
IMAC Judge App Documentation

Release 0.5

IMAC-Org

2023-09-14

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1 Introduction

These pages contain the documentation of the IMAC Judge App. Depending on how you're viewing these, they are available as a html site at <https://imac-org.github.io/imac-judge-docs/> or as a PDF file.

1.1 Overview

This is (hopefully) to become the central documentation store for the IMAC Judge app. One documentation site that describes hardware, software, design and development.

A user guide can be part of this but should be a separate document as it will be passed to the end users for use and they probably don't want to hear about things like Spring Boot, KiCad and Materialize ;-).

1.2 Development

Under this section the development aspects will be documented. Things like how to compile the code and design decisions etc.

Applicaton Flow Ideas

Right now the application stores a “next round number” per pilot. This schema will need to change because you can have different round numbers for different types of rounds. It's not such a problem for Knowns/Unknowns but for freestyle it will be an issue.

For example, lest say you score 1 round of Sportsman, Intermediate and Advanced. For pilots in these classes the ‘next round’ will be round 2. You break for lunch and decide to run a freestyle round while people are eating.

For those pilots in Unlimited flying Freestyle, this will be their ‘round 1’ but it's ‘round 2’ for the others. After lunch you have more problems because now some sportsman pilots are up to ‘round 3’ and some are only at round 2 because they did not fly freestyle. The solution is to maintain round numbers per class and per type (and freestyle separately as well).

Currently, each time you choose a pilot you have to select the round type. So here is an opportunity for the judge to screw it up and cause lots of headaches for the CD. If he accidentally chooses known instead of unknown he's caused a problem.

Here is my proposal on how the flow can happen that will hopefully solve problem 1 and minimize problem 2.

Scenario 1 - Filter pilots per round.

- Only one round can be flown at a time (per flightline)
- Rounds are defined giving round numbers, sequence count and schedule.

Class	Type	Round	Seqs.	Schedule	State	Action
SPORTSMAN	KNOWN	1	2	SPO-Known-2023	Unflown	FLY
SPORTSMAN	KNOWN	2	1	SPO-Known-2023	Unflown	FLY
SPORTSMAN	UNKNOWN	1	1	SPO-Unknown-20230707-Sat	Unflown	FLY
INTERMEDIATE	KNOWN	1	2	INT-Alt-Known-2023	Unflown	FLY
INTERMEDIATE	KNOWN	2	2	INT-Alt-Known-2023	Unflown	FLY

- Any of the rounds can be chosen as the 'current round' and you can stop and start rounds mid-stream by simply selecting another round to fly.

Class	Type	Round	Seqs.	Schedule	State	Action
SPORTSMAN	KNOWN	1	2	SPO-Known-2023	Complete	
SPORTSMAN	KNOWN	2	1	SPO-Known-2023	Complete	
SPORTSMAN	UNKNOWN	1	1	SPO-Unknown-20230707-Sat	Unflown	SW
INTERMEDIATE	KNOWN	1	2	INT-Alt-Known-2023	Complete	
INTERMEDIATE	KNOWN	2	2	INT-Alt-Known-2023	Flying	CLO
	FREE	1	1	Freestyle	Unflown	SW

- Extra rounds can be added and it's not a problem when rounds are not flown - it makes no difference to the results.

When a round is being flown, the pilots are filtered so you only see pilots participating in this round. And the round number and sequence information is of course taken from the active round, not from the pilots record.

Scenario 2 - All pilots are available.

So how can we have this work for smaller comps where we just want everything to fly - as they do now? I believe this can be achieved with a small change to the code. Rounds are still defined but when you choose a pilot, if he is the first pilot in this class to fly the current round, you then choose Known, Unknown or Freestyle.

Selecting a round won't be necessary and the pilots won't be filtered.

So when the application state shows that the current class does not have an active flight, and you choose a pilot from that class, then you are asked: * Is it a known or unknown? * What schedule is it? * Is it a single or a double?

A new round is 'defined' and saved. Since we are in 'unfiltered' mode, then there is no need to mark the round as active. That is done automatically.

The pilot flies, you score it, and you move on to the next pilot. One of three things happens.

1. **You choose a pilot from the same class who has not flown this round.**

When this happens you are simply allowed to score the round as usual.

2. **You choose a pilot from the same class who has already flown this round.**

When this happens, you are shown that the scores exist and can choose another pilot.

3. **You choose a pilot from another class.**

If there is not a round active for this class, then you are prompted to choose one as described above. If there is a round active, then you just score according to that round.

In this scenario I'm not sure how we do freestyle. I think the only solution there is to ignore it, but when a freestyle round should be scored, the CD will simply set the freestyle round to the 'active' round and turn on 'filtering mode'. Then for that round the judges will only see freestyle pilots and have the freestyle schedule.

In both of these scenarios we are still relying on the judge to 'pick the right round'. Scenario one gives him the opportunity to pick a lot of things but it's quite easy to go back and reselect a round when he realises his mistake. If he has chosen known instead of unknown *and* the known is a single sequence round *and* he's not looking at the figures or using the sound, then he might make it through to the end and cause a lot of headache for the CD, but it should be fixable.

In the second scenario, it's easy as well to select the wrong type (known or unknown) and so the same danger applies.

One way to get around this is for the devices to communicate with each other. I've thought about how to solve this with ScorePad in the past and have come up with the following idea:

- Judge selects the round and clicks OK.
- Device advertises on the local network.:

I am judge X of Flight Line Y. I am scoring Sportsman Known Round 1.

- Device does not start scoring until it hears from every other judge device. It only needs to know how many devices there should be and that can be provided by Score.

1.3 Score Setup

Sequences Setup

Pilots Setup

Services

1.4 AeroJudge Device Setup

Setup New device

If you have a new device or a new SD card, then you need to download the full device image:

1. download image [here](#)
2. Use pi imager to write image to SD card

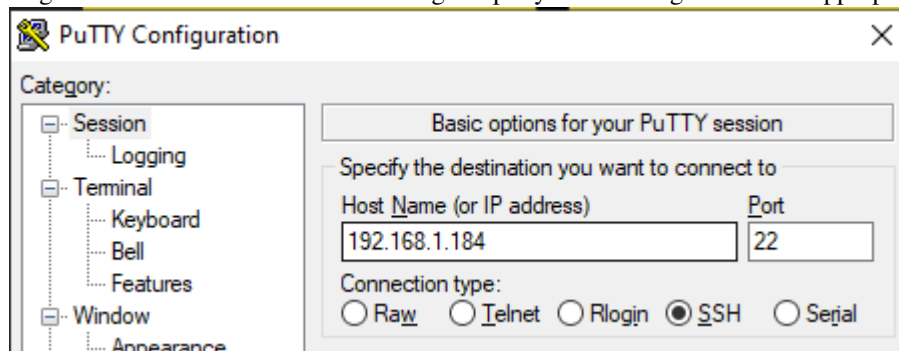
- Win32 Disk Imager <https://sourceforge.net/projects/win32diskimager>
 - balenaEtcher <https://www.balena.io/etcher>
 - Raspberry Pi Imager <https://www.raspberrypi.com/software/>
3. Once the pi image is written, a drive letter will be assigned (in Windows)
 4. Continue to Configuring device for a contest

Updating the device

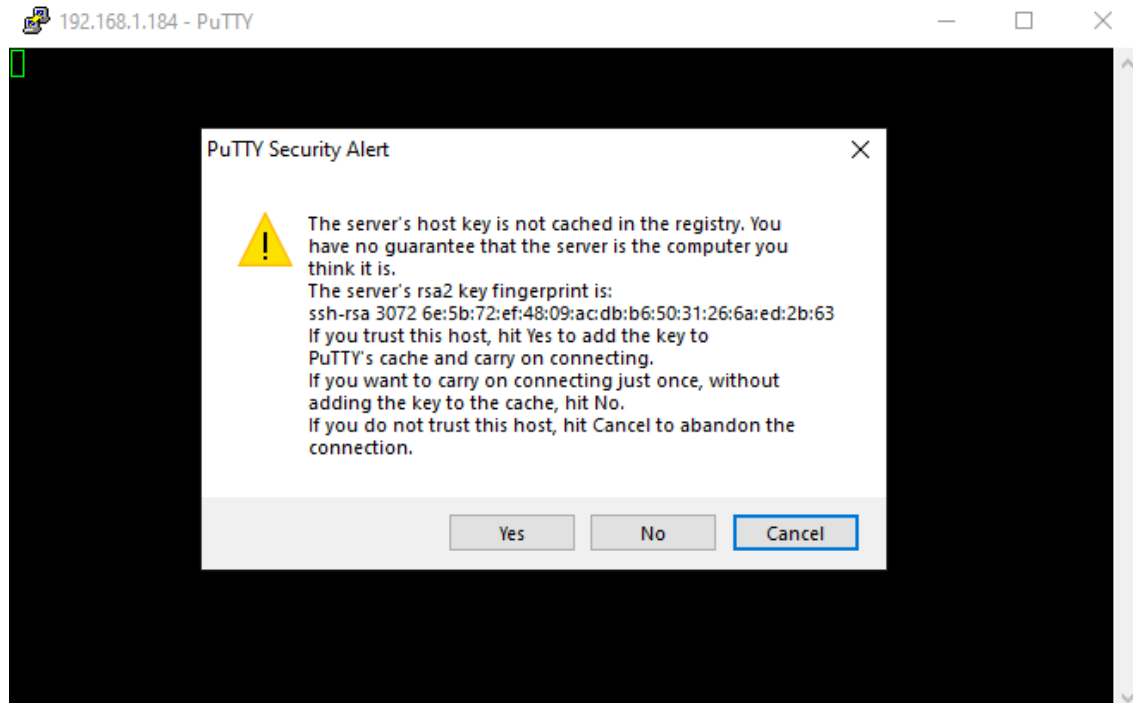
If you have an existing device that needs to be updated:

- If the device is connected to WiFi network with internet available:

1. Login to the device using putty entering the appropriate IP address

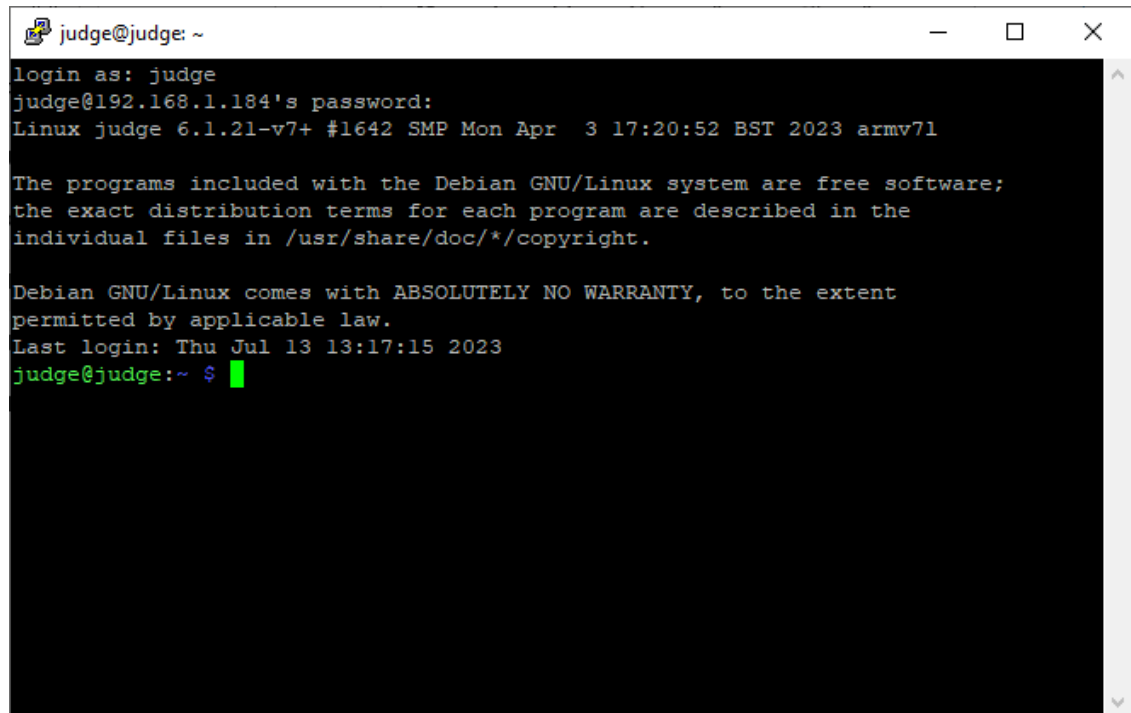


2. Answer Yes if you receive a security alert (only the first time)



3. At login as prompt enter “judge” and press enter.
4. **At the password prompt enter the appropriate password. Contact the IMAC AeroJudge development team for the current password.**

Note: When typing the password no characters will be displayed on the screen. If a mistake is made, press Enter and it will prompt again to enter the correct password.



```
judge@judge: ~
login as: judge
judge@192.168.1.184's password:
Linux judge 6.1.21-v7+ #1642 SMP Mon Apr  3 17:20:52 BST 2023 armv7l

The programs included with the Debian GNU/Linux system are free software;
the exact distribution terms for each program are described in the
individual files in /usr/share/doc/*/copyright.

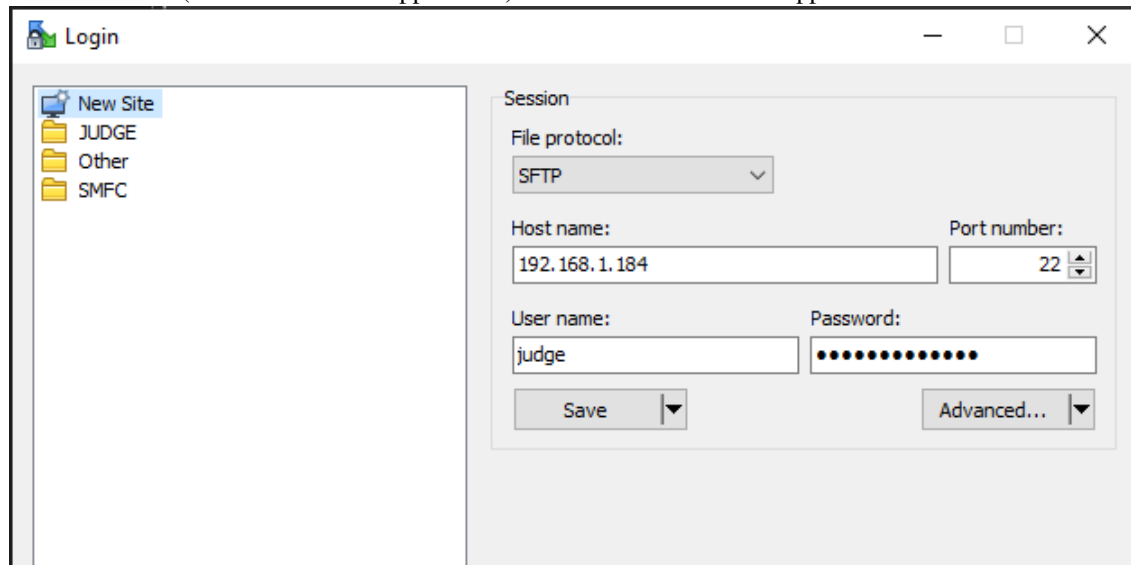
Debian GNU/Linux comes with ABSOLUTELY NO WARRANTY, to the extent
permitted by applicable law.
Last login: Thu Jul 13 13:17:15 2023
judge@judge:~ $
```

5. Run update command:

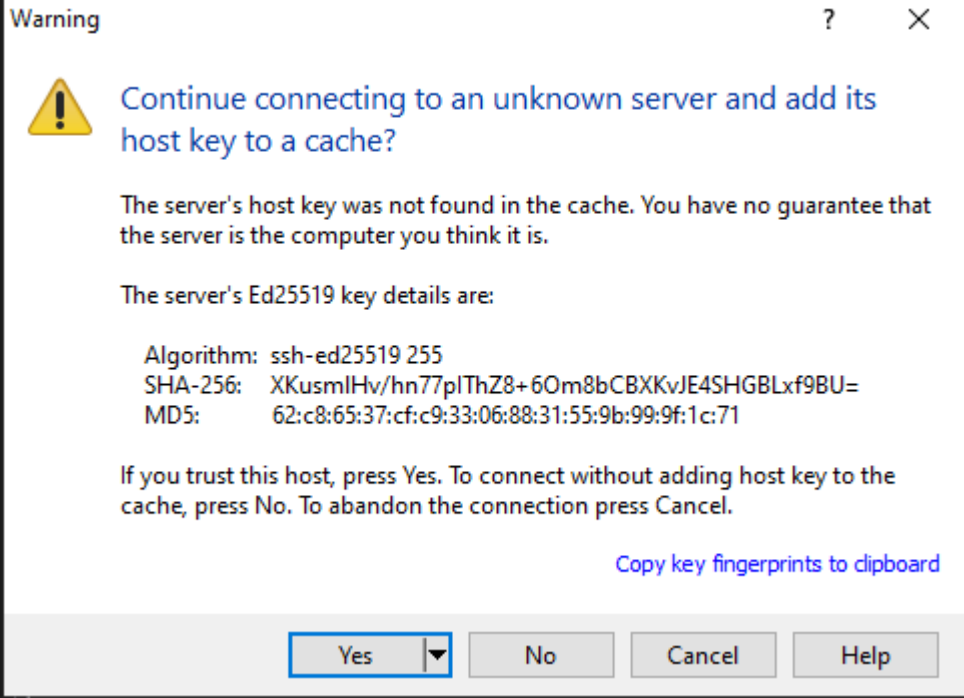
```
./judge_update.sh
```

- If the device is not connected to a WiFi network with internet, but you have the ability to obtain (or previously obtained) the latest judge application:

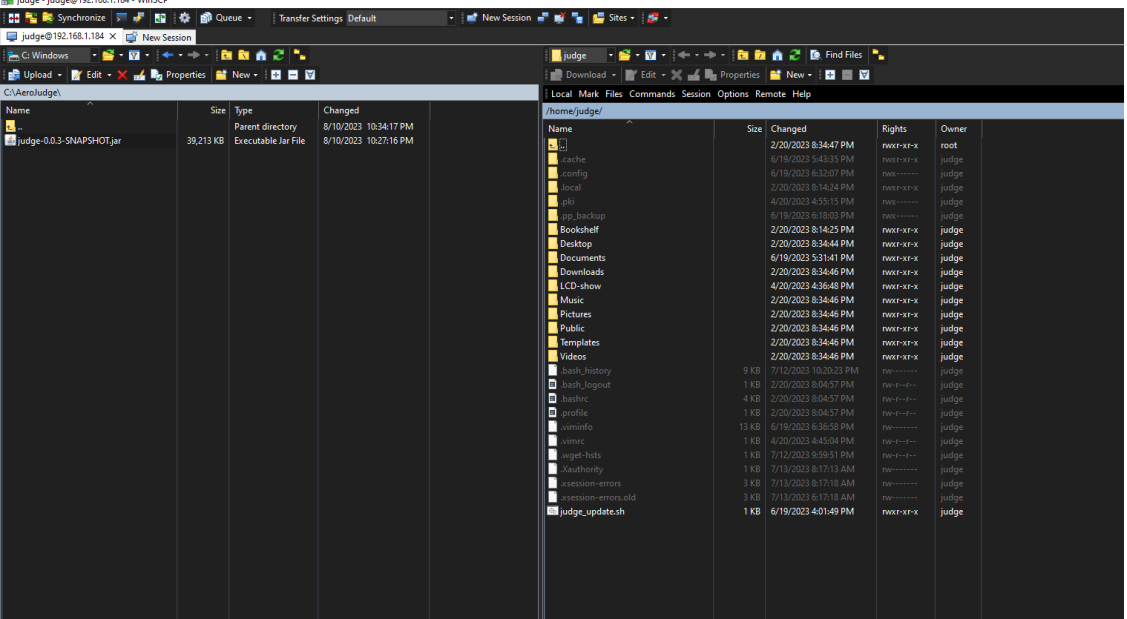
1. Use [WinSCP](#) (or similar FTP application) to transfer the new application file to the device



2. Answer Yes if you receive a security alert (only the first time)



3. Navigate to the location with the updated application, click on the file and drag it to the device folder:



4. The file should now appear on the device:

Name	Size	Changed	Rights
.		2/20/2023 8:34:47 PM	rw-r--r--
.cache		6/19/2023 5:43:35 PM	rw-r--r--
.config		6/19/2023 6:32:07 PM	rw-r--r--
.local		2/20/2023 8:14:24 PM	rw-r--r--
.pki		4/20/2023 4:55:15 PM	rw-r--r--
.pp_backup		6/19/2023 6:18:03 PM	rw-r--r--
Bookshelf		2/20/2023 8:14:25 PM	rw-r--r--
Desktop		2/20/2023 8:34:44 PM	rw-r--r--
Documents		6/19/2023 5:31:41 PM	rw-r--r--
Downloads		2/20/2023 8:34:46 PM	rw-r--r--
LCD-show		4/20/2023 4:36:48 PM	rw-r--r--
Music		2/20/2023 8:34:46 PM	rw-r--r--
Pictures		2/20/2023 8:34:46 PM	rw-r--r--
Public		2/20/2023 8:34:46 PM	rw-r--r--
Templates		2/20/2023 8:34:46 PM	rw-r--r--
Videos		2/20/2023 8:34:46 PM	rw-r--r--
.bash_history	9 KB	7/12/2023 10:20:23 PM	rw-r--r--
.bash_logout	1 KB	2/20/2023 8:04:57 PM	rw-r--r--
.bashrc	4 KB	2/20/2023 8:04:57 PM	rw-r--r--
.profile	1 KB	2/20/2023 8:04:57 PM	rw-r--r--
.viminfo	13 KB	6/19/2023 6:36:58 PM	rw-r--r--
.vimrc	1 KB	4/20/2023 4:45:04 PM	rw-r--r--
.wget-hsts	1 KB	7/12/2023 9:59:51 PM	rw-r--r--
.Xauthority	1 KB	7/13/2023 8:17:13 AM	rw-r--r--
.xsession-errors	3 KB	7/13/2023 8:17:18 AM	rw-r--r--
.xsession-errors.old	3 KB	7/13/2023 6:17:18 AM	rw-r--r--
judge_update.sh	1 KB	6/19/2023 4:01:49 PM	rw-r--r--
judge-0.0.3-SNAPSHOT.jar	39,213 KB	8/10/2023 10:27:16 PM	rw-r--r--

5. Login to the device with Putty (or in WinSCP use menu :menuselection: *Commands* → *Open Terminal*) and run the following commands in order:

```
sudo systemctl stop kiosk.service
sudo systemctl stop judge.service
mv {filename you transferred} /var/opt/judge/bin/judge.jar
sudo systemctl start kiosk.service
sudo systemctl start judge.service
```

Note: No response will be seen after the commands are run

```
judge@judge: ~  
judge@judge:~ $ sudo systemctl stop kiosk.service  
judge@judge:~ $ sudo systemctl stop judge.service  
judge@judge:~ $ mv judge-0.0.3-SNAPSHOT.jar /var/opt/judge/bin/judge.jar  
judge@judge:~ $ sudo systemctl start judge.service  
judge@judge:~ $ sudo systemctl start kiosk.service  
judge@judge:~ $
```

Configuring device for a contest

1. Insert SD card, opening the result drive, and find the file named settings.json.
2. Open this file in a standard text editor (not a rich editor like MS Word).
3. Edit the file placing the appropriate values after the colon (:) being careful to preserve all formatting (braces, quotes, commas).

```
{  
  "judge_id":1,  
  "line_number":1,  
  "score_host":"192.168.50.100",  
  "score_http_port":80,  
  "language":"en"  
}
```

settings.json file parameters:

line_number is a single integer number starting at 1. Each AeroJudge device for a given flight line should have the same number. A different flight line should have the next highest integer number (eg 2) for all devices being used on that line.

judge_id is a single integer number starting at 1. Each AeroJudge device for a given flight line should have a different judge id from 2 (minimum) to the number of judges for that line.

score_host is the network IP address of the computer running the Score software with services running

score_http_port is the port number entered on the Score software services tab

language is the two letter language code (currently only “en” is supported)

4. Be sure to eject the disk properly (right-click drive letter and choose Eject)
5. Insert the SD card back into the device and power the device

1.5 AeroJudge Users Guide

Start screen

New Comp screen

Pilot Selection

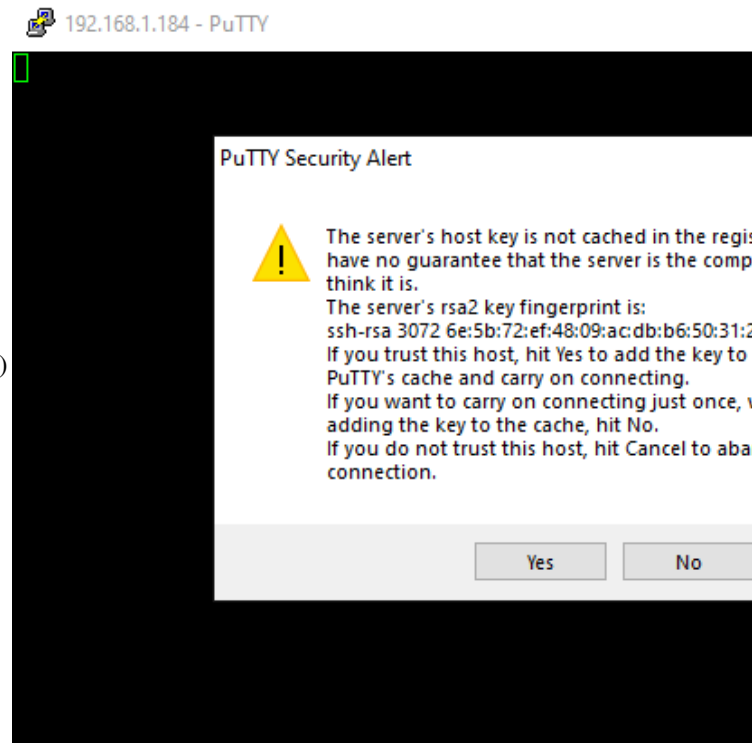
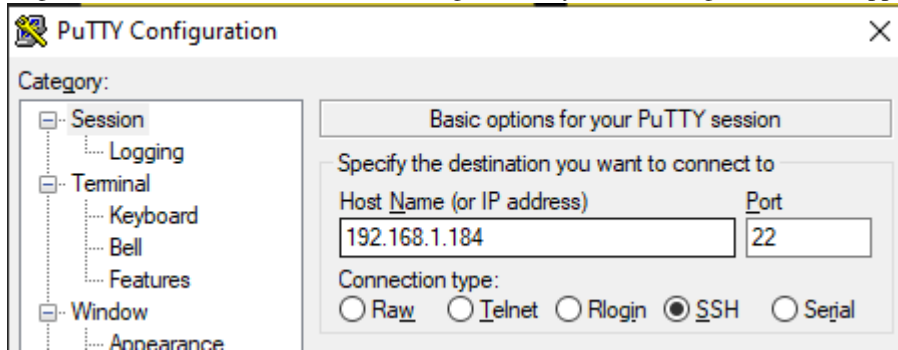
Judging/Scoring

1.6 AeroJudge Advanced Topics

Logging into a device

These steps are needed for any of the advanced topics below. First download an SSH client [Putty](#) or [SmarTTY](#)

1. Login to the device using Putty entering the appropriate IP address



2. Answer Yes if you receive a security alert (only the first time)

3. At login as prompt enter “judge” and press enter.
4. **At the password prompt enter the appropriate password. Contact the IMAC AeroJudge development team for the current password.**

Note: When typing the password no characters will be displayed on the screen. If a mistake is made, press Enter and it will prompt again to enter the correct password.

```
judge@judge: ~
login as: judge
judge@192.168.1.184's password:
Linux judge 6.1.21-v7+ #1642 SMP Mon Apr  3 17:20:52 BST 2023 armv7l

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individual files in /usr/share/doc/*/copyright.

Debian GNU/Linux comes with ABSOLUTELY NO WARRANTY, to the extent
permitted by applicable law.
Last login: Thu Jul 13 13:17:15 2023
judge@judge:~$
```

```
judge@judge: ~
login as: judge
judge@192.168.1.184's password:
Linux judge 6.1.21-v7+ #1642 SMP Mon Apr  3 17:20:52 BST 2023 armv7l

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individual files in /usr/share/doc/*/copyright.

Debian GNU/Linux comes with ABSOLUTELY NO WARRANTY, to the extent
permitted by applicable law.
Last login: Thu Jul 13 13:17:15 2023
judge@judge:~$
```

5. A command prompt will appear after entering the password:

Note: This is a Linux console and is very case sensitive (unlike Windows). Most all commands and parameters will be lowercase (unless otherwise noted). See¹

¹

Stopping/Starting the app

There are two processes running on the device to provide the functionality that makes up the AeroJudge application. Stopping both of these processes is necessary if you are upgrading the AeroJudge application.

- To stop the application display (web browser) which will display the desktop, enter the following command and press enter:

```
sudo systemctl stop kiosk.service
```

- To stop the application itself (what manages the scoring), enter the following command and press enter:

```
sudo systemctl stop kiosk.service
```

- To start the application itself (what manages the scoring), enter the following command and press enter:

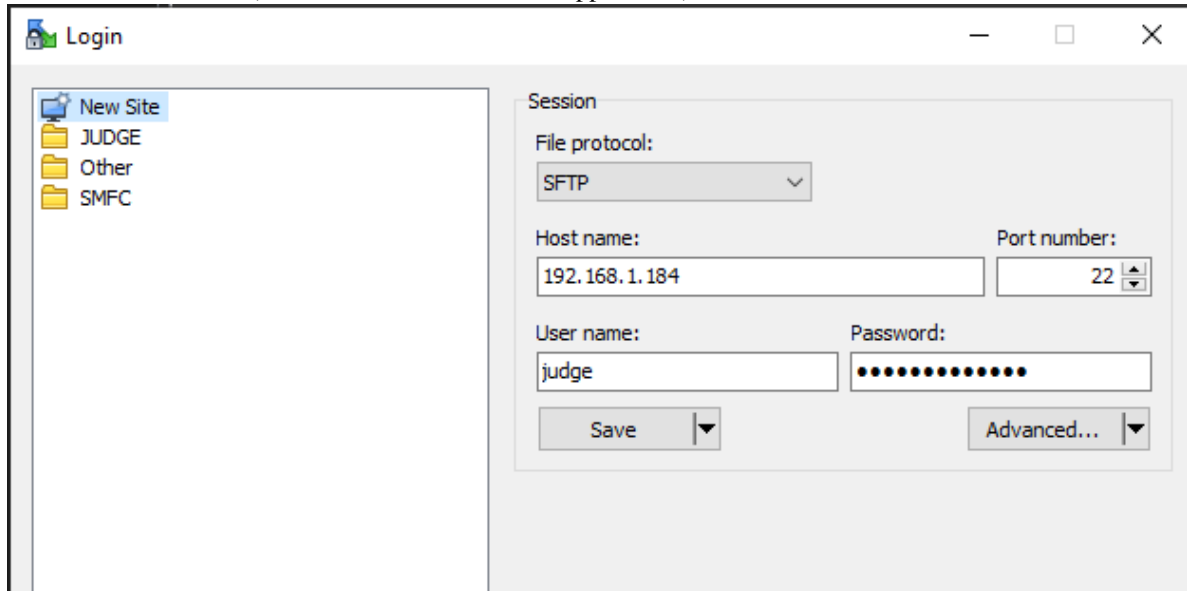
```
sudo systemctl start kiosk.service
```

- To start the application display (web browser) which will display the desktop, enter the following command and press enter:

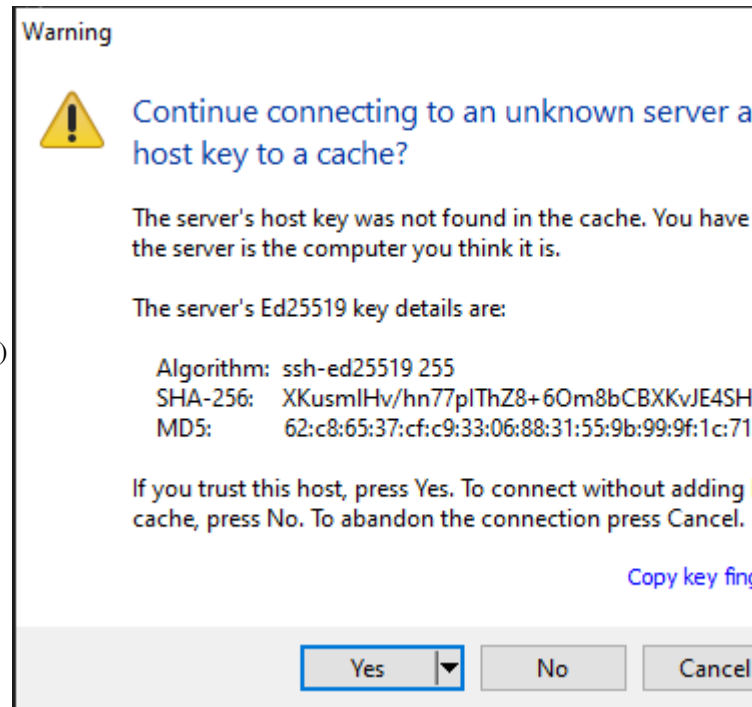
```
sudo systemctl start kiosk.service
```

Archiving old comp data

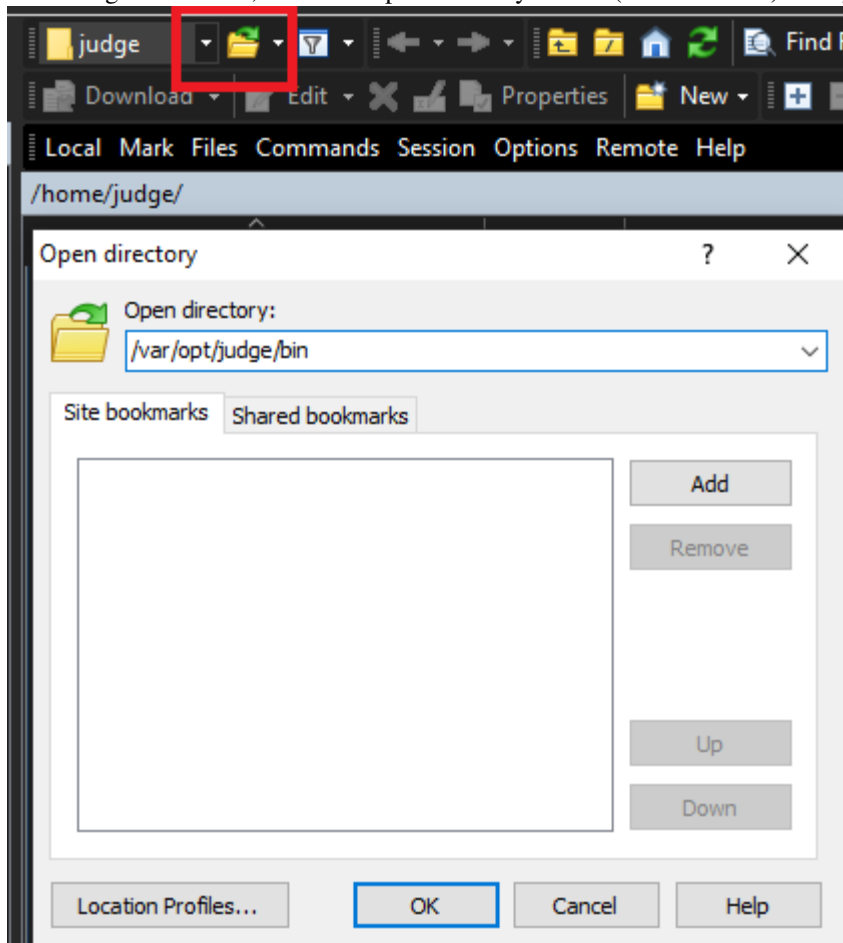
1. Use [WinSCP](#) (or similar FTP application) to connect to the device



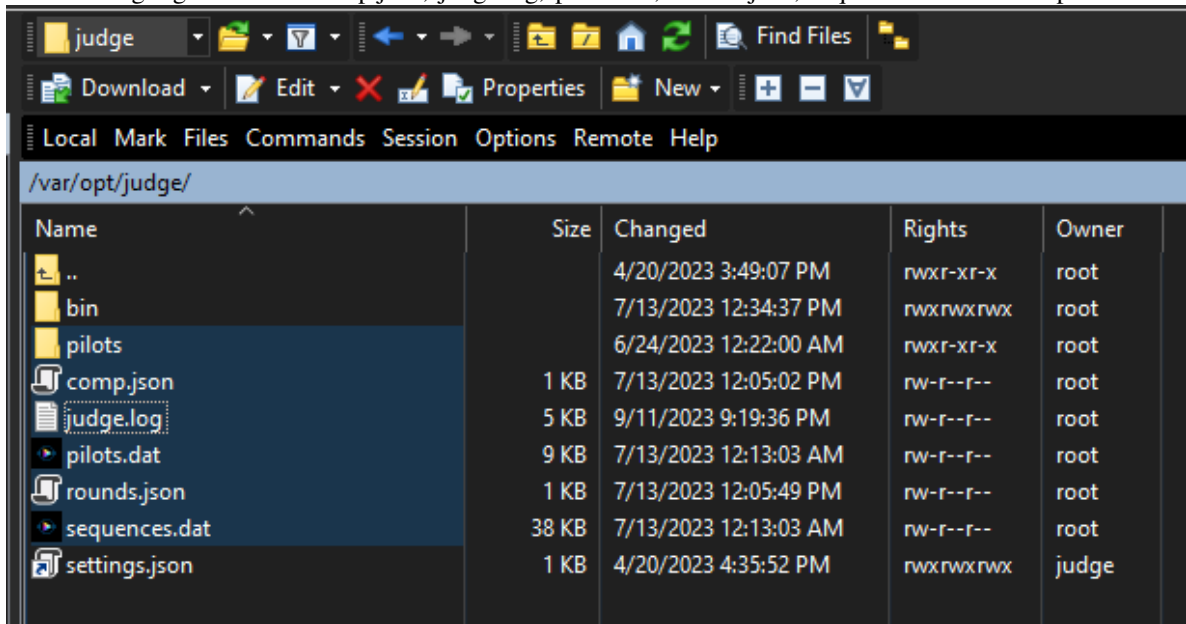
2. Answer Yes if you receive a security alert (only the first time)



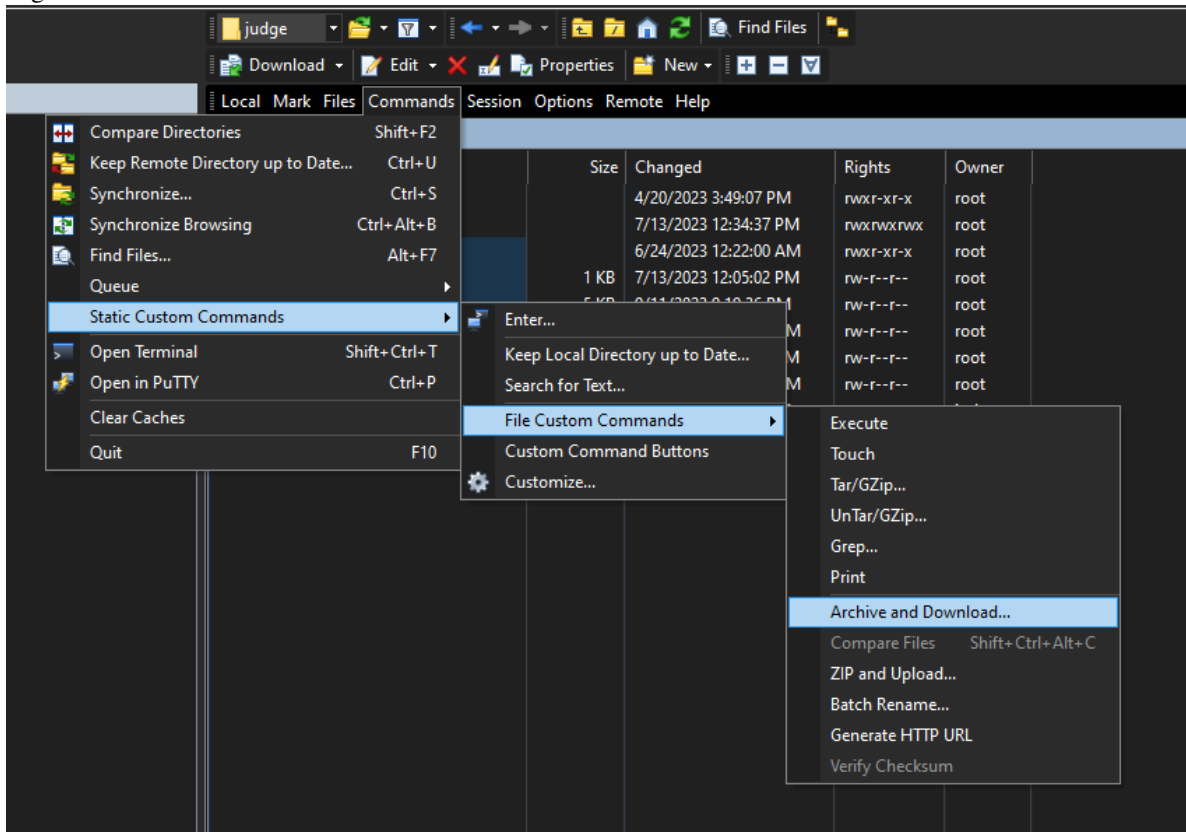
3. On the right-hand side, Click the open directory button (*Control* → *O*) and type `/var/opt/judge` and click OK



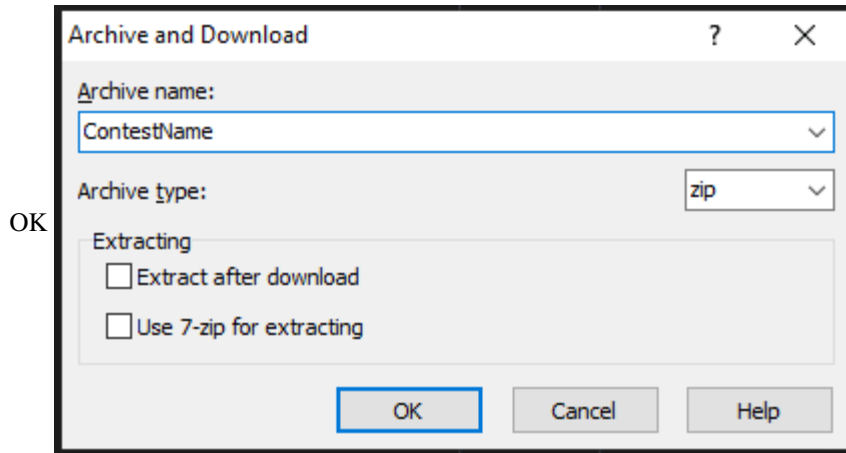
4. Select to highlight the files comp.json, judge.log, pilots.dat, rounds.json, sequences.dat and the pilots folder



5. Right click and choose *Static Custom Commands* -> *File Custom Commands* -> *Archive and Download...*



6. Enter a name for the archive (suggest to use contest name and date), select archive type (suggest zip), and click



7. New archive file will then appear on the computer folder on the left

C:\AeroJudge\			
Name	Size	Type	Changed
..		Parent directory	9/11/2023 9:37:26 PM
ContestName.zip	15 KB	Compressed (zipp...	9/11/2023 10:20:43 PM
judge.jar	39,213 KB	JAR File	8/10/2023 10:27:16 PM
judge-1.0.87.jar	35,229 KB	JAR File	9/11/2023 9:35:43 PM

8. (Optional) To clear out that data, use the Delete option on the right-hand side (with the 5 files and 1 folder selected)

Quick Linux command primer

sudo is similar to an Administrative command prompt - it runs any command that follows with admin rights

systemctl is a background process manager much like Windows Services. It allows the following common actions: start, stop, restart, status

cp is the copy file command

mv is the move file command

judge.service is the background application that shows the pilots, collects scores, and sends scores to Score application

kiosk.service is the web browser running in “kiosk” mode which removes all toolbars, address bars, etc. to minimize risk of users unfamiliar with the app from closing it or navigating away from the application address.