

Request for Technology Fee Funds

NOTE: A separate request should be made for each initiative.

I. Department Number/Department Name:

360 College of Computing & School of ECE

Title of Request (please be brief):

JINX Cluster Update

Amount of Request (formula from detailed budget below):

\$174,130

Are there any installation/renovation costs associated with this request?

If "Yes" then indicate the source of approved funding:

(Note: Tech Fees are not allowed for installation/renovation)

Executive Summary of Request (100 words or less):

We propose to upgrade our current aging JINX resource to ensure stability as well as to make use of advancements in GPU technology.

Specific class and/or lab initiative(s) if applicable:

(See Part III narrative and continuation section)

Contact person for this request (incl. phone #):

Mercer, Riley (4-4767), Vuduc

Indicate priority per department if applicable:

Number _____ of _____

Indicate priority per college or unit:

Number 2 of 6

II. Impact on Students - Provide course title, course number, and anticipated enrollments:

Titles/Numbers of Course(s)

(see attached narrative and continuation section)

Anticipated Enrollments

Graduate: 838

Undergraduate: 112

Total: 950

NOTE: Other impacts on students should be described in narrative.

III. Narrative - Provide narrative justification for your intended use of the technology fee funds. Include narrative on how the education or research of the students will be enhanced. Also include how the request aligns with the Strategic Plan of Georgia Tech. Continue in the block below if necessary.

Georgia Tech's strategic plan sets goals to be among the most highly respected technology-focused learning institutions in the world and to sustain and enhance excellence in scholarship and research. To our knowledge, the College of Computing's instructional HPC facilities are unique on campus. Funded by Technology Fees, the JINX HPC and Dune storage clusters provide instructional access to an increasingly common heterogeneous architecture of high performance stream processing capability via its GPGPUs coupled with standard CPUs, interconnected with high performance networking, and attached to large filesystems. The cluster has performed well and been a valuable resource for multiple units on campus, but due to increasing age (funded in FY11) and the advancement of GPU technology, it is time for an upgrade. Replacing the entire cluster is a large investment, so with that in mind, we split the upgrade into three stages. Last year we expanded the cluster with non-GPU compute nodes, enabling a better separation of jobs requiring GPUs and those that did not. This year we are proposing to replace half of the GPU nodes. If the demand for GPU-enabled nodes continue to grow, we will request additional nodes.

IV. Detailed Budget - Requested Items by Category List separately any equipment, software, and other allowable expenses (see Tech Fee Guidelines). There is a formula in the "total column" that multiplies the number of items times the unit price. You may enter a figure into the total column if the unit pricing is not applicable. If you need additional rows, contact the Budget Office to receive a modified form.

Supporting documentation is required - Include price justification in some form, such as quotations, published price lists, etc. as a separate PDF attachment. All supporting information should be in a single PDF.

Proposed Number of Items	Estimated Price per Unit	Total (\$)
Servers - GPU compute node	10	\$12,100
Server - Head node	1	\$7,450
10Gbps Network switch and uplinks	1	\$29,086
Server - Home Directories	1	\$6,975
Infiniband Switch	1	\$8,600
Ethernet/Power Cables	1	\$264
Infiniband Cables	10	\$65
Fiber Jumpers	1	\$105
Total (linked to the total amount of request line above)		\$174,130

Please return form via e-mail in Excel format to: tina.clonts@business.gatech.edu. Supporting information only in a PDF file.

III. Continuation of narrative justification, if necessary

The classes expected to use the proposed cluster improvements include CSE6140, CSE6220, CSE6221, CSE6230, CSE6236, CSE6730, CSE6740, CS1372, CS4140/6140, CS4225, CS4245, CS4335, CS7641, CS4290, CS6220, CS6290, CS8803, CS4225, CS6210, ECE2035, ECE2036, ECE3020, ECE4100/6100, ECE8893, ECE6101, ECE6110, and MATH4777.

Our approach to designing the additional nodes was to add a smaller amount of servers than the previous Jinx cluster had but focus on very high end GPUs far better than currently offered on the Jinx cluster. Another consideration in this proposal is the use of Intel CPUs which provide better performance and power monitoring features that our courses can make use of when the assignments do not require GPUs specifically which significantly increases the positive impact these nodes will have on the cluster. Like other Deepthought cluster nodes these servers will have high speed ethernet as well as infiniband; however, the CPU and RAM will be more in line with the Jinx cluster nodes, a more standard GPU node configuration, they are replacing. Each node will be equipped with a FDR Infiniband card to provide access to the Dune storage cluster. Our proposal also includes supporting infrastructure, such as a 10 Gb network switch, infiniband switch, head node server and home directory server storage.

The installed equipment will be available to any programming classes in CSE, CS, or ECE that has a need for student access to a common and powerful computing platform to complete out-of-class assignments. The cluster will be installed and maintained by the existing CoC computing support group within current resources.