



# Condor at W&L: Exploiting Excess Resources for the Computational Sciences

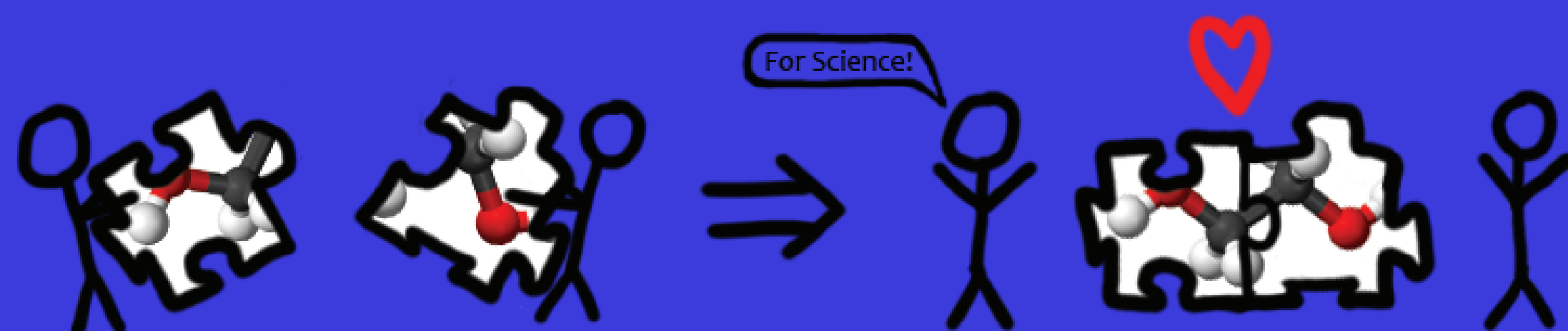
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## What is Condor?

Condor is a distributed supercomputing system that is designed to run intensive computations on a group of computers when they are not otherwise in use. Idle CPU cycles are harvested to run computations to further the sciences, such as chemistry and biology.

## Supercomputing

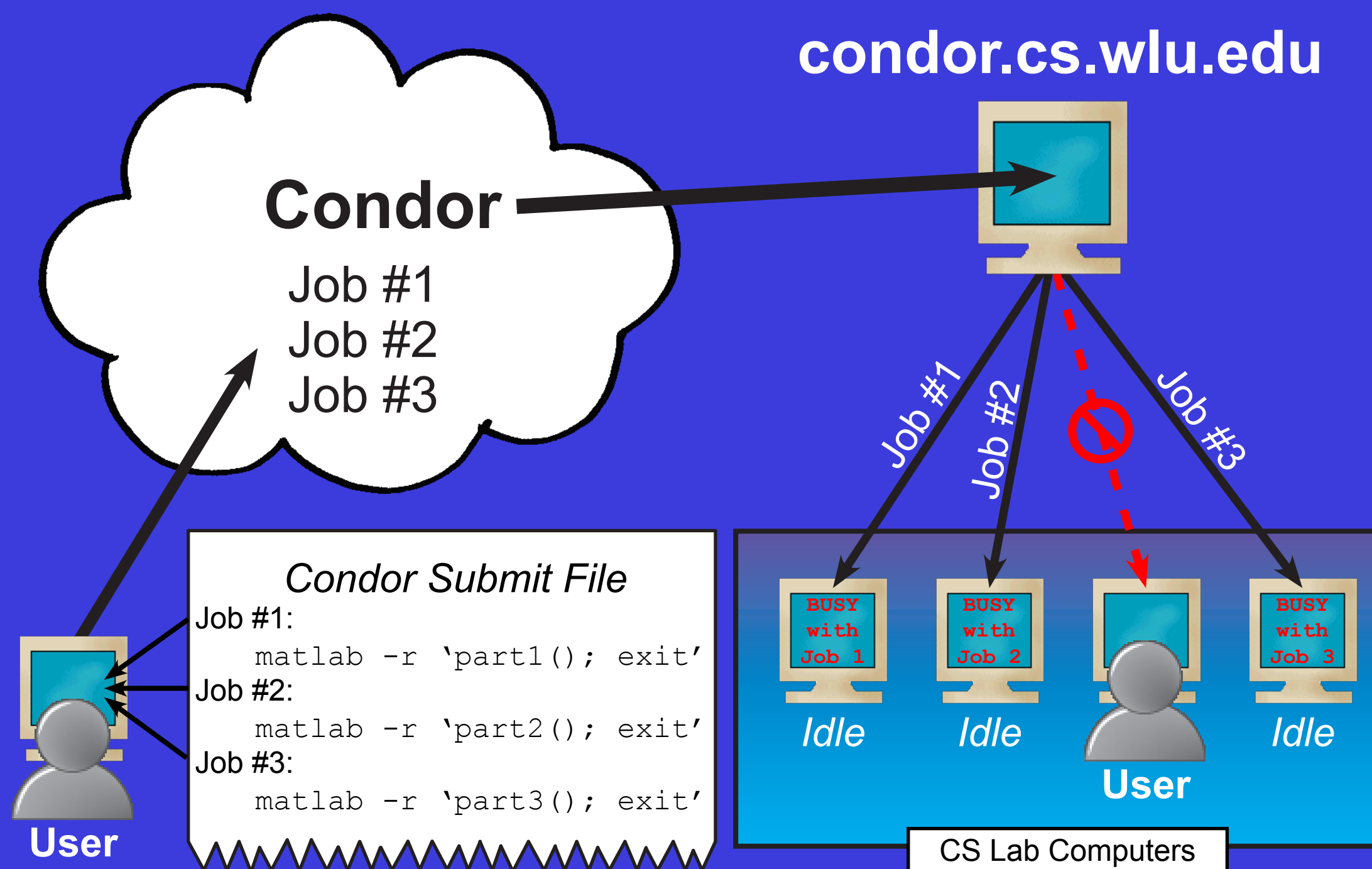
High Performance Computing (HPC) problems are like puzzles: all of the pieces relate to each other and can work together to reach a common goal.



High Throughput Computing (HTC) is a different type of supercomputing. HTC problems are typically easier to parallelize because they involve high-level parallelization, such as parameter sweeps. Each part is performed independently from the rest, like the three painters painting this mural of John Brown. Condor can run either kind of supercomputing problem, but it is best suited to run HTC-type jobs.



## How Does it Work?



Condor receives a Condor Submit File from the user that tells Condor how to run the programs. The commands are then sent to idle computers to run.

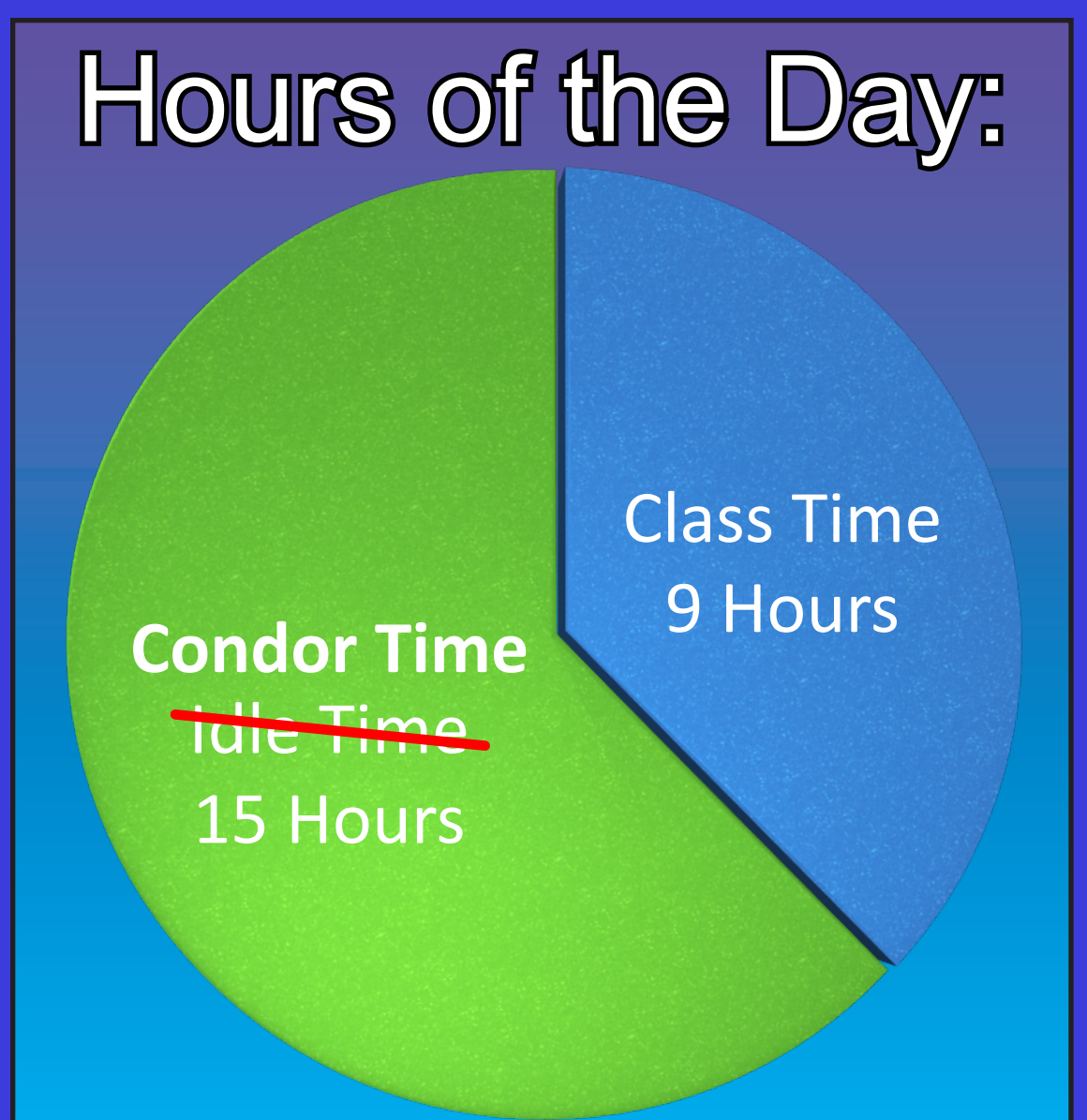
## Using the Python Module

I created a Python program to make it easy for users to submit Condor jobs using a Python script like this. The script acts as an interface to Condor by automatically generating a Condor Submit File and submitting it for the user. This program, called **CondorPyScripting**, will be available for use on the W&L Condor Project Wiki.

```
Python Submission Script
import condor
j = condor.Job()
j.setOutput("out1.txt")
j.queue("matlab -r 'part1(); exit'")
j.setOutput("out2.txt")
j.queue("matlab -r 'part2(); exit'")
j.setOutput("out3.txt")
j.queue("matlab -r 'part3(); exit'")
j.submit()
```

## How is it Useful?

School computers are idle for most hours of the day. Instead of being bored, they can do Condor jobs for science. If a user logs on to use the computer, Condor will stop any jobs that are running on it and move them to another computer.



## Technical Notes

I designed the Condor cluster for long-term support. Easy-to-use scripts can be run to administer the cluster. The Condor programs and configuration files are all in one central networked storage location, simplifying upgrades.

## Condor as a Resource

I will be available to provide help sessions to guide new users in running jobs on Condor and otherwise encourage its use. Learn how to run your Computational Science jobs on Condor with the project's wiki at:

<http://condor.cs.wlu.edu/>

