

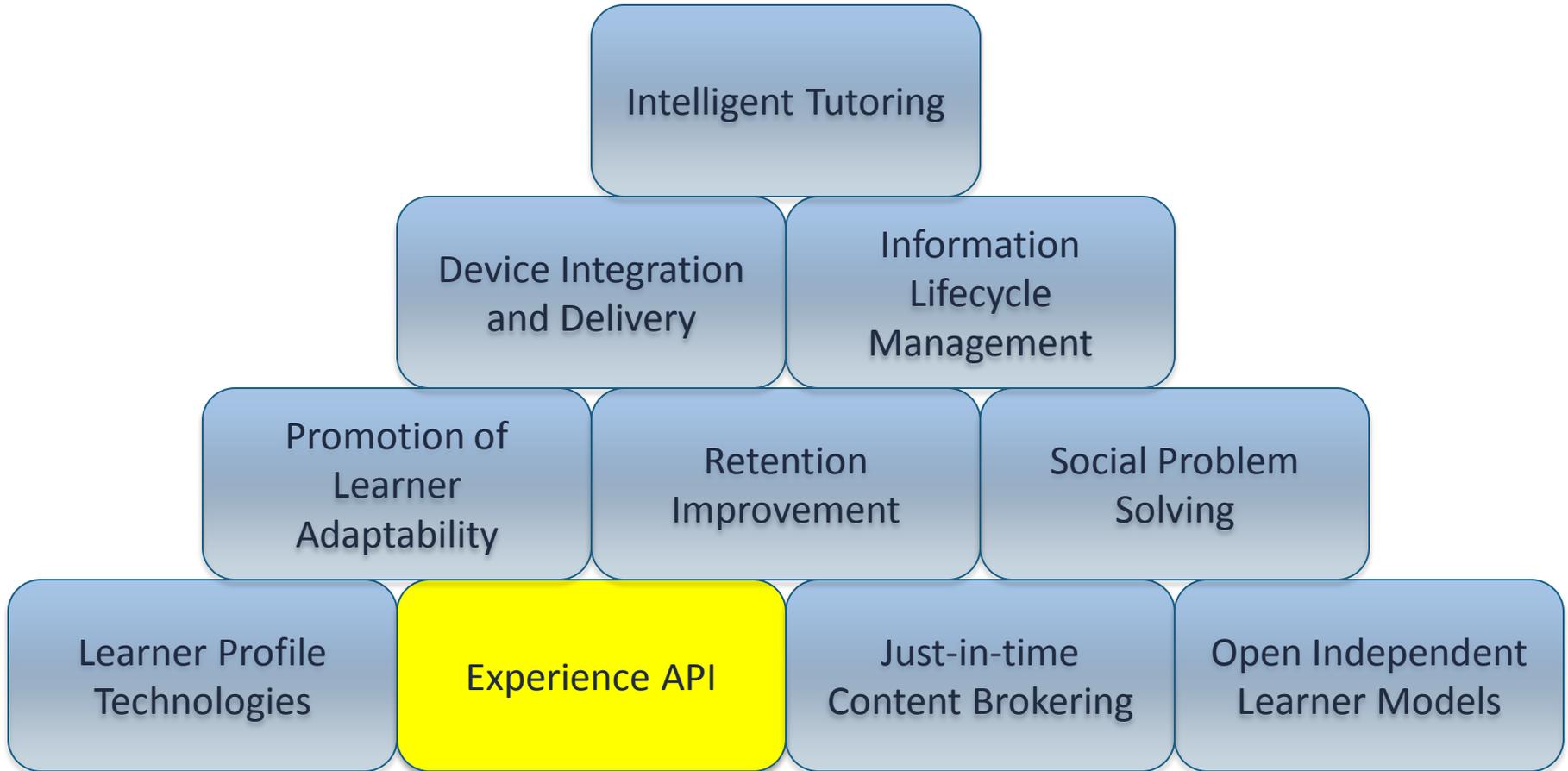
**The Power of Global Collaboration**  
Defense | Government | Industry | Academia

# The Experience API: Origin and Capabilities

Nikolaus Hruska & Andy Johnson – Contractors  
with Problem Solutions in Support of ADL



# Our Focus Today





# ADL's Training & Learning Architecture (TLA)



- *Facilitate, coordinate and lead the design of a new model to support innovative learning experiences.*
- The TLA will support development of a Next Generation Learning Environment.
- The Experience API is the first part of the TLA.



# A Little History



- Standardize and modernize education and training
- Work with Services, DoD, other Federal Agencies, and NATO
- Goal is to deliver relevant learning, anytime, anyplace
- Much of the work has been done with SCORM (Sharable Content Object Reference Model)



# What did SCORM Provide?



- Common Launch Mechanism
- Content Packaging
- Common Protocols (Code)
- Common Data Model
- CMI Data Model, LOM Metadata, AICC Packaging, IMS Simple Sequencing combination



# SCORM Worked Like a Charm...in 2004



- Implemented by larger organizations that could afford LMSs to manage large number of members
- Sequencing was quite organization-specific
- Those who did internal sequencing used SCORM 1.2
- Made content reusable, but not very sharable



# Technology Advances Affecting Use of SCORM



- Open Source movement
- Mobile technologies
- Widespread wireless
- Games
- Augmented Reality
- Changes to Web Languages and Best Practices

# Tracking Learning Beyond SCORM



# Addressing the Gaps



- SCORM works for its intended use
- But there were gaps and limitations on what could be tracked
- Realization that something "like SCORM" was needed to meet changing technology and ADL Community's requirements



# ADL's Response



- Contract awarded to Rustici Software for what became "Project Tin Can"
- Collaborate with key players within the distributed learning industry
- Analyze existing requests from the ADL community



# Requirements Gathering Process



- Collected “Project Tin Can” data
  - Interviews with industry and academia
  - Input from Services via working groups
  - 100+ LETSI white papers
  - Tin Can User Voice forum
  - Impetus for first version of Tin Can API
- Compiled data with previous ADL input and summarized on ADLnet.gov
- Resulted in two mandates:
  - **Make it simple...**
  - **Make it powerful...**



# The “Tin Can API”



- Created as an ‘Activity Streams’-type model to address the community’s requirements
- Included prototypes and a specification
- The “Tin Can API” stabilized into the **Experience API**

# How Should We Track Learning?



# Learning is Everywhere



Credit: Liz Burow (@Burlix)



# Guiding Principles for Moving Forward



- Track diverse user learning experiences
- Move beyond the single-learner model
- Eliminate out-of-date technology practices
- Improve or eliminate the content sequencing
- Include tools, guides and best practices
- Provide clearer instructions and more efficient testing
- Provide a means to expose user data



# What is the Experience API?



- ADL renamed the Tin Can API effective when the 0.95 version was released
- Simple, lightweight web service API
- **No restrictions on content**, just on how to report to tracking system
- Supports mobile out of the box, as well as any platform (out of browser!)
- Tracks experiences, not just completions
- Not a replacement for SCORM, but can track SCORM and other legacy content

# Using Activity Streams to Track Learning



# Activity Streams as the Model



- Collaboration between Google, Facebook, Microsoft and others
- <Actor> <Verb> <Object>  
(I did this)
- Allows reporting of experiences
  - Nikolaus posted a photo
  - Nikolaus liked a photo
  - Nikolaus commented on a photo



# Benefits of Activity Streams



- Supported in media and industry
- Adaptive content
- Working group surrounding spec already in place (Open Web Foundation)
- Incorporation of new web standards



# Statement



- “I Did This” is an Experience API adaptation of Activity Streams – called a *Statement*
- Meaningful, yet flexible
- Covers traditional (i.e. SCORM) learning (scored, passed, completed)
- Also captures informal learning
- Allows compound statements



# I (Actor/Agent)



- Single Learner
- Team Learning
- Group/Guild Learning
- Combined Identities
- Authentication



# Did (Verb)



- Experience
- Assessment
- Collaboration/Gaming
- Social Media
- Virtual Marketplace



# This (Activity)



- Activities can be anything – text, video, audio, games, social interactions, etc.
- Real or virtual
- Associate with competencies
- Use authority to determine completion
- Activities can drive the meaning of a verb



# Example Statements



- John Connor attempted "The War of 1812, Part 1"
- John Connor experienced "The Battle of New Orleans Video"
- John Connor completed "The War of 1812, Part 1"
- John Connor attempted "The War of 1812, Part 2"
- John Connor completed "The War of 1812, Part 2"
- John Connor attempted "The War of 1812, Assessment"
- John Connor answered "Question 1" with "True"
- John Connor answered "Correctly"
- John Connor answered "Question 2" with "False"
- John Connor answered "Correctly"
- John Connor answered "Question 3" with "a"
- John Connor completed "The War of 1812, Assessment"
- John Connor scored "80%" on "The War of 1812, Assessment"
- John Connor satisfied objective "Battles of the War of 1812"
- John Connor mastered objective "The War of 1812" to level "1"
- John Connor passed "The War of 1812, Assessment"



# Usage within Social Media



- Facebook integrates OpenGraph technology
  - “Senses” the type of content and reacts accordingly
- Common vernacular as Twitter
- Etc.

# **Learning Record Store: the Core of the Experience API**



# Learning Record Store (LRS)



- The LRS serves as a storage center for all Actor, Verb, Object sets
- The LRS is an abstracted out tracking application that has historically been associated with the Learning Management System (LMS)
- Supports lifelong learning and personal accountability of data



# Comparison of LRS and LMS



## Learning Record Store

- Tracking service
- Learner owns data in the LRS
- Can aggregate learner data from multiple systems
- Not a replacement for an entire LMS

## Learning Management System

- Suite of tightly coupled/proprietary services
- Learner does not own data
- Only stores data from LMS sessions
- Could contain LRS

# **Benefits of the Experience API**



# Easy In, Easy Out



- The Experience API is a means of providing trackable and storable learning data
- Very little validation is done at run-time, which makes it fast and flexible
- Won't throw out "Andy friended Biochemistry quiz"
- Other services will extract meaning from the data and expose it in interesting ways to the learner



# Support for Various Types of Learning



- Team training
- Massively multiplayer learning
- Mentoring
- Real-time instructor interaction
- Intelligent tutoring



# Extensibility



- The Experience API is highly extensible
- Use of URIs for verbs and activities makes this possible
- No “core” verb or activity model
- ADL “Best Practices” document accompanies the spec



# Benefits of Extensibility



- Allows communities of practice to grow their own
- Like MedBiquitous ([medbiq.org](http://medbiq.org)) extended SCORM
- Easier with Experience API
- Communities can use a baseline and extend it as they see fit

# **ADL's Role and the Future of the Experience API**



# ADL Contributions



- Organizer and facilitator of the Experience API Working Group
- Multiple blog posts and articles on ADLnet.gov
- Create free LRSs for each Experience API version release
- Testing through prototyping



# Prototypes



- Tin Can Rally (Word Puzzle Game)
- Data Visualizations
- Bookmarklet LRS Tracking
- Virtual World LRS Tracking
- All are freely available (source code too) on our GitHub site



# Tin Can Rally



Solve the Puzzle

e

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t



Gameboard



Manual Entry



Leaderboard



About

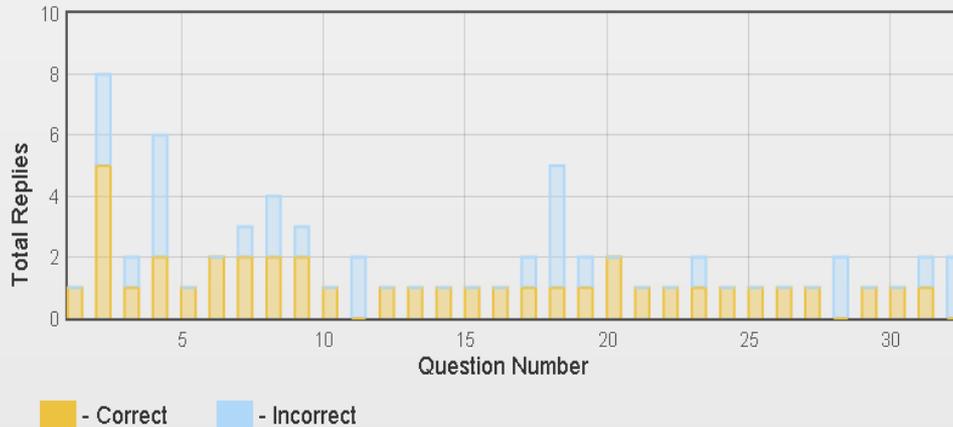
# ADL 'Tin Can Rally' Dashboard

start playing now at: <http://mlc.adlnet.gov>

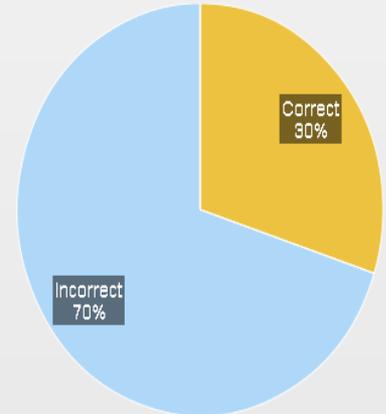
## 25 Players

- aaa is now playing!
- Alex Turkov... is now playing!
- Alex Turkov... is now playing!
- ryngme is now playing!
- David Mende... is now playing!
- kbporter is now playing!
- Clairesch is now playing!
- Clairesch is now playing!
- EricJohnson is now playing!

## 65 QR Codes Scanned



## 10 Solve Attempts



## 39 Tiles Uncovered

- Sue got a letter!
- Sue got a letter!
- ryngme got a letter!
- Rick Raymer got a letter!
- Sue got a letter!
- Sue got a letter!
- Sue got a letter!

## Top Scanners

Sue	12
Rick Raymer	11
Ccolton	10
nhruska	8
Jimpfarrell	5
Mark dewey	5
andyj	4
Jono MLearncon	4
clembotic	4
EricJohnson	3

## 3 Puzzle Solvers

- Sue solved the puzzle!
- Rick Raymer solved the puzzle!
- Ccolton solved the puzzle!



# Bookmarklet



www.adlnet.gov/capabilities

TCAPI Bookmarklet

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## ADL Capabilities

### SCORM®



The Sharable Content Object Reference Model (SCORM) represents a collection and harmonization of specifications and standards that define the interrelationship of content objects, data models, and protocols such that objects are sharable across systems that conform to the same model. [Learn More...](#)

### Training & Learning Architecture

Although SCORM has been tremendously successful and adopted worldwide, ADL recognizes the need for a SCORM that matches today's technological environment. This effort has begun primarily through the development of the Experience API (Tin Can API). Through Tin Can and future efforts, the TLA capability will include:

# Tin Can Statement Viewer

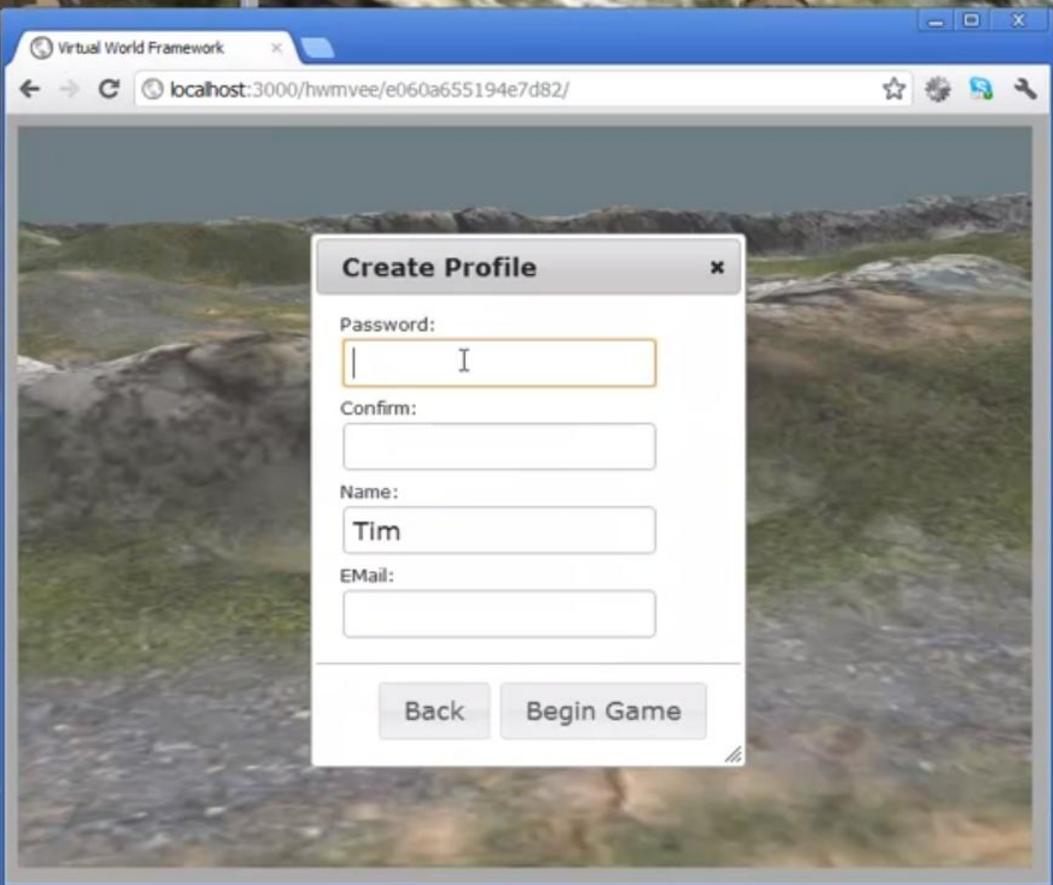
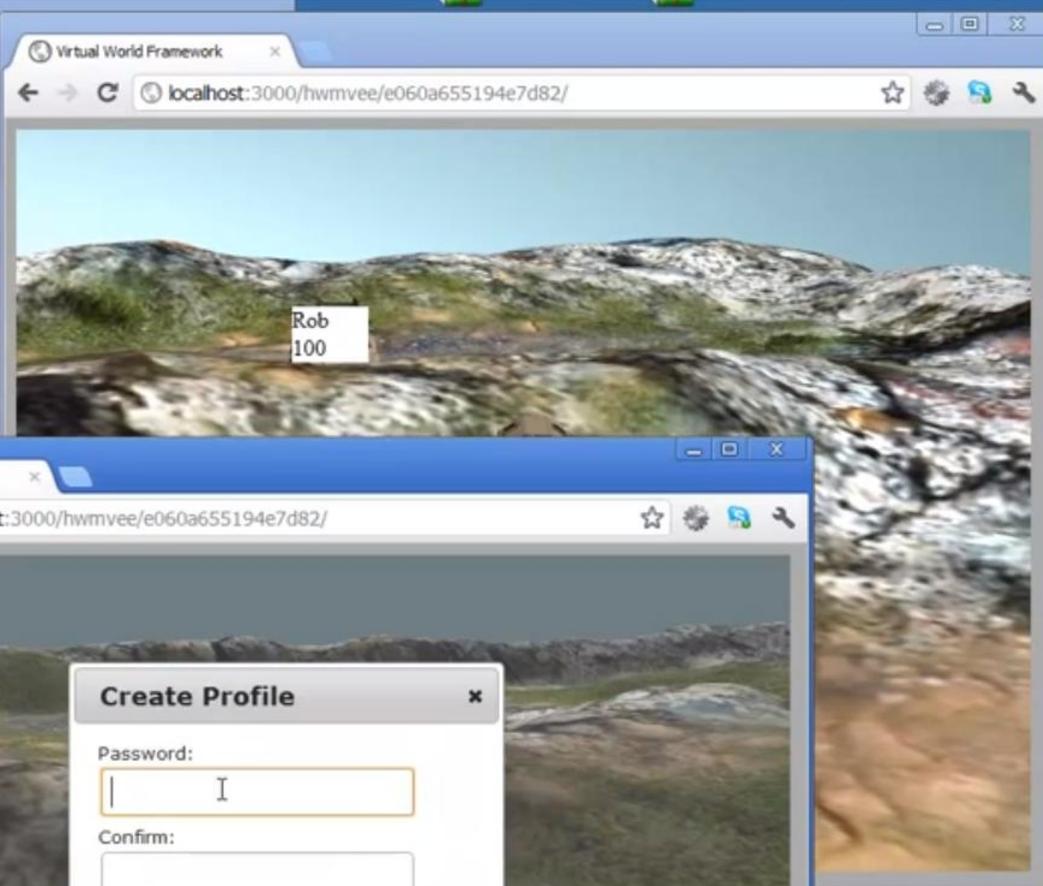
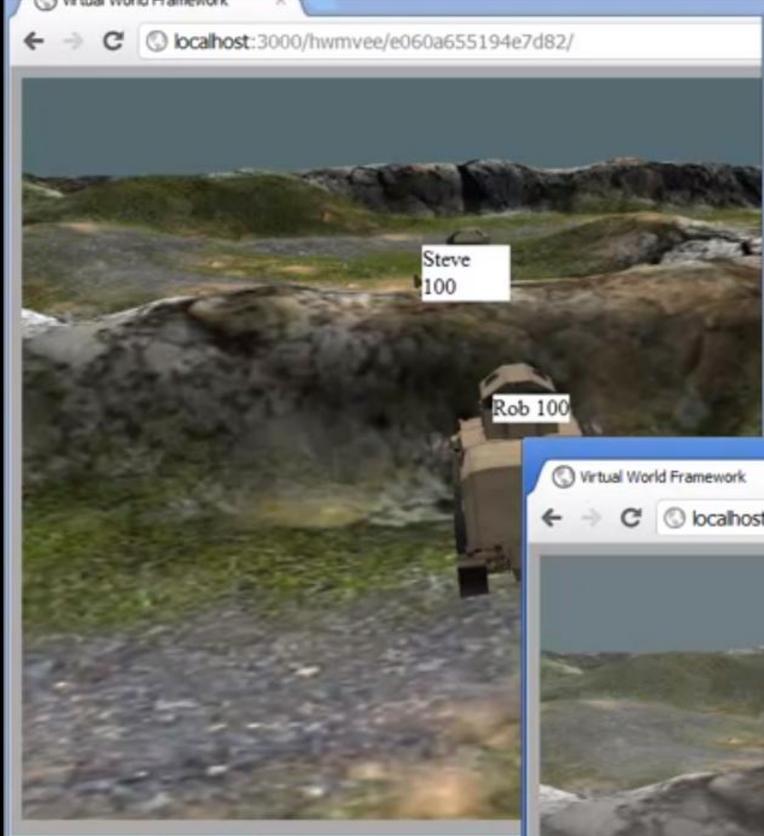
Click on a statement to see the raw statement data.

Actor Email	Verb	Activity ID
<input type="text" value="Email Address"/>	<input type="text" value="Verb"/>	<input type="text" value="Activity ID"/>

<input type="button" value="Refresh"/>	<input type="button" value="Show Advanced Options"/>	<input type="button" value="Show TCAPI Query"/>	<input type="button" value="Export Selected"/>	<input type="button" value="Clear Sandbox"/>
--	--	---	--	--

2012-10-24T14:28:47.151	Nikolaus Hruska <b>experienced</b> 'http://www.adlnet.gov/capabilities/tla'
2012-10-24T14:28:40.031	Nikolaus Hruska <b>experienced</b> 'http://www.adlnet.gov/capabilities'
2012-10-24T14:28:29.831	Nikolaus Hruska <b>experienced</b> 'http://www.adlnet.gov/resources'
2012-10-24T14:28:20.781	Nikolaus Hruska <b>experienced</b> 'http://www.adlnet.gov/'

```
{
  "id": "c4936bfb-9b5a-42fe-8933-68a176952410",
  "actor": {
    "name": [
      "Nikolaus Hruska"
    ],
    "mbox": [
      "mailto:nikolaus.hruska.ctr@adlnet.gov"
    ],
    "objectType": "Person"
  },
  "verb": "experienced",
  "inProgress": false,
  "timestamp": "2012-10-24T14:28:19.749Z",
  "stored": "2012-10-24T14:28:20.781Z",
  "authority": {
    "account": [
      {
        "accountServiceHomePage": "http://cloud.scorm.com/",
        "accountName": "FSU67CYAXH"
      }
    ],
    "objectType": "Agent"
  },
  "object": {
    "id": "http://www.adlnet.gov/",
    "definition": {
      "type": "link"
    },
    "objectType": "Activity"
  }
}
```





# adlnet

Joined on Dec 11, 2011

**19** public repos   **0** private repos   **13** members

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**ADL\_LRS** Python ★ 17 4  
Last updated 31 minutes ago

**vwf** Perl ★ 0 9  
forked from virtual-world-framework/vwf  
Virtual World Framework  
Last updated 2 days ago

**LR-Interface** JavaScript ★ 0 0  
Last updated 2 days ago

**xAPI-TestSpec** ★ 0 2  
Last updated a month ago

**RUSSELgwt** Java ★ 0 0  
Last updated a month ago

**3D-Repository** JavaScript ★ 14 3  
Last updated a month ago

**RUSSEL** JavaScript ★ 0 0  
Last updated a month ago



# Early Adopters (As of June 2012)



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OpenSesame



ROLEPLAY™  
Learning Interaction

serco

Tapestry

dominKnow: connect the thoughts

Litmos  
LOVE YOUR LMS

eLogic  
LEARNING



float  
mobile learning



ONPOINT  
DIGITAL  
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Questionmark®

Problem  
Solutions

Rapid Intake™ Work as One™  
Cloud-based Collaborative Course Authoring

RUSTICI  
SOFTWARE

MediaTechnics  
Innovative technology for publishing and education



# Transitioning the Experience API



- ADL is a Research and Development initiative
- Ultimate goal is to move the Experience API to a specification group where it can be maintained
- Target date: May 2013

# Wrapping Up



# How You Can Get Involved...



- <http://tincan.adlnet.gov>
  - Wiki <http://tincanapi.wikispaces.com>
  - Google Groups
    - Stakeholders, Adopters, Spec Contributors
  - Developers <http://github.com/adlnet>
    - Open Source LRS
    - “Content” Examples



# Questions?



- Nikolaus Hruska
  - Email: [nikolaus.hruska.ctr@adlnet.gov](mailto:nikolaus.hruska.ctr@adlnet.gov)
  - Twitter: [@nikolaushruska](https://twitter.com/nikolaushruska)
- Andy Johnson
  - Email: [andy.johnson.ctr@adlnet.gov](mailto:andy.johnson.ctr@adlnet.gov)
  - Twitter: [@AndyJohnsonADL](https://twitter.com/AndyJohnsonADL)



# Webinar Resources Page



All of the previous links are listed on a landing page for this webinar at:

<http://www.adlnet.gov/xapiwebinar>

You can also find more information on:

- The TLA
- Building apps using the Experience API
- What SCORM users should expect from the Experience API