

# User-Managed Software at OLCF

Fantastic Software and Where To Find It

ORNL is managed by UT-Battelle LLC for the US Department of Energy



U.S. DEPARTMENT OF  
**ENERGY**

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# Introduction

- Who is speaking to you today?



# Jamie Finney

- HPC Software Support Engineer
- OLCF since May 2020





# Definition

- What are we talking about?



# User-Managed Software

The UMS program defines a set of policies by which users of OLCF systems are granted the ability and responsibility to install, maintain, document, and support software packages intended for use by other general users on OLCF resources.

# Systems

- Where can we use this?



# Currently Available Systems



Summit



Andes



# Currently Available Systems



Spock

# Access via Modules

- How do I use other people's stuff?



# Usage

```
> module avail ums
----- /sw/summit/modulefiles/core -----
ums/default

> module load ums
> module avail ums
----- /sw/summit/modulefiles/core -----
ums/default (L)

----- /sw/summit/modulefiles/ums/core -----
ums-abc123/default
ums-xyz987/default
```

# Use Cases

- When should this be done?
- When should this not be done?





# UMS Use Cases

A software team ...

- Wants to provide optimized builds for other teams to use.
- Is helping setup a build environment for another project's team.

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# UMS Use Cases

A software team ...

- Wants to setup a build environment for your team to use.
- Wants to install a package, but does not have the time or people to dedicate to support it.
- Wants to install software, but not provide access via modules.

# UMS Use Cases

A software team ...

- Wants to setup a build environment for our team to use.
- Wants to install packages but does not have the time or people to dedicate to support it.
- Wants to install software, but not provide access via modules.



# Policies

- What's the catch?



# UMS Policies

- Products installed should be limited to those explicitly listed in the project application and approved by the OLCF.
  - The project application is reviewed by the Export Control Office. If you would like to install additional packages not listed in your original application, the Project PI must contact the OLCF at [help@olcf.ornl.gov](mailto:help@olcf.ornl.gov) before making changes.
- Products must provide appropriate modules for their software.

# UMS Policies

- Products must provide a statement of support, to be displayed via the module system and in other appropriate contexts/locations.
  - The statement should clearly indicate that the product is not supported or maintained by the OLCF, but is supported by the UMS project applicant and/or the UMS project team.
  - The statement should clearly indicate the organization that is providing support and maintenance, and clearly indicate the preferred method(s) of reporting issues or requesting support.

# UMS Policies

- Product modules will be grouped under project-level modules.
  - Users will be advised to do a `module load <UMS project>`, which will expose modules for the individual products associated with that project, accessed by a second `module load <product>`.
- Project PI must ensure that support is provided for users of the product, as documented in the statement of support.



# UMS Policies

- Project PI must ensure that the product is updated in response to changes in the system software environment (e.g. updates to OS, compiler, library, or other key tools) and in a timely fashion. If this commitment is not met, the OLCF may remove the software from UMS.

# UMS Policies

- Project PI must ensure that installations are tested to ensure basic functionality before being released to users. These are expected to be at minimum basic function/unit tests to ensure that the build/install was successful.
  - The resources provided by the OLCF for UMS shall not be used for software development or for routine testing purposes beyond the installation testing as described above.

# UMS Policies

- Products may be removed from UMS at the request of the Project PI by notifying the OLCF ([help@olcf.ornl.gov](mailto:help@olcf.ornl.gov)) of their intent and cleaning up their directory space.
- If a product is judged to be problematic for the OLCF, it may be removed by the OLCF staff, who will also notify the Project PI.

# Modulefile example

- How do I write one?





# Modulefile Example

```
> module show ums-abc123
-----
/sw/summit/modulefiles/ums/Core/ums-abc123/default.lua:
-----

help([[ABC software description (User Managed Software)

The ABC123 UMS project provides this feature.
THIS SOFTWARE IS NOT SUPPORTED BY THE OLCF.
Please direct all support questions and concerns regarding this software
installation to one of the following:

- Point of Contact: <UMS Project PI>
  - Email: <UMS POC email>
  - GitHub: <if applicable>

Documentation:
  <URL to the project's documentation>
]])

whatis("UMS - ABC Software")
prepend_path("MODULEPATH","/sw/summit/modulefiles/ums/abc123/Core")
```

# Modulefile Example


```
-- my_library@1.0%gcc@8.5 +abc build_type=Release +mpi+data1~data2~endian_reverse+fortran arch=linux-  
rhel7-power8le/laughtu  
  
whatis([[Name : my_lib]])  
whatis([[Version : 1.0]])  
whatis([[Target : power8le]])  
whatis([[Short description : The Awesome Library version 1]])  
whatis([[Configure options : -DBUILD_SHARED_LIBS:BOOL=ON -DMY_LIBRARY_BUILD_TESTING=OFF -D DMY_LIBRARY  
_BUILD_EXAMPLES=OFF -D DMY_LIBRARY_USE_MPI=ON -DMY_LIBRARY_USE_MGARD=OFF -DMY_LIBRARY_USE_ZFP=ON -  
DPYTHON_EXECUTABLE:FILEPATH=/sw/summit/python/3.6/anaconda3/5.3.0/bin/python3.6]])  
  
help([[The Awesome Library version 1, developed in the Awesome department]])  
  
prepend_path("PATH", "/autofs/nccs-svm1_sw/summit/ums/my_lib/spack/opt/spack/linux-rhel7-power8le/gcc-  
8.5/my_lib-1.0-laughturafeb2sto7ctkmzenulsq6n3a/bin", ":")  
prepend_path("LD_LIBRARY_PATH", "/autofs/nccs-svm1_sw/summit/ums/my_lib/spack/opt/spack/linux-rhel7-  
power8le/gcc-8.5/my_lib-1.0-laughturafeb2sto7ctkmzenulsq6n3a/lib", ":")  
prepend_path("LIBRARY_PATH", "/autofs/nccs-svm1_sw/summit/ums/my_lib/spack/opt/spack/linux-rhel7-  
power8le/gcc-8.5/my_lib-2.5.0-laughturafeb2sto7ctkmzenulsq6n3a/lib", ":")  
prepend_path("CPATH", "/autofs/nccs-svm1_sw/summit/ums/my_lib/spack/opt/spack/linux-rhel7-power8le/gcc-  
8.5/my_lib-1.0-laughturafeb2sto7ctkmzenulsq6n3a/include", ":")  
prepend_path("CMAKE_PREFIX_PATH", "/autofs/nccs-svm1_sw/summit/ums/my_lib/spack/opt/spack/linux-rhel7-  
power8le/gcc-8.5/my_lib-1.0-laughturafeb2sto7ctkmzenulsq6n3a/", ":")  
prepend_path("PYTHONPATH", "/autofs/nccs-svm1_sw/summit/ums/my_lib/spack/opt/spack/linux-rhel7-  
power8le/gcc-8.5/my_lib-1.0-laughturafeb2sto7ctkmzenulsq6n3a/lib/python3.6/site-packages", ":")
```


# Application Process


- How do I get in on this exciting opportunity?





# <https://my.olcf.ornl.gov/project-application-new>


 **OAK RIDGE**  
National Laboratory


 **myOLCF**


 **NEW ACCOUNTS** ▾


 **LOG IN**


 **New Project Application**


 **Preview**


 This form will take approximately 15 minutes to complete. Be sure to have the following information on-hand before starting, as the form data **cannot be saved** for later submission.


 **PI's Information**


 Name


 Citizenship


 Email


 Address


 Phone


 Employer


 **Project Information**


 Program Name


 Resources Requested


 Project Allocation


 Project Funding


 Research Area


 Project Objective


 **Project Proposal**


 Proposed Project Module Name


 Project Summary


 Previous Computational Proposals


 Overview and Significance of Research


 Research Objectives and Milestones


 Justification for Computing Resources


 State-of-the-Art and Parallel Performance

 Proposed Computational Approach

 Data Management Plan

 Team Members

 References

 **Project Classification**

Will there be publishable data as a result of this work?

Will the proposed project considered fundamental research or publicly available information as defined by National Security Decision Directive (NSDD) 1897?

Will you use proprietary data?

Will you generate proprietary data?


Will you use Sensitive or Restricted data?

Will you generate Sensitive or Restricted data?

Will you use or generate health data?

Will you use or generate human health data?

Will you use or generate human Protected Health Information (PHI)?

 **Export Control**

Military, space craft, satellites, missiles, and/or associated hardware, software, technical data?


Nuclear reactors & components, nuclear material enrichment equipment, components (trigger list) and/or associated hardware, software, technical data?

Source code or object code for 128-bit or greater encryption?

Weapons of mass destruction or their precursors (nuclear, chemical, biological)?

International Traffic in Arms Regulations (ITAR) as defined by the Department of State Directorate of Defense Trade Controls (DDTC)?

**Begin** →

 **OAK RIDGE**  
National Laboratory

LEADERSHIP  
COMPUTING  
FACILITY

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## New Project Application

Step 1 / 11

### Allocation Program Selection

\* Select the appropriate Allocation Program for your proposed Project

User Managed Software Program ▾

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## New Project Application

Step 2 / 11



### PI's Personal Information

* Title	* First/Given Name	Middle Name	* Last/Family Name	Suffix
Mr ▾	Jamie		Finney	
* Email	* Phone	* Birth Country		
	+1	UNITED STATES ▾		
Select/include country code (e.g. '+1')				



Please enter all of your current citizenships by using the 'Add Citizenship' button as needed.

* Citizenship Country	* Citizenship Type	<div>Remove Citizenship</div> <div>+ Add Citizenship</div>
UNITED STATES ▾	Citizen ▾	

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## New Project Application

Step 3 / 11



### PI's Shipping Address

Address Title

\* Street Address

1 Bethel Valley Rd

Street Address (Cont.)

\* City

Oak Ridge

\* State/Province/Region

TN

\* ZIP/Postal Code

37830

\* Country

UNITED STATES ▾

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Next →



## New Project Application

Step 4 / 11



### PI's Employment Information

OLCF Moderate Username

Enter your OLCF Moderate username, if applicable

ORCID [\(what's this?\)](#)

\* Employer

Choose your primary employer from the list above

Other Employer

If you selected "Other" at left, write in your employer

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## New Project Application

Step 5 / 11



### Project Information

\* Project Name

The title of your project, in 12 words or less

\* Project Duration (months)

\* Research Area

\* Funding Source

Please select the primary source of the project's funding from this list

Other Project Funding

If your project's funding source was not listed

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## New Project Application

Step 6 / 11



### Project Proposal

\* Proposed Project Module Name

ums- abc123

Please propose a name for the module that your project will provide. The module name will be prefixed with "ums-". If the proposed name conflicts with an existing module name, we will contact you for an alternative.

\* Project Module Description

Please provide text for the module description to be included in the project-level modulefile. This will be seen by users via the module system.

\* Project Support Description

One of the expectations of the UMS Program is that providers will support the software they make available through the program. Please provide a succinct but thorough description of how users can obtain support. Please include specific email addresses, URLs, phone numbers, etc. as appropriate and other information to set expectations. This text will be included in the modulefile as well.

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## New Project Application

Step 7 / 11



### Computing & Data Resources



List the system(s) on which you plan to provide software under this project

\* Resources Requested

Select One



\* Allocated Hours

Remove  
Resource

+ Add  
Resource

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## New Project Application

Step 7 / 11



### Computing & Data Resources



List the system(s) on which you plan to provide software under this project

\* Resources Requested

\* Allocated Hours

✓ Select One

EVEREST

HPSS Archive

Summit

Andes

Remove  
Resource

+ Add  
Resource

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## New Project Application

Step 8 / 11

### Project Classification & Export Control

Does the proposed project involve any of the following areas?

- ☐ No Will there be publishable data as a result of this work?
- ☐ No Will the proposed project considered fundamental research or publicly available information as defined by [National Security Decision Directive \(NSDD\) 189?](#)
- ☐ No Will you use [proprietary data](#)?
- ☐ No Will you generate [proprietary data](#)?
- ☐ No Will you use [Sensitive or Restricted data](#)?
- ☐ No Will you generate [Sensitive or Restricted data](#)?
- ☐ No Will you use or generate [health data](#)?
- ☐ No Will you use or generate human [health data](#)?
- ☐ No Will you use or generate human Protected Health Information (PHI)?

Does the proposed project involve any of the following areas?

- ☐ No Military, space craft, satellites, missiles, and/or associated hardware, software, technical data?
- ☐ No Nuclear reactors & components, nuclear material enrichment equipment, components (trigger list) and/or associated hardware, software, technical data?
- ☐ No Source code or object code for 128-bit or greater encryption?
- ☐ No Weapons of mass destruction or their precursors (nuclear, chemical, biological)?
- ☐ No [International Traffic in Arms Regulations \(ITAR\)](#) as defined by the Department of State Directorate of Defense Trade Controls (DDTC)?

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## New Project Application

Step 9 / 11




### Policies & Agreements

Please read and review the policy documents linked below.



No

I have read and agree to abide by the [OLCF Computing Policy](#) 



No

I have read and agree to abide by the [OLCF Data Management Policy](#) 



No

I have read and agree to abide by the [OLCF Security Policy](#) 



No

I have read and agree to abide by the [OLCF Institutional User Agreement Policy](#) 



No

I have read and agree to abide by the OLCF User Managed Software Policy

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## New Project Application


Step 10 / 11

### Comments

How did you hear about this OLCF Allocation Program?

Comments/Questions

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## Review

### PI's Information

Edit

Name	Mr. Jamie Finney
Email	<input type="text"/>
Phone	<input type="text"/>
Birth Country	United States
Citizenships	United States (Citizen)
Address	1 Bethel Valley Rd Oak Ridge TN 37830 United States
Username	user_name
ORCID	--
Employer	Oak Ridge National Laboratory (ORNL)

### Project Information

Edit

Program Allocation	User Managed Software Program
Project Name	Awesome UMS Project
Research Area	User Managed Software
Project Funding	U.S. Department of Energy
Resources Requested	Summit (with 10 allocation hours)

### Project Proposal

Edit

Proposed Project Module Name	ums-abc123
Project Module Description	description
Project Support Description	support

### Project Classification

Edit

Will there be publishable data as a result of this work?	No
Will the proposed project considered fundamental research or publicly available information as defined by National Security Decision Directive (NSDD) 1897?	No
Will you use proprietary data?	No
Will you generate proprietary data?	No
Will you use Sensitive or Restricted data?	No
Will you generate Sensitive or Restricted data?	No
Will you use or generate health data?	No
Will you use or generate human health data?	No
Will you use or generate human Protected Health Information (PHI)?	No

### Export Control


Edit

Military, space craft, satellites, missiles, and/or associated hardware, software, technical data?	No
Nuclear reactors & components, nuclear material enrichment equipment, components (trigger list) and/or associated hardware, software, technical data?	No
Source code or object code for 128-bit or greater encryption?	No
Weapons of mass destruction or their precursors (nuclear, chemical, biological)?	No
International Traffic in Arms Regulations (ITAR) as defined by the Department of State Directorate of Defense Trade Controls (DDTC)?	No

### Policies & Agreements

Edit

I have read and agree to abide by the OLCF Computing Policy	Yes
I have read and agree to abide by the OLCF Data Management Policy	Yes
I have read and agree to abide by the OLCF Security Policy	Yes
I have read and agree to abide by the OLCF Institutional User Agreement Policy	Yes
I have read and agree to abide by the OLCF User Managed Software Policy	Yes

 I affirm and certify that the responses and information to the questions above are complete, true and correct. I understand that any misrepresentation, falsification, or omission of any facts requested in this web form may cause to void the relationship between ORNL/UT-Battelle and me, whenever discovered. I acknowledge that the terms of this web form contained above may be contractual. I acknowledge that ORNL/UT-Battelle is relying on the information and answers I have submitted herein in accordance with its internal procedures. This affirmation and certification shall be binding upon me as the Principal Investigator (PI).

### \* Affirmation & Certification Statement

Select One

Please review the affirmation statement above

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# Links

- What you really came for.



# Relevant Links

## General Information

- OLCF User Docs -> Software -> User-Managed Software
- <https://docs.olcf.ornl.gov/software/UMS/index.html>

## Policies

- OLCF User Docs -> Accounts and Projects -> OLCF Policy Guides -> User-Manged Software (UMS) Policy
- [https://docs.olcf.ornl.gov/accounts/olcf\\_policy\\_guide.html#user-managed-software-ums-policy](https://docs.olcf.ornl.gov/accounts/olcf_policy_guide.html#user-managed-software-ums-policy)

## Application

- <https://my.olcf.ornl.gov/project-application-new>



# Questions?

- Thanks for coming!

