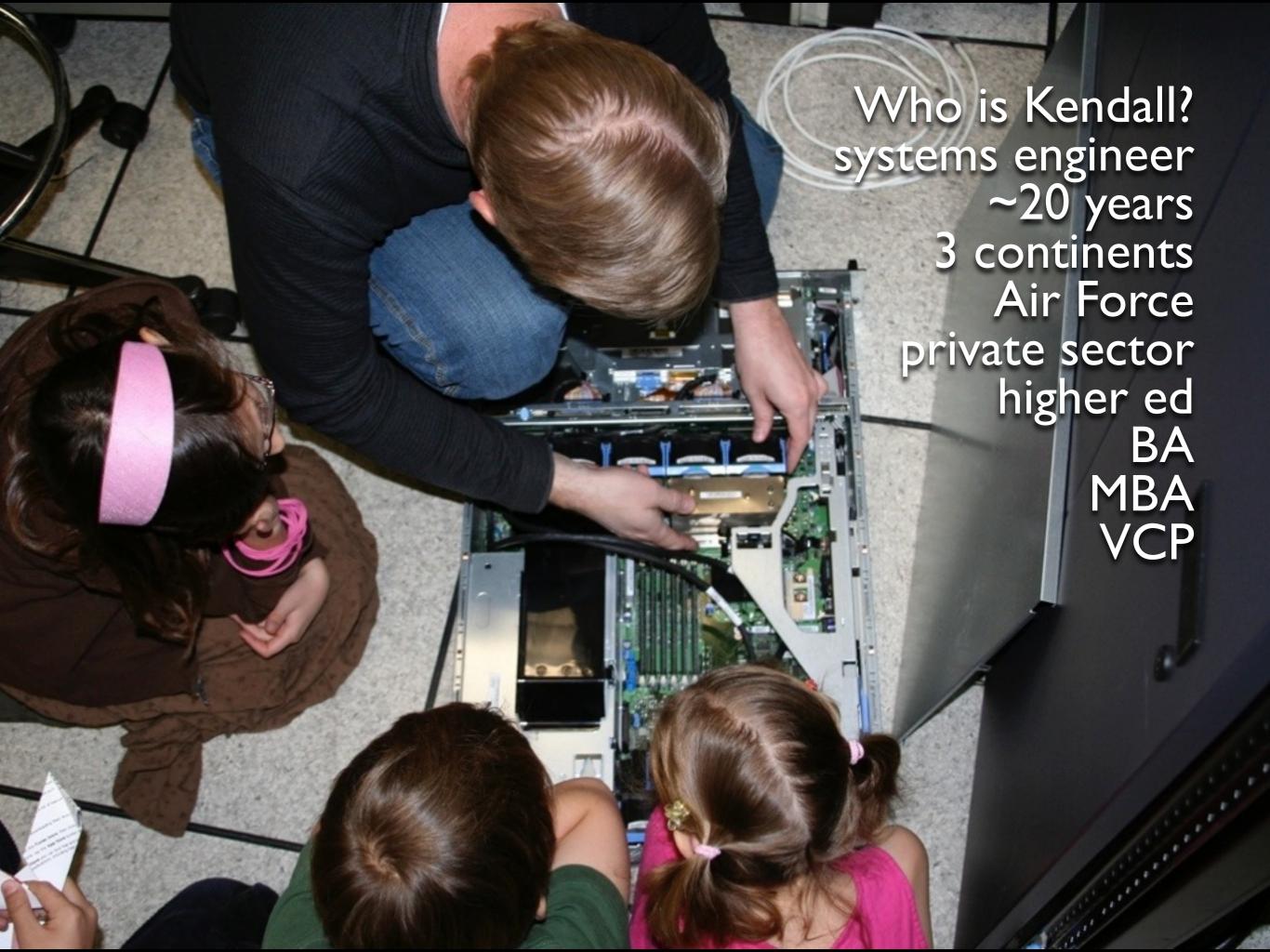
### Cloud Operations

Kendall George
Operations Manager, Shared Services Cloud
The University of Oklahoma
<a href="mailto:kendallg@ou.edu">kendallg@ou.edu</a>
<a href="mailto:kg@kendallgeorge.com">kendallgeorge.com</a>
@kendallgeorge

October 3, 2014



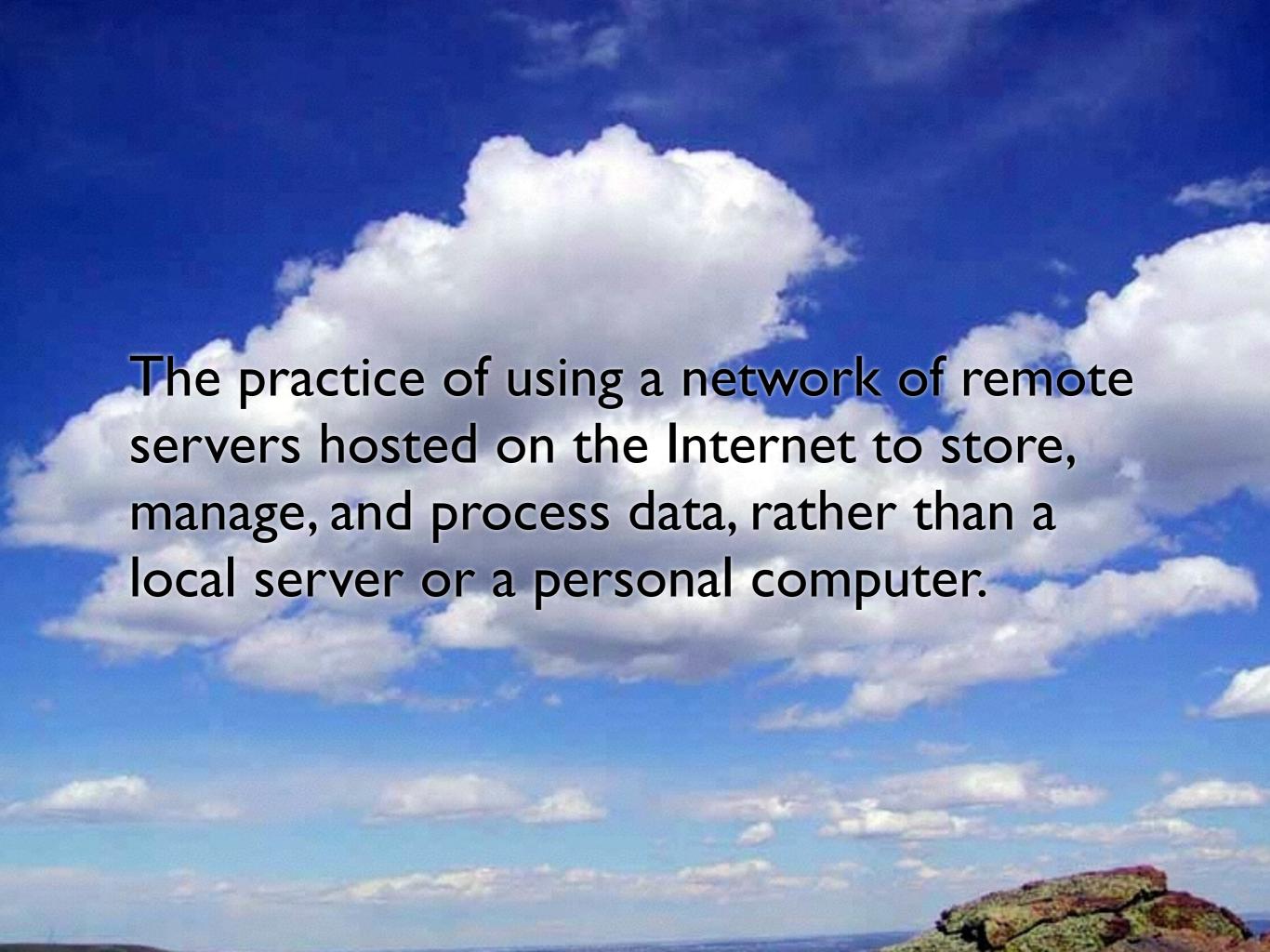
#### Overview

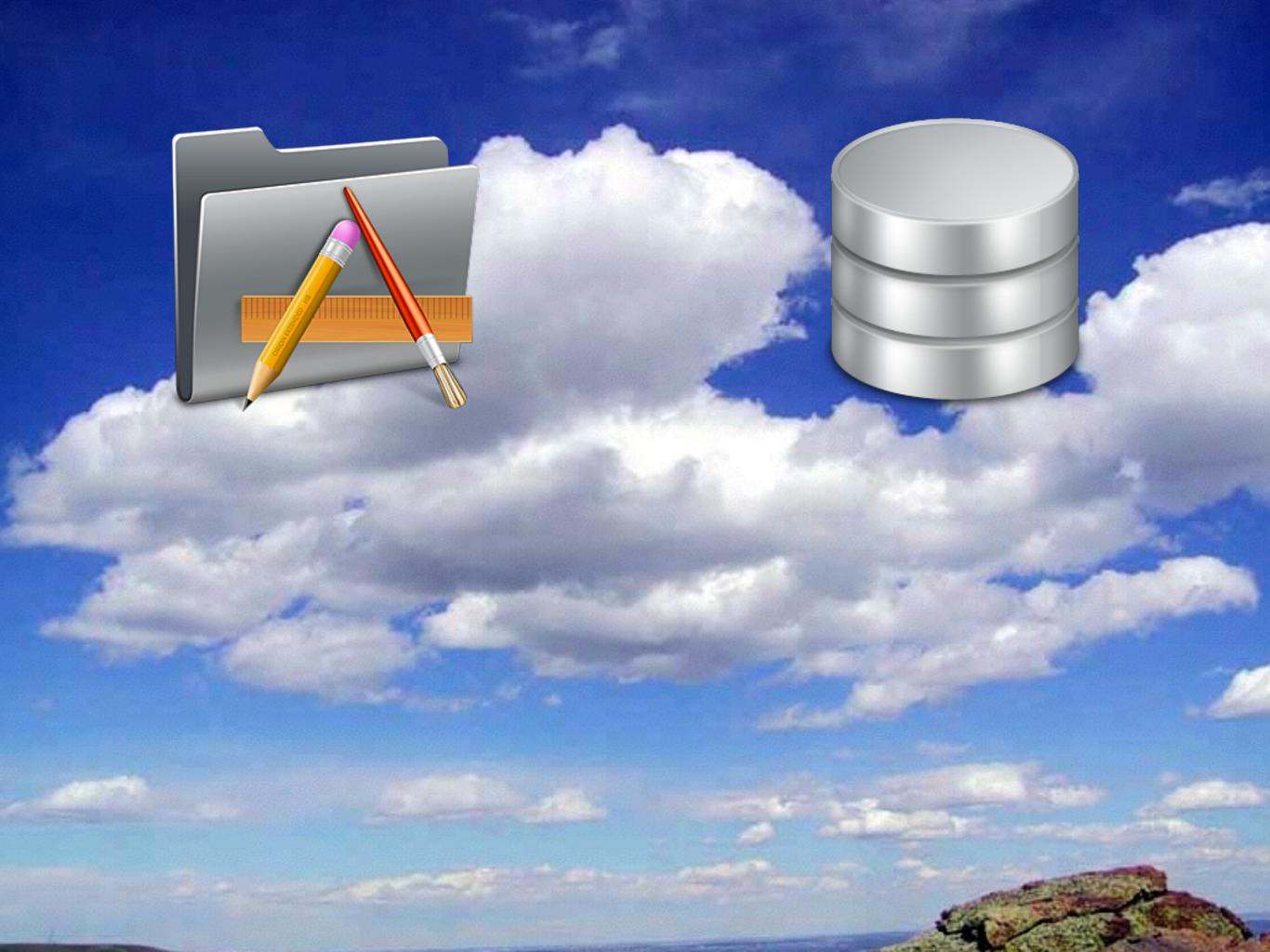
- What is the cloud?
- OU's Cloud Journey
- What does OU's cloud look like?
- How do you run a cloud?

### What is cloud?

#### [insert picture of cloud here]



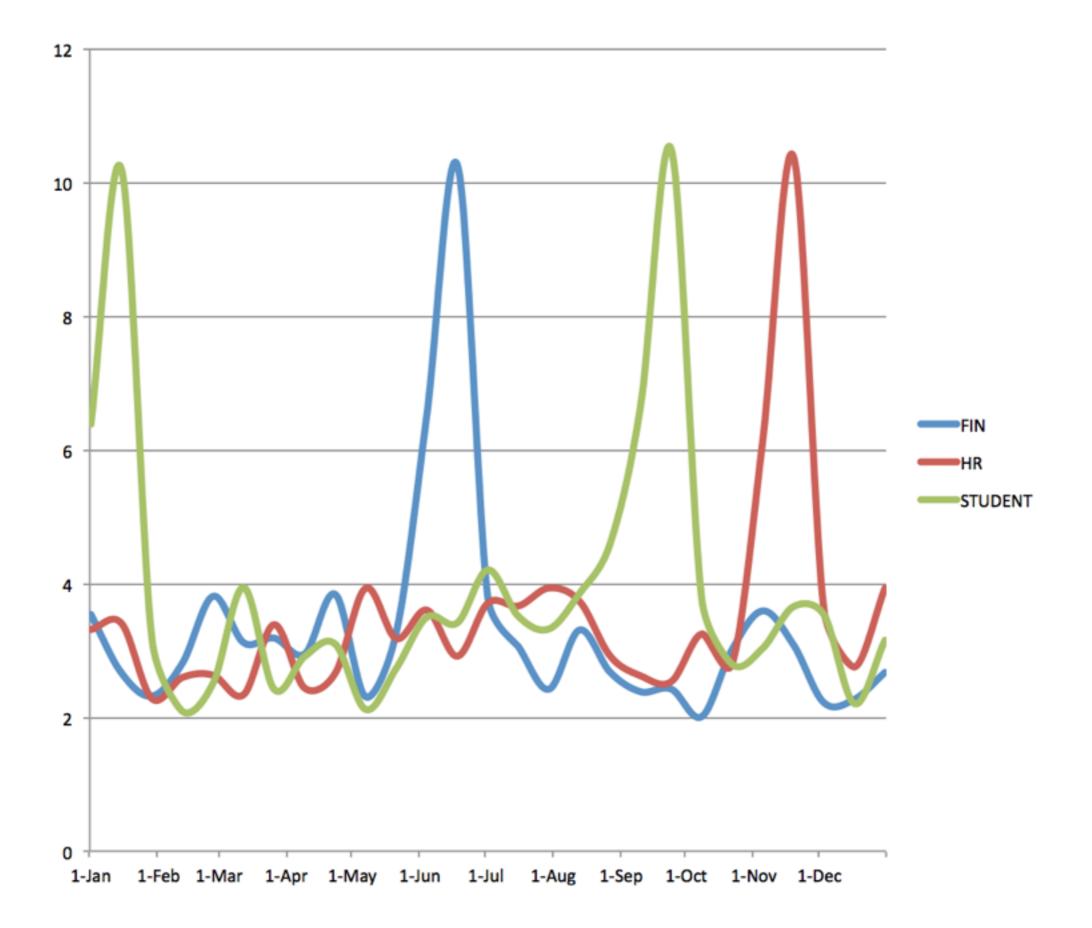


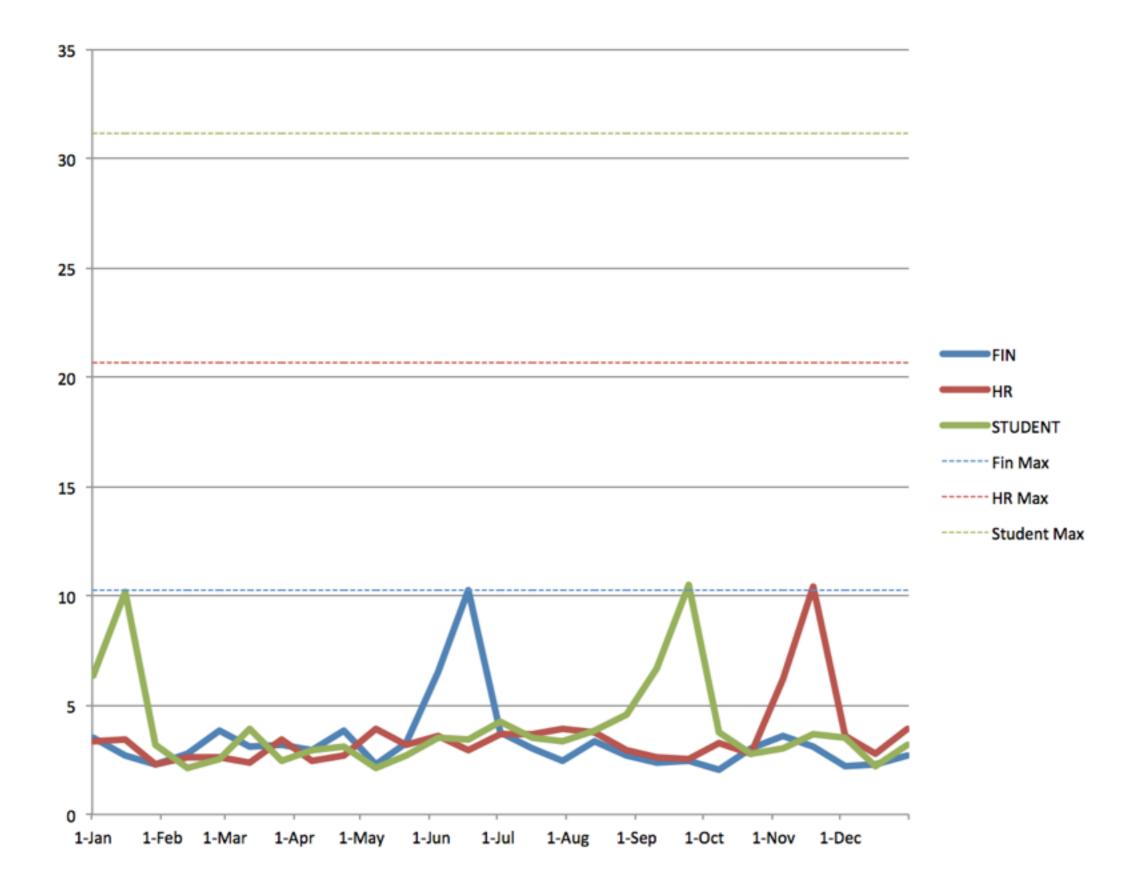


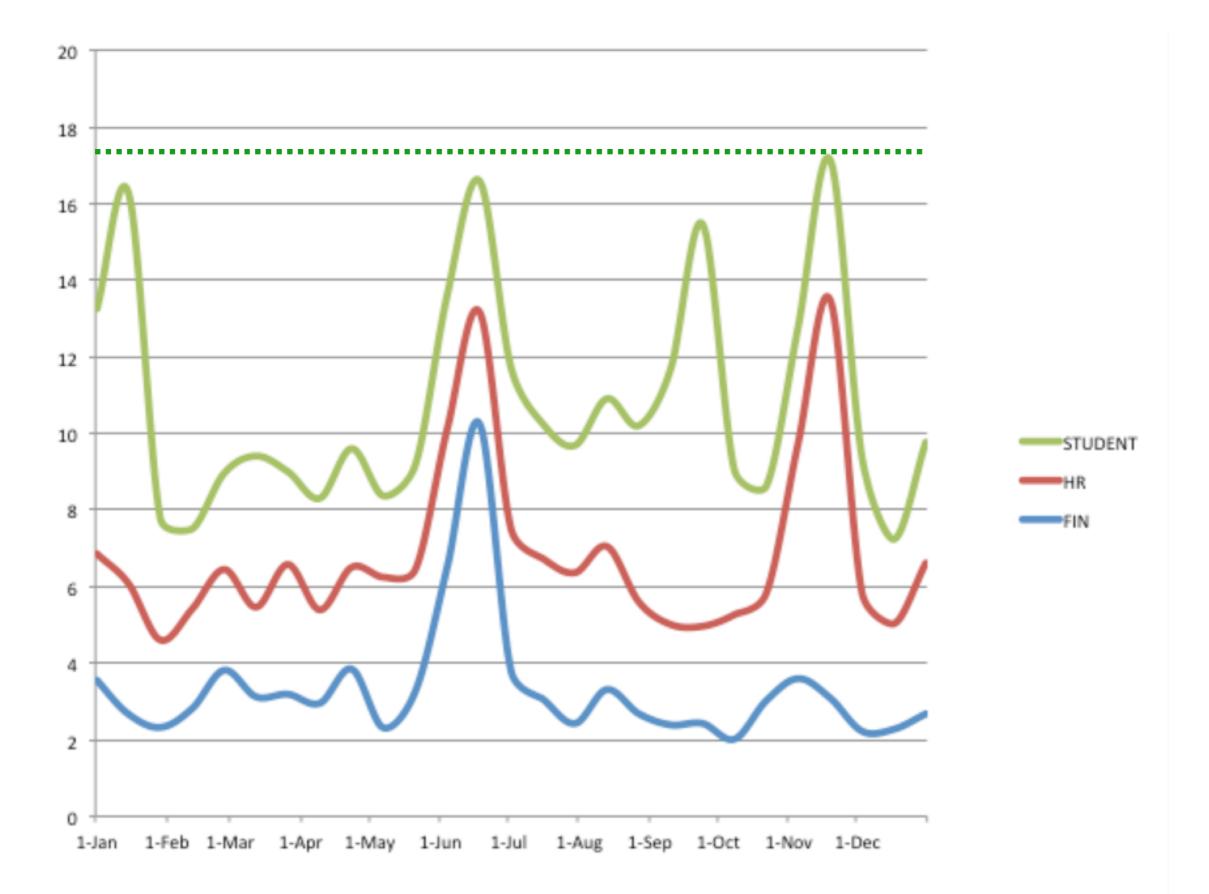
#### Caveats

- Self-service
- Broad Network Access
- Resource Pooling
- Elasticity
- Measured service









#### Caveats

- Self-service
- Broad Network Access
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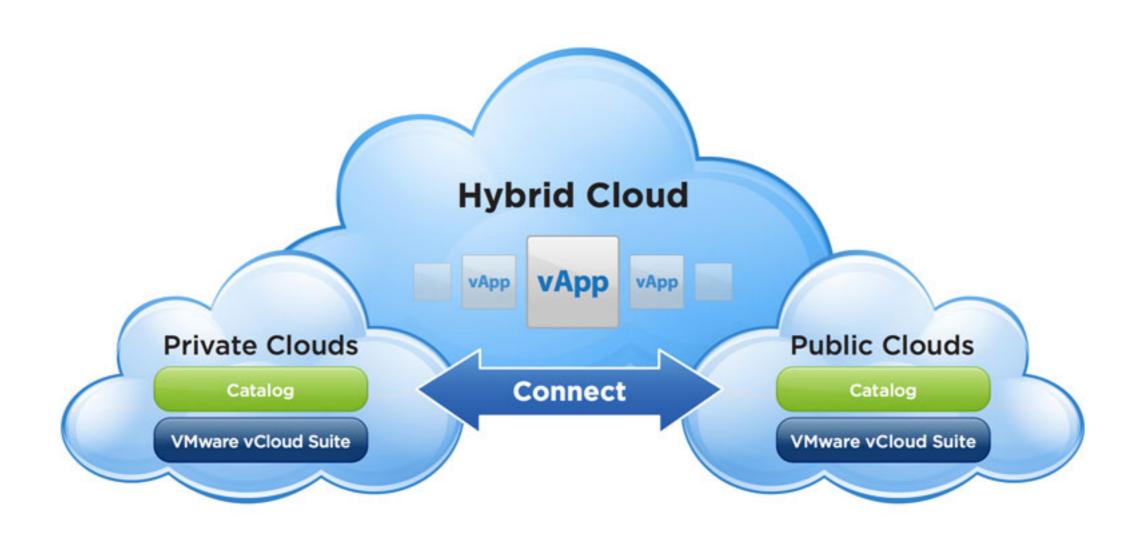


#### Three Different Kinds

- Public
- Private
- Hybrid







#### How OU Got to the Cloud

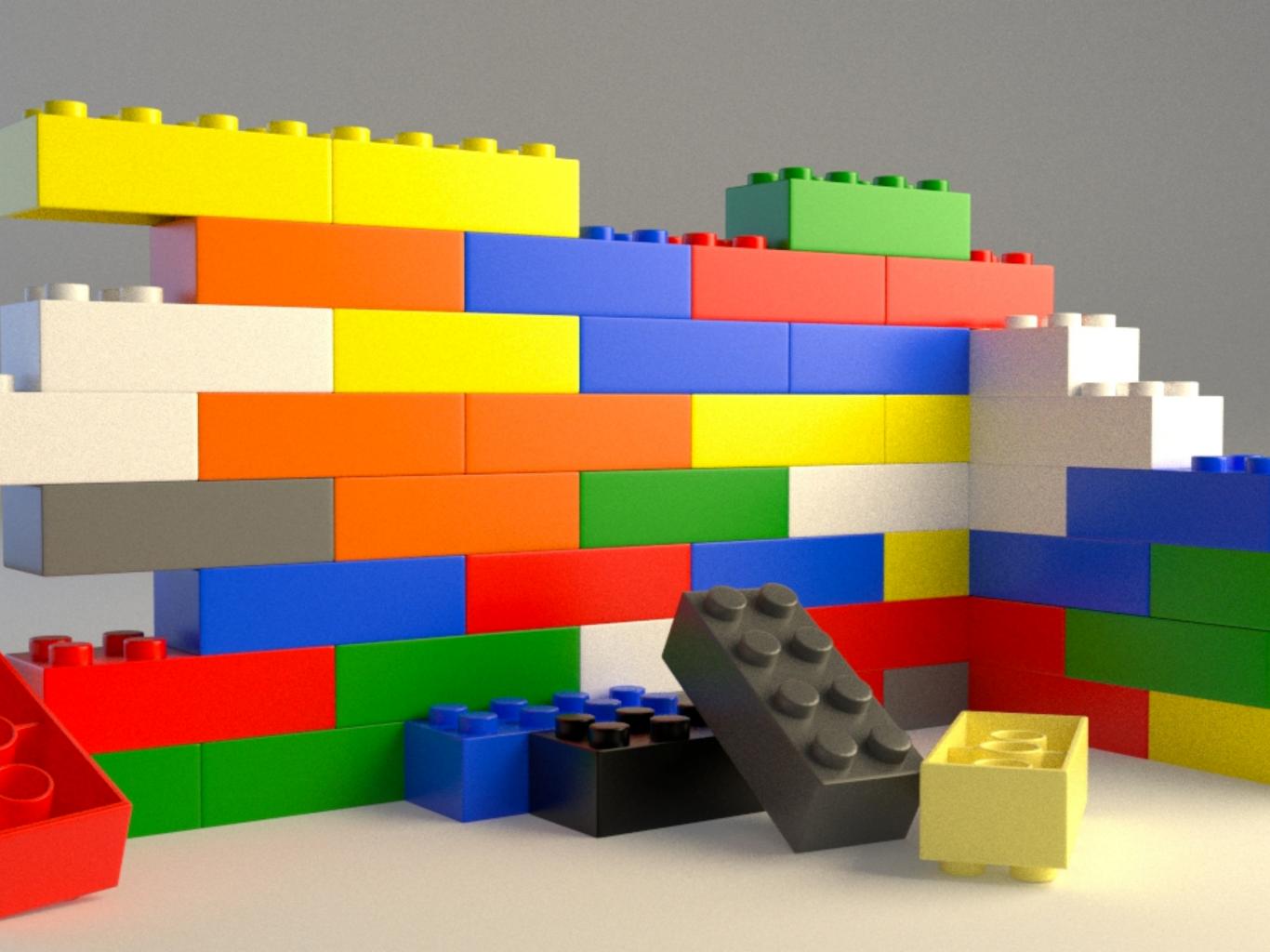


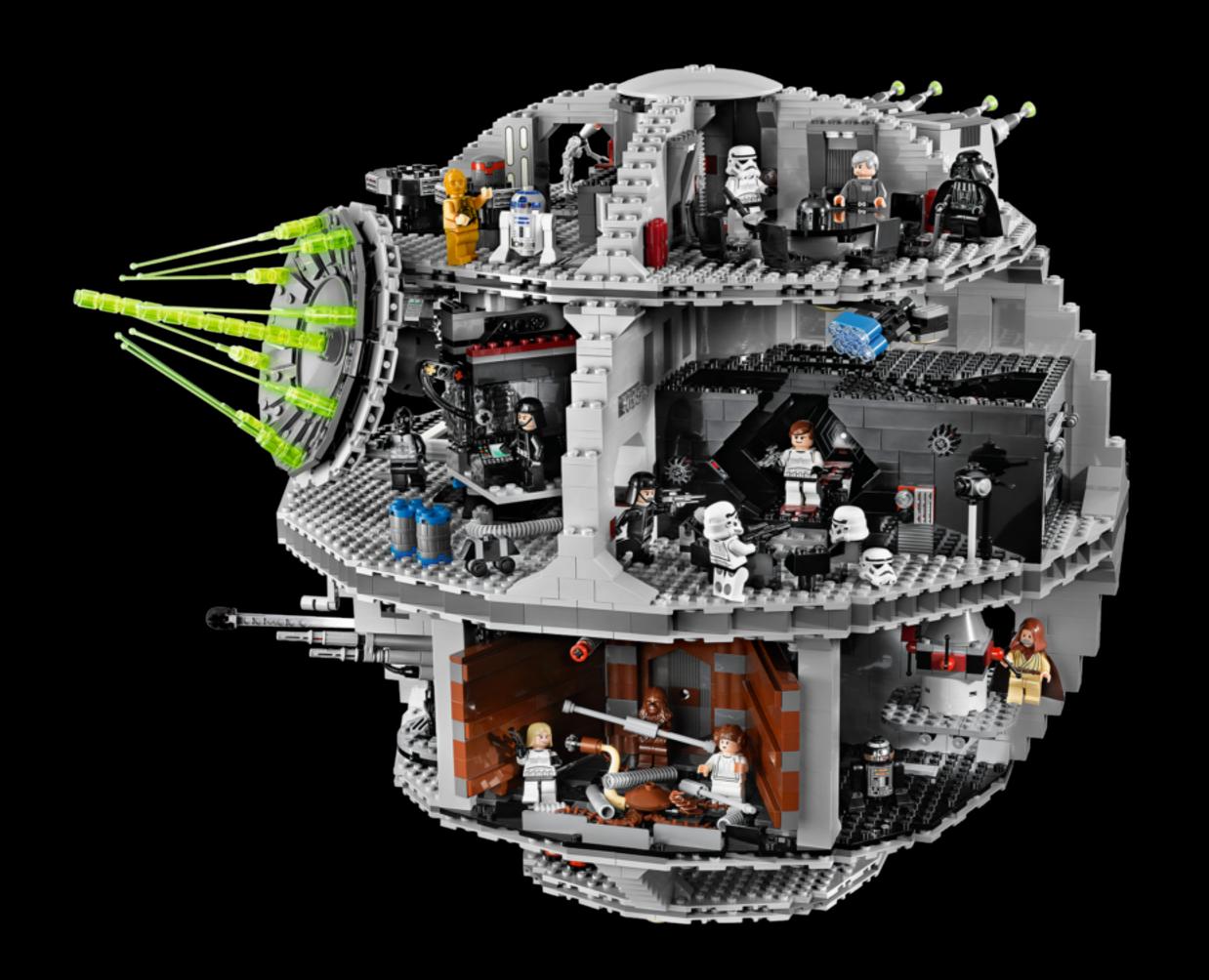


HSC oluster MAMARIA LOCAL usquere Replication RP. pesmace SOOF 55 Tulsa 52 IRAM 10NS \$. 4. RP. Distributed 52 STORAGE Resource Pool · Replication · Budeva See dispersed flut it space 52 Auto / Ida . net domain 52 Db Service NORMAN CLUSTER . Ms say server 52 FW/ Sec. . Mc Afec AV LOCAL R.P. HSC Resource POOL Tulsa Resource POOL SS RP. DEStiluted R.P.

LOCAL / HSC NARMAN SS R.P.

## What does OU's Cloud Look Like?





HARONASA TUPPOOT! - Lids 605+ - Fiber Cost FACILITY Networking Implementity. VOICE Junes service. Appliantions Bruce P Backup VM WIRE 63 Jam McCiollan Randy

SOC [INS, INS, AU]

Fireuglis | Security Soft Fireugli, TAPS

DNS LMT GANE > DC Suitching

Network Zam OMAII Runion Bolion

Andu Sanah Possible intercino font List Preve Hu Manie Gold Parent Repair Manie Glanking Clause Cl Facilities Share RKS-A-LOT.



# 3 campuses. 3 data centers.







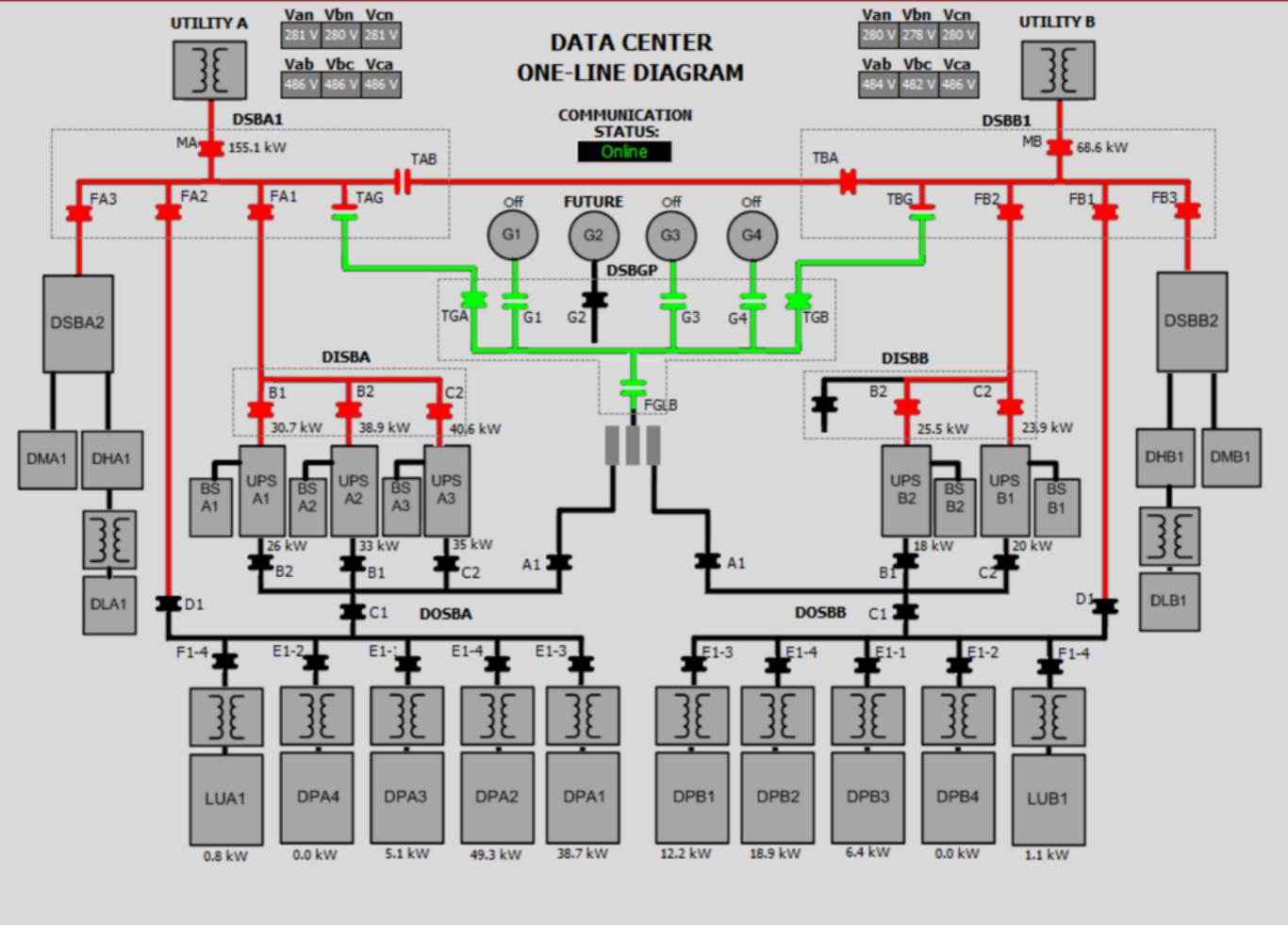


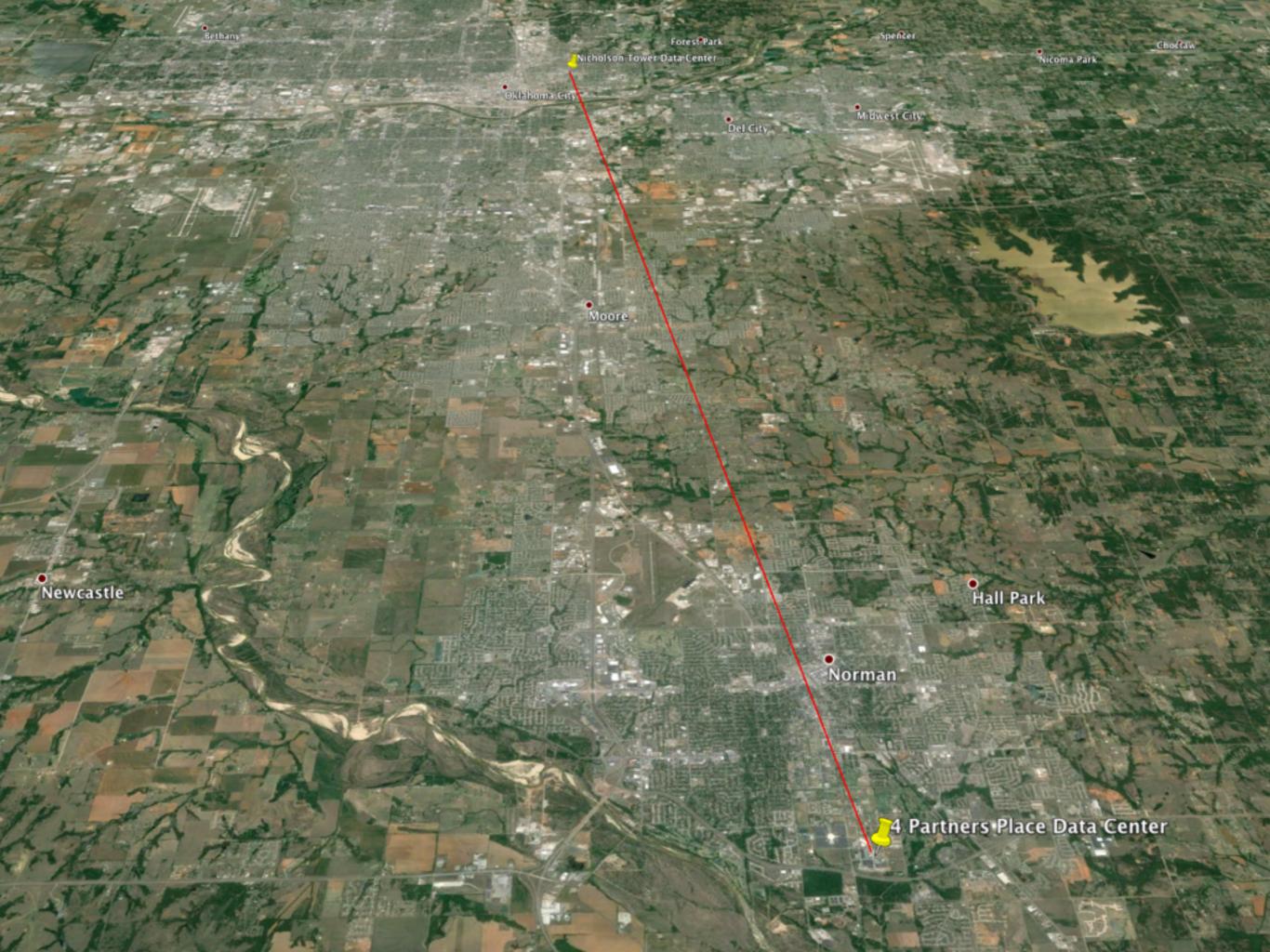




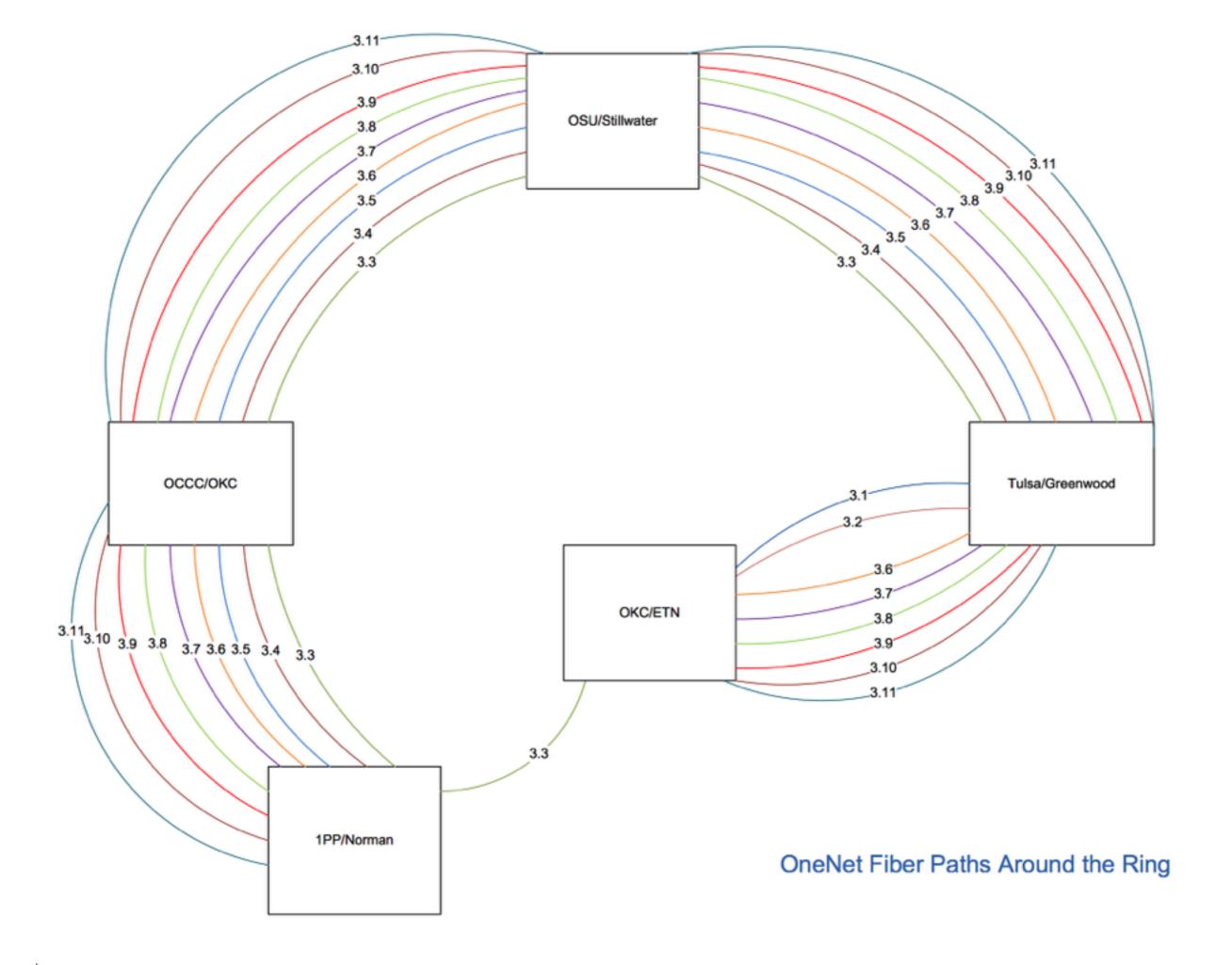








## Connectivity





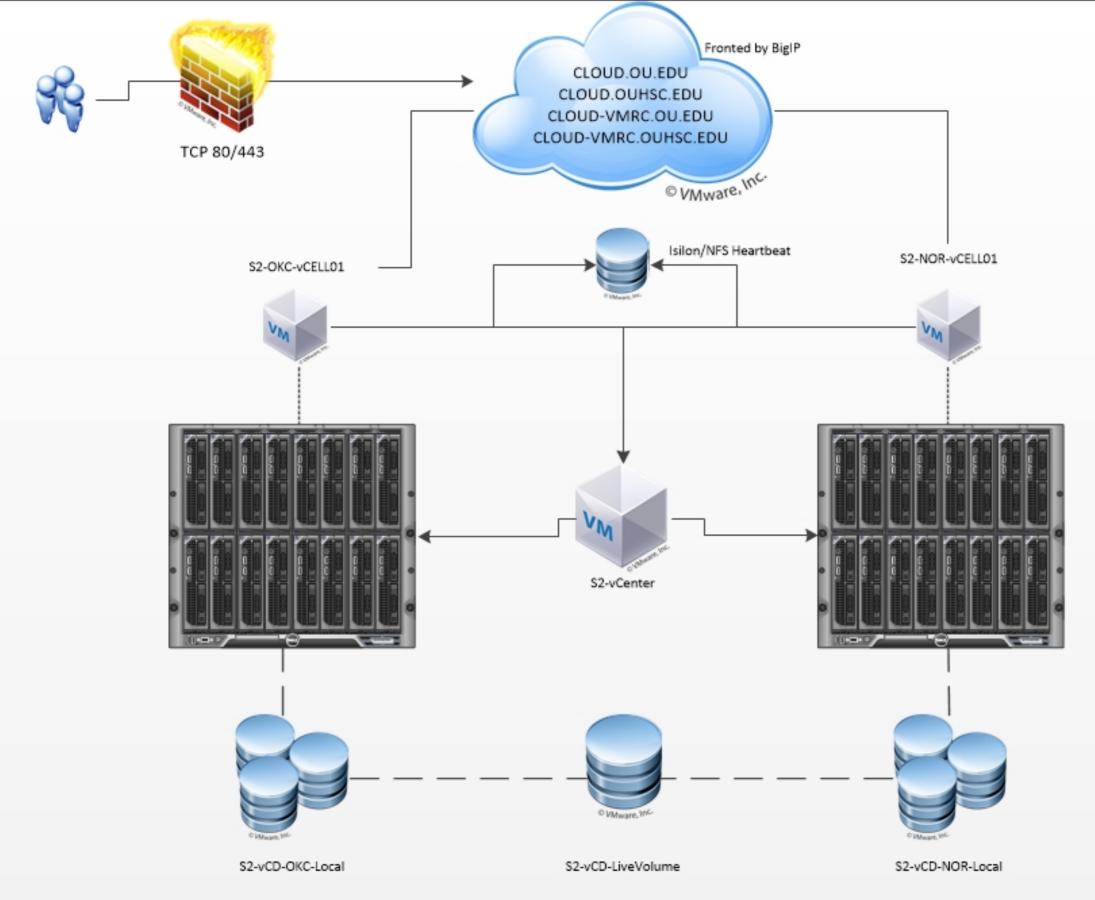
ASK TUSE ASK 10. GOT HSC Internet Peer VOC (7K'S) Edge eNet 20619 5K'S Network Core 10.69 54 PAN ISO 7 10,1 5K's Distribution No de for M.C. 619 Share IT VR's SK's (storage Row) Suited 6.91 Stack NAS Herd-End MOF 5.1.6

### Storage Platforms





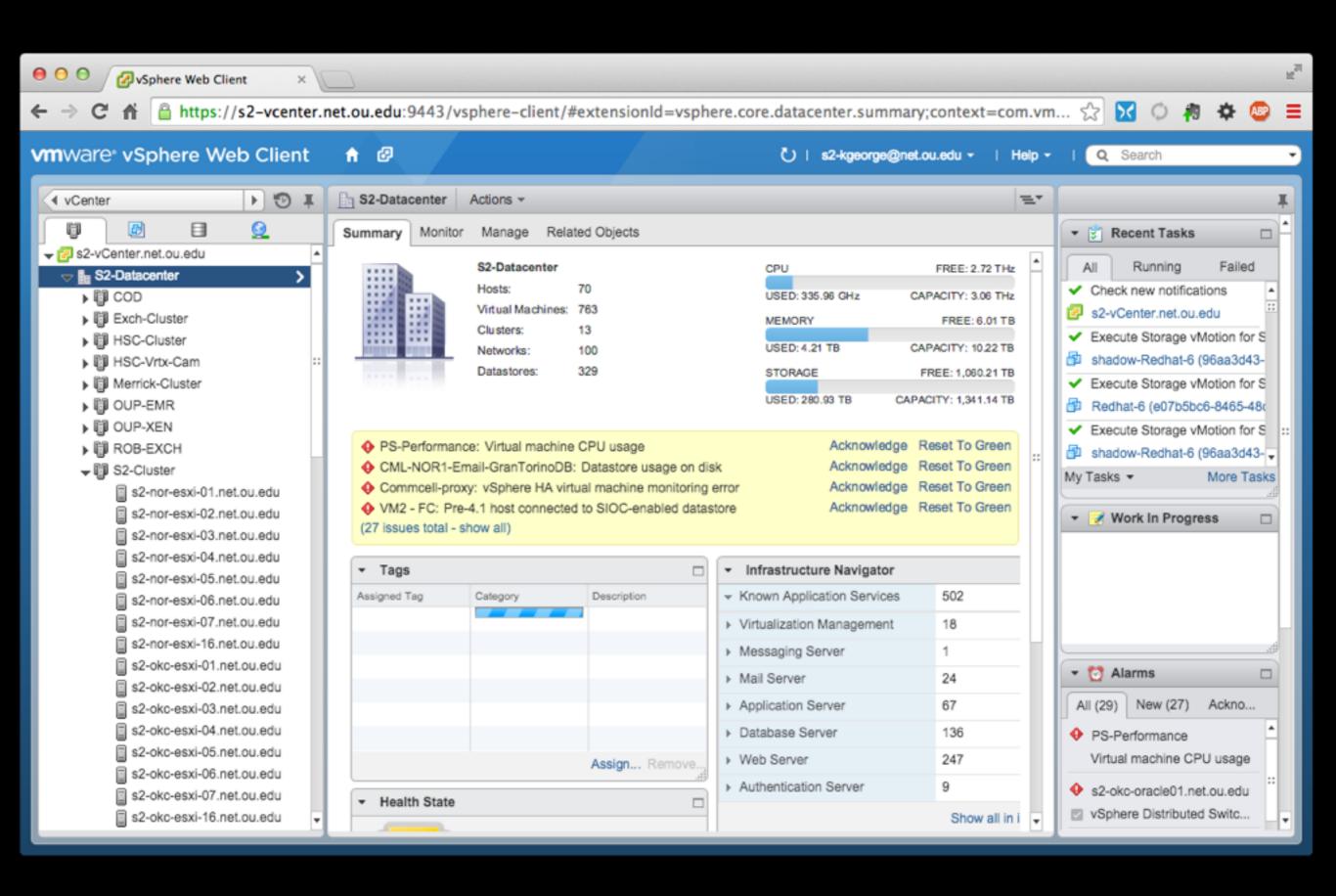
### Virtualization



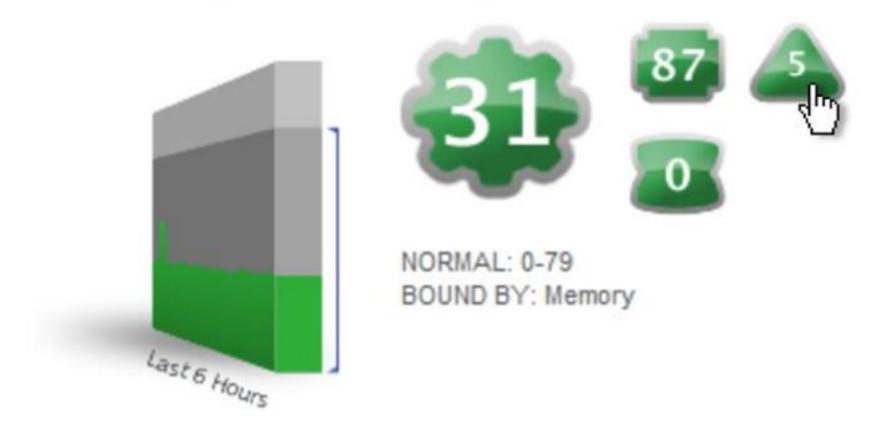
VMs ZONE: CONTROL VLAN 265 – S2 Management Tools

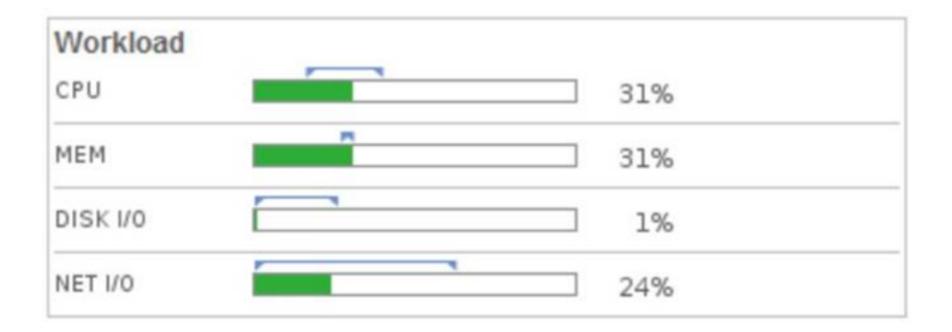
vCloud Director Ports: TCP 80,443,1099,8999,50125,61613,61616

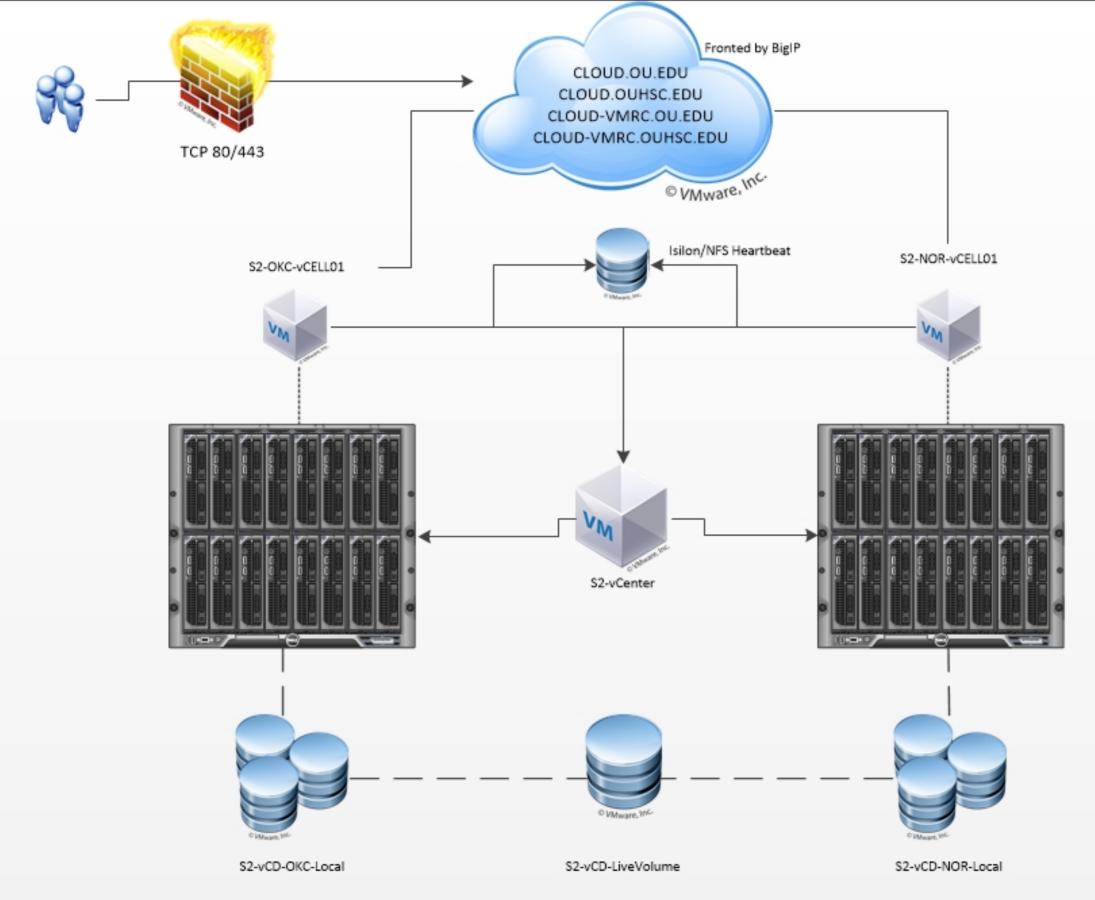
See second page for legend on what each port interacts with in the environment.



#### Workload (Cluster: S2-Cluster)



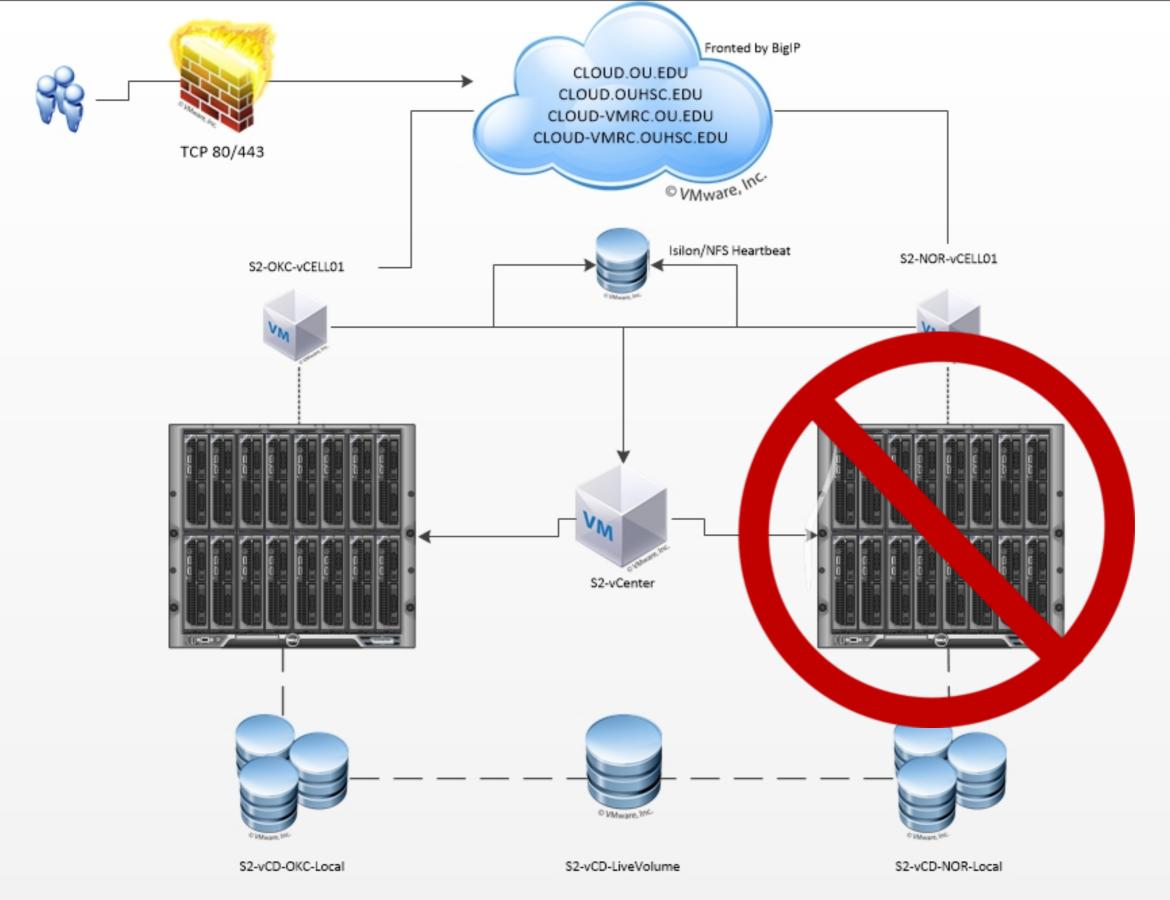




VMs ZONE: CONTROL VLAN 265 – S2 Management Tools

vCloud Director Ports: TCP 80,443,1099,8999,50125,61613,61616

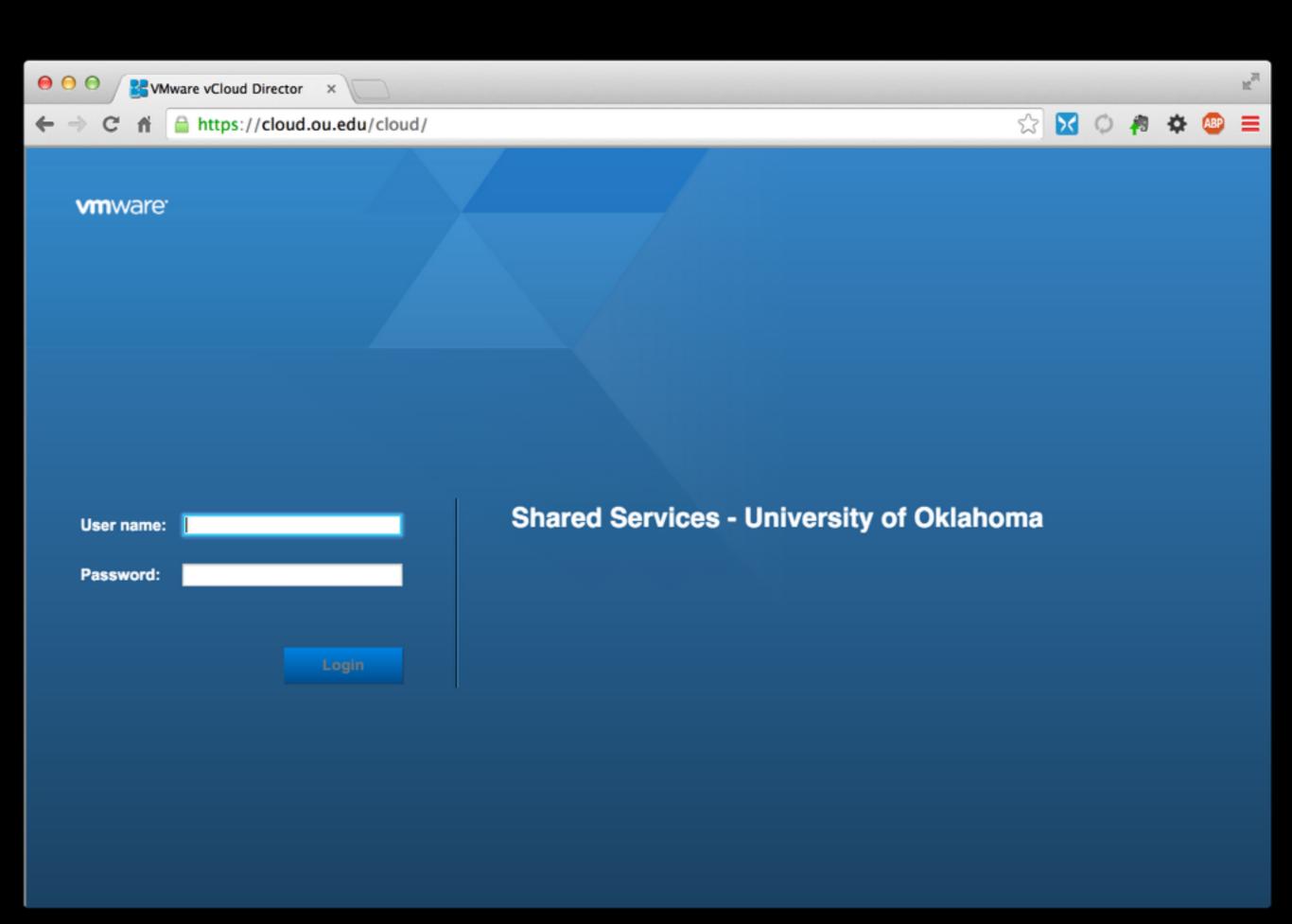
See second page for legend on what each port interacts with in the environment.

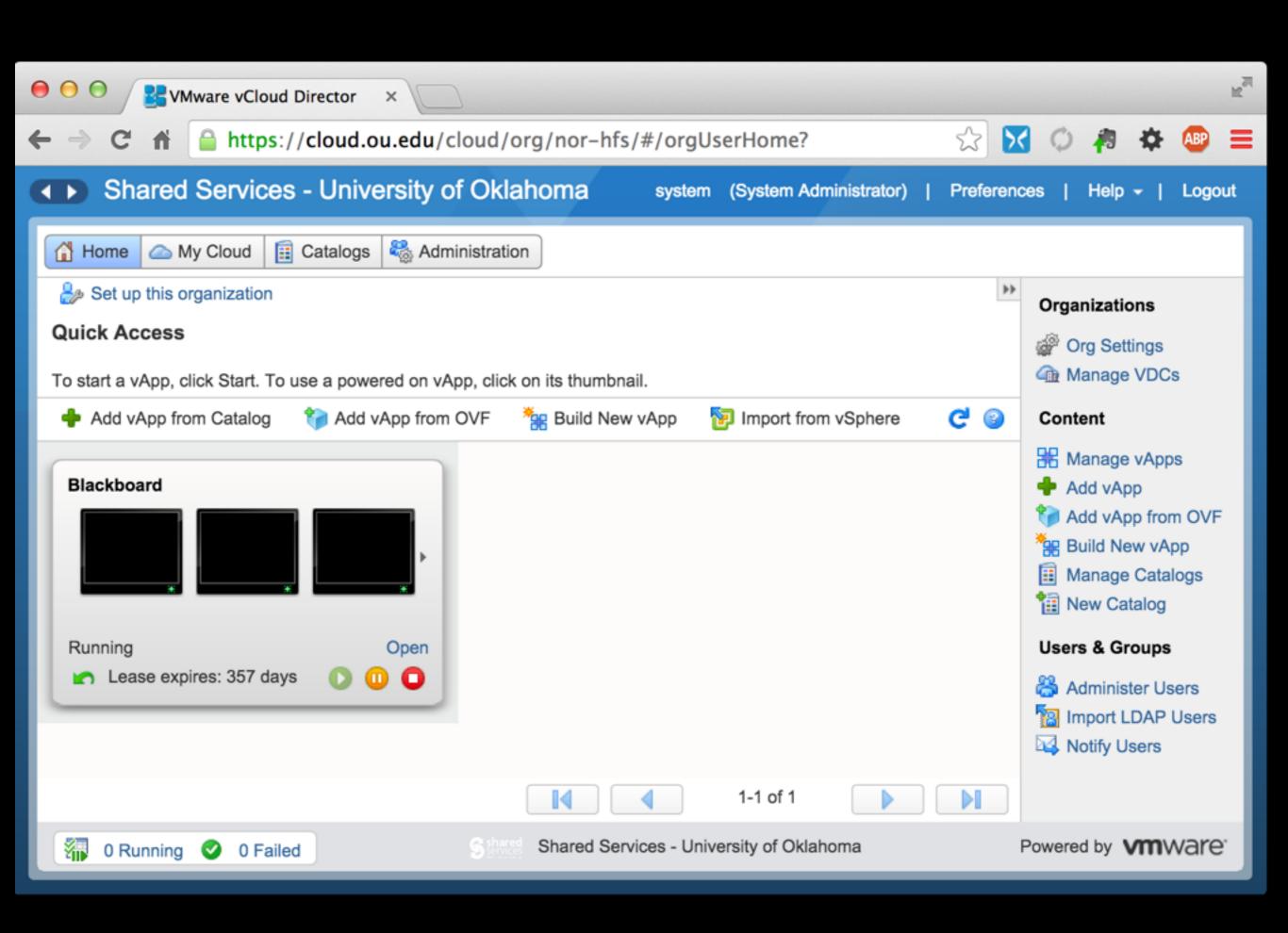


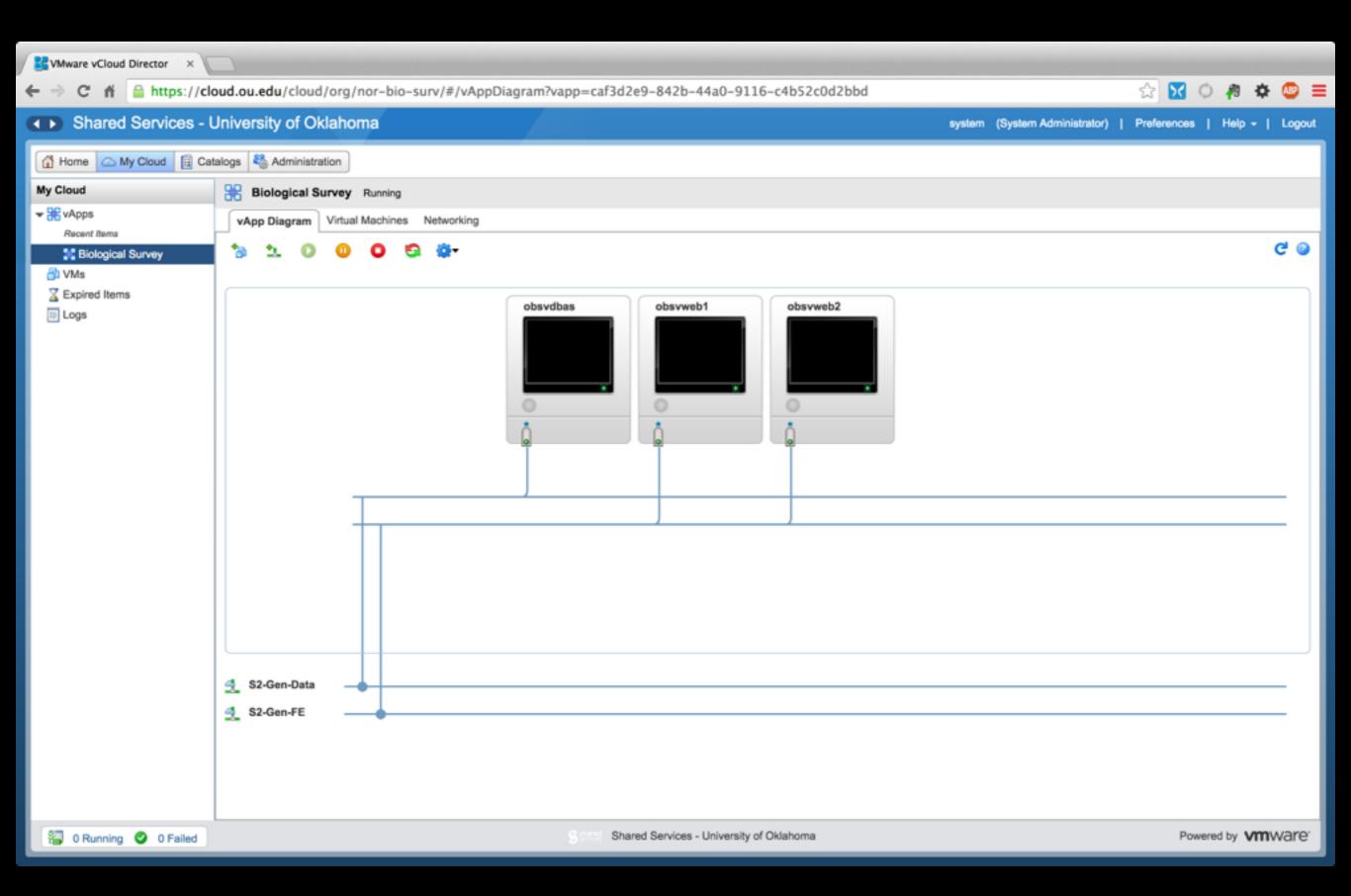
VMs ZONE: CONTROL VLAN 265 – S2 Management Tools

vCloud Director Ports: TCP 80,443,1099,8999,50125,61613,61616

See second page for legend on what each port interacts with in the environment.

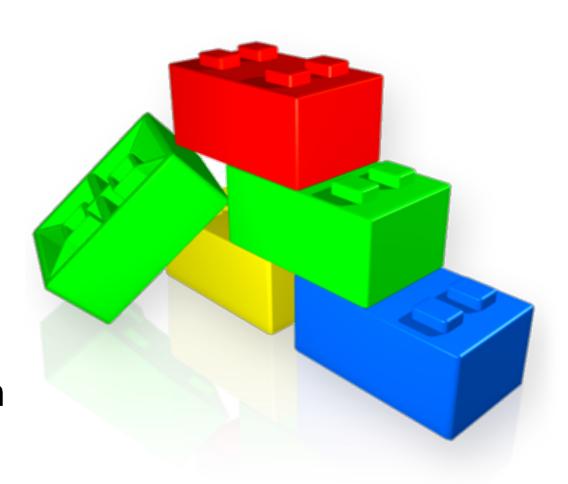






### Catalog of Services

- Colocation
- Block Storage
- File Storage
- Enterprise Backup
- Virtual Servers
- Document Collaboration
- DbaaS
- Certificates

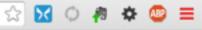


Switch to IT View











Welcome, Kendall George

search

♠ Q □ ™UNIVERSITY #OKLAHOMA



2014-09-05 - Quota violation

#### SERVICE CATALOG



Explore our service offerings and request the services you need through a simple check-out process.

Check service request status

#### TECHNOLOGY SUPPORT



Submit support requests or track and manage your open incidents using OU IT's incident management system.

Request Help

View open incidents

#### SELF HELP RESOURCES

Our self-help section can help you find answers to common questions. Learn more.

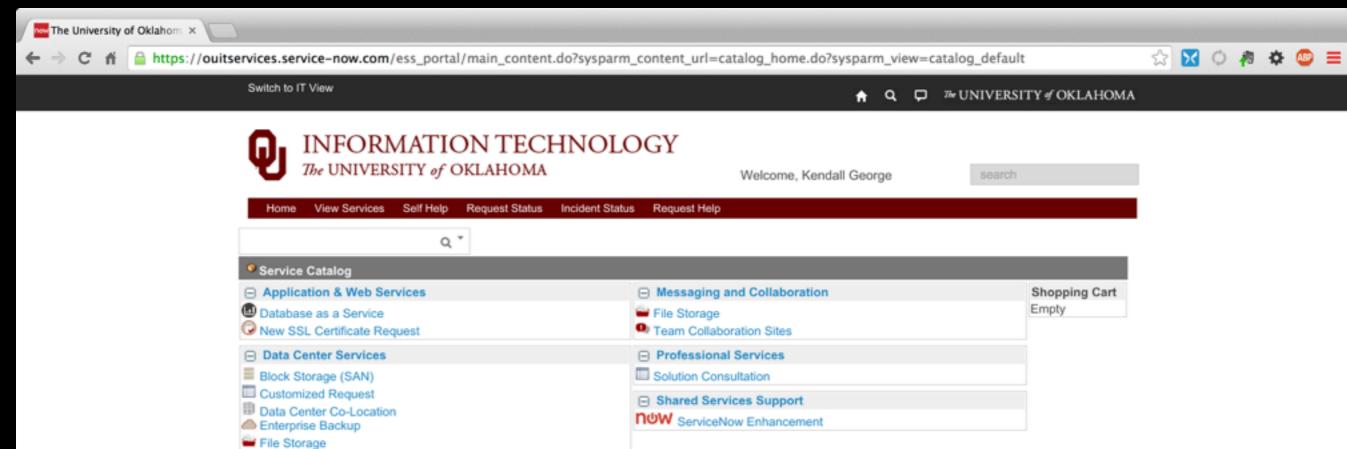


#### SITE ACCESS

Any user without an OU account that would like to request a service or submit an incident may request an account for this website only by using the self registration form.



NORMAN CAMPUS HSC CAMPUS TULSA CAMPUS



Virtual Server Hosting



## What runs on our cloud?

# A bunch of stuff everybody does...

back-up archivingfile shares developer support budgeting Services DHCP. facilities monitoring monitoring SharePoint Web messaginglicense management certificate management benefits management Remote Desktop accounts management Apache Terminal Server collaboration directory services document imaging system patching Conferencing accounting accounting www.ou.eduprovisioning human resources payroll, virtualizationdatabase XythosVoice Mail WebEx email Plesk

# Stuff specific to education...

video capture tutoring
Computer labs
Appointment Management game footage
Electronic Medical Records learning management system
classroom scheduling iTunesUID cards
student systempayment systems
degree advising
distribution

Athletics
Athletics
Appointment Management game footage
learning management system
card system
cash registers
Health Clinic

#### And healthcare like...

## EMR

### Also research...

## supercomputing GISWeather



### Running a Cloud

### Who?



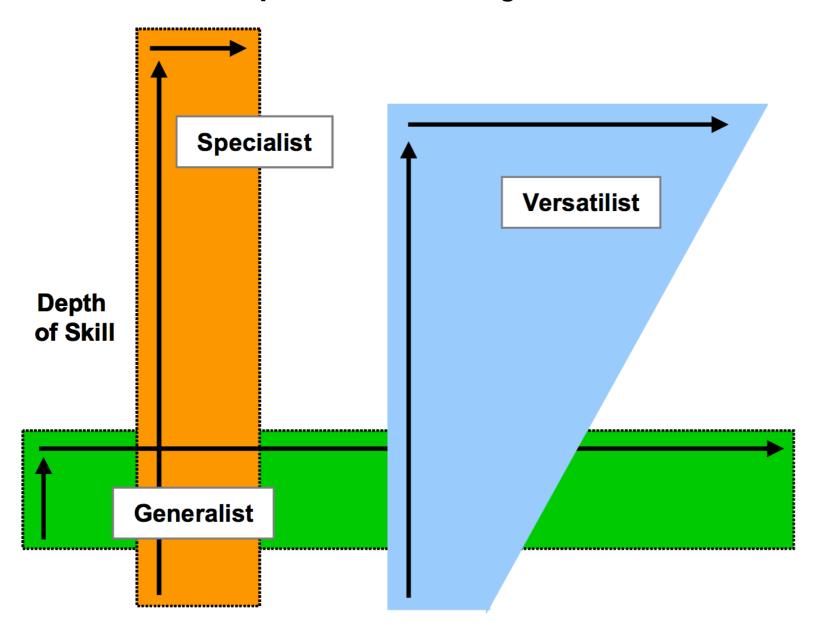


### Operations Team

- Fractional
- 15 systems administrators
- All three campuses
- On average ~75%
- ~ II FTE equivalent
- Versatilists
- Also 2 facilities managers
- 24/7 on-call



#### **Scope of Roles and Assignments**



#### **Specialist**

- Deep Skills
- Narrow Scope
- Peer-Recognized
- Unknown Outside Domain

#### **Generalist**

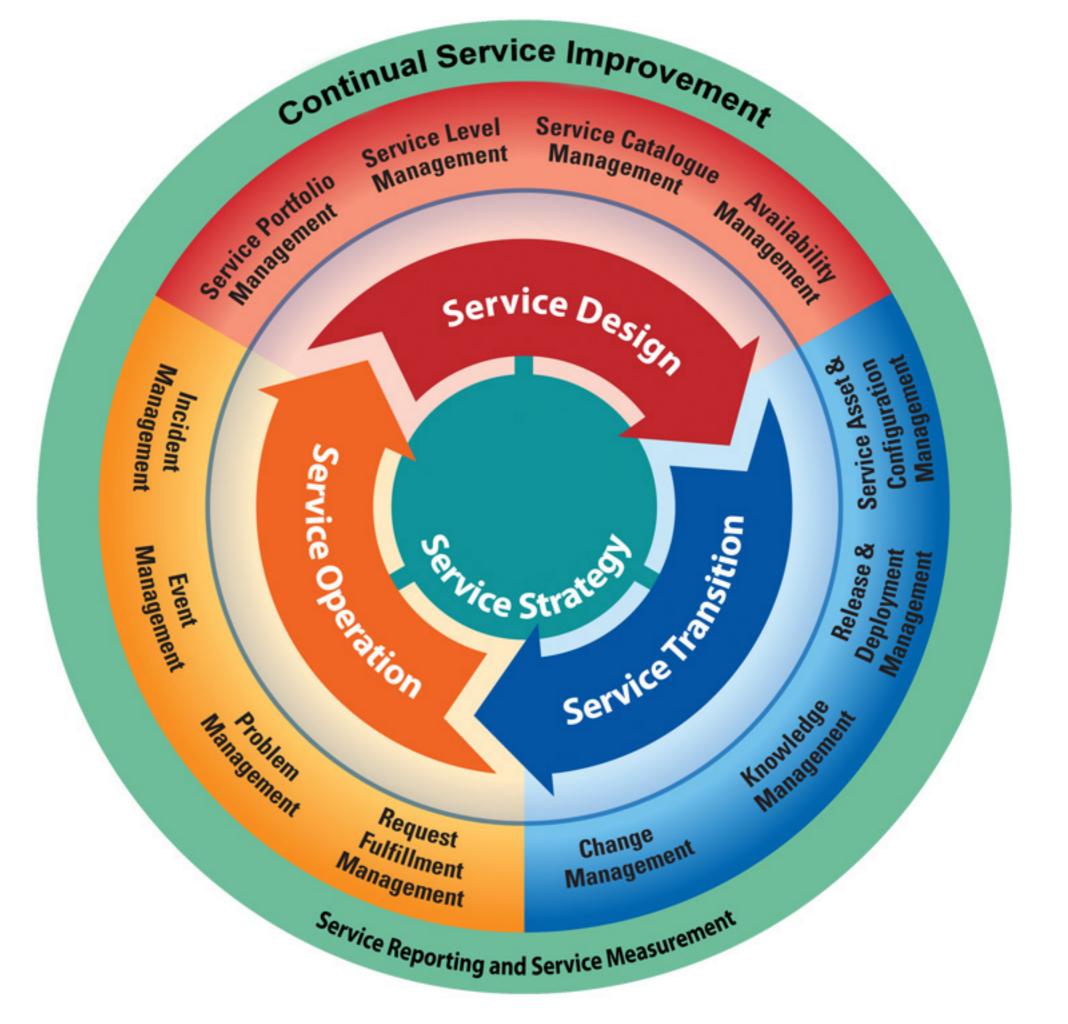
- Broad Scope
- Shallow Skills
- Quick Response
- Others Lack Confidence

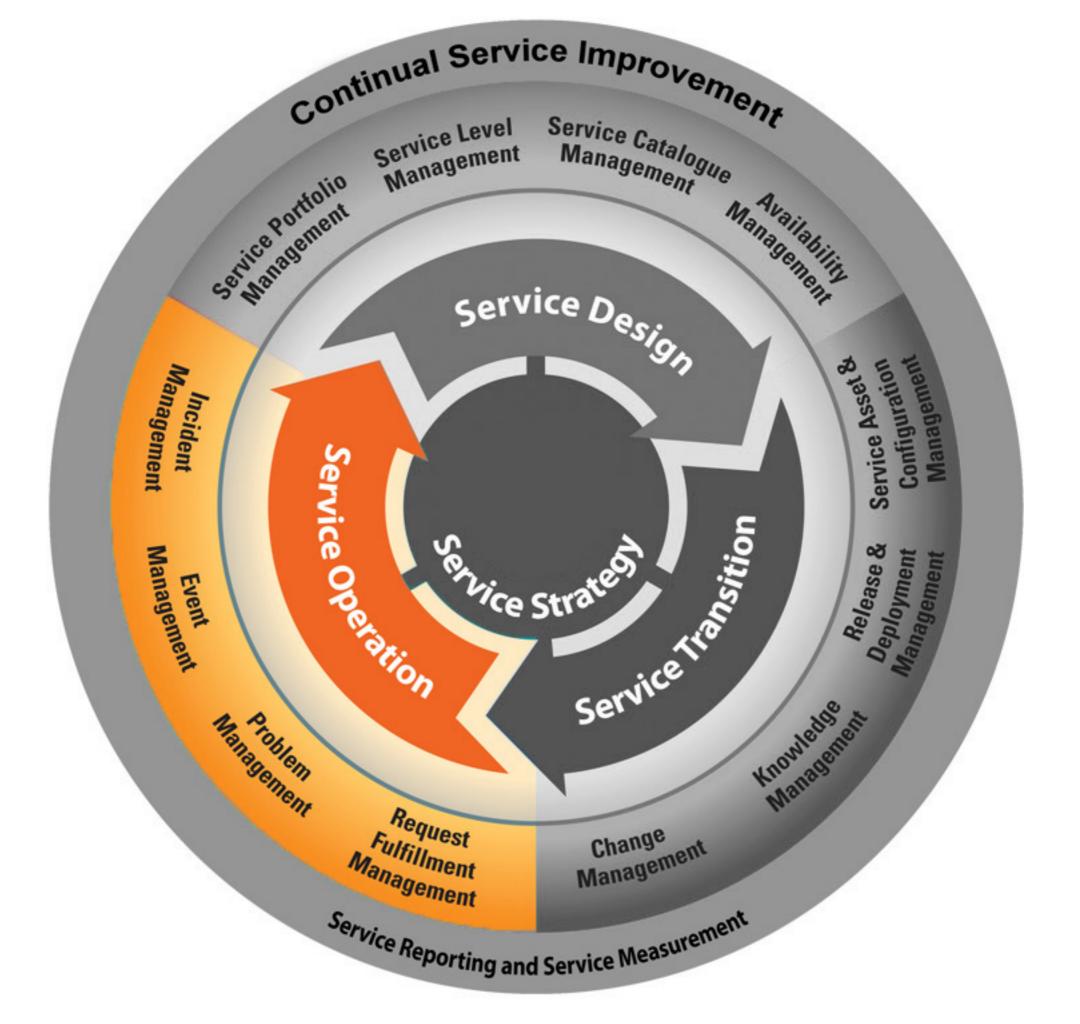
#### **Versatilist**

- Deep Skills
- Wide Scope of Roles
- Broad Experience
- Recognized in Other Domains

Source: Gartner (November 2006)

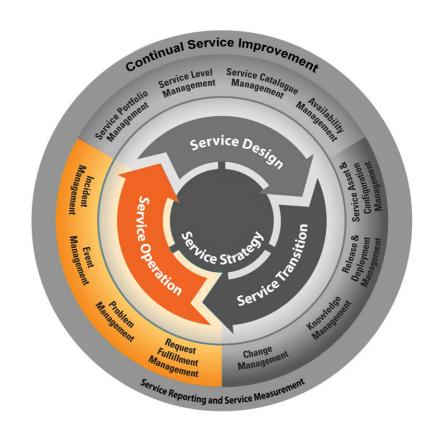
### What do we do?



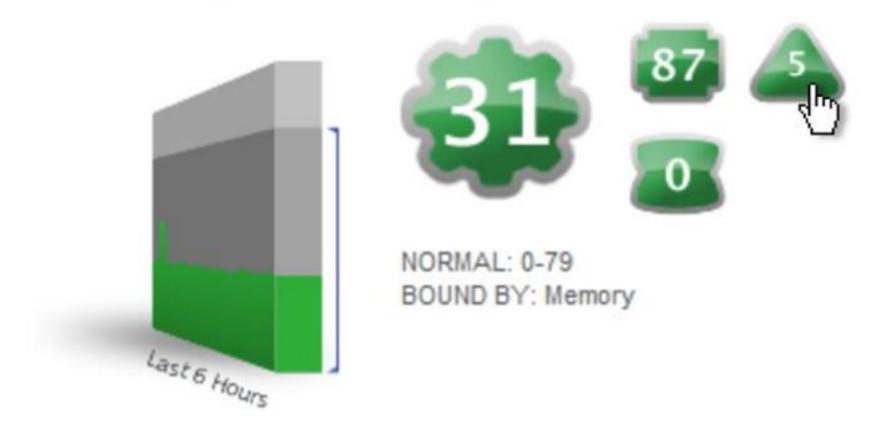


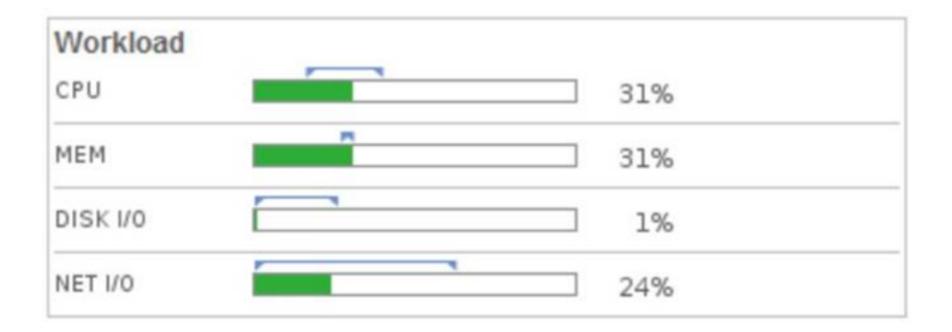
### Operations Activities

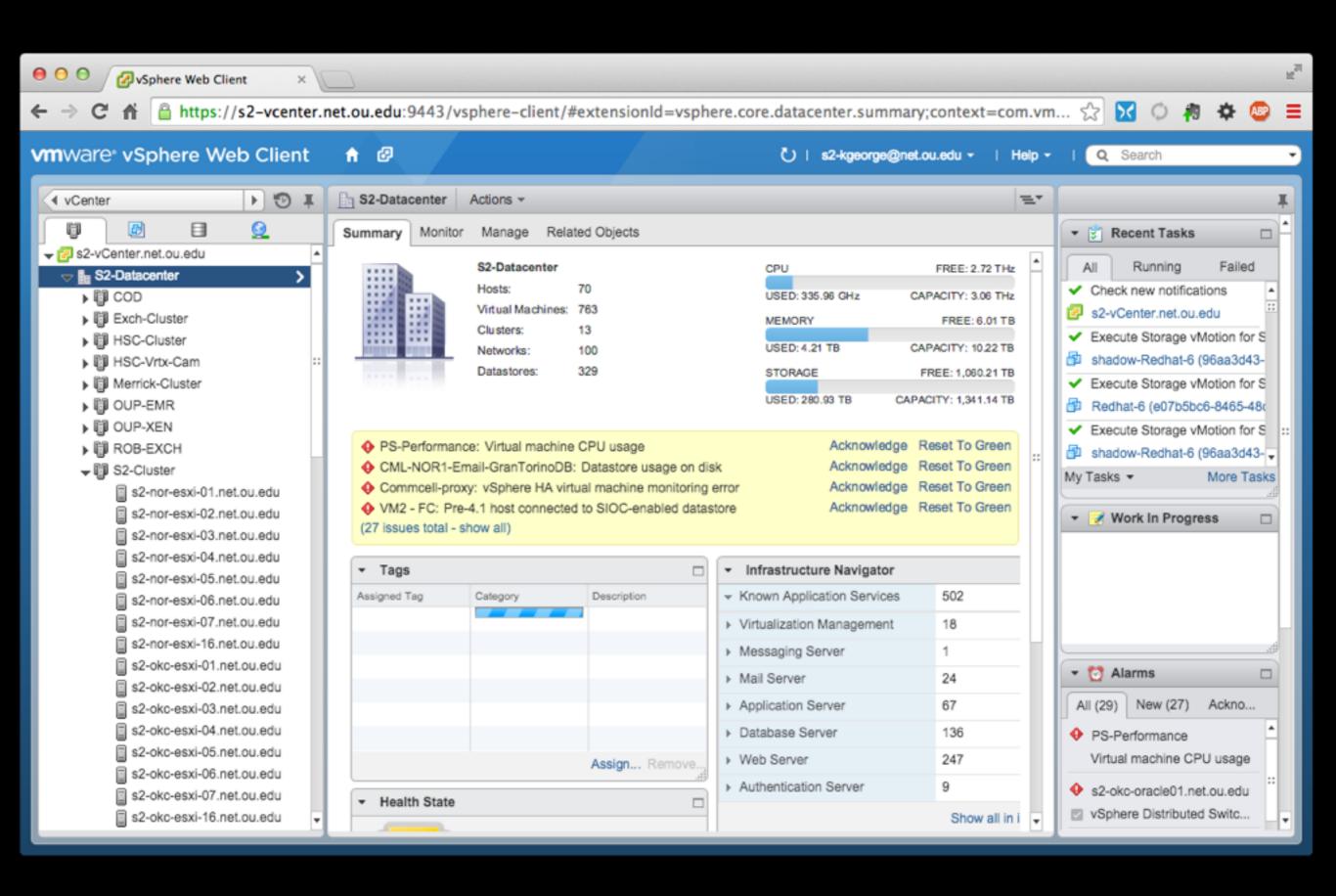
- Request Fulfillment
- Event Management
- Incident Management
- Problem Management



#### Workload (Cluster: S2-Cluster)









1 (210) 100-032

Details

Text Message Today 1:58 AM

1 of 2

FRM:it-operations@ouhsc.edu

SUBJ:Niagara Alarm From

M1BUtility

MSG:Source: M1BUtility

Timestamp: 02-Oct-14 1:58:00

AM CDT

State:

(Con't) 2 of 2

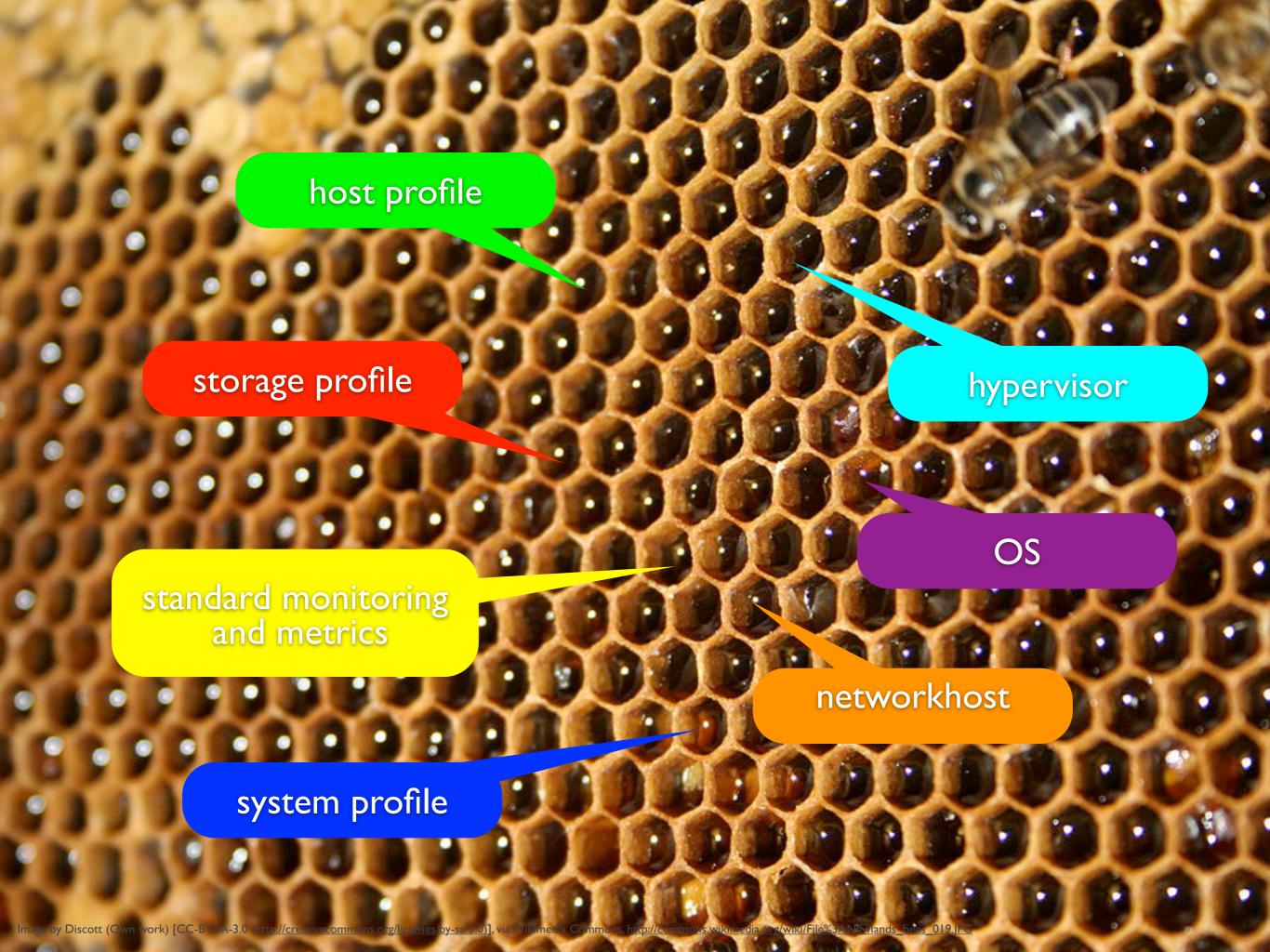
Offnormal / Unacked

Alarm Class: Critical\$20Alarms Text: Loss of Utility Power

(End)

### Design Considerations

- Standardization
- Enterprise
- Resiliency
- Availability
- Business continuity
- Disaster recovery





#### Other Considerations

- 24/7 Ops
- Physical Security
- Change Management
- Documentation
- Training
- Billing
- ...



### Questions?

