NOAA
Web Operations Center (WOC)

NOAA OCIO WOC

Chi Kang

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Background

- The Web Operations Center was originally an incubator project funded by the OCIO's Office of High Performance Computing & Communications.

- NOAA WOC has a demonstrated track record for providing shared infrastructure, applications, and assisting in streamlining IT processes for data dissemination, resulting in ~50% operational cost reduction.

- NOAA WOC has served as an Enterprise Service for consolidating Data Dissemination Resources for various applications.

- Currently Largest Data dissemination system in NOAA

- Currently only FISMA system that is common to NOAA

- Reasons customers consolidate to NOAA WOC
- Redundancy
- Scalability
- Security
- Availability

NOAA WOC Tier Services

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- Static and Application Hosting via NOAA Webfarm (three tiers)
- Tier 1 – Static web sites
- Tier 2 – Common standard configuration application hosting
- Tier 3 – Virtual machine (VM) hosting

- Dedicated Hosting
- Farms of Systems Hosted by the WOC for specific complex function

- NOAA PODs
- Private Cloud Services. (Pilot in FY11 and FY12)

NOAA PODs - Overview

- Complete end to end redundancy deployment in
- East Farm (Silver Spring, MD)
- Central Farm (Norman, OK)
- West Farm (Boulder, CO)
- Future Deployment in
- 2nd East Farm (Largo, MD / College Park, MD)
- South Farm (Fort Worth, TX)
- 2nd West Farm (Seattle, WA)
- 2nd Central Farm (KC, MO)

NOAA PODs - Management

CloudStack Management Server - The management server is a server instance that resides outside your virtual infrastructure that controls the creation, starting, stopping and other tasks associated with your cloud.
Virtualized Hosts - These are the hosts that are running virtual servers. (KVM and Xen. No current plans for VMware)
Primary Type Storage (common) - NFS, iSCSI, and AOE
Secondary Storage (uncommon) – PVFS, Gluster, and GPFS.
PBS Server – Torque with MAUI schedulers

NOAA PODs - Characteristics

On-demand self-service – FISMA System can unilaterally provision computing capabilities.
Low latency / High bandwidth access – NWAVE, NLR, Abilene, and Commodity Internet access to Farms.
Resource pooling – Within PODS, FISMA systems can create several number of virtual machines long as the sum of there specs adds up to specs within a POD environment.
Elasticity - Capabilities can be rapidly and elastically provisioned, some cases may need reboot of VM or at least a migrate to different Hypervisor node.
Cost based on Measured Service - Resource usage will be monitored and reported. Cost model directly based on dynamic usage or NOAA FISMA system can buy into dedicated time.

Metrics – Cost

Example

Current Cloudstack Cost at NOAA WOC
$0.63 per 64GB RAM / 16 Cores / 384 GB per hour.

- Cost Saving achieved with scalability and consolidation of shared resources.
- FISMA Certification Still required by the system.

Total Cost of Ownership!

Conclusion

- NOAA's Complex and diverse mission requires a scalable solution that has delegated administrative approach.

- Brute consolidation isn't the answer, but a smarter approach is needed.

- Buzz words to take back!
  - Software-as-a-Service (SaaS)
  - Platform-as-a-Service (PaaS)
  - Infrastructure-as-a-Service(IaaS)

- Leveraging systems and programs that already exist in NOAA. Solutions that makes sense for NOAA.