Workshop
Learning Analytics supported by ILIAS

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Vorstellung Uwe Kohnle

- 20 years of e-learning experience
- „(Technology) Evangelist“ für Open Educational Resources
- ILIAS-Maintainer for
  - SCORM (1.2, 2004)
  - LTI (Learning Tools Interoperability)
  - xAPI/cmi5
- General Director of internetlehrer GmbH, ILIAS Premium Partner from Bruchsal in Baden-Württemberg
  - Trainings
  - Customizing
  - Developments

xAPI – Relevanz

The xAPI (Experience API) specification is increasingly regarded as a key specification in the e-learning segment, complementing and replacing SCORM. As with SCORM, Advanced Distributed Learning (ADL) is responsible for the specification.

xAPI will revolutionize E-Learning: There are new options for Learning Analytics - possibly supplemented by Artificial Intelligence.

This workshop is about Learning Analytics, but also about the role ILIAS can play in this context and what is already possible today.

xAPI in Context of Total Learning Architecture

To understand xAPI, it is important to see xAPI in the context of the Total Learning Architecture of ADL.

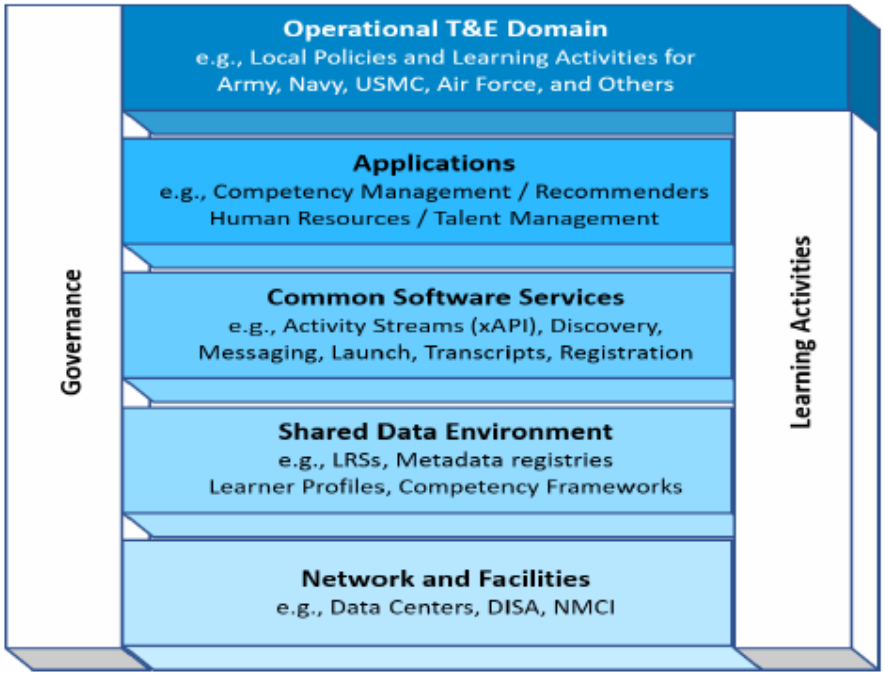
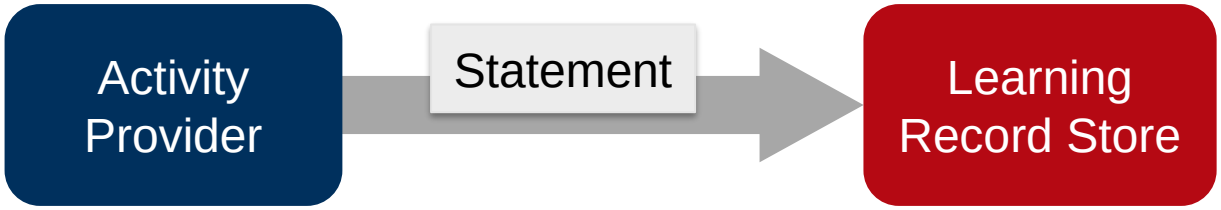


Figure 1. TLA Service Layers – *The TLA's service layers centralize external access to data and functions, hides the complexity of implementation across physical components, and allows for versioning of the services across the TLA ecosystem. This enables a suite of learning applications to use common services and shared data to glean insights about learners, content, context, and competencies within the 2018 TLA Test and Demonstration.*

xAPI in a nutshell

between a learning experience and a Learning Record Store …



Activity Provider

e.g.: video, game, Learning module, app, webcam, flight simulator…

Statement

describes an event like

I – DID – THIS

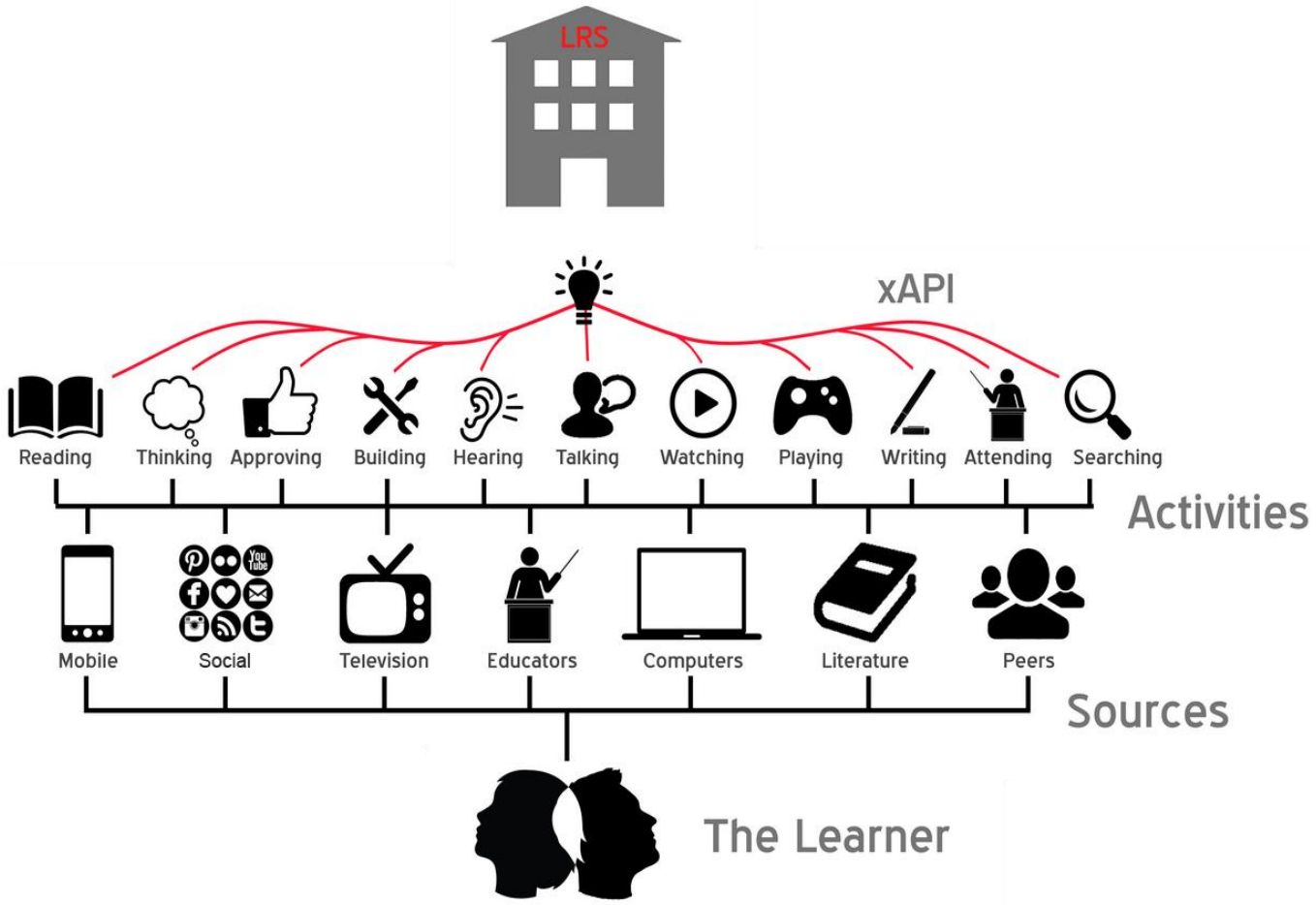
Bart experienced “Math with Itchy & Scratchy”

Lisa answered question „spelling-nucular“ with result 10

Learning Record Store (LRS)

A system that stores learning information, such as statements, session data, and activity data.

xAPI – for everything!

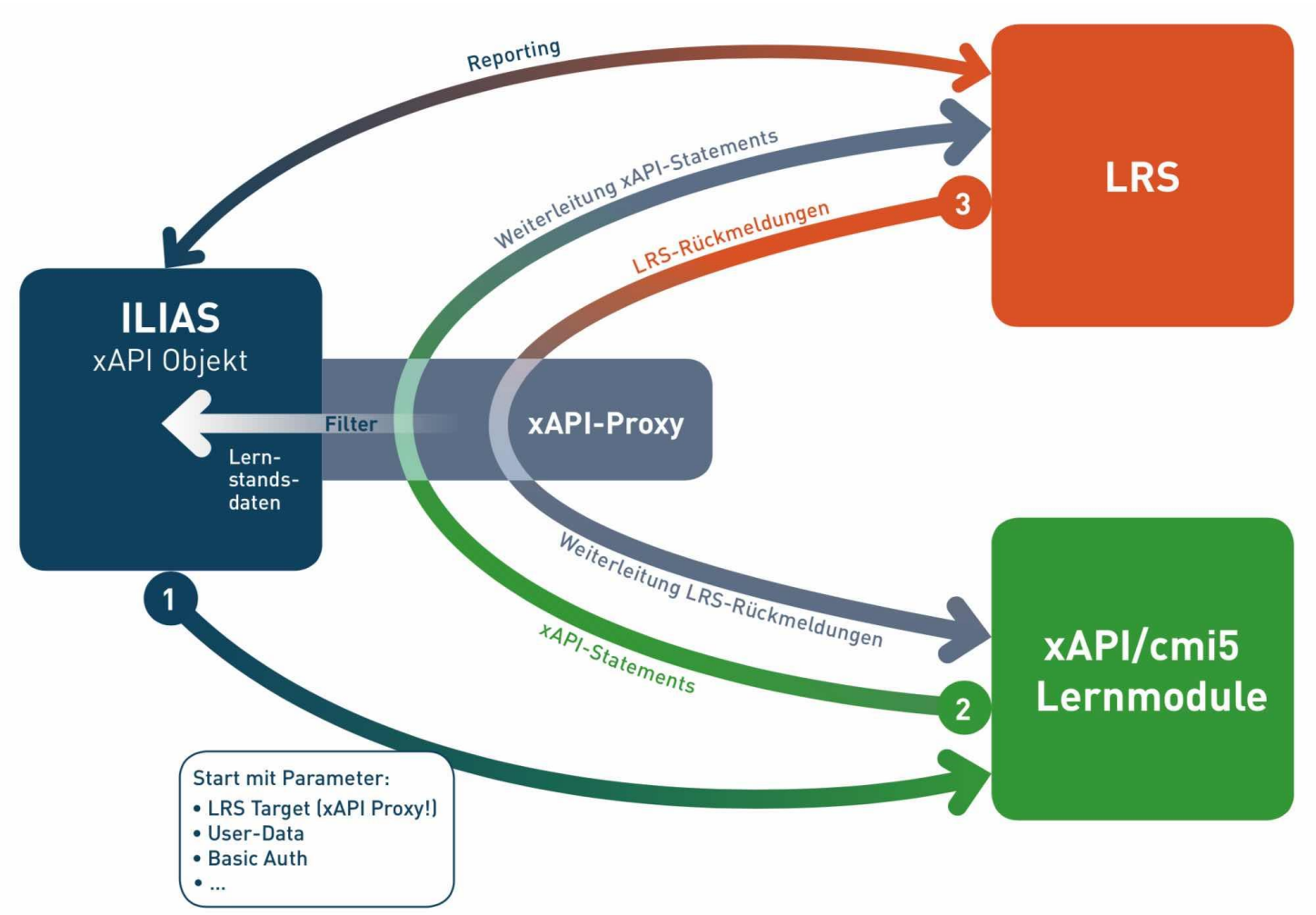


Two ways to get xAPI-Data into ILIAS 6

- Request a Learning Record Store directly or via cron-job
- Get data via the xAPI Proxy – a USP of ILIAS with a wide range of options!

The Proxy is similar to a Dedicated Proxy for HTTP/HTTPS

The xAPI Proxy in details



Challenges and solutions

- Launch H5P-Resources via LTI and get xAPI-Data
- Combining different systems required a new test environment.
- Matching with Learning Progress in ILIAS is in progress.
- Data Privacy!!
- …

challenges of complex test scenarios

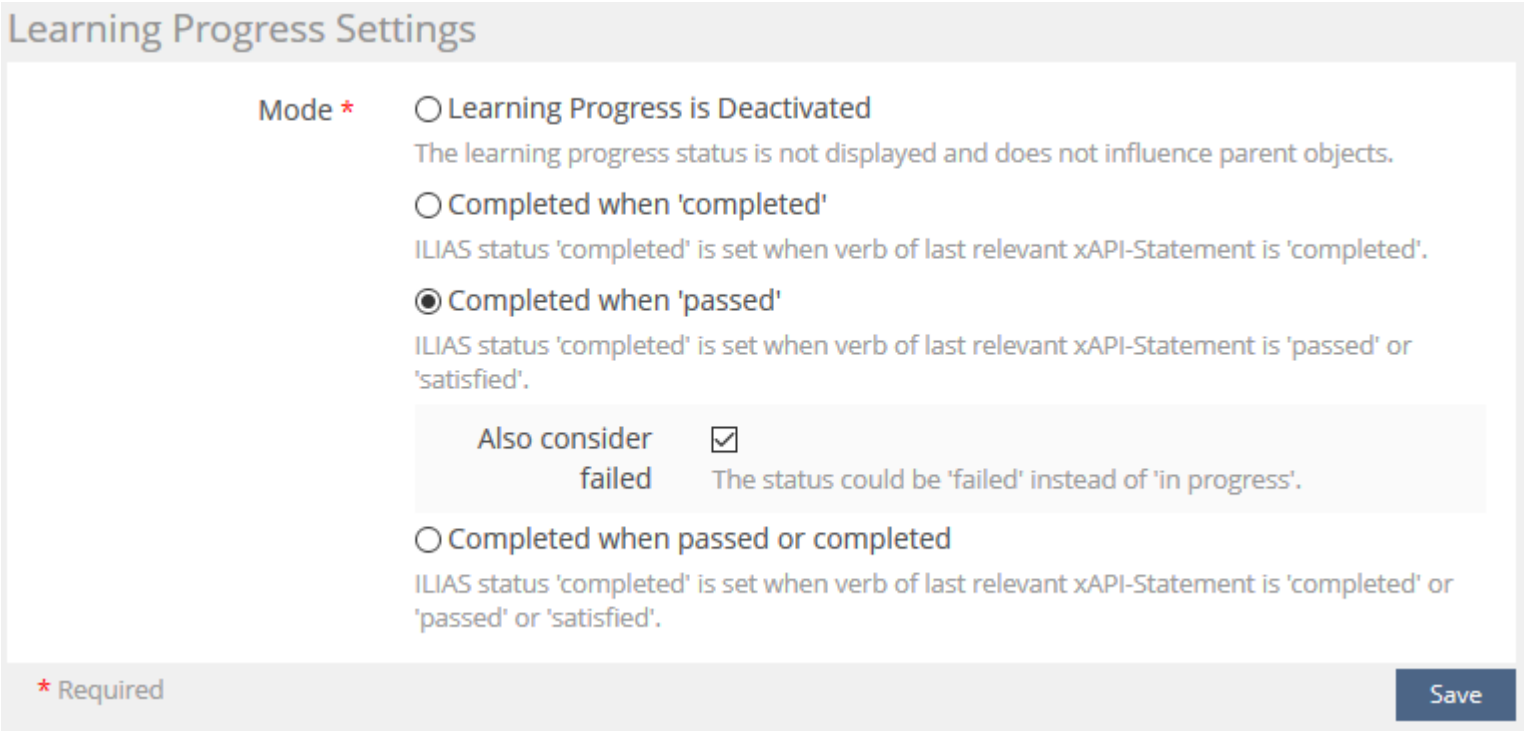
- testing and development scenarios often require multiple infrastructures and application configurations for diverse purposes
- expensive provision of various tools, installation candidates, third-party software and network infrastructure
- LTI / xAPI example:
  - Multiple LMS Instances (ILIAS, Moodle) for Integration Tests (Consumer / Provider)
  - LRS (Learning-Record-Store) for xAPI Activities
- ILIAS plugins for thirdparty systems: Opencast, BigBlueButton, Nextcloud ...
- multiple LMS or third-party systems needs to be involved into testcases
- independant tester needs access to extended infrastructure without technical overhead

solution: Docker Test-Environment

- configurable applications with docker stacks (docker-compose)
- multiple ILIAS instances based on different code branches and repos can be easylly installed as docker stacks side-by-side in a transparent network
- third-party systems like Moodle, Leraninglocker, OpenCast can be launched side-by-side as docker stacks (low effort for customizing official docker stacks)
- every application can be referenced by custom domain name and valid TLS connections: (https://) ltiprovider.example.com, lticonsumer.example.com, moodle.example.com, lrs.example.com, opencast.example.com ...
- secure and easy access for tester with Chrome/chromium
- support for Linux and Windows user (scripts for automation SOCKS5-Proxy and ssh-tunnel, little technical competences required)

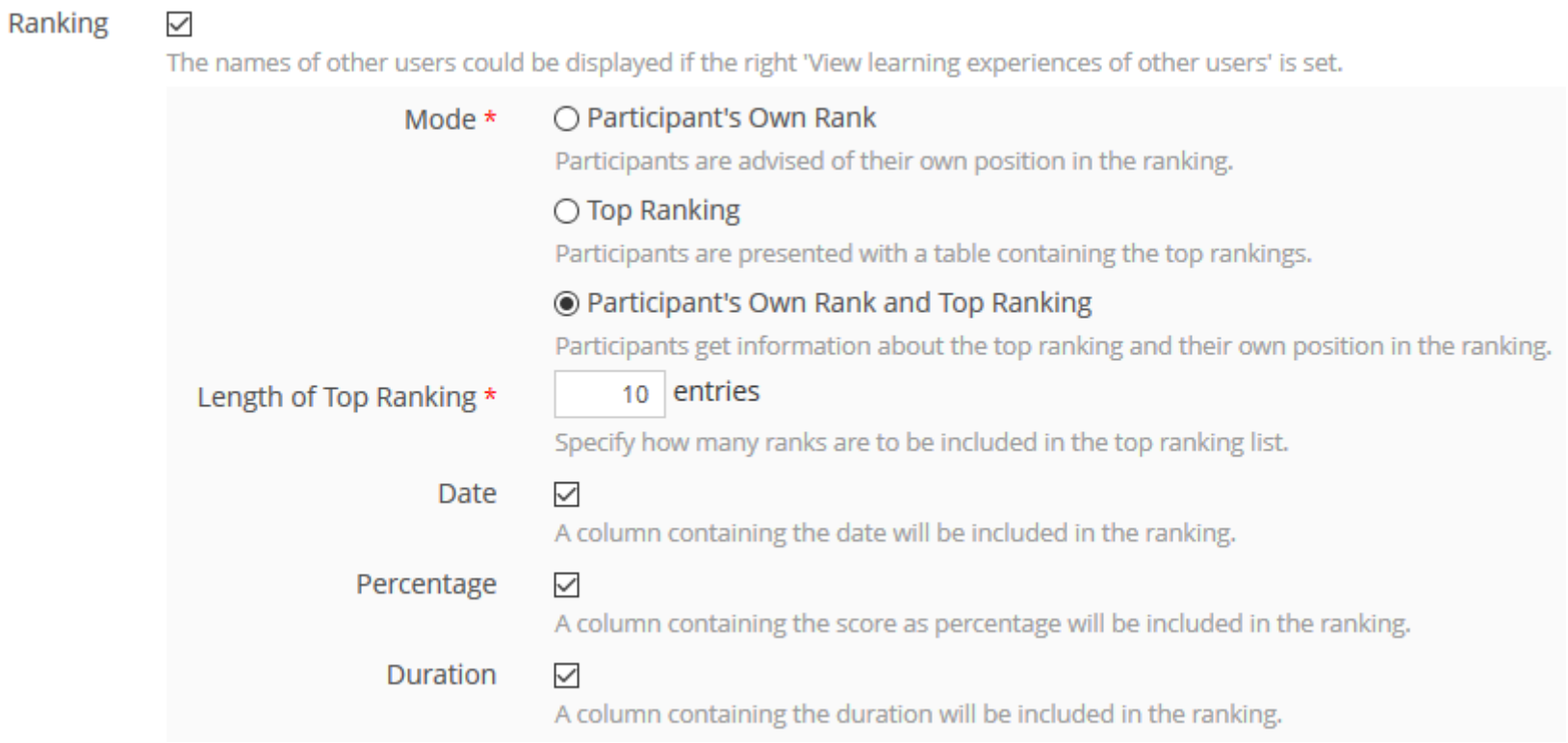
xAPI – Learning Progress

- Cmi5 vocabulary is used.



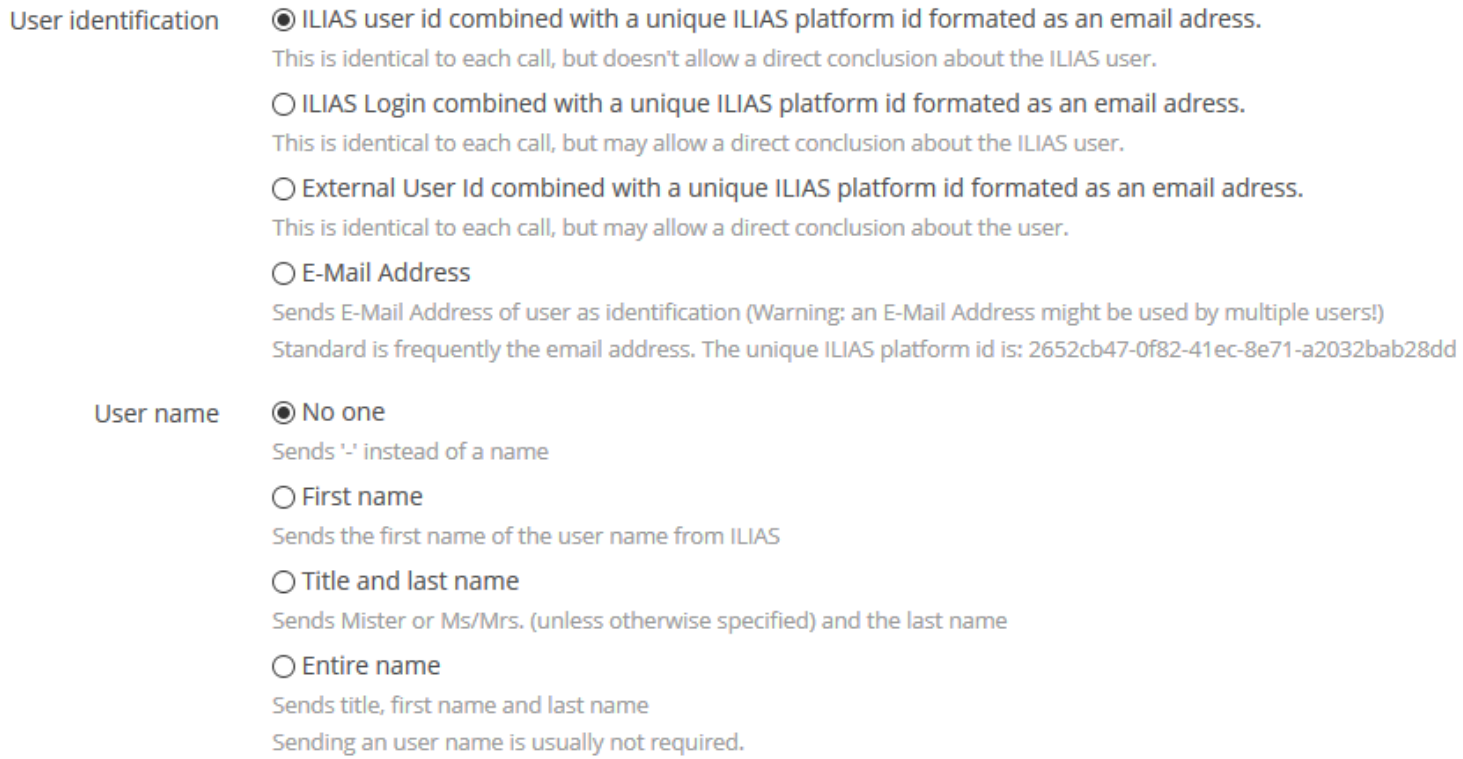
- It is not enough! There are some good ideas in Feature Wiki!

xAPI – Options for Ranking



xAPI – Data Privacy

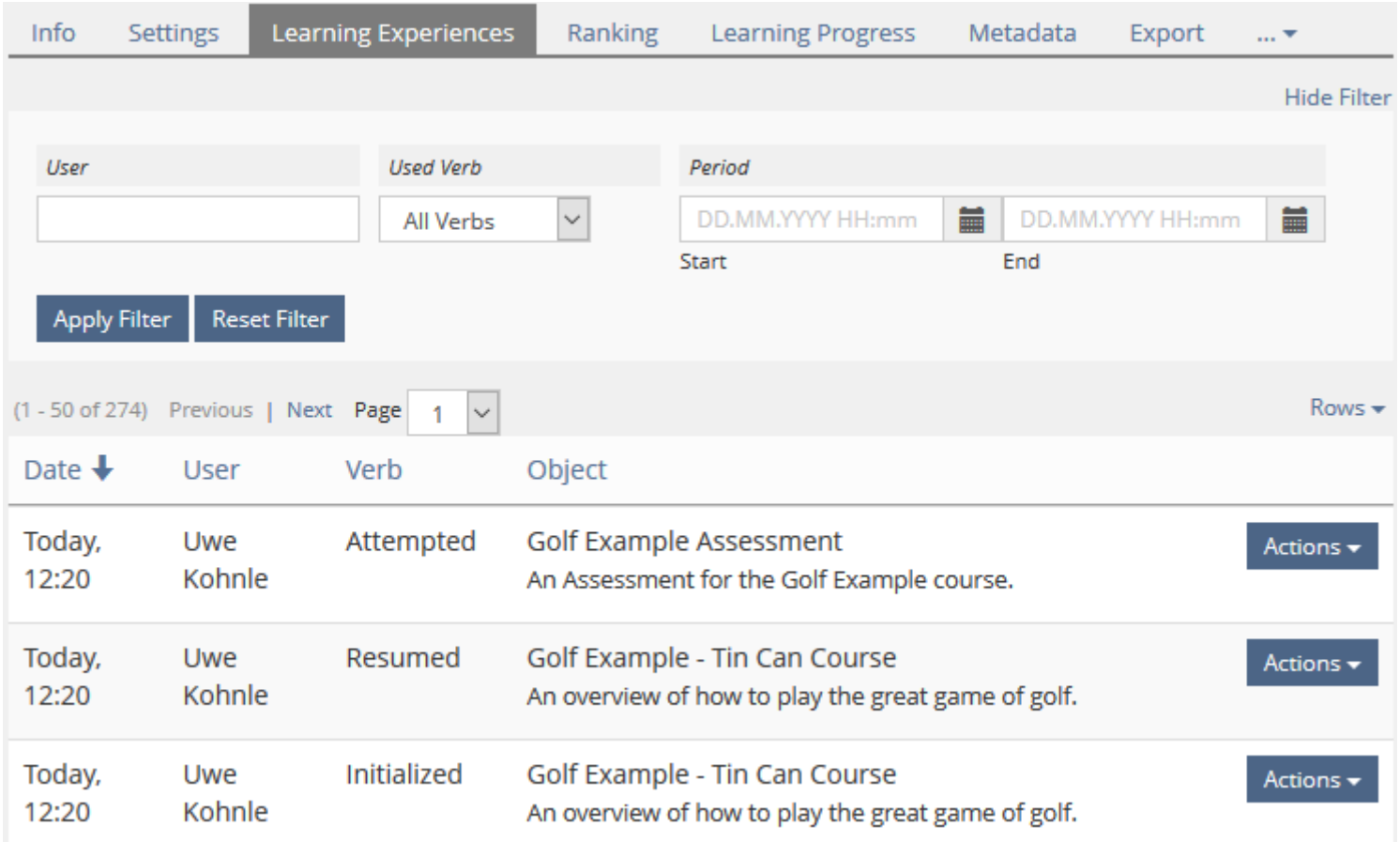
- Pseudonymization possible



- Statement Reducer to minimize the amount of data to be stored is planned for ILIAS 7

xAPI – Data Privacy with Statement Viewer

- Can be set visible also for learners. Removes pseudonymization



Plugin Lp2Lrs for ILIAS 6

- Each learning progress change in ILIAS is sent to a predefined learning locker client (LRS). It includes context information about the object itself (ID, type, title, time, if possible score) and the parent object (ID, type, title - if it's a course, group or category). The learning progress changes are stored in a separate table and transmitted via a cron job to the LRS as an xAPI statement.
- Developed for a ILIAS 5.3 Feature branch for the Koninklijke Landmacht. Coming soon for ILIAS 6.

Where xAPI is used already with ILIAS

- DGUV with xAPI-Plugin
  - Several Berufsgenossenschaften
- Army of the Netherlands with ILIAS 5.3-Feature Branch and Lp2Lrs-Plugin
- ?
- ?

Main advantages of combining ILIAS with Learning Analytics

- Any Object of ILIAS supporting Learning Progress can send xAPI-Statements.
- Data Protection Mechanisms with the use of ILIAS xAPI-Proxy can generate pseudonymized and anonymized data – and nevertheless personalized reports can be generated with ILIAS.
- Additional reports e.g. for ranking are already available in ILIAS 6.
- Data minimization will be realized object based soon.

Noch Fragen?

Reflexionsrunde als Blitzlicht zum Schluss

Welche wichtigste Erkenntnis nehmen Sie heute für sich mit?