

# Reports from Resources WG

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# Agenda

## Day 1

- Virtual Clusters on Comet: Handling Disk State
  - Phil, Dmitry, Luca @ SDSC
- PRAGMA Experimental Network Testbed
  - Kohei (NAIST), Matthew (UF)

## Day 2 (w/ Bio Sci. WG)

- PRAGMA-RDA Collaboration
  - Beth Plale (IU), Yoshio Tanaka (AIST)
- PRAGMA Cloud
  - Yoshio Tanaka (AIST)



# ***Virtual Clusters on Comet: Handling Disk State***

**Philip Papadopoulos, Dmitry Mishin, Luca Clementi\***

**San Diego Supercomputer Center**

**\* Now at Twitter, Inc.**

**SDSC**

**SAN DIEGO SUPERCOMPUTER CENTER**

*at the* **UNIVERSITY OF CALIFORNIA; SAN DIEGO**



## ***Virtualized Clusters on Comet***

### **Goal:**

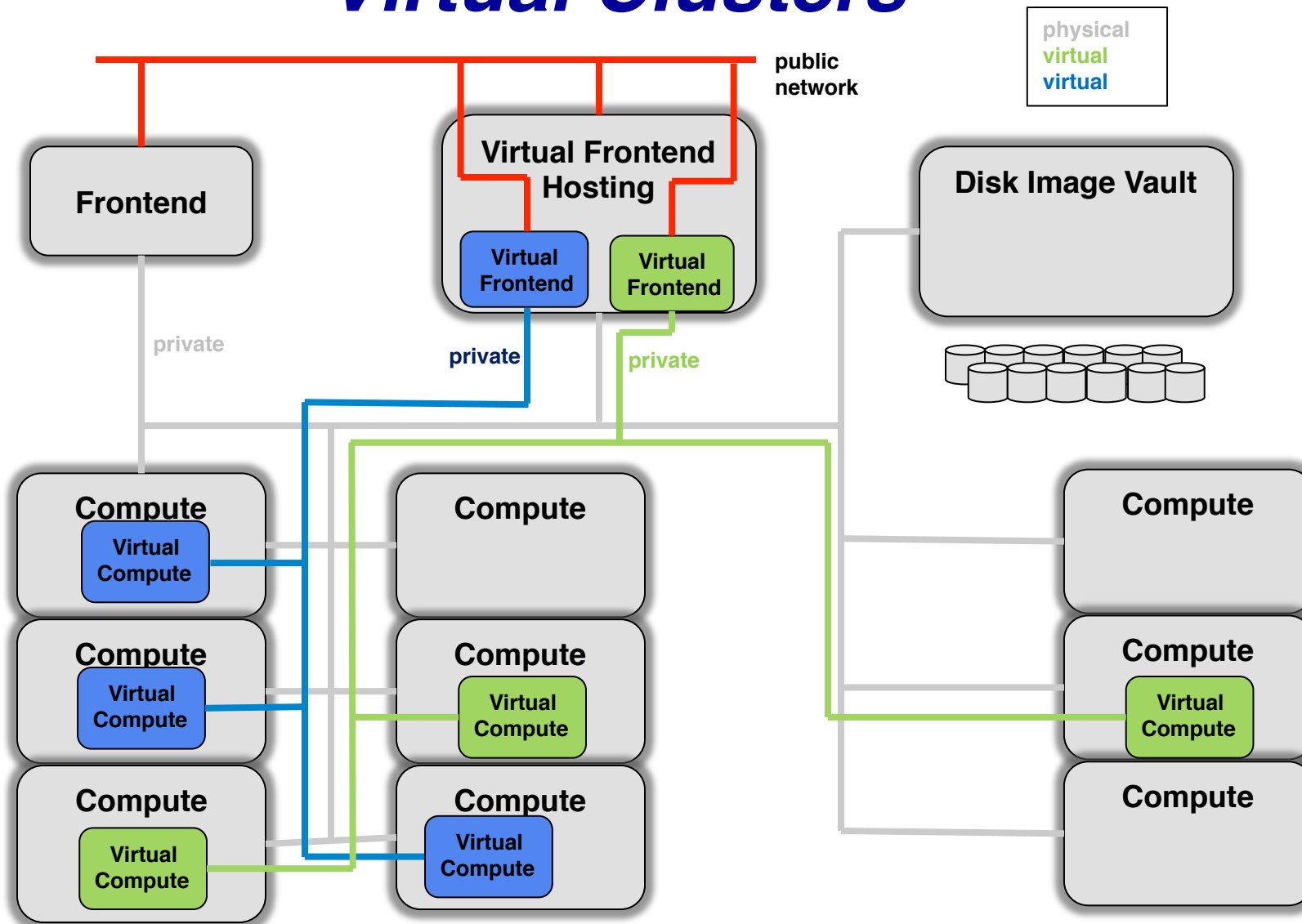
Provide a near bare metal HPC performance and management experience

### **Target Use**

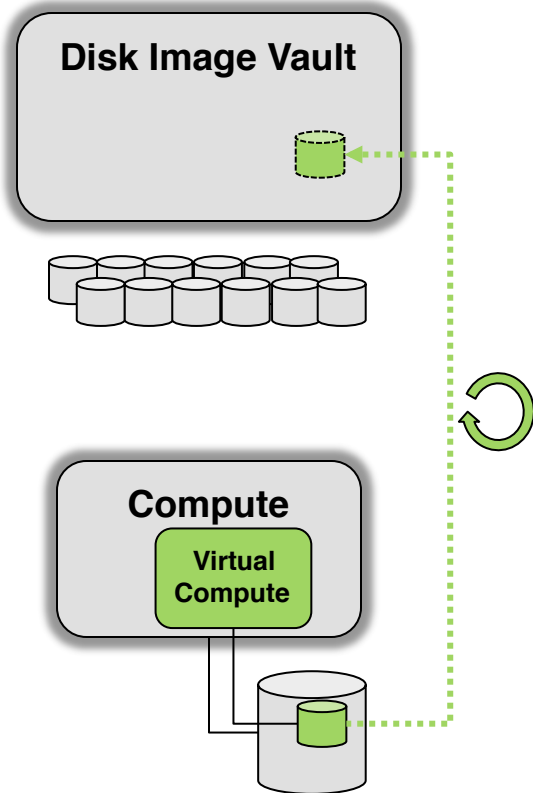
Projects that could manage their own cluster, and:

- can't fit our batch environment, and
  - don't want to buy hardware or
- have bursty or intermittent need

# Virtual Clusters



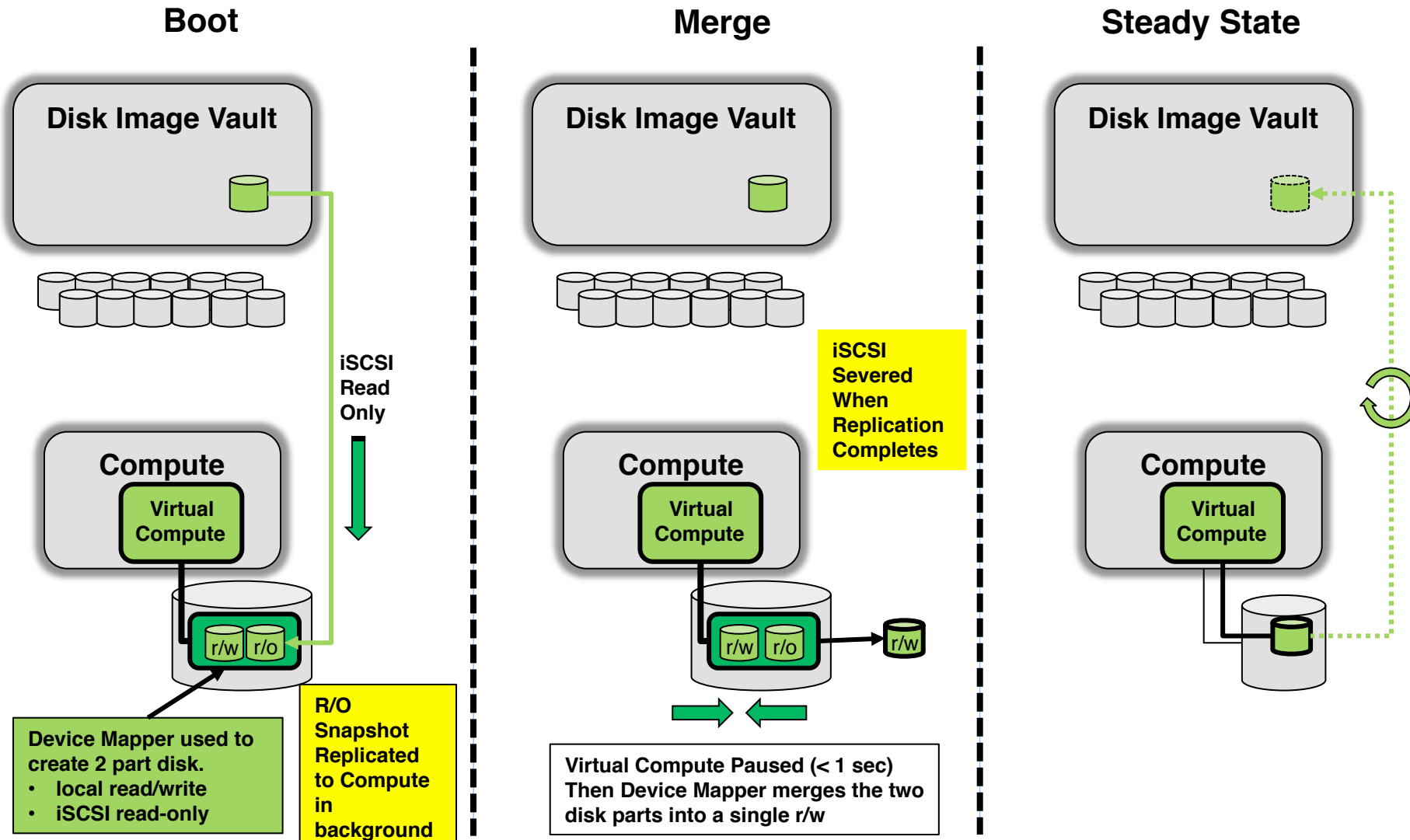
# ***Steady State for a Virtual Compute Node Disk***



- Virtual Node Disk Image is on local physical disk of Physical Compute node
- Virtual Disk Image is periodically Synced to Disk Image Vault
- At Virtual Node Shutdown: Virtual disk image is synced to disk vault and then removed from Physical compute node

**How do we get to steady state?**

# Getting to Steady State: 3 Phases



PRAGMA 29

# PRAGMA Experimental Network Testbed (ENT)

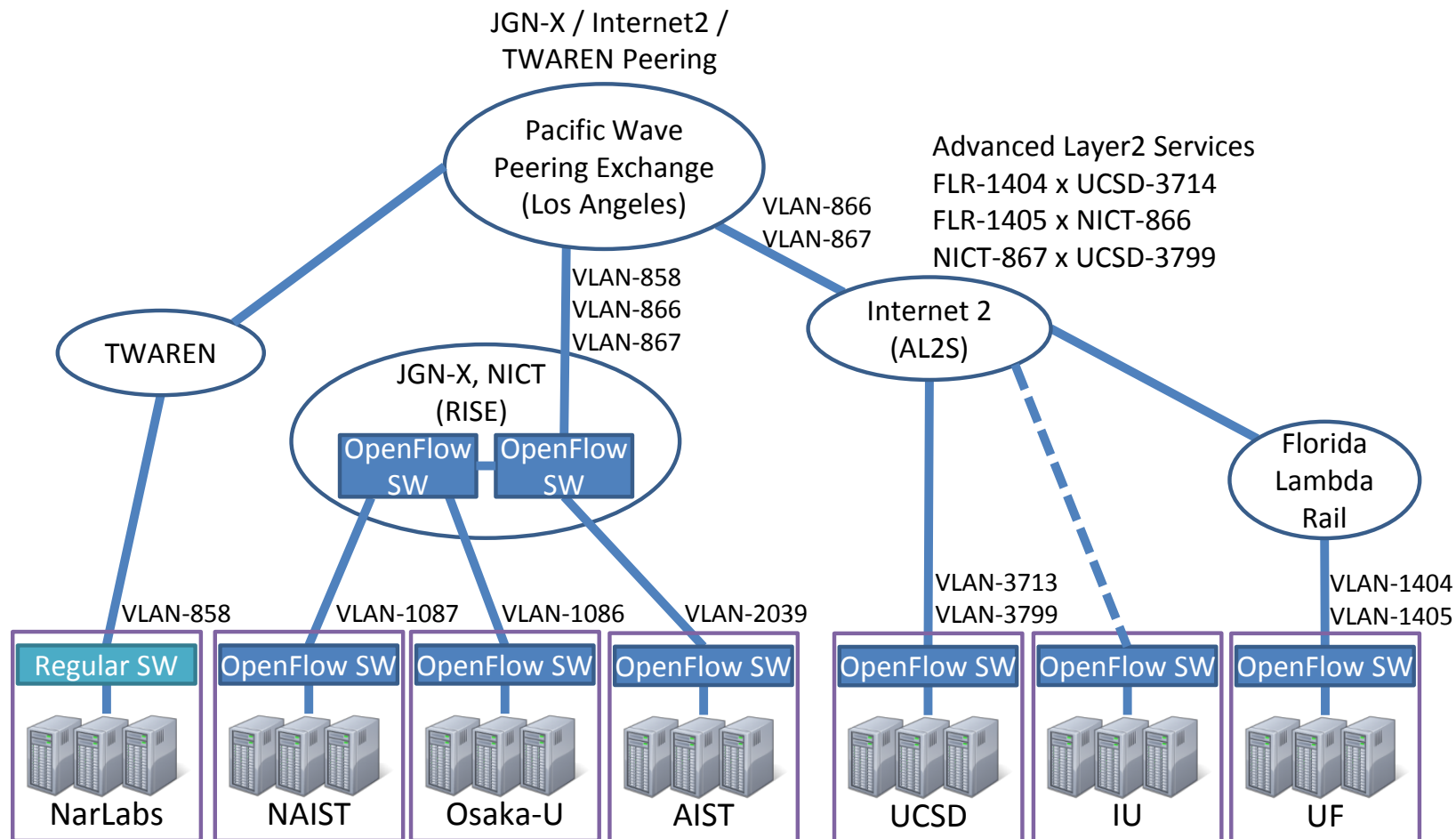
Kohei Ichikawa (NAIST)

Matthew Collins (UF)



# ENT Activities: ENT backbone

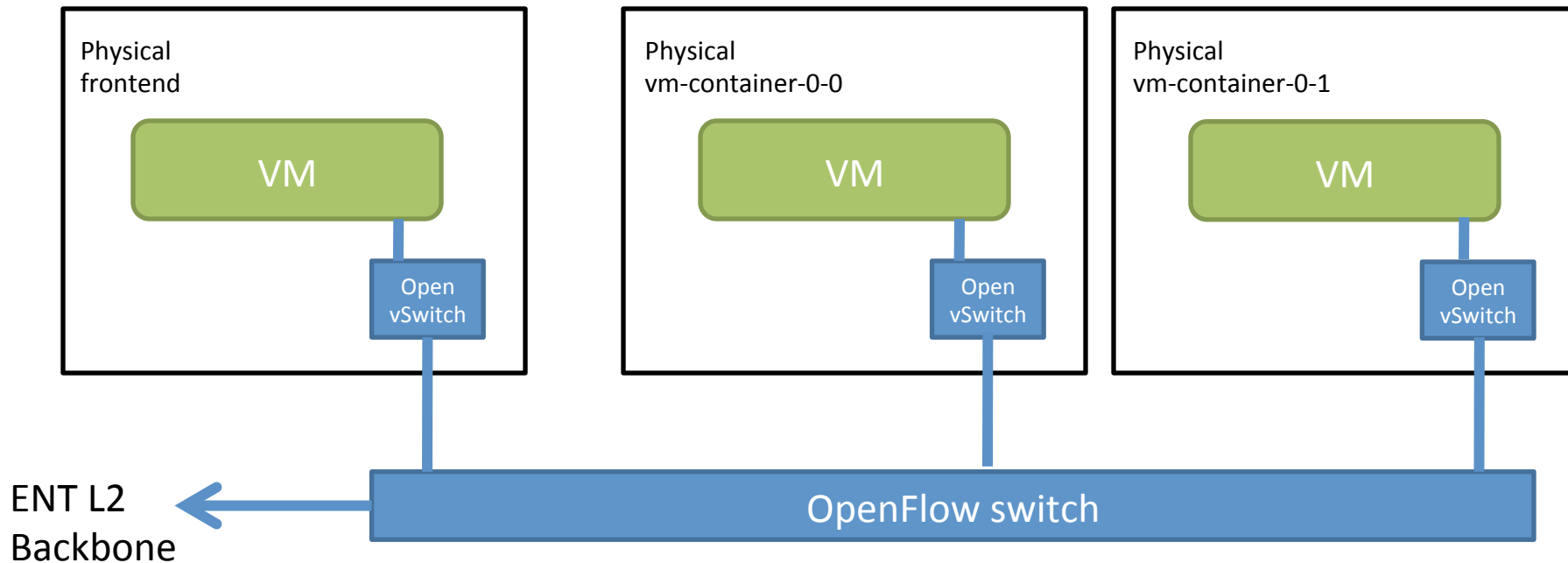
- Indiana University (IU) nodes are up (connected via GRE)
- IU will try to use ENT for trust data sharing



# ENT Activities:

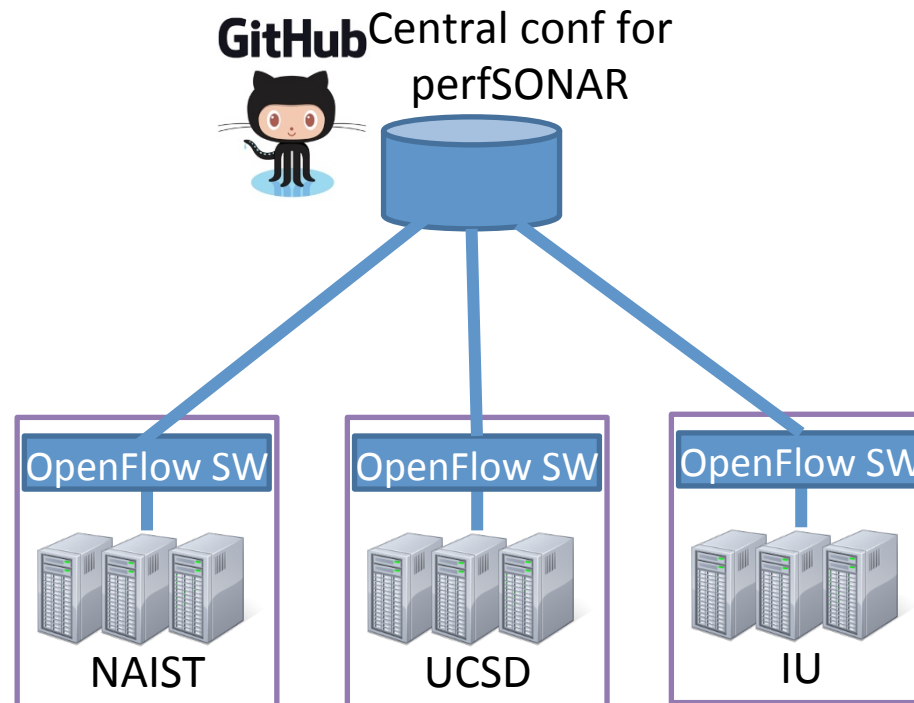
## Deployment with Rocks Cluster

- Open vSwitch Roll
  - Automate installation of Open vSwitch on Rocks and connect the cluster to OpenFlow switch
    - <https://github.com/rocksclusters/openvswitch>
    - Document: [https://github.com/pragmagrid/pragma\\_ent/wiki/Installing-Rocks6.2-cluster-with-Open-vSwitch-Roll](https://github.com/pragmagrid/pragma_ent/wiki/Installing-Rocks6.2-cluster-with-Open-vSwitch-Roll)



# ENT Activities: perfSONAR deployment

- Central mesh configuration for perfSONAR was uploaded on Github
- Once perfSONAR node is deployed at your site, you can easily join to the mesh group



# Future Plans

- Network expansion (more sites)
  - Interconnecting RISE (JGN-X) & FSFW (Internet2)
- Trust data sharing  
(HathiTrust Digitalized Books Corpus)
  - Address data licensing and security with SDN
- End user support
  - Visualization
  - Usability study
  - ENT operation center
  - Wiki: [https://github.com/pragmagrid/pragma\\_ent/wiki](https://github.com/pragmagrid/pragma_ent/wiki)

# Roadmap of ENT

- Pragma30
  - Expand ENT to more Asian countries
    - China, Korea, Thai, Indonesia, Philippines
  - Stable AutoVFlow
  - Monitoring & visualization tool
- Pragma31
  - Reservation or scheduling service
    - VM & Network
- Pragma32
  - User friendly UI & API
  - Making reservation from Web or API & automation
- Pragma33
  - Expand ENT to at least 10 institutions

# PRAGMA DATA

Beth Plale



Proposed PRAGMA effort:  
synergistically advancing PRAGMA  
data issues and RDA adoption  
efforts through proof of concept



- RDA membership grown to 3000+ members
- After 2.5 years, first results are coming out
- RDA encouraging adoption of results
- Lots of traction on “testbeds” as way of encouraging evaluation of outputs. This testbed discussion is taking place in Data Fabric Interest Group
  - Testbed in Europe: RDA/EU and EUDAT
  - Testbed in US: RDA/US and NDS Labs
  - Testbed in Pacific Rim: **opportunity for PRAGMA impact**



# Proposed PRAGMA-RDA “Sprint”

- Objective: Evaluate use of two RDA services related to PIDs on PRAGMA testbed using Lifemapper as use case
- Purpose: evaluate use of these services for broader contribution to biodiversity
- Evaluation criteria: contribution it makes to PRAGMA data goals and application goals
- Linking results back to RDA: Beth is member of Data Fabric IG and a lead in testbed coordination group. Jason Haga (?)

# PRAGMA-RDA “Sprint”

- Install RDA PIT and RDA Data Type Registry services on PRAGMA testbed (where: IU, AIST)
  - Use installed demo versions as available (?)
- Work with Lifemapper to define PID assignment for selective output products
- Use default PIT types. Register PIDs used by Lifemapper, GBIF, iDigBio
- Simple use case that uses PIT service to resolve PIDs (including using GBIF and iDigBio PIDs)

Do these by the next PRAGMA (PRAGMA 30)

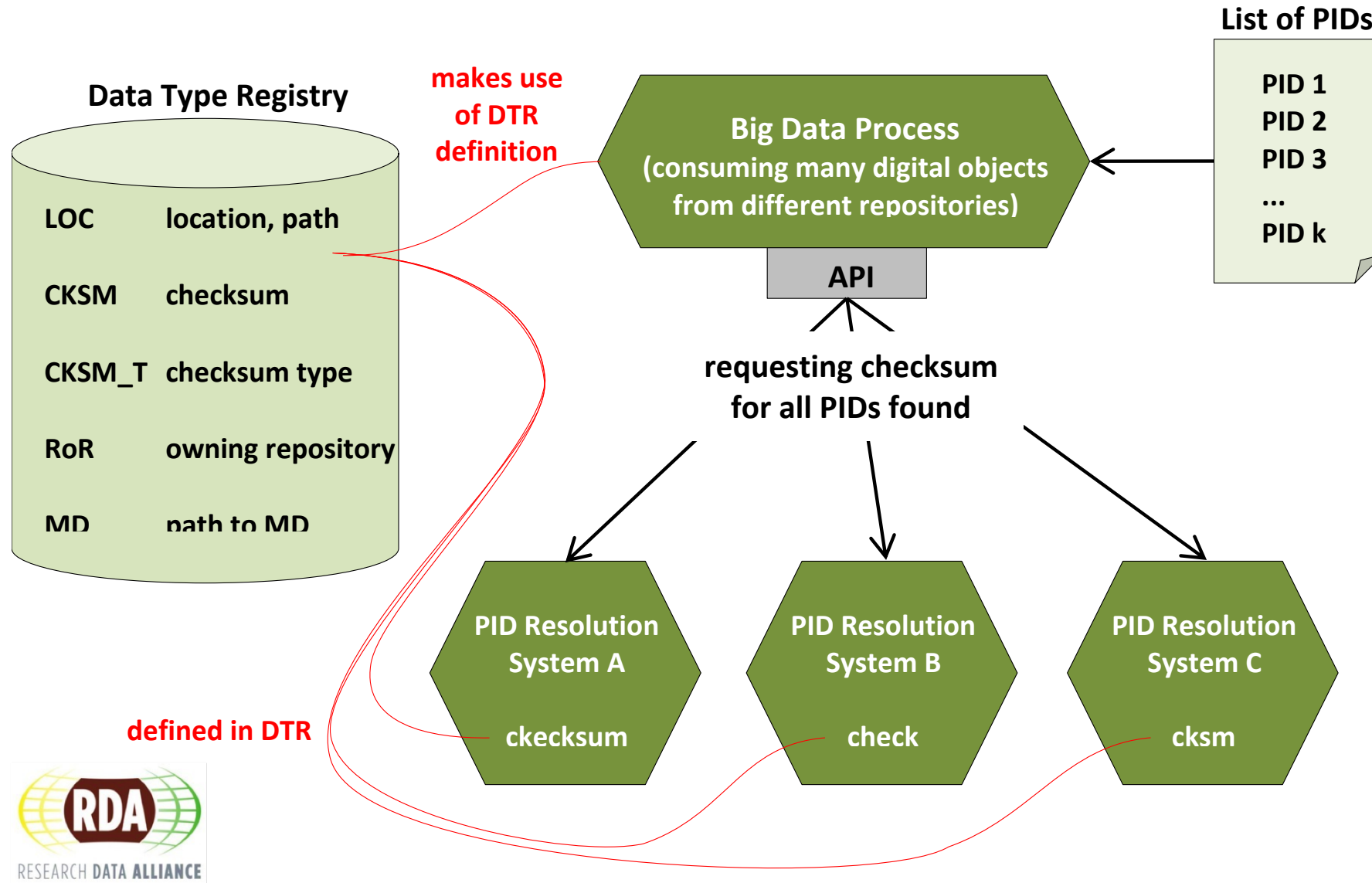
# RDA Output: PID Information Types

- Result: **generic API** and set of **basic attributes**
- **PID Record** is like Passport (Number, Photo, Exp-Date, etc.)
- Goal: all **PID Service-Providers** agree on one API and talk same language (registered terms)
- **Test-Installation available**
- **Uses Data Type Registries RDA Output**

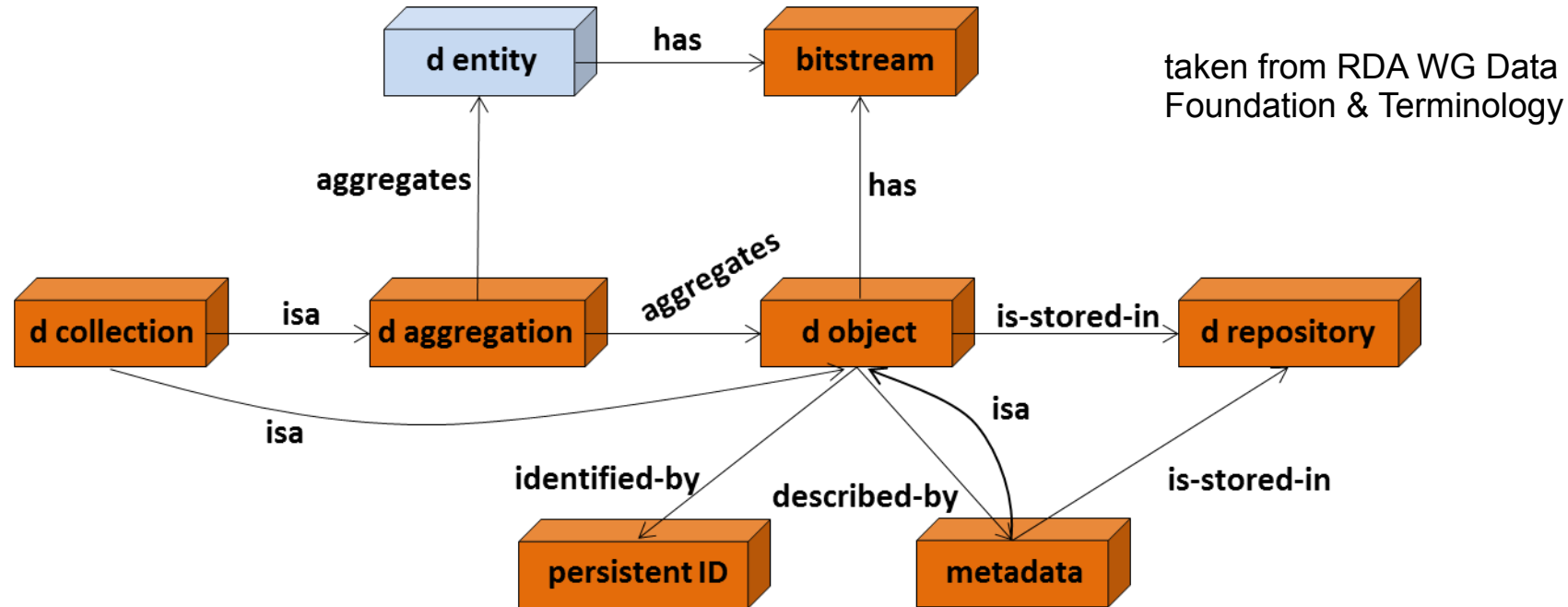
<http://smw-rda.esc.rzg.mpg.de/PitApiGui>



# RDA Result: PID Information Types



# RDA Result: common data model



- PIDs are beginning of trust chain
  - Need worldwide, independent and robust PID system
- Metadata are essential in anonymous data world

PRAGMA Cloud

# PRAGMA Cloud: Agenda and summary

- Open discussion on re-building PRAGMA Cloud
- Reviewed the current status
  - PRAGMA ENT is the testbed for network.
  - Lifemapper and Lightweight Scheduling Tool are running PRAGMA Cloud.
  - But the current PRAGMA couldn't be a stable testbed for users.
- Agreed to rebuild STABLE PRAGMA Cloud.

# PRAGMA Cloud: Agenda and Summary (cont'd)

- Software requirements
  - pragma\_boot and the tool for resource booking.
- Driving applications
  - Lifemapper
  - Virtual screening
  - ... more applications are welcome!
- Administration
  - Need to consider how to provide users/tools “up-to-date” resource information.
    - Not only available resources but also the status of physical resources.
  - For the moment, update information manually.
  - By the next PRAGMA, list some options for automatic update.
- Milestones
  - Phil and Yoshio will build detailed schedule/milestones (hopefully by SC15).