A Study of Credential Integration Model in Academic Research Federation Supporting a Wide Variety of Services

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Outline

- Introduction to GakuNin and HPCI
- Issues
- Consideration of credential integration
- Related works
- Summary

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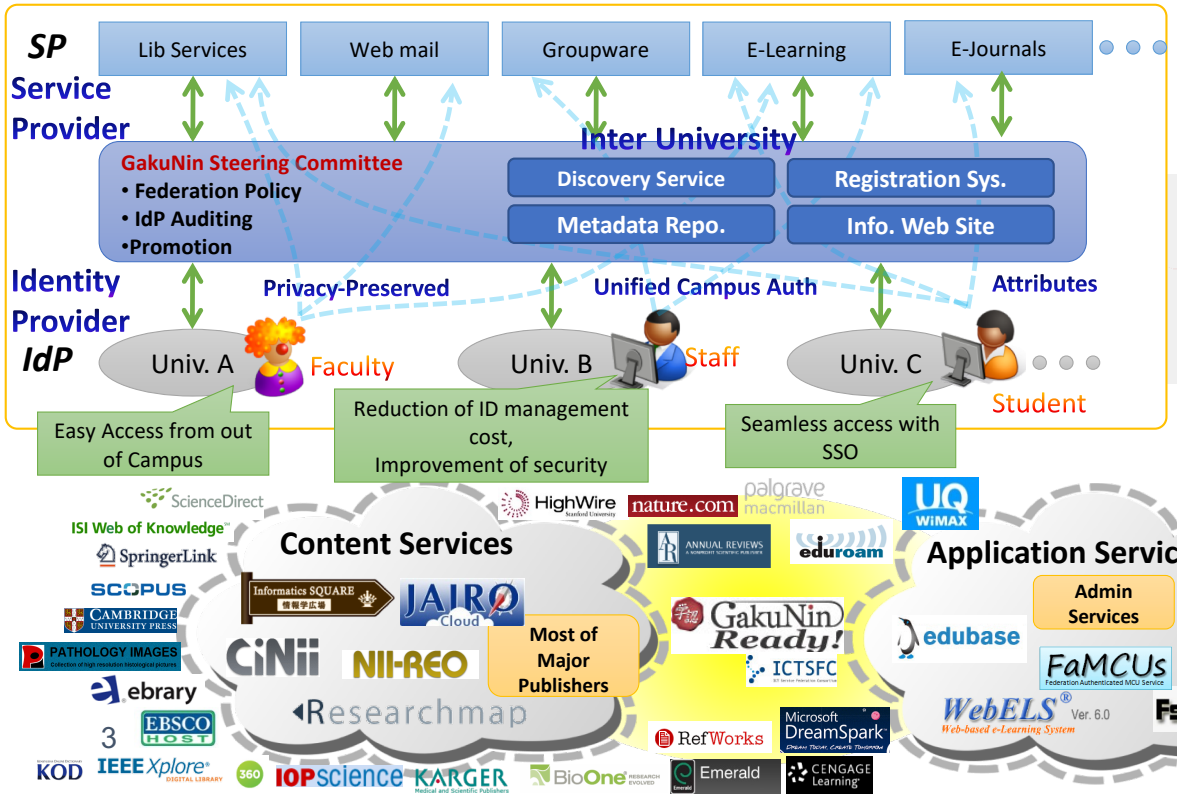
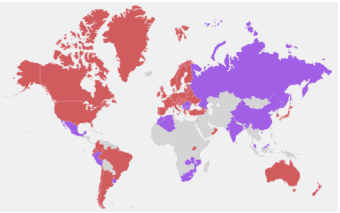
GakuNin An Academic Identity Federation in Japan

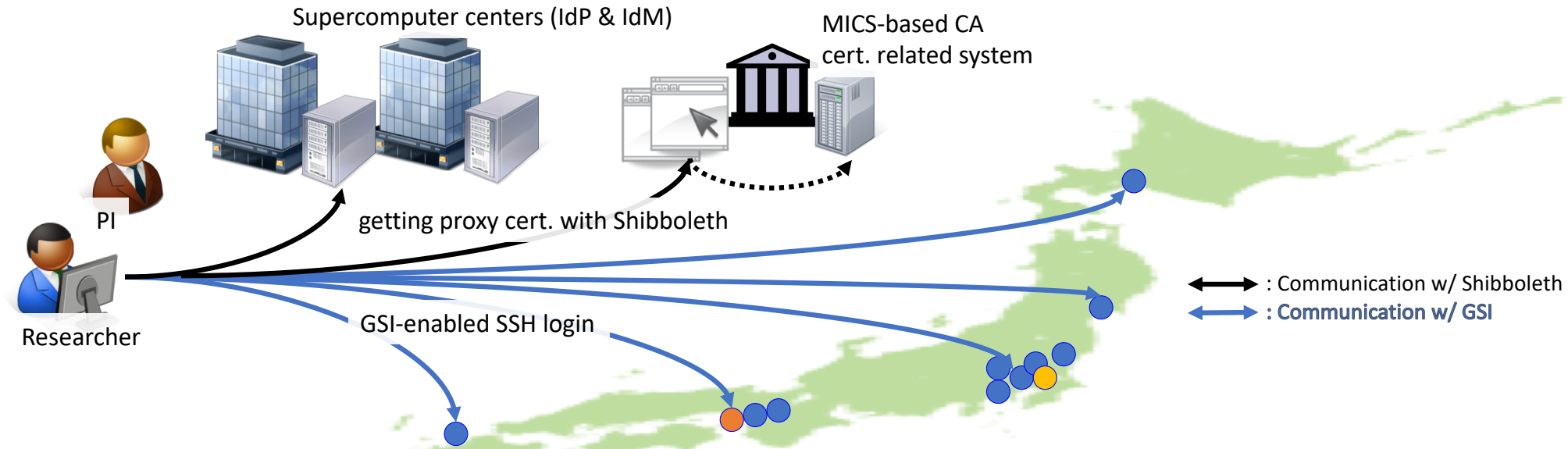
- Build up new ICT infrastructure to support R&E based on SSO technologies
- Provides trust framework (technologies, policies and assessment)
- Offers value added services (academic discount, etc.) by collaboration with commercial
- Improves usability and security with continuous R&D (including multifactor/cert. auth.)



Academic Federations have been established per country basis



HPCI: High Performance Computing Infrastructure



HPCI authentication system features include:

- Single user ID and multiple accounts called HPCI-ID, HPCI and local accounts
  - HPCI accounts are managed by identity providers.
- A hierarchical initial identity vetting system based on face-to-face meetings with photo-IDs
- Two kinds of credentials for services in HPCI:
  - Shibboleth assertion for Web services: certificate issuance, CMS, etc.
  - GSI proxy certificate for access to supercomputers and storages

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Difference between HPCI and Gakunin

- What is difference between HPCI and Gakunin?
- IdP in HPCI is different from IdP in Gakunin:
  - Gakunin IdP is managed by an academic institution and covers all constituent members of its academic institution.
  - HPCI IdP is managed by a supercomputer center (university or institute) and covers only HPCI users who are not only academic researchers but also industrial ones.
- Why did HPCI build dedicated IdPs ?
  - HPCI IdP has to satisfy a strict LoA imposing identity vetting via a face-to-face meeting.
  - HPCI IdP needs to cover industrial researchers.
  - HPCI is not a common service to all constituent members of an academic institution like e-Journals.
- Only if HPCI users are academic ones, at least HPCI and Gakunin IdPs should be integrated.

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Guiding question

- How do we integrate HPCI IdP and GakuNin IdP in order that academic users only need to manage one credential?
- We select GakuNin IdP as primary identity provider because GakuNin IdP is operated by home organization that user belongs to.
- How do we apply a credential issued by GakuNin IdP to HPCI services?

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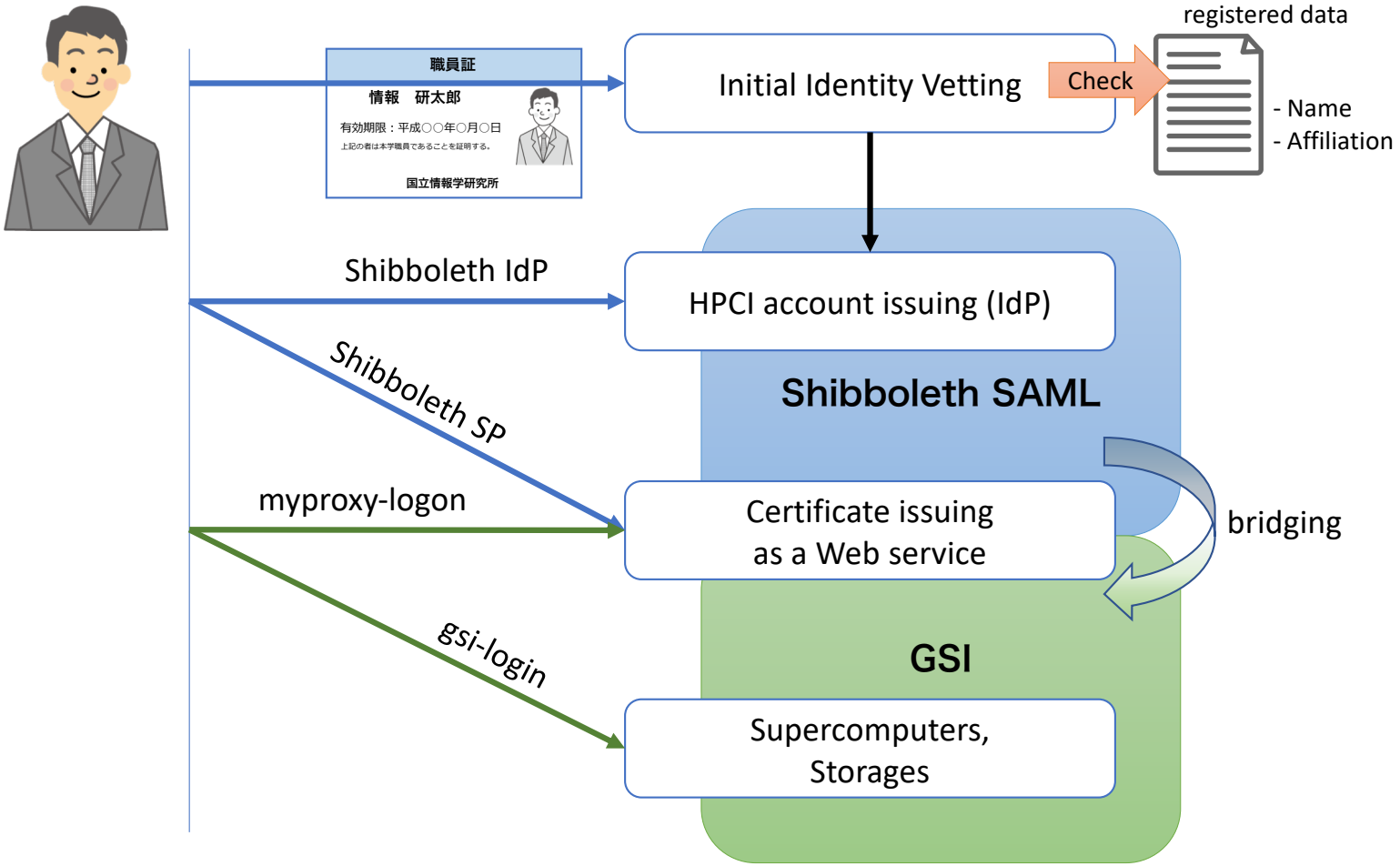
Authentication flow in HPCI



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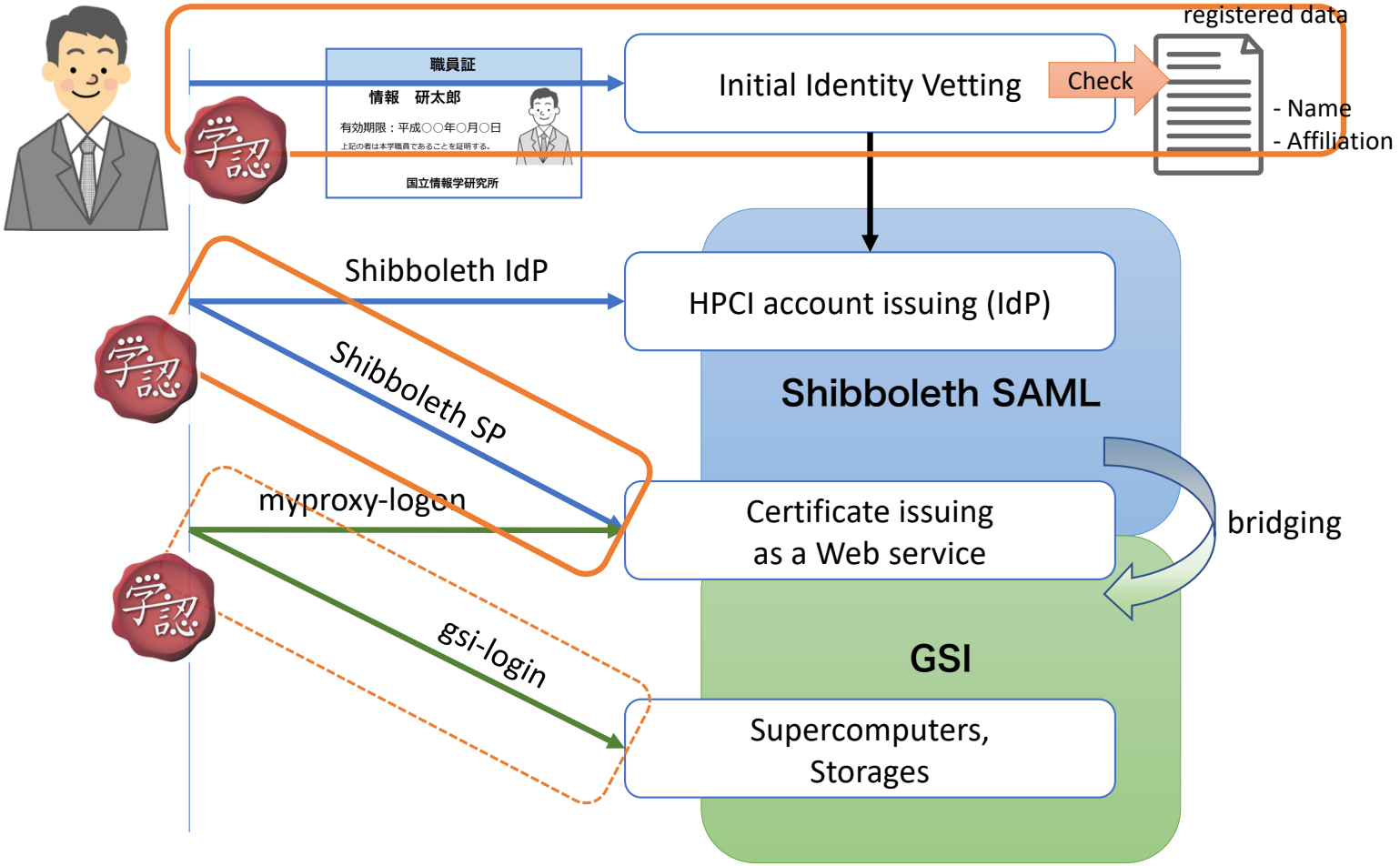
Possibilities for GakuNin credential application



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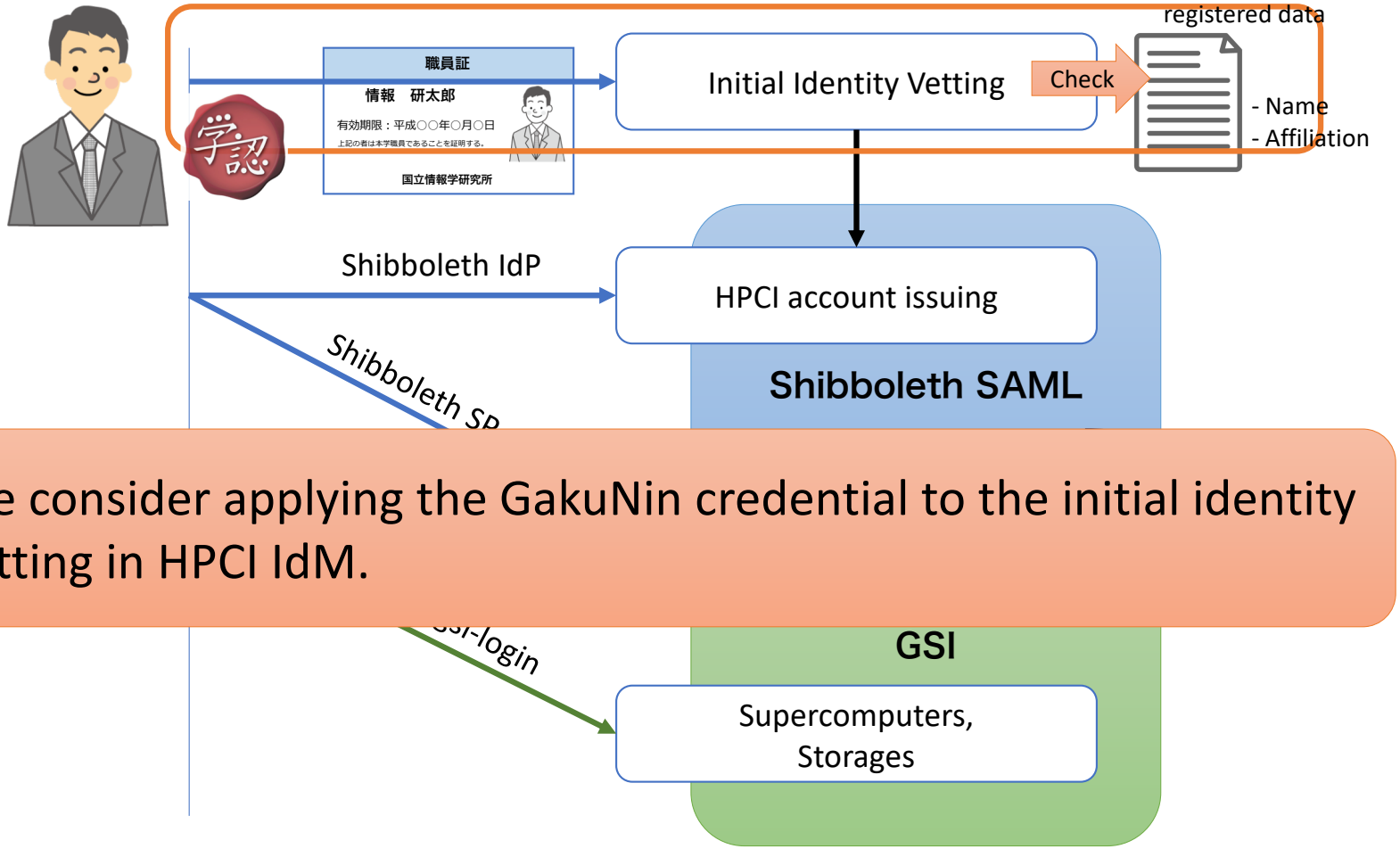
Possibilities for GakuNin credential application



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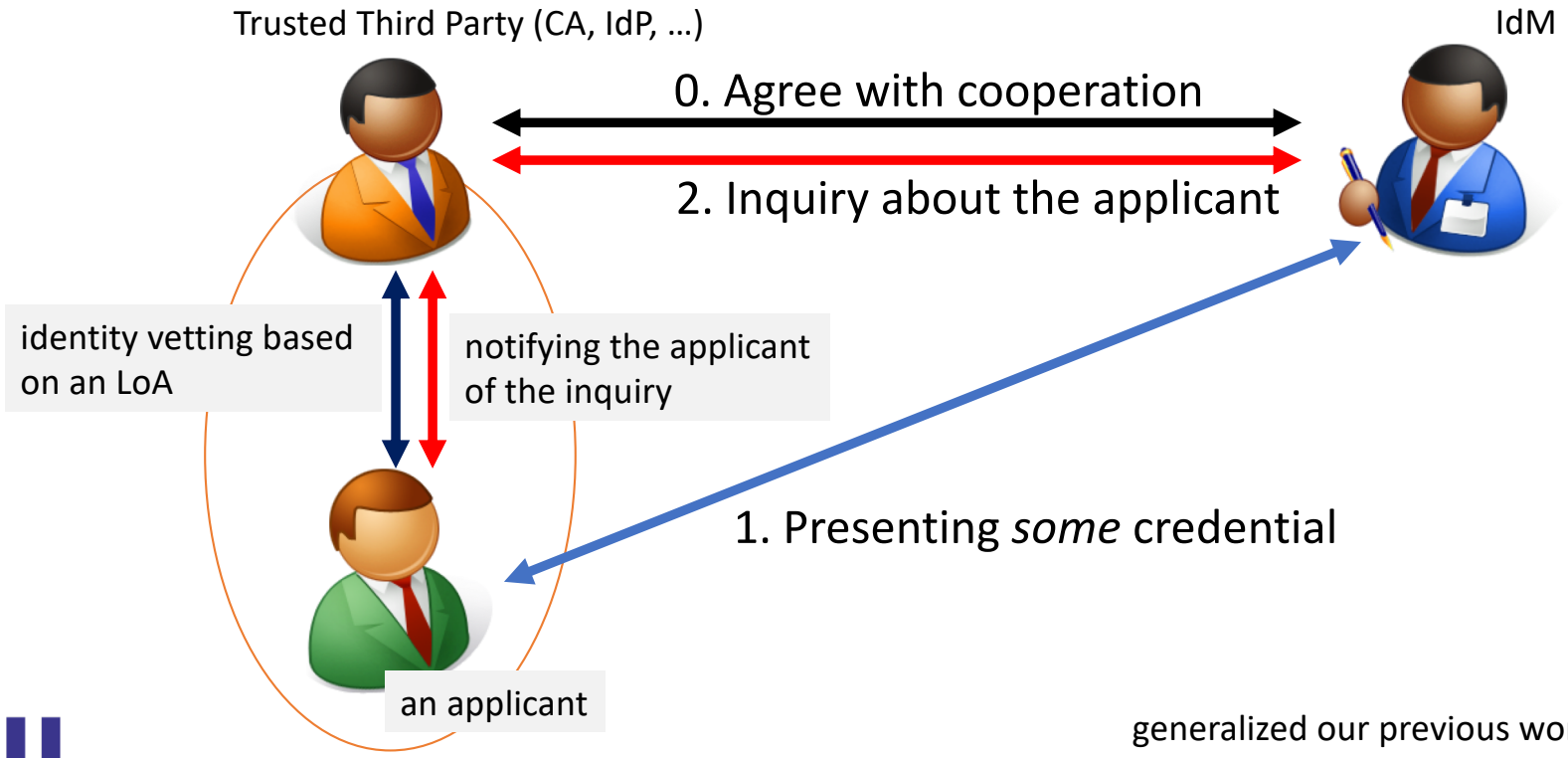
Basic idea:
Initial identity vetting with external credential



generalized our previous work, PoS(ISGC2017)009

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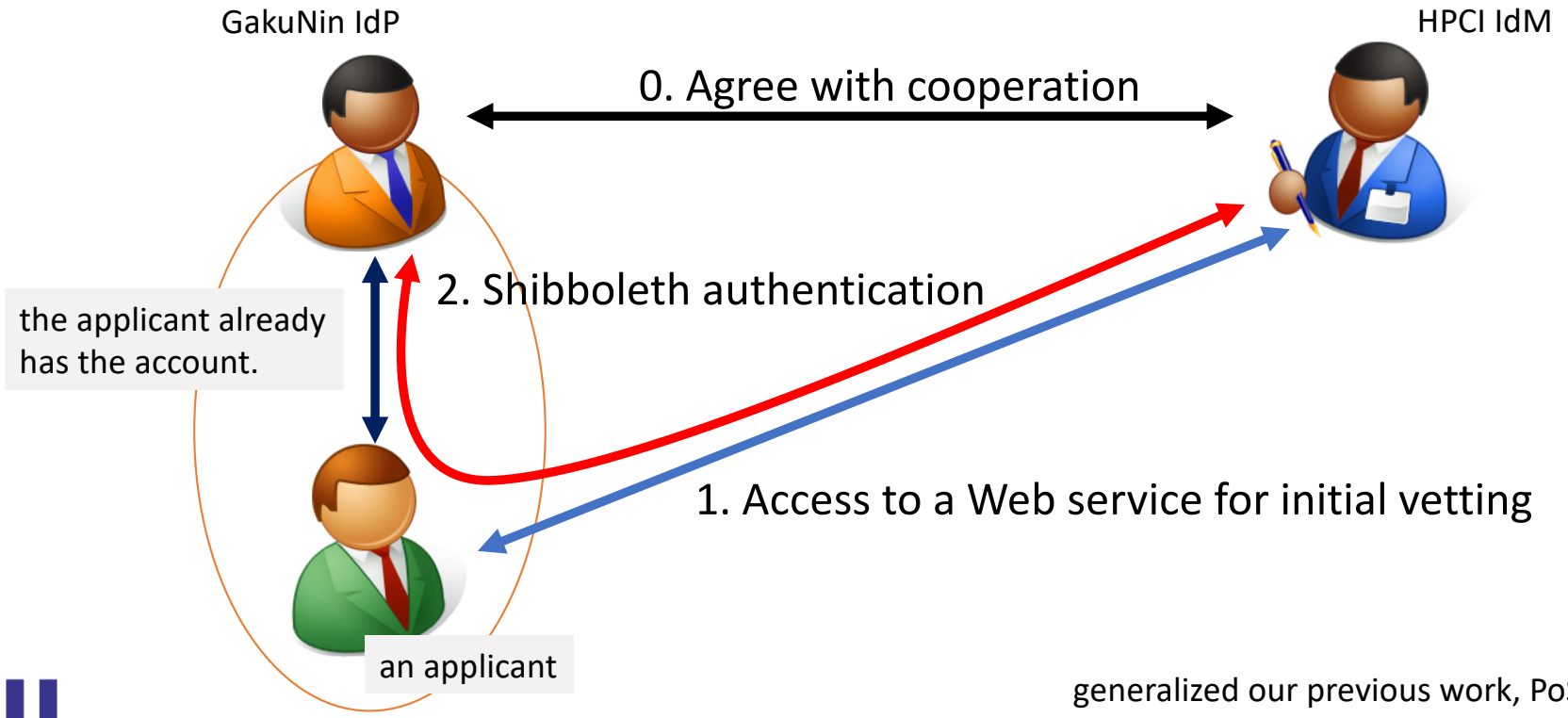
Initial identity vetting with credential issued by GakuNin IdP



generalized our previous work, PoS(ISGC2017)009

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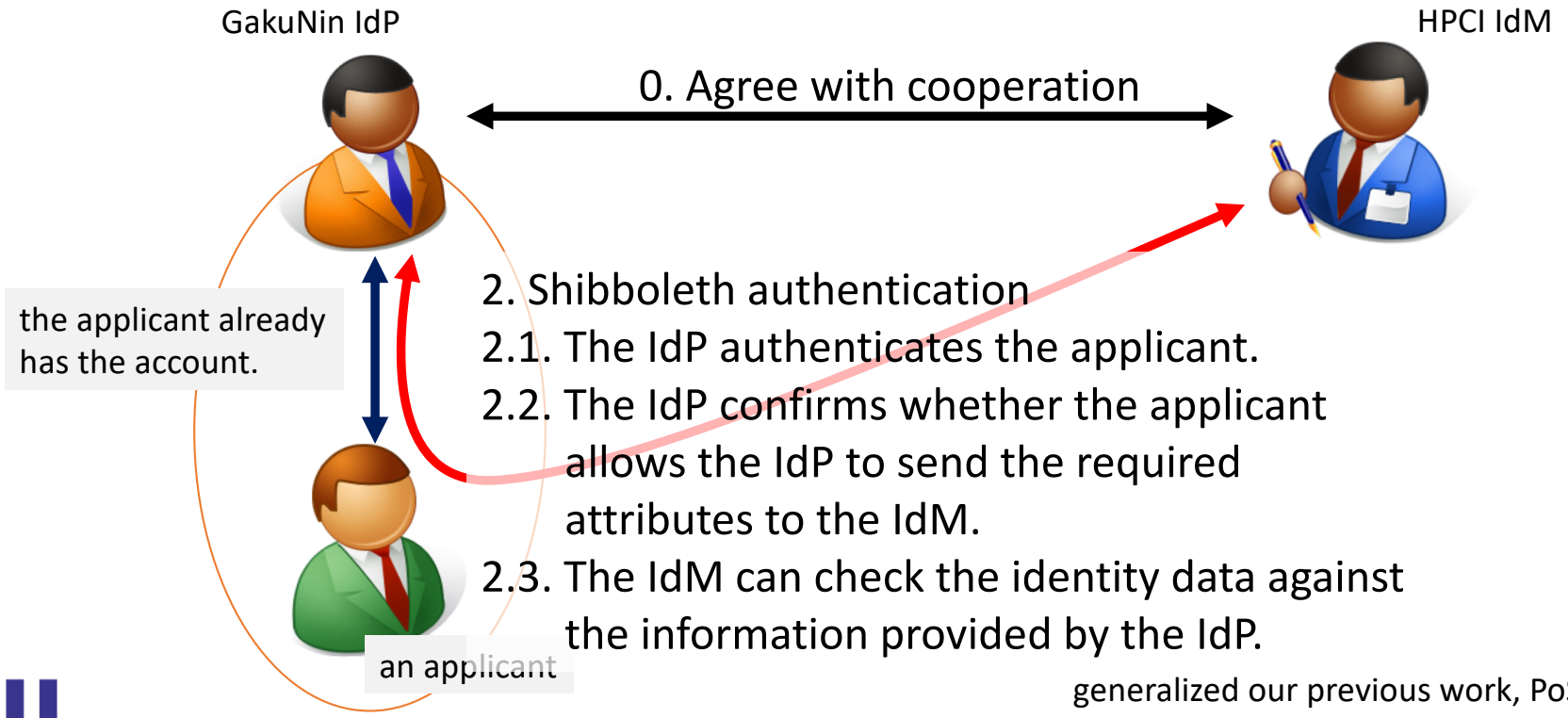
Initial identity vetting with credential issued by GakuNin IdP (Cont'd)



generalized our previous work, PoS(ISGC2017)009

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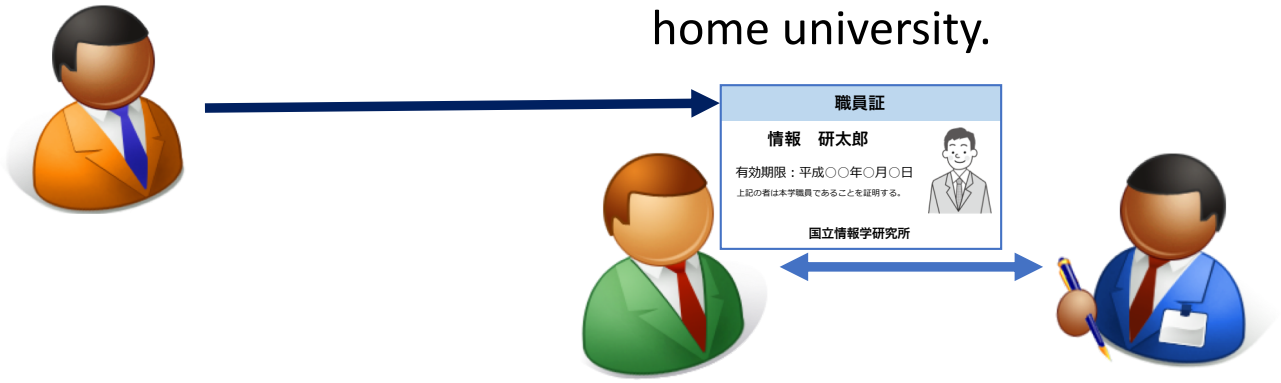
Discussion

- Do the proposed procedure provide the same level of assurance?
  - HPCI IdM must vet the identity of user based on a face-to-face meeting with a photo-ID.

GakuNin IdP (University)

The user present her/his photo-ID issued by home university.



The proposed procedure can intuitively be regarded the same as the initial identity vetting based on a face-to-face meeting.

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Discussion (Cont'd)

- Another possibility of GakuNin crendential application.
  - Due to the end of GSI support, HPCI needs to reconsider the authentication and authorization system in HPCI to access to supercomputers and storages.
  - Credential for Web services may be changed by new AA system in HPCI.
  - However the GakuNin credential application to initial identity vetting will remain almost unchanged.

Related Works

- AARC Blueprint Architecture
- *Snctfi* from AARC's policy work

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Summary

- We introduced authentication infrastructures, GakuNin and HPCI.
- We proposed a credential integration model in which GakuNin credential (SAML assertion) can be used to the initial identity vetting in HPCI.

- Our approach can be extended to more general case.
- Our approach should be corroborated with a trust framework.

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