

# xAPI/Caliper Next Generation: Developing Consensus

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# Meeting Objectives

- To start the journey of appropriate alignment of the work by ADL on xAPI and IMS on Caliper
- To identify:-
  - The known/knowns
  - The known/unknowns
  - The unknown/knowns
  - The unknown/unknowns

# Agenda

Time	Activity
09:00-09:30	Agree Agenda and Introductions
09:30-10:00	ADL and IMS Perspectives
10:00-10:30	xAPI Overview
10:30-10:45	Break
10:45-11:15	Caliper Overview
11:15-12:00	xAPI/Caliper Comparison
12:00-13:00	Lunch
13:00-15:00	Comparison of Caliper Profiles and xAPI Recipes
15:00-15:30	BREAK
15:30-16:30	Review of Transport Mechanisms
16:30-17:00	Wrap Up and Plans for Future Work

# Introductions

- Quickly go around the room to introduce ourselves to each other
  - Name
  - Affiliation and Role
  - Interest in xAPI/Caliper
  - Key objective for the meeting

# Initial Survey Result

- Adoption
  - 66% xAPI only, 10% Caliper only, 10% both, 14% neither
- Solution Perspective
  - 50% see xAPI and Caliper as solving the same
  - 20% see them solving different problems
- Support for convergence
  - 53% Yes, 12% No, 33% Not sure
- 78% would like to see a crosswalk/mapping of the data models and think it would be beneficial to both communities
- 38% of the respondents have already begun work on comparing the two specs and are willing to share their findings

# xAPI/Caliper Comparison

Category	xAPI	Caliper
Use-cases/Scenarios/Motivations		
Service/Endpoints		
Data Models		
Security Mechanisms		
Transport Mechanisms		
Vocabs, Profiles, Recipes		
Data Science		
Adoption Support		



# Use-cases/Scenarios/ Motivations

USE-CASES/SCENARIOS/MOTIVATIONS		SERVICE MODEL	
X API	CALZ PER	X API	CALZ PER
<p>Enable Adaptive Learning within SCORM content</p> <ul style="list-style-type: none"> <li>↳ Beyond Browser</li> <li>↳ Outside LMS</li> <li>↳ Outside Package</li> </ul> <p>System-to-System Data Transfer (Can. Outside LMS)</p> <ul style="list-style-type: none"> <li>↳ Data Ownership</li> <li>↳ Multi-Agent Statements</li> <li>↳ Extensible Data Model</li> <li>↳ Agnostic Security Models</li> </ul>	<p>Content / Resolve LTZ / Black Box Conundrum</p> <p>Student engagement on Learning activities</p> <p>Real-time data messaging / mixed source data</p> <p>Quantified Metrics</p>	<p>Read</p> <p>Write</p> <p>Delete</p> <p>-----</p> <p>Authentication of Data</p>	<p>Post/Write</p>

Link



# Services/Endpoints

SERVICE MODEL	
x APIZ	CALLPER
Read Write Delete	Post/Write
-----	
Authentication of E. Data	



# Data Models

DATA MODEL	
XAPIZ	CALZPER
<ul style="list-style-type: none"> <li>• statement</li> <li>• 4 types of object in statement               <ul style="list-style-type: none"> <li>• Activity <math>\Rightarrow</math> Activity Type</li> <li>• Addressable Items have IDs</li> <li>• Object can be a substatement</li> <li>• Recipe is an activity (sequence)</li> <li>• Authentication part of data model</li> <li>• Models state</li> </ul> </li> </ul>	<ul style="list-style-type: none"> <li>• events</li> <li>• context</li> <li>• Object of interaction can be session/entity</li> <li>- JSON-LD</li> <li>• Addressable - Entities Non-Addressable</li> <li>• No events have dependencies</li> <li>• Objects are not Activities</li> <li>• Controlled Vocab (Profiles)</li> <li>• Endpoint must translate language</li> </ul>

object/entity relationships

$\frac{xAPIZ}{activity}$  /  $\frac{CALZPER}{event}$  relationship

Granularity/Time

Event Scripting Language / Activity Scripting

ML based



# Security Mechanisms

SECURITY/Authorization	
x API	CALLER
Basic HTTP OAuth 1.0*	API Key Bearer Token

x API
<ul style="list-style-type: none"> <li>• gives back</li> <li>• retrieval</li> <li>• signed from</li> <li>• Can store</li> </ul> <hr/> JSON HTTP Permissions





# Transport Mechanisms

TRANSPORT	
X API	CALL CENTER
<ul style="list-style-type: none"><li>• gives back ID</li><li>• retrieval of data</li><li>• signed statements from originator</li><li>• Can store signature</li></ul>	<ul style="list-style-type: none"><li>• LTI</li><li>• Authenticate Events but no signature</li></ul>
JSON	JSON-LD*
HTTP/HTTPS	HTTP/HTTPS
Permissions (Vendor dependant)	
Fail/In Modes	
E-T-E	Status Handling / Offline

ation  
ZPER  
Key  
Token

OT  
xAPI  
Attachments



# Vocabs, Profiles, Recipes

PROFILES / RECIPES		DATA SCIENCE	
X API		X API	CALZ PER
PROFILES Doc IRIS Vocab Vocab Set/Seq of Recipes	of IMS App Data	M. PROFILE List of "Actions" Triple Extensible Action list	
RECIPE u/cure ↔ x API syn/seq		Missing	
	Clean Definition Process "Specification" Adapt Process	Instrumentation	Provenance/Curation Workflows Verb/Action distributed Extensions/Capture Process

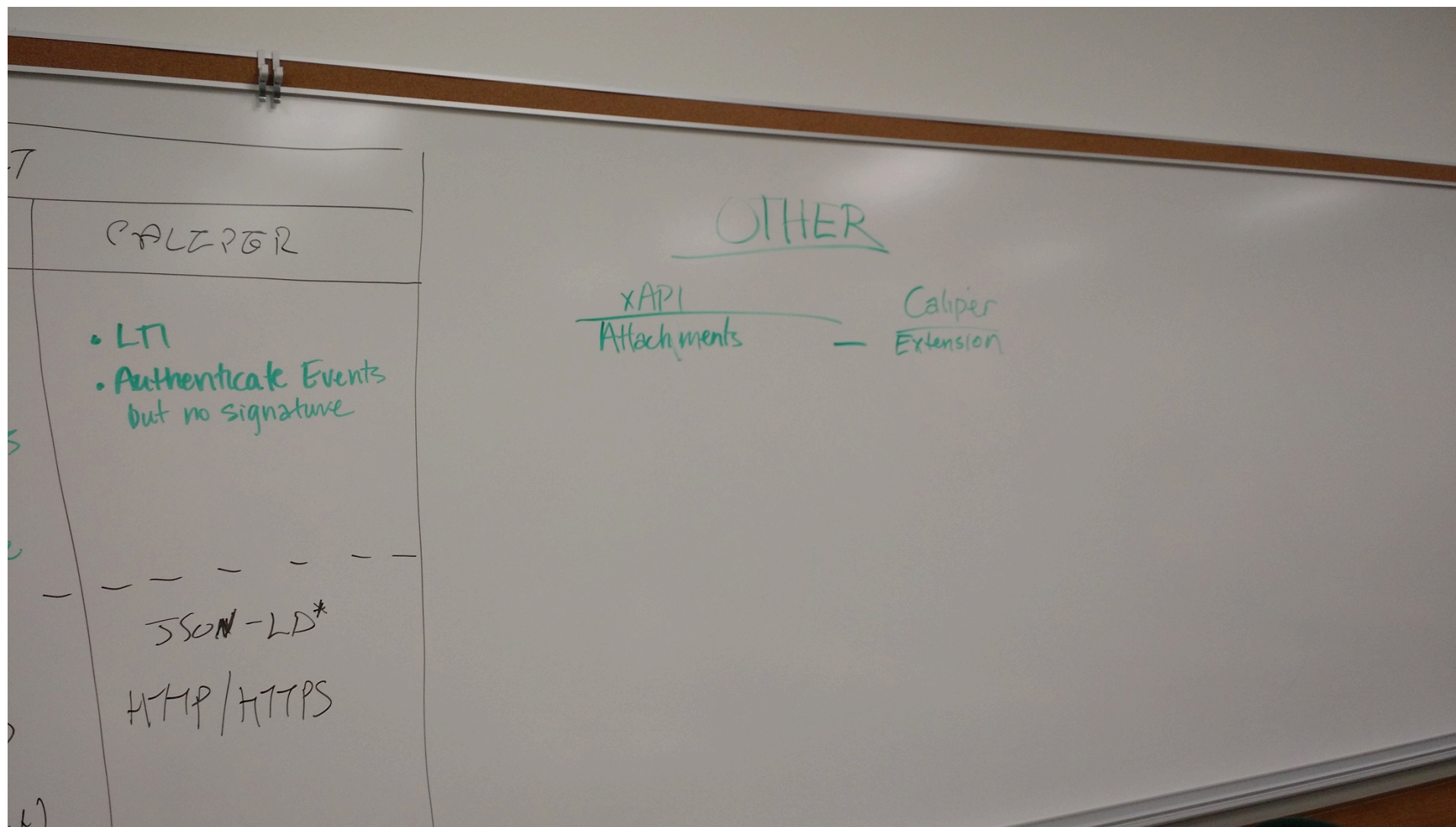


# Data Science

DATA SCIENCE	
X API	CALZPER
End Data Authenticity	
-----	
<u>Missing</u>	
Instrumentation	Provenance/Curation
	Workflow
	Verb/Action Distributed Consistency
	Extension/Capture Process

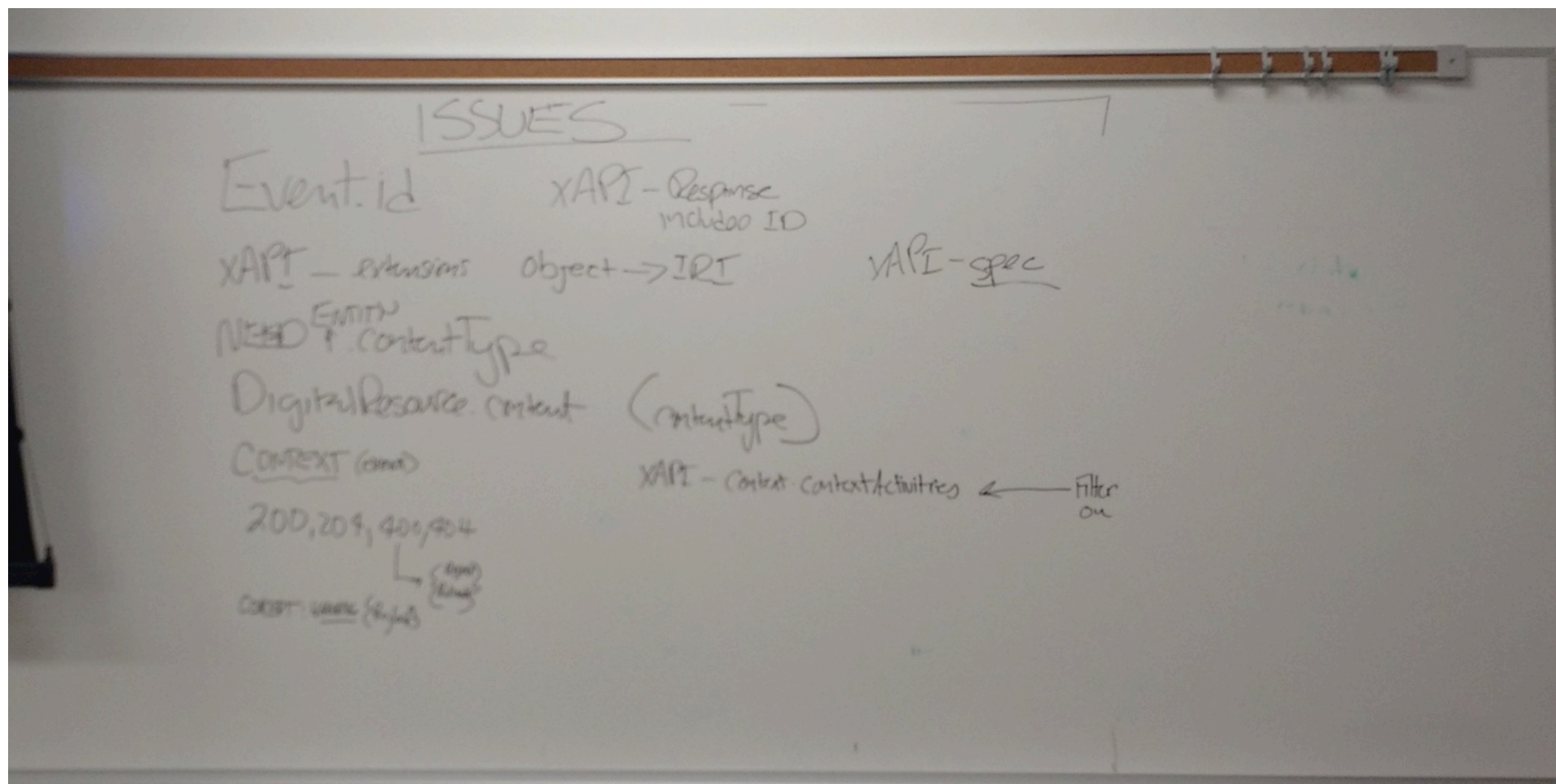


# Other





# Issues/Suggestions







# Issues/Suggestions

Caliper Extension

Person  
- membership

Person  
- memberof  
- roles

id this

SUGGESTIONS

Session is part of (child)

ImpGuide → Upgrade path  
deprecations (navigate from)  
object type

↳ IRI make clear (can't dereference)

AssessmentItem content?

Assessment → Attempt (object?)

Instance ID  
ENTITY ← OBSOLETE

PROBLEM OF ENSURING FOR A STREAM OF EVENTS (Assess)  
props function consistent

Quality of service negotiation between sensor/endpoint negotiation

RESPONSE FORMAT RFC 7807

DECLARATION → CANONICAL SOURCE

## Next Step Actions

- ADL and IMS to review the meeting minutes and produce a plan for the next steps
- Next face-to-face meeting at the IMS Quarterly meeting at ASU (Scottsdale, Arizona) on 9th November, 2016

# Questions & Comments