White Area lecture on the CERN-Solid collaboration

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Overview

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What is Solid

- Sir Tim Berners-Lee (TimBL) announced his Solid project (Social Linked Data) in 2016.
- This Open Source platform aims to re-decentralize the Web and empower users' control over their own data.
- Solid includes standards, missing from the original Web specifications, giving back to the users:
  - *ownership* of their *data*, private, shared, and public.
  - *choice* on the *storage* where these data reside and
  - *control* over who has *access* to them.
- TimBL co-founded inrupt to implement the Solid standards.

Why CERN should be involved

- CERN is the birthplace of the Web
- Many sophisticated software projects at CERN
  - Already open source
  - Operational status (tens of thousands of users)
- Solid is here to stay - we should be more actively involved than we were with W3C.

The Solid pod

- People store their data securely in decentralized data stores called *Pods*. (*)
- Pods are like secure personal Web servers for data.
- Solid connects resources in different pods by representing all data as *Linked Data*, i.e. every piece of data gets its own HTTP URL on the Web, and we use those URLs to refer to this data.
- When data is stored in someone's pod, they control who and what can access it.
- There will be a pod demo by Jan.

(*) Pod: a usually protective container or housing (from the Webster dictionary).

The Solid servers

1. **Node Solid Server (NSS):** *Open Source* server by the MIT Solid team since 2016. NSS instances in the next slide.
2. **Enterprise Solid Server (ESS):** inrupt's commercial *Closed Source* alternative, based on Trellis. Launched in November 2020. Article.
3. **Community Solid Server (CSS):** *Open Source* project by Ghent University, paid for by inrupt, to rewrite NSS from scratch in TypeScript.
4. **php-solid-server (PSS):** *Open Source*, good test results, under dev. The basis for the Nextcloud app that makes Nextcloud compatible with Solid.

Solid servers' interfaces

- All Solid servers have the same common interface, so they don't need to know anything about what apps are being run on them. See more here
- Two public demo/test sites for making your own pod. They both run NSS:
  - inrupt.net run by inrupt, hosted at inrupt premises, USA, data in Amazom Web Services.
  - solidcommunity.net run by the Solid organisation, hosted in the UK, data in Digital Ocean.
  - a few others people show at the monthly Solid World Webinar.

Slide with input from TimBL

Solid specifications

Recently matured, they cover areas of:

* Authentication
* Authorisation
* Data inter-operability
* Testing suites

As the **Web Access Control (WAC)** gives all privileges to the user, **Access Control Policies (ACP)** are now being defined to assist newcomers.

Specs' current location: https://solid.github.io/specification/

Specs' future location: https://solidproject.org/TR/

Test suite: https://github.com/solid/test-suite

Solid implementations

By start-up companies and government agencies. Most engaged countries, so far, are Belgium, the Netherlands, Germany and the UK.

- UK NHS (National Health System)
- Flanders' government applications
- Belgian Digita inox (connects your different pods)
- inrupt developments - sign-up and play

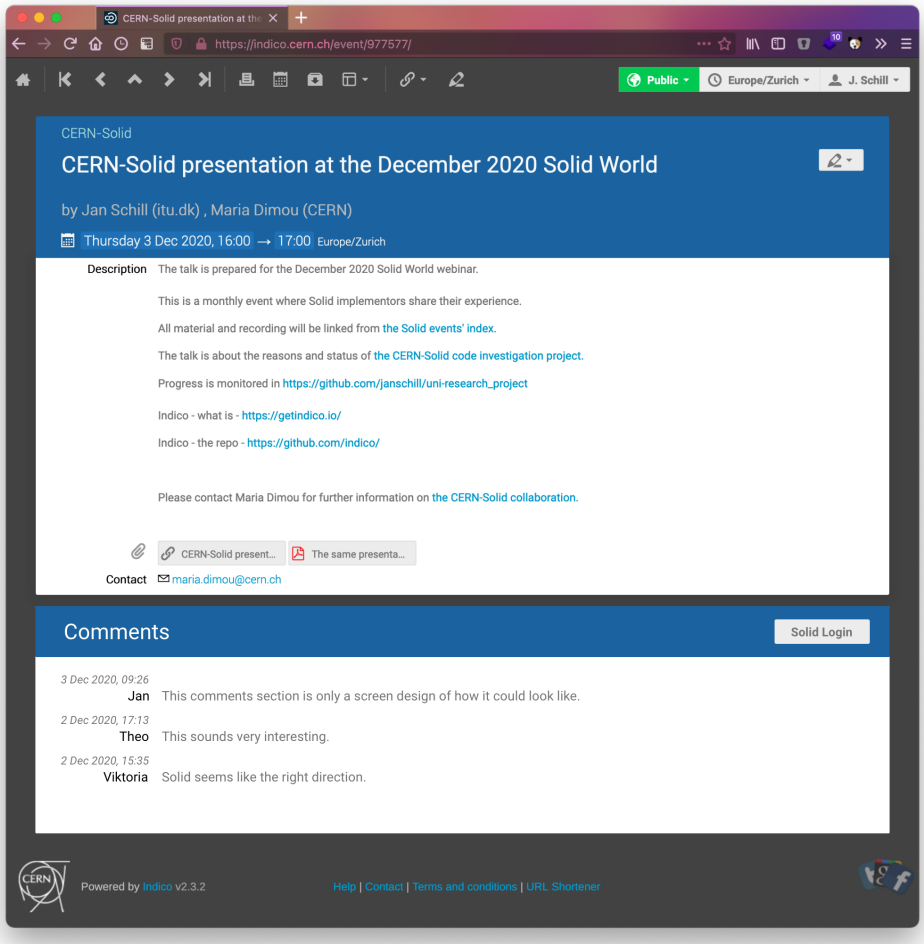
Activities summarised in the Solid newsletter and reported at the monthly Solid World Webinar.

The CERN-Solid code investigation project

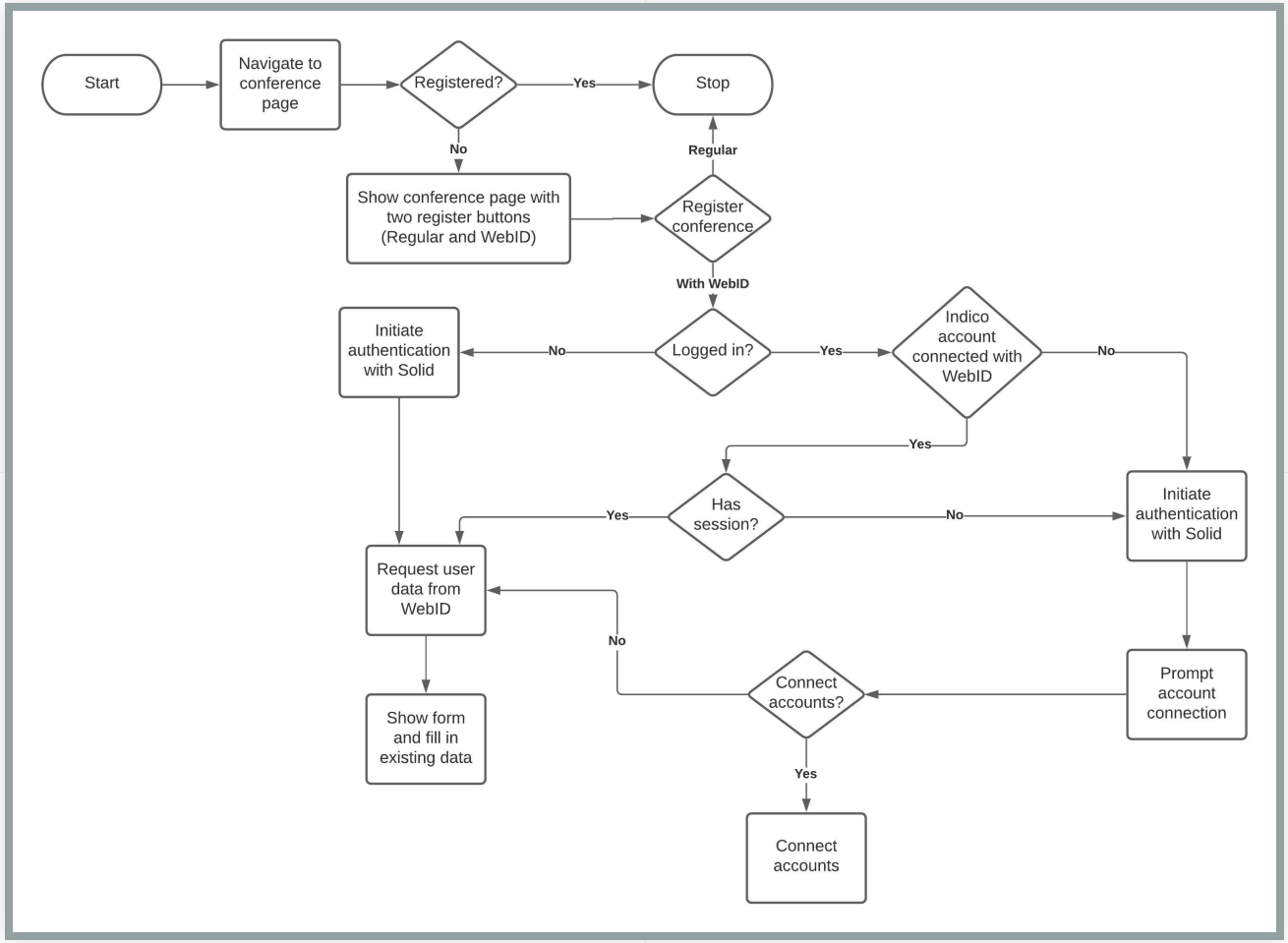
1. **Review Solid specifications**
2. **Evaluate Solid implementations**
3. **Enrich Indico with Solid principles**
4. Recommendations on Solid adoption in CERN applications
5. Document challenges, advantages, gaps
6. Presentation of proceedings

Full project description
Very comprehensive report on points 1 & 2 by Jan
GitHub: janschill/uni-research_project

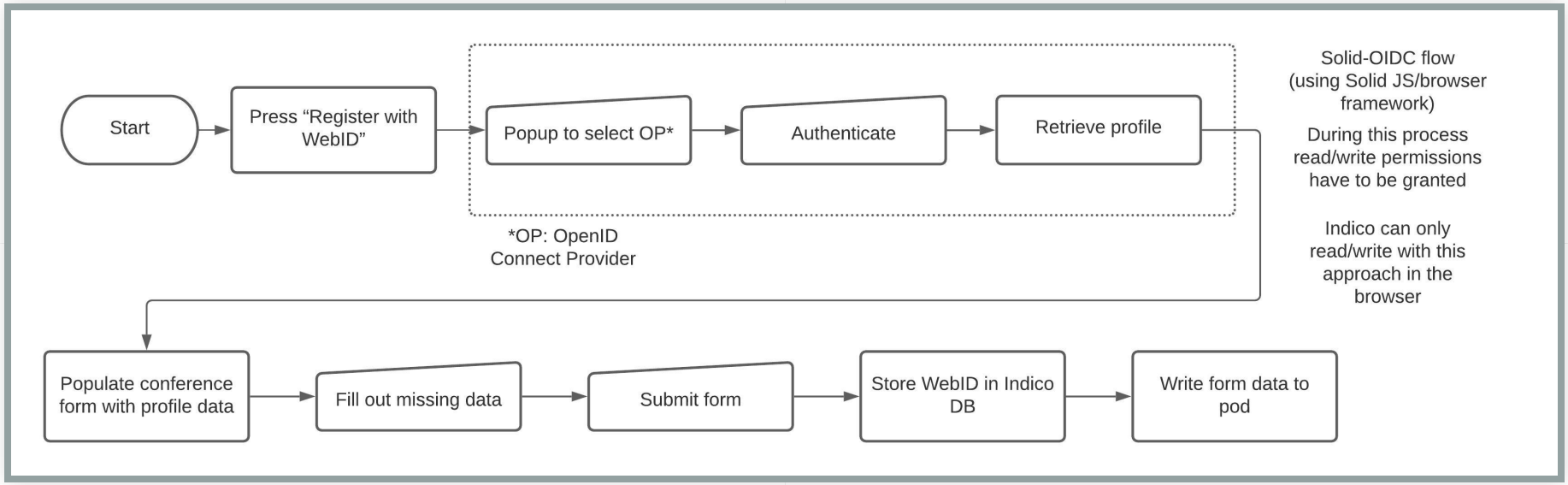
Proof of Concept via Indico extensions



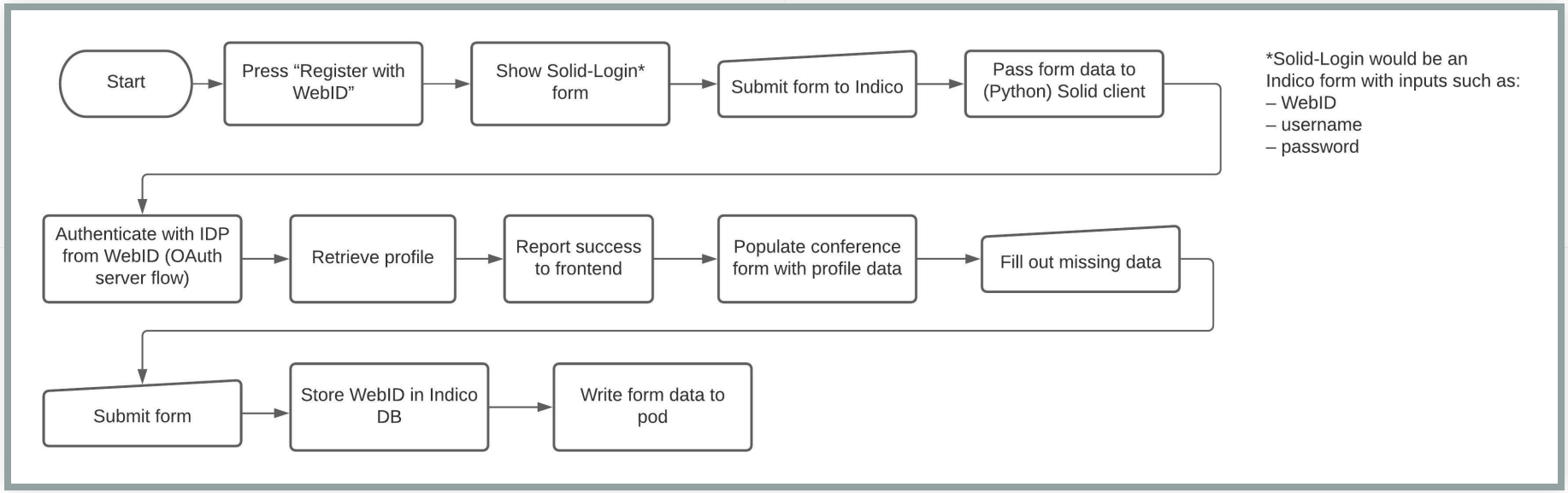
Conference Registration



Conference Registration Client-Side



Conference Registration Server-Side



How to Login/Register with a Solid Pod

1. Pick a provider: solidcommunity.net* or inrupt.net**
2. Register with **username***, **password, name, email address**
3. Log in using the newly created WebID with username and password
4. Go to https://podbrowser.inrupt.com/ and log in

*Hosted: *DigitalOcean (UK) , **AWS (USA)*
*WebID: ***username will be part of your WebID*

Other relevant CERN applications

Mutual benefit will derive from other PoCs with:

- The CERN *Notifications project*, unilateral, via subscription and archived.
- The *new CERN Authentication* project.
- *CS3MESH*, a pan-European cross-institution mesh that will offer data sharing/co-editing facilities, relying on the federation of different sites by using well-known APIs.
- *InvenioRDM*, a Research Data Management, open source platform for persistent paper & data registration.

Conclusion

The success of the CERN-Solid code investigation project is important:

1. For Jan's MSc thesis at itu.dk to demonstrate that the implementation works.
2. For CERN to be inspired by the PoC and embrace Solid.
    - Solid is there to stay. We should embark now!
3. For Solid to show that its principles can work in an environment of tens of thousands of users.

Thanks!

- To TimBL for always giving advice, despite the millions who contact him.
- To Michiel de Jong & Sarven Capadisli, for their answers to our frequent questions.
- To Jan Schill (from Maria) for choosing this project for his MSc thesis.
- To the CERN/IT-CDA management for approving this work.

References current

- *The Solid project web site:* https://solidproject.org
- *Jan's MSc Thesis description:* https://it-student-projects.web.cern.ch/projects/cern-solid-code-investigation
- *Thesis repo.:* https://github.com/janschill/uni-research_project
- *CERN-Solid entry point:* https://indico.cern.ch/category/11962/
- *CERN-Solid chat:* https://gitter.im/cern-solid/community

References Historical

- *The original Web proposal:* https://www.w3.org/History/1989/proposal.html
- *When the CERN Web was Open Source (most data missing today):* https://weboffice.web.cern.ch/WebOffice/
- *Past attempts to involve CERN in W3C work:*
  - *CERN-W3C 2014 proposal:* https://cern.ch/dimou/personal/CERN-W3C_Collaboration.pdf
  - *CERN-W3C 2017 proposal:* https://cern.ch/dimou/personal/CERN-W3C_Collaboration_2017_proposal.pdf