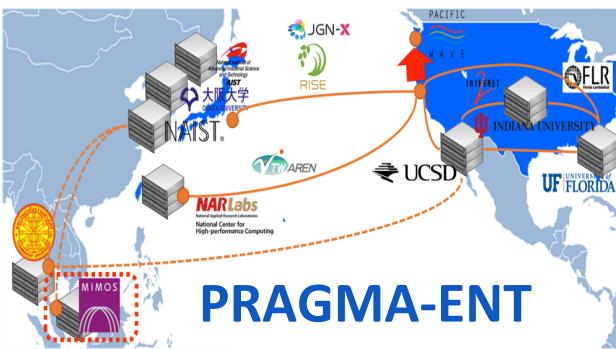


RESOURCES WG AND EXPEDITIONS UPDATES

Nadya Williams (UCSD)

Hsiu-Mei Chou (NCHC)

Areas of activity



AirBox
PerfSONAR



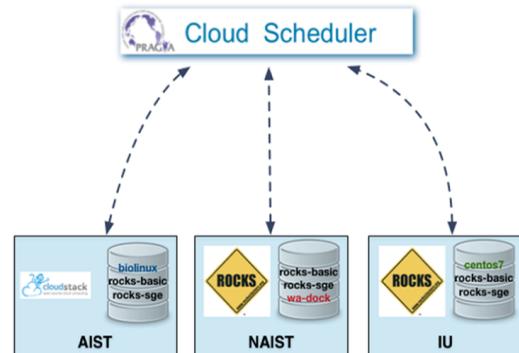
GRAPLER lake modeling



GPU



Lifemapper



PRAGMA Clusters



PRAGMA Storage and S3

PRAGMA 33 Goals: PRAGMA Cloud and storage

- Integrate Thammasat Cloud Scheduler GUI ✓
- Finish Clonezilla repository integration with different drivers (e.g., Cloudstack) ○○○
- Add Openstack PRAGMA Boot driver ○○○
- UCSD will add GPU nodes. ○○○ (available for testing)
- Finish PRAGMA-ENT integration and add more resources for pragma-boot
 - Add resources from NCHC and AIST ○○○
 - Finish integration of resources from University of Florida ○○○
 - Add UCSD Rockstar resource ○○○
- More applications
 - GRAPLER lake modeling ✓
 - Airbox virtual cluster image (CENTRA) in progress ○○○
- Prepare 160TB S3 enabled storage in progress ○○○
 - UCSD, AIST, UF (minimum). NICT (JOSE), (possibly NCHC)
 - Store data (e.g. AirBox)
 - Integrate with PRAGMA-ENT
 - Evaluate performance.
 - Nakagawa-san's experiments on PRAGMA Cloud Storage and demo @ PRAGMA33.
 - UCSD will figure out appropriate S3 software ([Scality](#), [Minio](#), [Ceph](#))
 - Need to consider Simple ID management ([Ceph?](#))

Legend: ✓ done ○○○ in progress

Biodiversity Expeditions: Lifemapper Goals

Research Projects

- **PRAGMA 33: NA flora/Comet project (Charlie)**
 - Work with SDSC to request enough Comet resources for Charlie job ✓ (IB interfaces, data storage)
 - Nadya and Aimee debug Comet job workflow, storage (June/July)
 - Nadya and Aimee complete computations **by PRAGMA 33** (waiting for data)
- **PRAGMA 33: Taiwan instance**
 - Work with Fang Pang to find interested Taiwanese researchers ✓
 - Aimee assemble high resolution environmental data, Taiwanese species occurrence data ○○○
 - Work with Taiwanese researchers to define biogeographic hypotheses ○○○
 - Nadya and Aimee travel to NCHC to deploy on OpenStack at NCHC (**July/Aug 2017**); ✓ (on KVM)
 - Queryable dataset by PRAGMA 33 ○○○

New Technologies

- **PRAGMA 33: SAGE2 Visualization - postponed**
 - Work with Jason Leigh lab and other PRAGMA SAGE sites to install hardware and software at Kansas
 - Send LM programmer to work with Dylan Kobayashi at either Hawaii (May) or AIST (July)
 - Work with Dylan and Jason to create visualization tools for Global PAM or subsetted outputs, linked spaces in a browser (late summer 2017)
 - Small demo by PRAGMA 33
- **PRAGMA 33: PID proof-of-concept - postponed**
 - Work with IU to define data types and metadata/provenance to capture
 - Work with IU to create PIDs and catalog Taiwan-data PAM, metadata and related data types (no services)
 - Discuss results at PRAGMA 33

Outreach/Broaden Communities – postponed

- Develop session at PRAGMA 33 / eResearch Australasia on Lifemapper, to recruit biodiversity researchers from Australia to participate.
- Organize workshop of like-minded researchers looking to understand species along west coast of north and south America. (Pamela Soltis)

Lake expedition updates

- GRAPLER software and resources
 - Usability improvements, bug fixes
 - Arianna Krinos (undergraduate from Carey's lab) visited UF during the summer, and collaborated with GRAPLER developers – it was a very valuable experience!
 - Nodes at UF, NAIST, XSEDE Comet
 - Successful XSEDE allocation in the summer: ~1M SUs
- GRAPLER uses
 - Research with land use & climate change scenarios
 - New GRAPLER teaching modules being developed (led by Cayelan Carey)
 - Miami/Ohio, Loyola, VTech, Wells College, SUNY New Paltz, Dundalk Institute (Ireland); Oct/Nov 17
- Feeding into new projects
 - NSF S&CC water quality forecast project, Jan'18

IPOP updates

- Major effort towards Fall '17 IPOP release
 - Redesign of data plane (tincan)
 - Improvements to control plane framework
 - Caught up to latest WebRTC libraries
 - Build/test/evaluation on IoT gateway devices
 - Raspberry Pi, 3G/WiFi networks
 - Driven by SCC project and future PRAGMA efforts
 - Continued work on visualization framework for overlay networks
 - Moving towards Cytoscape
 - Thanks Haga-san for the suggestion during PRAGMA-32!

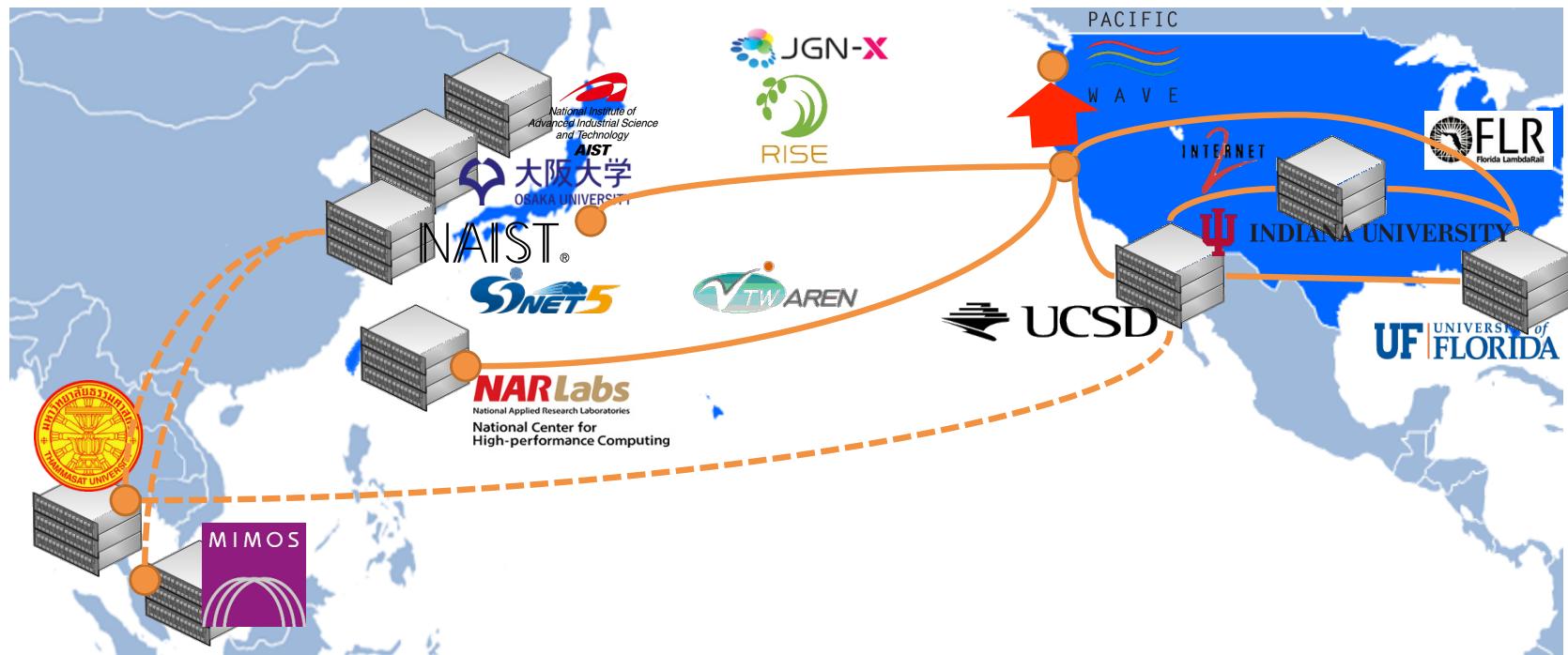
GRAPLER teamwork makes the dream work!



PRAGMA-ENT Updates

Infrastructure

- ▶ JGN's RISE switch has been moved from Los Angeles to Seattle
- ▶ SINET (another Japanese NREN) is trying to be connected to ENT dynamically with NSI (Network Service Interface)



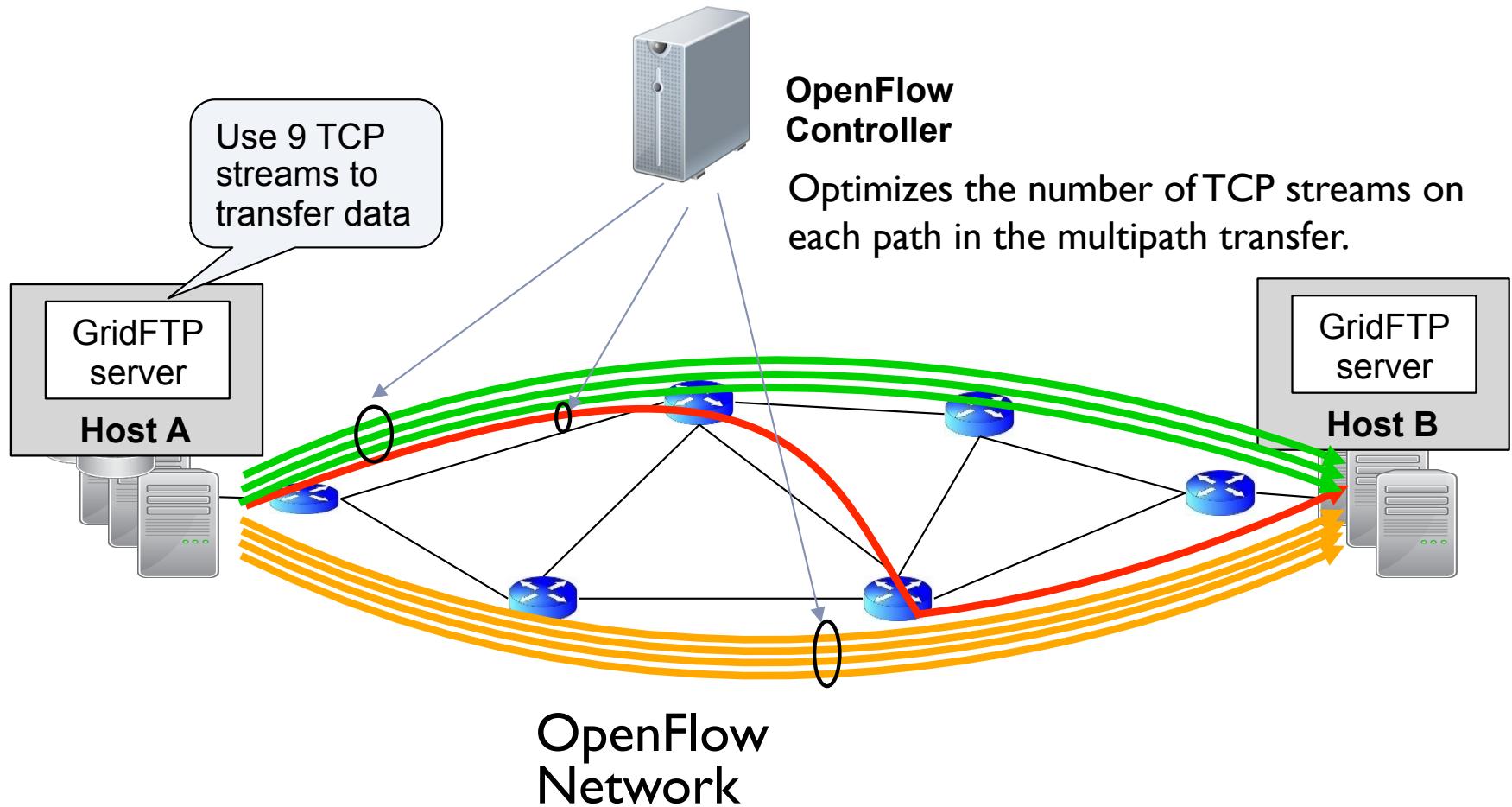
PRAGMA-ENT Updates

- ▶ Applications
 - ▶ `pragma_boot` supports Open vSwitch interface
 - ▶ Virtual clusters created by `pragma_boot` can be connected to ENT through vSwitch
 - ▶ Shava (UCSD) will give a demo in the workshop
 - ▶ Optimization of multipath TCP transfer
 - ▶ Improves GridFTP performance by optimizing the number of TCP streams over multipath network
 - ▶ Che (NAIST) will give a demo at the PRAGMA booth in eResearch
 - ▶ Dynamic storage deployment over the dynamic VLAN service (NSI)
 - ▶ Extends ENT backbone dynamically using NSI and deploys storage services
 - ▶ Will be demonstrated in the next PRAGMA (34)

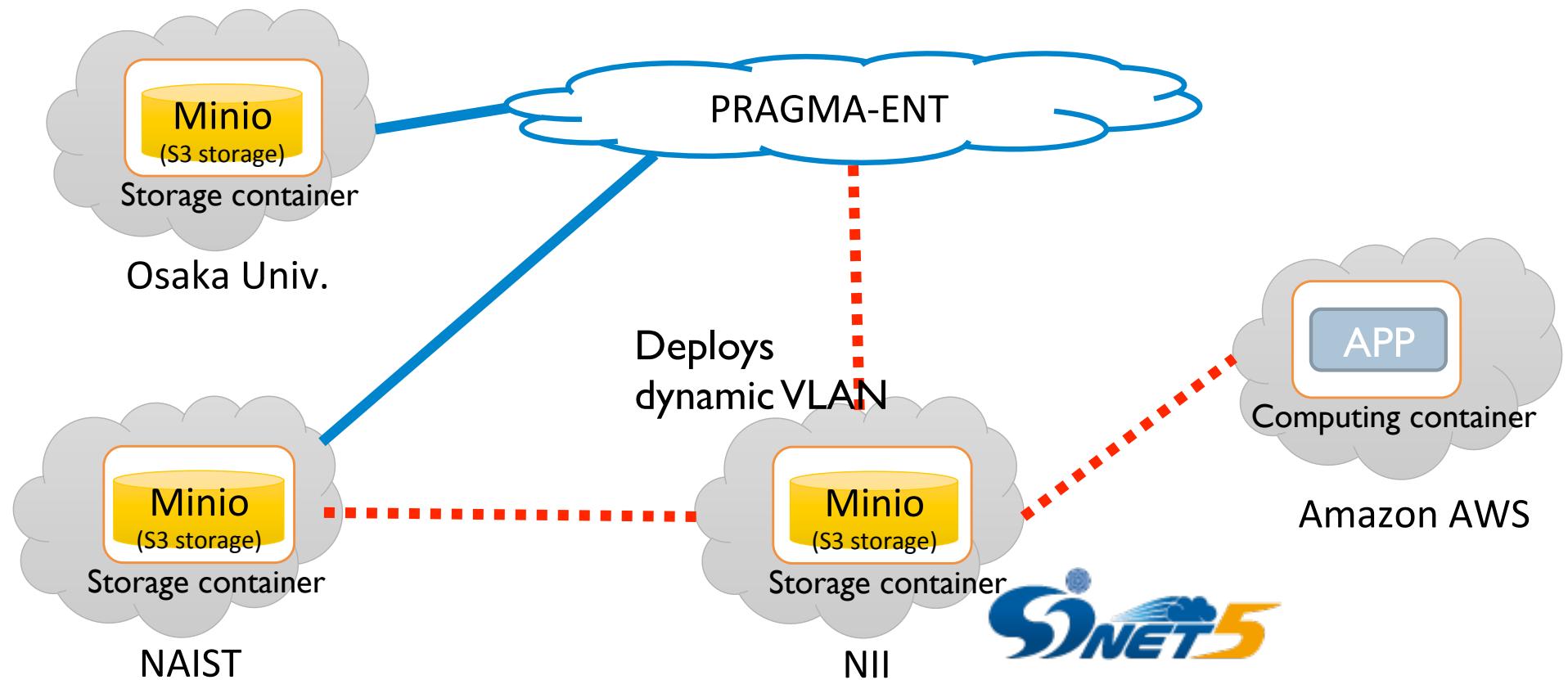


Optimization of multipath TCP transfer

Demo at PRAGMA Booth

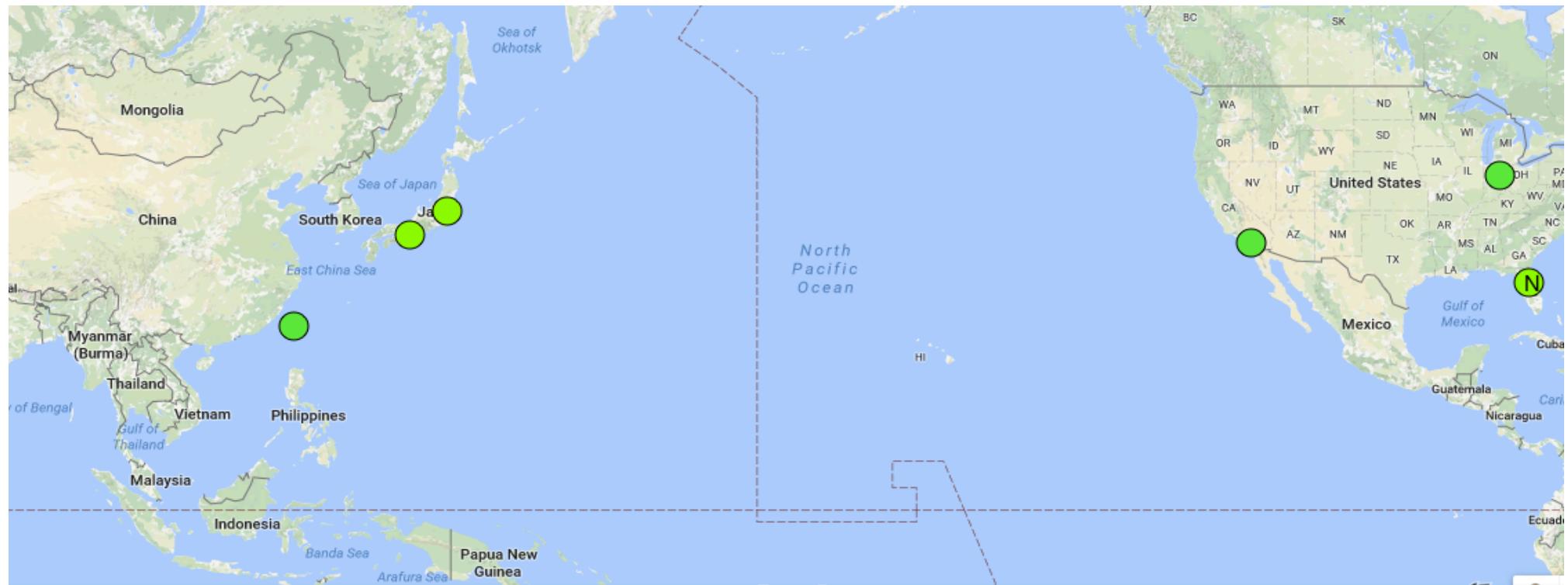


Dynamic storage deployment over the dynamic VLAN service (NSI)



PRAGMA Cloud Testbed

Goal: A persistent Cloud testbed for Biosciences and other PRAGMA working group members to run application experiments.

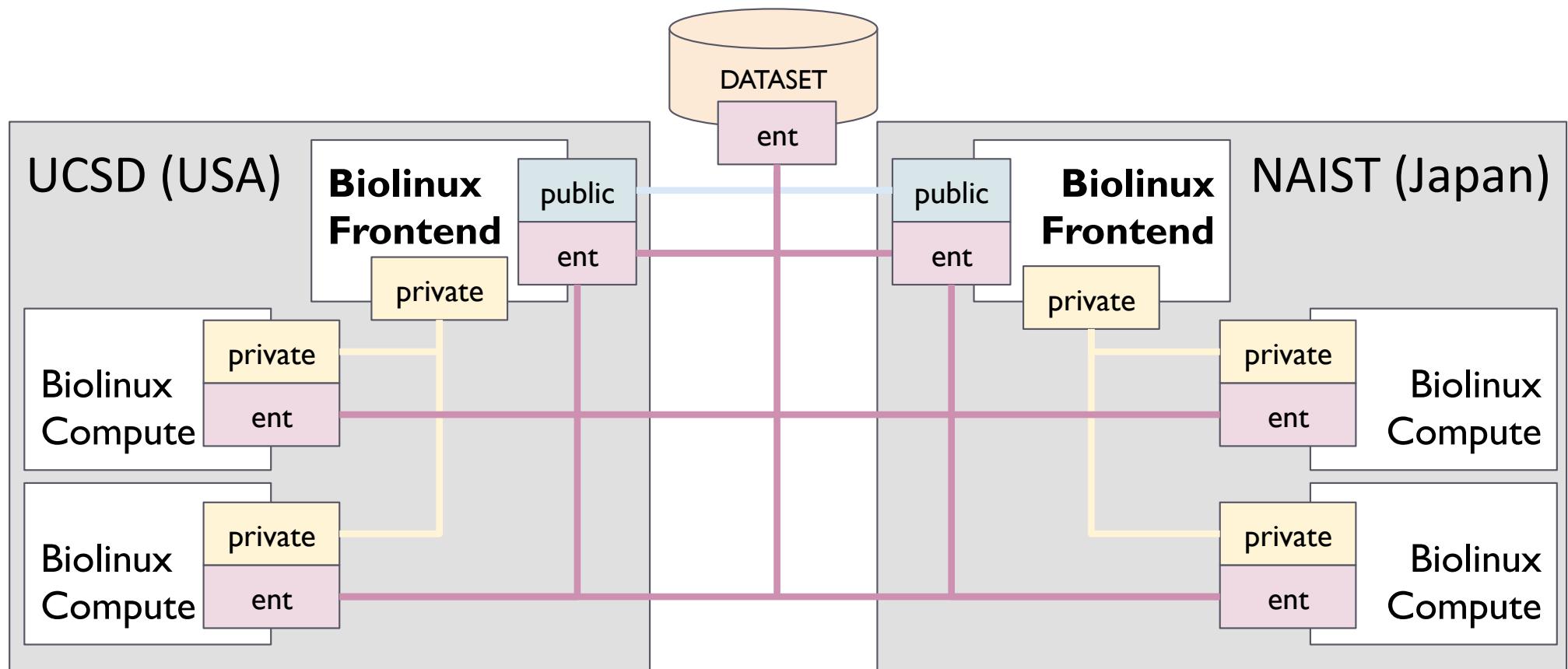


● Online sites ● N New sites (since PRAGMA32)



Virtual clusters can be ENT-enabled

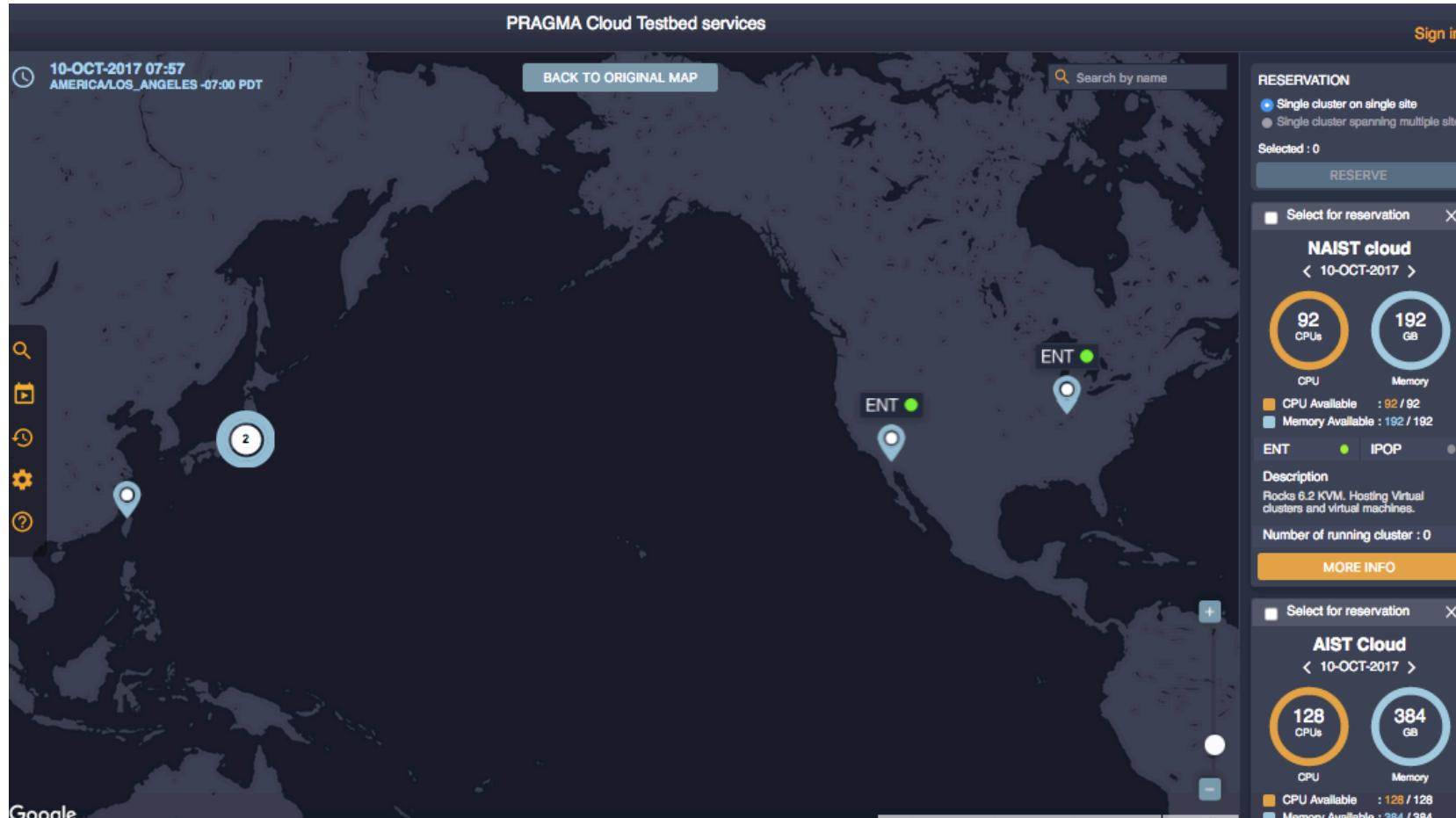
Uses: access protected datasets, multi-site virtual clusters



```
$ pragma boot biolinux 16 add-iface=openflow:10.103.1.0/16
```

New: Cloud Scheduler GUI in Production

<https://cloud.pragma-grid.net>



ICSEC-2017 accepted paper