {  "id":<String*>,*  "ts":<Number*>,*  "schema":<String>,  } | | | |
| id | | Connection ID. | |
| ts | | Connection creation date, as Epoch time. | |
| schema | | Experiment schema as a JSON string. Must be parsed separately with the schema parser. | |
| Response Codes | | | |
| 200 OK | | | Connection created. |
| 400 BAD\_REQUEST | | | Invalid request. One of a number of user errors was detected e.g. requested schema does not exist or connection table is full. An additional message will be provided in the body. |
|  | | |  |

#### DELETE /connect/:schema-id

Close an existing connection to an XDM schema.

|  |  |  |  |
| --- | --- | --- | --- |
| Request Headers | | | |
| Content-Type | text/plain; charset=utf-8 | | |
| Request Body | | | |
| None. | | | |
| Response Headers | | | |
|  | | | |
| Response body | | | |
| {  "id":<String*>,*  "ts":<Number*>,*  "schema":<String>,  } | | | |
| id | | Connection ID. | |
| ts | | Connection creation date, as Epoch time. | |
| schema | | Experiment schema as a JSON string. Must be parsed separately with the schema parser. | |
| Response Codes | | | |
| 200 OK | | | Connection created. |
| 400 BAD\_REQUEST | | | Invalid request. One of a number of user errors was detected e.g. connection table is full. An additional message will be provided in the body. |
|  | | |  |

### /event

#### POST /event

Trigger a user-defined event in the specified session.

|  |  |  |  |
| --- | --- | --- | --- |
| Request Headers | | | |
| Content-Type | | text/plain; charset=utf-8 | |
| Request Body | | | |
| {  "sid": <String>,  "name": <String>,  "value": <String?>,  "ts": <Number?=NOW>,  "params": <Array?> [  {  "key": <String>,  "val": <String?>  },  ...  ],  } | | | |
| sid | Current variant session ID. | | |
| name | The name of the event. Any string. | | |
| value | Value of the event. Any string. | | |
| ts | Event creation date, as Epoch time. Optional. If not given, defaults to now. | | |
| params | A map of event parameters. Optional. | | |
| Response Headers | | | |
|  | | | |
| Response body | | | |
| None. | | | |
| Response Codes | | | |
| 200 OK | | | Event triggered. |
| 400 BAD\_REQUEST | | |  |

## /session

|  |  |
| --- | --- |
| GET /session/:id | |
| Get session by ID.   |  |  |  | | --- | --- | --- | | Headers | | | | Content-Type | text/plain; charset=utf-8 | | | Request Body | | | | None | | | | Response body | | | | {  "sid": session-id::String,  "ts": timestamp::Number,  "schid": schema-id::String,  "req": request-def::Object ?,  "states": [  {  "state": state-name::String,  "count": visit-count::Number,  },  ...  ],  "tests": [test-name::String,...]  "disqualTests": [test-name::String,...]  }  request-def ::=  {  "state": state-name::String,  "status": status::String,  "comm": is-commited::Boolean,  "params": [  {  "key": param-name::String,  "val": param-value::String  },  ...  ],  "exps": experience-list::List[String]  } | | | | session-id | | Current variant session ID. | | timestamp | | Session creation timestamp, as the Unix Epoch time, i.e. the number of milliseconds since January 1, 1970, 00:00:00 GMT | | schema-id | | Variant schema ID in effect when this session was created. | | state-name | | The name of a visited state. | | visit-count | | Number of times this state has been visited by this session. | | test-name | | The name of a traversed test | | is-qualified | | Is this session qualified for this test. | |  | | | | Response Headers | | | |  | | | | Response Codes | | | | 200 OK | | Session found and returned. | | 400 BAD\_REQUEST | |  |  PUT /session/:id | |
| Save or replace user session by session ID. Idempotent. Body is not parsed but saved in the session store under the ID. Only parsed if required instantiation on Server. |  |

|  |  |  |
| --- | --- | --- |
| Headers | | |
| Content-Type | text/plain; charset=utf-8 | |
| Request Body | | |
| See response body of GET /session/:id | | |
| Response body | | |
| None. | | |
| Response Codes | | |
| 200 OK | | Session created or replaced. |
| 400 BAD\_REQUEST | | Invalid request body. One of a number of user errors was detected in the request body, e.g. a missing required parameter. An additional message will be provided in the HTTP Status header. |

# Future

## Schema Management

* Symbolic variables in schema definition file.
* Multi-line comments.
* Write own parser to provide support for:
  + Line numbers for semantical errors.
  + Preserve original line number before removal of comments.
* Expire connections that appear to have leaked, e.g. have no active sessions for some period of time.
* Hard vs soft schema reload. Hard will recreate an existing schema even if active connections exist, while soft will wait for all active connections to close (possibly indefinitely, i.e. recommended in conjunction with previous point). The goal is to have a mode in which no active sessions will receive a ConnectionClosed exception.