Maryland Advanced Research Computing Center

HHPC@JHU

Jaime E. Combariza, PhD
Director

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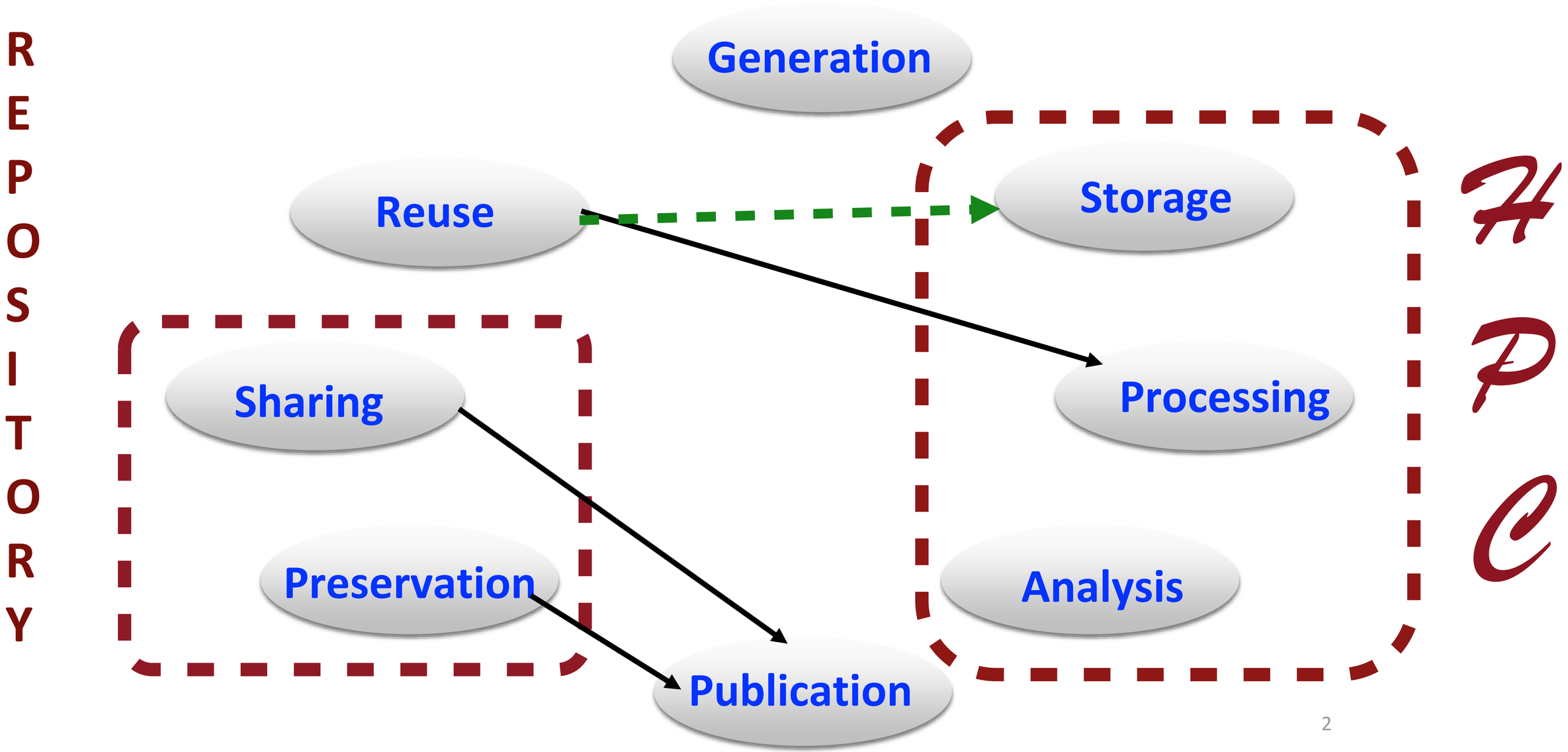
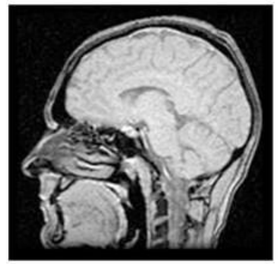
Data Lifecycle



Collecting Big Data

High Res. telescopes

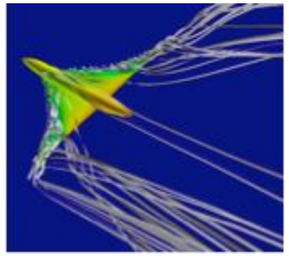


Brain Science

Human Genomics

Large Scale Experiments

Social Networks



Predictive Computational Science

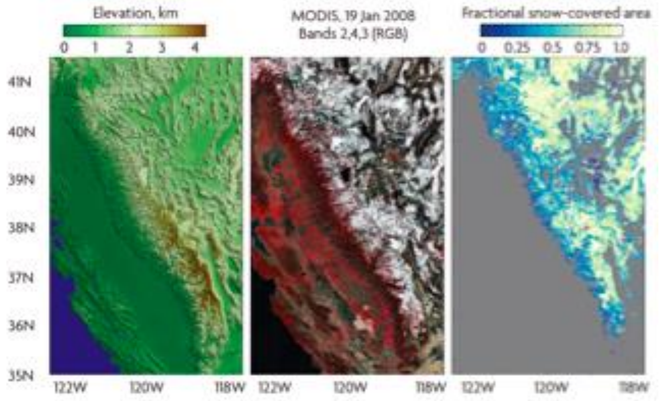
Smart Networks

Virtual Libraries

Satellites

Financial Markets

Data-Rich Environment (Effects)



Eco-Informatics

Biomedical Informatics

Digital Humanities

Astro-Informatics

Data Driven Applications

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Opportunities

Innovation, Competition and Productivity

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What's being done

- WH 2012 200M R&D for big data
- NSF & NIH (many programs)
- Gordon and Betty Moore Foundation

- Many schools VIDA, DI^2, idies

- States, e.g.: Mass
- Xsede (9/2/14)

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What's Maryland doing?

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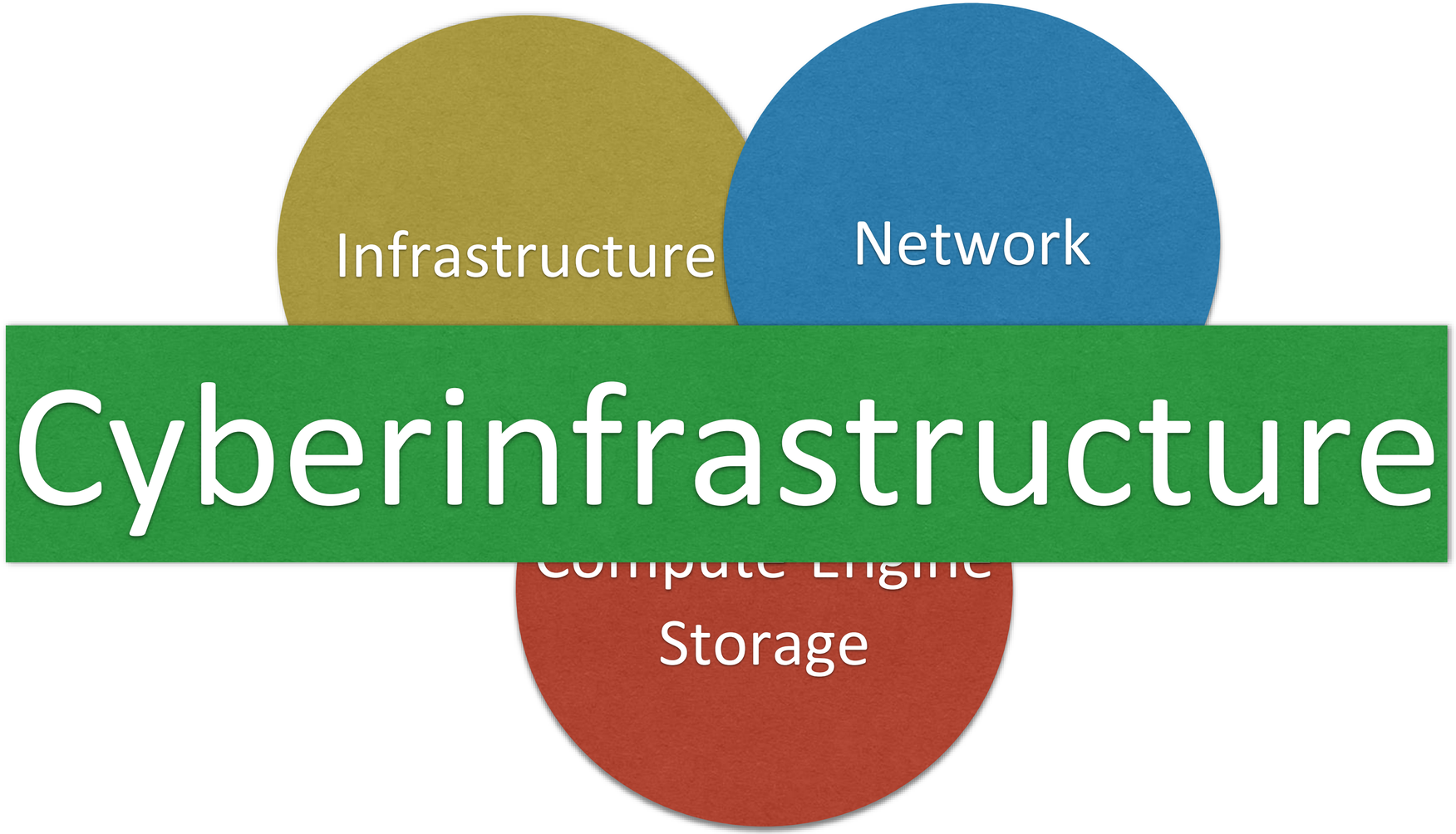
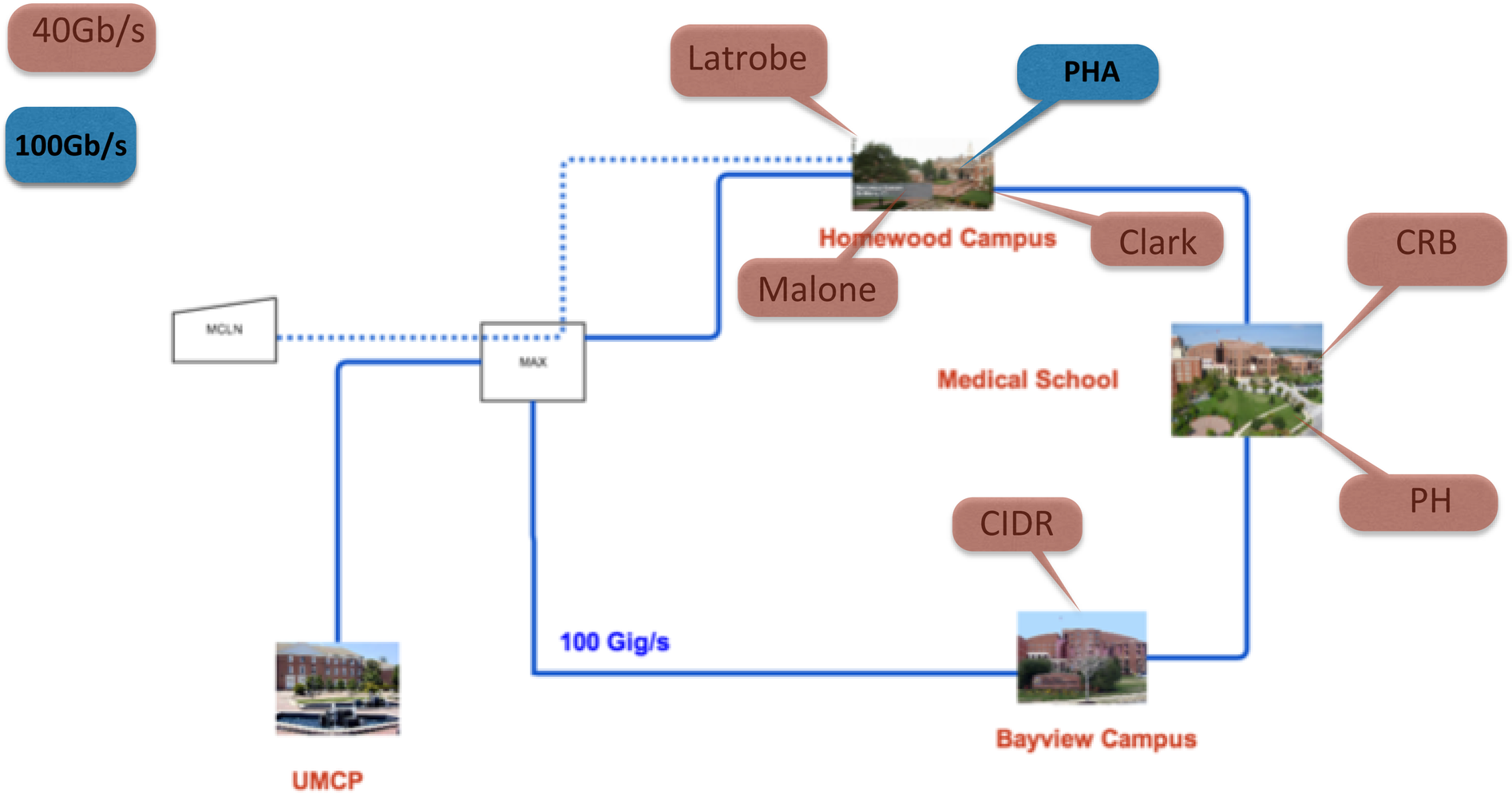
Data center and data-rich environment



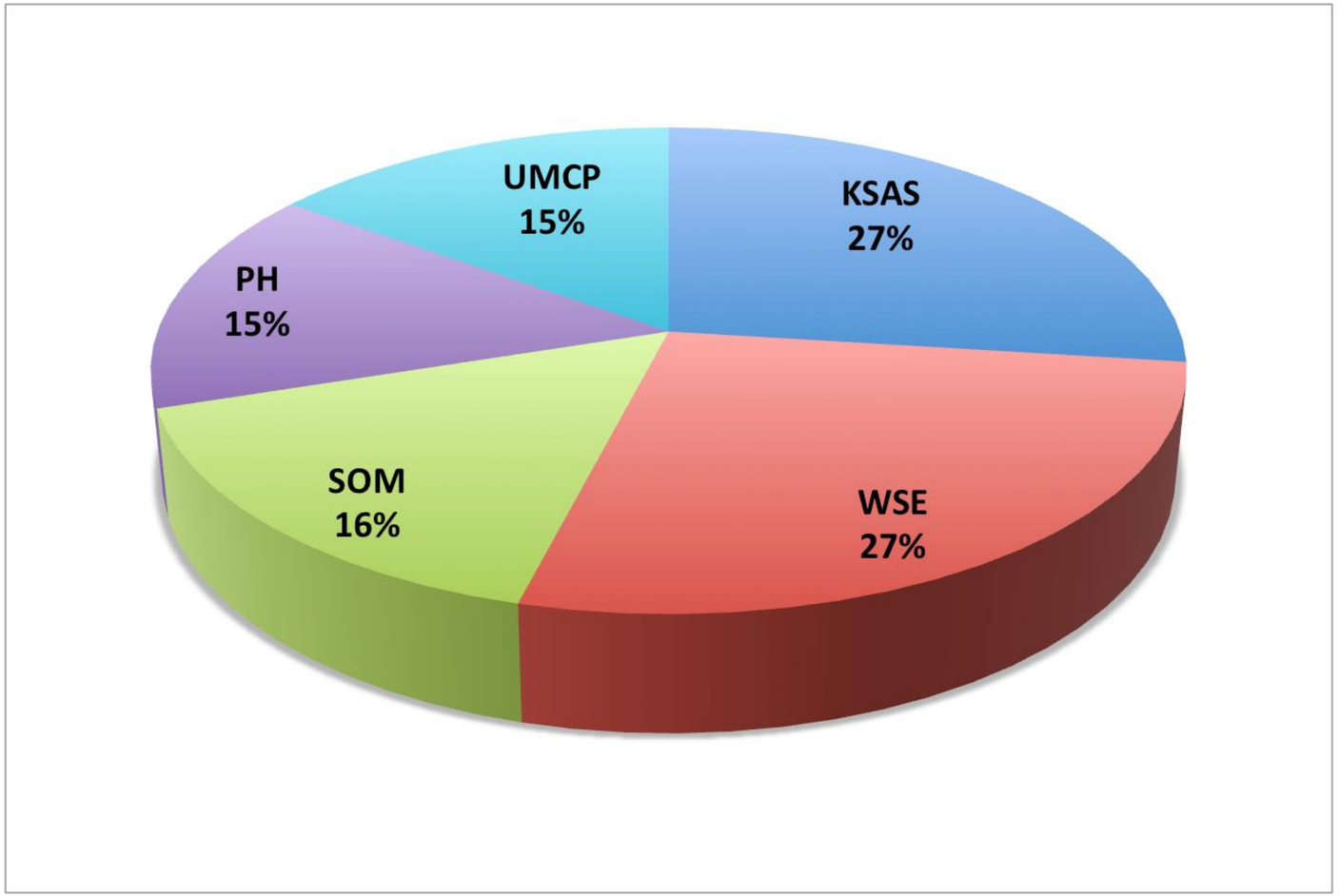
Science DMZ @ JHU



HoRNET

HPC Resources & Model

- Approx 18,000 cores and 20 Petabytes storage



KSAS:10.5M Quarter

WSE: 10.5M/Q

SOM: 6.2M/Q

PH: 5.8M/Q

UMCP: 5.8M/Q

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Hardware

Count	Description
648	Regular compute nodes, 128 GB RAM, Haswell 2.5GHz, 24 cores
50	Large memory nodes, 1 Tbyte RAM, ivy Bridge 3.0GHz, 48 cores
24	GPU nodes, 48 Nvidia K40 GPUs, 24 cores per node
2 PB	High Performance File System (CIFS)
14 PB	zFS File System
FDR-14 Infiniband Connectivity 2:1 blocking	
R_{peak}= 771 TFLOPs, R_{Max}=617 TFLOPs, (61st place on Top500)	

Governance

- Facility Governing Board (3 members JHU, 3 members UMCP)
- Scientific Management Committee (4 faculty members from JHU and UMCP).
  - Policies
  - Allocation models
  - Utilization

Timeline

- Data center: End of November
- Network install “mid December”
- Hardware deployment Dec 1 - Jan 2015
- Production system:

Co-Location

- Priority
- Early Spring we will have better guidelines and policies
- Cluster/server hosting and management
- Cluster/server hosting
- Virtual servers

Next . . .

- Website
  - FAQs
  - Instruction on how to connect
  - Request accounts
  - Queueing system and queues
- Software & Application support
- Add Condos
- Documentation

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Summary

- Create state of the art HPC facility (current and future needs)
- Develop an HPC ecosystem:
  - To foster collaboration and advance research agendas
  - Develop or improve tools for more effective data analysis
  - Resource to attract and retain top researchers
  - Facility to properly house HPC resources with different requirements (Co-location)
  - Researchers concentrate on science not on IT

Information

- combariza@jhu.edu
- Web site (soon) marcc.jhu.edu

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