



# Qube Rendering at CCS

A guide to rendering Maya using the Qube Renderfarm



## General guidelines for scene submission

- Optimize your scenes regularly. If you've optimized it, but then worked on it again... optimize it again. Caching helps with this.
- Simplify your scene however you can. Caching helps a lot with this.
- If there is something in your scene that is NOT contributing to a render (such as Hidden layers / geometry) then please DELETE IT. Hiding or setting assets to 'nonrenderable' does nothing for optimization. If you don't need it in the render, get rid of it for that scene.
- Save revisions of your scene. Save a "render" version that's been cached, baked and optimized, and a "live" version for continued editing.
- Check your RAM levels when the scene has been loaded and with a rendered frame in the framebuffer.
- No live dynamics. Cache / bake everything that is animated with a dynamics solution.
- Make sure your scene can load & render without having to load it in via openPipeline. OpenPipeline is a great tool, but you have to be sure that the scene can load without it being resident. Before you send a scene to render make sure it can load in via Maya menu: file>open.
- Did you set proper render settings? Check the render directory, file type, frame padding, renderable camera, resolution and renderable layers.
- No spaces in folder names or file names!
- Each shot is unique. Some shots need different render settings. What works great for one shot may not necessarily work for another shot. Don't just "set it and forget it".
- Don't set reflections to be too deep. Don't make mirrors that reflect mirrors that refract through glass that reflect off mirrors, etc.
- Don't reference into references into references. You will end up creating an unrenderable and unrepairable scene if you do this.

### General guidelines for Mental Ray

- Use Maya's built in Render Diagnostics (only works with Mental Ray) before you send to the farm
- Use ray tracing and not scanline mode.
- Don't forget to set the Quality > Framebuffer to either RGBA Float or RGBA Half.

### General guidelines for Arnold

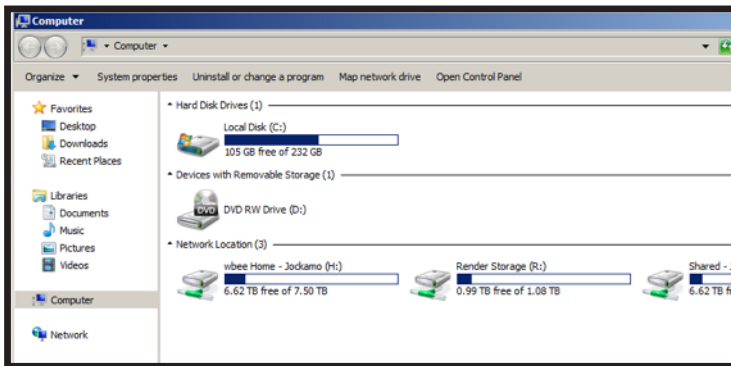
- Use Arnold's subdivision settings. Look in the object attributes for "Arnold" and then tweak "iterations". Don't crank this up past 4. These settings have a direct link to render times and RAM usage. Too high a setting will crash the renderfarm.
- Under Textures: Uncheck "Auto convert textures to TX"
- Use only the built-in Arnold shaders. If you've found a third-party shader, we can't support it at this time.
- The Sampling and Ray Depth settings are the core of Arnold and are directly related to render times. Use them wisely and carefully. Optimizing these settings on a shot-by-shot basis will greatly improve your efficiency. Start all your shots at value 1 for all sampling settings and only increase them slowly, one by one with a test render for each iteration. Increase AA samples before the other samples. If you can get a good image with low settings, use low settings. Don't increase settings unless you absolutely need to.
- Using lots of AOV's eats up RAM. Being frugal here will pay off in shorter renders. Select what you will actually USE.
- IN Arnold, selecting "tiled" for EXRs will help with RAM usage.

# Maya/Qube RenderFarm Instructions

In order for your Maya Project to render successfully through the Qube RenderFarm you must follow the 'Maya Project Structure'.

This means that you must create a 'New Maya Project' when starting a new project. It is important that you place your scenes in the 'Scenes' folder within this Maya project folder, textures in the "SourceImages" folder, and so on. Please use short names and underscores in place of spaces when naming your folders, files, projects, textures, etc.

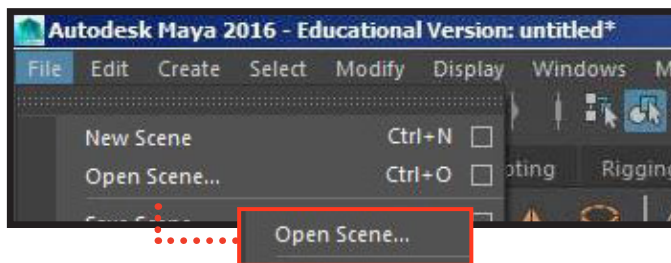
**Open "Computer" - open the "Render Storage (R:)" volume.**



In the "Render Storage (R:)" volume, select File – New Folder. Rename this folder using your CCS username. (ex. Jdoe or Jdoe2)

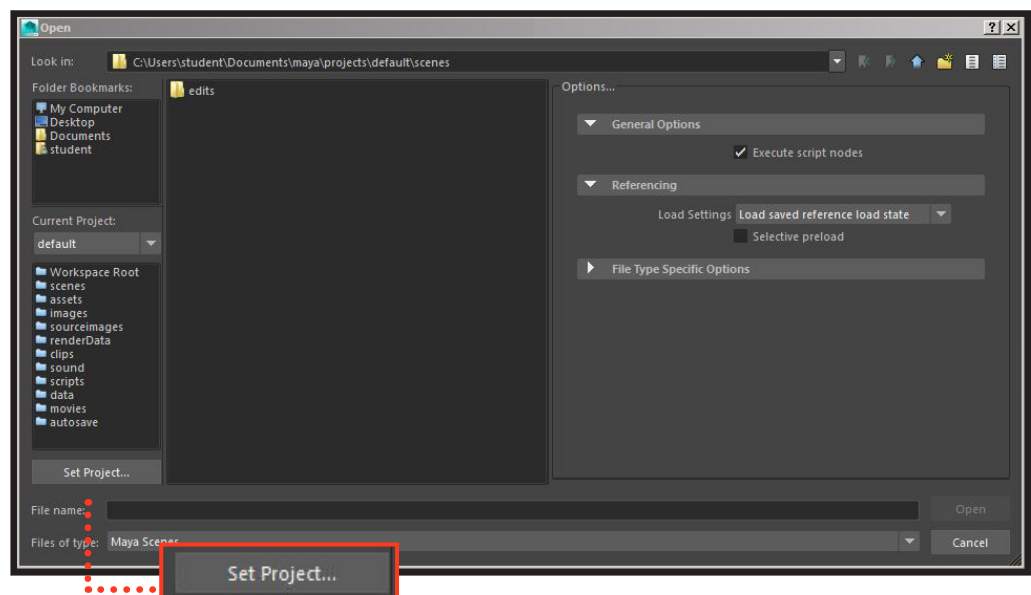
Copy your complete project folder into the folder you just made with your CCS username.

**Once your project folder is done copying, disconnect your external drive, or any other external media source.**

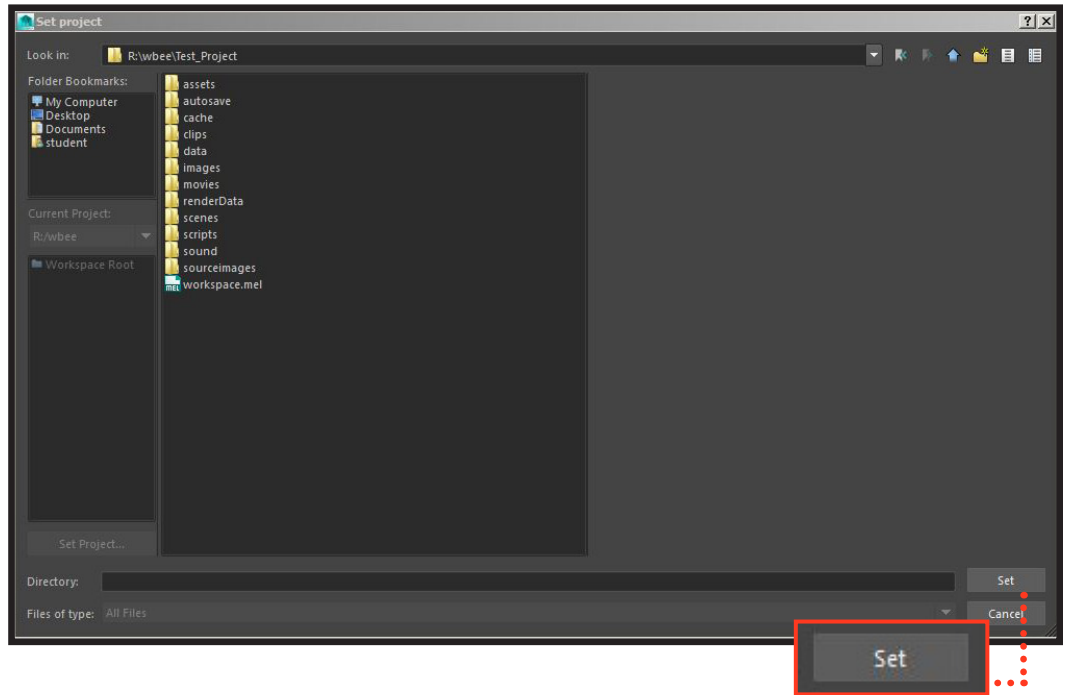


Open Maya. Select 'File', and select 'Open Scene'.

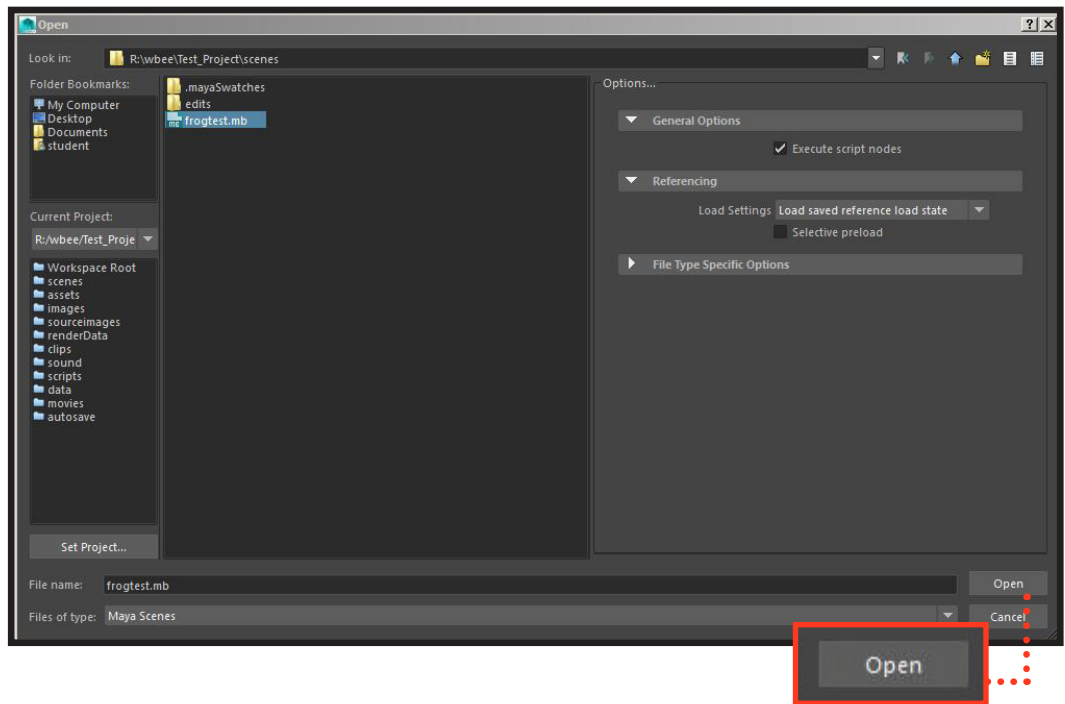
Select 'Set Project' and navigate to your 'Project Folder' on the "Render Storage (R:)" directory.



Highlight your 'Project Folder' and click on 'Set'.



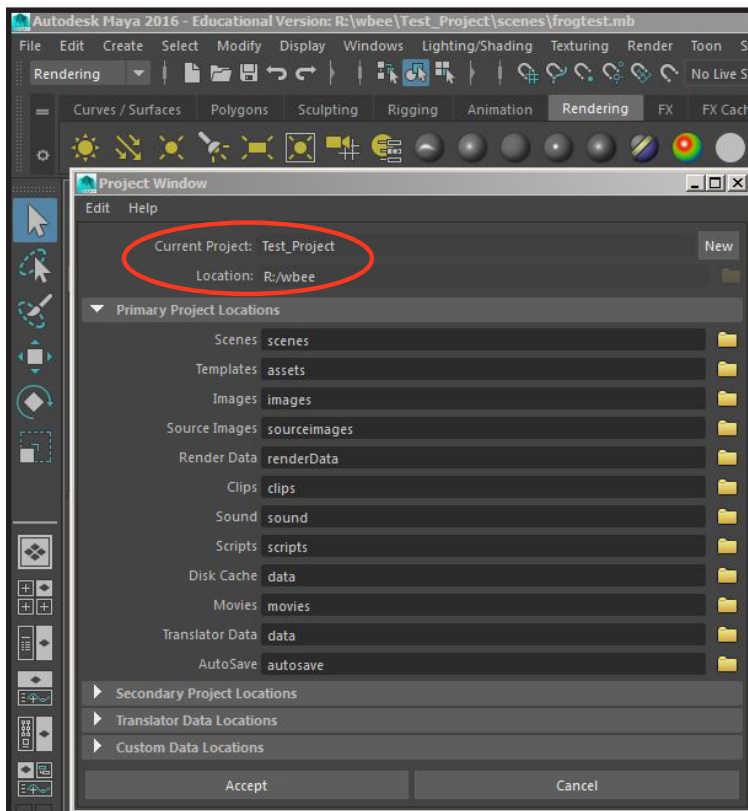
Open the scene that you want to render.



Best Practice: Following the previous instructions is considered a “Best Practice” standard. Opening Maya and setting your project folder first before opening your scene file (rather than double-clicking on your scene file to open Maya) ensures that your project directory will be set to the R:/ volume.

Once your scene has opened, select 'File' – 'Project Window' and check to see that your project settings are correct.

The 'Current Project' field should be set to the name of your 'Project Folder' and the 'Location' field should be set to 'R:/YourUsername'.

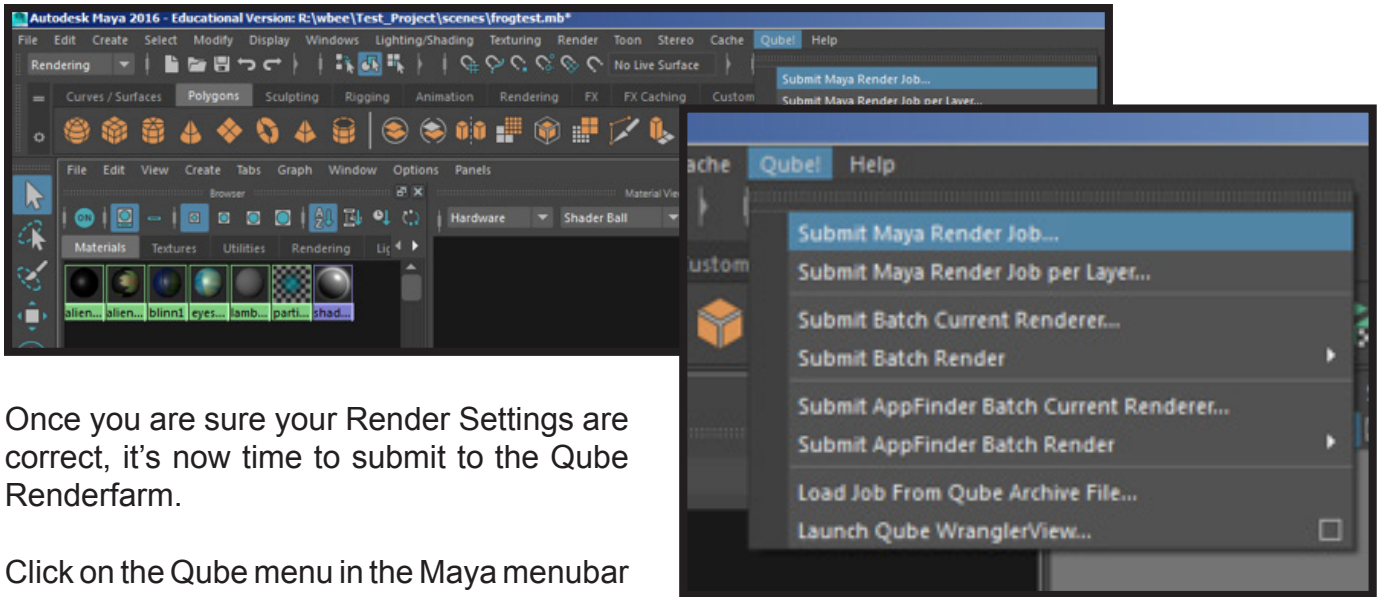


## Clean your scene before submitting to the Qube Renderfarm

- Maya's render.exe and batchrender.exe programs do NOT like Unknown or Unused nodes anywhere in your scene. A good method to properly clean a scene is to first IMPORT ALL REFERENCES. While the render farm supports referencing, if your references are not optimized, the render will likely fail. It is easier to import everything then clean the scene, then to go to all your references individually and clean them one at a time.
- After your references are imported, go to your Hypershade and Delete Unused Nodes. After that, clean your scene using File > Optimize Scene Size. Be warned that the Optimize Scene Size function can destroy your scene if you are using customized data structures if this happens simply undo the operation and go through each Optimize function until you eliminate the one that breaks your scene.
- Delete anything in your scene that is not contributing to the render. The farm DOES NOT SUPPORT LIVE DYNAMICS, remove them or Cache / bake everything that is animated with a dynamics solution. The farm will fail with scenes that have references that are themselves referenced (i.e. do NOT build a renderable scene with more than ONE level of referencing!). Beware of overly long (256 character) namespaces. No Spaces in Filenames or file paths!
- We highly recommend that you use the caching technologies that are included with Maya. The two major types are Autodesk Geocache and Alembic Cache. Used properly, either of these caching methods will help to cut down on scene errors, simplify your scene and will also speed up both your viewport and rendering performance. Network rendering works better when you give the renderer less to process. Live rigs, histories and references should be eliminated from the scenes that you wish to submit to render; caching is a way to streamline this process.

## Submitting your job to the Qube Renderfarm

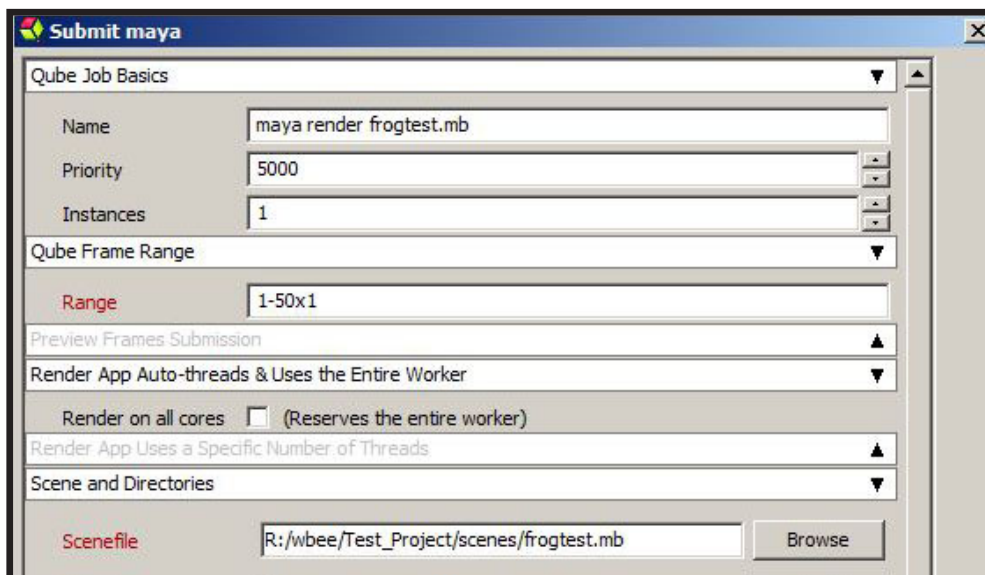
When you are ready to submit your job to the renderfarm, please make sure your Maya Project Structure has been properly set, your Render Globals have been set, and the camera you want rendered checked 'renderable' in the output settings. Make sure all your textures and materials are pointing to your Project on the R:/ volume.



Once you are sure your Render Settings are correct, it's now time to submit to the Qube Renderfarm.

Click on the Qube menu in the Maya menubar and select "Submit Maya Render Job...".

The Qube "Submit maya" window will open.



Notice in the Qube “Submit maya” window that all your project settings have been automatically populated in the appropriate fields.

If these settings are not correct, **DO NOT CHANGE THE SETTINGS HERE**. Close out the Qube “Submit maya” window and make your changes in your “Render Settings”; then save and reopen the Qube “Submit maya” window.

The next instructions must be followed exactly as shown. These settings are optimized to provide the most efficient use of the Qube Renderfarm and will give the fastest rendering speeds.

**DO NOT FILL IN OR CHANGE ANY OF THE FIELDS UNLESS INSTRUCTED TO DO SO.**

There are only two settings that you need to fill out before submitting your render job to the Qube Renderfarm:

Submit maya

Qube Job Basics

Name: maya render frogtest.mb

Priority: 5000

Instances: 1

Qube Frame Range

Range: 1-50x1

Preview Frames Submission

Render App Auto-threads & Uses the Entire Worker

Render on all cores  (Reserves the entire worker)

Render App Uses a Specific Number of Threads

Scene and Directories

Scenefile: R:/wbee/Test\_Project/scenes/frogtest.mb

Project dir: R:/wbee/Test\_Project/

Cameras/Layers/Lights

Renderer

Image File Output

Image Size

MEL Scripts

Qube Worker Selection

Qube Advanced Job Control

Email (job complete)  student


Email (failed frames)  student

FlightCheck scripts

Qube Job Delayed S

Qube Job Environment

Qube Actions

Set Defaults Clear Defaults  Expert Mode  Cancel Submit

In the “Qube Advanced Job Control” field, check the “Email (job complete)” box and enter your email address to receive notification when your job has completed the rendering process.

If you would like to get notification for failed frames, check the next box and enter your email address again.

Now check the “Expert Mode” box and continue.



**REMINDER: DO NOT FILL IN OR CHANGE ANY OF THE FIELDS UNLESS INSTRUCTED TO DO SO.**

Scroll down; in the “Render App Uses a Specific Number of Threads” field, check the “Slots = Threads” box and in the “Specific Thread Count” field, enter the number 8. If done properly, it will look exactly like the magnified box below:

The image shows a screenshot of the 'Submit maya' dialog box. A red box highlights the 'Render App Uses a Specific Number of Threads' section, which is also magnified in a separate window. In the magnified view, the 'Slots = Threads' checkbox is checked, and the 'Specific Thread Count' field contains the number 8. A red dotted line connects the magnified view to the main dialog box. To the right of the magnified view, a red-bordered box contains the text: 'IMPORTANT: MAKE SURE TO SELECT THE CORRECT FIELD: "/>

**IMPORTANT:  
MAKE SURE TO  
SELECT THE  
CORRECT FIELD:  
“RENDER APP USES  
A SPECIFIC NUMBER  
OF THREADS”.**

Now, click Submit.

Your job has now been submitted to the Qube Renderfarm.

The “Submit maya” window will automatically close, and a “job ID” will come up. Record this number for future reference.

The Qube Renderfarm manages the different render jobs one at a time. Once you submit a job, the Renderfarm puts it in a queue and begins rendering it once the last job is complete. You can see the jobs in the queue by opening the “Qube Artist View” shortcut located on the desktop.

## IMPORTANT POINTS TO FOLLOW TO ENSURE SUCCESSFUL USE OF THE QUBE RENDERFARM

- In order for your Maya Project to render successfully through the Qube RenderFarm you must follow the 'Maya Project Structure'.
- Best Practice: After copying your project folder to the R:/ volume, opening Maya and setting your project folder first before opening your scene file ensures that your project directory will be set to the proper location. (Do not double-click on your scene file to open Maya.)
- Before you submit your job to the Renderfarm, ensure all your scene images, textures and other assets are in your project folder on the R:/ volume.
- Once you have copied your project folder to the R:/ volume, be sure to disconnect your external drive, or any other external media source before doing any test rendering.
- **TEST** render individual frames from your scene located on the R:/ volume to the local computer before sending your full job to the Qube Renderfarm. This will ensure that you are not missing any textures, assets, etc.
- **IF YOUR LOCAL COMPUTER CANNOT RENDER THE FRAME, THE RENDERFARM WON'T BE ABLE TO EITHER!**
- If you are satisfied with the results of a local render from the R:/ volume, **FIRST** submit a test render of a few frames on the Qube Renderfarm before submitting your whole job to ensure that the output is what you expect.
- If no frames rendered at all, there is a problem with your animation file. If the same frames are failing over and over again, there might be a problem in the animation settings or possibly missing textures that are not in the correct folder.
- **SUBMIT EARLY.** There may be a lot of students using the Renderfarm. The Qube Renderfarm renders jobs on a first-come, first-serve basis. Towards the end of the semester there will be heavy use and submitting jobs late will not guarantee that your job will be finished in time.

**It is imperative that you follow the instructions closely in the Qube Renderfarm instructions booklet. Do not set or change any settings unless specifically required in the instructions. To do so may cause your render job to fail or take a much longer time to process than expected.**

# QUBE ARTIST VIEW

Qube Artist View is software used to monitor the status of the job you submitted to the Qube Renderfarm. You open Artist View by clicking on the icon located on the left side of your desktop.

The screenshot shows the Qube ArtistView 6.7-2 interface. It features a menu bar (File, Edit, View, Submit, Utility, Help) and a toolbar with various icons. The main area is divided into several panes:

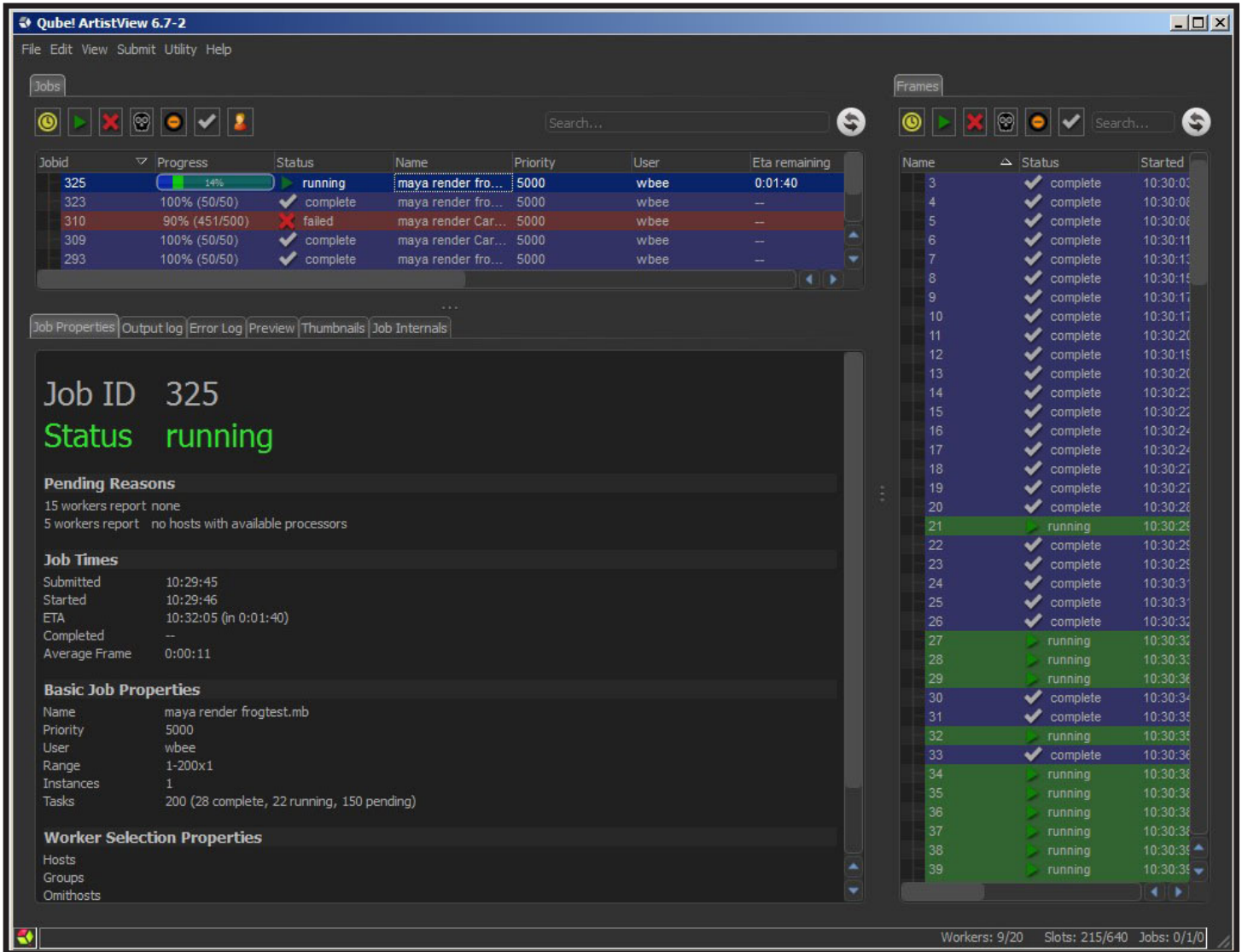
- Jobs Pane:** A table listing jobs with columns for Jobid, Progress, Status, Name, Priority, User, and Eta remaining. Job 325 is highlighted as 'running'.
- Detail Tabs:** A row of tabs including Job Properties, Output log, Error Log, Preview, Thumbnails, and Job Internals.
- Details Pane:** A large area displaying job details for Job ID 325, including Status (running), Pending Reasons, Job Times, Basic Job Properties, and Worker Selection Properties.
- Frames Pane:** A table showing frame-level status with columns for Name, Status, and Started. Frames 72, 78, and 86 are highlighted as 'running'.

Numbered callouts (1-6) point to specific UI elements: 1. Filter & Search Bar; 2. Jobs Layout Pane; 3. Detail Tabs; 4. Details Pane; 5. Frames Tab; 6. Component Pane.

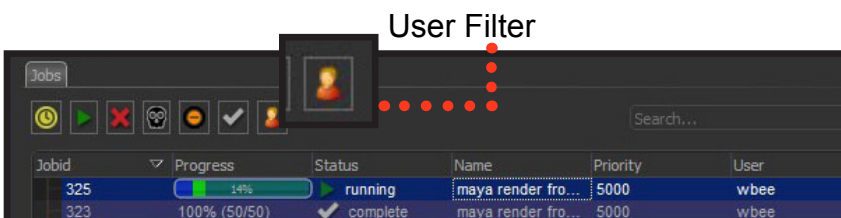
- 1. Filter & Search Bar** - Use the Filter Bar to filter down the job layout to include only those jobs you are interested in.
- 2. Jobs Layout Pane** - Shows a summary of jobs submitted to the Renderfarm.
- 3. Detail Tabs** - Use the Detail pane to get specific details of each job.
- 4. Details Pane** - This area shows various details of the job depending on the tab selected.
- 5. Frames Tab** - Used to show specific frame output information.
- 6. Component Pane** - This area shows information associated with the frames with the jobs selected in the Jobs Layout Pane.

The Jobs Pane shows a column summary of the jobs submitted to the Renderfarm. Here you will see the jobs that you have submitted.

Notice that they are color coded. Green is the color of a job that is currently running; Blue is the color of a successfully completed job; Red is the color of a job that has failed; Brown is the color of a job that has been killed.

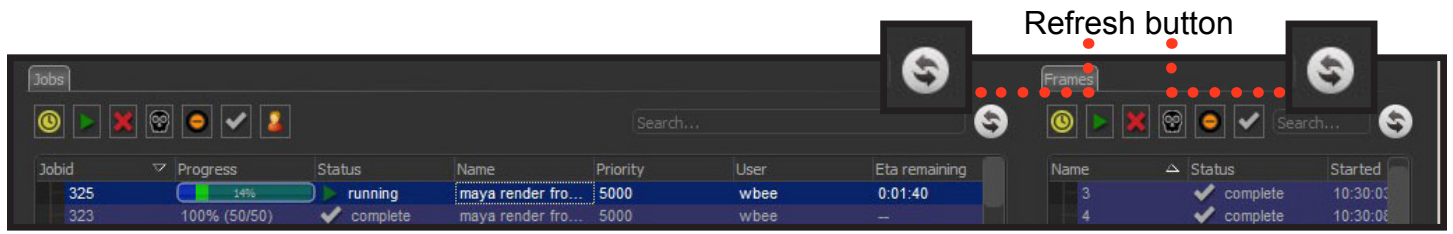


The row of buttons just under the 'Jobs' tab is a set of filters which will show or hide jobs in the Job Panel.

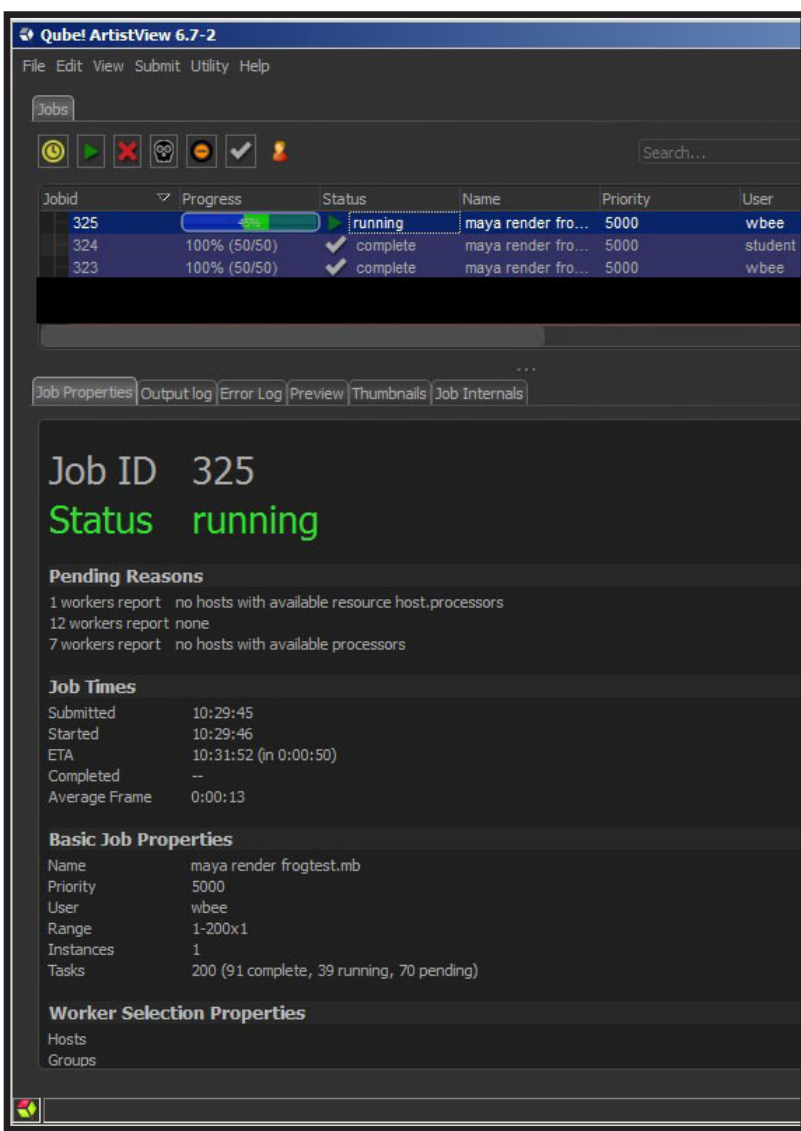


When you click on the 'User Filter' you will only see your own jobs. Click on it again and you will see all jobs that have been submitted by other users.

Refresh Button: By default, the Artist View UI does not refresh itself. To update the information and display it click on the appropriate refresh button. Notice there are two refresh buttons, one for the overall job progress and the other for individual frame updates.



The series of tabs under the Jobs Pane (the Details Pane) offer information about the currently highlighted job. (Click on your job to highlight it.)



**Job Properties:** The Properties pane contains basic information about the job.

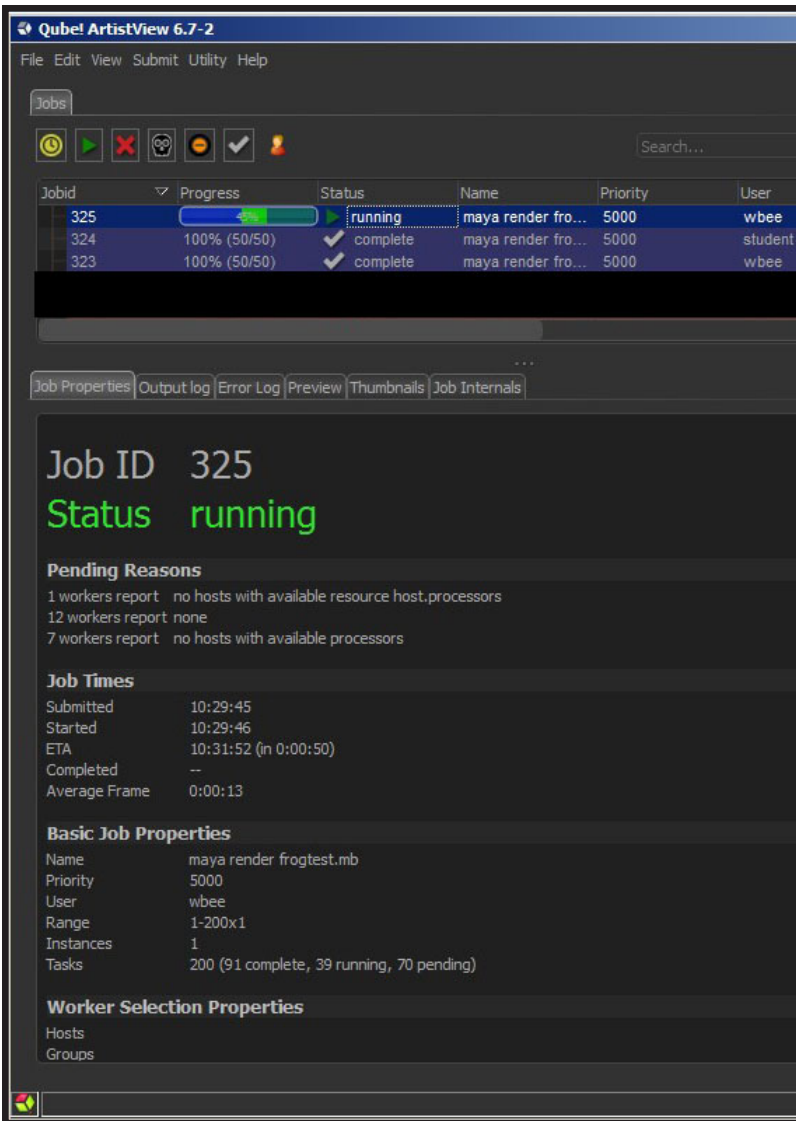
It displays start time, when your job completed and an average time it took to render a frame. It also displays the fields specified in the submission form.

**Output Log:** This shows the Stdout (standard output) text output from the job highlighted in the 'Jobs' pane.

To show the output for a specific frame, highlight the frame in the 'Frame' pane to the right. The search bar underneath allows searching for text in the log.

**Error Log:** This shows the Stderr (standard error) text output from the job highlighted in the 'Jobs' pane.

To show the output for a specific frame, highlight the frame in the 'Frame' pane to the right. The search bar underneath allows searching for text in the log.

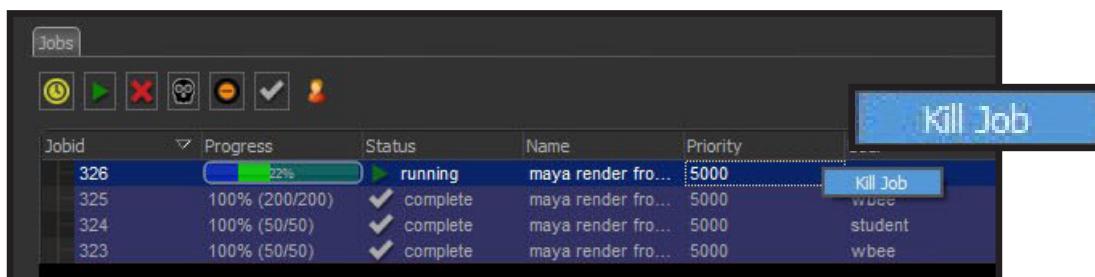


**Preview:** This shows a scrubbable preview of the selected jobs output.

**Thumbnails:** This feature is not available for all image formats at this time, such as “.exr” files.

**Job Internals:** This shows very detailed information about the job, from submission parameters to dispatch history.

If after submitting your job to the Renderfarm, you notice in the Details pane that there are problems with your job (such as missing textures, etc.), you can stop your job by right-clicking on it and selecting “Kill Job”.



Once you have fixed the problem, you will have to re-submit the job through Maya.

If you have any questions regarding the Qube Renderfarm, contact Sue Day at [sday@collegeforcreativestudies.edu](mailto:sday@collegeforcreativestudies.edu)

## NOTES

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