PRAGMA 25

Working Group Updates

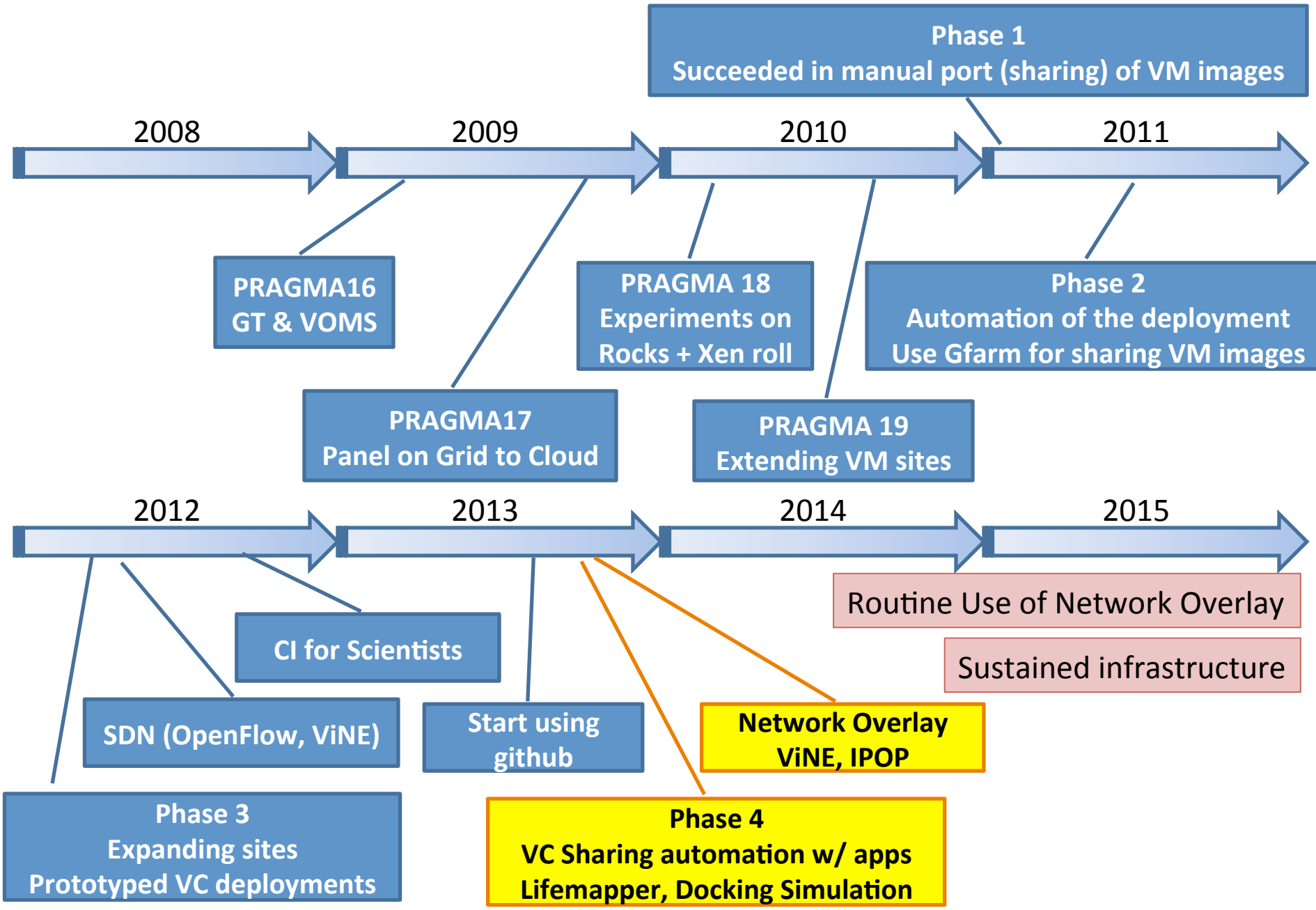
Resources Working Group

Yoshio Tanaka (AIST)

Phil Papadopoulos (UCSD)

Most slides by courtesy of Peter, Nadya, Luca, and Pongsakorn

Past, Current, and Future of Resources WG



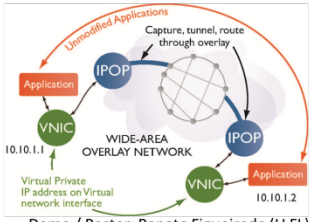
Resources in PRAGMA 25 at a glance

Predicting Water Quality in Lakes

Learning Phytoplankton Rules using SDN

- Indicators of water quality controlled by phytoplankton
- Run multiple simulations to understand rules
- Using VMs to avoid challenges of different architectures
- Using IP-over-P2P (IPOP) to interconnect VMs across multiple institutions

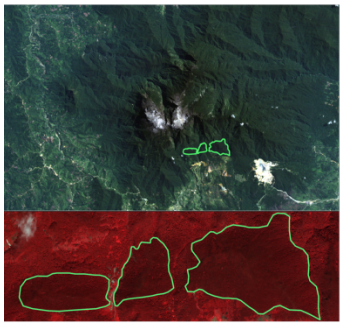
Collecting light, temperature data



Demo / Poster: Renato Figueiredo (U FL)

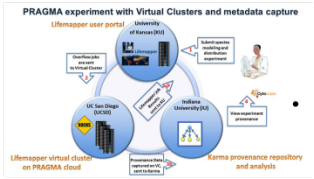
Biodiversity in Extreme Environments

Distribution Prediction by Sharing CI and Provenance Capture



Additional Work of Expedition

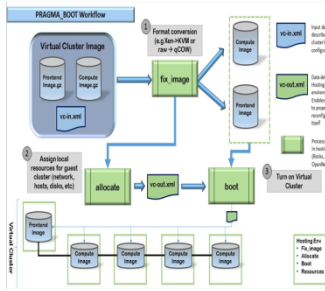
- Gained remote sensing data
- Expanded interactions



Demo: Nadya Williams (UCSD), Aimee Stewart (KU), Quan Zhou (IU)

PRAGMA VC Sharing Automation Phase 4

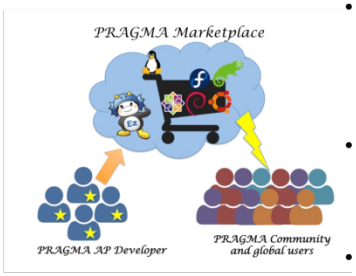
- For specialized applications: "build once, run easily everywhere"
- Share a virtual machine image among multiple hypervisors (Xen and KVM, and Virtual Machine (VM) and hosting middleware (Rocks, Ezilla, OpenNebula, Amazon EC2)
- Developed *pragma_boot* to automate VC translation



Demo: U-chupala, Pongsakorn, Ichikawa Kohei (NAIST); Clementi Luca, Williams Nadya, Papadopoulos Philip (UCSD) Tanaka Yoshio, Ota Akihiko (AIST) Huang Weicheng (NCHC)

Lightweight Cloud Application Marketplace

- Metadata Service to bridge cloud users and available VM images Provides registration service for vm owners (storage designated by owner)
- Provides tool to convert between VM formats
- http://140.110.30.2:6242/appliance

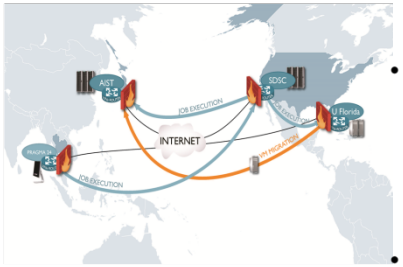


Demo: Chi-Ming Chen, Kuo-Yang Cheng, Weicheng Huang (NCHC); Yoshio Tanaka (AIST), Luca Clementi, Nadya Williams, Philip Papadopoulos (UCSD)

ViNe: Software Defined IP Overlays

Infrastructure (VR) and Management

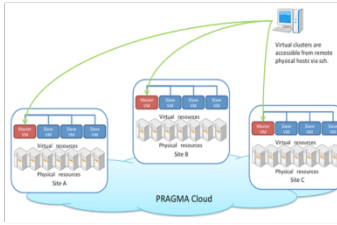
- ViNe (U FL): SDN establishes wide-area IP overlays (public, private networks)
- ViNe live migration of VM illustrated at PRAGMA 24
- Future: expand PRAGMA sites; user defined isolated overlays



Demo: Mauricio Tsugawa (U FL); Nadya Williams, Luca Clementi, Phil Papadopoulos (UCSD)

Deployment of Virtual Clusters for Molecular Docking Experiments on the PRAGMA Cloud

- Docking experiments are key tool *in silico* drug discover
- Physical grid computing can create inconsistent results - heterogeneity
  - Impacting results
  - Demonstrated by PRIME student (2009)
- Used *pragma_boot*
- Long-term goal: improve virtual dock



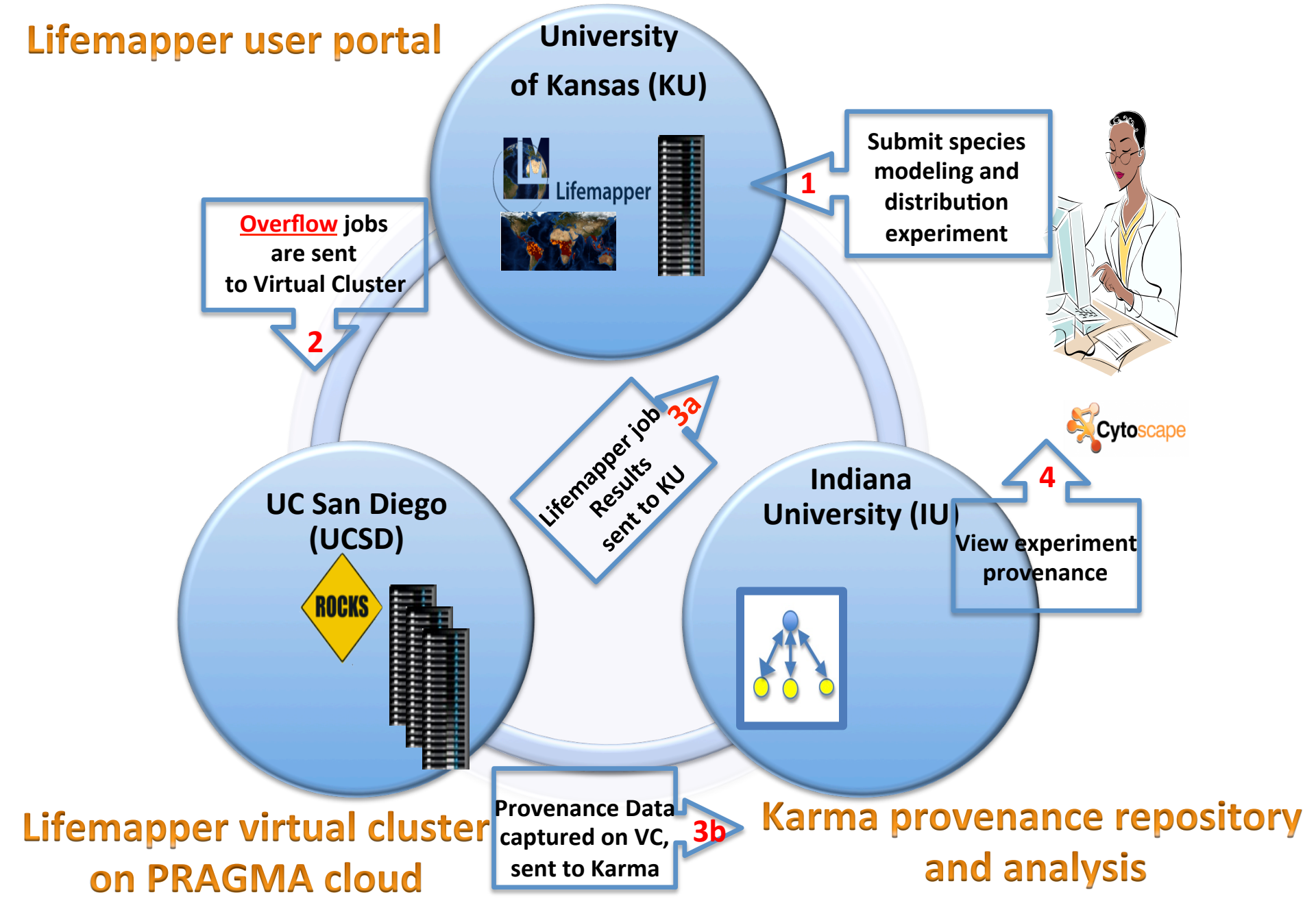
Demo: Kohei Ichikawa (NAIST), Kevin Lam, Karen Rodriguez (PRIME 2013) Wen-Wai Yim (PRIME 2009), Jason Haga UCSD

Summary of the 2nd day Discussion @ PRAGMA24

- Scenario: Three different labs want to share computing and data
  - What are the resources (data, computing)
  - How do they author their software structure (VM/ VC) to do what they need (e.g. LifeMapper Compute Nodes)
  - How do they provide network privacy
  - How do they control their distributed infrastructure

Main contributors:
Nadya (UCSD), Aimee(KU), Quan (IU)
See the demo today!!

PRAGMA experiment with Virtual Clusters and metadata capture

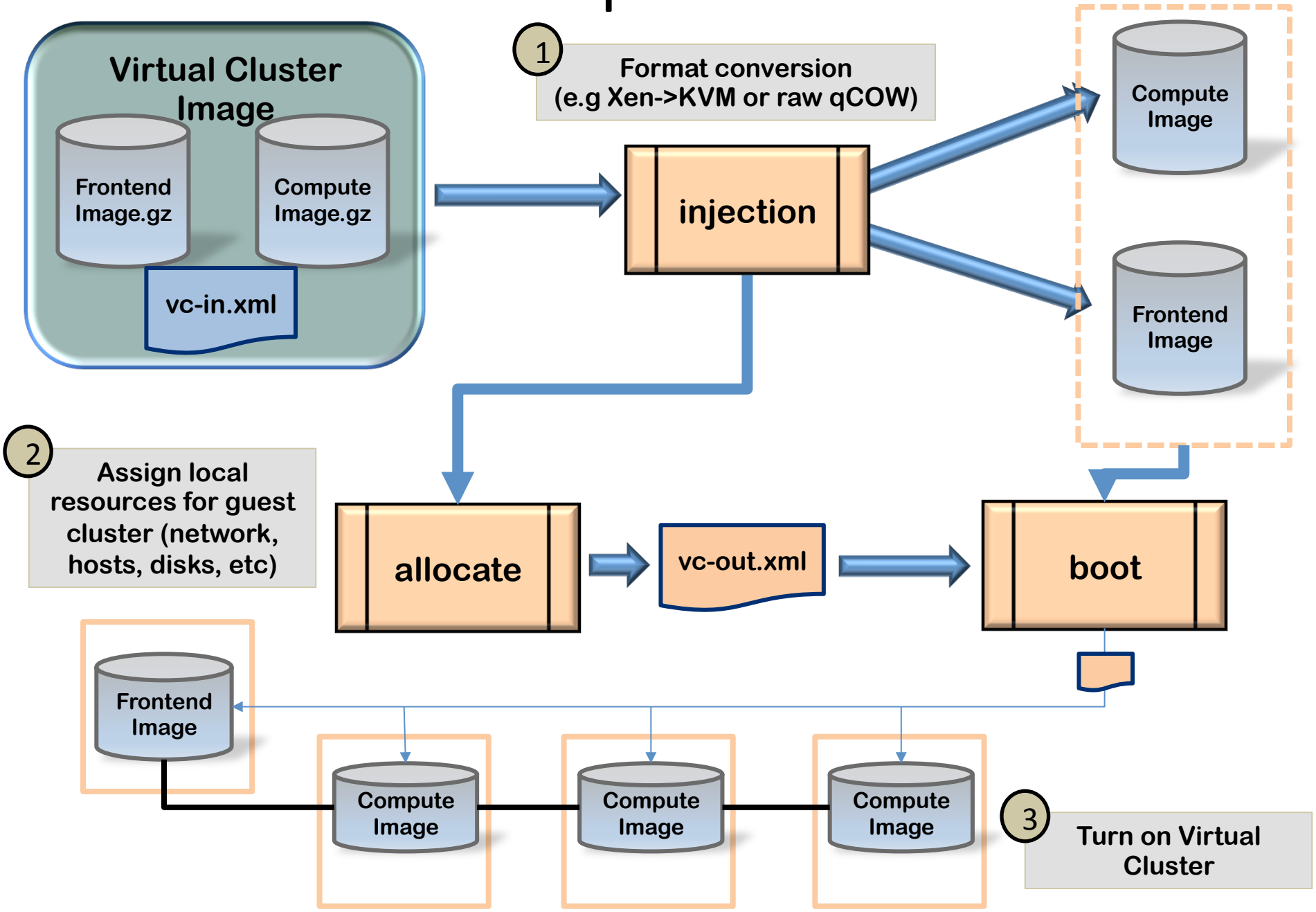


Summary of VC Sharing Discussion @ PRAGMA 24

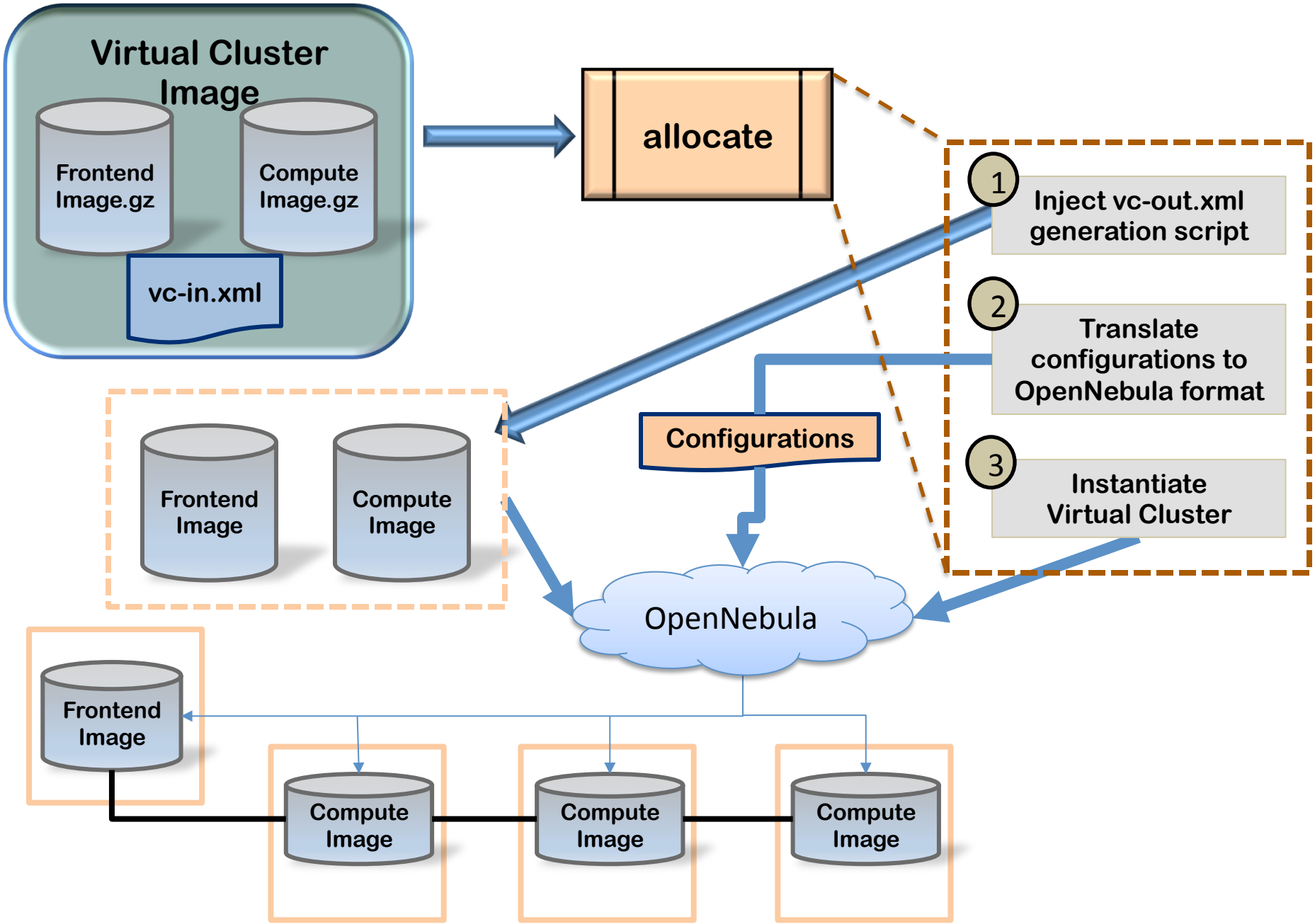
- Demonstrated booting VC images on two cloud hosting environments.
  - Rocks/KVM by SDSC
  - OpenNebula/KVM by AIST
- Next steps
  - Review the design of the scripts and re-implement by python.
  - Do this in San Diego in July (SDSC, AIST, NCHC).
    - Detailed schedule TBD.
    - Anybody interested in is welcome to join.
  - SDN integration with VC (NAIST/Osaka)

Done in Sep. and Oct.
Main contributors:
Luca (UCSD) & Built (KU->NAIST)
See demo tomorrow!!

Rocks Implementation



OpenNebula Implementation



Agenda of breakouts

- Thursday 14:00-16:15
  - Discussion: VC sharing
    - Detailed demo by Luca and Built
    - Discussion for improvements and next steps based on insights gained through the demonstration
- Friday 11:10-12:30
  - Discussion: CI for Scientists
    - Detailed demo by Nadya, Aimee, and Quan
    - Overlay network demo by Renato
    - Discussion for improvements and next steps based on insights gained through the demonstration
- Friday 14:00-15:30
  - Discussion: What services should PRAGMA provide?
    - How users use PRAGMA Cloud?
    - What persistent infrastructure should PRAGMA provide / use?
      - Github, Gfarm, Marketplace
    - What kind of services (data, computing, etc.) are available?