

**COMMISSION ON UNIVERSITY SUPPORT
MEETING MINUTES
October 15, 2015
Research Building 14, Conference Room 115 at VT CRC, 1770 Forecast Drive**

MEMBERS

Members Present: Cynthia Bonner, Robbie Ashton, Paul Deck, Christina Lapel, Edward Lener, Henry Murray, Scott Midkiff, Savita Sharma (for Dwight Shelton), Ryan Speer, Tom Tillar, Amy Tunison

Members Absent: Richard Ashley, Lay Nam Chang, Mary Christian (with notice), Kathy Hosig (with notice), Chris Kiwus (with notice), Charles Phlegar (with notice), Ken Smith, Sherwood Wilson (with notice)

Guests: Richard Hach, Terry Herdman, Steve Mouras, Pat Rodgers, Jason Soileau

Recorder: Vickie Chiocca

1. Approval of agenda

Edward Lener, Chair, called the meeting to order at 2:00 p.m. The agenda was approved.

2. Announcement of approval of September 17, 2015 minutes

These minutes were approved electronically.

3. Reports from Committee Chairs/Representatives

The **Campus Development Committee** met on September 24, 2015. Mr. Soileau noted the following discussion items:

- Updates on summer construction projects as well as projects currently under construction.
- Briefings on the Campus Master Plan, Northwest Precinct and the Drillfield Improvement Project.

The **Energy and Sustainability Committee** met on April 27 and September 28, 2015. Mr. Mouras shared the following discussion items:

- Updates on the Green Request for Proposals (RFP); five projects were funded for 2014-15.
- Earth Week 2015 (that took place in April 2015).
- Composting challenges due to vendor that went out of business; another vendor was obtained on short notice.
- Energy Manager briefed on initiatives involving energy reduction in buildings as part of the 2014-15 budget plan.

The **Transportation and Parking Committee** met on October 9, 2015. Mr. Speer noted the following discussion items:

- Chief Foust gave a police department update, stating that the changes to Drillfield Drive have gone well with few incidents reported.
- Update on the Parking and Transportation Master Plan - A public Town Hall meeting is scheduled October 26 from 4-6 p.m. at Squires Student Center, Brush Mountain room (<http://www.vtnews.vt.edu/articles/2015/10/101315-vpa-ptmasterplan.html>). The public is encouraged to provide feedback using the master plan web site, located at www.vt-ptmp.com.

Mr. Lener requested an update on the functionality of new hang tags at parking lot security gates. Mr. Mouras noted there have been some technical issues. Mr. Speer will follow-up and report at the next meeting.

4. Acceptance of Committee Minutes

The April 2015 Energy and Sustainability Committee minutes were accepted electronically by the Commission for posting.

5. Next meeting date

Mr. Lener reported that the next Commission on University Support meeting will take place either on November 19 or December 17, depending on speaker availability for a presentation on the new learning management system. In addition, Mr. Lener has confirmed the new Provost, Dr. Thanassis Rikakis, to speak at the February 2016 Commission meeting and Mr. Charles Phlegar, Vice President for Advancement, to speak on his new role at the April 2016 Commission meeting.

6. New Business

Scott Midkiff gave a brief update on Canvas, the new learning management system noting that:

- 40% of students, 22% of faculty, and 12% of sections are now using Canvas; and
- a migration tool will soon go public that will enable users to pull content from Scholar into Canvas.

Mr. Midkiff gave a briefing on the Advance Research Computing (ARC) Information Technology at Virginia Tech (Attachment A). The Commission members then toured the high performance computing (HPC) facilities and the network operations center. Handouts were provided (Attachments B,C,D).

7. Adjourn

The meeting adjourned immediately following the tours at 3:00 p.m.



Advanced Research Computing
Information Technology
Virginia Tech
www.arc.vt.edu

Personnel

- **Associate VP for Research Computing: Terry Herdman (herd88@vt.edu)**
- **Director, HPC: Vijay Agarwala (vijaykag@vt.edu)**
- **Director, Visualization: Nicholas Polys (npolys@vt.edu)**
- Assist. Director, Development and Fiscal Admin: Alana Romanella (aromanel@vt.edu)
- Computational Scientists
 - Justin Krometis (jkrometis@vt.edu)
 - James McClure (mcclurej@vt.edu)
 - Brian Marshall (mimarsh2@vt.edu)
 - Srinivas Yarlanki (sriniy@vt.edu)
 - Srijith Rajamohan (srijithr@vt.edu)

Mission

Advanced Research Computing (ARC) provides *centralized support for research computing* by building, operating and promoting the use of advanced cyberinfrastructure at Virginia Tech. ARC delivers a comprehensive ecosystem consisting of *advanced computational systems, large-scale data storage, visualization facilities, software, and consulting services*. ARC provides education and outreach services through *conferences, seminars, and scientific computing courses*. ARC seeks to help maximize research productivity at Virginia Tech through interdisciplinary collaborations that connect researchers to new opportunities in computing and data driven research as they occur. By fostering strategic partnerships with the public and private sector, ARC serves to cultivate an entrepreneurial spirit around advanced computing infrastructure as a platform for collaboration and helps secure the position of Virginia Tech as a leader in education and research.

World-class Visualization Capacity

The Visionarium Lab

VisCube immersive projection room

High-resolution workstation

3D TVs, Touch-table

Interactive 3D Web and desktop



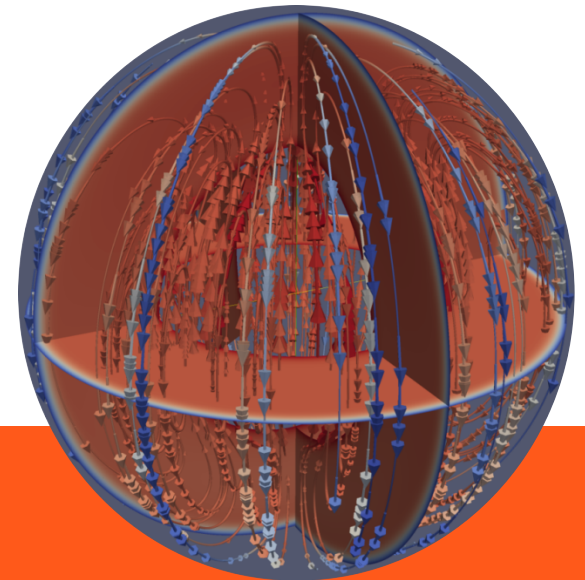
High Performance Visualization

Cluster rendering on ARC GPUs

HokieSpeed

BlueRidge

NewRiver



Visual Computing Services: *scaling for insight*

User support and
Consulting

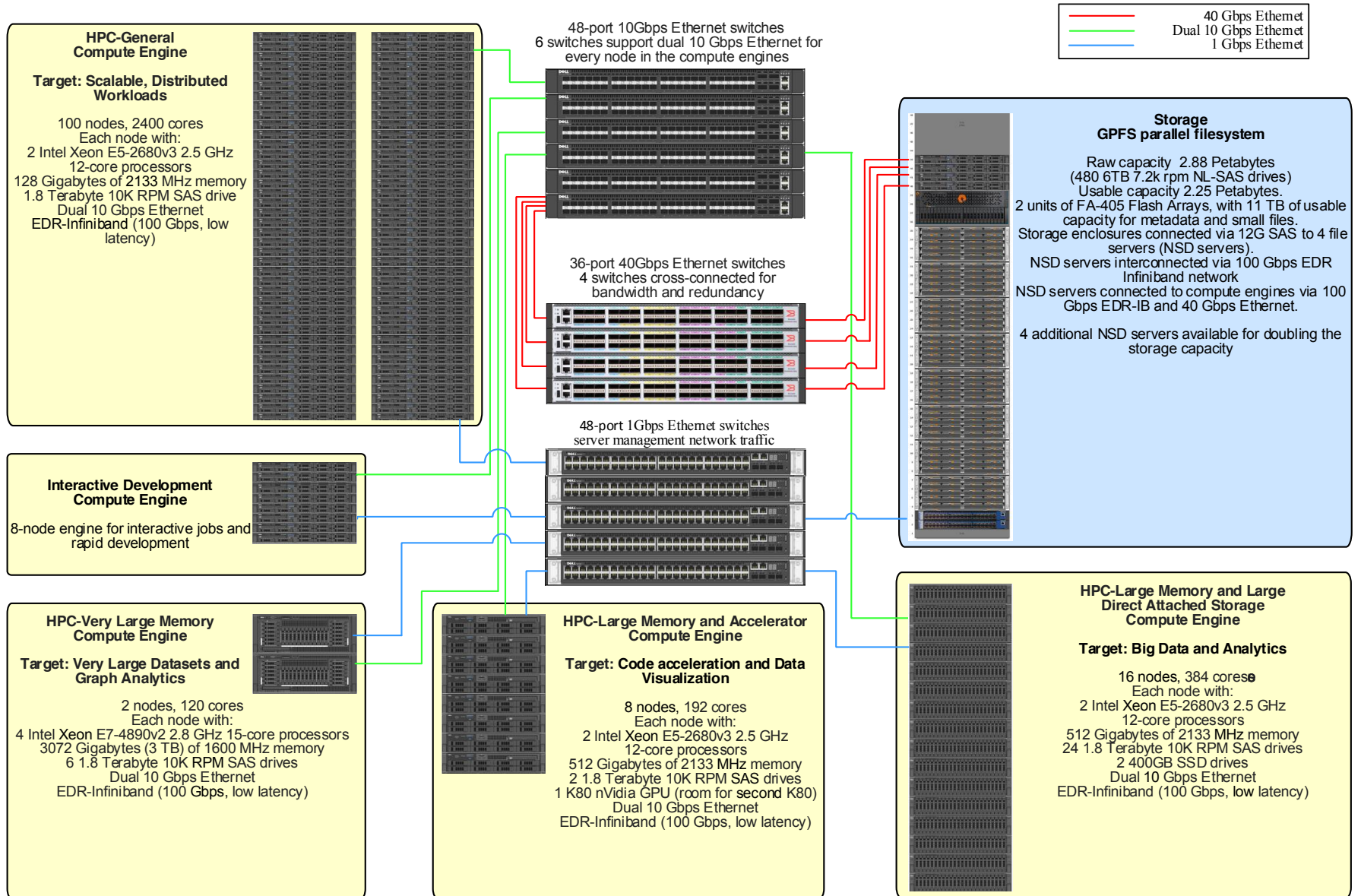
Trainings and Classes

Tours and Field Trips

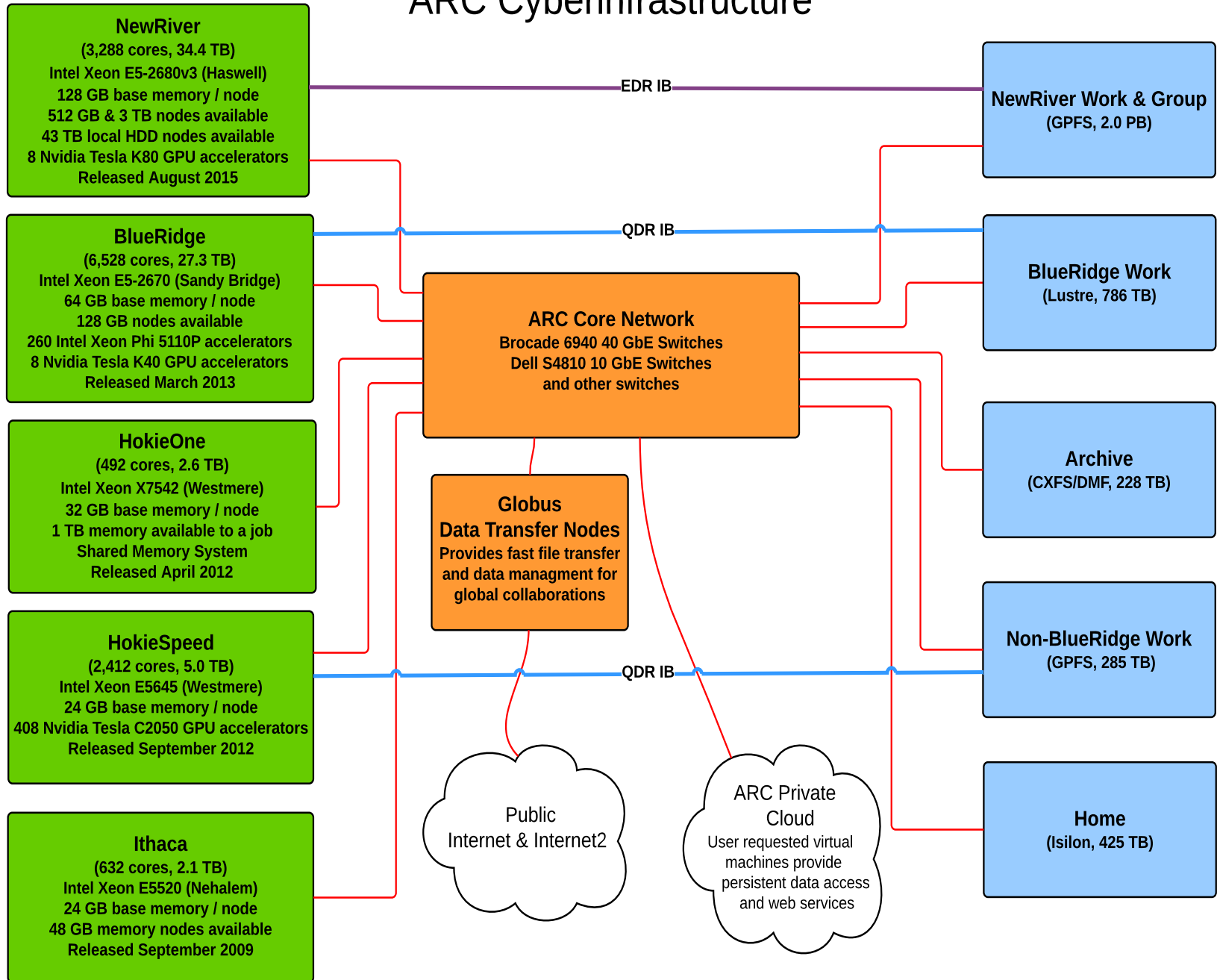
Project support and
Collaboration



NewRiver Compute System and Storage – FY15



ARC Cyberinfrastructure



Addendum A: Investment Computing Program Cost for NewRiver Compute Nodes

Type:	Type 1	Type 2	Type 3	Type 4	Type 5
Function:	General-purpose compute node	Large memory compute node	Large memory compute node with GPU	Large memory compute node with local storage	Extremely large memory compute node with local storage
Summary of Specifications:	<ul style="list-style-type: none"> • 2 12-core 2.5-GHz Intel E5-2680 processors (24 cores total) • 128 GB 2133-Mhz memory • 1 1.8-TB 10K rpm SAS drive • Low-latency EDR Infiniband interconnect • Dual 10G Ethernet 	<ul style="list-style-type: none"> • 2 12-core 2.5-GHz Intel E5-2680 processors (24 cores total) • 512 GB 2133-Mhz memory • 2 1.8-TB 10K rpm SAS drives • Low-latency EDR Infiniband interconnect • Dual 10G Ethernet 	<ul style="list-style-type: none"> • 2 12-core 2.5-GHz Intel E5-2680 processors (24 cores total) • 512 GB 2133-Mhz memory • 1 nVidia K80 GPU card • 2 1.8-TB 10K rpm SAS drives • Low-latency EDR Infiniband interconnect • Dual 10G Ethernet 	<ul style="list-style-type: none"> • 2 12-core 2.5-GHz Intel E5-2680 processors (24 cores total) • 512 GB 2133-Mhz memory • 24 1.8-TB 10K rpm SAS drives (30 TB usable disk space per node) • 2 256-GB SSD drives • Low-latency EDR Infiniband interconnect • Dual 10G Ethernet 	<ul style="list-style-type: none"> • 4 15-core 2.8-GHz Intel E7-8000 processors (60 cores total) • 3 TB 1600-Mhz memory • 6 1.8-TB 10K rpm SAS drives • Low-latency EDR Infiniband interconnect • Dual 10G Ethernet
Exchange rate:	1.00	1.83	2.26	2.86	3.32
Node Cost:	\$7,800	\$14,272	\$17,616	\$22,342	\$64,750
CSUs ¹ /year per \$50K ² :	1,280,000	700,000	567,000	447,000	385,000
Cores equivalent for \$50K ³ :	154	84	68	54	46
Priority burst limit (in cores) for \$50K ³ :	308	168	136	108	92

Notes:

1. A Compute Service Unit (CSU) provides access to one processor core for one hour on a Type 1 node
2. Annual CSUs available based on ~95% utilization of the nodes, including fractional nodes, that could be purchased for \$50,000.
3. Limit on number of nodes that can be scheduled in the priority queue. The limit is twice the number of nodes that could be purchased for \$50,000.
4. Storage is available to the Faculty Partner for an investment of \$200 for each terabyte of additional high-performance storage for the duration of this MOU.

VT-PRnet: 10 Gbps Pilot Research Network At Virginia Tech

Program Description: The University is developing a 10 Gigabits per second (Gbps) pilot research network (VT-PRnet) and invites proposals for a *10 Gbps connection to VT-PRnet*. Faculty members and researchers are requested to identify research and academic activities that will benefit from a persistent high-bandwidth connection. It is anticipated that up to four awards will be made for up to three years of a single 10G network connection.

Eligibility: All Virginia Tech faculty at Blacksburg campus are eligible. Multiple faculty members may submit a single proposal (and are encouraged to do so especially when they share a office/building demonstrating increased research impact) but only one connection will be provided per award.

Proposal Preparation and Submission: Each proposal must include the (i) faculty member name(s), unit(s), and contact information, (ii) desired location for the 10G connectivity and the system(s) or device(s) to be connected (include all endpoints even if they are not on campus), (iii) description of research utilizing the system(s) or device(s), (iv) justification for the need of a 10 Gbps connection, and (v) impact on current research and future research competitiveness. Submissions are limited to three letter-sized pages in 11-point font and should be sent to Mark Gardner, mkg@vt.edu.

Evaluation and Award Process: Submissions will be evaluated on the basis of (i) need for 10 Gbps network and likely impact on the PI's current research, (ii) improved competitiveness for future grants, (iii) readiness of the building where connection is requested and cost considerations, and (iv) impact on future roll-out of a more pervasive production-ready 10 Gbps research network.

Deliverables: All awardees will provide annual reports demonstrating the benefits resulting from the improved connectivity. The report must include a list of publications, proposal submissions, grants awarded, or any other research related output resulting from the award along with a short narrative describing how the award directly impacted the research efforts. The reports are due on the anniversary date of the start of the award.

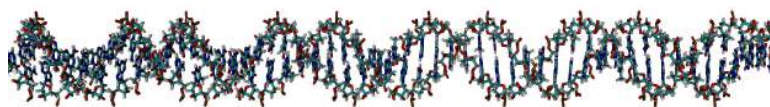
Term of Contract: This award will provide 10 Gbps network connectivity to the campus core and to national research networks (via MARIA and Internet2) for the price of 1 Gbps network connectivity (currently \$180/year). The report must include a list of publications, proposal submissions, for a duration of three years. It is anticipated that the award will start as early as Spring Semester 2016 and no later than Q2 2016.

Process Schedule: Submissions are due by October 30, 2015. Award notifications will occur by November 30, 2015. MOUs will be signed by December 15, 2015 and the rollout of the research network may occur early in 2016 Spring semester.

Points of contact: Mark Gardner, mkg@vt.edu



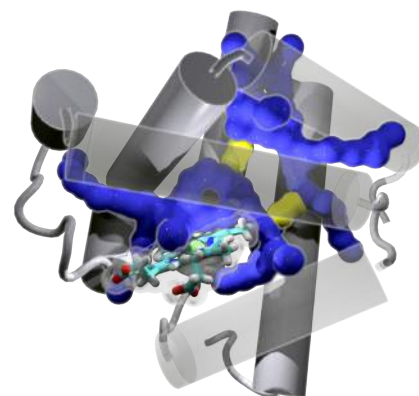
Virginia Tech
Invent the Future



Advanced Research Computing (ARC)

Mission

Advanced Research Computing (ARC) provides centralized support for research computing by building, operating and promoting the use of advanced cyberinfrastructure at Virginia Tech. ARC delivers a comprehensive ecosystem consisting of advanced computational systems, large-scale data storage, visualization facilities, software, and consulting services. ARC provides education and outreach services through conferences, seminars, and scientific computing courses. ARC seeks to help maximize research productivity at Virginia Tech through interdisciplinary collaborations that connect researchers to new opportunities in computing and data driven research as they occur. By fostering strategic partnerships with the public and private sector, ARC serves to cultivate an entrepreneurial spirit around advanced computing infrastructure as a platform for collaboration and helps secure the position of Virginia Tech as a leader in education and research.



High-Performance Computing

NewRiver, our newest premier HPC system

HPC-General: a 100-node 2400-core compute engine targeted at scalable and distributed workloads.

Each node with:

2 Intel Xeon E5-2680v3 2.5 Ghz 12-core processors
128 Gigabytes of 2133 Mhz memory, 1.8 Terabyte 10K rpm SAS drive, Interconnects: Dual 10 Gbps Ethernet, 100 Gbps EDR-Infiniband

HPC-Large Memory and Storage: a 16-node, 384-core compute engine targeted at Big Data and Analytics.

Each node with:

2 Intel Xeon E5-2680v3 2.5 Ghz 12-core processors
512 Gigabytes of 2133 Mhz memory
24 1.8 Terabyte 10K rpm SAS drives, 2 400GB SSD drives

HPC-Large Memory and Accelerator: an 8-node 192-core compute engine targeted at code acceleration and data visualization.

Each node with:

2 Intel Xeon E5-2680v3 2.5 Ghz 12-core processors
512 Gigabytes of 2133 Mhz memory
2 1.8 Terabyte 10K rpm SAS drives
1 K80 nVidia GPU (room for second K80 card)

HPC-Very Large Memory: a 2-node 120-core compute engine targeted at very large data sets and graph analytics.

Each node with:

4 Intel Xeon E7-4890v2 2.8 Ghz 15-core processors
3072 Gigabytes (3 TB) of 1600 Mhz memory
6 1.8 Terabyte 10K rpm SAS drives

Other HPC Facilities

BlueRidge:

- Cray CS-300 model (Intel Sandy-Bridge based).
- 318 nodes (6528 cores) w/ 64GB/node.
- Remote GPU Visualization

HokieSpeed

- 209 dual-socket nodes with Intel Xeon E5645 2.6GHz
- 418 NVidia Fermi (M2050) GPU cards.
- QDR InfiniBand interconnection

HokieOne (SGI UV-1000 Share-memory machine):

- 42 blades of dual Intel E7 Westmere 6-core chips (2.66GHz) and 2.62TB memory
- SGI NUMALink interconnection, high throughput system for data-intensive applications

Ithaca (IBM iDataPlex)

- 84 dual-socket node with quad-core Intel Nehalem 2.26GHz processors (672 cores)
- 24GB memory (10 nodes have 48GB)

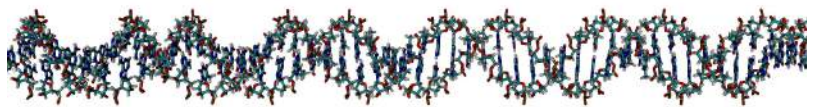
User Support:

User/Application Support: Full time support of systems and applications, and research collaboration.

System & Data Center: 24/7 support covering system operation and maintenance, security and performance monitoring.

www.arc.vt.edu

Images by Nicholas F. Polys, Alexey Onufriev, Scott King, Virginia Tech. All rights reserved



Advanced Research Computing (ARC)

Visual Computing Group

Across scientific, medical, design and teaching domains, visual communication is the common denominator for the knowledge economy. VT's Visual Computing Group is the on-ramp to high-performance graphics and visualization hardware, software and support services; from remote visualization and web publishing to high-end immersive venues we emphasize standards for portability, interoperability and durability.



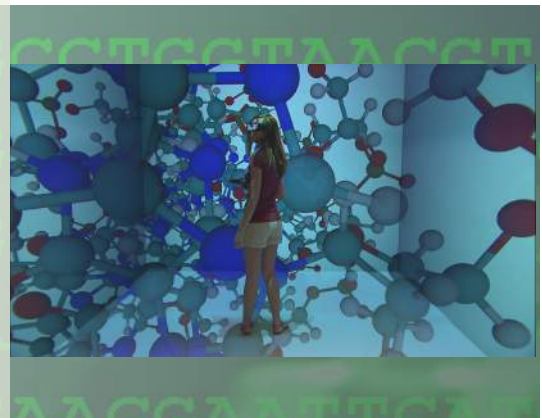
High-Performance Visualization

• Support and Development:

- Consult with faculty and student researchers to apply advanced visualization technology
- Train users on how to develop modern visualization solutions and equipment
- Develop cutting-edge visualization solutions for domain experts/HPC users
- Develop additional grants and funding streams with domain experts to include visualization tools and HPC

•Facilities

- NewRiver, BlueRidge, and HokieSpeed provide large memory and GPUs for interactive and batch computation, analysis and remote visualization
- **Visionarium** Lab includes reconfigurable display venues including Gigapixel and multi-touch tables
- **VisCube** Immersive Theater provides rendering power, resolution and brightness and wireless to accommodate the size and complexity of modern applications
- Cutting-edge software stack for numerous domains, emphasizing portability and ease-of-use



Contact

Vijay K. Agarwala (vijaykag@vt.edu)
Dr. Nicholas Polys (npolys@vt.edu)

www.arc.vt.edu

Images by Nicholas F. Polys, Nikita Sharakhov, Virginia Tech. All rights reserved.



Memorandum of Understanding Investment-Based Participation in NewRiver Computing Cluster

This Memorandum of Understanding (MOU) contains provisions that guide the working relationship between the Virginia Tech researcher, referred to here as *The Faculty Partner*, and *Advanced Research Computing (ARC)* for use of the NewRiver Computing Cluster (NewRiver) through the Investment Computing Program over the five-year term of this MOU.

Term

This MOU is effective for a term of five years from the initial date of participation specified at the end of this MOU.

Definitions

- The Faculty Partner – Virginia Tech faculty member identified in this MOU
- Compute Service Unit (CSU) – One CSU provides access to one processor core for one hour on a Type 1 node (see Addendum A)
- Exchange Rate – Number of CSUs needed to access one processor core-hour on nodes of Type 1 through 5 (see Addendum A)
- Storage Service Unit (SSU) – One SSU provides 1 terabyte of available storage for the duration of this MOU

Service Overview

The Faculty Partner is investing in priority access to compute nodes and storage in NewRiver. There are five different types of nodes in the system, referred to as Type 1 through 5. Investment-based participation in NewRiver provides access to all five types of nodes. However, given the differences in capabilities and costs associated with each type of node, the Exchange Rate varies across different types of nodes. Investment-based participation in NewRiver provides the Faculty Partner with a specified number of Compute Service Units, with varying consumption rates as determined by the Exchange Rate. At the time of signing of this MOU, the Faculty Partner agrees to provide an estimate of expected usage by node type for resource planning by ARC.

By default, the maximum amount of storage available to the Faculty Partner is the same as for any user of NewRiver. Additional storage is available to the Faculty Partner for an investment of \$200 for each terabyte of additional high-performance storage for the duration of this MOU (\$200 per SSU).

The total investment by the Faculty Partner and the associated number of CSUs and SSUs is specified at the end of this MOU.

The five types of nodes, their characteristics, the Exchange Rate, and the CSUs available for an example \$50,000 investment are specified in Addendum A.

Priority access will be granted to the participating Faculty Partner and their research team, which includes any students, post-doctoral researchers and collaborating faculty specified by the Faculty Partner.

Advanced Research Computing Responsibilities

- Use the Faculty Partner's investment to increase the capacity of NewRiver
- Provide cluster infrastructure, including data center space, racks, power cooling, networking, and base storage
- Establish and maintain user accounts and job submission queues
- Maintain cluster system hardware, networking, storage, and software
- Provide system administration services and technical support
- Provide a base suite of software including compilers, operating system software and some applications and libraries, not to exceed limits provided in current licensing agreements with vendors
- Install and provide best-effort support for commercial and public domain packages and libraries beyond the base software suite (Additional applications will be provided by the Faculty Partner and installed in accordance with licensing agreements. However, discipline-specific expertise for such software remains with the Faculty Partner and his/her affiliated research team.)
- Provide information regarding system maintenance outages and system status via email to all users of NewRiver including the Faculty Partner
- Provide information about CSU use and remaining balance to the Faculty Partner
- Provide the Faculty Partner with an equivalent number of CSUs and SSUs on a new system should NewRiver be decommissioned and replaced by a new compute cluster during the effective period of this MOU

Faculty Partner Responsibilities

- Provide funding for priority to access computational resources as described in this MOU
- At the time of signing of this MOU, provide an estimate of expected usage by node type for resource planning by ARC
- Recommend queue characteristics and identify users who are allowed to access the Faculty Partner's queue
- License discipline-specific software as needed (ARC will install and maintain the software on NewRiver upon receipt of the software, licensing and vendor contact information. When multiple software packages are requested, the Faculty Partner's research team will advise ARC on a priority and target installation date for each packaged to be installed. The Faculty Partner's research team has responsibility for subject matter expertise for discipline-specific application software.)

- Ensure that data that must be protected by federal security or privacy laws (e.g. HIPAA, ITAR, classified information, etc.) is not stored on ARC systems unless an exception has been negotiated explicitly (Normal operating procedures for NewRiver are not intended to meet the enhanced security required for data regulated under these laws, although it may be possible to support some forms of restricted research using NewRiver and other facilities.)
- Provide guidance regarding the purchase of future systems and policies that will be administered under this MOU
- Help establish general guidelines for the management and use of NewRiver and any future systems administered under this MOU
- Provide timely reports of all problems using the ticketing system provided by ARC¹
- Request user accounts online using ARC's account request form²

Job Scheduling

Advanced Research Computing provides and operates batch job scheduling and resource management software for the cluster, which together control how much of the cluster can be used by a given user and for how long, and gives priorities to new jobs that determine when they start. This software is configured to provide privileged access to the Faculty Partner's research group, as described below.

Priority Queue

The Faculty Partner's research group will be given access to a priority job queue. The priority job queue is configured to ensure that the Faculty Partner's queued jobs are scheduled ahead of queued jobs submitted by non-investing users until the annual limit of priority CSUs purchased in this agreement is reached. The priority queue also allows the Faculty Partner to access up to twice the number of processor cores purchased, as specified in Addendum A, and longer running times. The Faculty Partner may continue to use this priority queue once the annual limit of priority CSUs has been exceeded, although these jobs will no longer jump in front of jobs submitted to the normal queue. Specific details for the service provided by the queue will be negotiated with the Faculty Partner based on their job profiles and workflow and enumerated in an addendum to this MOU.

Normal Queue

The ability to share hardware is a considerable advantage to centralized computing. The normal queue can be accessed by general users according to the policies specified in documentation for NewRiver.

¹ http://www.arc.vt.edu/forms/support_request.php

² http://www.arc.vt.edu/forms/account_request.php

Special Circumstances

ARC will facilitate special needs of the Faculty Partner, such as higher priority access to resources or limited access to additional nodes to meet research deadlines.

Governance

Meetings related to management of NewRiver, to include the Faculty Partner or his/her representative, may be scheduled as necessary. The meetings will focus on reviewing potential issues and/or avenues for improvement, highlight high-profile successes and discuss future plans.

Service Availability

Advanced Research Computing maintains clusters as a highly available 24/7 resource. Exceptions to these terms of service are as follows:

- Unplanned system outages due to issues with other aspects of the facility such as power, HVAC, network, or emergency maintenance to address computer security incidents may prevent use of the system in a timely manner, and
- Routine software and hardware maintenance of the system.

Planned maintenance windows are announced at least one week in advance.

Acceptable Use Policies

The system is not intended for data protected by federal privacy and security laws and regulations (e.g. HIPAAA, ITAR, classified, etc.) without special arrangement. It is the responsibility of the Faculty Partner, his/her research team, and IT staff to comply with all Virginia Tech and Commonwealth of Virginia policies and standards specified at: <http://www.it.vt.edu/administration/policies>.

Questions about information security can be directed to ARC by submitting a consultation request.³

Facilities

NewRiver is housed at the Andrews Information System Building, 1700 Pratt Drive, Blacksburg, VA.

Support Process

All incident reporting should be submitted through the ticketing system provided on the ARC web portal.⁴ Advanced Research Computing will provide a response within one business day. Critical issues that disrupt large portions of the cluster or infrastructure will be addressed as quickly as possible.

³ http://www.arc.vt.edu/forms/consult_request.php

⁴ http://www.arc.vt.edu/forms/support_request.php

Termination

Either party may terminate this MOU by providing written notification to the other party thirty (30) days in advance of termination. In the event of termination, all equipment will remain the property of ARC. The Faculty Partner may sell or transfer the remainder of his/her access to another Virginia Tech researcher. ARC will facilitate the transfer to the new partner.

Storage

Multiple types of storage are available. Requests for custom storage needs, such as for HIPAA, ITAR and other protected data, will be considered on a case-by-case basis. Support for protected data must be negotiated explicitly between the Faculty Partner and ARC. Details for the storage are available at:
<http://www.arc.vt.edu/resources/storage.php>.

Home Directories

Home directories are provided for each user of the cluster and are subject to a quota. The Faculty Partner may purchase additional high-performance storage at a cost of \$200 per TB for the life of the MOU.

Group Storage

Group storage is provided to each research group and is subject to a quota. The Faculty Partner may purchase additional high-performance storage at a cost of \$200 per TB for the life of the MOU.

Scratch Storage

Scratch storage space is provided on NewRiver on a parallel file system. Files in the scratch file system are subject to automatic purging.

Archival Storage

Long-term storage is available via the archival storage system which includes off-site backup.

Initial Date of Participation:

Amount Invested:

Resources Provided:

- Compute Service Units:
- Storage Service Units:

Associate Vice President for
Advanced Research Computing

Faculty Partner

Vice President for IT and CIO

Department Head

Addendum A: Investment Computing Program Cost for NewRiver Compute Nodes

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A Brief Introduction to Information Technology Support (4Help)

Information Technology Support (4Help) is comprised of:

- Virginia Tech Operations Center (VTOC): Provides first-tier support for Information Technology services, and
- University Computing Support (UCS): Provides second and third tier support

Information Center: Virginia Tech Operations Center (VTOC) is composed of:

- **Call Center:** performs password resets, and monitors critical systems. (231-4357/4Help),
- **Virginia Tech Contact Center:** who take calls for university Directory Assistance (231-6000), and
- **Network Operations Center:** who take calls about network questions/problems (231-6780)

University Computing Support (UCS) provides second and third tier support, and includes

- the **Service Desk**
- **Desktop Support**
- **VIP Support**

The mission of Virginia Tech's Information Technology Support unit is to enhance the university's missions of teaching, learning, research, and outreach by providing centralized computing and telecommunications support services to Virginia Tech affiliates through:

- Consultations on computer desktop questions
- Constituent support for use of central computing, telecommunications, and multimedia services
- Advocacy for our constituents and departmental IT support personnel
- Extensive online documentation provided at the computing.vt.edu and answers.vt.edu Web sites

We endeavor to provide fast, courteous, and comprehensive computer support to Virginia Tech faculty, staff, and students for services provided by central Information Technology. Alumni, retired faculty, and retired staff may receive help with problems related to services provided to them by Virginia Tech.

Some interesting facts about the Virginia Tech Operations Center:

- The VTOC is staffed **24x7x365** to assist with opening incidents, provide a contact for emergency outages and perform critical monitoring – including servers (Big Brother) and SMARTS (network)
- The VTOC has taken over 60,000 calls in 2015:
 - 32,213 taken by the Call Center
 - 22,723 taken by Directory Assistance Operators
 - 5,590 taken by the NOC
- The groups in the VTOC also handle issues escalated to them from other groups using our incident management system, ServiceNow
- The VTOC is also home to the VNOC (Video Network Operations Center) who monitor video conferencing and WebEx classes