Performance Funding Project

Project Name: Remotely Accessible Virtual Environment Server – Part 1

Overview (Overall goal of project):

Provide the CISE department an NDG NetLab+ appliance as a front end for multicore VM servers so that faculty can give students access to Pods (groups of one or more virtual machines in a network) that have been configured for laboratory exercises. The system supports making specific machine/network configurations available to students through a web-browser interface that gives them remote desktop access and lets them carry out assignments and submit the results of their work.

The initial use of this system will be in the Penetration Testing and Ethical Hacking course where it is critical to provide students with access to small networks of machines that are not connected to the internet so that they can carry out activities that would normally be disallowed in any reasonably managed network (such as port-scanning, exploiting server weaknesses, and distributing malware).

Use of this system in other classes (in particular online classes in which being able to guarantee access to identically configured virtual machines and networks is important) is expected and encouraged.

A student technology fee grant is supporting $25,910 of the cost of this purchase specifically for cybersecurity classes. An additional amount of approximately $20,000 will expand the system to double the number of active pods (from 16 to 32) and active virtual machines (from 80 to 160), and will also support a VM host with greater capabilities than initially proposed.

Part 2 of this Performance Funding Project will propose expanding the system to have more computational power for VM Hosts. Although the NDG Netlab host will be enabled to support 32 active pods and 160 VM hosts, the ESXi host server proposed for purchase here would not be able to support the computational and I/O load imposed by running that many VMs. We propose to expand the system only after it has proven its ability to serve our needs.

Courses enhanced / new courses (labs, course materials, etc):

Penetration Testing and Ethical Hacking
Computer Security
Malware Reverse Engineering
Any other course that wants to provide VMs to students for completing course work.

Number of students affected per year:

86 in the fall semester alone, probably hundreds per year.

Resources required (between now and July 1, 2014):

NDG Netlab Server and software: $19,995
NDG On-site support: $9,995
Rackmount Management Server: $4,608
Rackmount VM 24 Core 4 socket Host Server w/192GB memory: $11,200

Faculty involved (list of names):

Joseph N. Wilson
Richard Newman

Faculty Development:

N/A

Project Outcomes:

Enable laboratory experiences in cybersecurity classes that cannot be achieved in any other feasible way. Support other classes that want to provide VMs or networks thereof to students for class projects.