UNIVERSITY OF LOUISIANA AT LAFAYETTE

STEP Committee

Technology Fee Application

Cloud Computing STEP Grant

Title

Dr. Robert Minvielle

Name of Submitter
(Faculty or Staff Only)

School of Computing and Informatics

Organization

Title: Cloud computing STEP Grant   Date: 1/13/2021

Name (Contact Person): Robert Minvielle

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Department/College/Org: School of Computing and Informatics

ABSTRACT (250 words or less):

In an effort to make remote learning easier for students to access and use, an on-premise cloud computing infrastructure (cmixcloud) was tested in Oliver Hall during the Fall 2019 semester. This was originally used for cloud computing classes and to help teachers whose classes were at capacity. This cmixcloud can be used to quickly deploy virtual servers, networks, and storage from premade images.

After testing this further in the Spring and Fall of 2020, it has become clear that an on-premise cloud can be used for multiple courses rather than just cloud computing. This also makes it easier for students and/or teachers working remotely to facilitate their classes. This system, however, is being implemented on outdated equipment. This STEP proposal is being written to help upgrade and increase the amount of hardware that is being used so that more classes can be facilitated by this remote system.

This system will be tested in the CMPS and INFX programs first. If this is found to be effective, this system can be used as a proof of concept and will be able to be scaled out to the rest of the university to aid with the process of remote learning.

Description of proposal:

A) Purpose of Grant and Impact to Student Body:

Cloud Computing has increased in its necessity and students' interest to follow this field as a career. To further students understanding of cloud computing, it was decided to use actual cloud computing systems during the course of instruction for the cloud computing course offered in the School of Computing and Informatics. A few companies have free versions of cloud access: Amazon, Microsoft, and Google. However, these "free" tiers still can accumulate charges to students and in some cases, these charges can become increasingly expensive for college students.

In Fall of 2019, an on-premise cloud infrastructure was built using two older servers in the School of Computing and Informatics. This cloud system was effective but limited in the amount of students it can serve simultaneously. After further investigation, this system could be used to facilitate more than just the cloud computing course. Many of our CMPS and INFX courses can be taught using this system. Given the University's current predicament with COVID-19, remote learning has seen a massive increase in adoption. This could be a solution to the demand for virtual classrooms rather than getting the free versions from the companies named above and possibly inquiring hefty fees for students. The actual proposal will be for one large DELL server which can create up to 128 virtual machines, with room to expand if the on-premise cloud system works as planned.

B) Projected Lifetime of Enhancement:

Projected lifetime of enhancement with no upgrades is seven years.

C) Person Responsible for:

The person responsible for implementation, installation, maintenance, operation and training is Dr. Robert Minvielle. He has configured the initial OpenStack cloud, and adding in this computing node will be under his direction.

D) Budget:

In the budget proposal, the main items are the servers themselves, which comes from our approved vendor Dell, with a five-year warranty. The supplies listed are power cords, adaptors, ethernet cables and fiber optical cables to connect the new server to the existing cloud infrastructure.

Budget Proposal

1.   **Equipment**   **$ 20,000**

2.   **Software**   **$ 0**

3.   **Supplies**   **$ 5,000**

4.   **Maintenance**   **$ 0**

5.   **Personnel**   **$ 0**

6.   **Other**   **$ 0**

TOTAL: **$ 25,000**