

Core university program seminar, Feb.12-13, 2009.  
Beppu, Japan.

# A study of content trustworthiness for academic institutions

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# Outline

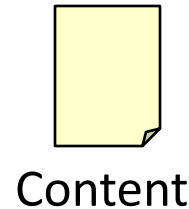
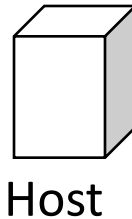
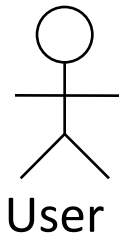
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1. Introduction
2. PENS
3. Prototype
4. Conclusion

# 1. Introduction

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- Construct campus authentication platform in KU
  - It aims to construct **secure, trustful, and open** ICT environment .
- Improve Trustworthiness



- User: authentication
- Host: server certificate
- Content:
  - A lot of contents are created and published.
  - How to trust of them?

# Institutional Repository

- Institute member can store and publish own contents.
- Most IR systems is managed by library.

## QIR: Kyushu University IR



The screenshot shows the QIR website interface. The main content area displays the following information:

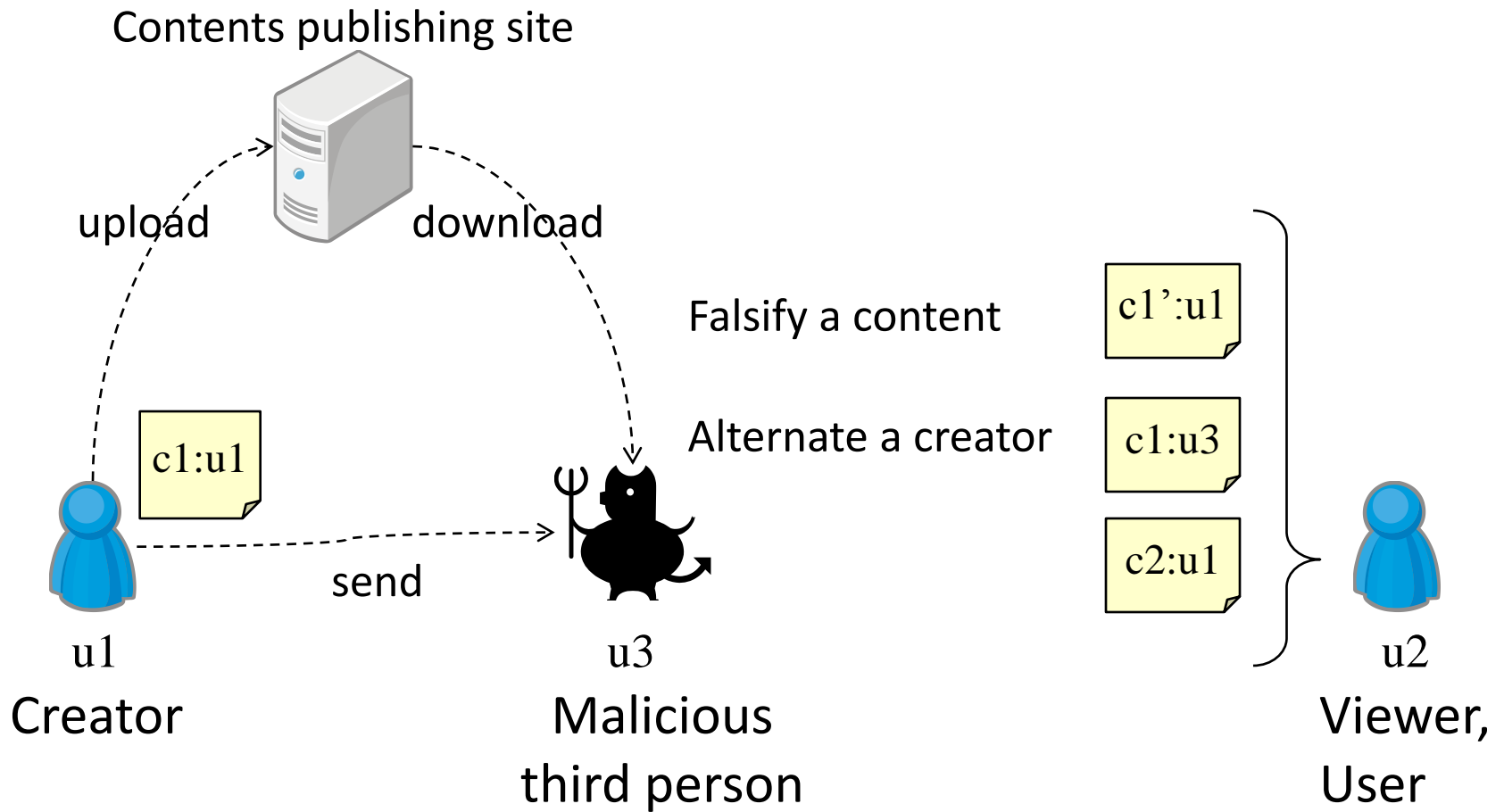
- このアイテムのアクセス数:** 313件 (2009-2-12 0:00集計)
- このアイテムへのリンクには次のURLをご利用ください:** <http://hdl.handle.net/2324/2965>
- このアイテムのファイル:**

ファイル	記述	サイズ	フォーマット	
2003_b_4.pdf		321Kb	Adobe PDF	<a href="#">見る/開く</a>

Additional metadata displayed includes:

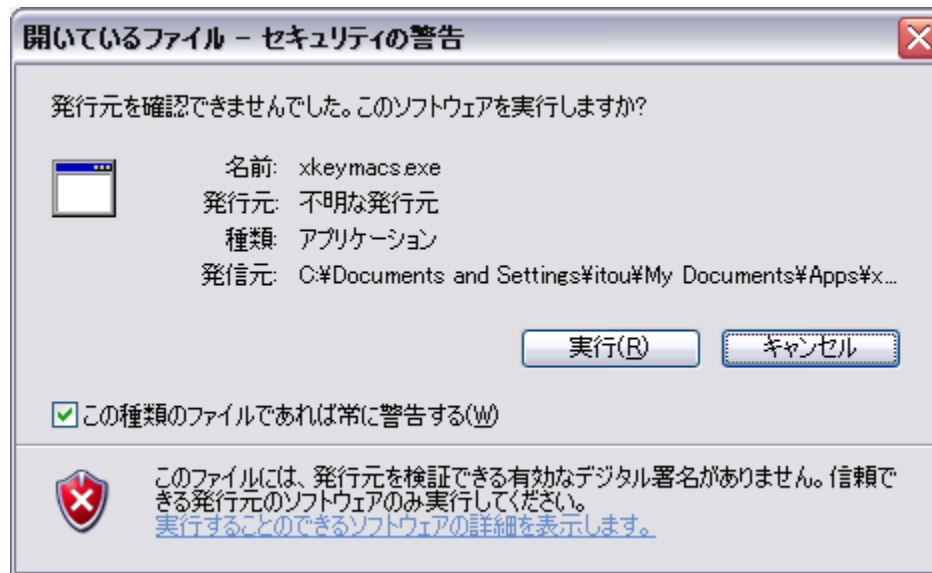
  - タイトル:** Semi-Automatic Construction of Metadata from A Series of Web Documents
  - 著者:** [Hirokawa, Sachio](#) / [Itoh, Eisuke](#) / [Miyahara, Tetsuhiro](#)
  - 著者名(別表記):** 廣川, 佐千男 / 伊東, 栄典 / 宮原, 哲浩
  - 著者情報:** Computing and Communications Center, Kyushu University[Hirokawa, Itoh] / Faculty of Information Sciences, Hiroshima City University[Miyahara] / 九州大学情報基盤センター[廣川, 伊東] / 広島市立大学情報科学部[宮原]
  - 出版年:** 2003-12-00
  - 刊行元:** Springer Berlin / Heidelberg
  - 掲載情報:** Lecture Notes in Computer Science || 2903 || p942-953

# Example of malicious incident



# Software trustworthiness

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Digital signature based system

# Conventional solutions

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- Fingerprint
  - Show the Hash value of a content.
  - If a content is changed, then hash values of original and falsified must different.
  - Problem
    - No easy check mechanism.
    - No metadata
- Digital signature
  - PKI based
  - Use Digital Certificate
  - Problem
    - Can't apply all files
    - Not so popular , yet.

Easy solution is required.

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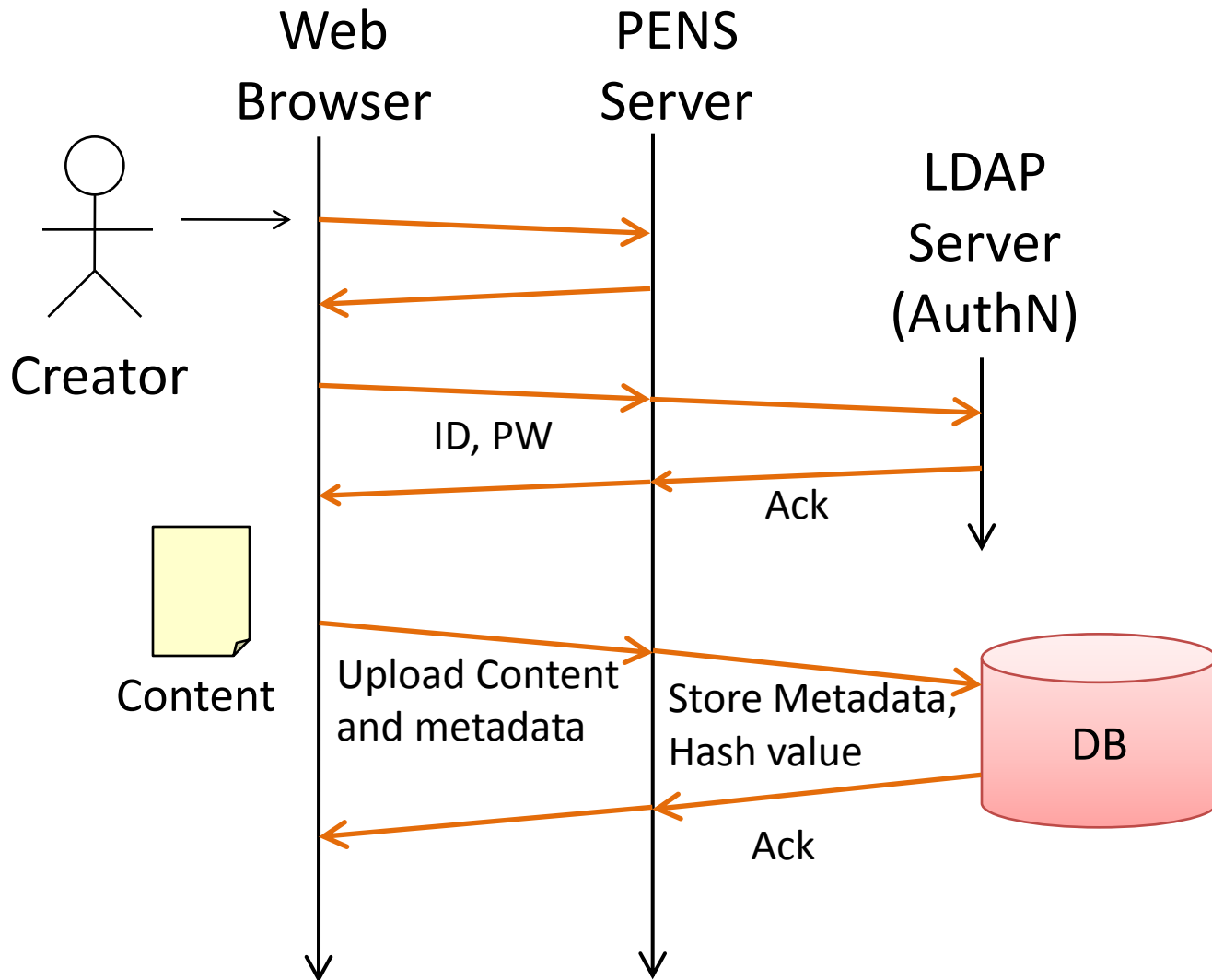
## 2. PENS

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- To guarantee trustworthiness of academic contents, we provide a very simple solution.
  - It's based on fingerprint.
- PENS: Private Electric Notary Service
  - This system is based on real world notary system.
    - Notary public: Grantee a public documents.
  - PENS guarantees:
    - creator
    - publisher (which the creator belongs to)
    - publish date (time stamp)
    - and without falsity (forgery )
  - Side effect
    - PENS can use as an easy content search system

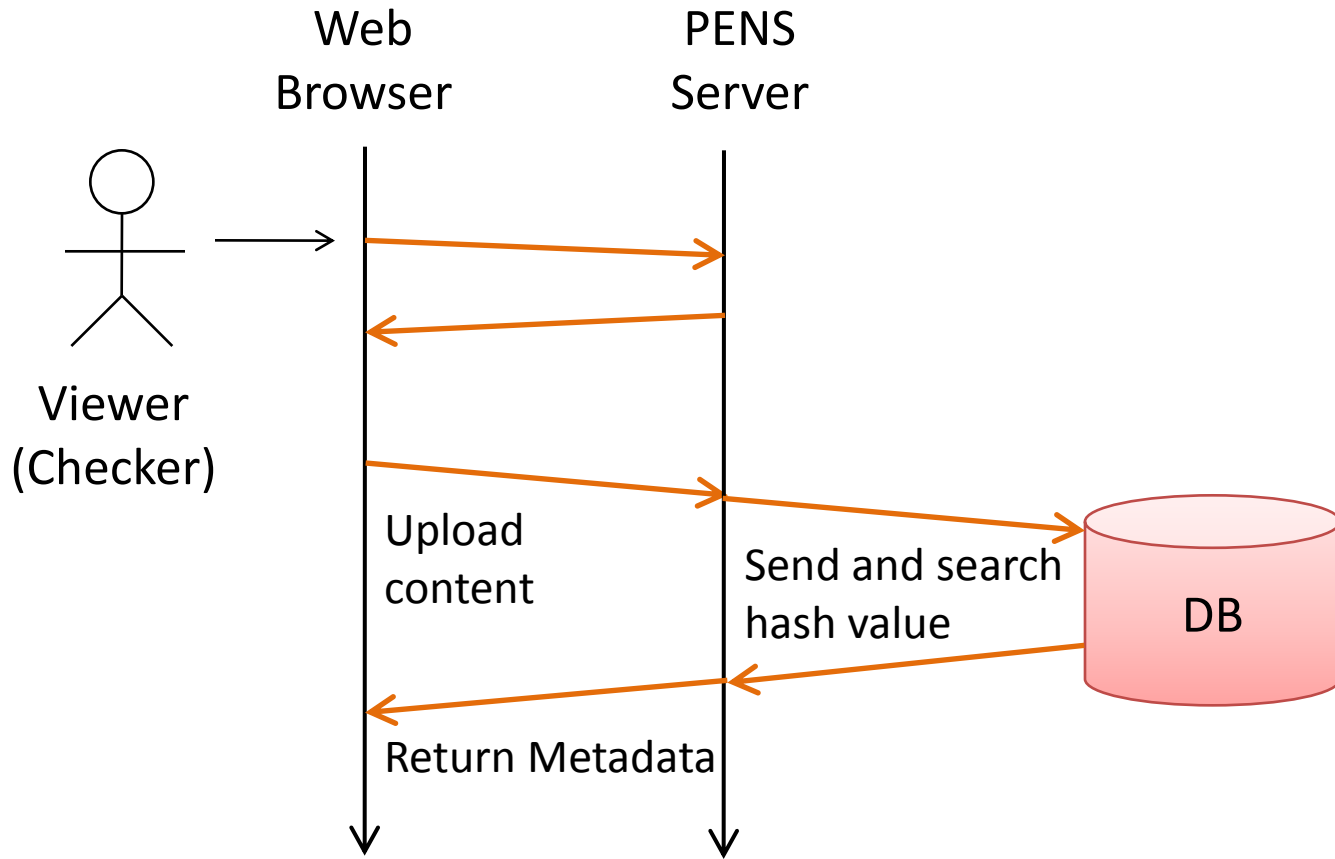


# Content uploading



# Content checking

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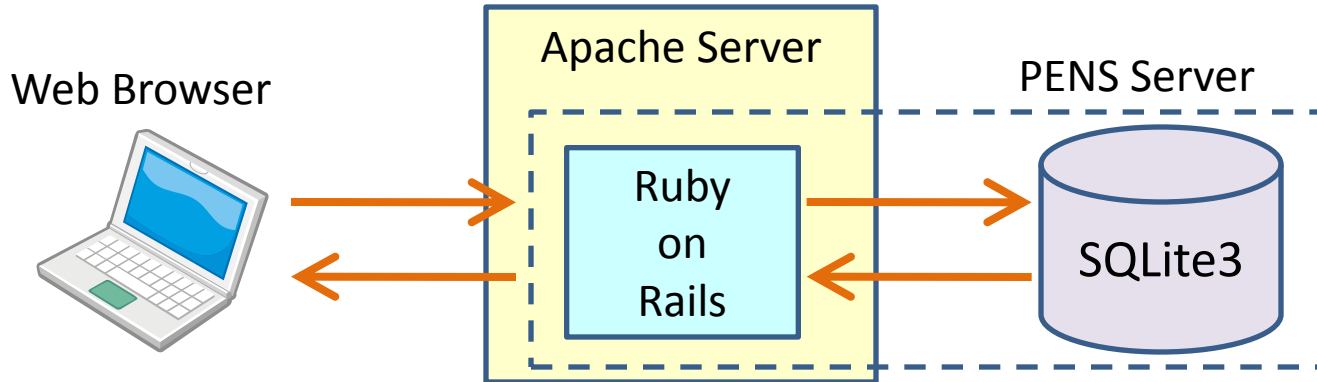


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# 3. Prototype



CPU	AMD Athlon 64 Processor 3500+
Memory	512MB
HDD	400GB
OS	FreeBSD6.2
Web server	Apache2.2.4
DB	SQLite3
Language	Ruby on Rails2.0.2
Hash algorithm	SHA-1(Secure Hash Algorithm 1)

# Uploading

Content file  
Title  
Creator  
Organization

電子ファイルの登録

電子ファイル:  参照

タイトル:

作成者氏名:

作成者所属機関:

※ 確定日付(電子ファイルの登録日時)は、アップロードと同時に自動で登録されます。

登録済み電子ファイルリスト

id	filename	title	author	party	uploaded at	SHA-1	action
14	graduate_bata.pdf	大学における私的電子公証サービス(2/6版)	横田幸也	九州大学理学部物理学科物理学コース	Fri Feb 08 14:33:07 +09:00 2008	6487e6c2095180a3c057ab598800dce18017e4c8	<a href="#">download</a> <a href="#">destroy</a>
13	graduate_bata.pdf	大学における私的電子公証サービス(2/6版)	横田幸也	九州大学理学部物理学科物理学コース	Fri Feb 08 09:47:14 +09:00 2008	98a09822975cc8a6fa2d4b466a1b28f75c1f02	<a href="#">download</a> <a href="#">destroy</a>
12	横田中間発表.ppt	大学における私的電子公証サービス(中間発表)	横田幸也	九州大学理学部物理学科物理学コース	Fri Feb 08 09:39:39 +09:00 2008	ca079a2a04a941840211673c60c994b4d7b34a	<a href="#">download</a> <a href="#">destroy</a>
11	graduate_bata.pdf	大学における私的電子公証サービス(2/6版)	横田幸也	九州大学理学部物理学科物理学コース	Tue Feb 05 12:58:51 +09:00 2008	54bc08716428a77c858080a794d11f0c0f8aa5	<a href="#">download</a> <a href="#">destroy</a>

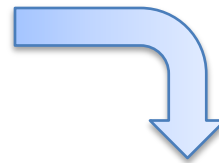
登録 修正

Date Hash

# Checking



Enter file name



Result



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# Conclusion

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- Summary
  - To Improve Trustworthiness, we provide PENS
    - It is very simple solution
    - It is based on finger print.
- In the future
  - Sophisticate PENS.
  - Use PENS in Kyushu U, and some cooperative Univs.
  - Make PENS network.

# PENS Network

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- Collaborative search system.
  - With IR of each university
- Under constructing...

