ID-Federation in Japan for trustfull inter-domain ubiquitous services

Ito, Eisuke
Research Institute For Information Technology, Kyushu University : Associate Professor : Information Science

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ID Federation in Japan for trustful inter/ intra-institutional ubiquitous services

Eisuke ITO

Research Institute for Information Technology, Kyushu University

itou@cc.kyushu-u.ac.jp

Outline

1. Introduction
2. Solutions for user authN problems
3. ID-federation
4. UPKI in Japan
5. IdM in Kyushu University
6. Conclusion

1. Introduction

- Recently, a variety of information services are being provided.
- Various aspects
  - Layer: Network , Transport, Application or Web
  - Content-type: text, document, picture, voice, movie, …
  - Target user: young or senior, male or female, biz or entertainment, …
  - **Open or Closed**
    - **Members only**
    - Many institutional services are closed.

User authN in closed service

- Closed services need user authN to identify a user
  - To provide personalized service
  - To be secure (keep secret, privacy)
  - To consider compliance

AuthN = Authentication

- The more closed service are provided, the more ID/ passwd are issued.
  - For end-uses, authN becomes complicated.
  - For administrators, user account management becomes complicated.
- SSO (Single Sign On) is requested, especially web applications

Inter-Domain Services

- Research and development of inter-domain service
  - Mash-up or Web-service
    - Development of new service with composition of multiple web services.
  - Grid computing
  - Wireless LAN roaming
  - Mutual exchange of e-Learning contents
    - (Unit exchange program among universities)

Objectives

Realize authN platform for trustful inter/intra-institutional (domain) services

- For inter-institutional services,
  - ID Federation between institutions (domains)
  - UPKI in Japan
- For intra-institutional services,
  - Identity Integration for all members
  - Deploy a campus-wide authentication infrastructure

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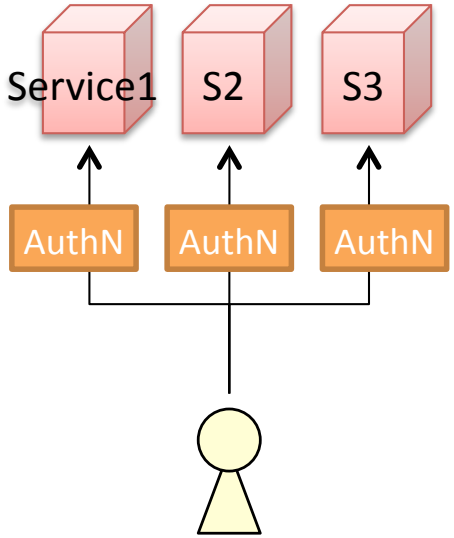
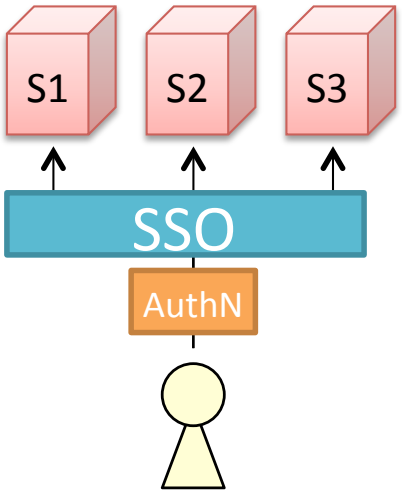
2. Solutions for user authN problems

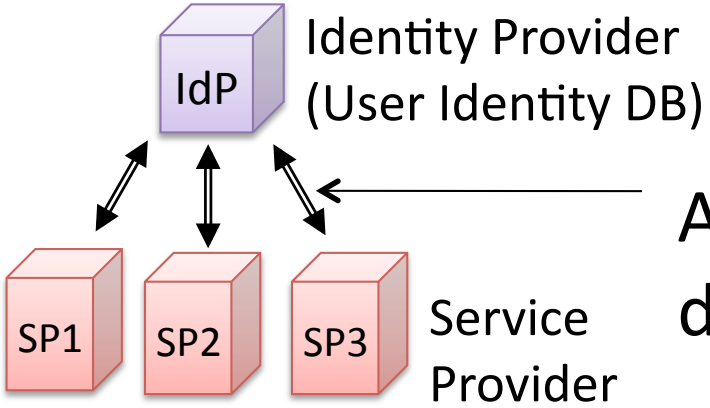
- SSO (Single Sign On)
  - Once a user authenticate, then gain access to the resources of multiple service systems.
- Divide SP and IdP
  - SP: Service Provider
  - IdP: Identity Provider
- AuthN/AuthZ data exchange
  - SAML: Security Assertion Markup Language
- Identity Integration
  - Set a centralized user DB in a institution/organization,
  - Any service lookup the DB.
- ID Federation
  - Make alliance between instituitons
  - Mutually exchange user authN/authZ information



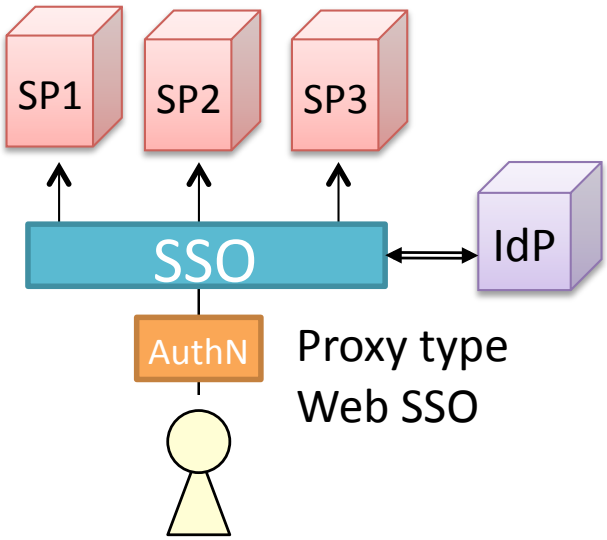
Single Sign On

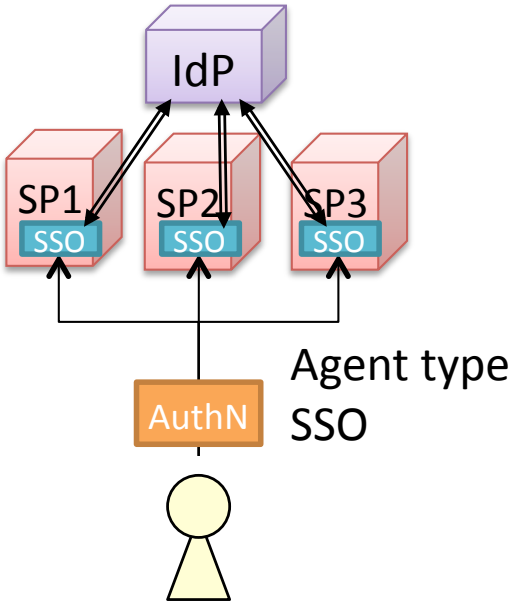


Divide SP and IdP



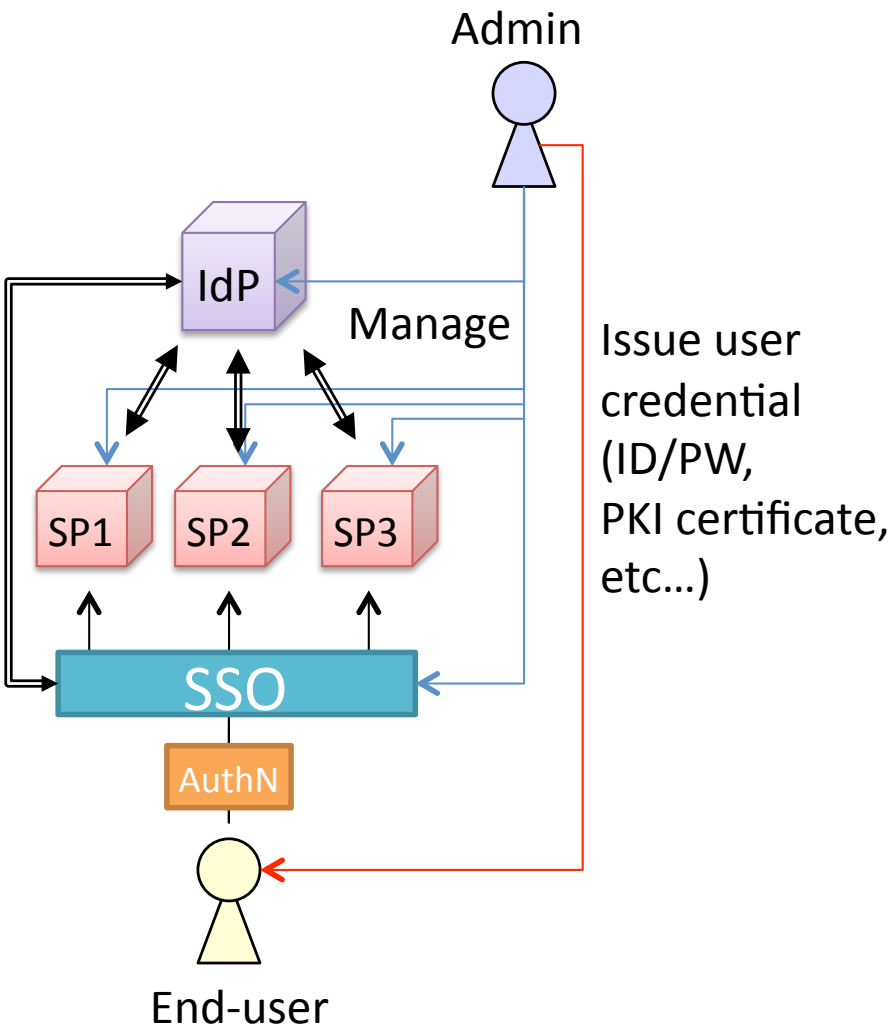
AuthN/AuthZ
data exchange





Identity Integration

- Intra-Institutional services
  - Set a centralized user DB in a institution/organization, any service lookup the DB.
- Purpose
  - Reduce administration cost
  - The president can control all systems



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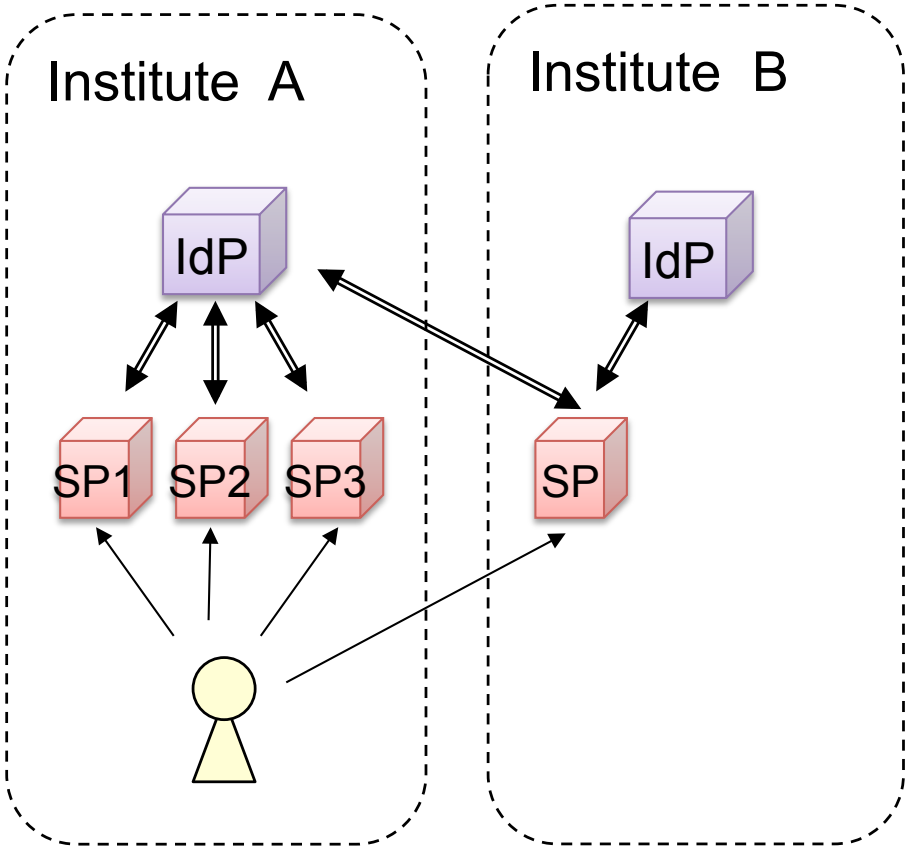
3. ID-Federation

- Federated organizations mutually exchange user identity data
- Ex.
  - Institute A and B are federated.
  - User of institute A accesses to an SP of B
  - The User sends the same credential to the SP for user AuthN.



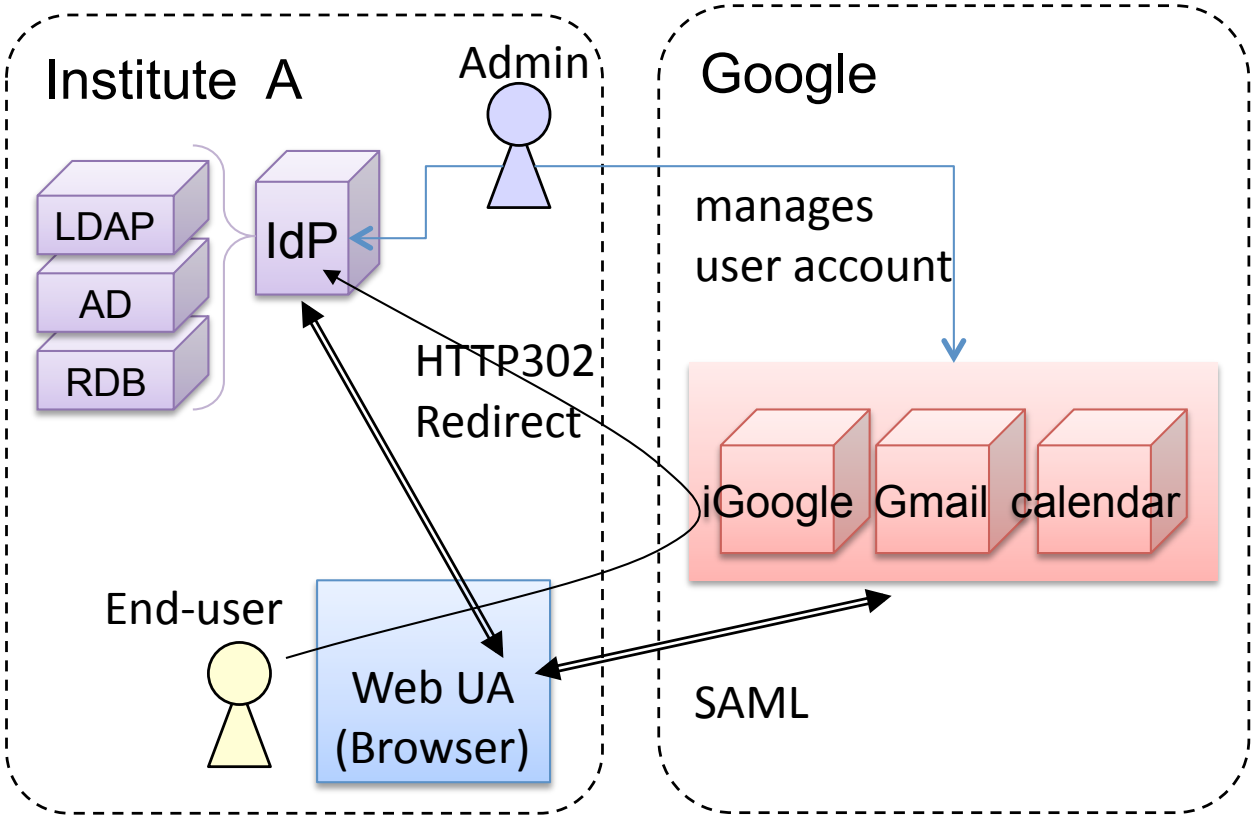
Federation systems

- Web based services systems
  - Google Apps Education Edition
- Eduroam
- Shibboleth
- OpenID

Example1

Google Apps Education Edition

- Google Apps for educational organization
- Free service
- Enable ID Federation



Microsoft Windows Live@edu
Yahoo! Mail Academic Edition

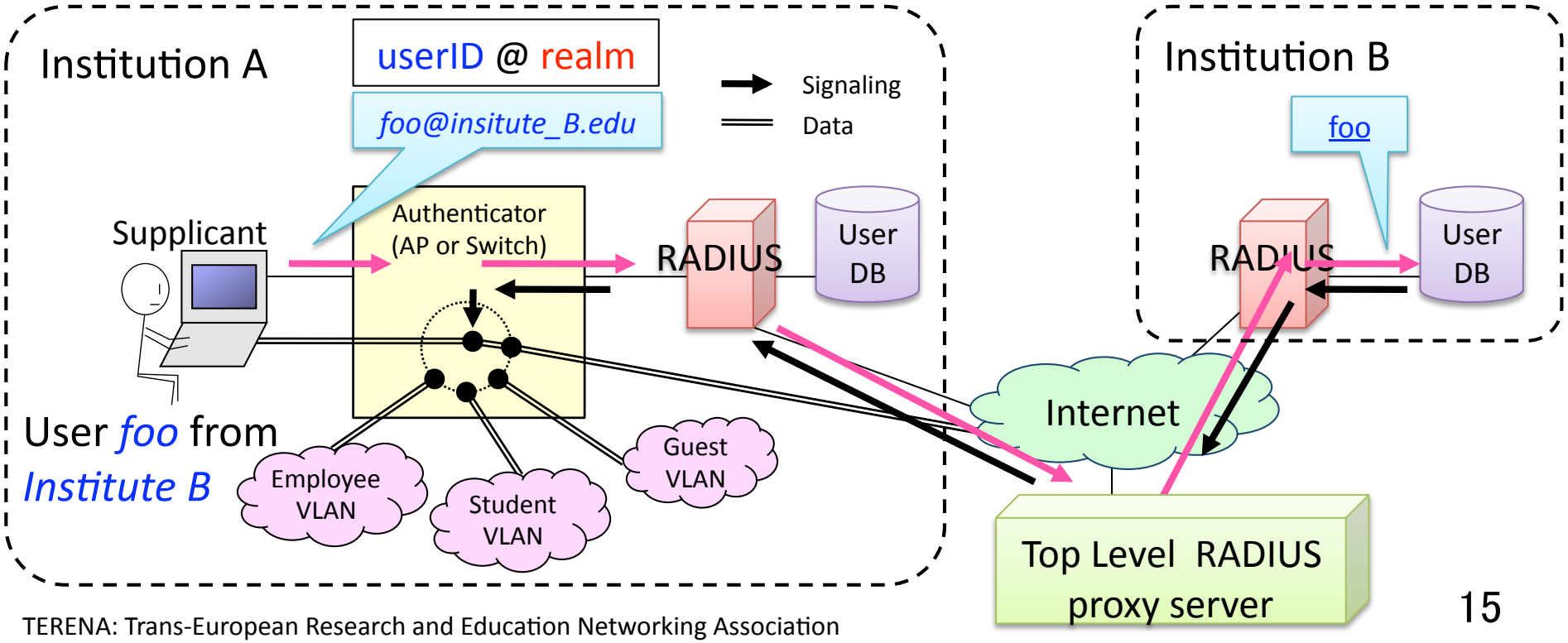
may have the same architecture.

Example2

http://www.eduroam.org/

eduroam

- Inter-institutional wireless roaming environment based on 802.1X and RADIUS
- Developed and deployed by TERENA
  - Mainly Europe, and Oceania. Asia was joined recently.

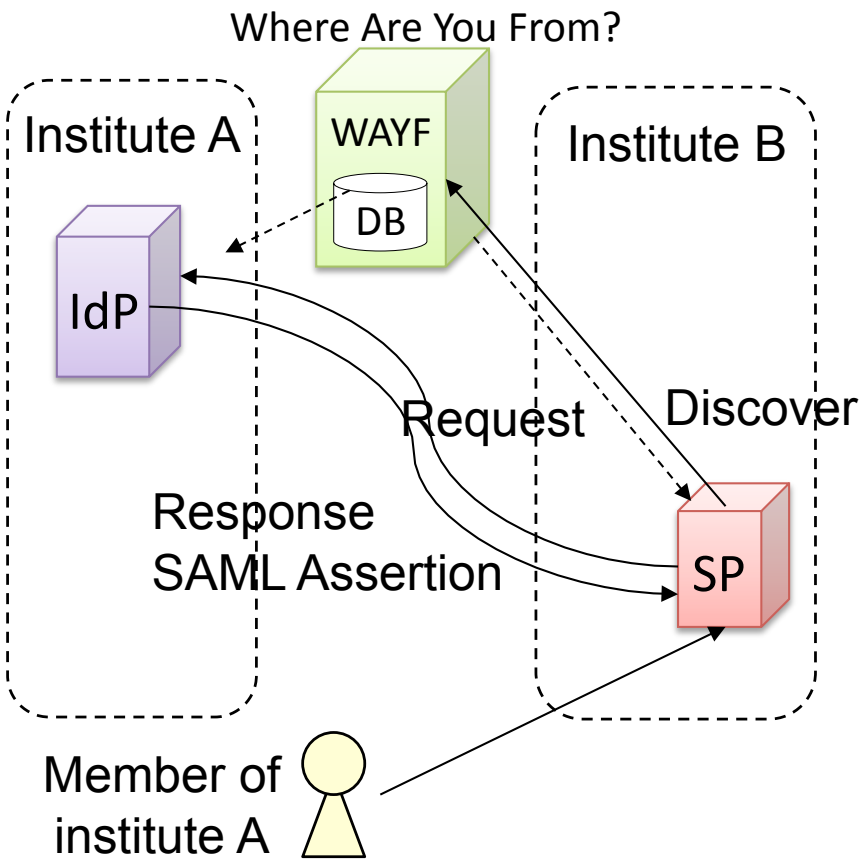


TERENA: Trans-European Research and Education Networking Association

Example3

Shibboleth

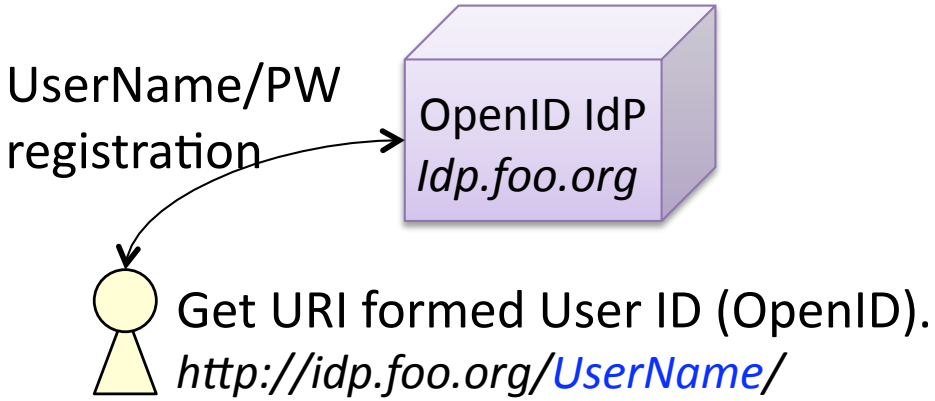
- Shibboleth
  - An Internet2 subproject
  - The name of middleware for Web SSO
- WAYF server must know IdPs
  - IdPs and the WAYF are tightly connected
- WAYF server becomes bottleneck.

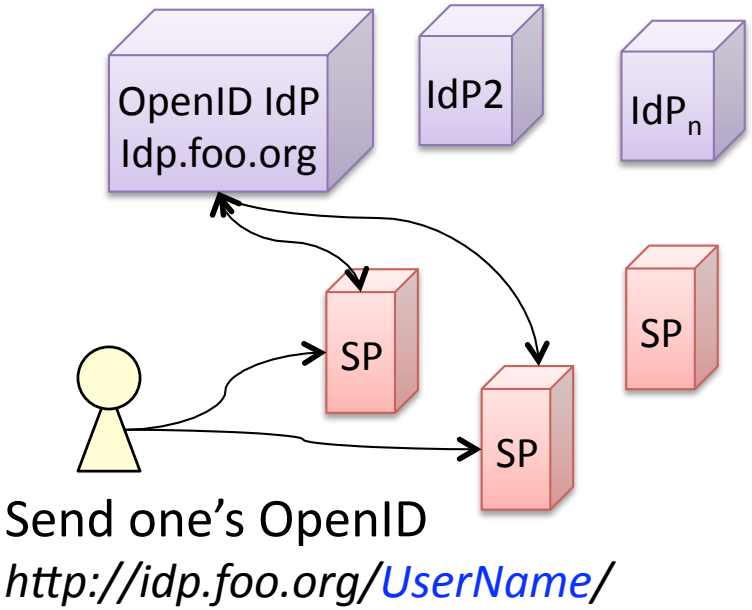


Example4

OpenID

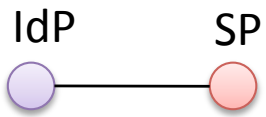
- A decentralized SSO system
- User's identifier is represented as URI format
  - Easy to resolve where the IdP is.
    - Maintenance free
  - Easy to keep uniqueness without centralized control
- Problem
  - How to trust the IdP?



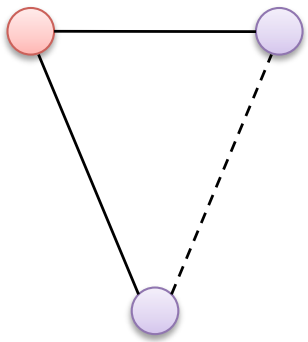


Federation structure

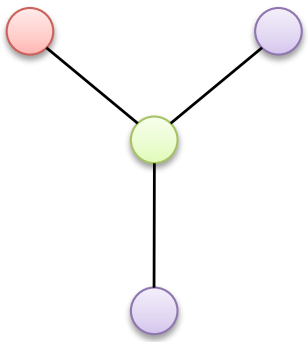
1 to 1



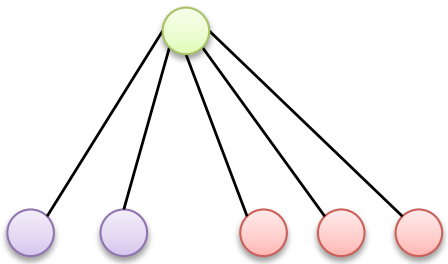
Network



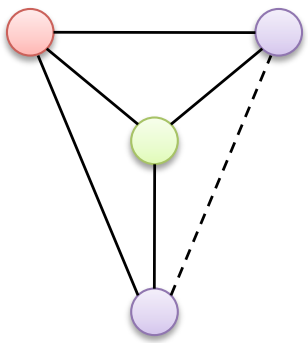
Broker or Bridge

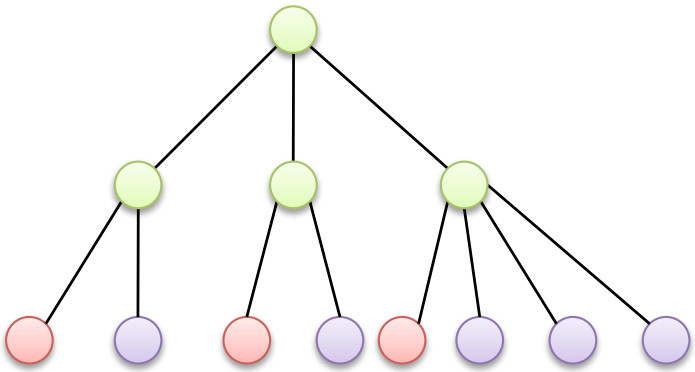


Tree



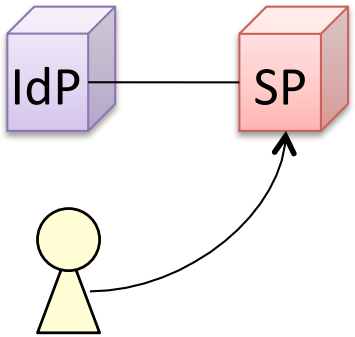
Hybrid



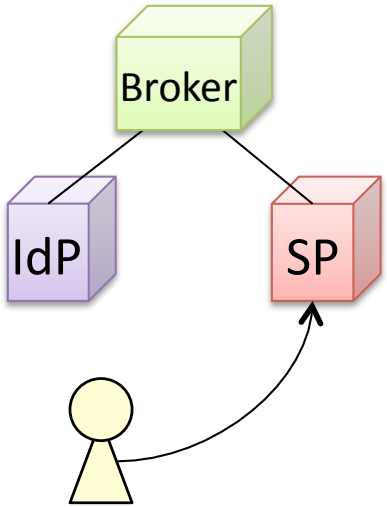


AuthN/AuthZ data exchange

- On-demand exchange user authN/authZ data
  - Web apps, Shibboleth, eduroam, OpenID

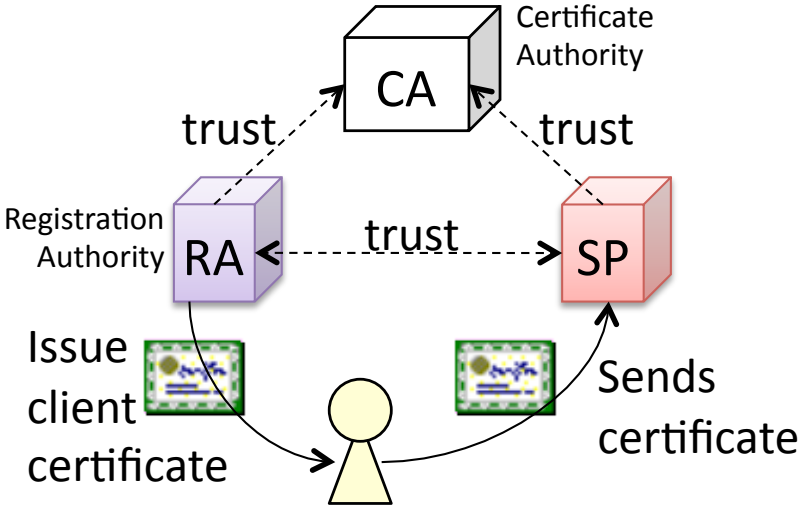


Easy to implement but NOT scalable



Broker is the bottle neck.

- PKI style
  - Trust the same CA
  - Trust each other
  - No communication between entities



How to trust other institute CA/RA?
CRL distribution is difficult.

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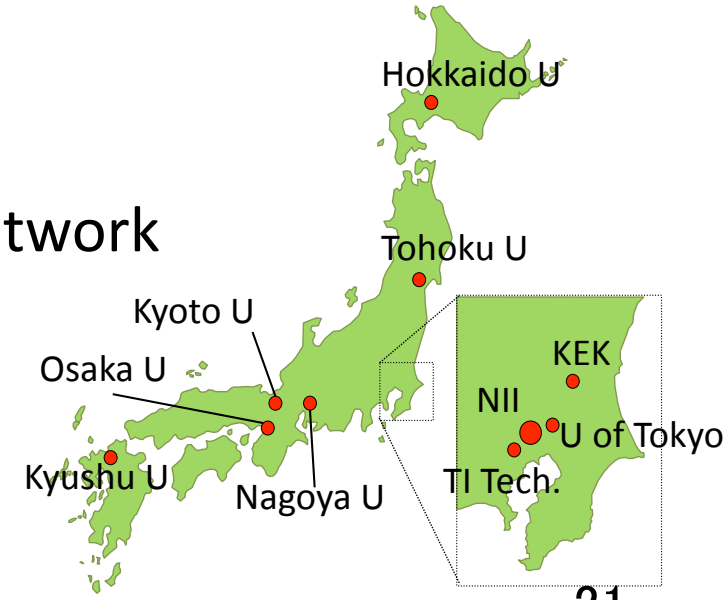
4. UPKI in Japan

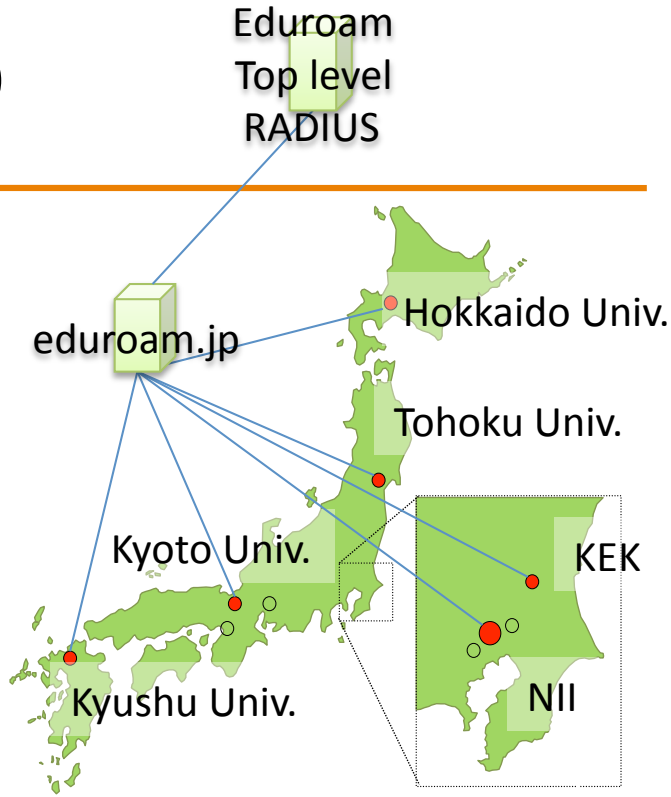
- CSI (Cyber Science Infrastructure) Project
  - Since 2005,
  - NII (National Institute for Informatics) of Japan
- Purpose :
  - A nation-wide platform for inter-institutional services
- Four subprojects
  - Grid computing
  - Advanced high speed broadband network
  - Institutional repository for library
  - UPKI



UPKI

- UPKI
  - U: University/Universal/Ubiquitous
  - Nation-wide electronic certification platform.
  - The inter-institutional exchange of user authN
  - Construct mutual trust among institutions.
- Results
  - Publish template of CP/CPS for CA in University
  - Server certificate distribution
  - eduroam.jp

eduroam.jp



- eduroam experiment in JP
  - Part of UPKI project
  - 6 institutions are participated
  - Tohoku University is leading
    - Running JP Top RADIUS Server

Participated Institution (2007/9/13)

Institution	AuthN Used	Access Granted
National Institute of Informatics	802.1x	eduroam standard
Hokkaido Univ.	802.1x	?
Tohoku Univ.	802.1x, TKIP, PEAP	VPN
High Energy Accelerator Research Organization (KEK)	802.1x	?
Kyoto Univ.	802.1x	eduroam standard
Kyushu Univ.	802.1x	VPN(planned)

eduroam standard includes: IPSec VPN, PPTP VPN, SSH, HTTP, HTTPS, IMAP2/3/S, POP/POP3, Passive FTP, SMTP/SMTPS, RDP

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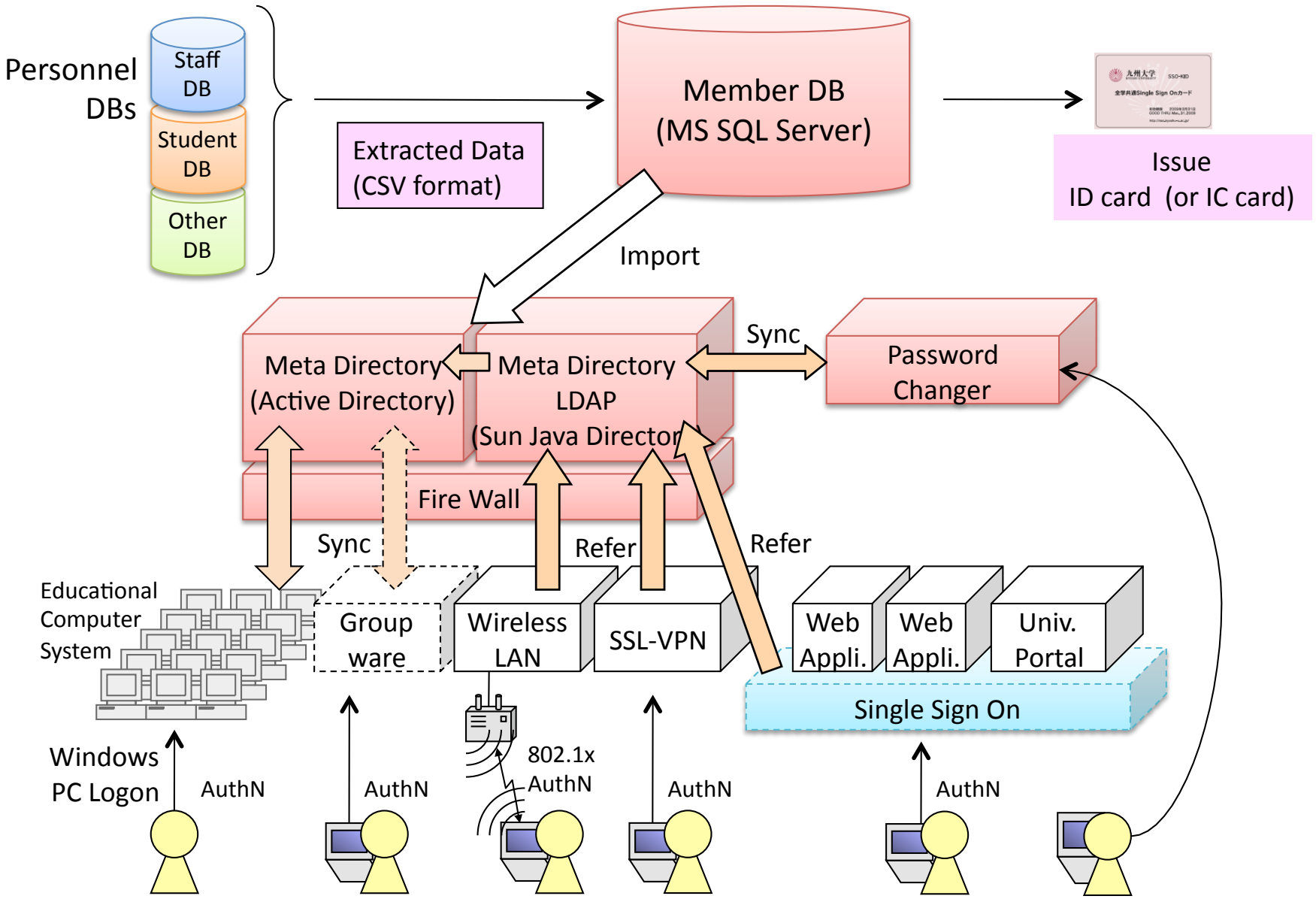
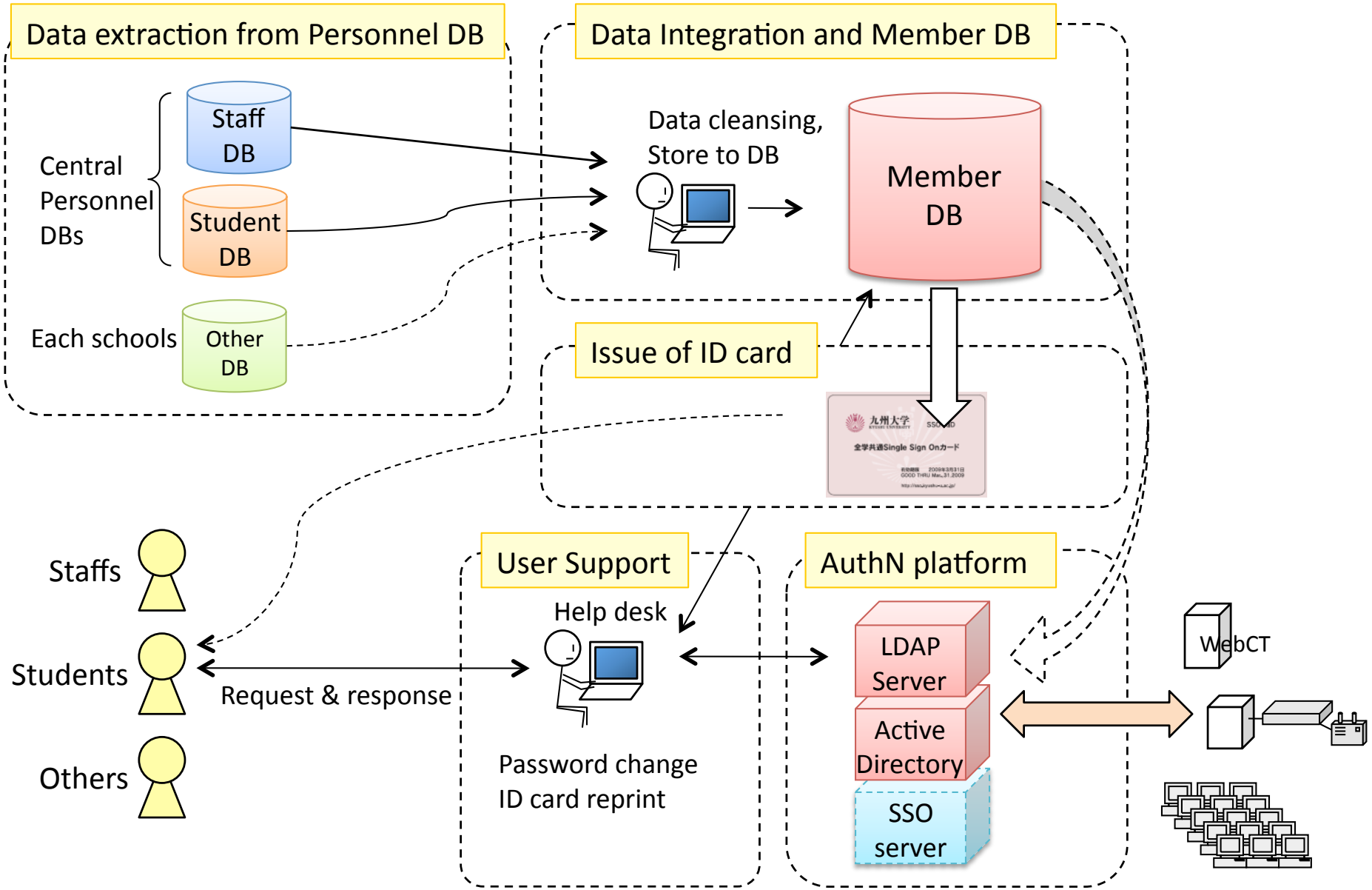
5. IdM in Kyushu Univ.

- Since 2005
- Construct IdM (Identity Management) System
  - Integrate user ID/PW, user Identity
  - Centralized user authentication platform
- Connect between applications and the IdM
- Identity Management Division

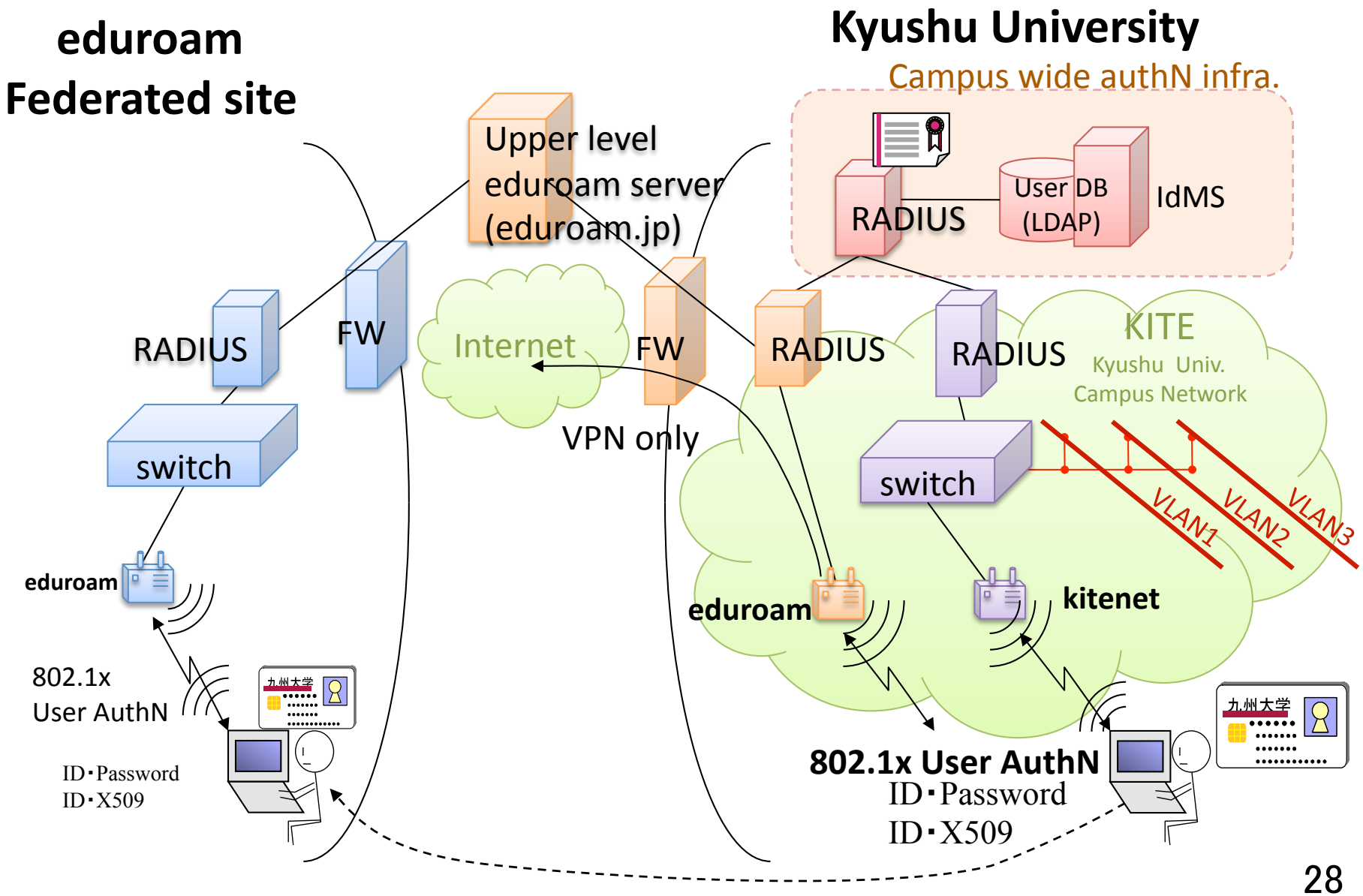
IdMS System Overview



Work flow to update member data



For Campus Network & Roaming (under development)



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6. Conclusion

- For trustful inter/intra-institutional ubiquitous services,
  - Not only service cooperation
  - User AuthN/AuthZ cooperation is necessary.
- ID Federation
  - Introduced four systems
  - Discuss about ID federation styles and problems
- CSI and UPKI project in Japan
- IdM in Kyushu University

- In the fututure,
  - PKI based nationwide ID-federation (for inter-institutional services)
  - E-Tokens (such as IC card)
  - Authorization mechanism