

# IEEE CCWC 2021 IoT Workshop

## SSH: Windows & Raspberry Pi

2020-01-23

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### SUMMARY

This document shows how to get SSH running between your RPIs and Windows. It also shows how to install necessary systems.

This also shows how to install git on the RPIs.

### DETAILS

SSH is the remote secure shell. The RPIs need their SSH server running so your host (Windows) machine can interact directly with the RPIs.

Git is necessary to get some code for our RPIs.

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## STEPS

### STEP 1: CREATE TWO RASPBERRY PI FOLDERS

On your Windows 10 machine, duplicate the folder `~/workshop/Rpi` to two new folders:

`RPi_1`  
`RPi_2`

In the workshop folder.

Each folder should have three files:

`2020_12.qcow2`  
`qemukernel`  
`versatile-pb.dtb`

`Host> ls ~/workshop`

`RPi`  
`RPi_1`  
`RPi_2`

## STEP 2: TURN ON SSH ON RASPBERRY PIS

On each RPi enable and run SSH:

```
Rpi_*> sudo systemctl enable ssh
```

```
Rpi_*> sudo systemctl start ssh
```

Check the SSH status:

```
Rpi_*> sudo systemctl status ssh
```

You should get an indication that ssh is up and running.

## STEP 3: RASPBERRY PI GIT INSTALLATION

```
pi@raspberrypi $ sudo apt-get install -y git  
pi@raspberrypi $ git version
```

Git should be version 2.20.

#### STEP 4: RUN A RASPBERRY PI QEMU VIRTUAL MACHINE

You should do this next step with both RPI\_1 and RPI\_2.

```
Windows > cd ~/workshop/RPi_1
```

```
Windows> qemu-system-arm -M versatilepb ^  
-cpu arm1176 ^  
-m 256 -hda "./2020-12.qcow2" ^  
-net nic -net user,hostfwd=tcp::5022-:22 ^  
-dtb "./versatile-pb.dtb" ^  
-kernel "./qemukernel" ^  
-append "root=/dev/sda2 panic=1 rootfstype=ext4 rw" -no-reboot ^
```

Once your virtual RPI\_1 is running, then do the following

```
Windows > ssh -p 5022 pi@localhost
```

```
Windows > pi@raspberrypi $
```

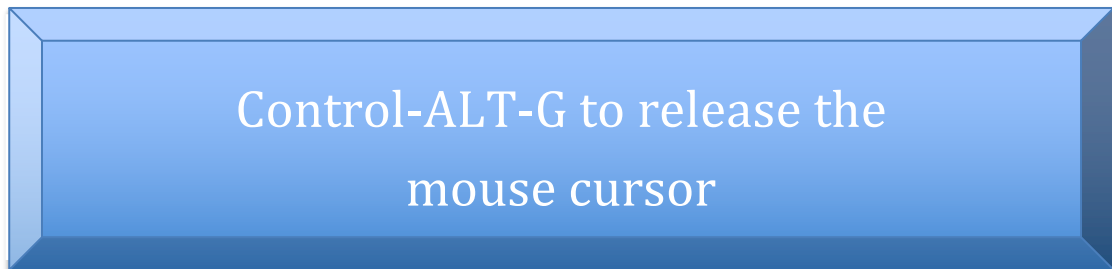
Here you should be able to work on the raspberry pi from a windows terminal.

For example, try:

```
Windows > pi@raspberrypi $ top
```

## STEP 5: FINAL DETAILS

If your mouse cursor gets caught in your RPIs, then:



To shut down the Raspberry Pi gracefully, go to the Raspberry Pi's prompt and shut it down

```
RaspberryPi> sudo shutdown -h now
```