

Task Statement of Work (SOW)

Date: December 1, 2015
Task: NCCS User Support
Task Order: 6064/0
Task Monitor: 

I. Summary of Work

The task order covers User Support within the NASA Center for Climate Simulation (NCCS).

II. Period of Performance

The period during which the work for this task shall be performed is between March 1, 2016 and February 28, 2017.

III. Task Description

Area 1: Help Desk

The contractor shall be responsible for:

- a. Providing a single point of contact for users to obtain information about and request access to all NCCS services. The contractor shall be responsible for communicating to the user community through the use of electronic mail, websites, teleconferences, meetings, and social media (e.g., Twitter, Facebook). The contractor shall provide timely and succinct communications to the user community about system status, availability, system load, downtimes, news, announcements, and relevant changes to the environment that may affect systems and services.
- b. Providing on-site help desk from 8:00 a.m. to 6:00 p.m. Eastern Time (U.S.) Monday through Friday. The contractor shall answer the NCCS help desk phone, take initial emails through the ticketing system, and provide Level 1 support for the users, such as basic trouble shooting, and resolving issues with user accounts.
- c. Providing all aspects of account management, including account creations, account deletions, account modifications, and password resets.
- d. Providing continuous updates to the NCCS website (www.nccs.nasa.gov) about systems and services. The contractor shall create and publish documentation on the website about all aspects of the center such as news and announcements, message of the day, frequently asked questions, lessons learned, best practices, and presentations. The contractor shall provide input for the NASA High-End Computing web site (www.hec.nasa.gov).
- e. Processing all tickets through the NCCS ticketing system by capturing the relevant data about the trouble ticket and performing any necessary Level 1 support. For tickets that require Level 2 support or higher, the contractor shall assign those tickets to designated personnel. The contractor shall track all tickets to completion. The contractor shall look for trends across all trouble tickets, report those trends, and recommend action if necessary.
- f. Reporting on the allocation and accounting of all systems and services used within the NCCS. The contractor shall track and maintain records of the usage of all systems and services by the NCCS

community on a daily basis. The contractor shall report on the usage of all systems and services monthly, identify trends, and provide recommendations.

- g. Coordinating NCCS user forum meetings, brown bags, and weekly user teleconferences with the NCCS user community. The contractor shall be responsible for all aspects of these meetings, including scheduling time and place, announcing the meeting, creating presentations or documents, capturing meeting notes, publishing documents and notes, and providing follow up on action items.

Area 2: User Liaisons

The contractor shall be responsible for:

- a. Maintaining liaisons, building relationships, and regularly meeting with key science user communities to ensure that CISTO and NCCS future plans meet their science needs. The contractor shall identify critical performance factors and coordinate with CISTO and the NCCS to ensure that solutions adequately address the computational and storage requirements of the user community. The contractor shall report back to CISTO and NCCS about meetings with users and provide recommendations for how to better serve the user community.
- b. Providing user impact assessments of potential changes to the NCCS operational environment. The contractor shall coordinate changes of the operational environment with the user community.
- c. Supporting all customer outreach activities, including the NCCS user forum meetings, brown bags, and weekly teleconferences. In addition, the contractor shall be a liaison between the NCCS and the broader community by attending other scientific meetings. The contractor shall report back to the NCCS after returning from these meetings and provide recommendations for how to better serve the user community.
- d. Expanding the user base of the NCCS through meeting with potential users. The contractor shall discuss the capabilities of the NCCS with potential users, understand user requirements and workflow, and make recommendations for how the NCCS may be able to assist new science users.

Area 3: Applications Support

The contractor shall be responsible for:

- a. Providing support for the user community. The contractor shall be assigned trouble tickets and requests for assistance through the ticketing system. The contractor shall respond to tickets and work with users, systems administrators, vendors, and the open source community to help resolve any issue.
- b. Identifying, recommending, and installing programs, utilities, and tools required by the user community (such as different versions of MPI). Once identified, the contractor shall install and test for functionality and performance the proposed programs, utilities, or tools for use on NCCS systems. As appropriate, the contractor shall document the usage of these programs, utilities, or tools and share the documentation with the user community.
- c. Profiling, porting, migrating, debugging, and optimizing applications across different high performance computing systems. The contractor shall respond to requests for support from the user community for general performance engineering of applications, including answering basic to advanced questions, and enhancing and troubleshooting applications across different high performance computing systems.

- d. Benchmarking specific applications, libraries, and tools on different high performance computing systems. The contractor shall baseline the performance of existing systems within CISTO and the NCCS, across NASA, and even outside of NASA as necessary. The contractor shall support the effort to set yearly allocations by running benchmarks for the creation of a standard billing unit. The contractor shall support the running of benchmarks on advanced technology components as necessary and compare the performance of applications to existing systems.
- e. Responding to and supporting requests from the user community to assist in the parallelization of applications on different high performance computing systems. The contractor shall work closely with the user to assess the application through performance profiling, recommend the best approach to parallelization, and implement the agreed upon method for parallelization.
- f. Raising awareness of the services found within CISTO and the NCCS to existing and potential users. The contractor shall provide training and consulting services to users through a variety of mechanisms, including one-on-one support, brown bags, teleconferences, WebEx, on-line documentation, and user forums.
- g. Documenting best practices for how to use CISTO and NCCS resources, relevant white papers, parallelization studies, and general success stories. The contractor shall provide outreach to the CISTO and NCCS user community, universities, and industry partners through the presentation of relevant work at general meetings or conferences.
- h. Monitoring the status and availability of CISTO and NCCS resources from the user perspective. The contractor shall periodically measure the functionality and performance of resources and compare to baseline measurements. The contractor shall maintain documentation of baseline measurements and all subsequent performance measurements. The contractor shall support upgrade and integration efforts as required by testing the functionality and measuring the performance of new components. The contractor shall participate in highly collaborative teams, as necessary, to address specific performance issues.
- i. Monitoring the utilization of the systems by analyzing workload characteristics. The contractor shall analyze and recommend changes to the resource management policies and scheduling algorithms to maximize the utilization of resources.

Travel and Training

At a minimum, travel and training shall include approved trips to relevant industry conferences and vendor user groups, such as SC16 (November 13-18, 2016, in Salt Lake City, Utah).

In addition, travel to visit off site users shall at a minimum include the following:

- Travel to visit GISS users (1 person, 1 day each) – Spring & Fall 2016

IV. Deliverable Items and Schedule

In addition to the day-to-day work described in section III, the following deliverables will be completed:

Number	Deliverable	Due Date
US4-1	<p><i>Ticket Analysis</i> Provide an analysis of tickets that provides a breakdown of tickets by functional area and also provides a trend analysis.</p>	Monthly

US4-2	Brown Bag Seminars Give at least one Brown Bag Presentation every two months, and provide PDF versions of presentation material for NCCS web site.	By last working day of every second month
US4-3	Meeting Notes Provide informal notes (intended for internal sharing within NCCS) from all "focused" meetings or "office hours" with current and potential NCCS customers and peer organizations, e.g., staff from Global Modeling and Assimilation Office (GMAO), Goddard Institute for Space Studies (GISS), Joint Center for Scientific Data Assimilation (JCSDA), NOAA, Oak Ridge National Labs, etc.	To NCCS staff by five working days following the meeting; to respective external groups by 7 working days following the meeting
US4-4	Plan: Discover-Related Updates to NCCS Resource Utilization Database Environment Develop and implement plan(s) for pertinent updates and improvements to the NCCS Resource Utilization Database Environment to accommodate updates in the Discover environment. As appropriate, this may include (but not be limited to): dedicated partitions and reservations, for used and unused resources; improvements in handling of multiple-day jobs; usage of nodes shared by more than one job; resource allocation and tracking for Large Shared Memory Node(s); trackable resources.	Ongoing
US4-5	Implementation: Discover-Related Updates to NCCS Resource Utilization Database Environment Implement the approved plan(s) for pertinent updates to the NCCS Resource Utilization Database Environment to accommodate updates in the Discover environment.	Ongoing
US4-6	Update User Documentation on NCCS Web Pages Update NCCS User Documentation on the NCCS Web Site, with a particular focus on improving accuracy of information and usability of information for inexperienced NCCS users. Six weeks following the beginning of the Task Year, provide a high-level plan describing the approach for implementing these updates. Provide brief, high-level reports of progress in this area in the monthly reports.	Initial plan: April 16, 2016 Updates ongoing
US4-7	Run Sustained System Performance Tool (SSP) and Post Results Run the SSP at regular intervals and following each Discover downtime (at a minimum), including numerical results check developed in CY3, and post results to the NCCS staff wiki, or other mutually agreed upon staff-accessible location, to assist in monitoring	Ongoing, as needed

	and trend analysis. Maintain accurate documentation describing the SSP and so that it can be run by at least two NCCS staff members on a regular basis, to baseline and document NCCS system performance from a user application perspective.	
US4-8	<p>Maintain SSP and SBU benchmarks for Current Discover Environment</p> <p>Update the SSP to handle additional NCCS computational environments (e.g., new software stacks, compilers, libraries, operating system releases; additional computational hardware, and interconnect fabrics). Update SSP documentation as needed. Maintain current versions of relevant codes and scripts needed to run the NASA HEC Program SBU benchmark on current Discover cluster hardware and software environments. Document instructions for running the SBU benchmark in the current Discover environment, and, considering future (generic) Discover environment changes, identify areas of the SBU benchmark and scripts that would likely need attention to adapt to such changes.</p>	Ongoing, as needed
US4-9	<p>Update SSP for Current User Practice</p> <p>Provide a yearly evaluation of the current SSP against current user practice, and document recommendations regarding which portions of SSP applications may need updating, including a Reasonable Order of Magnitude of time and resources required to perform those updates on the SSP. Implement approved updates to the SSP, and update corresponding SSP documentation.</p>	September 30, 2016
US4-10	<p>Develop SSP-Building Regression Testing Module</p> <p>Create a module for building constituent SSP software, to be used in initial regression tests of the effects of new compiler and MPI modules prior to their release for users. If deemed feasible, add this module to the regular SSP runs (including a related results matrix), so that the SSP runs this build module against all of the major NCCS-supported compiler/MPI module combinations.</p>	December 16, 2016
US4-11	<p>Assess Footprints Status</p> <p>Assess the NCCS's production Footprints environment against recommended supported Footprints release for Linux, and provide a recommendation to NCCS regarding the advisability of upgrading the NCCS Footprints environment. If the recommendation is to upgrade, include a Reasonable Order of Magnitude estimate of time, effort, and hardware, and software (if</p>	July 29, 2016

	any) resources needed to upgrade the Footprints environment.	
US4-12	Implement Footprints Enhancements for TY4 Propose a list of suggested enhancements to the Footprints features and configurations for TY4, including (as feasible) reformatting the Ticket email format, and changing the escalation configurations. Implement the approved enhancements.	October 31, 2016
US4-13	User Account Lifecycle Management (UALM) Updates and Support for TY4 Execute the Government approved plan to develop and operationally deploy UALM updates for TY4. Provide ongoing support and necessary bug fixes to UALM.	February 28, 2017
US4-14	UALM Draft Plan: TY5 Proposed Updates Based on feedback and additional requirements, design and document functionality and workflow definition(s) for the UALM for TY5. This plan shall include a high-level implementation schedule, estimated level of effort, and any other resources required to implement TY5 updates.	February 28, 2017
US4-15	Draft ADAPT Resource Tracking Process Draft a proposed initial process and, if warranted, workflow for allocation tracking of resources utilization (by project and, as feasible, by user) on the ephemeral part of the Advanced Data Analytics Platform (ADAPT), including a description of how such utilization would be tracked (and reported) via NCCS resource utilization database tables. Develop a high-level plan for implementing the proposed process, and workflow (if applicable), and database changes. Include a rough order of magnitude estimate for effort, hardware (if any), and software (if any) to implement the process.	June 30, 2016
US4-16	Implement ADAPT Resource Tracking Process Implement the approved initial process and workflow for allocation tracking and reporting of resource utilizations on the ephemeral part of the ADAPT.	October 30, 2016

V. Travel

The contractor is expected to propose travel as necessary to perform this task. As part of the contractor's Task Order response, a spreadsheet of proposed travel shall be provided to the Government that outlines the proposed travel during the contract year. It is expected that travel plans will change throughout the contract year. Therefore, travel plans shall be updated and forwarded to the Government on a monthly basis.

Travel may include (but not be limited to):

- Attend training and conferences relevant to support this task.
- Travel to other centers as required.
- Attend technical meetings as required.
- Travel to training locations.
- Trips to Goddard in support of deliverable activities.

After the completion of travel, the Contractor shall provide to the Task Requester and Contract Management a Trip Report for both domestic and foreign travel that includes:

- Name of Traveler
- Trip Itinerary
- Task Name and Number
- Purpose of Trip
- Contact(s) and Summary of Discussion(s)
- Summary of Presentation(s) / Talk(s)
- Copy of Presented Material, if applicable

In addition to the above, the following information shall be included in all Trip Reports for foreign travel:

- Statement of and Date of Threat Vulnerability Briefing
- Statement of and Date of Threat Vulnerability Debriefing (including the date the debriefing questionnaire was mailed to the Threat Vulnerability office. If no formal debriefing was required, so state)
- Statement of and Date of Export Compliance Briefing (if not applicable, so state and provide date of approval for 1676 package)

VI. Training

It is expected that the contractor personnel assigned to this work have the necessary training at the beginning of this task to complete all deliverables. The contractor may propose training beyond what is typically expected of the proposed labor categories that they deem necessary in support of their technical approach to meet the deliverables. Training plans must be updated on a monthly basis and forwarded to the Government to include, but not limited to, the following information: training completed, upcoming training, and proposed modifications to the training plans.

Training may include (but not be limited to):

- Conferences tutorials or workshops relevant to support this task.
- Cross training at other centers as required.
- On-line training.

The Contractor shall provide to the Task Requester and Contract Management a Report for all training that includes:

- Name of Person Attending Training
- Training Content/Agenda/Overview
- Task Name and Number

- Purpose of Training
- Summary of Training/Presentation(s)/Talk(s)
- Contact(s) and Summary of Discussion(s)
- Copy of Training Material, if applicable

VII. Work Location

This work shall be performed primarily on-site at the Goddard Space Flight Center, but the contractor may be required to perform some work at the contractor's facility.

VIII. Reporting Requirements

The contractor shall:

- (B.1.2) Monthly Status Reports (MSR) shall be submitted on or before the 8th calendar day of each month for the previous month or as jointly determined following contract award. There should be one MSR per month that covers all task orders under the contract. The MSR shall be distributed electronically to the Contracting Officer (CO), Contracting Officer's Representative (COR), and all Task Monitors.
- (B.1.4) All White Papers, Presentations, Posters, Code or Reports outlined in the Deliverable Schedule shall be provided electronically to the COR and Task Monitor as specified.
- (B.1.5) Provide an electronic copy of a Monthly Highlights Report (MHR) to the COR and Task Monitors by the last business day on or before the 4th calendar day of each month. There should be one MHR per month that covers all task orders under the contract. The highlights will be incorporated into the Monthly NCCS report written by Government personnel to the High-End Computing Portfolio Manager.
- (B.1.8) Provide a final task order report within 30 days after completion in electronic form to the Contracting Officer (CO) (letter transmittal only), Contracting Officer's Representative (COR), and Task Monitor.
- (B.1.9) Travel reports shall be included in the next MSR.
- (B.1.10) Provide an electronic copy of the NASA Form 533 for this task 10 days after the close of the Contractor's accounting period and Quarterly in accordance with Attachment. Send the 533 to Contracting Officer (CO), Contracting Officer's Representative (COR), Resource Analyst (Code 603), and Finance Office (Code 155).
- (B.1.12) The annual Financial Report of NASA Property in the Custody of Contractors (NASA Form 1018) is due October 15. This shall be submitted through the NF 1018 Electronic Submission System (NESS).
- (B.1.13) An electronic copy of the New Technology Reports is due to the Contracting Officer (CO) and New Technology Representative if one is required by any of the task orders under the contract.
- (B.1.15) Electronic monthly and annual Safety & Health Reports (S&HR) shall be submitted to Contracting Officer (CO) and Code 350. There should be one S&HR per month that covers all task orders under the contract.
- (B.1.16) An electronic Personal Identity Verification (PIV) Report shall be provided to the Contracting Officer (CO), Contracting Officer's Representative (COR), and Code 240 monthly. There should be one report per month that covers all task orders under the contract.
- Meet with the Contracting Officer's Representative (COR) and technical and financial Government representatives monthly to discuss financial status. Topics covered shall include:

Funding provided by NASA, Funding planned to be provided by NASA, Funding obligated to the Task Order, Status of subcontracts for Tools and ODCs, Expenses invoiced, Funds available on the Task Order (not expensed or obligated on subcontracts), and Expected monthly labor expenses.

IX. Security Requirements

This task shall comply with IT security requirements as documented in the NCCS IT Security Plan and 600 IT Security Plan as applicable.