

# Materials, Services, Facilities and Technology Fee Fiscal Year 2019-2020 Budget Request Form

**DUE: Friday, January 25th, 2019**

If you have questions about this form, please contact David Daniels at [david.daniels@csuci.edu](mailto:david.daniels@csuci.edu)  
For additional information please consult the MSFT web page

## ▼ Application

### Project or Activity Title

Cloud Computing Infrastructure

### Requestor

Michael Soltys-Kulinicz

### Requestor Phone Number

8054373713

### Requestor Email

michael.soltys@csuci.edu

### Staff Support Member for Activity

Stephanie Chavez

### Staff Support Member Email

stephanie.chavez@csuci.edu

### Amount of MSFT Funding Requested

36000.00

### Date Funding Needed By

2019-12-01

### Are you a member of the Division of Student Affairs?

- No  
 Yes

### Please select your AVP/Dean

Kohli, Vandana - Dean of Arts & Sciences

Require\_DSA\_AVP\_Review

### Will you receive funds from any other source(s)?

- No  
 Yes

### Has this project or activity previously received MSFT funding?

- No  
 Yes
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Please describe how the use of MSFT funds for this project or activity will benefit the CI student body.

Please provide the following in your application. You may attach additional files as needed (applicants may be requested to meet with the committee to discuss proposals)

**1. Brief Project Description**

Describe the project and its benefits to the educational or co-curricular experience of students at CI. Please provide specific information about how MSFT funds will be used and their impact on the campus. Please describe how this project benefits CI students? Please describe items and provide justification if your request includes the purchase of computers, equipment, furniture or other materials. Please provide a timeline for implementation of the proposed project. If physical improvements are requested please describe need, scope and impact of work to be completed. If the project includes provision of services please indicate the type of service, personnel costs and level or quantity of service to be provided with project funds.

**2. Project/Activity Budget**

Please enclose a complete detailed budget of the entire project. Indicate specific items of requested MSFT funding including (where applicable) a schedule and priority of project items to be considered if the project is funded at a reduced level. Were other, less costly, approaches considered when preparing the budget for the project? Are there elements that could be eliminated or deferred if funding is not available for the entire project?

**3. Project Assessment**

Describe how the effectiveness of the project will be assessed and measures that will be used to determine if it has attained its objectives. Please note a report will be due at the end of the semester (or fiscal year for annual projects). If funded, how will the project acknowledge the use of student funds so that students are aware that their student fees made (or helped to make) it possible? If appropriate, indicate how the project or activity promotes sustainability at CI.

**4. Sources of Project Support**

Please list the other sources of funding, and additional support for the activity. If this project or activity has been conducted previously please indicate how it was funded. Please explain if MSFT is the only source of support for the project.

**Brief Project Description**

Over the last two years, initially with the help of Michael Berman (AVP IT), Computer Science has invested in an educational partnership with Amazon Web Services (AWS). AWS is the world's largest provider of Cloud infrastructure services. This partnership allows Computer Science to use cloud services such as compute servers, storage, databases and networks, without having to make costly capital investments. We get to use the most sophisticated tools in the cloud, such as Redshift machine learning, without having to build them ourselves, and we pay as we go, and use them as we need them. This has truly been a revolution, and a new model of obtaining compute resources at low cost for our students.

Buying usage credits from AWS we will obtain some great savings (about 60% in savings, as you can see from calculations below). We are requesting \$36,000 for a year, which breaks down to \$3,000/month, but gives us approximately \$4,800 of services.

Michael Soltys has invested a lot of time into the AWS partnership. For example, in order to secure the AWS education discounts, Soltys had to commit to passing the certification as an "AWS Cloud Solutions Architect", a lengthy process. Soltys applied for the educational partnership, and now AWS opens accounts for our students, with a \$75 credit so they can learn the AWS basics for free. Still, when students use AWS for advanced projects, such as capstones or senior core courses we incur costs.

**Brief Project Description Additional Documents**

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## Project/Activity Budget

Based on the current estimates, we will be spending about \$3000/month. However, if we obtain the MSFT funding, we will be able to do more with the same amount, as we will get a discount by buying AWS cloud credits before hand. AWS has a sophisticated pricing console, called CloudWatch, which Michael Soltys uses to predict costs, and close or open services for our students to stay within the budget.

Currently, AWS is being used by students from diverse classes and activities; for example: Senior capstone students use AWS for their projects. One of the most frequently undertaken project by capstone students is the development of a mobile app. Such apps require a server with a static IP address in the cloud. AWS allows us to open such servers (called virtual instances) at the price of 20cents an hour - this is a lot cheaper than running such servers on campus within our own infrastructure.

Our students in COMP 424 (Security) and COMP 429 (Networking) learn to design security policies for data in the cloud using the AWS "Identity Access Management" system. This gives them familiarity with the main cloud technology in the industry. The Networking students learn to create "Virtual Private Clouds", of any level of complexity, with hundreds or thousands of nodes by using AWS.

Here is the breakdown of service costs per month:

-Elastic Cloud Compute instances (EC2): \$1,000 - the cost is \$0.1786/hour at discounted price (by buying credits with MSFT funds), and we expect 40 students to use an average of 140 hours of compute, for a total of 5600 hours, which is about \$1,000.

-Simple Storage Service (S3): \$1,700- this included S3, Glacier storage for long term archival processes (as when we do data mining on large data sets that do not have to be active all the time, but only during analysis), as well as Elastic Block Storage (EBS), which will be \$1000 for S3 storage, 0.023/GB, and we expect about 40T, \$200 for Glacier (\$0.004/GB per month), and \$500 for EBS, which is required to have solid state memory while using EC2

-Router 53 and Virtual Private Cloud - \$300 - this includes the basic monthly cloud networking infrastructure.

## Project/Activity Budget Additional Documents

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## Project Assessment

There are two tools included in the AWS services that enable assessment of usage. They are called "CloudWatch" (mentioned in the Budget section), and "CloudTrail". Both of them give detailed statistics of usage by students, and they will be used for assessment as they produce excellent reports.

Students learning outcomes will be measured by the quality controls that we are currently developing to apply for ABET accreditation. This included rubrics for all classes.

The value of AWS is two fold: First, cost effectiveness (no capital investment, pay as you go, and use resources (rather than "rack-them, stack-them, power-them" model). Second: sheer amount of tools available through the AWS console: from networking, to machine learning, to databases, to programming languages for even driven software solutions such as "Lambda". Thus it allows us to do what we need to do anyway, at a VERY LOW COST. Thus the value arises from comparing in house solutions to cloud solutions.

We will also be assessing the impact on the students with the usual teaching evaluations where student comment on tools they use in their courses.

## Project Assessment Additional Documents

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## Sources of Project Support

As mentioned above, we applied for an AWS Educate partnership, and we were accepted. This was not automatic: we had to make investments of time in order to obtain the necessary certification. We get discounts for being in the partnership, and we have negotiated with Amie Carobrese, the AWS representative for the CSU a discount by paying before hand. Here is an example of such a discount: pay as you go on demand server of a certain type that we use is \$0.479/hour, so using it for a year (8760 hours) is \$7,529. But paying up front is \$0.1786/hour, which is \$1,564, and hence a 63% savings!

## Sources of Project Support Additional Documents

### Accounting String to Fund Any Overage Above MSFT Award

660003 GD901 772

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#### **Fiscal Management:**

Project sponsor's unit or department may be responsible for incurred over and above what is funded through the MSFT. If support is requested for costs beyond initial award, or for use on activities or materials not included in approved proposals, the project sponsor must seek approval from the MSFT committee. The project sponsor will be responsible for managing purchases, transfers of funds, and all transactions related to approved projects

Please review MSFT web page for information about the fund and its objectives before submitting your application.

 Michael Soltys-Kulinicz Jan 10 2019

#### ▼ AVP/Dean Review

- I recommend approval of the MSFT Funds Request described on this page
- I DO NOT recommend approval of the MSFT Funds Request described on this page

Comments

 Vandana Kohli

Jan 16 2019