FACULTAD DE CIENCIAS EXACTAS Y NATURALES
UNIVERSIDAD DE BUENOS AIRES

Departamento de Ciencias de la Atmósfera y los Océanos
Componente Universitaria del Centro de Formación Profesional para Latinoamérica de la Organización Meteorológica Mundial (OMM)

2020 Unidata Community Equipment Awards - Cover Sheet

Proposal Title: Upgrading LDM server at DAOC University of Buenos Aires

Date: March 20, 2020
Principal Investigator Name: Moira Doyle
Title: Adjoint Professor
Institution: Department of Meteorology and Ocean Science (DAOC) – Departamento de Ciencias de la Atmósfera y los Océanos (DCAO) – Facultad de Ciencias Exactas y Naturales (FCEN) – Universidad de Buenos Aires (UBA), Argentina.
Telephone number: (+54) 11 5285 7821
FAX number: (+54) 11 4576 3357
Street Address: Int Güiraldes 2160 - Ciudad Universitaria, 1428 Buenos Aires, Argentina
Email address: doyle@cima.fcen.uba.ar / moira.doyle@gmail.com

Signature of PI:

Name of Institution Official: Sergio Dasso
Title: Director of the Department of Meteorology and Ocean Science (DAOC) – Departamento de Ciencias de la Atmósfera y los Océanos (DCAO) – Facultad de Ciencias Exactas y Naturales (FCEN) – Universidad de Buenos Aires (UBA), Argentina.
Telephone number: (+54) 11 5285-7821
FAX number: (+54) 11 4576 3357
Email address: sdasso@at.fcen.uba.ar / direccion@at.fcen.uba.ar

Signature of University Official:

[Note: Argentina is in full quarantine due to COVID-19, then we include digital signetures in this cover letter].

Upgrading LDM server at DAOC University of Buenos Aires

Project Summary:

This proposal aims to upgrade a key component of our computing infrastructure in the Department of Meteorology and Oceans Science at University of Buenos Aires, Argentina. The Department received a Unidata grant in 2002 which was used, among other things, to purchase a powerful PC which acted as server to ingest, store, and process data from the Unidata stream. This server is our Local Data Manager (LDM) server, so its well-being is critical. The data ingested are used: (a) in research applications by both faculty and students (undergraduate and graduate); (b) in classes, covering broad uses like satellite information analysis, synoptic meteorology, weather forecasting, space weather and data assimilation among others; and (c) to maintain our departments weather website. The current proposal seeks funds to upgrade our LDM server capabilities and storage capacity from 2002 technology to 2020 technology and capabilities.

Project Description:

Founded in 1821, the University of Buenos Aires (UBA) is one of the largest universities in Latin America and has produced four Nobel Prize winners. Over 60.000 students inscribe each year to study in the different faculties. The Department of Atmospheric and Oceanographic Sciences (DAOC) is part of the Faculty of Exact and Natural Sciences, and it is also the university component of the Regional Meteorological Training Center (RMTC) of the World Meteorological Organization (WMO) (Region III) in Argentina. It has been responsible for graduate courses on atmospheric sciences since 1952, the longest tenured meteorology program in the country and in South America. It has also undertaken the only graduate program in oceanographic sciences in Argentina for the past 27 years and is a recognized post-graduate center in the Spanish-speaking region.
The DAOC has a long record of working closely with the National Weather Service on operational weather research and training. For the past 10 years DAOC has been responsible for the academic training of the fellows who are part of the human resources program funded by the National Meteorological Service and the Ministry of Science and Technology with the goal of incorporating a new generation of technicians and scientists in the National Weather Service. The atmospheric program curriculum is focused on advanced atmospheric theories and applied coursework, where students are engaged in hands-on active learning through meteorological instruments, data analysis including Unidata (e.g., IDV, GEMPAK, McIDAS) visualization and other software (e.g., R, grads). The main computational accessibility for meteorological students and faculty in DAOC is the computer lab within the department in the second pavilion II of the University Campus. In 2003, the department received Unidata funds to improve its computer infrastructure, improving communications with an operationally quicker system. A whole network which worked at 10Mb/sec with various HUBs in series was replaced by a 100 Mb/sec network and the HUBs were replaced with switches. New machines were incorporated for the computer room, increasing the number of computers available for students from 5 to 8. This has also resulted in more and better computers for research. The COMET MeteoForum project contributed through UCAR the necessary funds to acquire a datashow projector to be used in classes connected to Internet and to be able to develop educational modules during lessons, to work with real time

meteorological events and any other digitally available data which could be useful in the classroom. LDM software became operative and thus we were able to start processing a given amount of data.
Many curricula utilize this lab during semesters, including the courses Laboratorio de Procesamiento de Información Meteorológica, Meteorología General, Estadística para el Sistema Climático 1, Procesos Termodinámicos en la Atmósfera, Meteorología Sinóptica, Laboratorio de pronóstico del tiempo, Métodos numéricos, Sensoramiento remoto del Sistema Terrestre, Dinámica de la alta Atmósfera, y Meteorología Espacial. However, computing infrastructure in this lab (part of it originally purchased under a 2003 Unidata Equipment Award) are nearing end of life and unable to keep up with current software demands. We estimate that more than 50% of the hardware in our computer lab is near end of life and potential hardware failures would not be able to repair, given its age. The new building where DAOC will be moving into will count with several brand new computer labs which our students will have access solving one of our problems: out of date terminals.
On the other hand, ongoing budget issues in DAOC and in Argentina, have greatly limited significant funding opportunities for complete replacement of outdated or failed hardware, the one in most critical state being the LDM server. The equipment requested herein denotes an evident upgrade and replacement of current infrastructure. It will allow the DAOC program to continue and expand the use of the Unidata software suite in both teaching and research.
DCAO has formed and interacted with high level scientists world wide keeping high standard classes, research and innovation in the latest technologies and methodologies. In this sense, machine learning techniques and data analytics as well as space weather and atmospheric electricity have been included in our curricula during the past years to interest students in developing these new research areas at DAOC. There is also a great interest in studying mesoscale meteorology through the use of remote sensing and modeling, particularly after the success of the RELAMPAGO Project field campaign at the end of 2018 where many international resources were displayed and a huge amount of atmospheric and hydrological information was compiled. This Unidata equipment grant and purchase of a new server would allow using Unidata software to have accesses, decode and analyze this information by students of Sensoramiento remoto del sistema terrestre and help develop this research area where university scientists work in collaboration with the NWS research department on the improvement of weather monitoring, forecast systems and nowcasting.

In addition, DAOC has used WRF model for training during the past years. At present WRF-CHEM is being implemented to study dust storms both as research and training topics. However, our current server does not have the capacity to store high resolution nested outputs necessary to study the different events.

Besides research and teaching purposes, our server ingests data from the Unidata stream, stores and then processes the data to display on the department weather page (http://www.at.fcen.uba.ar/banco-de-datos/tiempo/). However, the density of information has increased considerably and our 18 year old server is at its limit in age and capacity. For example, GOES-16/east has become operational, with another large data stream of very high-resolution and high frequency data. GOES-17 has now been launched, so we can soon expect a doubling of this new satellite data coming in. As a result of this rapid growth in data flowing into the LDM, our server is now unable to fully process this large volume in a timely manner. This results in blank web pages because the processors have

not had time to create a field by the time the field is being pulled for display to our web site. The products and information displayed in our website are consulted not only by meteorologists but by other scientists in the University Campus (biologists, geologists, chemists) as well as from other disciplines like architecture. We desire therefore to upgrade with a new 10-core server in order and 16TB storage capacity to keep pace with the data stream, as well as software advances expected over the next years.

All of the above are a significant problem for our program. We need funds to replace our outdated server. Therefore, we request fund in this proposal to purchase one (1) HP 10 core server (HPE DL380 Gen10 4114 1P 8SFF 800W WW Svr) with 8 2TB HD for storage and 32 GB RAM.

It is anticipated that installing a new server in our computer lab will enhance the learning environment for our undergraduate meteorological education. Given award of this proposal, we expect to
• facilitate student training and development with LDM;
• integrate Unidata infrastructure into our meteorology curricula;
• showcase our meteorological students with local WRF numerical simulation.

Funding this Project will go a long way to maintaining our ability to offer students cutting-edge classes (e.g., GOES data analysis), and will also support our strong research program which impacts undergraduate and graduate students, as well as faculty as they conduct data-intensive research projects.

Budget:

The University of Buenos Aires Department of Atmospheric and Oceanographic Sciences proposes the purchase of a HPE ProLiant DL380 Gen10 Server, 8 HD of 2TB each and 32 GB of memory, based on current specifications need for an LDM server and the estimation of the need to have a server that will last well into the future. While no minimum specification was suggested, we feel that this particular model will optimize cost and efficiency, while providing a high-end performance server capable of meeting the unique needs of UBA Meteorology program. The total cost of the server system is

$ 12.424 (see attached quote).

Full time faculty and staff time is covered by DAOC. While UBA will not provide direct matching funds toward the purchase of the proposed equipment herein (in this instance), a high technology building has recently been completed which will allocate DAOC and attend to computer lab necessities.

i. Itemized budget request

Amount	Description	Unit	Total
1	***SERVER*** HPE DL380 Gen10 4114 1P 8SFF 800W WW Svr (P06421-B21)	U$S 4.443	U$S 4443
8	***STORAGE*** HPE HDD 2TB SAS 7.2K SFF SC 512e DS (765466-B21)	U$S 864	U$S 6.912
1	***MEMORY*** HPE 32GB 2Rx4 PC4-2666V-R Smart (815100-B21)	U$S 1069	U$S 1069

Project Milestones:

Assuming funding awarded on June 1, 2020:
a) June 1 – June 15: request revised quotes to allow for cost changes and hardware improvements between the dates of proposal submission and award; order servers. Current quote is attached.
b) June 15 – August 15: install new servers in parallel with current server; install and test data access, processing and configure the new server to replicate the current functions of the old server. There will be a testing period with the new and old servers side-by-side to ensure everything is working OK. The precise timing will depend on the workload of the DAOC server team.
c) Ideally, everything is installed and up and running in time for the new semester in late August 2020.

Av. Triunvirato 3840 Piso 6 Of. B
C1431FBO
Ciudad de Buenos Aires

Tel.Fax: (54.11) 4521.4195
email: ventas@trio.com.ar
www.trio.com.ar

TRIO
GRUPO INFORMATICO

Buenos Aires, 16 de Marzo de 2020

Sres.: Universidad de buenos Aires
At. : Sr. Luis Asturillo
Ref. : Servidor HP

Reng	Cant	Descripción	Unitario	Total
1	1	HPE DL380 Gen10 4114 1P 8SFF 800W WW Svr (P06421-B21)	U$S 4.443,00	U$S 4443,00
	8	HPE HDD 2TB SAS 7.2K SFF SC 512e DS (765466-B21)	U$S 864,00	U$S 6.912,00
	1	HPE 32GB 2Rx4 PC4-2666V-R Smart (815100-B21)	U$S 1069,00	U$S 1069,00

Total de la oferta por renglón completo en Dolares: U$S 12.424,00 (dólares doce mil cuatrocientos veinte cuatro con 00/100)

GARANTIAS:
Renglón 1: Brindada directamente por HP.

Toda garantía se hará efectiva en nuestro laboratorio o en los services oficiales de los distintos fabricantes, según corresponda.

CONDICIONES:
Forma de pago: transferencia bancaria.
Plazo de entrega: 15 días hábiles sujeto a disponibilidad del fabricante.
Mantenimiento de la oferta: 30 días.
Los precios están expresados en dolares e incluyen IVA.



Lic Diego Shestenge
SOCIO