Realization of a Lightweight Account Management System Supporting Campus Members with Various Status

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Agenda

1. In General
   - User account, Authentication and Authorization
   - User account management process

2. In (Japanese) Universities
   - Peculiar circumstance and problems
   - Our idea and system design
   - Our account management system
User account

• Allowing a user to authenticate to system service
• Being granted authorization to access system service
• Typically method: Using a combination of a user ID and their secret password
Authentication and Authorization

● Authentication
  • Checking a proof of identity
  • Checking the requisite attributes

● Authorization
  • Specifying access rights to resources
  • Typically method: Using the defined access control rules (an access control list / capability)
User account management process

- For various information services,
  - Issuing a new account
  - Changing its authorities (as necessary)
  - Changing its attributes (as necessary)
  - Disabling or deleting the account
  ...
Who can get the account?

• In universities:
  • Students
    - Regular students, short-term exchange students, ...
  • Faculties and Staff
    - Regular employment, Irregular (ex. part-time) employment, ...
• Others
  - Visiting researchers, secretaries who are paid by private funds, ...
Members in our university (TUAT)

- Students: 6000
- Faculties and staff: 1700
  - Regular employment: 700
  - Irregular employment: 1000
- Others: ? (not accurately grasped)
Our circumstances

- No explicit definition for campus members
  - Various status members are managed by each section by their own policy
- No explicit policy for account management
  - Various information services are managed by each section by their own policy
- Short-term exchange students; yes or no?
- Part-time employment staffs; yes or no?
Problems in our circumstance

- Constructing trusted databases for human resources is not easily.
- Different operation policies often make some exceptions (irregular operations by manually).
- Getting data for authentication and authorization is not easily.
Our main services
Example of member's status

<table>
<thead>
<tr>
<th>Status</th>
<th>Staff A</th>
<th>Staff B</th>
<th>Staff C</th>
</tr>
</thead>
<tbody>
<tr>
<td>Management Section</td>
<td>Section a</td>
<td>Section b</td>
<td>Section a</td>
</tr>
<tr>
<td>Available Services</td>
<td>Educational affairs, E-mail, Financial affairs, Network, PC room, Groupware, Shared storage</td>
<td>E-mail, Financial affairs, Network, Shared storage</td>
<td>E-mail, Network</td>
</tr>
</tbody>
</table>
If a user makes an application for his or her account, ...

- Checking which section manages an applicant
- Checking whether an applicant can use the service or not
- Checking attributes (personal data) that service requires and getting them from each section
- Converting raw data to adapt to the system
- Registering converted data to the system and creating applicant's account
- Issuing user ID and password to an applicant
Ideal system

- Explicit definition for campus members
- Unique trusted database
- Unified policy for issuing an account
- Unified authentication and authorization scheme

Users could access each service by their own single account
Ideal system

- Explicit definition for campus members
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Users could access each service by their own single account
Why we could not?

It is too difficult to unify:

- Databases storing personal data in each section
- Management policies for services or systems in each section
- Operation policies for services or systems in each section

We do not have enough resources ...
Our idea

- A lightweight system;
  - Be adaptable to campus members with various status.
  - Be adaptable to databases storing personal data managed by different policies.
  - Be adaptable to services or systems managed by different policies.

Mediating between the different policies
System design

• Web-based user interface
  • For users and operators
• Compact database
  • No replications of original data
• Simple data format for the registration
  • For various services
Basic functions

- Accepting user's requests
  - Issuing a new account
  - Changing user's password
  - Disabling user's account
- Assigning (or removing) an account to a service
- Registering (or excluding) user's ID and password to authentication systems
Features

- Gathering raw data for accounts from each management section
- Processing raw data, in order to adapt requirements of the system automatically by predefined rules
- Sending registration data in the form of a simple CSV file to each system
- Being able to handle exceptions
  - For invalid data, special treatments, ...
Our account management system
Process of issuing an account
Web-based user interface
Furthermore

- Improving the system robustness (such as system redundancy)
- Improving the unification of authentication
- Improving the adaptability to “GakuNin” (Academic access management federation in Japan)
- Coping with Single Sign-On
Conclusion

• We have developed a lightweight account management system.
• This can support various kinds of services and systems.
• It is possible to cooperate with a new system which will be provided in near future.
• We did not reconstructing databases storing personal data.