# OSPool Resources for Teaching & Education

Rachel Lombardi OSG Research Computing Facilitation Team Throughput Computing 2023



#### The Open Science Pool (OSPool) provides a *free, ready-to-use* platform

for instructors who are teaching High Throughput Computing concepts

for academic courses, conference workshops, and other events.

# Why use OSPool Resources for your Event?

- Free to academic, non-profit, and government institutions
- No allocation
- Easy-to-access
  - Limited-to-no interaction with OSG staff required
- Many use cases
  - Academic classes, conference workshops, in-lab trainings, etc.
  - Applicable to any research domain
- Provide attendees with real-world experience on national scale computing system
  - Practice using a job scheduling software (HTCondor), running large workflows, etc.

#### New Service: OSPool Notebooks

OSPool Notebooks use a Jupyter interface and allow researchers to interact with an OSPool Access Point, HTCondor, and, optionally, the OSPool

	File Edit View Run Kernel Tabs	s Sett	rtings Help				
	+ E C		Is jovyan@jupyter-email-3arll₁× IREADME.ipynb ×				
	Filter files by name	Q	■ + X □ □ ► ■ C → Markdown ∨	Bash			
0	<ul> <li>/ tutorial-bwa /</li> </ul>		Download Data to Analyze				
							:=
.—	data 8 minutes	ago	data used in the Data Carpentry workshop. This data includes both the genome of Escherichia coli (E. coli) ar	nd			
*	logs 4 minutes	ago	paired-end RNA sequencing reads obtained from a study carried out by Blount et al. published in PNAS.				
	<ul> <li>results</li> <li>8 minutes ago</li> <li>software</li> <li>8 minutes ago</li> <li>bwa-container.sh</li> <li>3 months ago</li> </ul>		Additional information about how the data was modified in preparation for this analysis can be found on the Data				
			Carpentry's workshop website.				
			[1]: (download data sh				
	🗅 bwa-container.sub 3 months	ago					
	🗅 bwa-many-jobs.sub 4 minutes	ago	% Total % Received % Xterd Average Speed Time Time Time Current Dload Upload Total Spent Left Speed				
	🗅 bwa-test.sh 3 months	ago	100 1343k 100 1343k 0 0 1373k 0::: 1372k				
	🗅 bwa-test.sub 3 months	ago	% Total % Received % Xferd Average Speed Time Time Time Current Dload Upload Total Spent Left Speed				
	🗅 download_data.sh 3 months	ago					

## New Service: OSPool Notebooks

OSPool Notebooks can be launched anytime!

- Researchers with Guest Accounts can submit HTCondor jobs to a <u>small execution test pool</u>
- Researchers with Full Accounts can submit HTCondor jobs to the <u>OSPool</u>

Clickable interface is a **lower barrier of entry** for researchers with newer computing skills



Visit <u>https://notebook.ospool.osg-htc.org</u> to launch an OSPool Notebook

#### Past Events







Distributed Computing at the African School of Fundamental and Applied Physics

Gqeberha, South Africa

African Centers of Excellence in Bioinformatics Global Consortium Meeting Great Plains Network Annual Meeting

Kampala, Uganda

Kansas City, Missouri

### Getting Started using OSPool Resources for Your Next Event

### What is *Your* Next Event?

#### **Professors/Teaching Staff**

 Do you want to teach an academic course that could benefit from High Throughput Computing resources?

#### **Research Principal Investigators/Lab Managers/Researchers**

- Do you want to explore if High Throughput Computing, HTCondor, or the OSPool is right for you or your lab's research analyses?
- Do you want to host a group training to share best practices and domain computing knowledge with others?
- Are you writing a grant and want to consider using OSPool resources?

#### **Students**

 Do you want to learn more about High Throughput Computing, job submission, and national scale computing systems?





#### **Explore our Tools**

#### **Conduct Initial Testing of your Event Materials**

**Evaluate using Guest or Full Attendees for Attendees** 

Prior to the Event: Request Full Accounts, Test All Materials

Event



### Explore our Tools & Your Materials

Can your event be structured to use the High Throughput Computing resources?

	Ideal Jobs! (up to 10,000 cores across Jobs, per user!)	Still Very Advantageous!	Less-so, but maybe
<b>Cores</b> (GPUs)	<b>1</b> (1; non-specific type)	<8 (1; specific GPU type)	> <b>8 (or MPI)</b> (multiple)
Walltime	<10 hrs* *or checkpointable	<20 hrs* *or checkpointable	>20 hrs
RAM	<few gb<="" th=""><th>&lt;10s GB</th><th>&gt;10s GB</th></few>	<10s GB	>10s GB
Input	<500 MB	<10 GB	>10 GB
Output	<1 GB	<10 GB	>10 GB
Software	'portable' (pre-compiled binaries, transferable, containerizable, etc.)	most other than $\rightarrow$	Licensed software; non-Linux

#### What workloads are good for the OSPool\*?

# Explore our Tools Conduct Initial Testing of your Event Materials Evaluate using Guest or Full Attendees for Attendees Prior to the Event: Request Full Accounts, Test All Materials Event



### Guest Account with OSPool Notebooks

Attendees can launch a OSPool Notebook at *any time* and practice HTCondor job submission with smaller workflows. You do not need to know attendees in advance.



Visit <u>https://notebook.ospool.osg-htc.org</u> to launch an OSPool Notebook

## **Full Accounts**

- Attendees will need to request an account in advance of the event
- Submit full scale High Throughput workflows to the OSPool
  - Can optionally use OSPool Notebook interface or a regular terminal interface
- Accounts will be automatically deactivated after the event





**Open Science Pool** *Compute Capacity* 



Open Science Data Federation Storage Capacity





### Instructional Resources

#### **Publicly Available Slides and Recordings**

- Introduction to the OSPool and OSPool Policies
- <u>OSPool Training Slides and Recordings for</u> <u>Researchers</u>
- Hands-on Tutorials for Researchers
- Recordings for Researchers and Admins

#### Worksheets

• High Throughput Computing Worksheet







#### Interested in using OSPool resources for an upcoming event? Let's discuss!



Email					
support@osg-htc.org					
Learn more					
<b>OSPool Resources for Teaching &amp; Education</b>					

#### Acknowledgement

This material is based upon work supported by the National Science Foundation under Cooperative Agreement OAC-2030508 as part of the PATh Project. Any opinions, findings, and conclusions or recommendations expressed in this material are those of the author(s) and do not necessarily reflect the views of the National Science Foundation.