

CICP2018 Project Application Form (**must not exceed 4 pages**)

1. Title of the Project

Note: The title should be within 15 words. Choose the word carefully, since it cannot be changed after the proposal has been accepted.

- “Smart Contract-Based Access Control for the Internet of Things”

2. Project Leader (*The project leader is not allowed to propose other projects as a leader)

Laboratory's name, Grade, student ID, name and E-mail address

- Large-Scale Systems Management Laboratory, M1, 1811295, Masanari Yamamoto,
yamamoto.masanari.yl8@is.naist.jp

3. List of Co-Researchers (*If any)

Example:

1. Large-Scale Systems Management Laboratory, D1, 1821038, Takanori Hara,
hara.takanori.hm8@is.naist.jp
2. Software Engineering Laboratory, D1, 1821003, Yoshiharu Ikutani,
ikutani.yoshiharu.ip8@is.naist.jp
3. Large-Scale Systems Management Laboratory, M1, 1811206, Yuta Nakamura,
nakamura.yuta.ns1@is.naist.jp

4. Advisor (*Mandatory, must be a faculty member of IS)

Note: Advisor must agree to be advisor before submitting application form.

Laboratory's name, title, name and e-mail address

1. Large-Scale Systems Management Laboratory, Assistant Professor, Jun Kawahara,
jkawahara@is.naist.jp
2. Large-Scale Systems Management Laboratory, Assistant Professor, Yuanyu Zhang,
yyzhang@is.naist.jp

5. Budget plan (Up to JPY 500,000)

Raspberry Pi × 10 : JPY 50,000

Tablet device × 2 : JPY 200,000

Arduino × 5 : JPY 50,000

Academic participation fee : JPY 100,000

Servomotor : JPY 50,000

Other equipment : JPY 50,000

Total: JPY 500,000

6. Research plan

Research plan should be summarized in up to 6 slides. Attach the 6 slides to the application form with 2 up format in addition to the abovementioned 5 items. All descriptions in the proposal must be written in English.

Background



- ◆ Thanks to the rapid advance of networking technologies, a number of objects are being connected to Internet (ex. IoT)
- ◆ Tight access control have to be implemented into IoT systems
 - ◆ Smart lock system for home doors
 - ◆ Automatic operation vehicle control devices
- ◆ However, traditional centralized access control schemes have crucial issues
 - ◆ When adversaries hack centralized access control schemes, they can rewrite the user information and do a spoofing attack
 - ◆ If the centralized server breaks down, the system is not available (ex. Someone can't enter his/her house)

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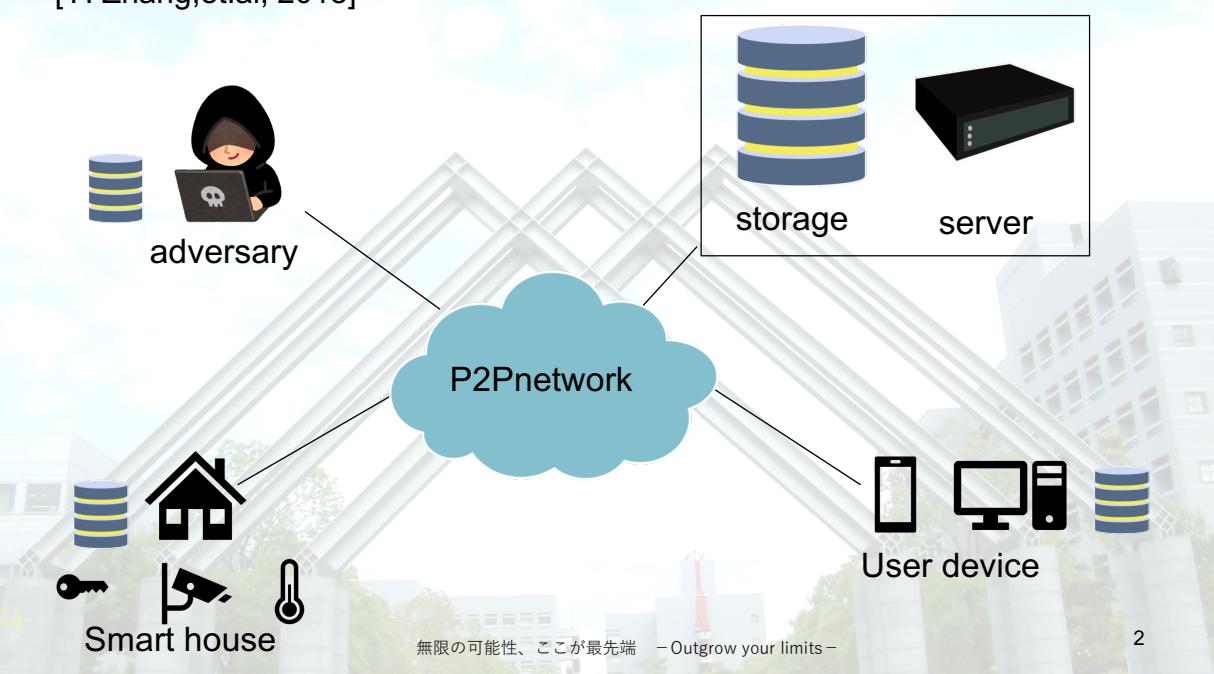
Purpose



- ◆ We propose and implement distributed authentication as access control schemes based on [Y. Zhang,et.al, 2018]

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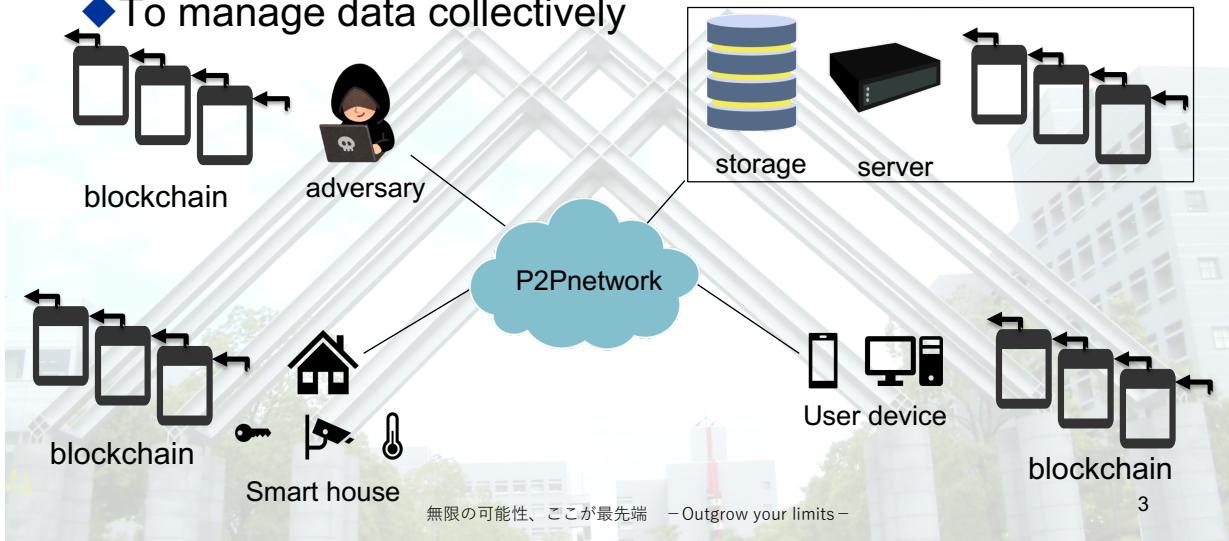


Originality



- ◆ We use the blockchain to achieve distributed authentication as access control schemes
- ◆ Why we use the blockchain?

- ◆ Prevent adversaries to rewrite stored data
- ◆ To manage data collectively



Challenging



- ◆ To keep data secret
 - ◆ Usually, data must be kept secret but blockchain keep data open

- ◆ Apply to smart lock
 - ◆ Smart lock is a remotely controllable key by smartphone
 - ◆ We assume the guest house owners lend their own rooms to untrustworthy visitors
 - ◆ If they use this system, they can hand over the key to the visitors safely and conveniently

Project Member



◆ Project Leader

- ◆ Masanari Yamamoto, M1, Large-Scale Systems Management Laboratory(LSM Lab.)

◆ Co-Researchers

- ◆ Takanori Hara, D1, LSM Lab.
- ◆ Yuta Nakamura, M1, LSM Lab.

◆ Advisor

- ◆ Jun Kawahara, Assistant Professor, LSM Lab.
- ◆ Yuanyu Zhang, Assistant Professor, LSM Lab.

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Research Plan



◆ June~Aug.

- ◆ To understand the theory related to BlockChain
- ◆ Design our system and structure model

◆ Sep.~Nov.

- ◆ Implement the proposed system(coding, testing)
- ◆ To make smart rock

◆ Dec.~Feb.

- ◆ Attach the smart lock to the door and simulate it
- ◆ Prepare for the presentation

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