Personal Cloud Controller (PCC)

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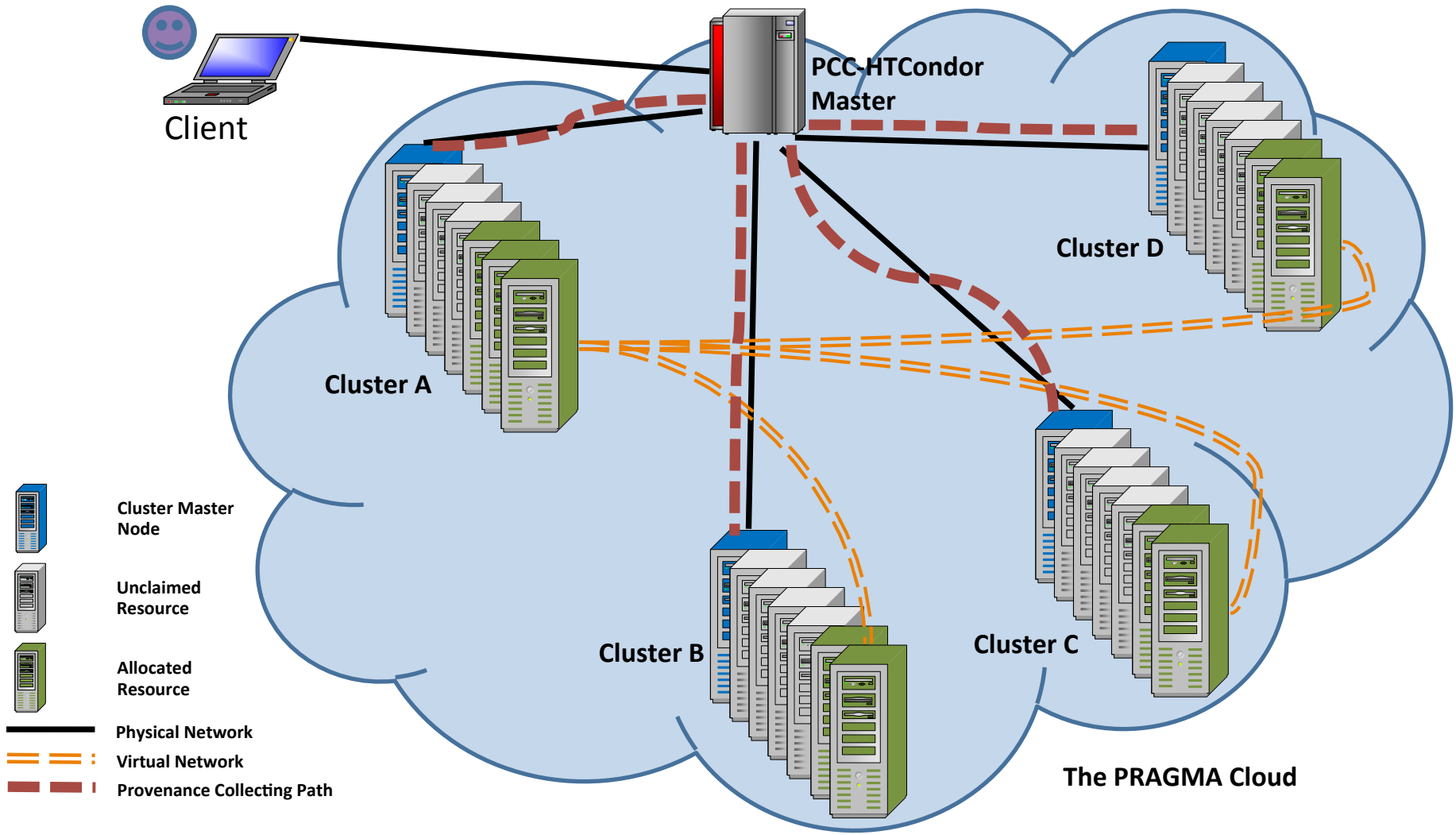
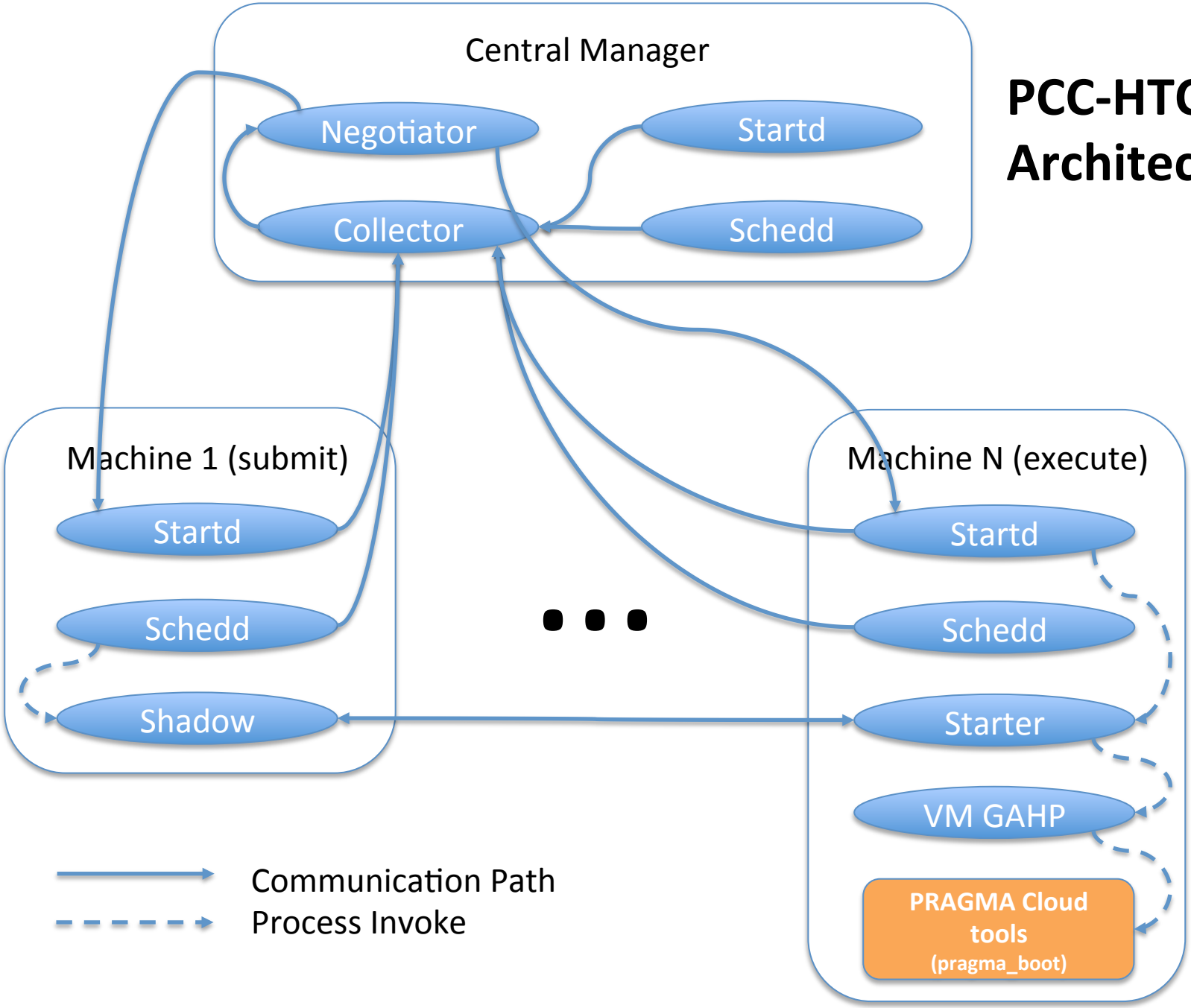
Overview

- Goals:
  - Enable **lab/group** to easily **manage** application **virtual clusters** on available resources
  - Leverage PRAGMA Cloud tools: pragma_bootstrap, IPOP, ViNE.
  - Lightweight, extends HTCondor from U Wisc.
  - Provide command-line and Web interfaces
- Working Group: Resources

PCC Enabled PRAGMA Cloud



PCC-HTCondor Architecture



PCC-HTCondor Job Submission

Sample PCC-HTCondor submission script

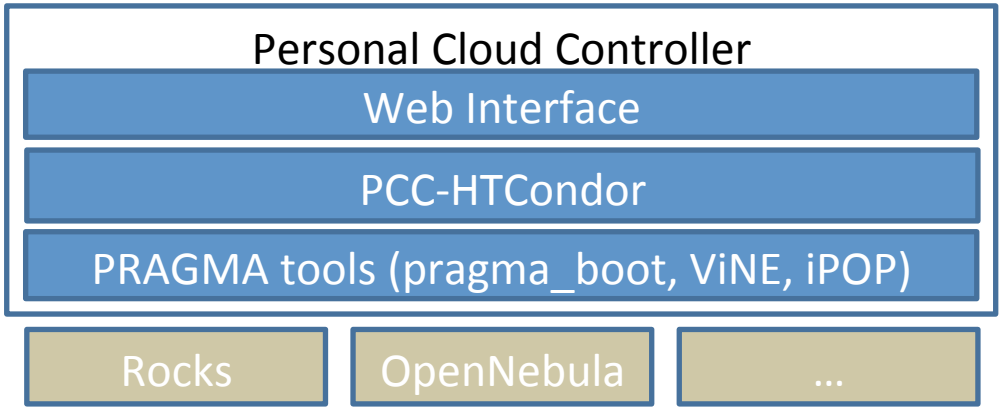
```
universe                = vm
executable              = lifemapper
log                     = simple.condor.log
vm_type                 = rocks
rocks_job_dir           = /path/to/the/job/dir
queue
```

.vmconf file in the rocks job directory

```
executable      = pragma_boot
basepath        = /opt/pragma_boot/vm-images
key             = ~/.ssh/id_rsa.pub
num_cores       = 2
vcname          = lifemapper
logfile         = pragma_boot.log
```

Status and Future Plans

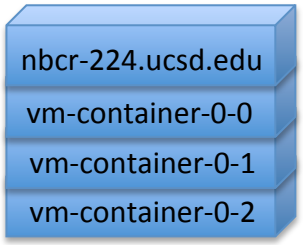
- Initial prototype implemented
  - Start and monitor virtual cluster using pragma_bootstrap via HTCondor (VM GAHP)
  - Web interface prototype (PHP)
- Near-term goals
  - Add increased controllability and robustness (April – June)
  - Multi-site clusters (July – Sept)



- Longer-term goals
  - Data-aware scheduling
  - Fault tolerance
  - Provenance

PCC Demo Overview and Setup

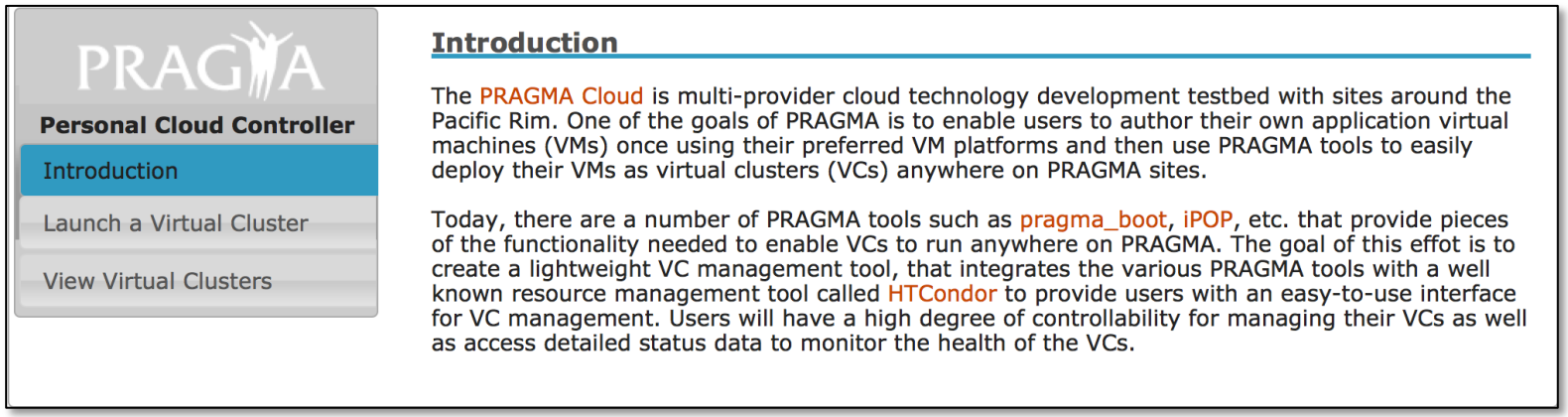
1. View PCC Web interface
   a. Fully launched "lifemapper" 8-core virtual cluster
   b. Just launched "dock6" 4-core virtual cluster
2. View Condor pieces
   a. Submit scripts
   b. condor_status
   c. condor_q

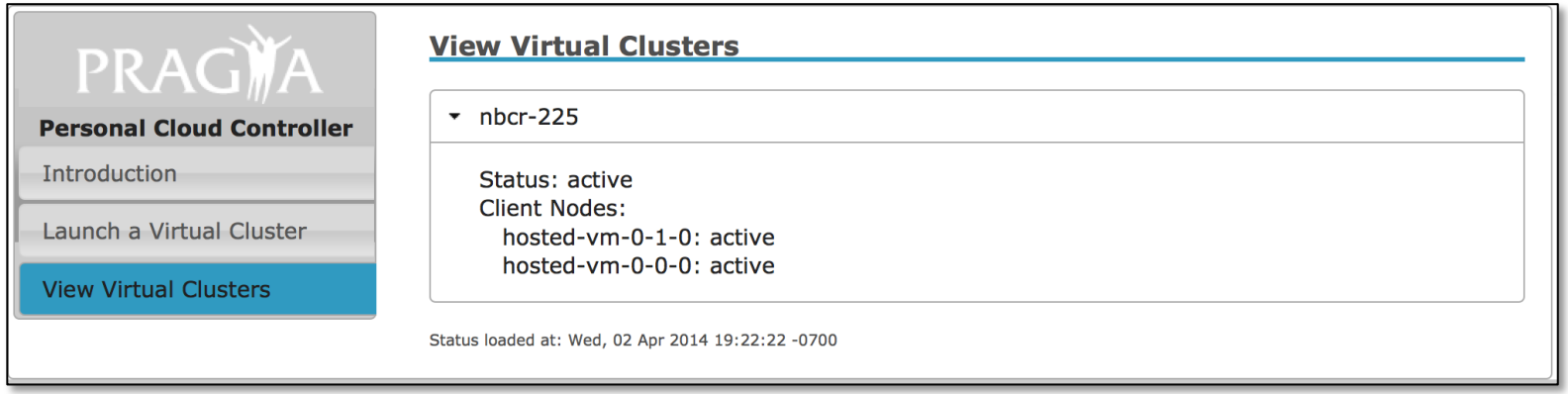


nbcr-224.ucsd.edu

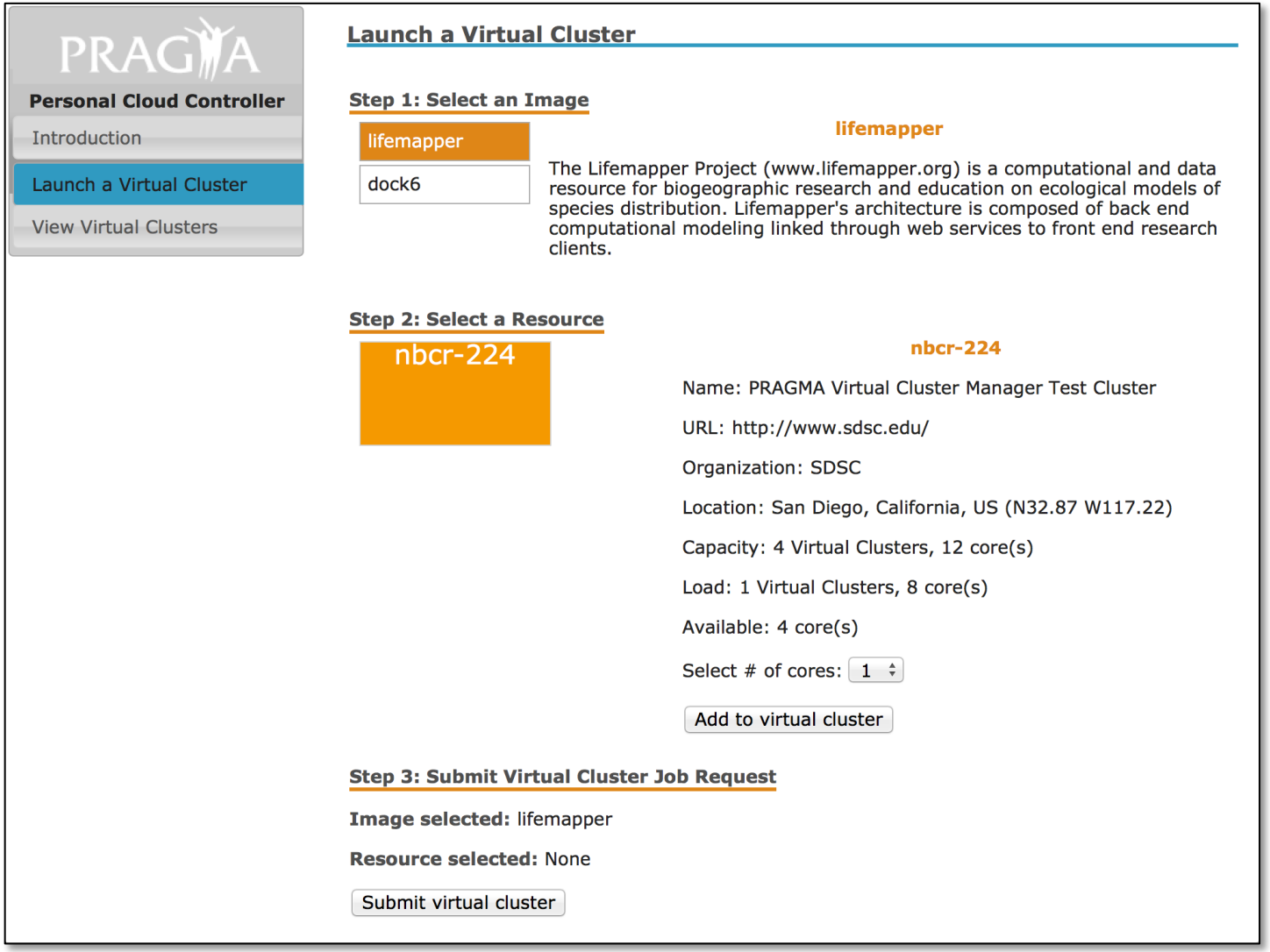
- 4 x Dell PowerEdge SC1435
  - 2 x Dual-Core 2.4 GHz AMD Opteron
  - 8 GB Memory
  - 250 GB Disk
- Rocks 6.1 with KVM roll
- Condor 8.0.6
- Pragma_bootstrap + 3 public IPs
- PCC + web frontend

Show web interface and ability to view running virtual clusters

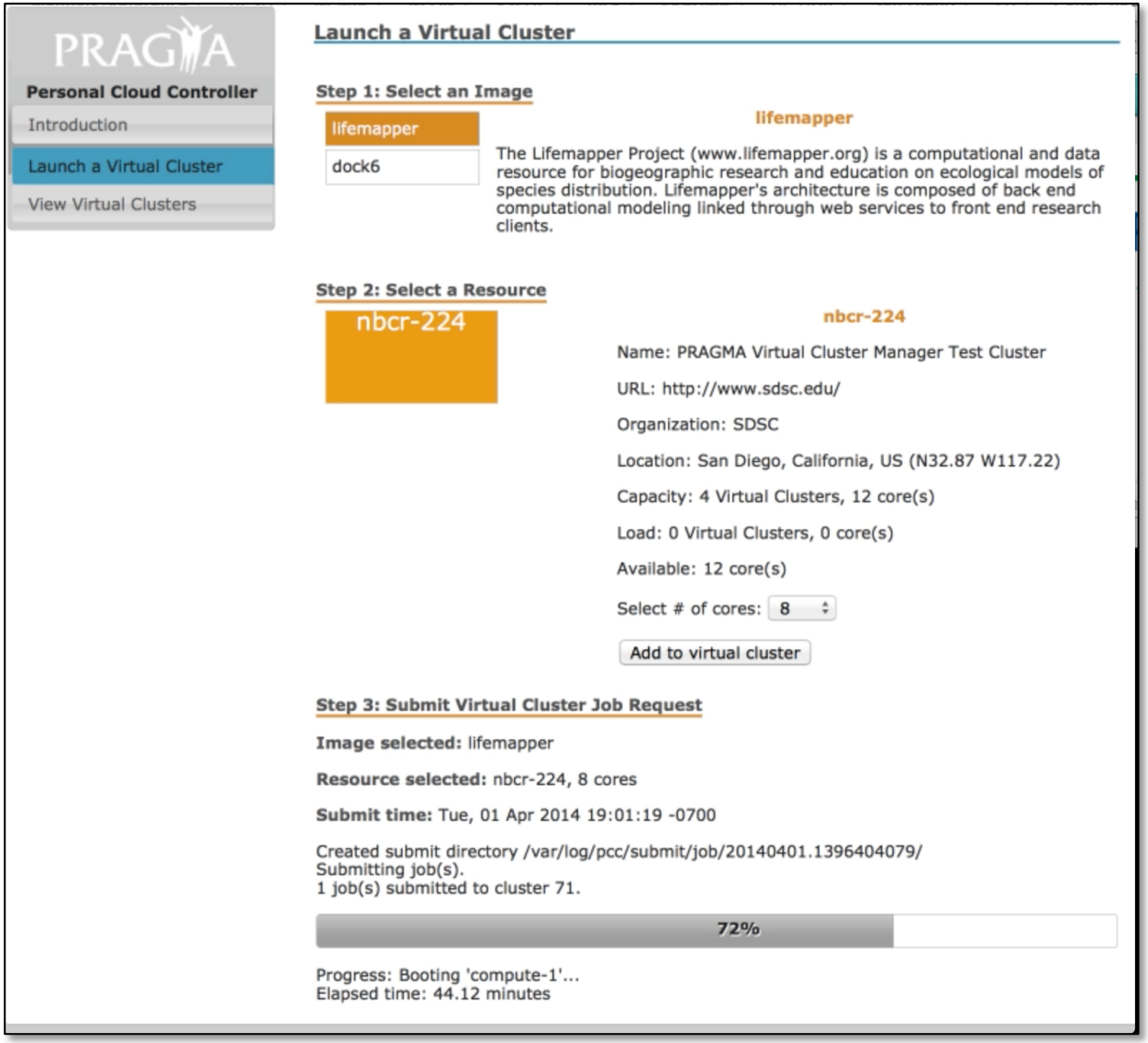




Show launch interface



Show launching virtual cluster



Show running virtual cluster

```
[root@nbcr-224 ~]# ssh nbcr-225.ucsd.edu
Last login: Wed Apr  2 19:42:33 2014 from nbcr-224.ucsd.edu
Rocks 6.1 (Emerald Boa)
Profile built 20:36 09-Oct-2013

Kickstarted 14:19 09-Oct-2013

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Rocks 6.1 (Emerald Boa)
Profile built 20:56 01-Oct-2013

Kickstarted 14:38 01-Oct-2013

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Rocks 6.1 (Emerald Boa)
Profile built 20:21 19-Aug-2013

Kickstarted 14:07 19-Aug-2013
[root@nbcr-225 ~]# rocks list host
HOST       MEMBERSHIP CPUS RACK RANK RUNACTION INSTALLACTION
nbcr-225:  Frontend   1    0    0    os        install
compute-1: Compute    4    0    1    os        install
compute-0: Compute    4    0    0    os        install
[root@nbcr-225 ~]# ssh compute-0
Last login: Wed Apr  2 19:42:43 2014 from nbcr-225.ucsd.edu
Rocks Compute Node
Rocks 6.1 (Emerald Boa)
Profile built 15:48 09-Oct-2013

Kickstarted 15:55 09-Oct-2013
[root@compute-0 ~]#
```

Show condor status

```
[root@nbcr-224 html]# condor_status -wide
Name                              OpSys      Arch   State     Activity LoadAv Mem  ActivityTime

slot1@nbcr-224.ucsd.edu           LINUX      X86_64 Claimed   Busy      0.110 2015   1+00:31:28
slot2@nbcr-224.ucsd.edu           LINUX      X86_64 Unclaimed Idle      0.000 2015   1+01:42:25
slot3@nbcr-224.ucsd.edu           LINUX      X86_64 Unclaimed Idle      0.000 2015   1+01:42:26
slot4@nbcr-224.ucsd.edu           LINUX      X86_64 Unclaimed Idle      0.240 2015   1+01:42:22
                     Machines Owner Claimed Unclaimed Matched Preempting

        X86_64/LINUX        4     0       1         3       0          0

               Total        4     0       1         3       0          0
[root@nbcr-224 html]#
```

```
[root@nbcr-224 html]# condor_q -wide


-- Submitter: nbcr-224.ucsd.edu : <169.228.41.224:45475> : nbcr-224.ucsd.edu
 ID      OWNER            SUBMITTED     RUN_TIME ST PRI SIZE CMD
  71.0   yuanluo         4/1  19:01   1+00:35:25 R  0   2197.3 rocks_vm_1

1 jobs; 0 completed, 0 removed, 0 idle, 1 running, 0 held, 0 suspended
[root@nbcr-224 html]#
```

Show submit files

```
[root@nbcr-224 20140401.1396404079]# cat condor.sub
universe                        = vm
vm_type                         = rocks
executable                      = rocks_vm_1
log                             = condor.vm.log.txt
vm_memory                       = 64
rocks_job_dir                     = /var/log/pcc/submit/job/20140401.1396404079/
JobLeaseDuration                = 7200
RequestMemory = 64
rocks_should_transfer_files = True
queue
[root@nbcr-224 20140401.1396404079]#
```

```
[root@nbcr-224 20140401.1396404079]# cat test.vmconf
executable      = pragma_boot
basepath        = /opt/pragma_boot/vm-images
key             = ~/.ssh/id_rsa.pub
num_cores       = 8
vcname          = lifemapper
logfile         = shava_pragma_boot.log
[root@nbcr-224 20140401.1396404079]#
```