Introduction of NII Research Data Management Platform and Collaborative Project with Academic Research Institutions

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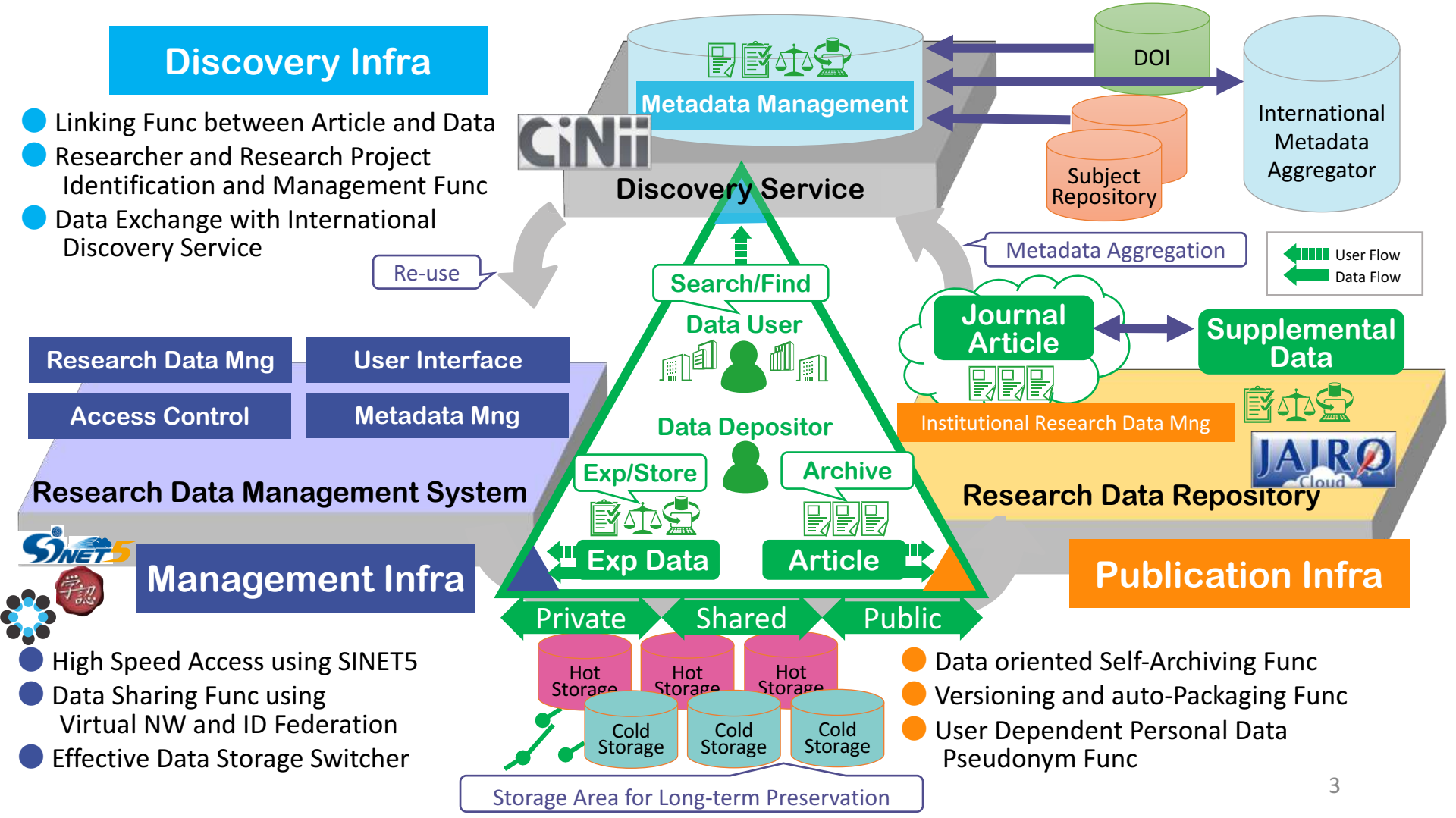
Background

- University and research institution have to preserve research data of their worker for ten years in Japan because two purposes are research integrity and open science.
- So university chief information officers (CIOs) are discussing the unified application which conserves research data systematically in the national scale.
- National Institute of Informatics (NII) are providing the service of the institutional repository, scholarly search engine, high-speed network, secure authorization system and Cloud hosting as existing work.

Research Data Infrastructure for Open Science

Objective	For facilitating interdisciplinary open science in Japan, national level common infrastructure is crucial. The infrastructure which allows researchers to manage and publicize their research data is designed and developed in corporation with academic communities.



by Committee on Open Science, Science Council of Japan
http://www.scj.go.jp/ja/info/kohyo/pdf/kohyo-23-t230-en.pdf

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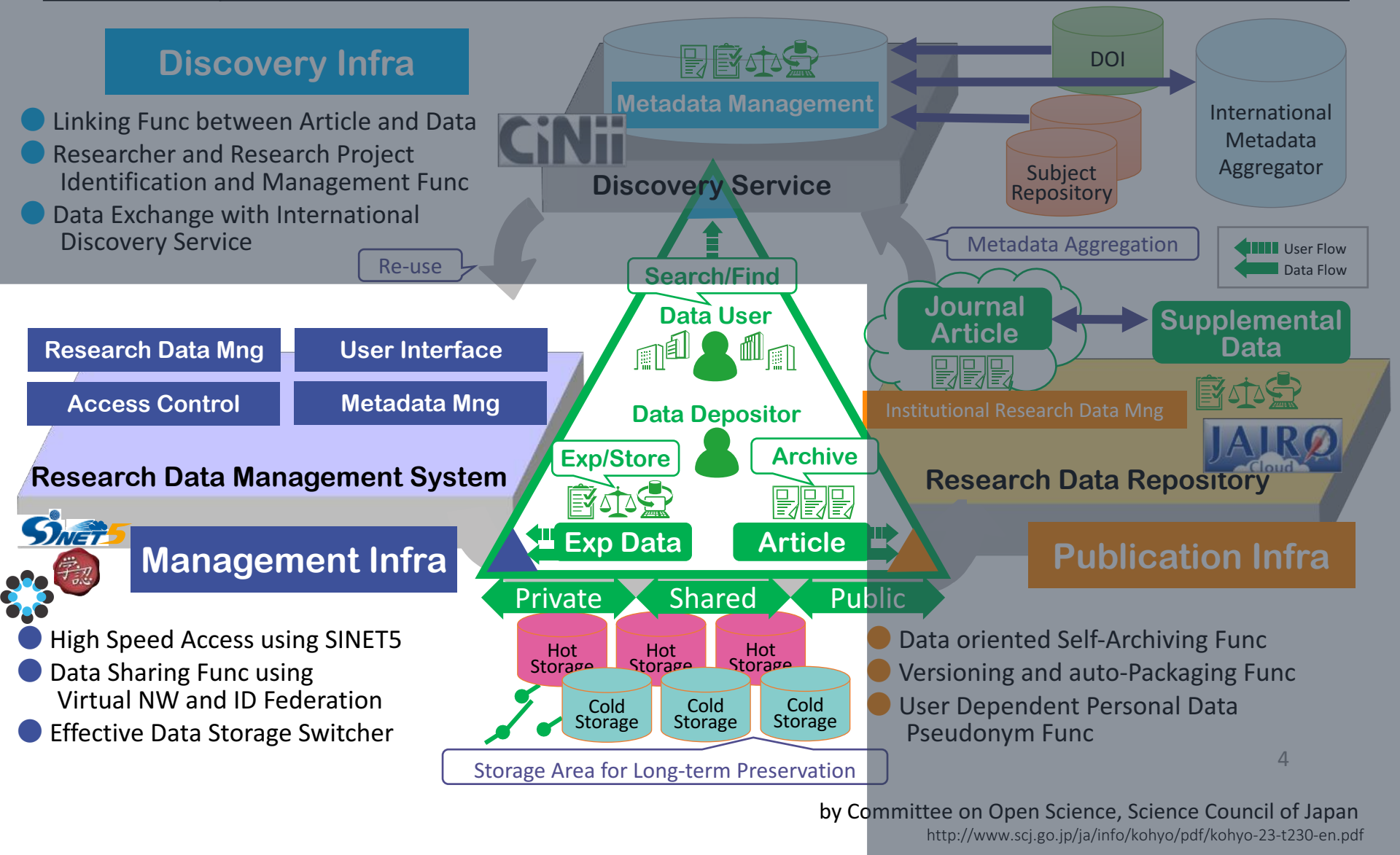

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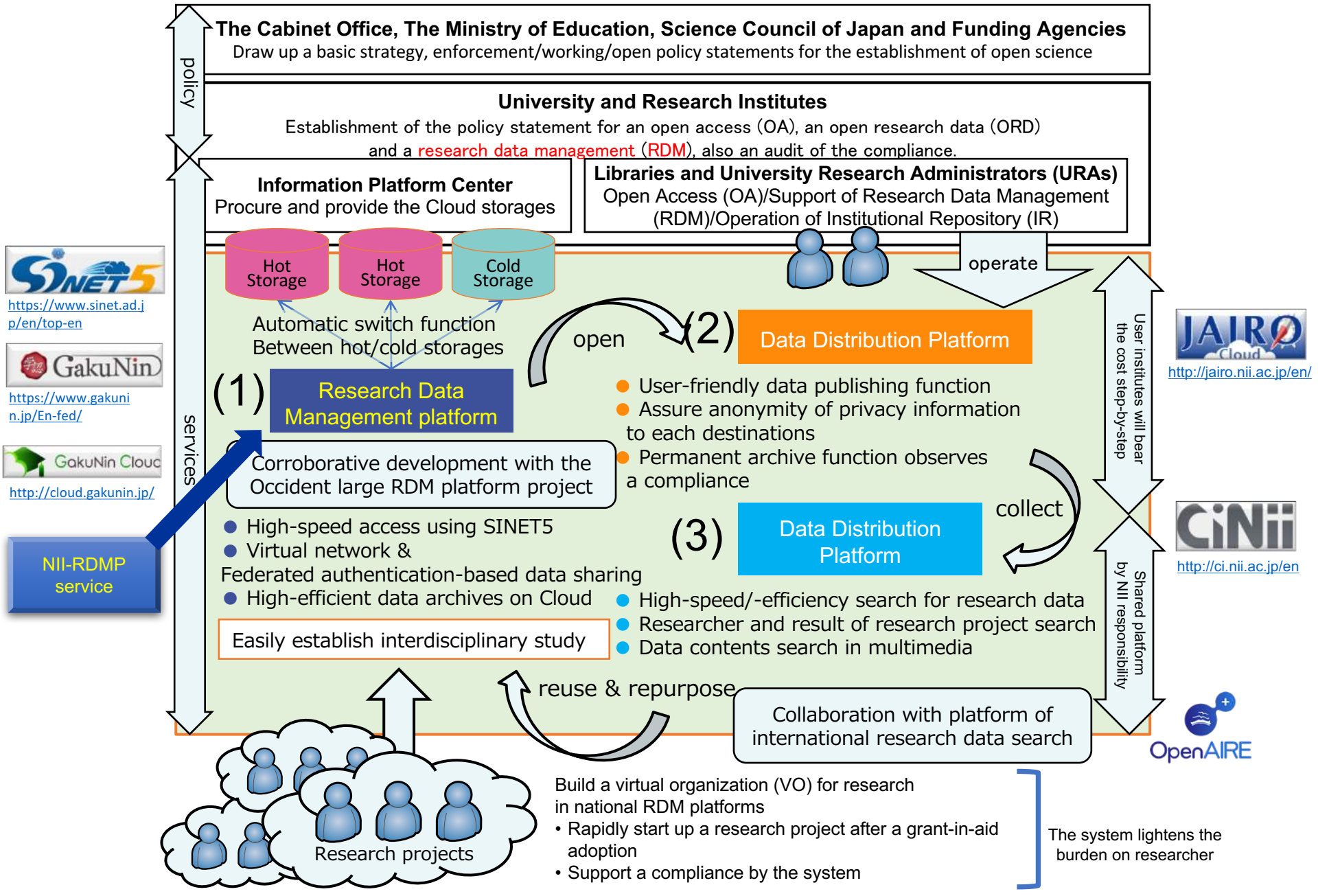
Strategy of National RDM platform project in Japan by NII



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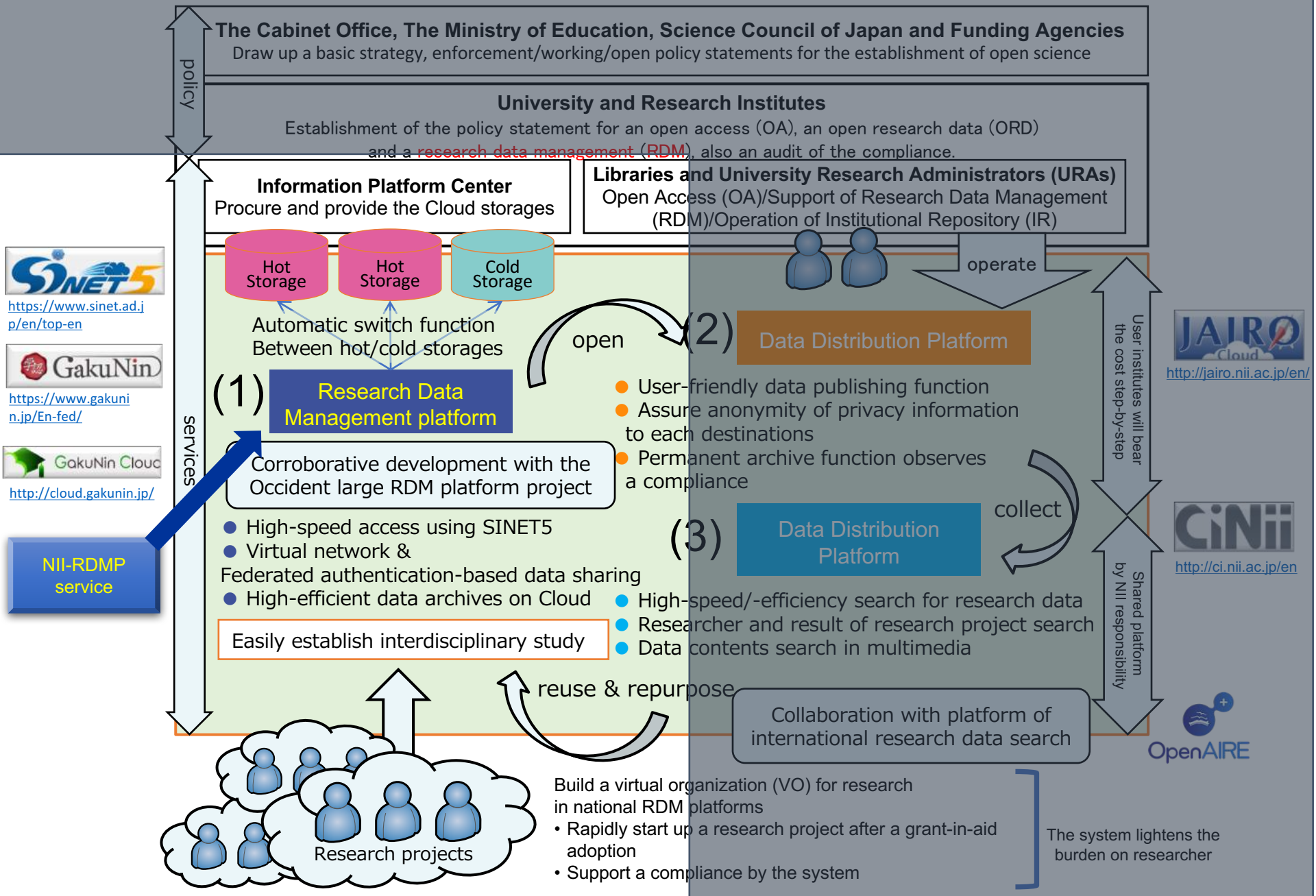
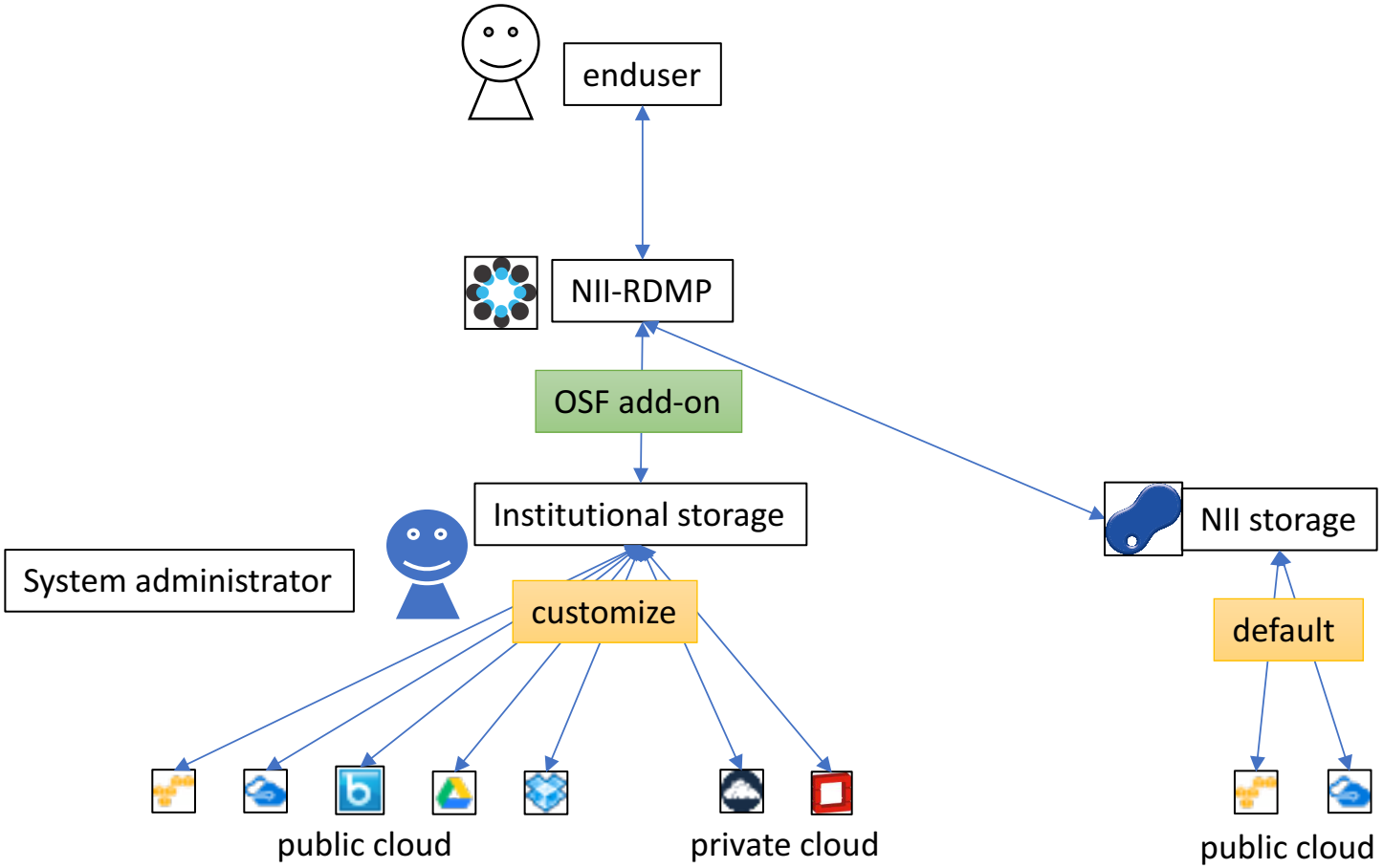


Purpose

- **NII-RDMP: NII Research Data Management Platform**
- NII newly develops the research data management platform (RDMP) for a researcher in universities and research institutions on the current NII service. It is also utilized for the improvement in a service of a library and funding agency.
- Additionally, new service will supply efficient metadata to a service of university libraries or funding agencies.
- First, the service aims at helping various disciplines with long tail data, and second we will customize the RDMP to domain situations.

Current progress (2017)

Concept of NII-RDMP



Ex. (XXXX Univ. Storage)

Material and Methods

System Development of NII-RDMP

Current NII services

Collaboration and Promotion in Research and Education

Resource

- Promotion of academic information circulation and open access
- Collaborative promotion of institutional repository expansion

CiNii

JAIRO Cloud

Federation

- Collaborative enhancement of authentication between universities

GakuNin Federation

eduroam

Cloud

- Dramatic cost reduction and enhancement of research and education environment by tailored cloud services

GakuNin-Cloud Direct Connection

Security

- Network flow analysis and dynamic control
- Raise of security level for SINET users

Flow Analysis

VPN

Network

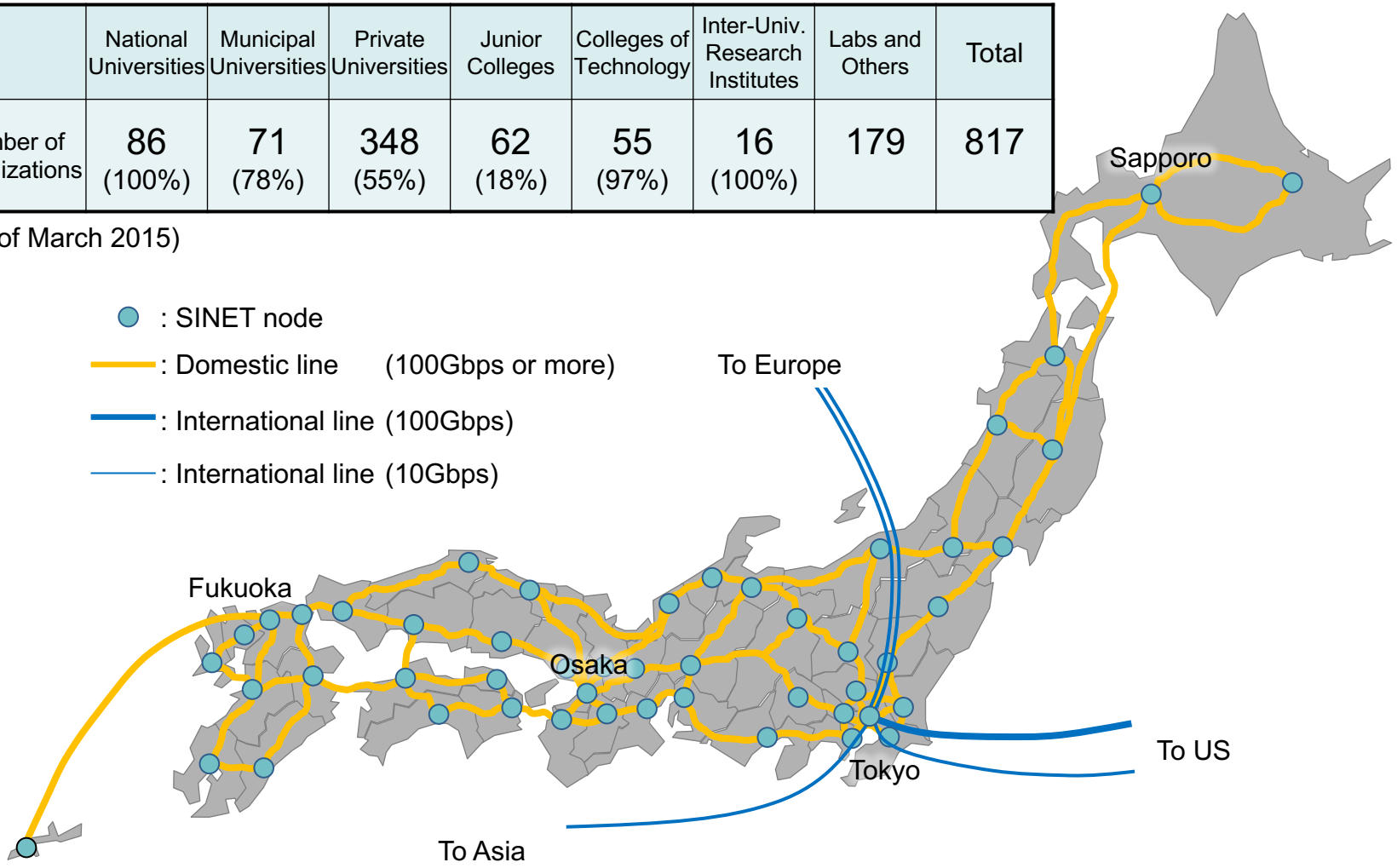
- Nationwide 100-Gbps backbone network and scalable network expansion
- High-speed direct international lines to USA, Europe, and Asia
- Introduction of new technologies such as SDN in response to user needs

Science Information Network (SINET)

- SINET is a Japanese academic backbone network for more than 800 universities and research institutions, and for about 3 million users.
  - SINET covers 100% of national, 78% of municipal, and 55% of private universities.

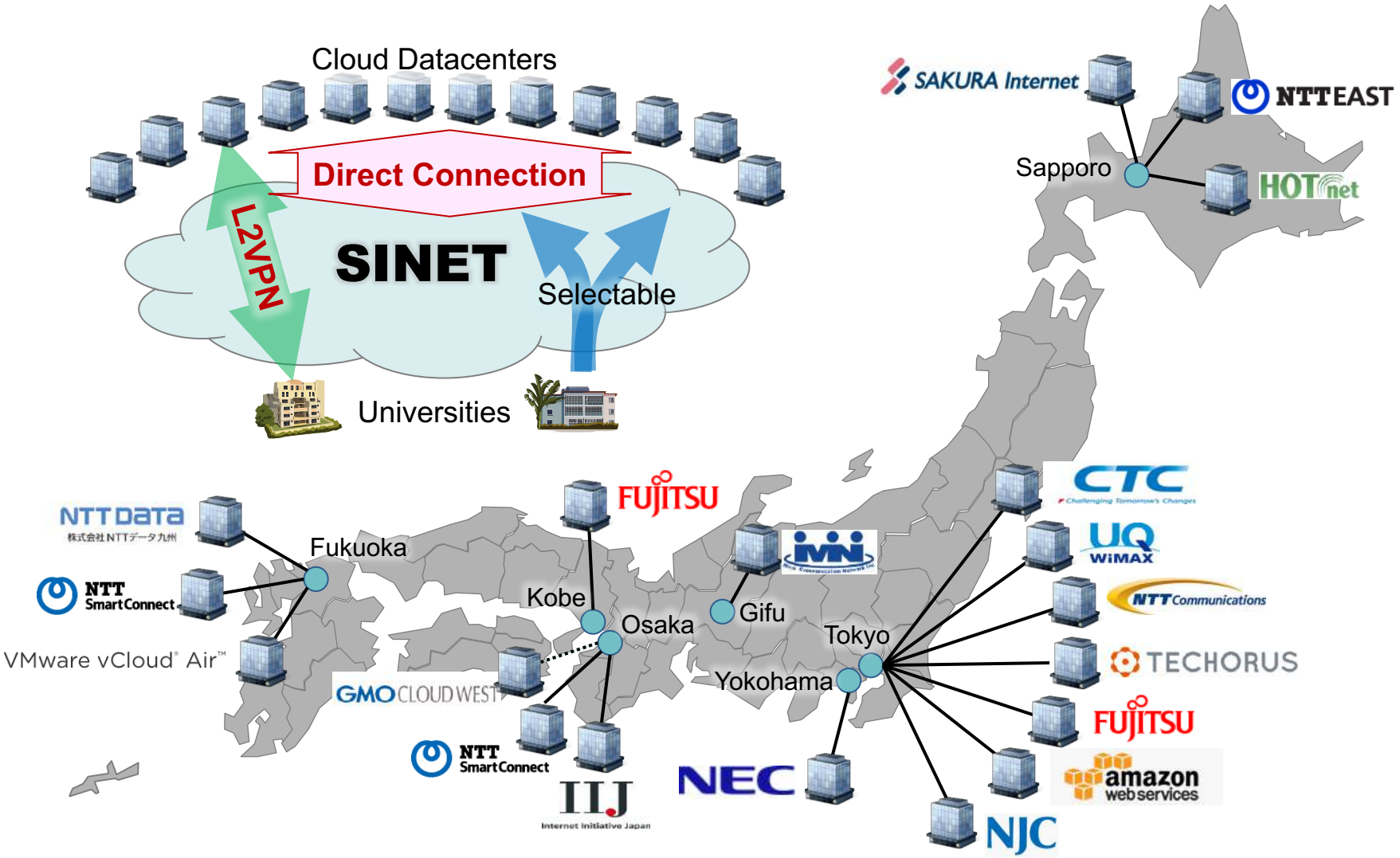
	National Universities	Municipal Universities	Private Universities	Junior Colleges	Colleges of Technology	Inter-Univ. Research Institutes	Labs and Others	Total
Number of Organizations	86 (100%)	71 (78%)	348 (55%)	62 (18%)	55 (97%)	16 (100%)	179	817

(As of March 2015)



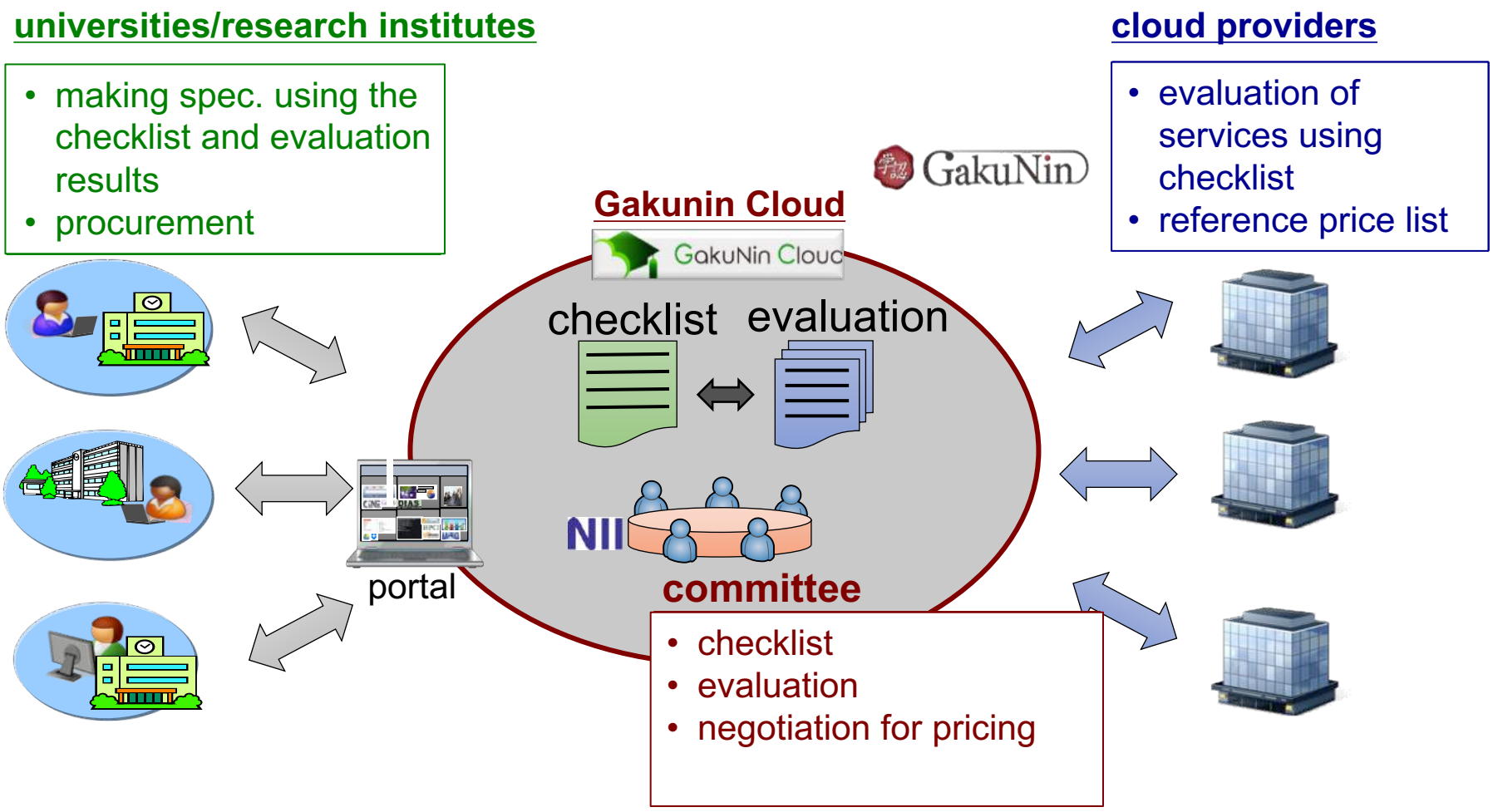
SINET–Cloud directly-connected services

- SINET has been promoting directly-connected cloud datacenters in collaboration with service providers in order to provide users with high-performance, secure, and inexpensive cloud services. 68 universities utilize this type of cloud services through SINET L2VPNs.



Gakunin Cloud

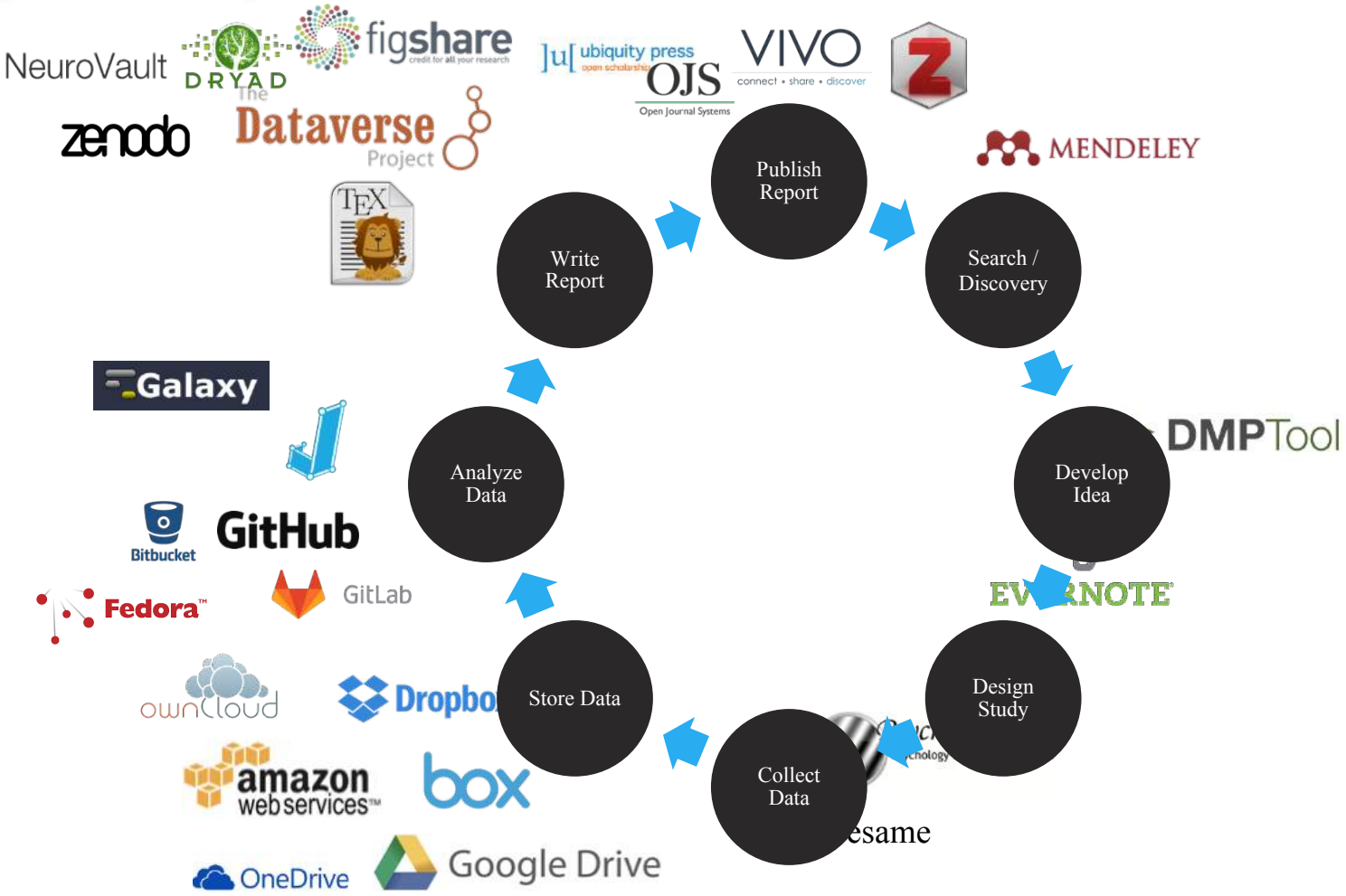
- NII helps universities/research institutes start to use cloud services:
  - checklist for cloud services and evaluation using the checklist
  - negotiation for pricing



Open Science Framework

Management Infra

Open Science Framework is an open source software for research data management by Center for Open Science in US.



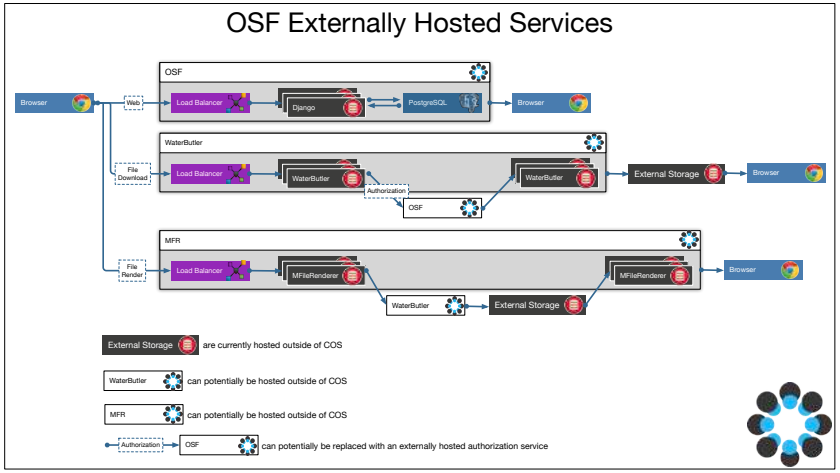
29 grants to develop open tools and services: https://cos.io/pr/2015-09-24/

by Dr. Jeff Spies, https://osf.io/zvp8k/

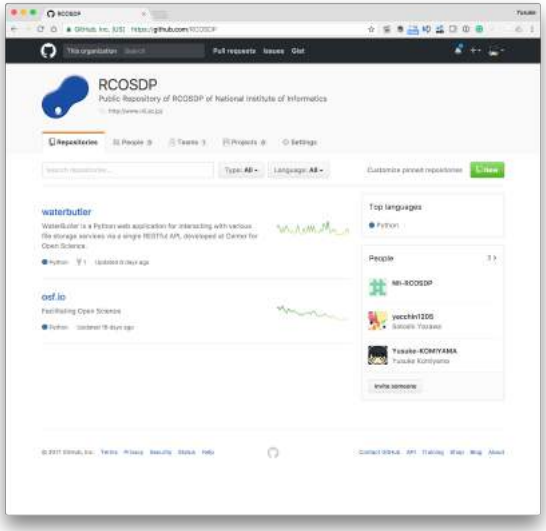
Communication with Center for Open Science

Site visit

Technical corroboration

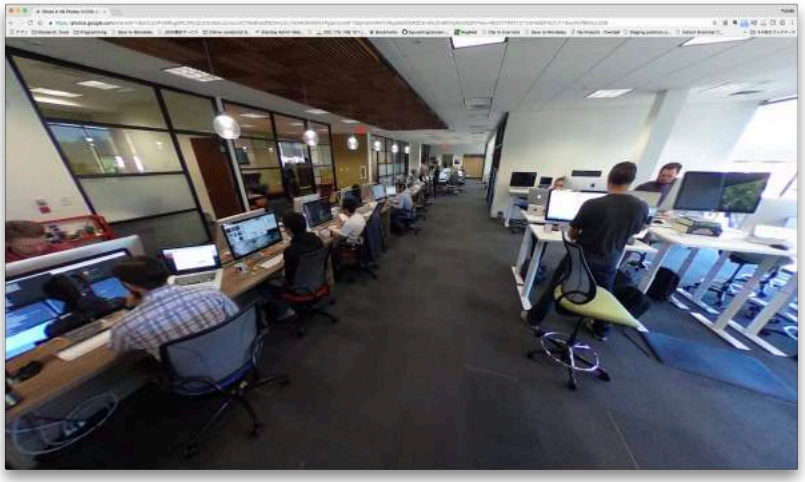


Source code sharing from NII

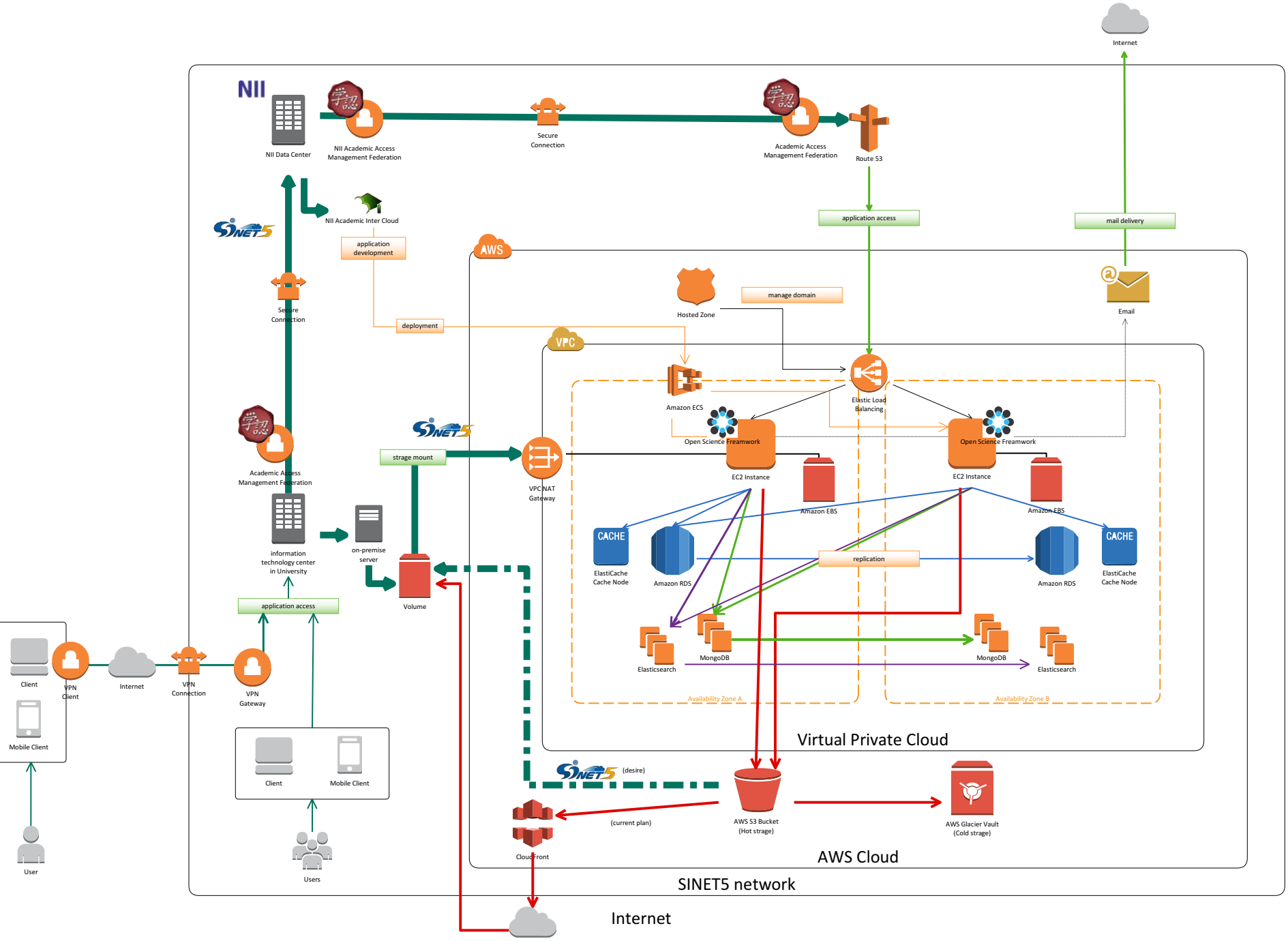


https://github.com/RCOSDP

COS office



https://goo.gl/photos/WmoHMVs3s7ouDbBN9



System configuration diagram of NII open science platform using AWS Cloud.

Results and Discussion 1

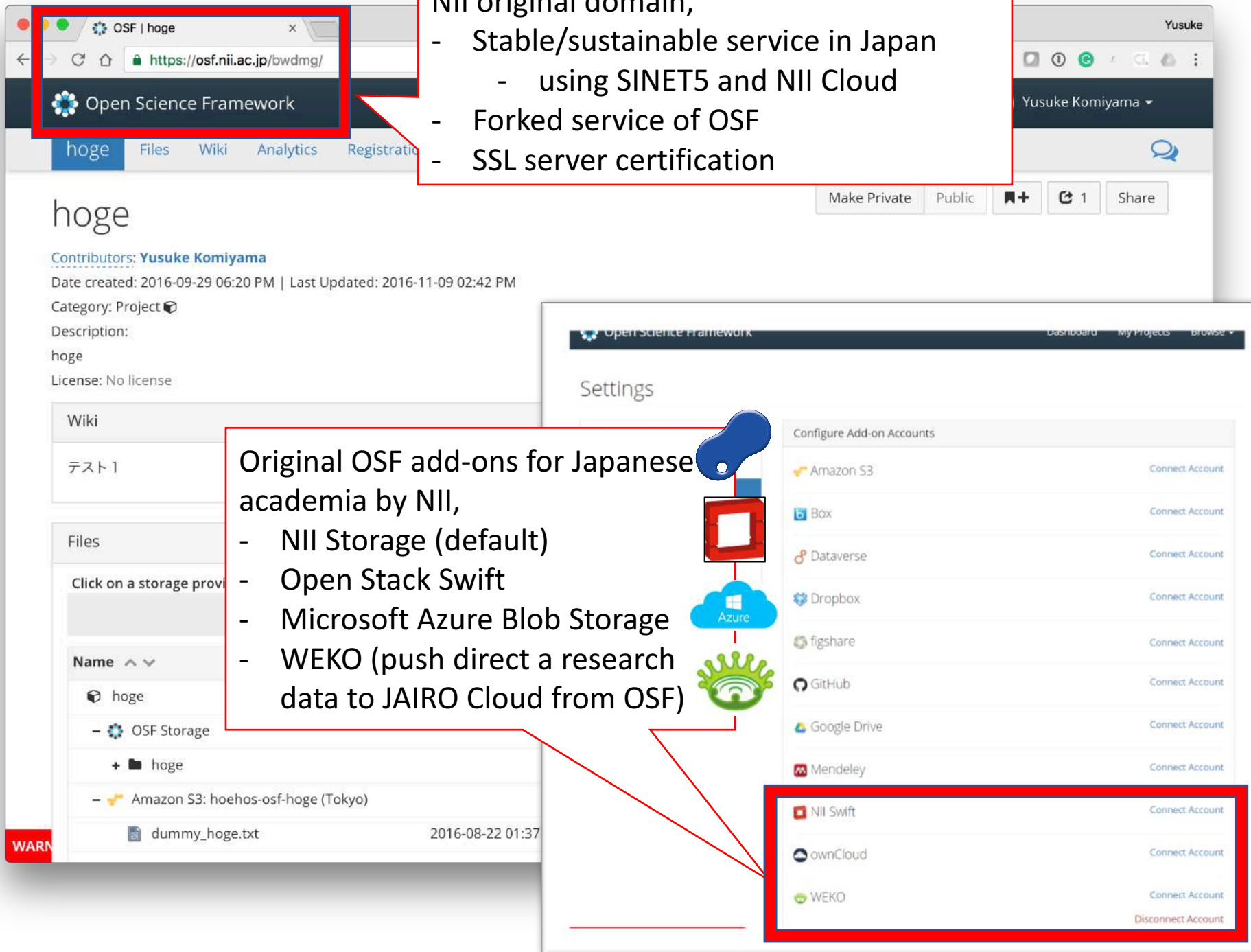
User Interface of NII-RDMP

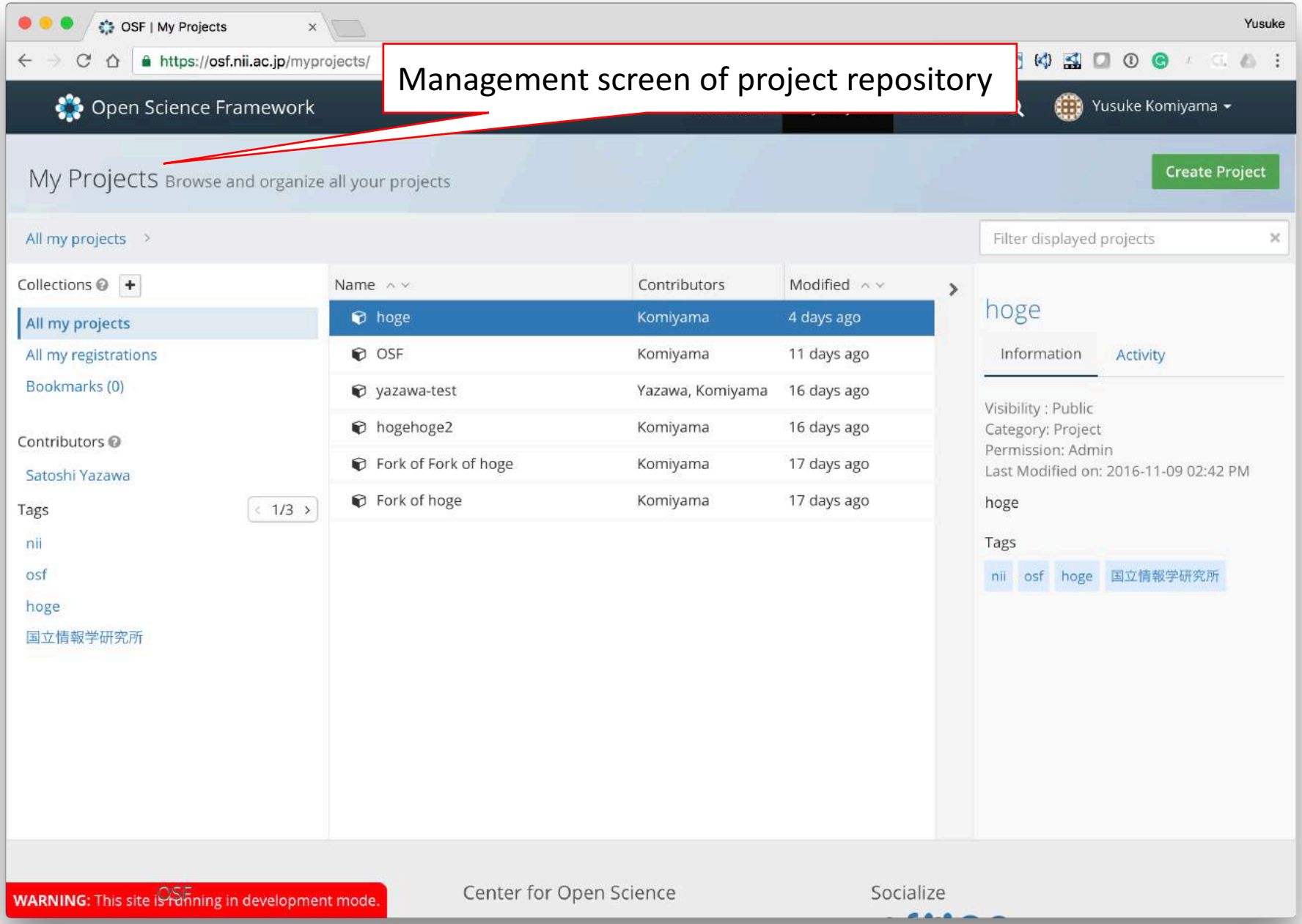
NII original domain,

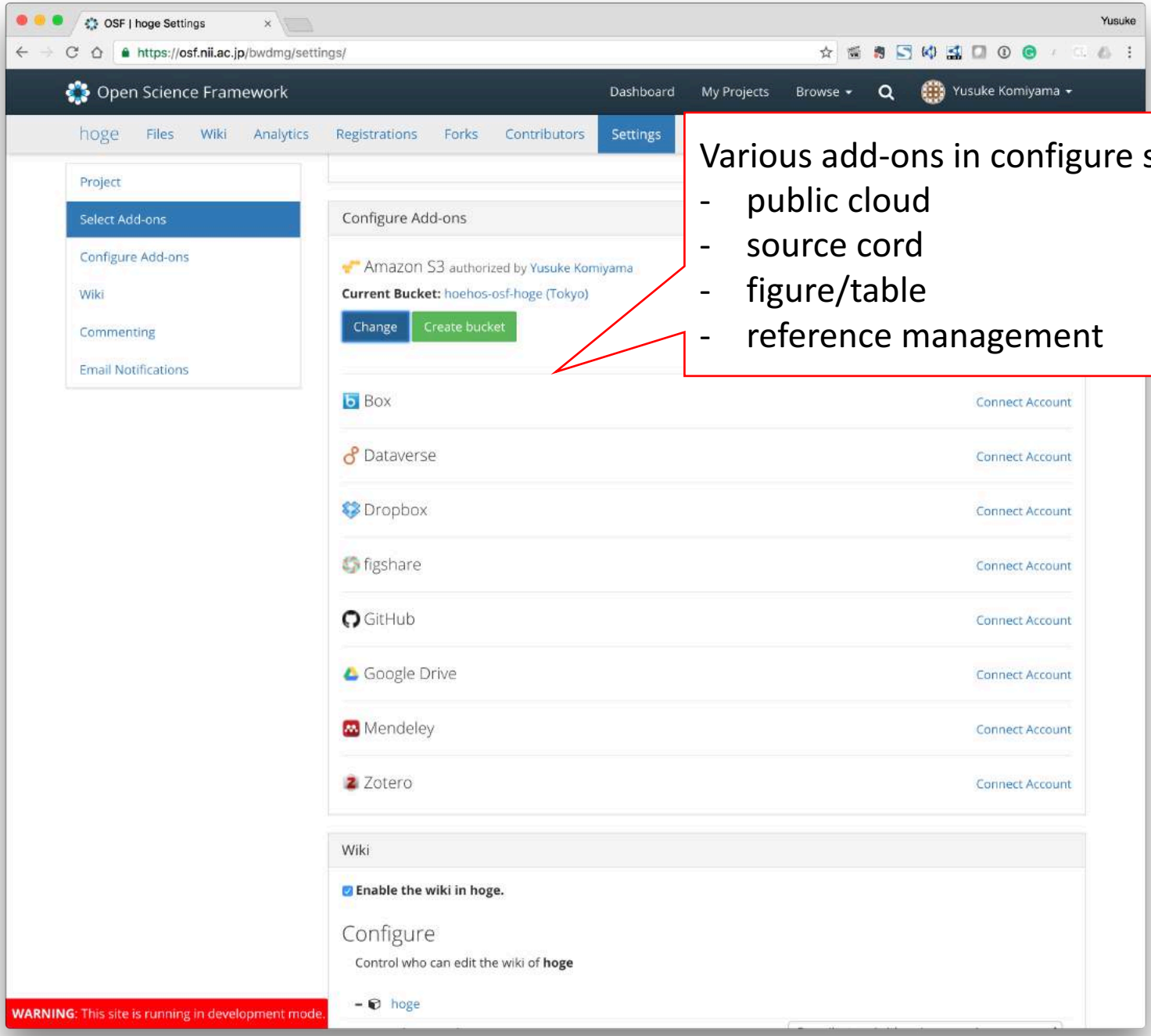
- Stable/sustainable service in Japan
  - using SINET5 and NII Cloud
- Forked service of OSF
- SSL server certification

Original OSF add-ons for Japanese academia by NII,

- NII Storage (default)
- Open Stack Swift
- Microsoft Azure Blob Storage
- WEKO (push direct a research data to JAIRO Cloud from OSF)

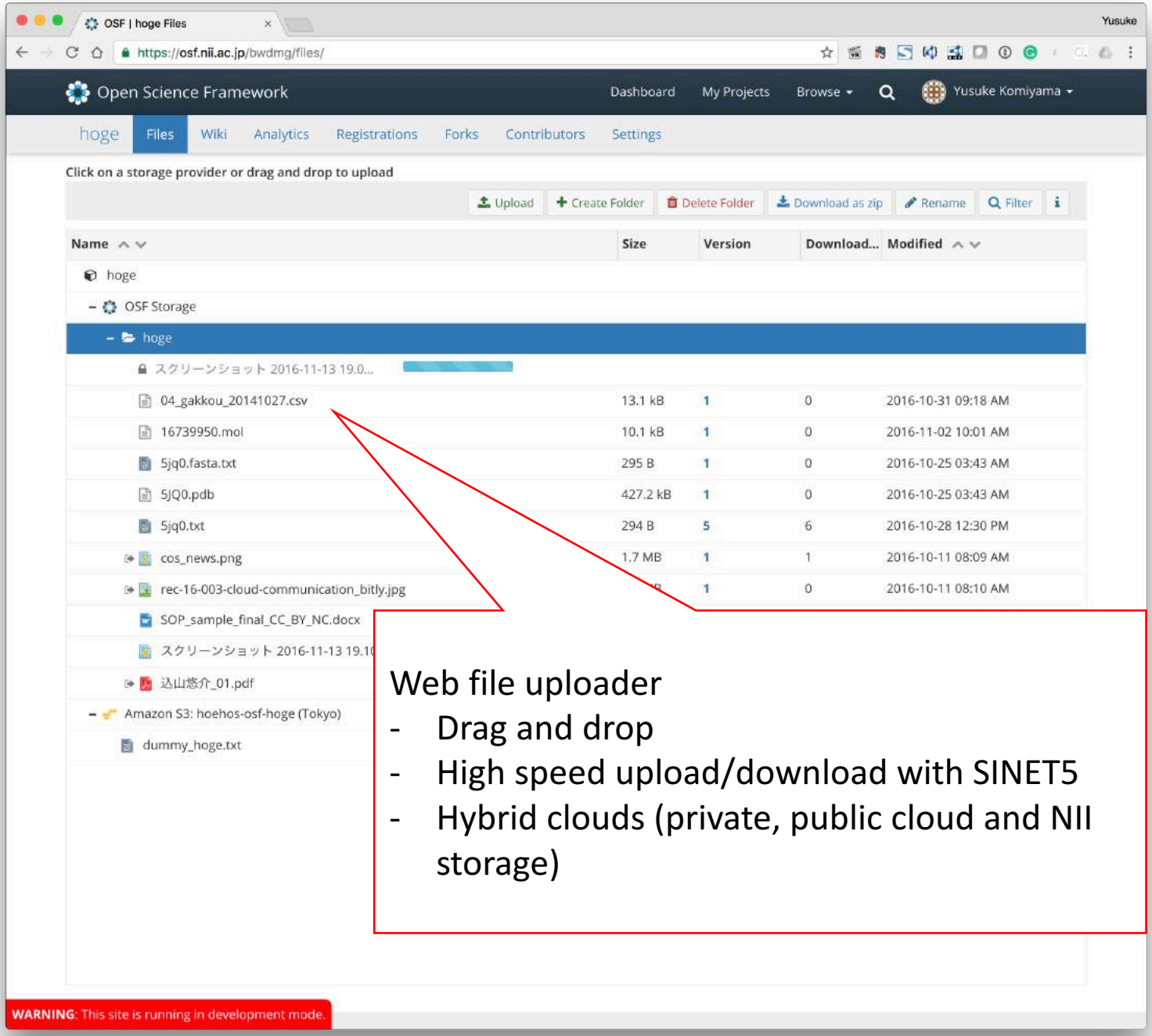



OSF | My Projects
Yusuke
https://osf.nii.ac.jp/myprojects/
Management screen of project repository
Open Science Framework
Yusuke Komiyama
My Projects Browse and organize all your projects
Create Project
All my projects
Filter displayed projects
Collections
All my projects
All my registrations
Bookmarks (0)
Contributors
Satoshi Yazawa
Tags
1/3
nii
osf
hoge
国立情報学研究所
Name
Contributors
Modified
hoge
Komiyama
4 days ago
OSF
Komiyama
11 days ago
yazawa-test
Yazawa, Komiyama
16 days ago
hogehoge2
Komiyama
16 days ago
Fork of Fork of hoge
Komiyama
17 days ago
Fork of hoge
Komiyama
17 days ago
hoge
Information
Activity
Visibility : Public
Category: Project
Permission: Admin
Last Modified on: 2016-11-09 02:42 PM
hoge
Tags
nii
osf
hoge
国立情報学研究所
WARNING: This site is running in development mode.
OSF
Center for Open Science
Socialize



Various add-ons in configure screen

- public cloud
- source cord
- figure/table
- reference management



Web file uploader

- Drag and drop
- High speed upload/download with SINET5
- Hybrid clouds (private, public cloud and NII storage)

https://osf.nii.ac.jp/9t6wx/

Open Science Framework | Dashboard | My Projects | Browse | Yusuke Komiyama

hoge | Files | Wiki | Analytics | Registrations | Forks | Contributors | Settings

04_gakkou_20141027.csv (Version: 1)

Delete | Check out | Share | Download | Toggle view: View | Edit | Revisions

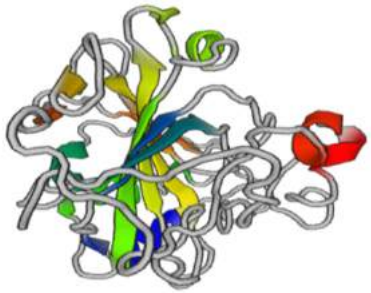
Filter

- OSF Storage
  - hoge
    - 04_gakkou_20141027.csv
    - 16739950.mol
    - 5jq0.fasta.txt
    - 5JQ0.pdb
    - 5jq0.txt
    - cos_news.png
    - rec-16-003-cloud-commu...
    - SOP_sample_final_CC_BY...
    - 込山悠介_01.pdf
  - Amazon S3: hoehos-osf-hoge (T...
    - dummy_hoge.txt

Sheet_1

Show rows with cells including:

施設名	郵便番号
環境情報センター	〒252-0236
相模川ビレッジ若あゆ...	〒252-0135
城山学校給食センター	〒252-0111
青少年学習センター	〒252-0207
青少年相談センター	〒252-0239
清新学校給食センター	〒252-0217
総合学習センター	〒252-0239
津久井学校給食センター	〒252-0153
津久井生涯学習センター	〒252-0159
ふじの体験の森やませ...	〒252-0182
相原小学校	〒252-0141
相原中学校	〒252-0143
青根小学校	〒252-0162
青根中学校	〒252-0162
青野原小学校	〒252-0161
青野原中学校	〒252-0161
青葉小学校	〒252-0228
旭小学校	〒252-0143



File management screen
- Smart version control
- Rapid preview

SOP#A0017-ver2

Total RNA preparation protocol V2-150420ed (miRNA mini kit; Q Company #123456),

Extract and purify total RNA including miRNA

Generally, you can purify total RNA from animal tissues of 50 mg or cultured cells of 1 × 10^7 cells without DNase1. In handling RNA, all procedure should be done in RNase-free environment.

1. **Cultured Cells: Collect cells according to Step-1a or 1b.**

   1a) Floating cell (upto 1 × 10^7 cells. Avoid excessive amount.)

   Count cell numbers, and centrifuged at 300 × g in a tube for 5 minutes to form cell pellet. Carefully remove supernatant completely, and proceed to Step-2.

   1b) Monolayer cells (upto 1 × 10^7 cells. Avoid excessive amount)

   After trypsinization count cell numbers, and centrifuged at 300 × g in a tube for 5 minutes to form cell pellet. Carefully remove supernatant completely,, proceed to Step-2.

2. **Add the Lysis Reagent (XXX company) of 700µL, and suspend the cells by vortex mixer. Incubate it for minutes at room temperature (20-30 ℃).**

   (If the cell pellet is hardened, tap the tube gently to loosen the particles before adding Lysis Reagent.)

   NOTICE1: Lysis Reagent should keep in cold dark space.

   NOTICE2: As Lysis Reagent contains toxic chemicals including phenol and guanidine thiocyanate, keep it away from skins.

3. **Add chloroform of 140 µL and** immediately vortex hardly **15 seconds (phase separation). After**

Results and Discussion 2

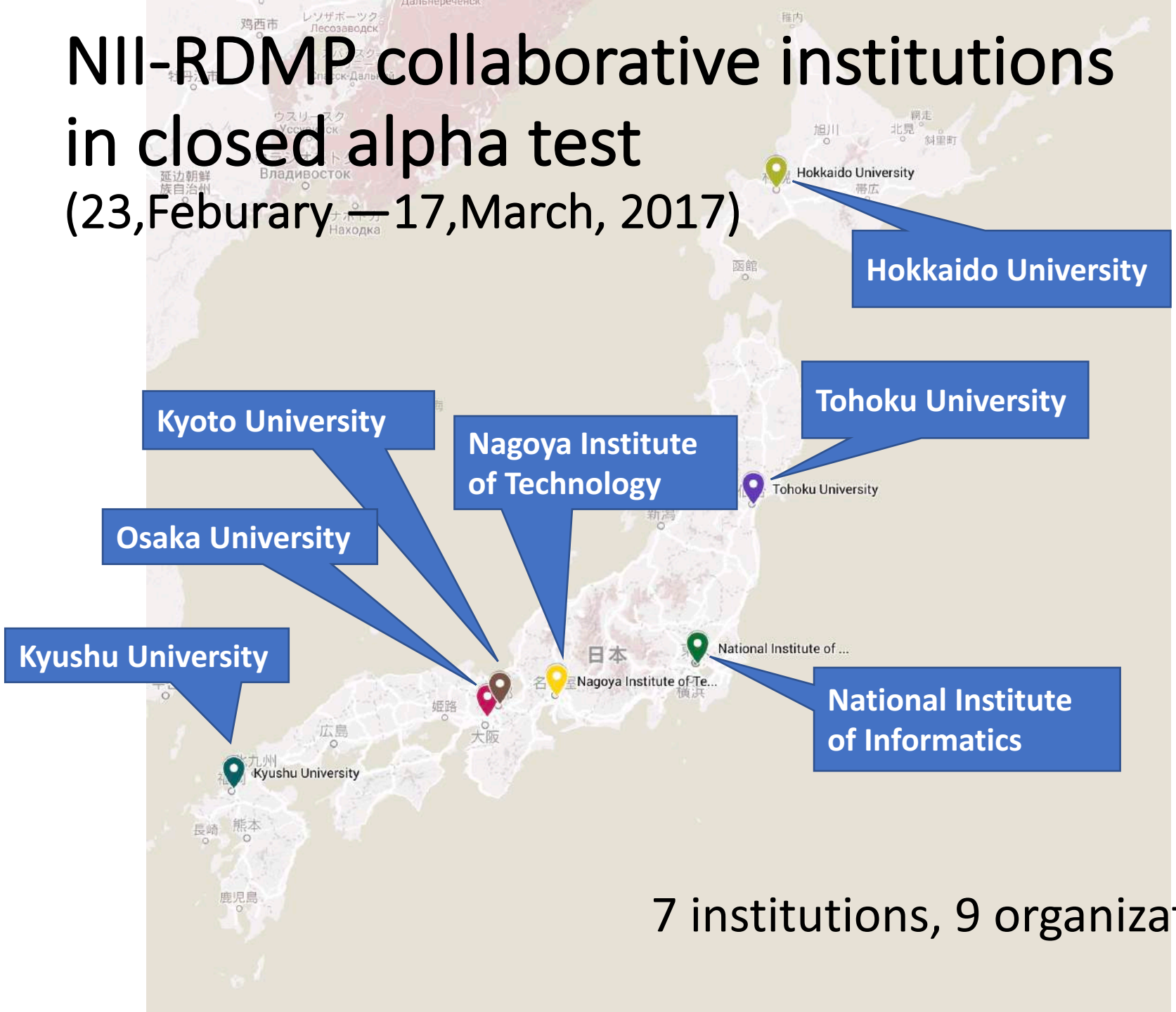
NII-RDMP closed alpha test

Purpose

- **NII-RDMP closed alpha test**
  - 23,Feburary—17,March, 2017
  - 7 institutions, 9 organizations
- We are evaluating NII-RDMP systems by the sub-working group of university CIOs, and our developer reflects the comments into the RDMP system.
  - Software debug
  - Scalable experiment
  - Accounting estimation on public Clouds

NII-RDMP collaborative institutions in closed alpha test

(23,Feburary —17,March, 2017)



7 institutions, 9 organizations

Restrictions in closed alpha test

- The organizer will drop all user database after the closed alpha test for security.
- Limited access by firewall control and NII OpenIdP account.
- Connect a Cloud storage to the RDMP via the internet.
- WEKO add-on and Gakunin Embedded DS are disabled.Private mode only in OSF.

Application tester wanted

- I am looking for the participating institution towards the second closed test of NII-RDMP in 2017. Please contact us if you are interested in our service.

Conclusions

- NII is currently providing the service of scholarly information infrastructure on a nationwide scale for academic communities, and also we need to collaborate the research result database with Japanese funding agencies.
- We are developing the NII-RDMP as new service for research data management of research integrity to the open science era.
- We are trying the closed alpha test for the software improvement with 7 universities.

Acknowledgments

- Dr. Sugiki Akiyoshi (Information Initiative Center, **Hokkaido University**)
- Dr. Yamaki Shunsuke (Cyberscience Center, **Tohoku University**)
- Prof. Matsuo Hiroshi (Department of Computer Science, **Nagoya Institute of Technology**)
- Dr. Tomoki Yoshihisa (Cyber media Center, **Osaka University**)
- Ms. Midori Moriishi (Information and Communications Technology Services, **Osaka University**)
- Dr. AOKI Takaaki (Institute for Information Management and Communication, **Kyoto University**)
- Dr. Kohei Hatano (**Kyushu University Library**)
- Dr. Eisuke Ito, (Research Institute of Information Technology, **Kyushu University)**
- Dr. Kazutsuna Yamaji (Digital Content And Media Sciences Research Division, **National Institute of Informatics**)

Fin