

# Guidance on Direct Charging Normalized Compute Unit (NCU) Services to Federally-Funded Projects

(Updated 9-9-2013)

## Background

The Florida State University Research Computing Center (RCC) is a unit of FSU's Information Technology Services Department. The RCC provides a number of high performance computing (HPC) resources and services. To learn more about the RCC and the services it provides please visit the website at <http://rcc.fsu.edu>. The subject of this guidance will be limited to the purchase of Reserved NCU Services vs. On-Demand NCU services.

## HPC NCU Purchase Options

1. **Reserved NCU Services** – Priority access to HPC resources (i.e., CPU cycles and data storage) for a five-year period with full payment due up front.
2. **On-Demand NCU Services** – Access to HPC resources (i.e., CPU cycles and data storage) for a fixed hourly rate based on usage.

## Primary Points

- The purchase of Reserved Normalized Compute Unit (NCU) services from the Research Computing Center (RCC) being charged to an award up front require a justification as to how the NCU services purchase is more economical than the purchase of On-Demand NCU services.
- An adequate proposal justification constitutes prior approval to purchase Reserved NCU services on a Federal award subject to Research Terms & Conditions (RTC) or Federal Demonstration Partnership (FDP) terms.
- If an adequate justification is not included in the proposal, then approval to purchase Reserved NCU services is required prior to purchasing (use DSR Form 31).
- CPU usage will be monitored over the life of an award to ensure that actual usage justifies the purchase option chosen.

## Purpose

This document is intended to provide guidance on the purchase of Reserved NCU vs. On-Demand NCU services related to:

- When this guidance shall be applied.
- When Reserved NCU service charges are allowable costs on Federally-funded projects.
- Monitoring NCU services usage throughout the award period.
- F&A calculations in proposal budgets.
- Proposal budget justification examples.

## Applicability

This guidance applies only to awards subject to the (1) Federal Demonstration Partnership [FDP] Terms & Conditions, or (2) Research Terms & Conditions [RTC's]. For awards not subject to either of these terms, the terms of the award will determine the allowability of either NCU purchase option.

"Federally-funded" projects include:

- Direct Federal awards (Fund codes 520 and 521),

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- Federal flow-through awards (Fund codes 523 and 524), and
- Non-Federal funds used as cost sharing on a Federal award.

### Allowability

#### 1. Awarded as Proposed

- a. The purchase of Reserved NCU services may be direct charged to a Federally-funded project if the cost was included in the proposed budget with a detailed justification, and the agency issued an award based on that proposal. The detailed justification should include an explanation of why and how the NCU services purchase is essential for and beneficial to the performance of the project, and that the purchase of Reserved NCU services is more economical than the purchase of the On-Demand NCU option.
- b. For proposals submitted to the National Institutes of Health using a modular budget where the PI intends to purchase Reserved NCU services, a detailed justification for the purchase must be included in the Additional Narrative Justification submitted to NIH even though NIH may not require it.

#### 2. **Not Included in Proposal** (if the Reserved NCU services purchase does not comply with 1.a. or 1.b. above)

- a. The purchase of Reserved NCU services should be included in the proposal budget. However in cases where it was not known at the time the proposal was submitted that there would be a need for computing services, then prior approval must be requested from Sponsored Research Services before the Reserved NCU services can be charged to a Federally-funded project. To obtain SRS approval, submit a ***Request for Approval to Purchase NCU Services (DSR Form 31)***.

### Monitoring of NCU Services Usage

CPU usage will be monitored over the life of an award for both types of NCU services. The RCC will periodically provide Sponsored Research Accounting Services (SRAS) with usage data comparing Reserved NCU to On-Demand NCU service costs during the life of the project for two purposes:

- Ensure that the project(s) initially charged have used the services.
- Ensure that the cost of the Reserved NCU services charged to the project(s) is/are still economically justifiable.

### Proposal Budgets and Facilities & Administrative (F&A) Calculations

The costs associated with the purchase of RCC services will be subject to the F&A rate that is in effect at the time of proposal.

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### **Budget Justification Examples**

The following section provides a set of examples to help justify the cost of RCC resources and services required to support your research proposal. Not every data storage requirement or computing challenge faced will fit neatly into one of the examples provided below. PIs are encouraged to contact the RCC Director if there are questions concerning the wording of the justification used in their proposals. The guiding principle behind these examples is to facilitate research by encouraging early coordination and planning with RCC staff.

### **Reserved NCU Services Examples**

#### ***HPC NCU, Standard***

A total of \$40,000 is requested to purchase 100 Reserved Normalized Compute Units (NCUs) from FSU's Research Computing Center. These funds will be used to complete our coupled Ocean and Atmospheric simulations, which will require approximately 2.5 million CPU hours and 3 Terabytes of disk space over the three-year project. The number of NCUs that will be required for the proposed work is based on 95% availability of the systems and 100% utilization of the NCUs over the life of the project. We have chosen to purchase NCUs because the "On Demand" charge for our level of utilization over this period of time would amount to nearly twice the cost of purchasing NCUs.

#### ***HPC NCU, High-Memory***

We allocated \$12,800 in our proposal to purchase 32 Reserved Normalized Compute Units (NCUs) with 256 GB of memory (8 GB per core) from FSU's Research Computing Center. These NCUs will be used to support a data analysis pipeline for sequence assembly and long running phylogenetic analyses. The software we propose to develop will require 100 GBs of RAM for an average size genome assembly and therefore will exceed the amount of memory on the standard HPC NCU allocations. The sequence assembly pipeline will run on 16 of the 32 NCU while the remaining 16 NCUs will be used for phylogenetic analyses. We anticipate 100% utilization of the 32 NCUs over the life of the grant.

#### ***HPC NCU, with GPU***

A total of \$23,000 was included in our proposal budget to purchase 32 GPU enabled Reserved NCUs from FSU's Research Computing Center. The proposed work will require over 1.5 million conventional CPU hours over the duration of the project. We can obtain this level of computations without the need to purchase more NCUs by using recently developed molecular dynamic software optimized for GPU accelerators.

#### ***Interactive & Remote Vis NCUs (Spear)***

A total of \$10,500 will be used to purchase 16 Interactive and Remote Vis Reserved NCUs from FSU's Research Computing Center. The funds are needed so that investigators in the Chemistry and Math departments at FSU can run Matlab and other internally developed interactive software on test data sets. The 16 NCUs come with a total of 64 GB of real memory, which is required to analyze the test data sets generated by this project. The systems will be used exclusively to support the proposed work.

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### **On-Demand or Data Storage Services Examples**

#### ***HPC NCU, Standard On-Demand***

We request \$20,000 for on-demand access to 2.2 million CPU hours hosted by the RCC. These CPU hours will be used for the analysis of three multiple sequence alignments generated by this project. We will use software to run in parallel MCMC and bootstrap analyses on 100 CPUs that are a part of FSU's main HPC cluster. We anticipate that the 100 CPUs will be in use approximately 25% of the time over the life of this project. We will have chosen to be billed for on-demand use of RCC resources rather than buy dedicated hardware because this approach is more cost effective given that our use of a relatively large number of processors will be sporadic.

#### ***Primary HPC Data Storage***

This proposal includes \$21,000 to purchase 21 Terabytes of extra disk space on the HPC primary file system from FSU's Research Computing Center. Additional storage is needed because our base NCU storage allocation will not be enough to support the storage requirements of our high-resolution models. We expect to collect seven Terabytes of data during each year of the three-year project.

#### ***Secondary HPC Data Storage***

A total of \$10,000 is requested to purchase 15 Terabytes of disk space from FSU's Research Computing Center. The disk space will be used to store genomic sequence data generated at the FSU's core sequencing facility and images generated using a 3D deconvolution microscope located in the FSU Biology building. This storage will be dedicated to the proposed research.