

NSF grant award #1205077

NSF NVC Report Georgia Southern University

April 2014

Leadership Team: Dr. Timur Mirzoev
NDG | VMware | EMC



Dr. Mirzoev, Mr. R. Alvarez

The goals set and achieved


- GA Southern's commitment on this project is to support the following classes with virtual labs for 10 partner schools:
 - VMware vSphere Install Configure Manage (ICM)
 - EMC Information Storage and Management (ISM)
- ALL TASKS ARE NOW COMPLETE**
- New class is developed with brand new virtual labs:**
 - vCloud Director: Install Configure Manage



Dr. Mirzoev, Mr. R. Alvarez

IT Infrastructure


- To increase IT efficiency, the Cloud Computing Research Laboratory (CCRL) at Georgia Southern University received software and hardware upgrades in 2014.
- RAM Memory and Storage Upgrades took place in March and April respectively.
- Result: Increased Virtual Machine density



Dr. Mirzoev, Mr. R. Alvarez

Hardware Summary


- Dell PowerEdge R610 Servers
 - Currently 5 servers, and 2 servers will be added to increase capacity
- Per server features:
 - Dual Intel Xeon E5530 @ 2.40GHz CPUs
 - 192GB RAM
 - 12 1Gbps Network Adapters
 - 4.5 TB local storage



Dr. Mirzoev, Mr. R. Alvarez

Software Summary


- VMware vSphere 5.1 Enterprise Plus
 - VMware vCenter Server 5.1
 - ESXi 5.1
 - VMware IT Academy (VITA) licensing
- NETLAB
 - NETLAB PE 2014.R1.Final



Dr. Mirzoev, Mr. R. Alvarez

VM Density


- 1,000 Virtual Machines per physical server
 - Standard VM configuration: 1 vCPU, 512MB RAM, 10GB HD
 - UP to 5,000 VM support
- Approx. 625 VMs per Partner College



Dr. Mirzoev, Mr. R. Alvarez

NETLAB+ (NDG)

- Remote access to virtual machines
 - Access to complete lab environment via http
 - Access to curriculum from school or home
- Multiple classes during the same term
 - Resource scheduling



Dr. Mirzoev, Mr. R. Alvarez

Course Development


- VMware – ICM 5.1
 - Industry leader in virtualization
 - Currently required by VMware before testing for certification.
 - 2 classes Fall 2013 test run



Dr. Mirzoev, Mr. R. Alvarez

Course Development


- EMC –
 - SAN Configuration and Administration
 - 1 class Fall of 2013 test run
 - 1 class Spring of 2014 test run
 - International connectivity test for labs was successful



Dr. Mirzoev, Mr. R. Alvarez

Publications to date


- ✓ Mirzoev, T., Alvarez, R. (2013). **Leveraging VMware vCloud Director Virtual Applications (vApps) for Operational Expense (OpEx) Efficiency.** World of Computer Science and Information Technology Journal (WCST) ISSN: 2221-0741, Vol. 3, No. 9, pp.156-163
- ✓ Mirzoev, T., Alvarez, R. (2013). **Using VMware vCloud Director (vCD) to Extend VMware vSphere Environments.** "Information Technology: Economics, Technology, Education". IV International Scientific Conference Students and Young Scientists.
- ✓ Mirzoev, T., Alvarez, R. (2013). **Leveraging VMware vCloud Director to Provision Infrastructure-as-a-Service (IaaS).** Computer science for the Information Society, Vol. 4. ISSN 2306-7233 (Online) ISSN 2306-6962 (Print)



Dr. Mirzoev, Mr. R. Alvarez

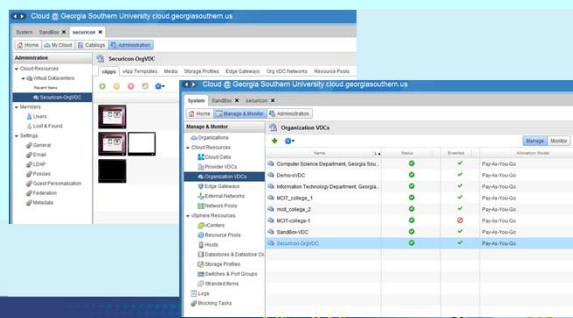
Future Plans

- Upgrade existing 1GigE core networking to 10GigE
- Increase VMware vCloud Director utilization
 - Install, Configure, Manage [V5.5] (Training)
 - Information Storage and Management (Training)
 - vCD Virtual Applications for other academic purposes
- Migration to vCloud Automation Center




Dr. Mirzoev, Mr. R. Alvarez

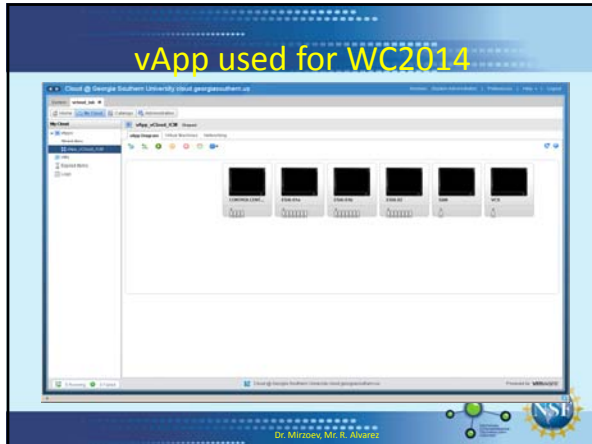
VMware vCloud Director - GSU



Name	State	Ready	Power On	Power Off
Cloud Data	OK	✓	✓	✓
Organization VDC	OK	✓	✓	✓
Edge Gateway	OK	✓	✓	✓
Information Technology Department, Georgia	OK	✓	✓	✓
net_lab_1	OK	✓	✓	✓
net_lab_2	OK	✓	✓	✓
net_lab_3	OK	✓	✓	✓
net_lab_4	OK	✓	✓	✓
net_lab_5	OK	✓	✓	✓
net_lab_6	OK	✓	✓	✓
net_lab_7	OK	✓	✓	✓
net_lab_8	OK	✓	✓	✓
net_lab_9	OK	✓	✓	✓
net_lab_10	OK	✓	✓	✓
net_lab_11	OK	✓	✓	✓
net_lab_12	OK	✓	✓	✓
net_lab_13	OK	✓	✓	✓
net_lab_14	OK	✓	✓	✓
net_lab_15	OK	✓	✓	✓
net_lab_16	OK	✓	✓	✓
net_lab_17	OK	✓	✓	✓
net_lab_18	OK	✓	✓	✓
net_lab_19	OK	✓	✓	✓
net_lab_20	OK	✓	✓	✓



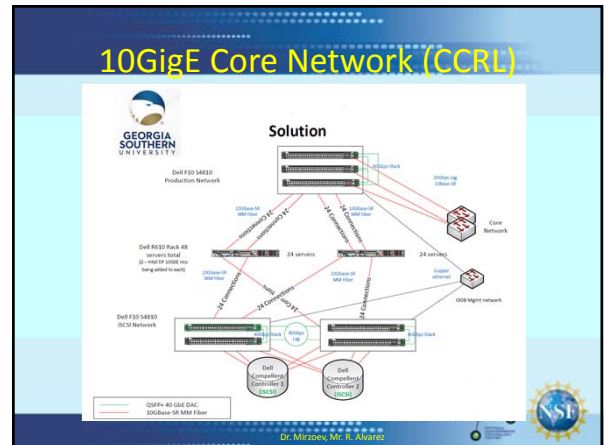
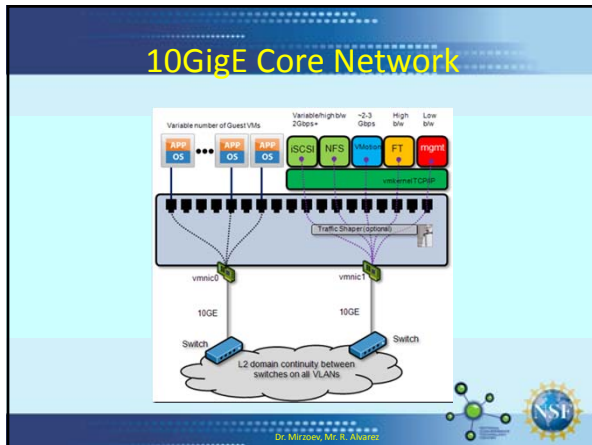
Dr. Mirzoev, Mr. R. Alvarez



10GigE

- Why 10GigE?
 - In the world of 10GigE, there is no need to dedicate vmnics (physical NICs) to each of the various traffic types. VLANs provide logical separation and 10GigE interfaces provide sufficient bandwidth and a better performing way to handle the vmkernel and VM traffic loads from ESXi hosts.

Dr. Mirzoev, Mr. R. Alvarez



Questions?

Dr. Mirzoev, Mr. R. Alvarez