Caliper / xAPI Webinar

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DISC
value proposition
Why xAPI / Caliper?

promote interoperability data / semantic

enable innovation

feed insights
Why xAPI / Caliper?
current initiatives
xAPI latest

1.0.3 spec
ADL LRS testing requirements
ADL vocabulary
New / updated profiles

ADL Companion spec
(semantic practices)

beta conformance suite
(imminent)
Hot off the wire, 18 Oct 2016

UK JISC national learning analytics service

Unicon delivers:
• Staff Dashboard
• Alert & intervention system (SSP)
• Predictive analytics model
• Learning Analytics Processor (LAP)

source: http://www.prweb.com/releases/2016/10/prweb13772136.htm
Caliper latest (1.1)

- Doc rewrites
- Spec impl guide ontology
- Cert suite upgrade
- Event model revisions
- Payload thinning
- LTI integration
- Sensor updates

**Discussion Forum Profile**

- Created
- Deleted
- Updated
- Removed
- MarkedAsRead
- MarkedAsUnread
- Posted
- Subscribed
- Unsubscribed

**Example Payload**

```json
{
  "sensor": "https://example.edu/sensor/001",
  "sentTime": "2015-09-15T11:05:01.000Z",
  "data": {
    "@context": "http://purl.imsglobal.org/ctx/caliper/v1/Context",
    "@type": "http://purl.imsglobal.org/caliper/v1/Event",
    "actor": {
      "@id": "https://example.edu/user/554433",
      "@type": "http://purl.imsglobal.org/caliper/v1/lis/Person" },
    "action": "http://purl.imsglobal.org/vocab/caliper/v1/action#Viewed",
    "eventTime": "2015-09-15T10:15:00.000Z",
    "object": {
      "@id": "https://example.com/viewer/book/34843#epubcfi(/4/3)",
      "@type": "http://www.idpf.org/epub/vocab/structure/#volume"
    }
  }
}
```
Conversations

Caliper / xAPI review meeting
(Utah Valley University, Park City, UT, 15 Aug 2016)

https://www.imsglobal.org/initial-xapicaliper-comparison
profiles
So what’s a profile?

- area of concern
- concepts
- relationships
- rules

controlled vocabulary
xAPI CoPs, profiles, recipes

Communities of Practice
• augmented reality
• badges
• Chinese language
• CMI5
• courses (SCORM)
• e-books
• healthcare education
• simulations
• social collaboration
• videos
• competencies & credentialing
• instructor professional development
# Caliper profiles

## Current
- Basic
- Assessment
- Forum
- Media
- Annotation
- Reading
- Assignable
- Session
- Outcome

## Future?
- Authoring
- Credentials
- Feedback
- Participation
- Problem Set
- QTI
- Search
- Simulation
- Social
- Survey
- Entity Mgmt

## New entities?
- Badge
- Survey
- Location
- Problem
- Rating

---

**Future?**

- new entities?
statements / events
Caliper event / xAPI statement

### Caliper event
- **actor**
- **action**
- **object**
- **eventTime**
- **id**

### xAPI statement
- **actor**
- **verb**
- **object**
- **id**
- **stored**

**optional**
- **target**
- **generated**
- **referrer**
- **edApp**
- **group**
- **membership**
- **session**
- **federatedSession**
- **extensions**
- **timestamp**
- **context**
- **result**
- **authority**
- **attachments**
- **version**

*Caliper sourcedId and xAPI id and stored property must be set by the LRS if not set by the event/statement emitter.*
xAPI statement
xAPI statement: earning an Open Badge

- **Actor**: Person
- **Verb**: earned
- **Object**: OB

**Context**
- **Activity**: OB recipe
- **Category** (contextActivities)
- **Result** (extensions)

**Attachments**
- OB image/png

**Additional Properties**
- **Theme**: badge class
- **Timestamp**: stored (set by LRS)

Source: http://specification.openbadges.org/xapi/
Caliper Event: basic

- Person: actor
- Video Object: object
- Started: action
- Date Time: eventTime

Statement

[Diagram showing a detailed structure of Caliper Event: basic]
Caliper Event: annotating a document

- **Actor**: Person
- **Object**: Document
- **Action**: tagged
- **Generated**: Tag Annotation
- **Role**: learner
- **Group**: course
- **Session**: federated
- **Extensions**: epub, tags, edApp
- **Time**: eventTime
- **Membership**: generated

Diagram showing relationships and entities involved in the Caliper event.
API
xAPI
uses standard requests (HTTP GET, PUT, POST, DELETE)

to an LRS’ endpoint which always has these Resources

- statements
- agents
- activities
- state

Learning Record Store

- Statement
- Agent
- Activity
- State
- About

about

CC BY NC
Caliper Sensor

.event
.send()
.event
.describe()
.entity
.getStatistics()

.event
.send(events)
.describe(entities)
.getStatistics()

.event
.send()
.entity
.describe()

.event
.store

Caliper information model

reading  annotation  assignable  session  outcome  + ...
CPS calls API Key service using SSL wire encryption & standard LTI credentials; call can be performed outside depicted sequence and the API key cached.

Caliper profile service (CPS)

POST

launch request
+ custom_caliper_profile_url,
+ custom_caliper_session_id

CPS response
apiKey, eventStore.url, expiryTime

GET

tool provider

sensor config

CPS declared in Tool Consumer Profile

GET

data stream secured using SSL wire encryption and tuple: apiKey (header), sensor_id & session_id

Caliper profile service (CPS)

Caliper API key service

event store
convergence?
Challenges

• Culture / Governance models
• IP and licensing
• Open vs gated development
• Data model / exchange format differences
Opportunities (now)

• establish verb / action equivalencies

• establish linkages between common profiles

• develop xAPI / Caliper data exchange mappings profile
final questions
finis
(thanks)
extras
(stuff for the director’s cut)
xAPI statement

```
{
    "id": UUID,
    "actor": {<Agent> | <Group>},
    "verb": {<Verb>},
    "object": {<Activity> | <Agent> | <Statement>},
    "result": {<Result>},
    "context": {<Object>},
    "authority": {<Agent> | <Group>},
    "attachments": [ <Attachment>, <Attachment> . . . ],
    "timestamp": "ISO 8601 timestamp",
    "stored": "ISO 8601 timestamp (set by LRS)"
}
```
Caliper Event

```json
{
  "@context": "http://purl.imsglobal.org/ctx/caliper/v1/caliper.json",
  "@type": "http://purl.imsglobal.org/caliper/v1/Event",
  "id": "local string identifier",
  "actor": {<Agent>},
  "action": "http://purl.imsglobal.org/vocab/caliper/v1/action#Action",
  "object": {<Entity>},
  "eventTime": "ISO 8601 formatted dateTime w/ millisecond precision",
  "target": {<Entity>},
  "generated": {<Entity>},
  "referrer": {<Entity>},
  "edApp": {<SoftwareApplication>},
  "group": {<Organization>},
  "membership": {<Membership>},
  "session": {<Session>},
  "federatedSession": {<LtiSession>},
  "extensions": {}  
}
```
Caliper: custom event (hypothetical)

- **edApp**
- **Person**
- **Goal**
- **Predicted Score**
- **activity context**
  - target
  - referrer
  - edApp
  - group
  - membership
  - session
  - federatedSession
  - extensions
- **statement**
- **actor**
- **set**
- **object**
- **time**
- **eventTime**
- **assign**
- **scale**
- **generated**
Caliper Sensor reference implementations

Sensor API

caliper-java
caliper-js
caliper-python
caliper-php
caliper-ruby
caliper-net
Caliper/LTI: Blackboard / Kaltura POC

Blackboard
- instrument Learn platform
- implement various Caliper profiles
- provision LTI tool launch with context info (user, course, content item) & endpoint security token
- design data visualization

Kaltura
- instrument platform
- implement Caliper Media Profile
- extend spec with “still watching” event (measure drop off rate)
- emit event data to Blackboard-specified endpoint.

Source: https://goo.gl/Wj9ci1