

# Pacific Rim Application and Grid Middleware Assembly (PRAGMA)<sup>1</sup>:

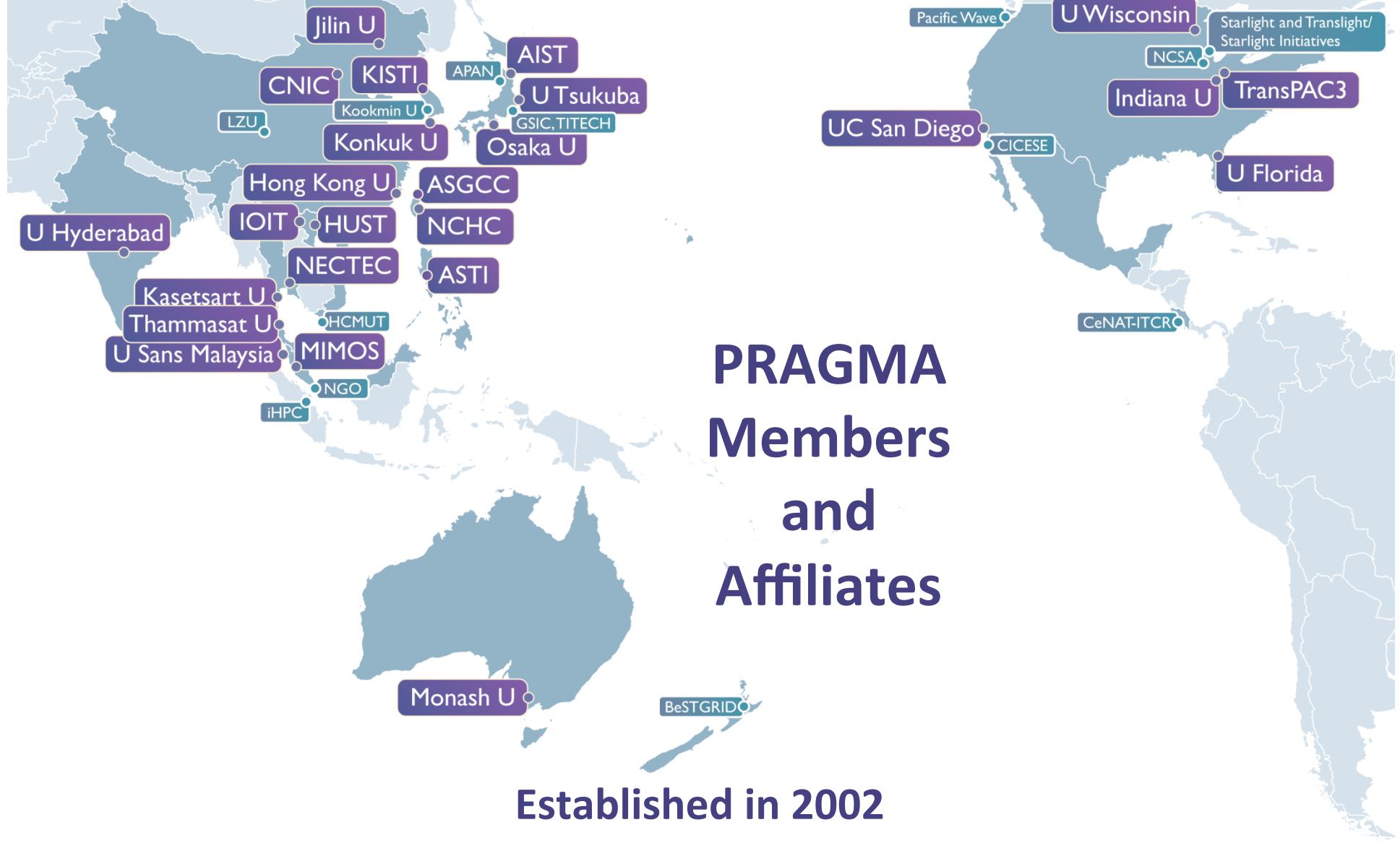
## Quick PRAGMA Overview, Software, Virtualization and Resource sharing

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Center  
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University of California San Diego

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# Community of Practice

## Scientific Expeditions and Infrastructure Experiments for Pacific Rim Institutions and Researchers



# PRAGMA Involves People

- Twice a year workshops
- Working groups
  - Resources
  - GEO Sciences and Telescience (Disaster Mitigation)
  - Life Sciences
- Expeditions
  - Lake Eutrophication
  - Biodiversity
  - Experimental Networking (ENT)



- Future Meetings
  - PRAGMA 28 Nara Japan April 8-10 2015

## Key Organizing Principle: Scientific Expeditions

- Information technology specialists + domain science application == Scientific Expeditions
- Domain scientists benefit from deep technical expertise
- Information technology specialists benefit from seeing how their tools/techniques can be used and improved.

## PRAGMA Resource Endpoints

Sites provide resources on a volunteer basis

- These *were* grid endpoints when PRAGMA started
- These are now virtualization (or cloud) hosting endpoints
  - Sites use: Rocks (KVM), OpenNebula, CloudStack,
- Expeditions use combinations of sites and endpoints (Multicloud)

# Use “Overlay” Networks to provide a trusted environment for focused sharing of resources

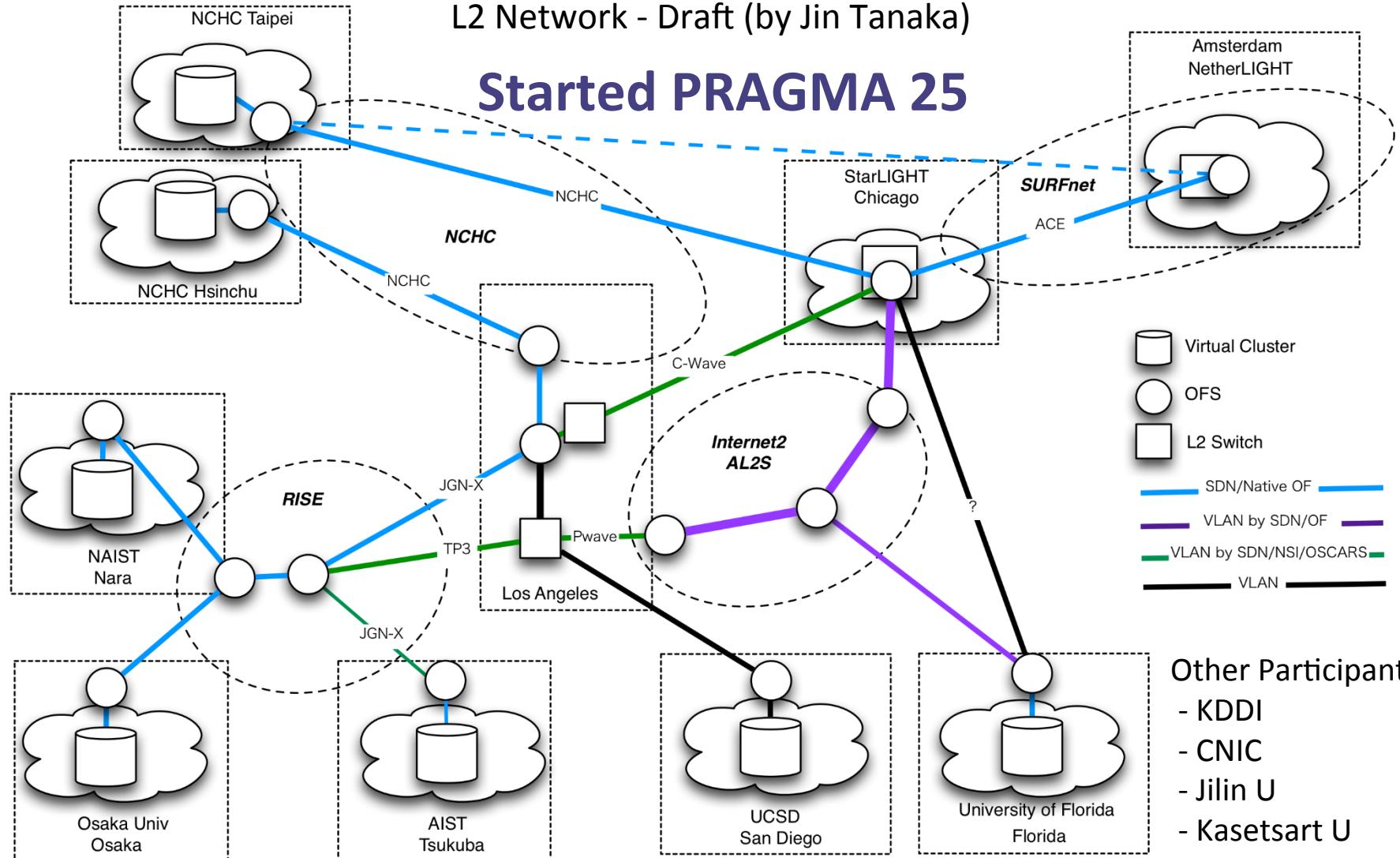


# PRAGMA Experimental Network Testbed (ENT)

Mauricio Tsugawa; Kohei Ichikawa

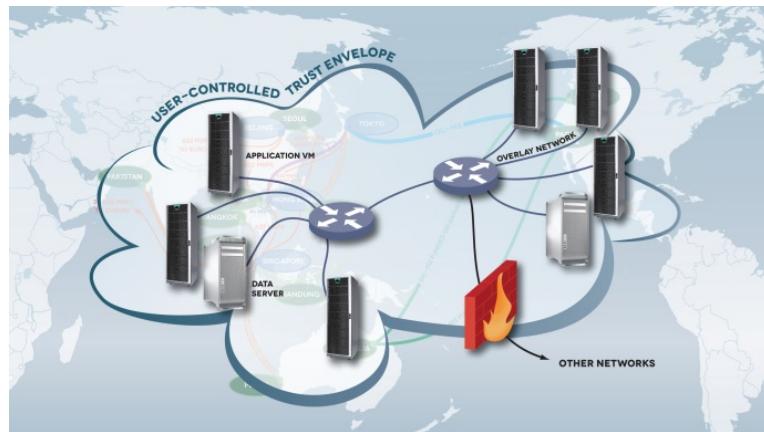
Draft diagram of Global SDN for PRAGMA Experimental  
L2 Network - Draft (by Jin Tanaka)

Rev 0 · 3 03/24/2014  
tanaka@ote.kddi.com



# Technology Trends Affecting Biodiversity

- Digitization of Collections
- Mobile Technologies
- Sensors – aquatic, terrestrial, and airborne
- Software Defined Networks

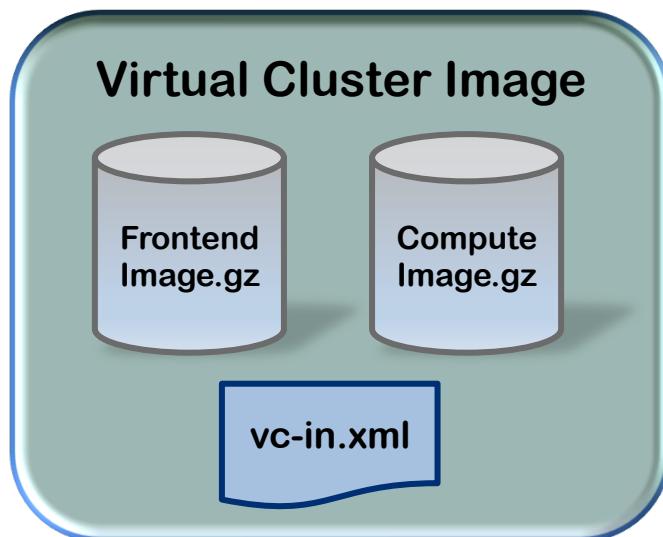


2 M wingspan, 4.9 kg

Lots of Data, Lots of Opportunities to Share

# Virtual Clusters

- Basic unit that is booted at a remote site is virtual cluster
- Define a standard way to share cluster images
  - E.g. frontend: LmDbServer, compute: LmCompute



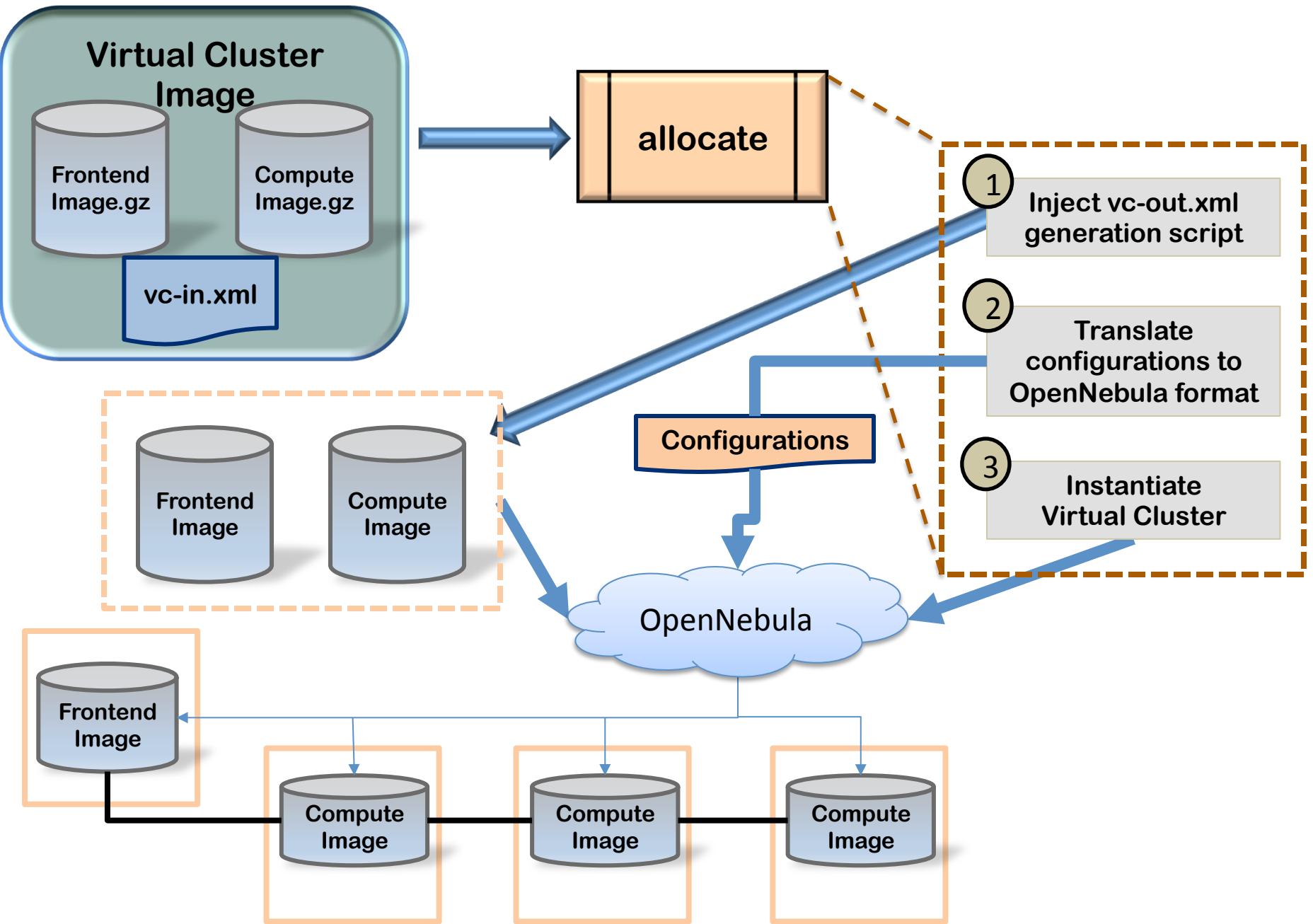
# Deployment

- Different hosting environments:
  - UCSD uses Rocks Clusters
  - AIST (Japan) uses OpenNebula
  - NCHC (Taiwan) uses a different version of OpenNebula
- How can we deploy the Virtual Cluster Image?



pragma\_boot:

[https://github.com/pragmagrid/pragma\\_boot](https://github.com/pragmagrid/pragma_boot)



## PRAGMA Presentations Today

- Scheduling of Resources Across PRAGMA to facilitate (multicloud) experiments
- What it takes to really make a scientific expedition work (Lifemapper)
- PRAGMA experiments in Software-defined Networking (PRAGMA ENT)
- How supercomputer center resource providers are adjusting to supporting virtual clusters