Panel
PRAGMA perspective on AI, Data Cyberinfrastructure, and Training

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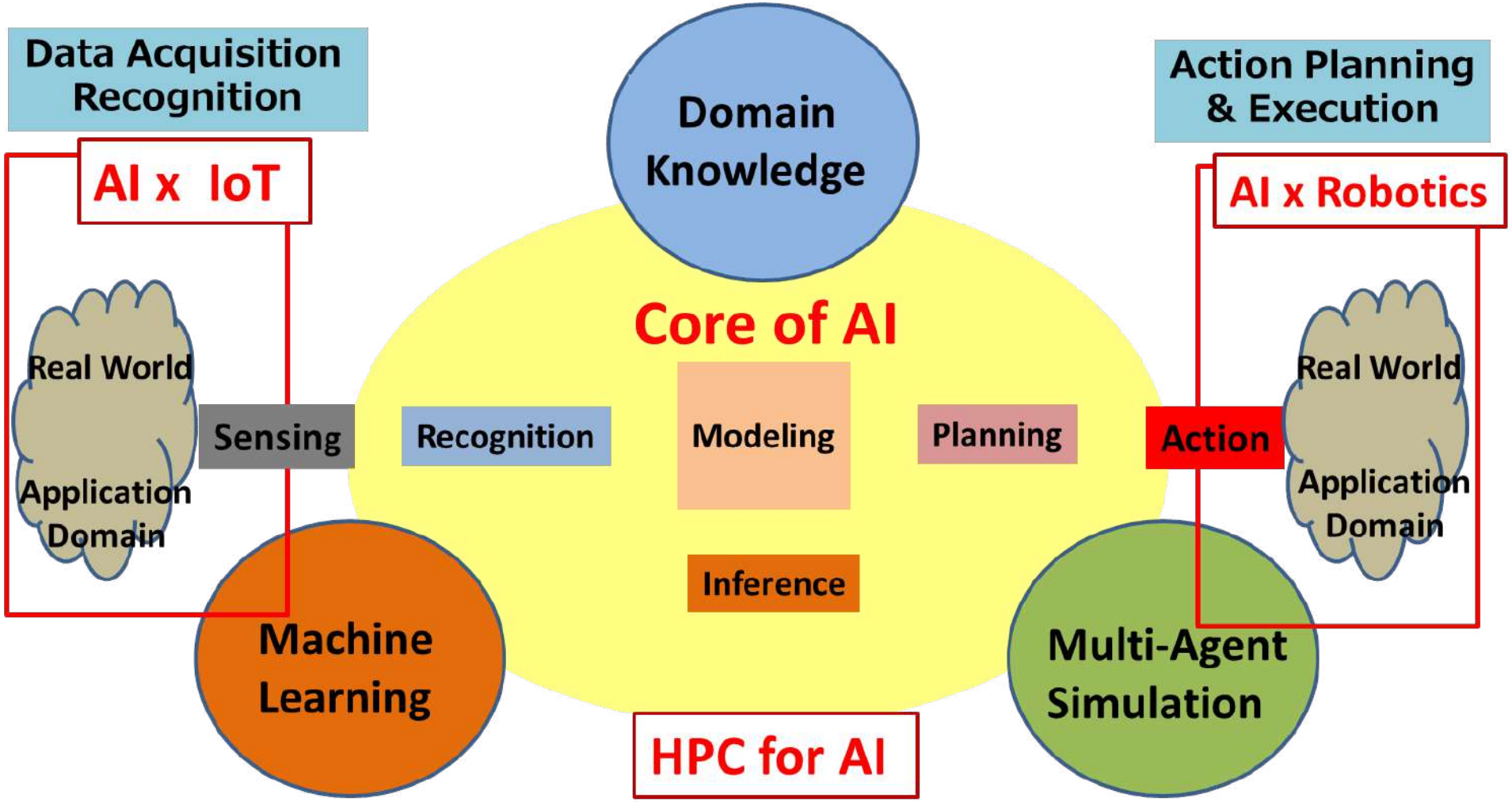
Questions given by Beth

- **Where is the innovation in AI and Cyberinfrastructure and how can PRAGMA help?**
- Where do you see the FAIR principles reducing the research burden for international collaboratories (such as GLEON)
- What AI applications motivate your work
- What are the unique infrastructure or sociotechnical challenges in AI research involving international partners
- What are the unique training challenges and needs for AI research? For FAIR data?

AI Research Direction@AIRC/AIST

AI Embedded in the Real World



ABCI: AI Bridging Cloud Infrastructure

東京大学 THE UNIVERSITY OF TOKYO AIST

Univ. Tokyo / Kashiwa II Campus

ABCI AI Bridging Cloud Infrastructure

- Open Innovation Platform for accelerate advanced AI research and development and experimental implementation empowered with high performance computing

1,088 GPU nodes
4 GPGPU (NVIDIA Tesla V100)
for each node (over 4,000 GPGPUs)
Peak Performance :
550 PFLOPS (harf precision)
37 PFLOPS (double precision)
Effective Performance :
19.88 PFLOPS (TOP500 #5, 2018.6)
14.423 GFLOPS/W (GREEN500 #4)
508.85 TFLOPS (HPCG #5)
Power Consumption (Max) : 2.3 MW
Average PUE : bellow 1.1 (estimated)
Operating from August 1, 2018

ABCI Direction

Phase 1: Powerful shared computing infrastructure for AI

- Mostly, extension of supercomputers
  - Support AI research by providing computing capability

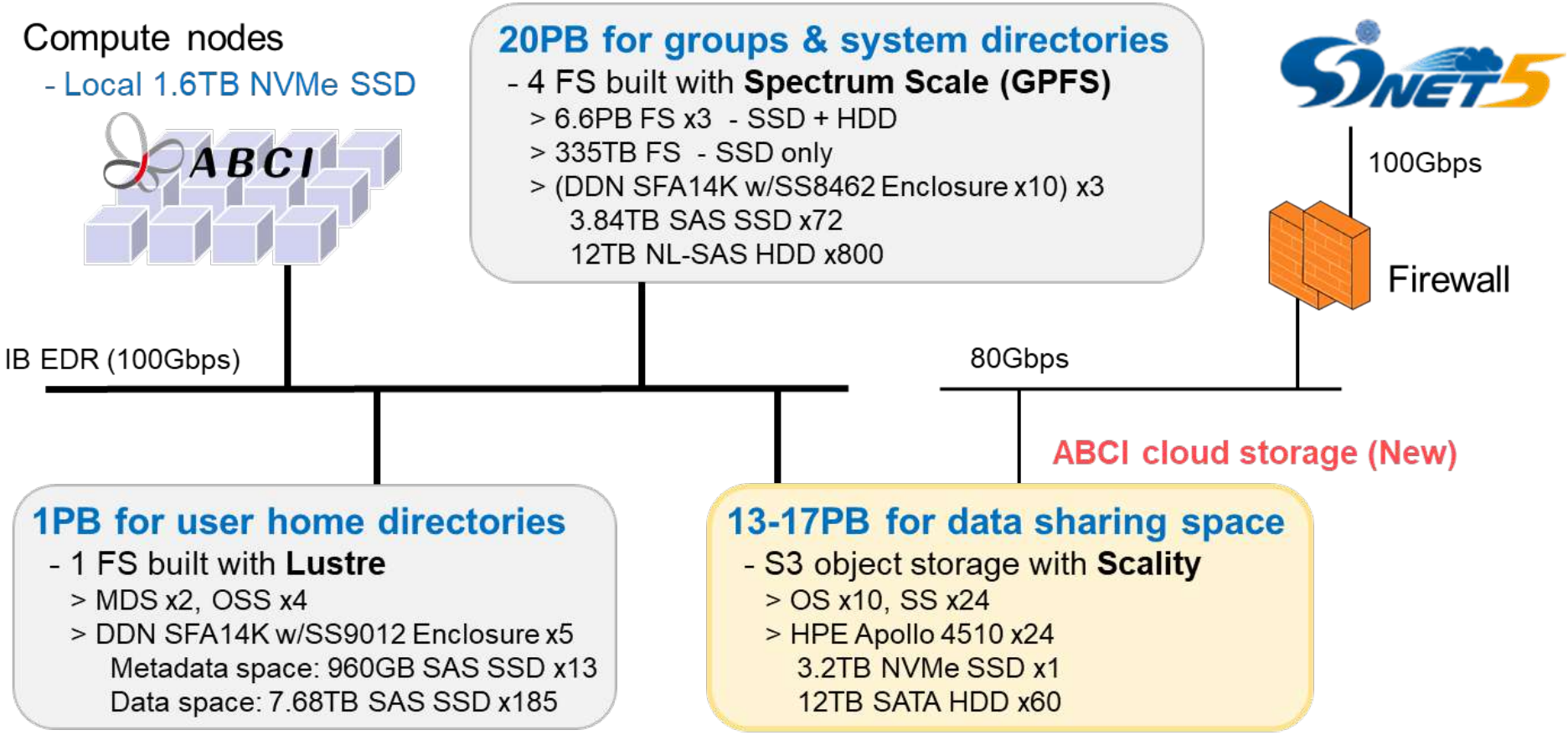
Phase 2: Bridging to Real World

- Create an eco system of data, their use & derivation including AI models via ABCI - The final goal is to be **"Open Innovation Platform."**

ABCI Storage Overview

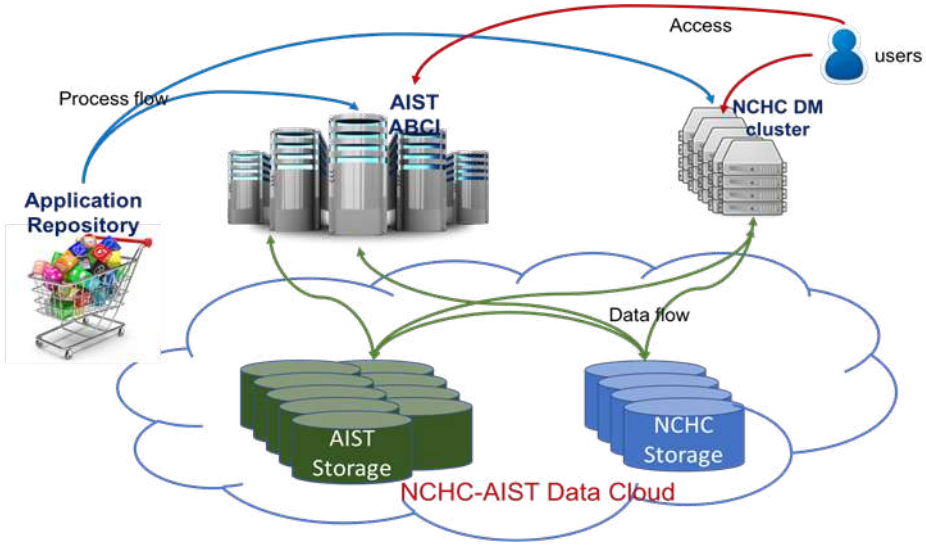
ABCI provides 3 types of storage services according to end usage.

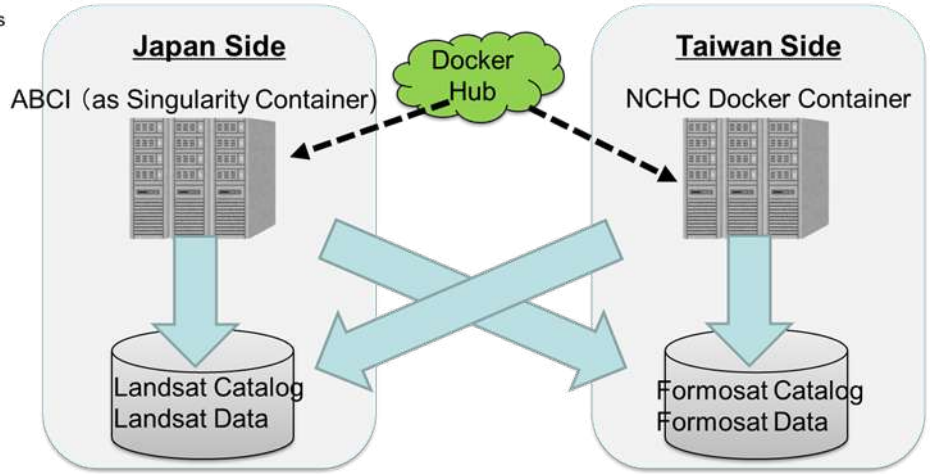
- POSIX shared file system x2
- Amazon S3 compatible object storage x1



PRAGMA AI Platform

- PRAGMA AI Platform:
  - PRAGMA Grid: Share computing resources and data by Grid middleware.
  - PRAGMA Cloud: Share computing resources and data by virtualization technologies.
  - PRAGMA AI Platform: Share knowledge (AI module) by container technologies. Computing resources and Data resources are also shared.
- Capabilities and status
  - Share trained model as well as non-trained model.
  - Access the data at each side.
  - POC and demonstration by AIST, NCHC and NSPO.
  - Expect to extend to the other collaborators.

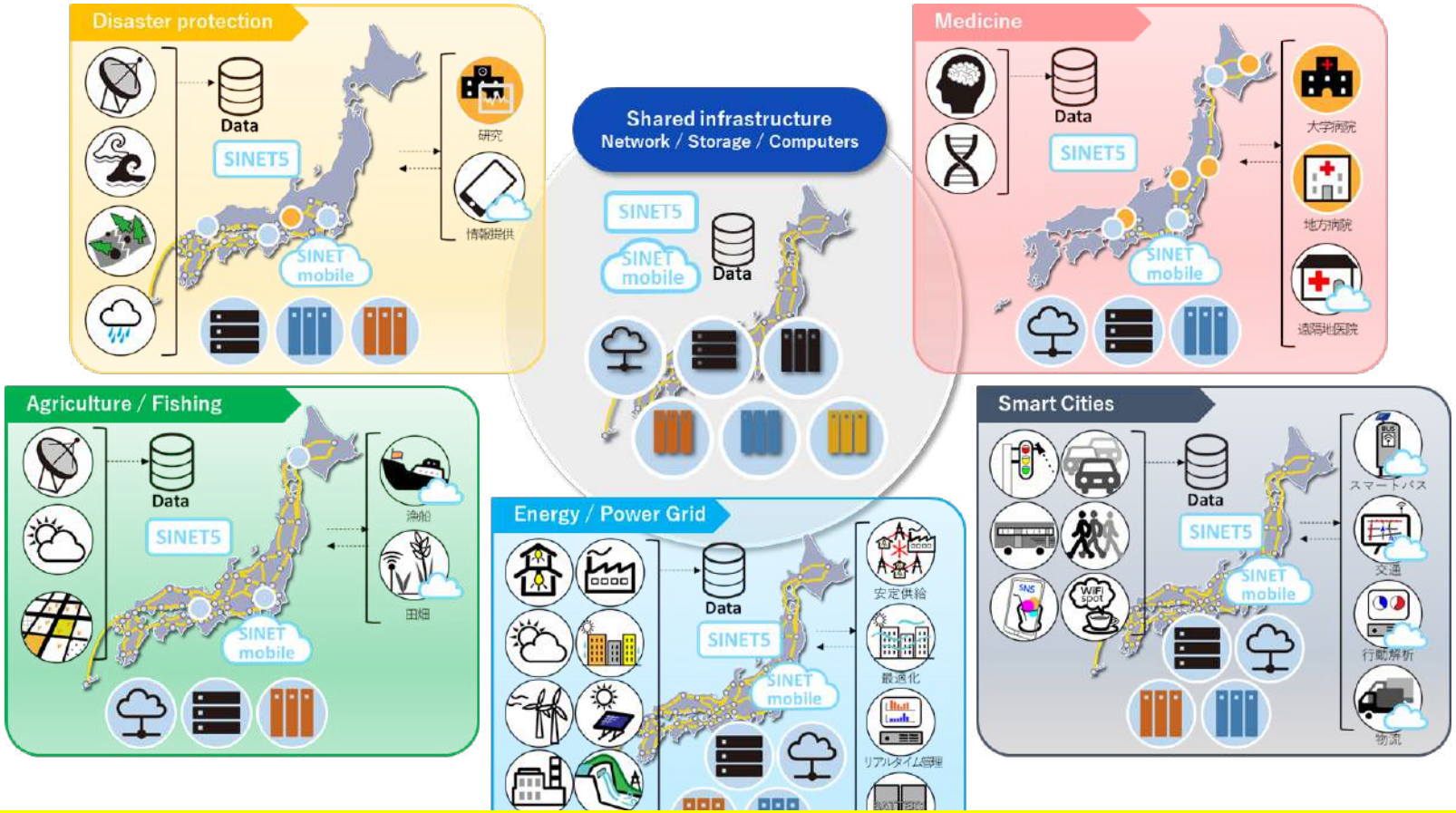




Data Exploitation Platform Project

Collaborative projects by universities in Japan, NII, and AIST.

- Will provide a rapid PoC environment for R&D data exploitation activities including industry-academia collaboration projects.



Create on-demand virtual platform based on the requirements by applications.

Answers/thoughts to the questions

- Distributed infrastructure for sharing knowledge, data, and any kinds of resources is essential to extend the use of AI in both industries and academies.
- We can use PRAGMA for developing and experimenting distributed infrastructure as an AI platform.
- However... We should review Grid and Cloud.
  - Grid
    - Federation is the key
      - Technical challenges such as security, meta-scheduling, etc.
    - Aimed to build virtual infrastructure for scientific applications for limited users.
    - No business model
  - Cloud
    - Federation is out of the scope
    - Provide services for limited w/ easy-to-use interface for big userbase
    - Started by private sectors who had business model
- Challenges
  - Build eco-system and establish business model.
  - Technical challenges
    - Overall design of the AI Platform
      - How do we provide data, AI modules, etc., and how users use the AI Platform?
    - Easy-to-use user interface / workflow, security, scalable catalogue services, etc.