ISISlab for Cloud

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What is ISISlab?

- Funded from the Office of Naval Research (ONR), DARPA, and Lookheed Martin.

- Created by DOC group at ISIS

- Open testbed for experimentation on DRE systems

- Associated with the Skoll Cluster at the University of Maryland

- 56 dual-CPU blades with 1GB memory, 40GB disks, and 4 NICs per blades

- Emulab software is used

Upgrading ISISlab for Cloud

- Hardware
  - Android Tactical Application Assessment and Knowledge Cloud (ATAAK Cloud) funded from DARPA
  - Add 7 racks (84 cores, 256GB, 11TB, and 6NICs for each)
- Software
  - OpenNebula
  - Elastic resource management
  - Support various hypervisors (Xen, KVM, VMWare)
  - Hybrid Cloud (AWS EC2 drivers)

Overview of OpenNebula

- Open-source cloud computing software
- Image Repository
- Template Repository
- Virtual Networking
- Hybrid Cloud
- Interfaces & APIs
  - CLI
  - EC2
  - OCCI
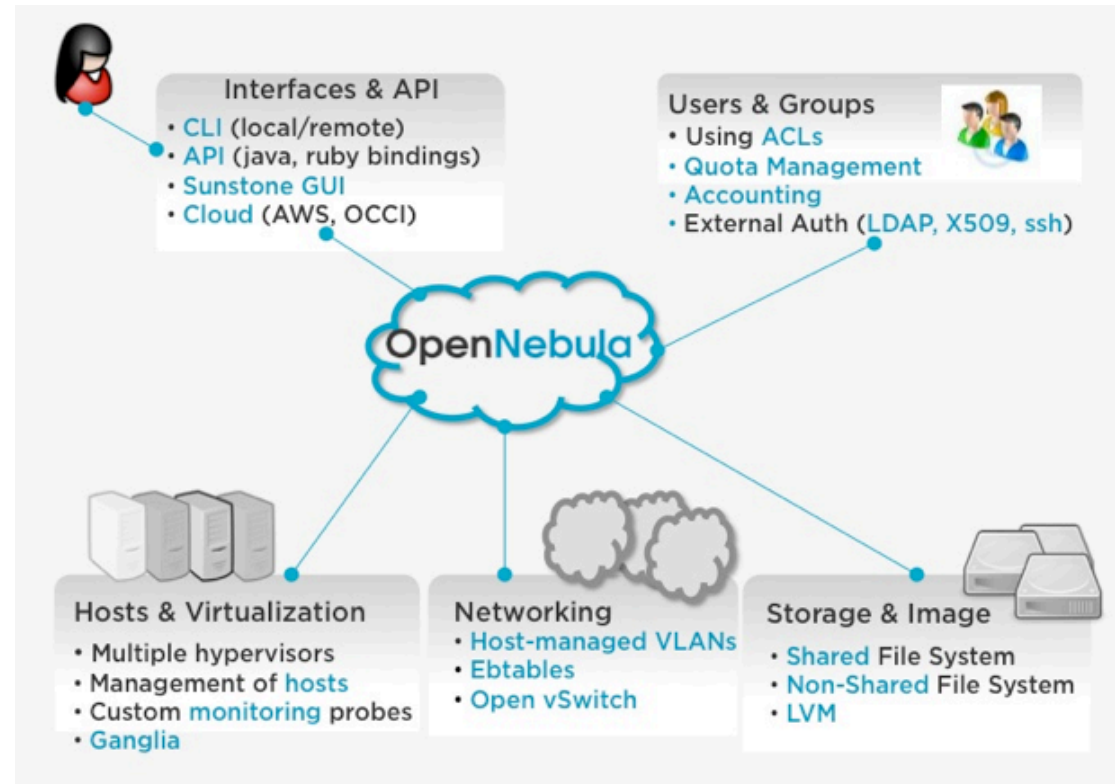
DOC Group Research

- Efficient auto-scaling in the cloud using predictive models for workload forecasting

- Adapting distributed real-time and embedded Pub/Sub middleware for cloud computing environments

- Scalable and QoS enabled resource monitoring system in clouds using real-time Pub/Sub middleware

- Model-driven engineering for interoperability of cloud platforms

- Fault-tolerant middleware for optimized placement of virtual machine replication

- ATAAK Cloud