Hardware: Challenges for NW-AIRQUEST & Related Projects

- Breezy cluster is so old! *If the head node fails, it's dead.*

- Aeolus is 5+ years old and components are largely at end of expected life. Expect increasing failures.

- Aeolus mass store rebuild&update is likely ~ $50K

- Aeolus also needs 4 new compute nodes (64 core) @ $7K plus a new head node @ ~$6K for another ~ $34K

- Aeolus–WSU Central Cluster: Need a high-data rate connection between systems. We are meeting Monday $??K

- NW-AIRQUEST budget shows $12K left in hardware.

- Is further NWA support for hardware possible, without trading off R&D &O support?

- If LAR & CEA & WSU can fund the mass store & connectivity upgrades now, can NW-AIRQUEST find support to replace aeolus nodes next year?

Hardware: Challenges for NW-AIRQUEST & Related Projects

- Aeolus mass store rebuild is underway as of May 2013!
  - Purchase #1 for first storage upgrade step
    - Cost: ~ 15K for:
      - zStax Single-CPU controller for ZFS, with OpenIndiana installed
      - 24 4TB Seagate Constellation drives
    - funded by $12K left in 2012 NW-AIRQUEST for Hardware and
    - funded by $3K from Jenny Adam's CEREO BioEarth project
  - Purchase #2 for further expansion in second step
    - Cost: ~ 11K for:
      - 24 4TB Seagate Constellation drives
      - 2 4TB Seagate Constellation drives as 'shelf spares'
    - funded by $11K from J. Adam's CEREO BioEarth Project
  - Storage Hardware for ~$26K is much less than the expected ~ $50K!

Hardware: Challenges for NW-AIRQUEST & Related Projects

- Purchase #3 for Aeolus Processor Upgrades, June 2013
- Cost $37K for
  - Two 8-core AMD nodes for use as Head and Login nodes
  - 5 new AMD compute nodes (4 x 16 core for 64 core each)
- Funded by $30K from Von Walden's Startup Package and
- Funded by $7K from Brian Lamb's NARA Project.

- *Total hardware purchase in Spring 2013 is $63K.*

- Aeolus–WSU Central Cluster: Need a high-rate data pipe between these systems. Switch cost at LAR ~ $?K.

- Power supply, UPS, and cooling are the other issues.

- So 2013-14 hardware & infrastructure projected at ~ $??K.

- Funding of IT staff for above work was from …..?

Kusznir - Svancara 0.25* FTE Cluster Support Position

Funding Project	Months	
NW-AIRQUEST	1	
NASA	1	(ends 12/2013)
GEOSS	1	(ends 09/2013)
BioEarth	2.5	
Black Carbon	3	
YAWNS-Ecology	1	(ends 09/2013)
NARA Biojet	1	
WISDM	1.5	
Total	**12**	

* The other 0.75 FTE is carried by the Smart-Apartments Project of Diane Cook & Maureen Schmitter-Edgecombe.

Spring 2013 Cluster Hardware Upgrade Costs

Funding Project	$K
NW-AIRQUEST	12
CEREO - BioEarth	14
NARA Biojet	7
V. Walden Start-Up	30
Total	**63**

AEOLUS Cluster upgrade

	2012	2013
OS	Rocks / CENTOS	CENTOS (others being considered)
Head Node	Dell (Intel, 8 cores)	Silicon Mechanics (AMD, 8 cores)
Dedicated Login Node	none	Silicon Mechanics (AMD, 8 cores)
Compute nodes from Silicon Mechanics	4 – 64 core	9 – 64 core
Memory per node	128 GB	128 GB
SM processors	256	576
Compute nodes from Dell	20 – 8 core	16 – 8 core
Memory per node	8 GB	8 GB
SM processors	160	128 (for compute total of 704 nodes)
CUDA nodes	1	1
pvfs2 storage	90 TB	0
zfs storage	0	190 TB (plus reconfig of older disks)

Hardware: Challenges for NW-AIRQUEST & Related Projects

Funding infrastructure supporting computing:

- Switch cost at LAR ~ $?K (but what is fate of IT's HPC?)

- Power supply/circuit work ~ $?K.

- UPS ~ $?K.

- Cooling ~ $?K.

The end