



# RAI Introduction

# RAID Overview

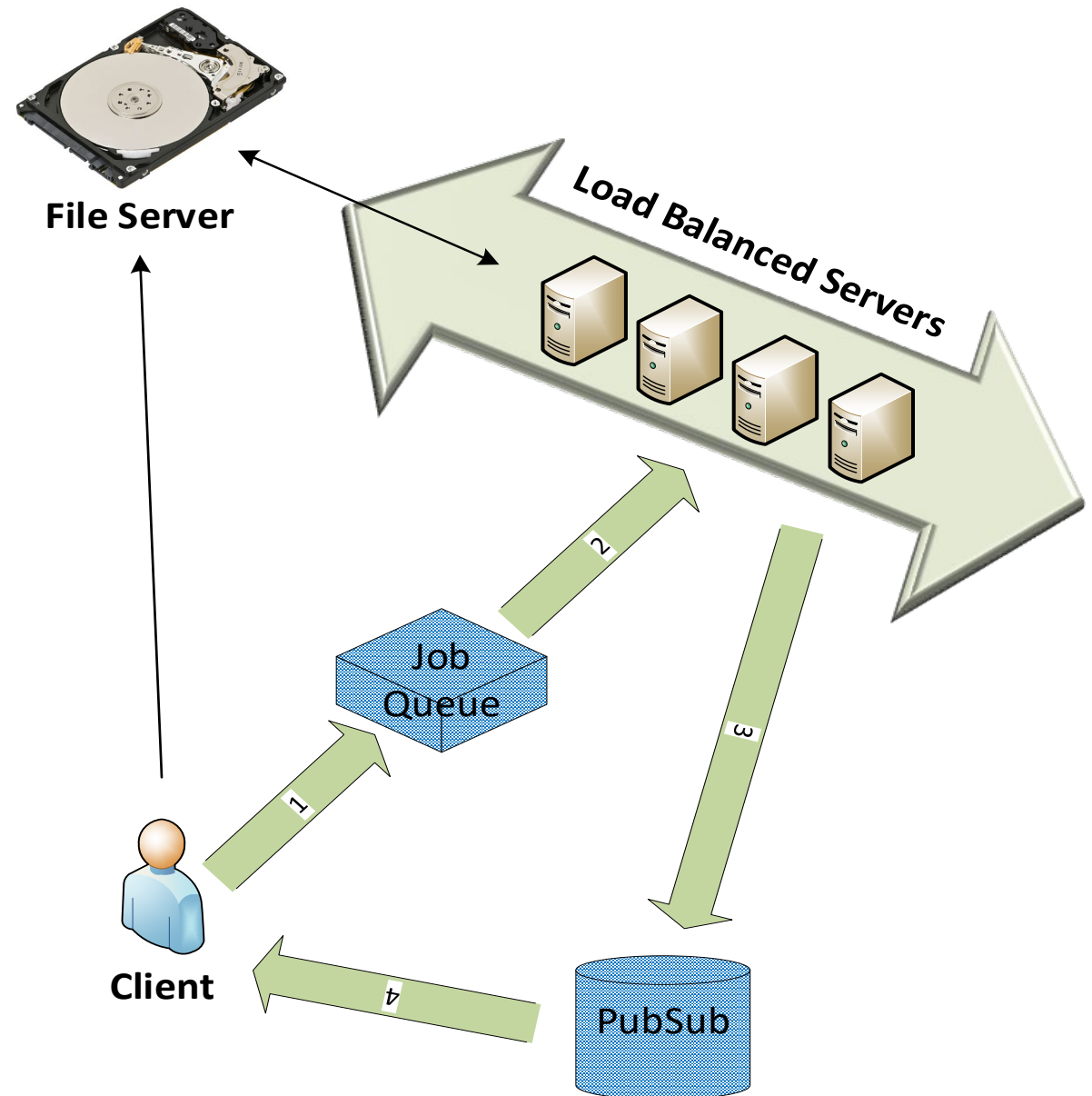
The Servers

- We have 4 RAID servers each with
  - 1 Intel Core i7-7820X
  - 32 GB Memory
  - 2 Volta GPU's



# Simplified View of RAID

- RAI (the client) uploads the working directory including code and rai\_build.yml to the *File Server* and pushes the job on the *Job Queue*.
- Servers with available *Workers* query the *Job Queue* and pop the oldest job off the queue and assign the job to an available *Worker*.
- The *Worker* downloads the working directory including code and rai\_build.yml from the *File Server*, redirects stdout and stderr to the *Client* through *PubSub*, and executes the commands in the rai\_build.yml file.
- When the job is complete, the *Worker* stores the output in the working directory and uploads it to the *File Server*.
- Finally, the *Worker* sends the *File Server* URL to *PubSub* then closes the stdout and stderr redirection.



## RAID Workers

- 3 Servers (the default queue)
  - With 8 workers each
  - Each GPU could be running up to 4 simultaneous jobs
- 1 Server (queue: rai\_amd64\_exclusive)
  - With 2 Workers
  - Each GPU will run at most 1 job (exclusive GPU access)

# RAI Installation

The Client



# RAI Installation

Download the rai binary for your platform below.

## Linux and Darwin rai binaries

In the documentation below, we refer to rai as the rai binary. Either rename your binary to rai or substitute the downloaded name when executing. When executing, you will need to include the full path to rai or add rai's location to your \$PATH.

Finally, the downloaded file will not have execute privileges. Use the 'chmod ugo+x rai' command to make the file executable.

## RAI Profile

You should have received a .rai\_profile file by email. Copy this text into ~/.rai\_profile (.rai\_profile located in your home directory). Your .rai\_profile should look something like this (indent equals 2 spaces, not a tab)

profile:

id: <your unique id>

firstname: <your first name>

lastname: <your last name>

username: <your user name>

email: <your institution email>

access\_key: <your access key>

secret\_key: <your secret-key>

affiliation: <your affiliation>

team:

name: ""

role: <your designated RAI role>



## Testing

To test your configuration, cd into the `device_query_lab` directory and execute `rai`.

```
rai -p .
```

## Windows

On Windows, you'll need to install WSL (Windows subsystem for Linux) and a virtual linux OS. Several Linux versions are available through the Microsoft Store.

# Command Line Options



# Command Line Options

RAI command line options (rai <command line option> -p .)

help	Lists available commands
history	View the history of your last 20 runs including URLs
l-history	View the history of your last 100 runs including URLs
queued	View the number of queued jobs waiting to run on your current queue
--queue	Set the queue to use. The default queue is built into your rai binary. When you are ready to profile add the option `--queue rai_amd64_exclusive` which will allow at most 1 job to run on each GPU. Note, when using this queue, jobs may stack up in the queue and time until execution will grow. See tip below regarding what to do when queues get large.
-p <<directory>>	Path to the directory you want rai to upload and execute. Use '-p .' To specify the current working directory.
ranking	View anonymous speed rankings for the project
--submit <<string>>	Use this option when submitting code for the various project deadlines. More details to follow.



# RAI Tips

## What to do when the queue is large

- First, you can determine the current queue size with the command 'rai -p . queued'. This defaults to the standard queue. To query the queue size of the rai\_amd64\_exclusive queue use 'rai -p . --queue rai\_amd64\_exclusive queued'.
- When running rai:
  - After the job has been accepted you can kill the rai process or even turn off your machine. The process will continue to run and the results will be posted. To see results after the run is complete use 'rai -p . History'.

## Modifying the rai\_build.yml file

- While working on an MP, feel free to modify lines below "build:". All other lines should not be modified in any way. The lines below build tell rai the commands to run on the server.