National Institute of Informatics

Organization and Activities

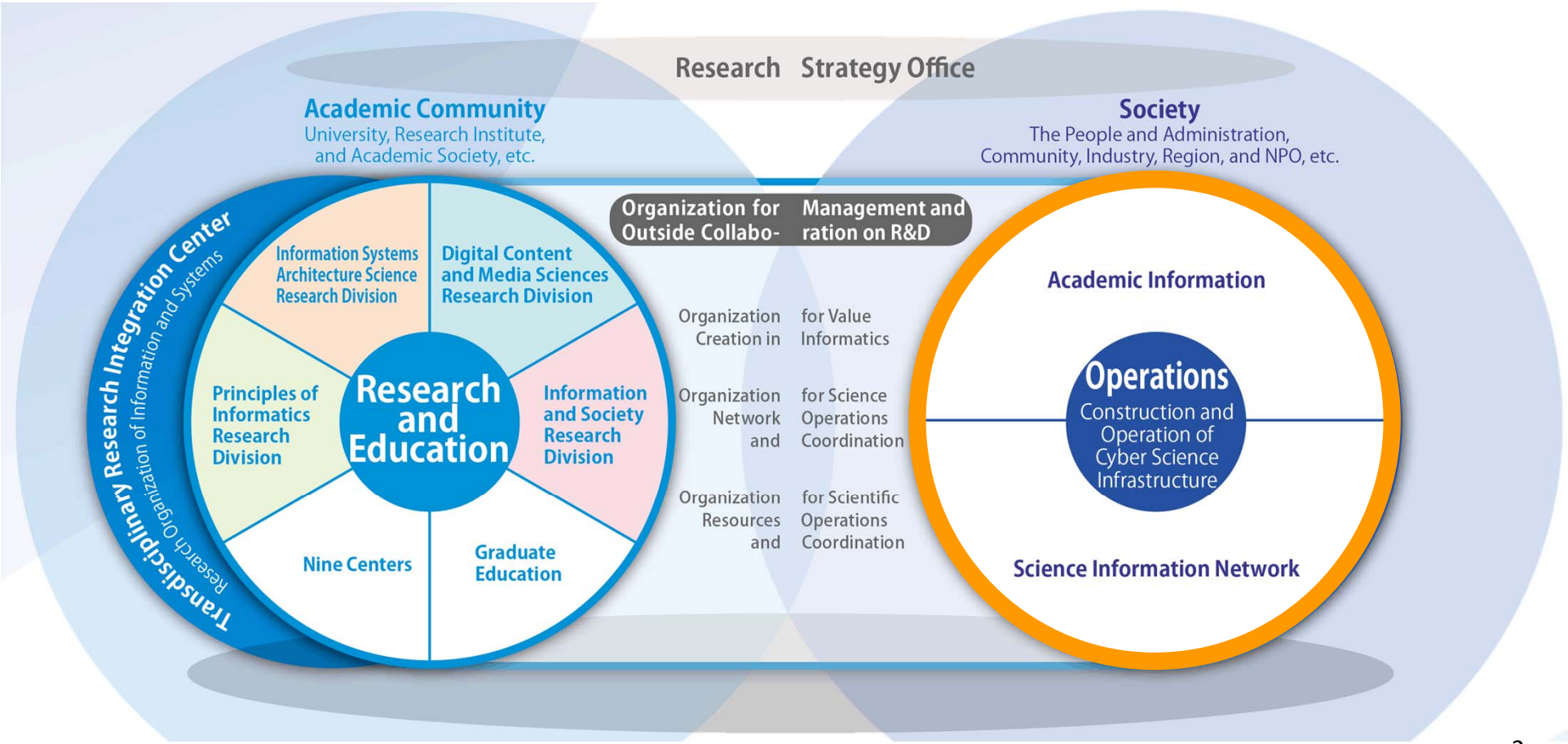
Miho Funamori

3 October 2017

National Institute of Informatics

Tandem Organization of NII

- The National Institute of Informatics (NII) seeks to advance integrated research and development activities in information-related fields, including networking, software, and content. NII also promotes the creation of a state-of-the-art academic-information infrastructure.



History of NII

- Pre-history as Research Center for Library and Information Science (RCLIS, 1976-) and Center for Bibliographic Information (1983) as centers within the University of Tokyo.
- Founded in 1986 as National Center for Science Information Systems (NACSIS)
- Reorganized in 2000 as National Institute of Informatics (NII)

IT Infrastructures for Academia

National Institute of Informatics JAPAN

NII SINET5 Infrastructure

Collaboration and Promotion in Research and Education

Resource

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

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

SINET: Japanese academic backbone network

- 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

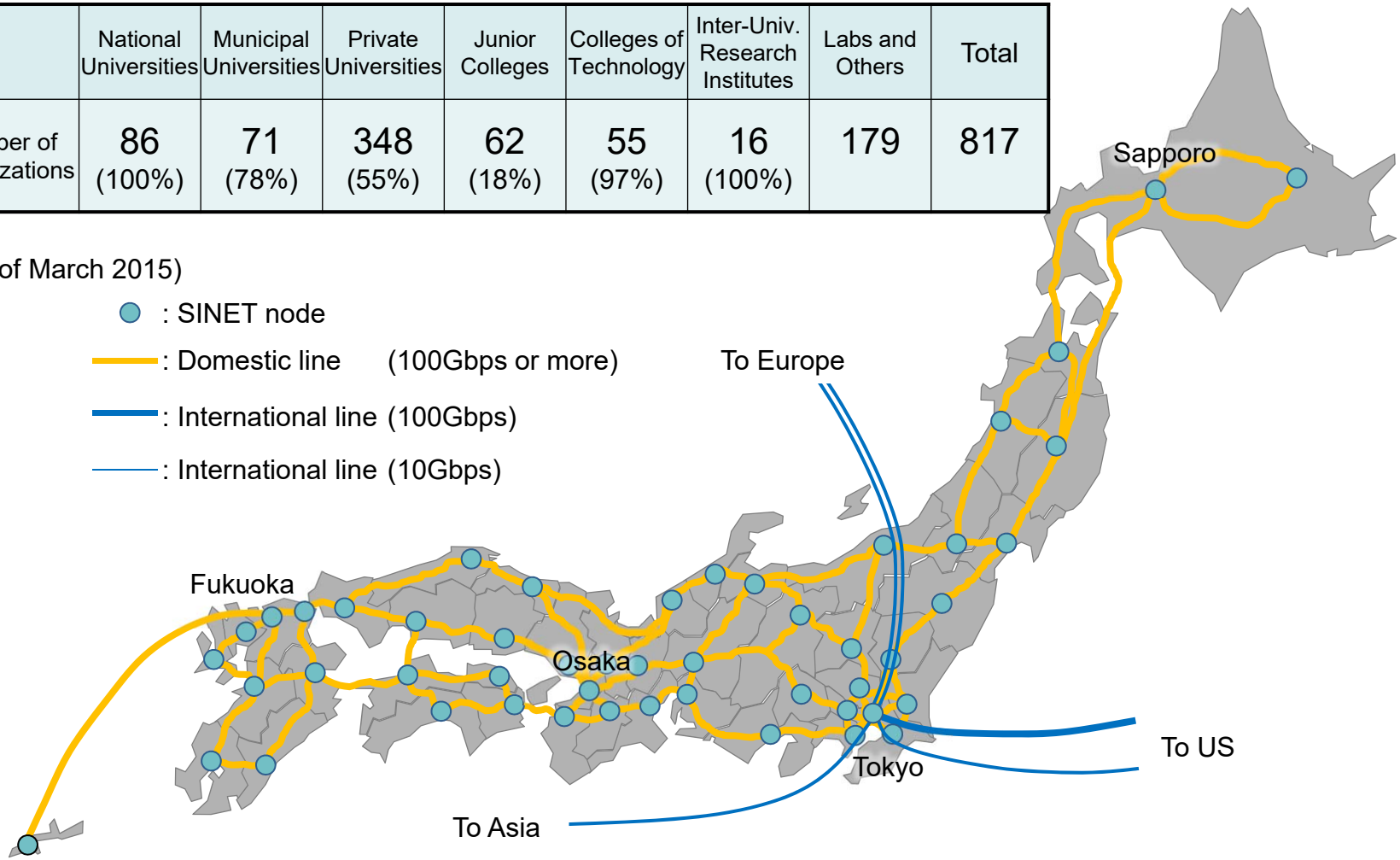
(As of March 2015)

: SINET node

: Domestic line (100Gbps or more)

: International line (100Gbps)

: International line (10Gbps)



From SINET4 to SINET5

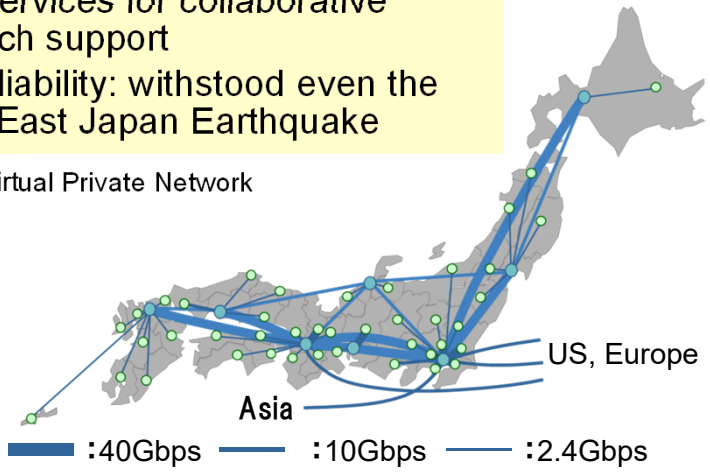
- SINET5 plans 1) Realization of the domestic network of the world highest level, 2) Reinforcement of the international lines, 3) Reinforcement of the information services (network, cloud, academic information circulation)

SINET4 (FY2011-FY2015)

1) Nationwide 40Gbps lines
2) 10Gbps x 4 international lines
3) VPN* services for collaborative research support

★High reliability: withstood even the Great East Japan Earthquake

* VPN: Virtual Private Network

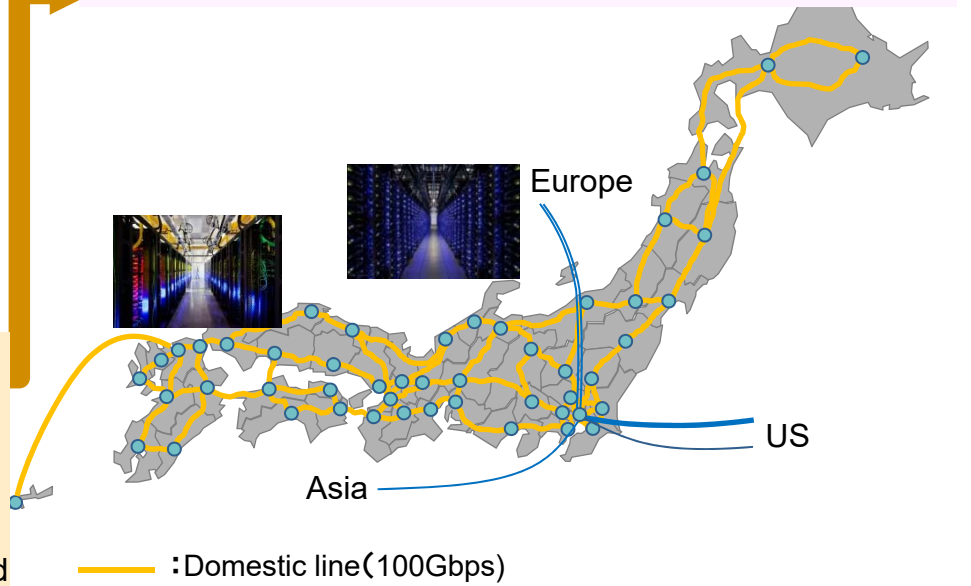


Surrounding environment

- Various research fields yearn for line speedup
- Increase of cloud utilization: a large quantity of communication data of universities flow into the SINET
- Most developed nations introduce 100Gbps line (US: introduction was completed, Europe: introduction started, China: introduction started, International: introduction started at US-Europe line)

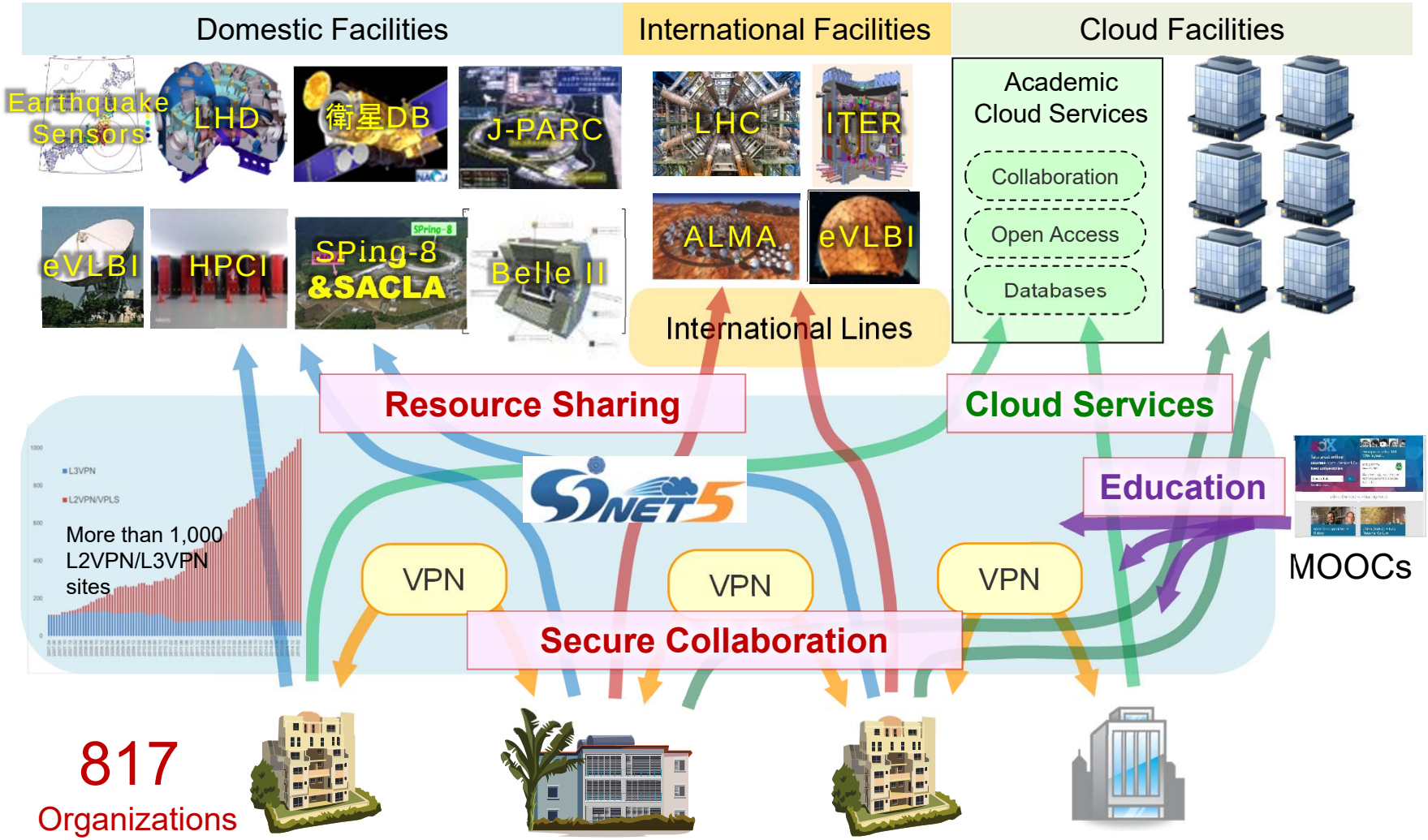
SINET5 (FY2016-FY2021)

1) **100Gbps lines throughout Japan**
2) Speedup of international lines (100Gbps)
3) Reinforcement of the information services
   - Expansion of network service function
   - Promotion of cloud utilization
   - Expansion of publishing and communicating academic information



Infrastructure for Research and Education

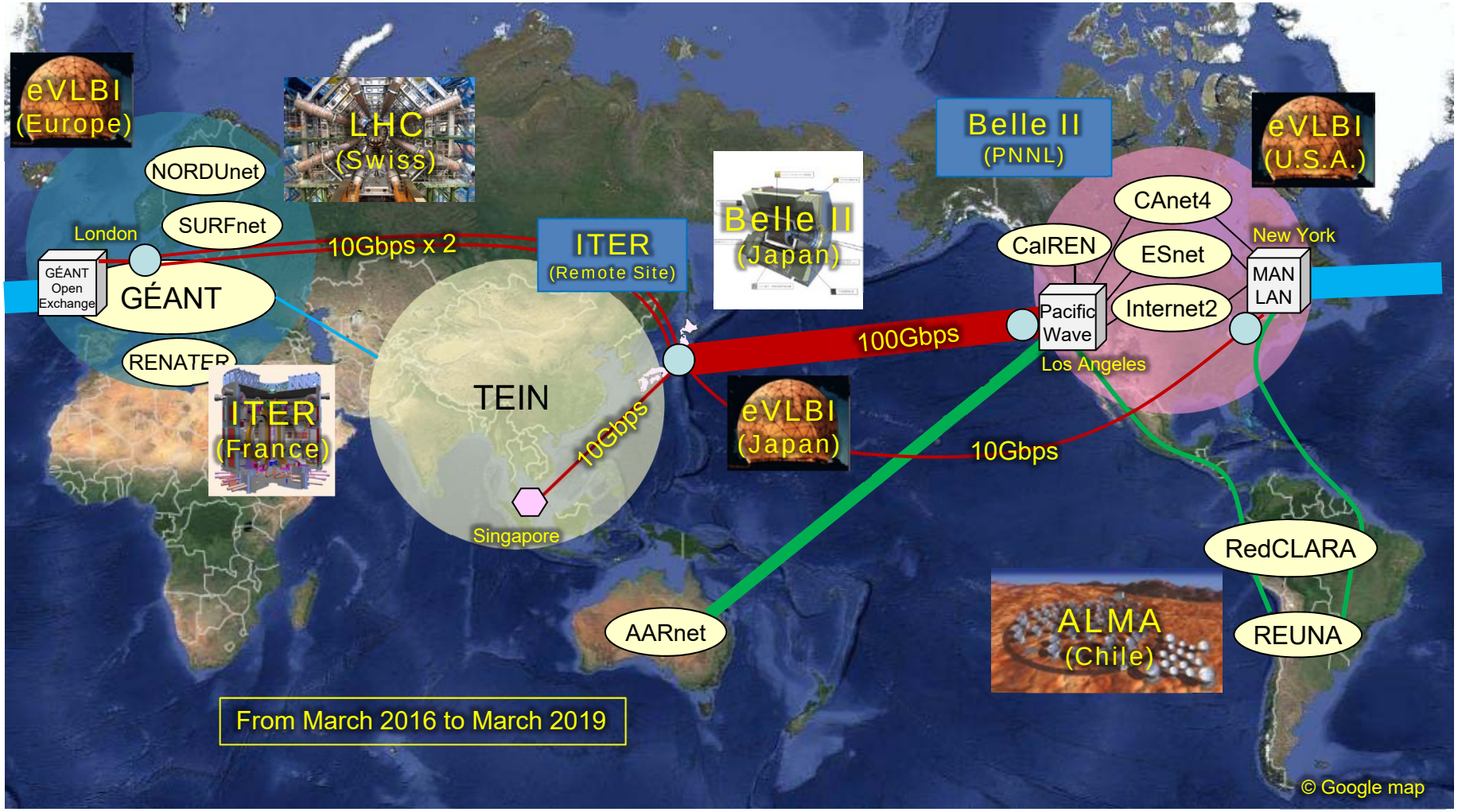
- SINET facilitates resource-sharing of research facilities in various scientific areas, fosters secure collaboration among researchers, promotes cloud services, and enhances educational environment of universities.



International Lines of SINET5

◆ SINET5 will have direct international lines to USA, Europe, and TEIN/Asia.

- USA: 100-Gbps line to Los Angeles and 10-Gbps line to New York
- Europe: Two 10-Gbps lines to London for small latency
- TEIN/Asia: 10-Gbps line to Singapore



Academic Information Services

National Institute of Informatics JAPAN

NII SINET5 Infrastructure

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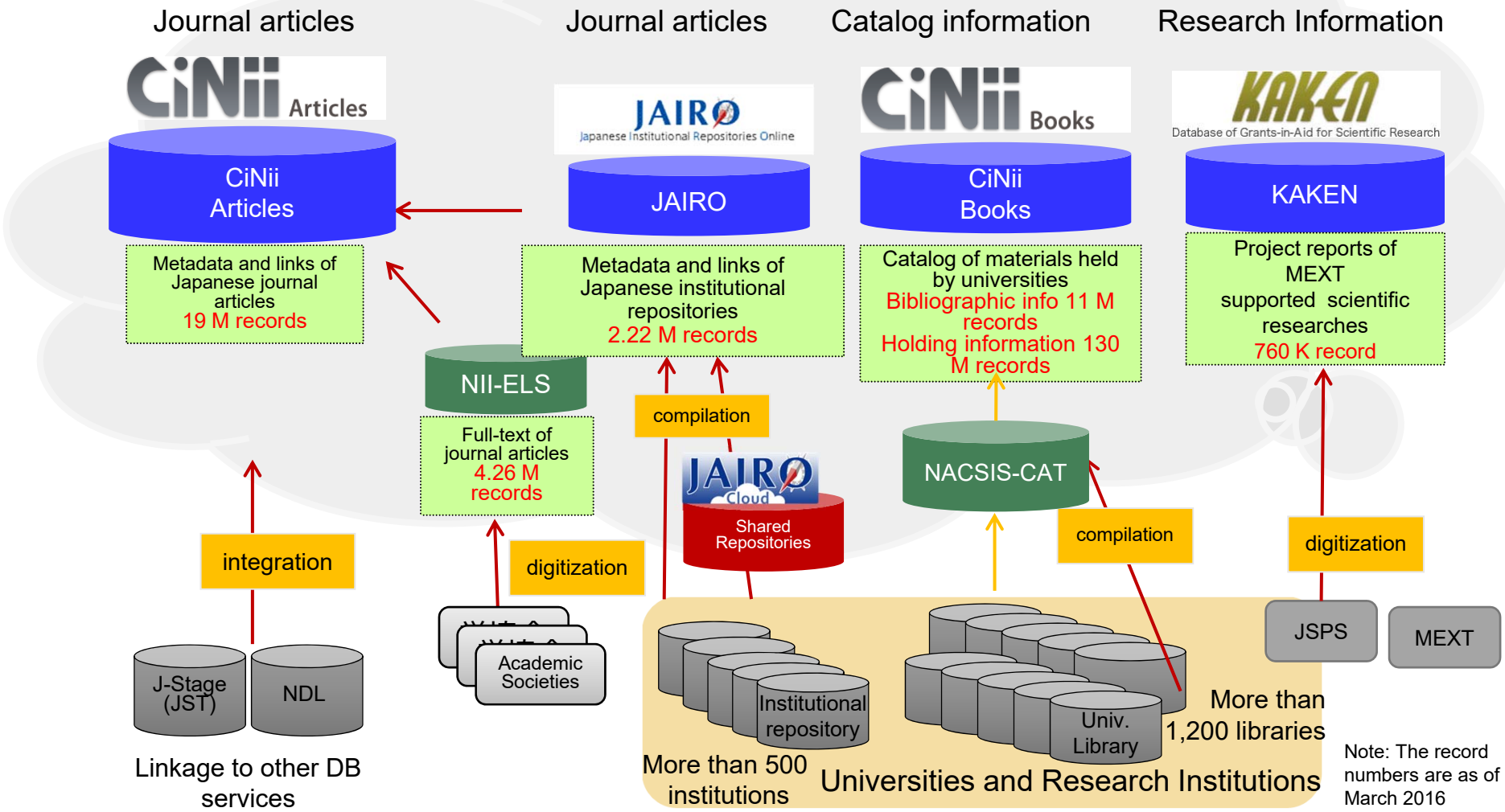
Scholarly Information Infrastructure

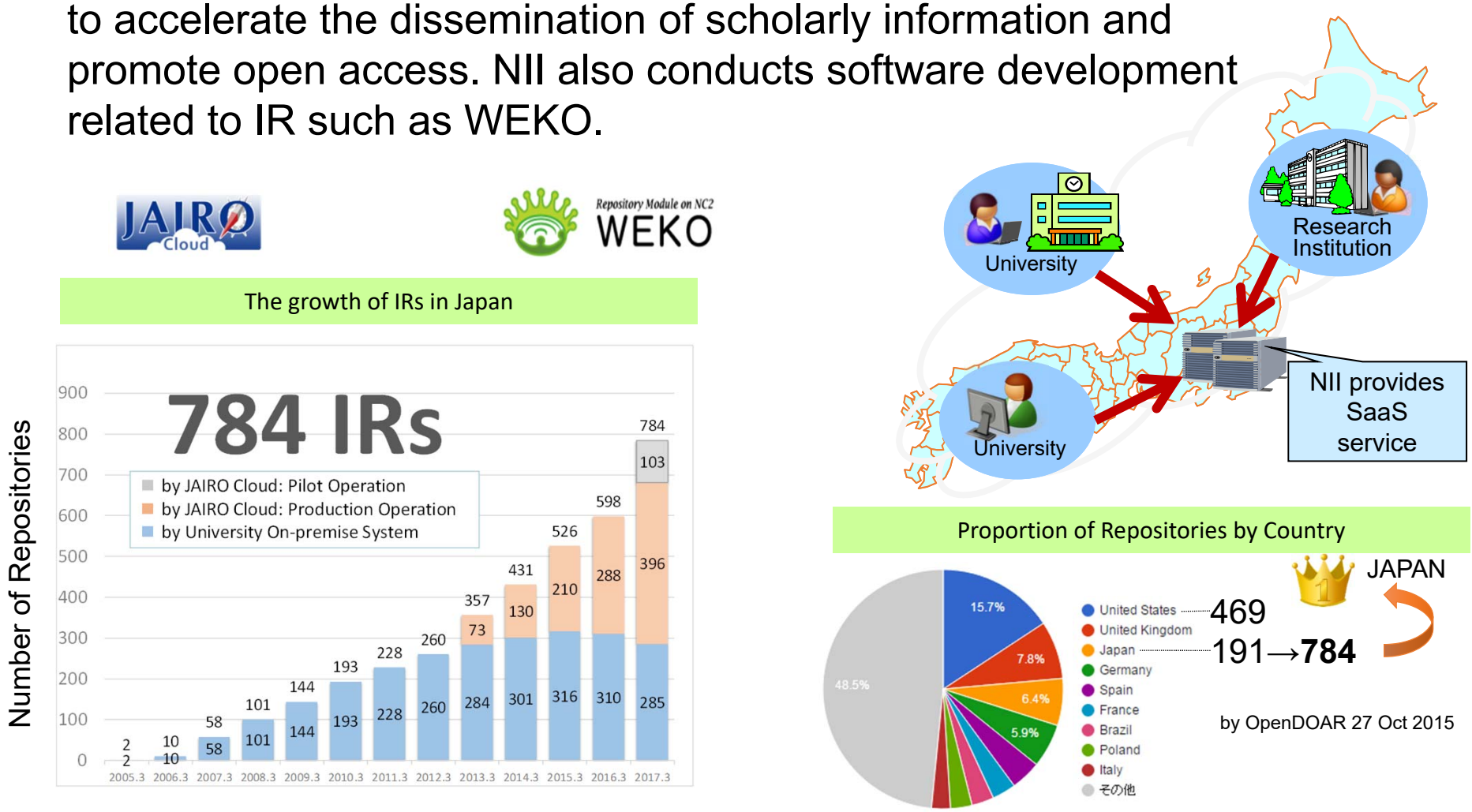
Scholarly information is disseminated through various portals provided by NII, in which the information is compiled with the collaboration with universities.



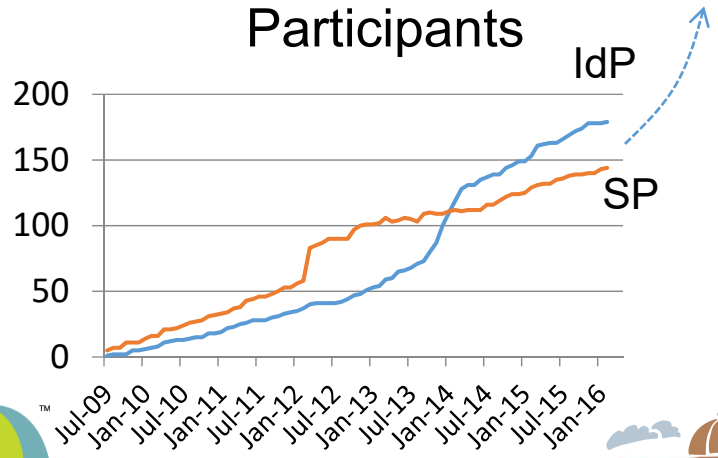
Note: The record numbers are as of March 2016

JAIRO Cloud : a shared Institute Repositories facility

NII provides a cloud resource named “JAIRO Cloud” as the share facility for scholarly information repositories since 2011, whereby to accelerate the dissemination of scholarly information and promote open access. NII also conducts software development related to IR such as WEKO.

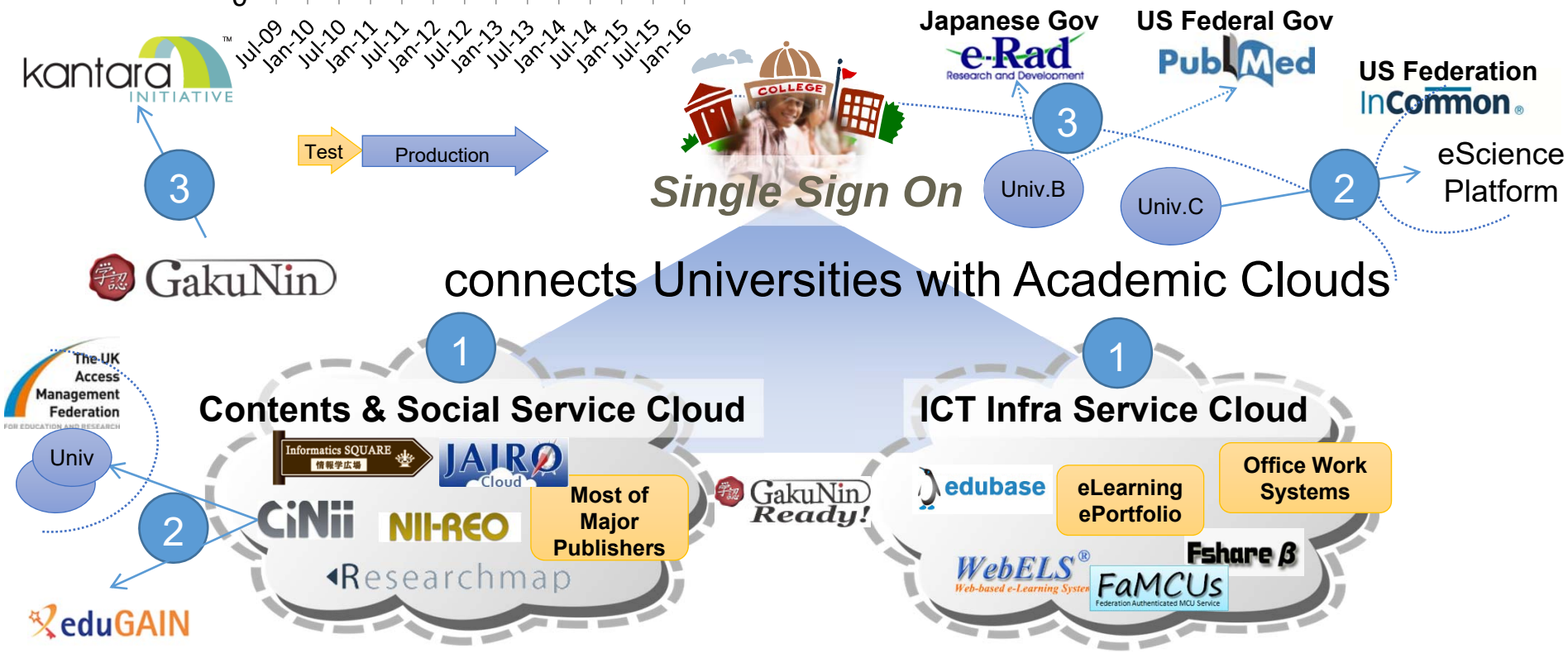


GakuNin: Identity Federation



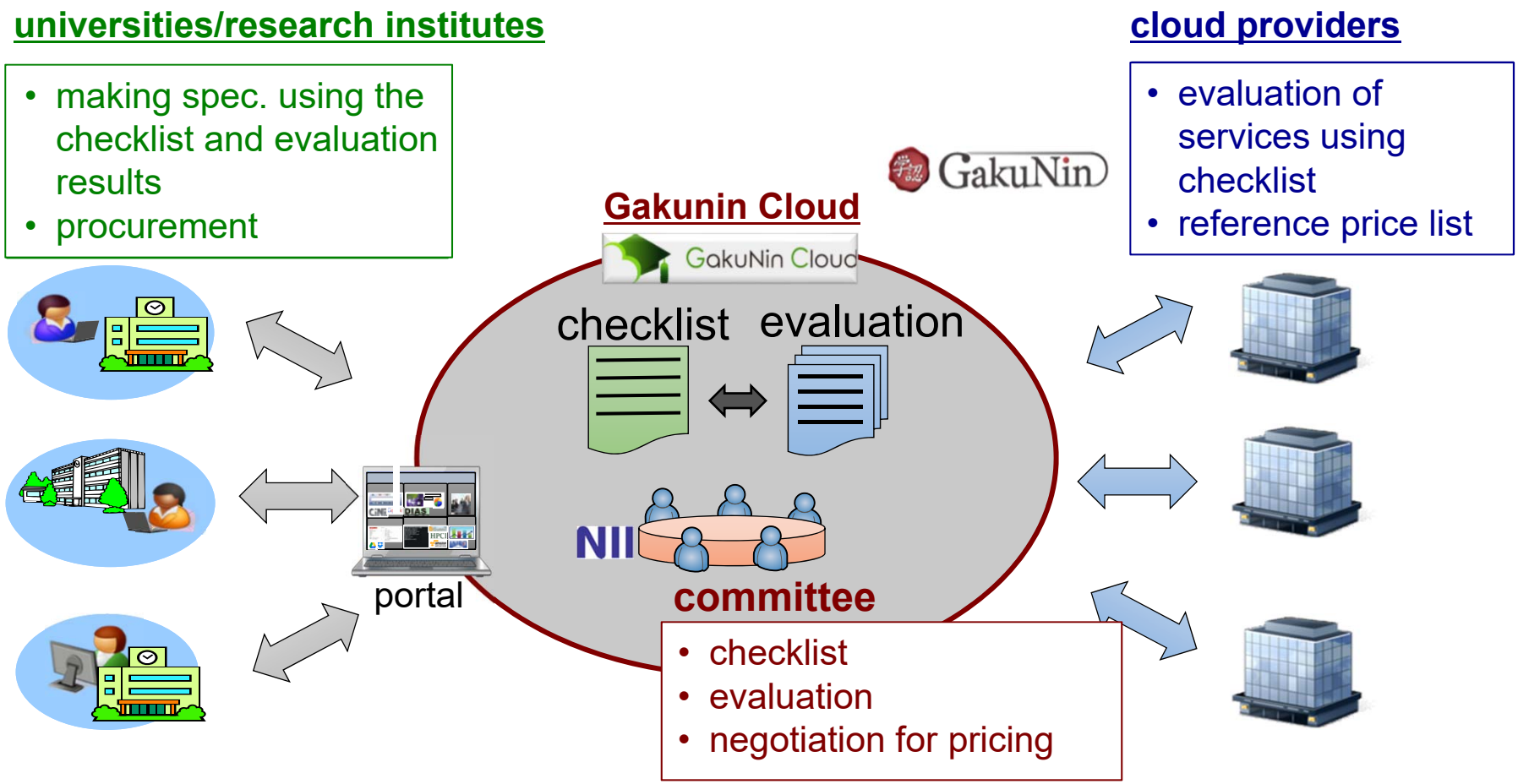
Current Challenges;

1. Academic Cloud Connections
2. International Collaboration
3. Level of Assurance Program



GakuNin Cloud

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



New National Service for Open Science

Open Science Report from Japanese Cabinet Office (2015)

Promoting Open Science in Japan

Opening up a new era for the advancement of science

Executive Summary

Report by the Expert Panel on Open Science, based on Global Perspectives

Cabinet Office, Government of Japan

March 30, 2015

It is vital for Japan to participate in international discussions and to demonstrate a proactive approach to the promotion of open science. The Expert Panel on Open Science based on Global Perspectives has discussed various relevant issues of immediate importance for Japan. Based on these discussions, the Panel presented the guiding principles for promotion of open science in Japan.

I. The Importance of Open Science

"Open science" refers to a new approach to promoting innovation through knowledge creation in science and technology. This will be realized by facilitating access to and use of publicly funded research results such as scientific papers and their underlying data by the scientific community, industry and the general public.

The concept of open science is spreading rapidly. At the G8 Summit held in June 2013, G8 Science Ministers issued a joint statement that endorsed the need for increasing access to publicly funded research, including peer-reviewed published research and research data. The statement triggered discussions in various forums worldwide.

Research community, and to the decline of Japan's international competitiveness.

Japan should keep pace with the global advancement of open science in a collaborative yet also strategic manner, so that the value of Japan's latest research and development activities can lead to business activities at the next stage.

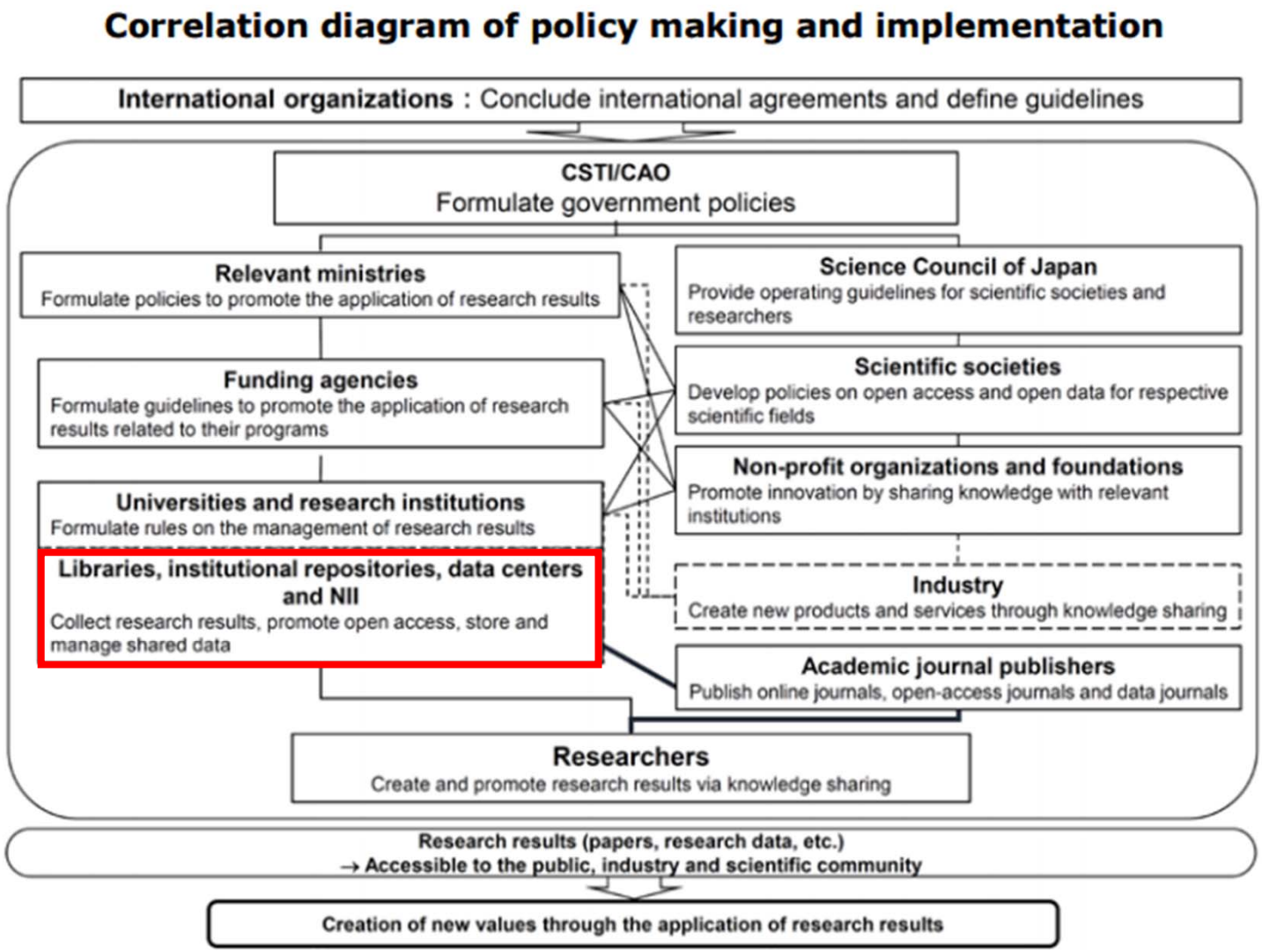
II. The Need to Promote Open Science

Open science may change scientific research. It will not replace traditional research methods, but will add new tools that help to advance science. It will make research results widely available in digital formats to all users including the scientific community, industry and the general public. This will enable additional value to be extracted from science and technology information, which will not only improve our knowledge, but will also reform innovation strategies.

For the scientific community, the acceleration of data-driven activities is expected to lead to new collaborations and to the prevalence of new research methods among researchers within the same research discipline and beyond. Industry and individuals are also expected to gain as they develop new products and services as a

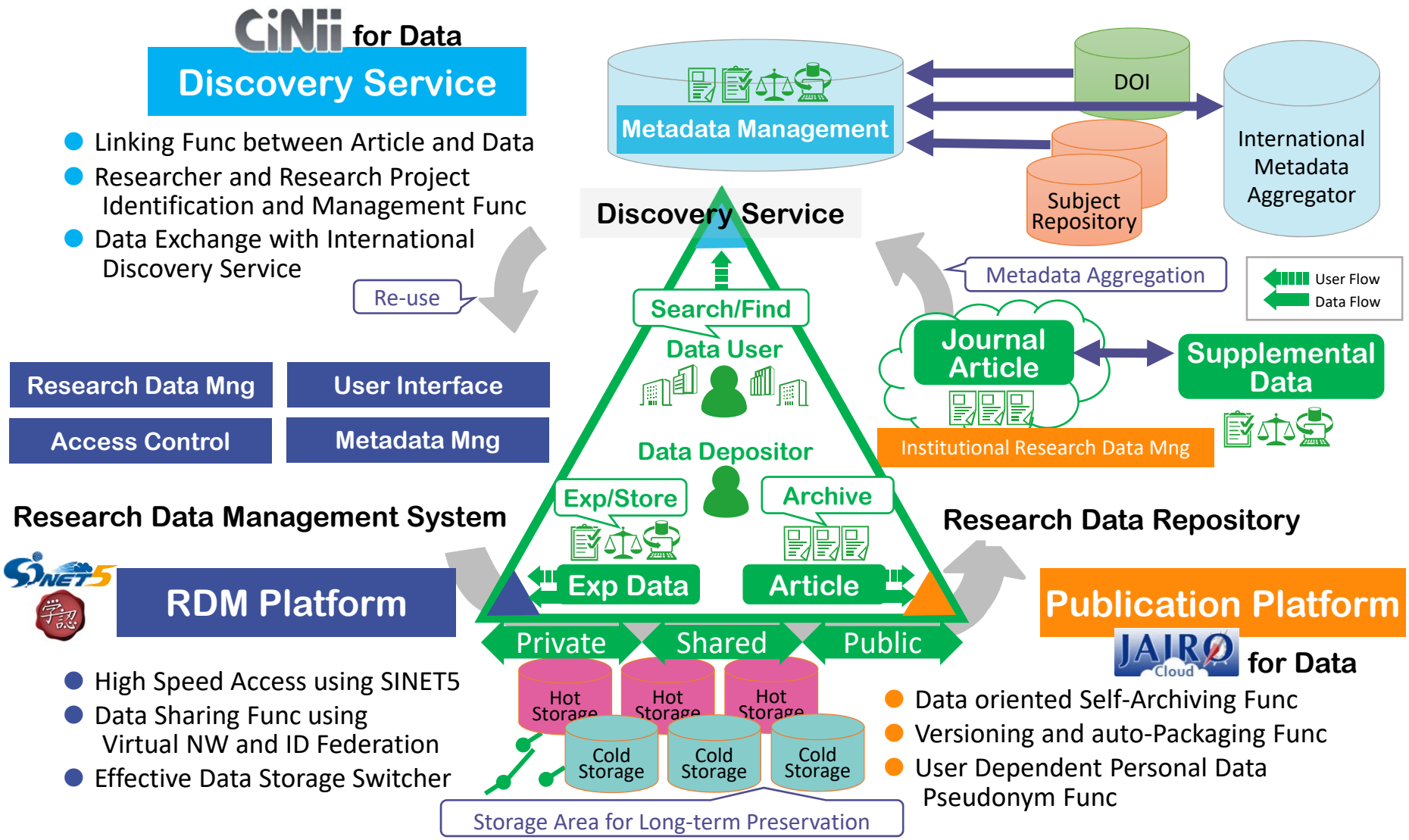
http://www8.cao.go.jp/cstp/sonota/openscience/150330_openscience_summary_en.pdf

Framework of the Open Science in Japan



http://www8.cao.go.jp/cstp/sonota/openscience/150330_openscience_summary_en.pdf

Research Data Infrastructure for Open Science



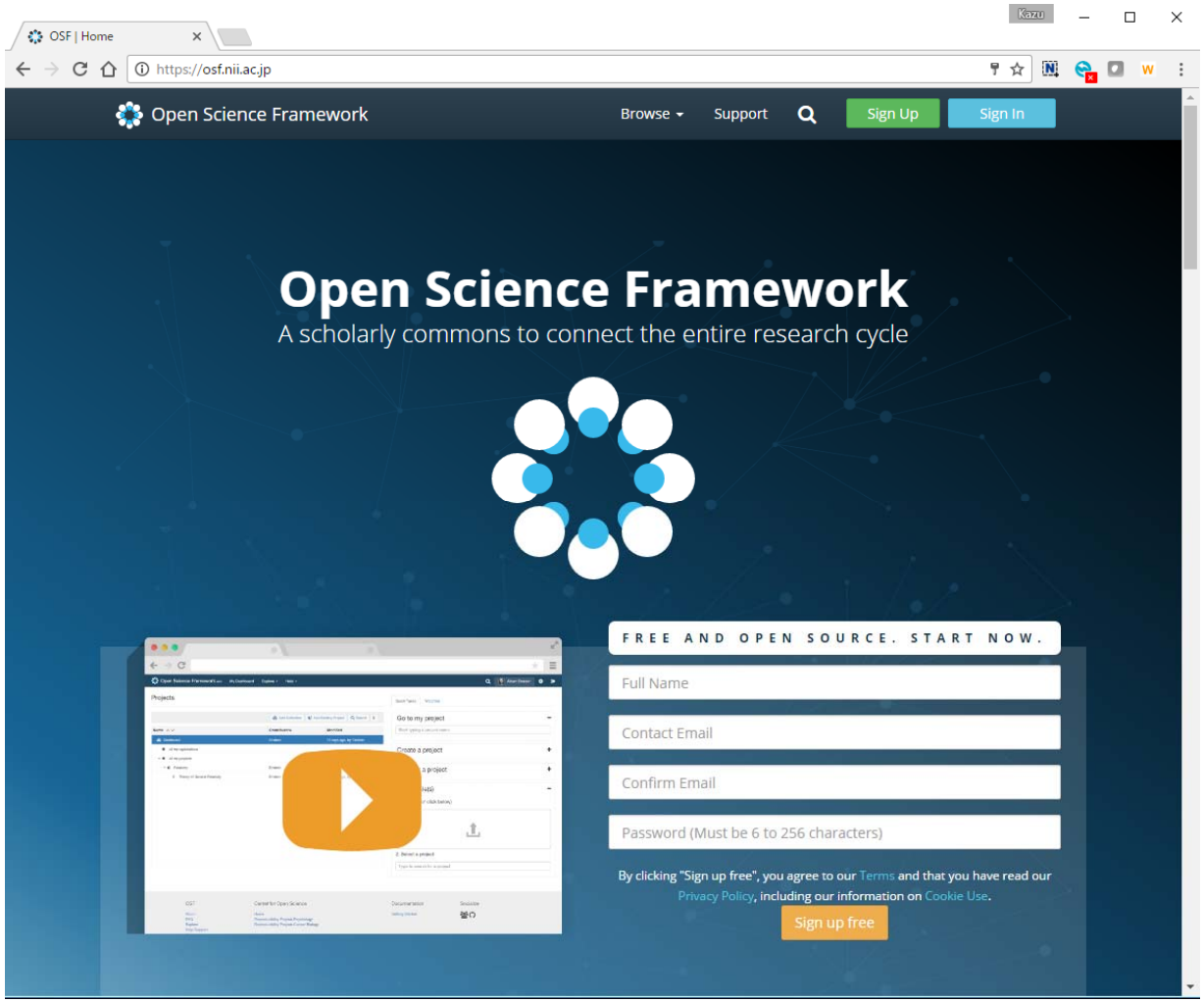
Solution

- Discovery Infrastructure
  - CiNii for Research Data
- Publication Infrastructure
  - JAIRO Cloud for Research Data
- Management Infrastructure
  - New service for RDM platform

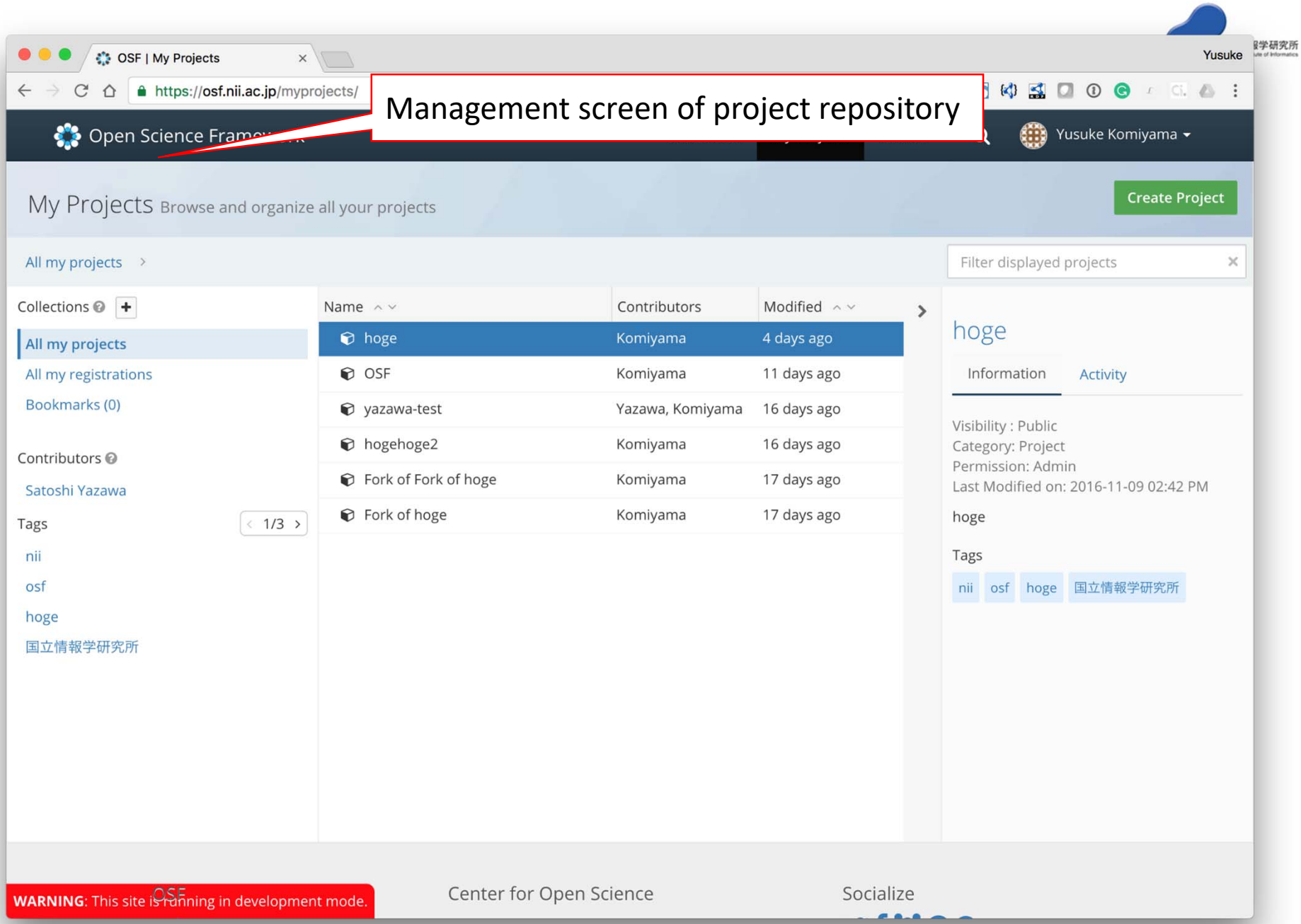
Based on

- SINET
- GakuNin Identity Federation
- GakuNin Cloud

Research Data Management Infrastructure

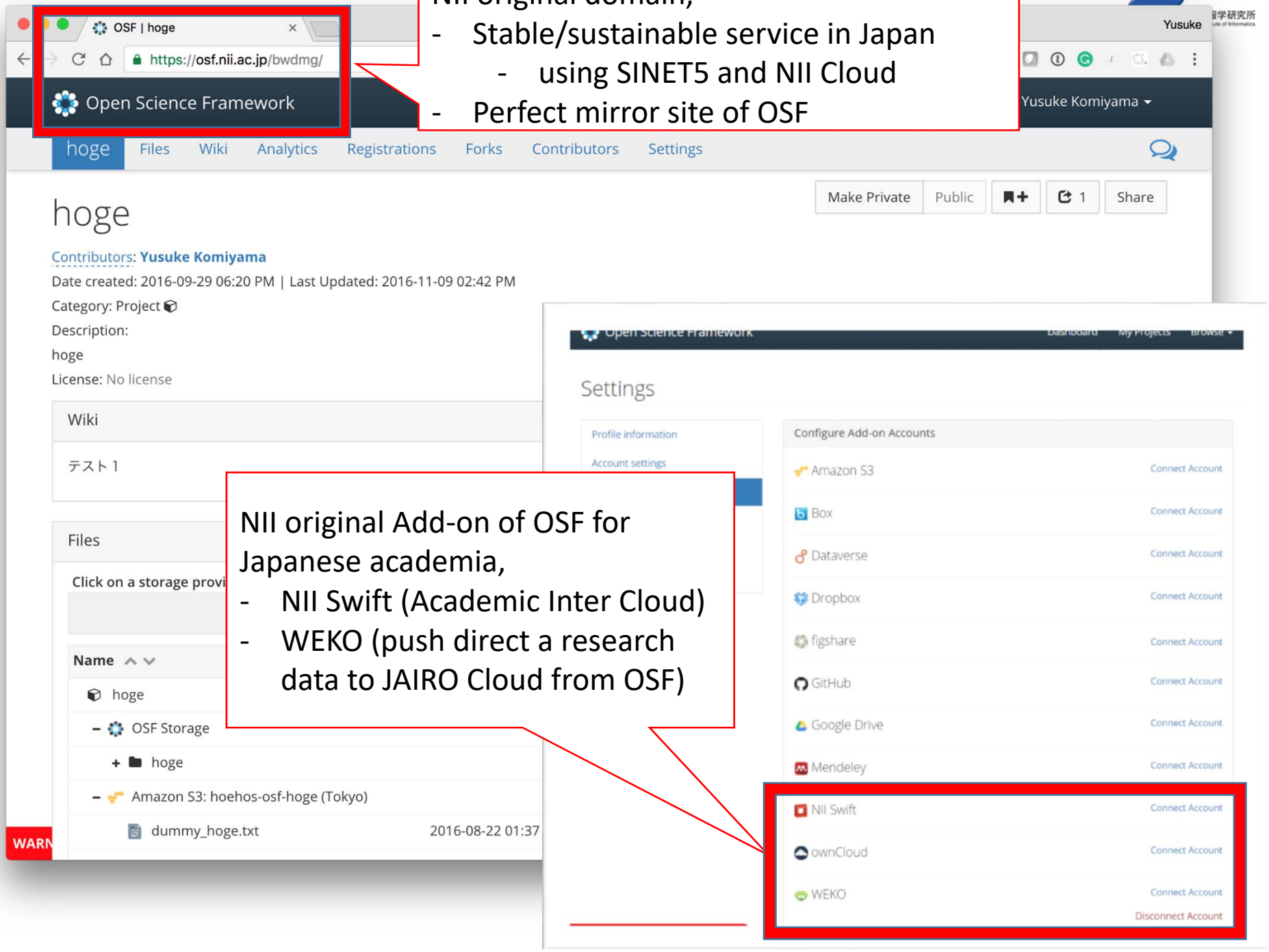


Collaborative Development with Center for Open Science US


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

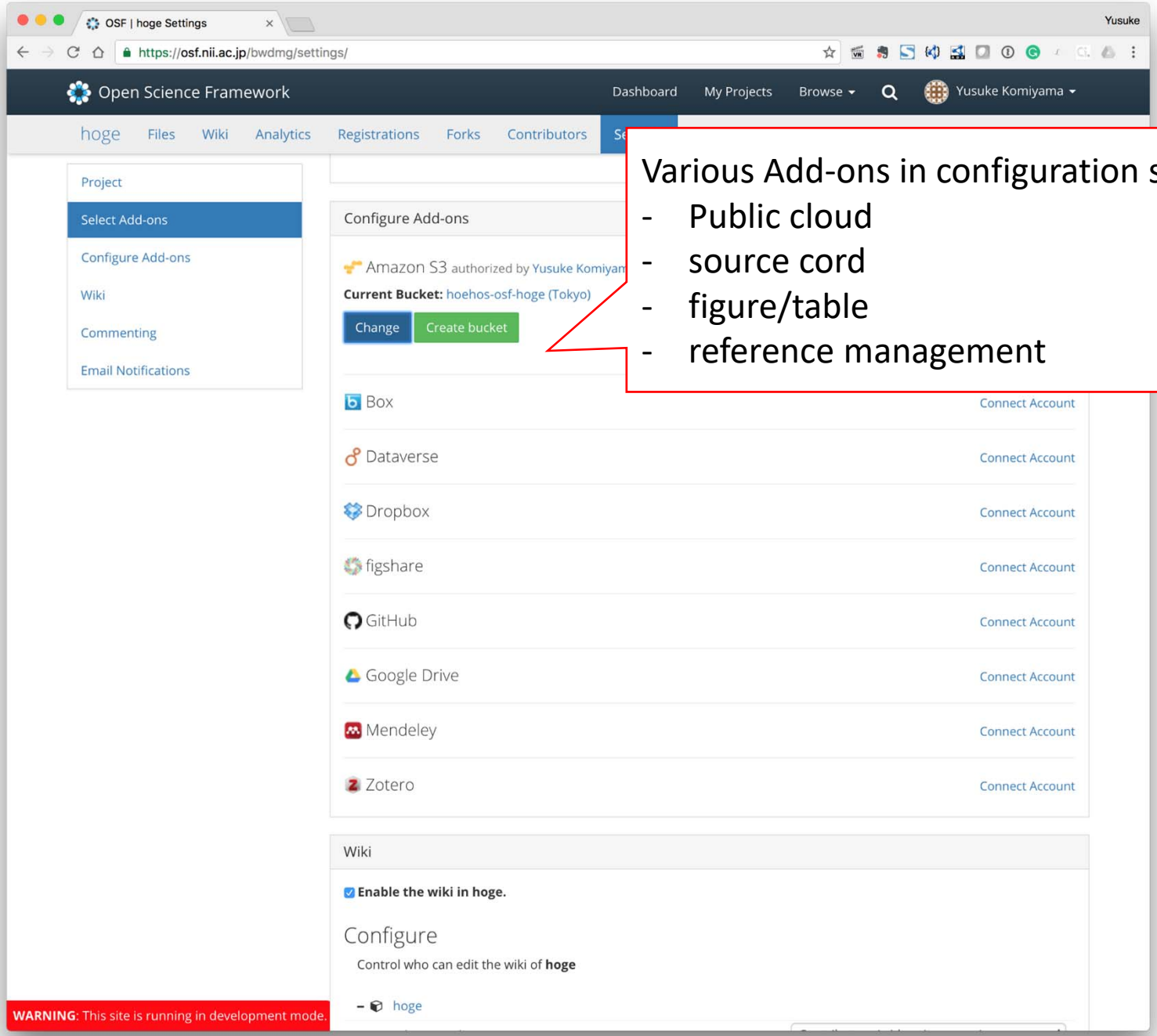
NII original domain,

- Stable/sustainable service in Japan
  - using SINET5 and NII Cloud
- Perfect mirror site of OSF



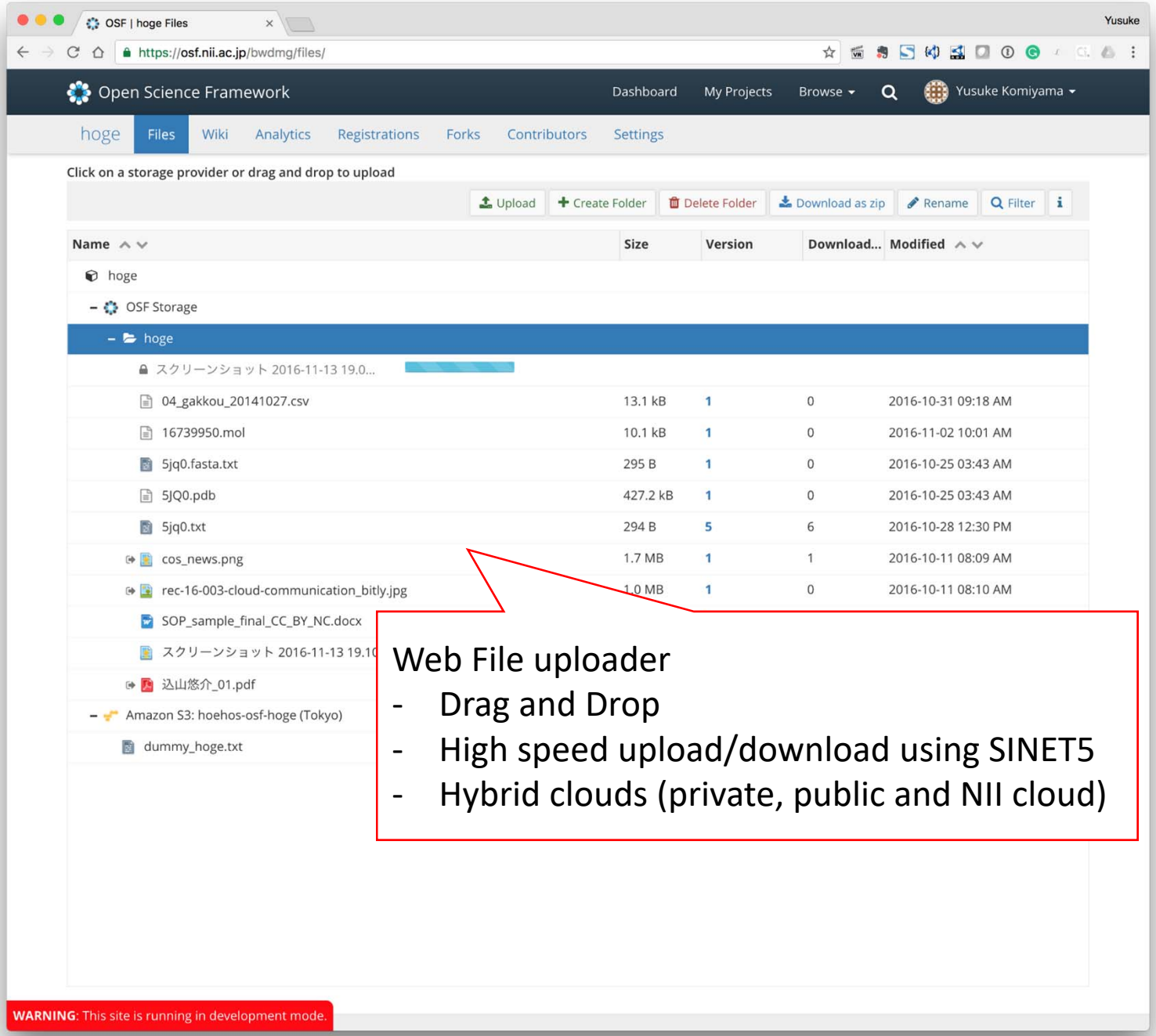
NII original Add-on of OSF for Japanese academia,

- NII Swift (Academic Inter Cloud)
- WEKO (push direct a research data to JAIRO Cloud from OSF)



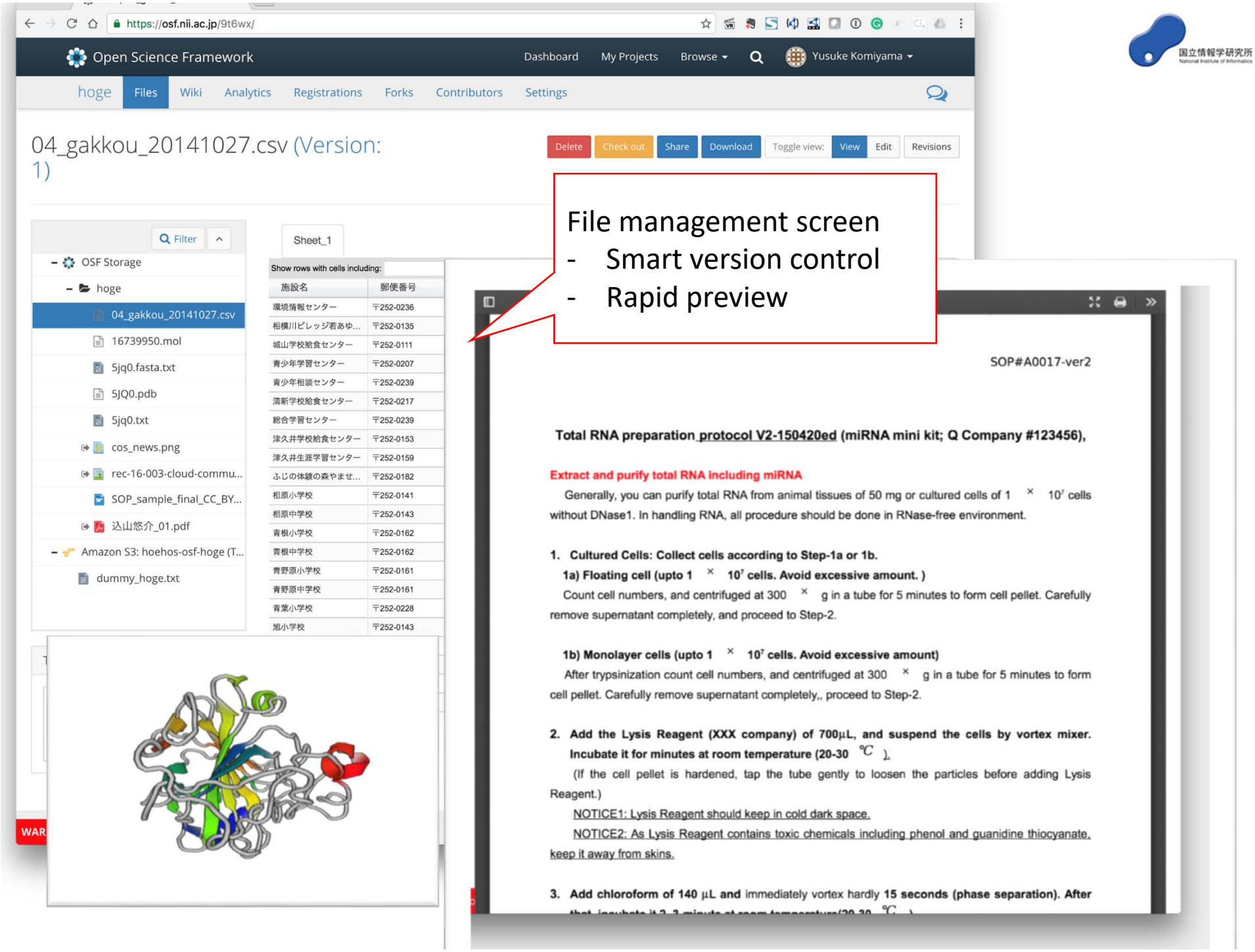
Various Add-ons in configuration screen

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

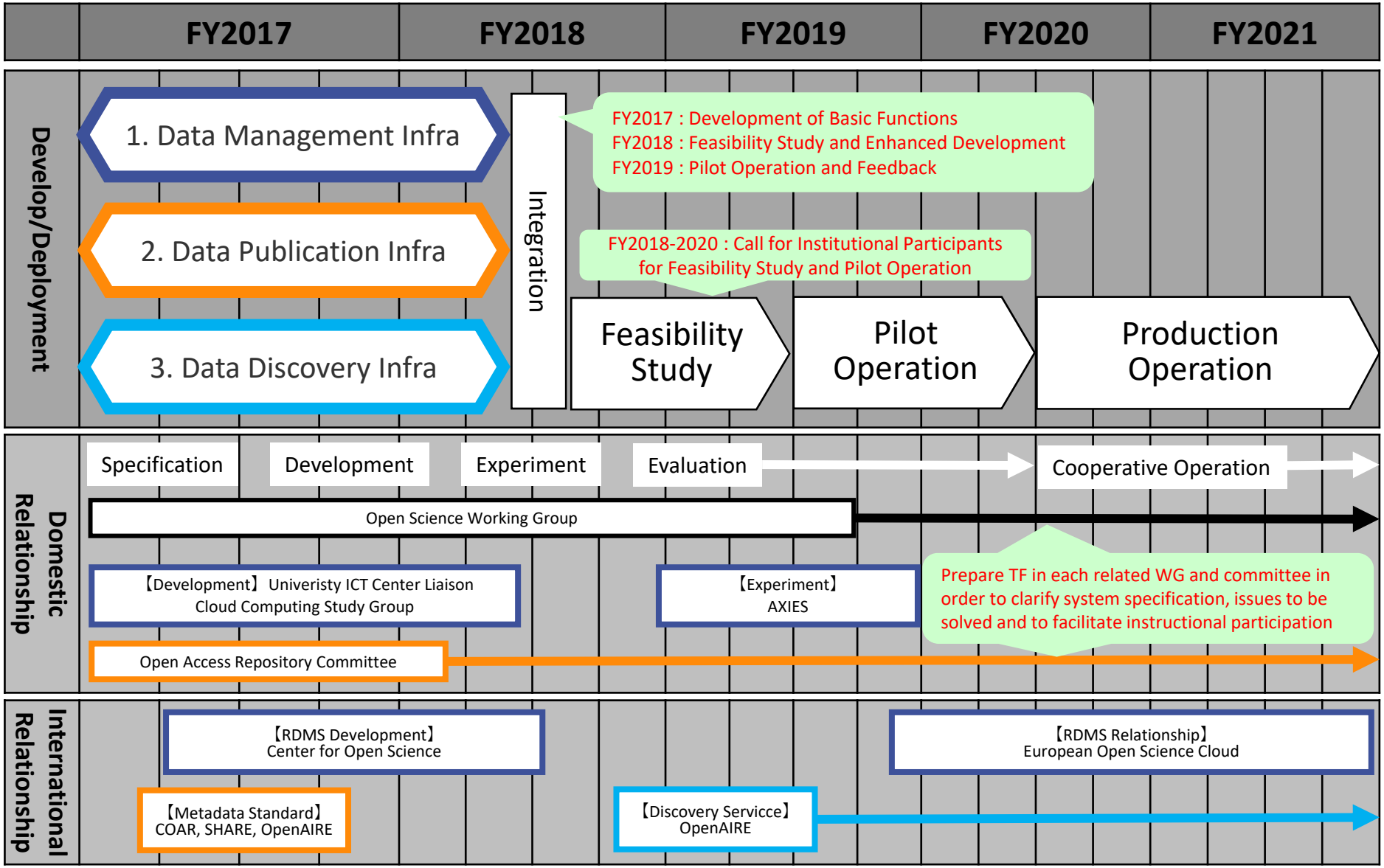


Web File uploader

- Drag and Drop
- High speed upload/download using SINET5
- Hybrid clouds (private, public and NII cloud)


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 × 10⁷ 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 × 10⁷ 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 × 10⁷ 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

Planning


FY2017
FY2018
FY2019
FY2020
FY2021
Develop/Deployment
1. Data Management Infra
2. Data Publication Infra
3. Data Discovery Infra
Integration
FY2017 : Development of Basic Functions
FY2018 : Feasibility Study and Enhanced Development
FY2019 : Pilot Operation and Feedback
FY2018-2020 : Call for Institutional Participants for Feasibility Study and Pilot Operation
Feasibility Study
Pilot Operation
Production Operation
Domestic Relationship
Specification
Development
Experiment
Evaluation
Cooperative Operation
Open Science Working Group
【Development】 Univeristy ICT Center Liaison
Cloud Computing Study Group
【Experiment】
AXIES
Prepare TF in each related WG and committee in order to clarify system specification, issues to be solved and to facilitate instructional participation
Open Access Repository Committee
International Relationship
【RDMS Development】
Center for Open Science
【RDMS Relationship】
European Open Science Cloud
【Metadata Standard】
COAR, SHARE, OpenAIRE
【Discovery Servicce】
OpenAIRE