

**Center for Applied High Performance Computing**

The Howard University

**Strategic Plan**

**v1.1**

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November 11, 2003

## Table of Contents

Mission Statement.....	3
Vision Statement.....	3
Center Goals.....	4
Goal: Create a solid foundation to support the vision of the center. ....	4
Goal: Encourage talented individuals to contribute to the center.....	4
Goal: Foster Truly Diverse Multi-disciplinary Collaborations .....	5
Appendix: Realization of Specific University Goals.....	6
Strengthening Academic Programs and Services .....	6
Promoting Excellence in Teaching and Research .....	6
Increasing Private Support .....	6
Appendix: Center Niche.....	7
Appendix: Center Thrust Areas .....	7

# The Center for Applied High Performance Computing Strategic Plan

## Mission Statement

To advance the state of the art in real applications of High Performance Computing by fostering Ethnically Diverse, Multi-disciplinary collaborations between Research, Education, and Industry.

## Vision Statement

Traditional HPC and Supercomputing Centers have continually focused on competing for the acquisition of newer and faster computing hardware resources, support, and related research agendas, sometimes at the expense of applications of the technology toward innovation and the search for knowledge. In addition the problem of under-represented groups including African-Americans and women in High Performance Computing and Science in general has gone unanswered, particularly at the crucial center formulation stage.

Howard University is in a unique position to apply an innovative approach to High Performance Computing that will fill this gap and foster true collaborations between diverse, interdisciplinary groups while leveraging the huge amount of available cutting edge resources that await truly innovative applications.

This approach, which focuses not on cutting-edge computing hardware, but on collaboration and applying the potential of widely varying groups of people will be reflected in the center's research aims. These aims will be in-line with the core values of the university to include national and community service and the betterment of African-Americans. Many of the aims will represent research on areas of particular interest to groups under-represented in research.<sup>1</sup>

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<sup>1</sup> E.g. African-Americans women are 1.5 times more likely than white women to die from breast cancer within 2 years of diagnosis.

## Center Goals

**Goal: Create a solid foundation to support the vision of the center.**

*Objective: Obtain resources and foster partnerships,*

- Obtain seed funding from at least 3 sources.
- Develop an operational budget that is sustainable for X years.
- Seek-out centers and universities with available hardware and other resources with complementary needs and an interest in collaboration.

*Objective: Strengthen and communicate our niche*

- Develop plans for 3-4 thrust areas that are not well addressed by existing centers.
- Attend at least 3 conferences & workshops in HPC and GRID.
- Attend at least 10 conferences & workshops outside HPC/GRID.
- Demonstrate Center's capabilities to over X individuals a year.

**Goal: Encourage talented individuals to contribute to the center.**

*Objective: Recruit and retain a talented staff.*

- Encourage qualified faculty within the department to attend professional meetings and share the knowledge gained with faculty, staff, and students.
- Create a departmental policies and procedures manual that conforms to the University OP manuals.
- Maintain state-of-the-art resources.
- Maintain competitive salary, benefits, and opportunities vis-à-vis peers.

*Objective: Make tools and techniques developed for HPC available.*

- Interact closely with researchers on campus.
- Work in conjunction with other departments on visualization techniques.
- Use new tools, techniques, and methodologies in multi-disciplinary research.

*Objective: Involve undergraduate and graduate students.*

**Goal: Foster Truly Diverse Multi-disciplinary Collaborations**

*Objective: Develop a mutually beneficial program with industry*

- Encourage commercialization of technologies
- Have open house days and open seminars.
- Seek research topics and funding jointly at all stages.
- Create a job-placement, internship and/or other employment programs with research partners in industry.

*Objective: Provide new opportunities in HPC.*

- Teach courses in parallel and scientific computing at Howard.
- Develop an education program that utilizes HPC. Program should include K-12 students.
- Bring in outside speakers on high-performance computing.
- Sponsor internal conferences for the benefit of faculty, students, and partners.
- Present and develop relevant HPC demonstrations.
- Create discussion and collaboration areas for problems that have not typically been able to benefit from HPC technology.
- Participate in Open Source projects.

## **Appendix: Realization of Specific University Goals**

Below are excerpts taken from the Howard University President's "Strategic Framework For Action II" and comments on how the center will help realize the goals stated in those excerpts.

### **Strengthening Academic Programs and Services**

- "Build the Interdisciplinary Science and Engineering Center." [...]
- "...ISE will support emerging fields."
- "Co-locate a federal research activity."

#### **REALIZATION:**

Science and engineering is heavily and increasingly reliant on state of the art computing technology. HPC is the leading edge of that technology for many computationally and data intensive studies. GRID technology, a technology that is an emerging field from HPC, will change the way computation is done. Federal and International programs are increasingly being done via GRIDs.

### **Promoting Excellence in Teaching and Research**

- Increase the number of endowed chairs.
- Increase the number and amount of graduate student stipends.

REALIZATION: Increased funding from industry.

- Create new interdisciplinary research groups
- Develop collaborations and establish stronger academic linkages and professional peer interactions with other leading universities and colleges.

#### **REALIZATION:**

HPC and Supercomputing has a history interdisciplinary work. GRID applications take it a step further, allowing groups of people anywhere in the world where the network is reachable to participate in research.

### **Increasing Private Support**

n/a

## **Enhancing National and Community Service**

- Build a National Digital Network to support urban education.

### REALIZATION:

The GRID is the ultimate network of the future where not only connectivity and websites, but computing power and storage are available from anywhere.

## **Appendix: Center Niche**

Commercialization and Entrepreneurship

## **Appendix: Center Thrust Areas**

Homeland Security

Simulation

Bio-Informatics