X-Window & Networking

Goal: Accessing 1of 5 RPi4B from the Over the Internet with graphical displays

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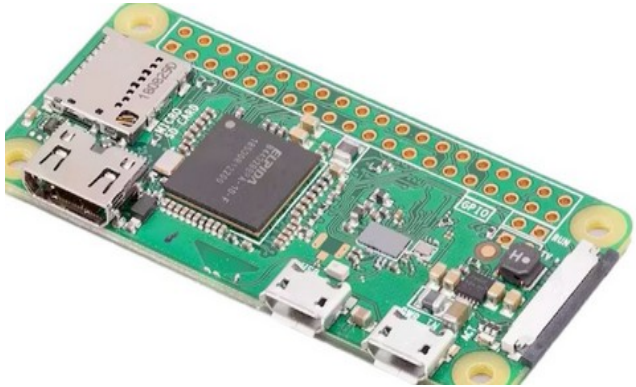
- Steps Required
- Need to ssh to
- LAN Home RPi3B+ on 162.197.186.xx
- Need to ssh to RPi3B+ local router
- Need to ssh to 1 of 5 RPi4B
-
- Run Graphical Application

- Examples graphical displays
  - Geany editor
  - Octave matlab like program
  - Gtkwave VCD viewer
  - Mousepad editor
  - GIMP
  - Lazarus IDE (Ulitobo Editor)
    - Bare metal for Pi
      - QEMU, Rpi Zero, RPi3B+, RPi4, and CM4

RPi Models

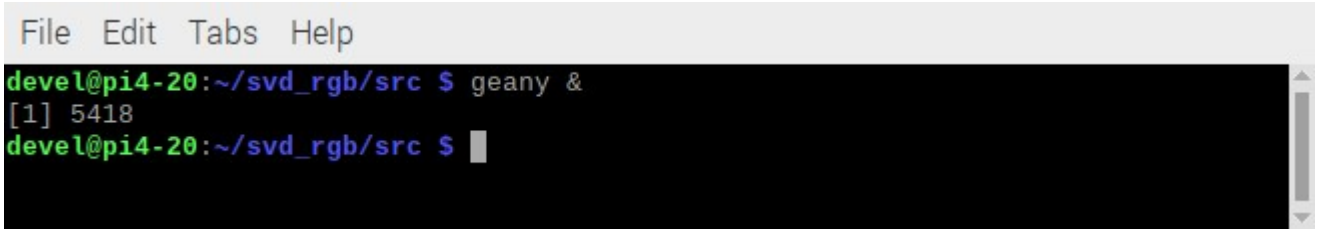


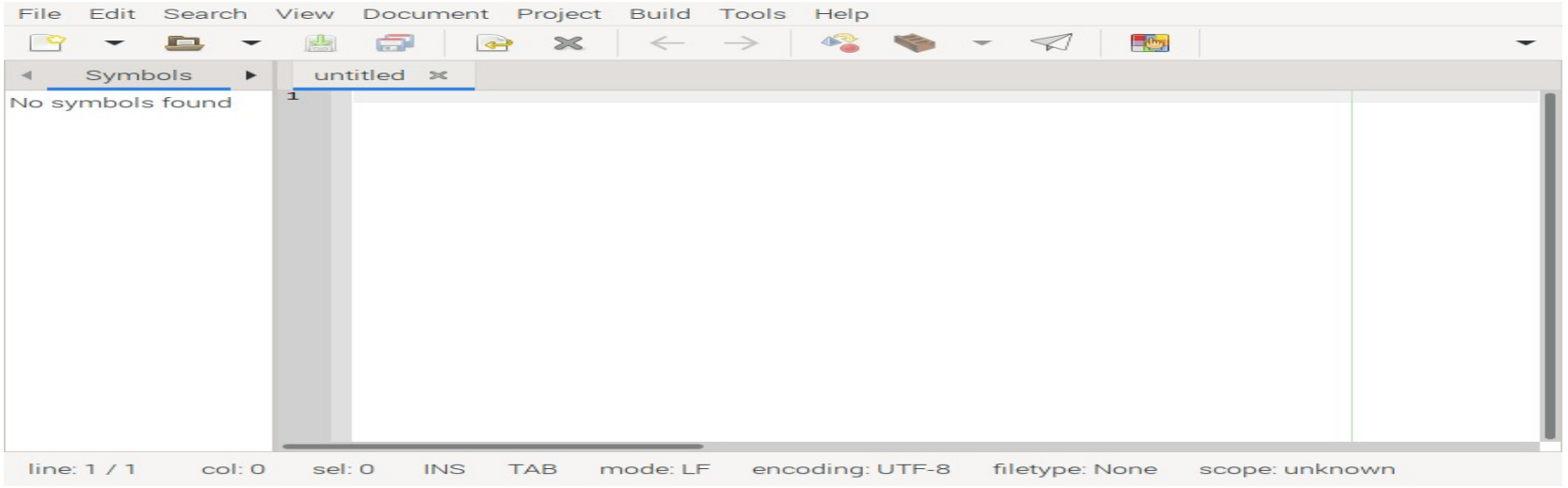
RPi CM4

RPi3B+

RPi4B

RPi3A


File Edit Tabs Help
devel@pi4-20:~/svd_rgb/src $ geany &
[1] 5418
devel@pi4-20:~/svd_rgb/src $


File Edit Search View Document Project Build Tools Help
Symbols
No symbols found
untitled
1
line: 1 / 1 col: 0 sel: 0 INS TAB mode: LF encoding: UTF-8 filetype: None scope: unknown

File Edit Search View Document Project Build Tools Help

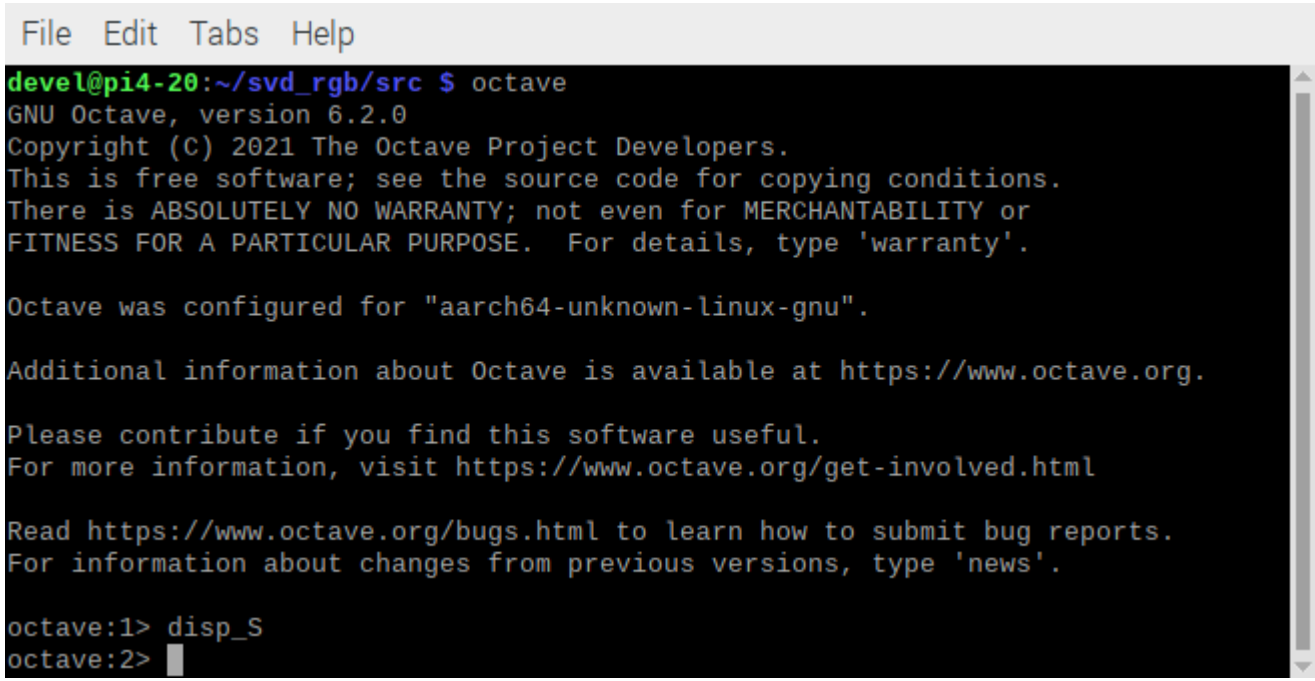
Symbols

No symbols found

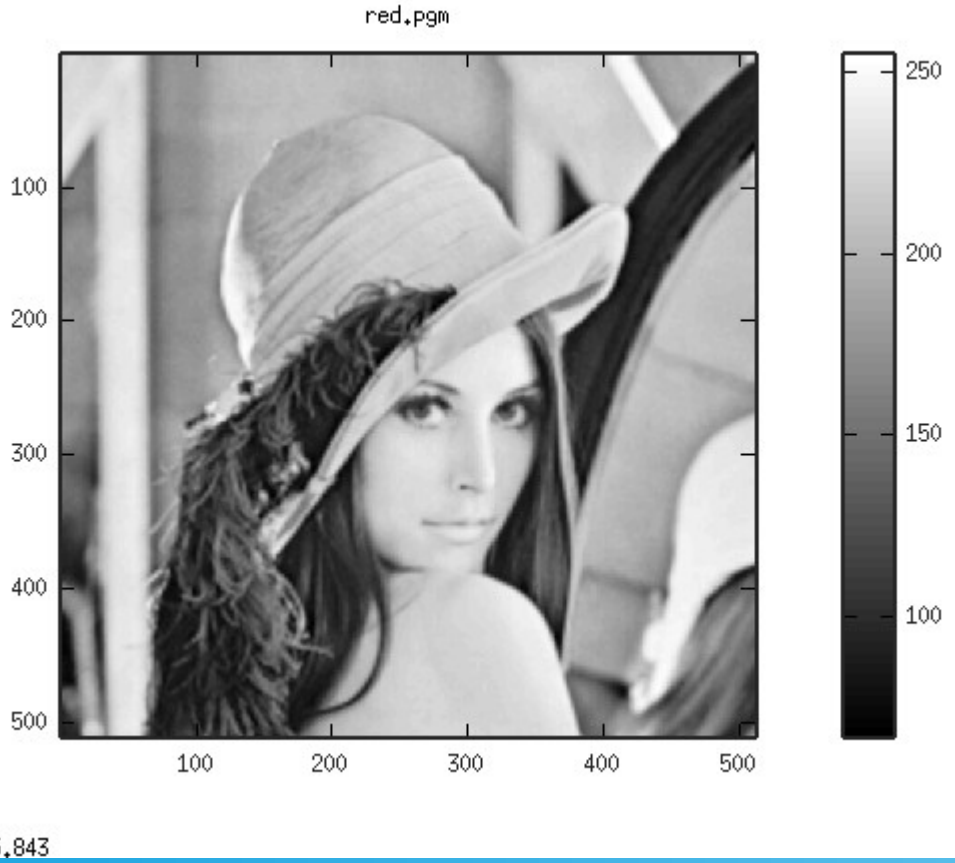
disp_S.m

```
58  fid = fopen('Sblu.bin','r'); blu = fread(fid, 512, 'float');
59
60  fid = fopen('rcred.bin','r'); im1 = fread(fid, [512,inf], 'int32');
61  fid = fopen('rcgrn.bin','r'); im2 = fread(fid, [512,inf], 'int32');
62  fid = fopen('rcblu.bin','r'); im3 = fread(fid, [512,inf], 'int32');
63
64  aa(1:n)= red(1:n);
65  figure
66  stem(aa)
67  title("n S values red image from C img_svd")
68
69  figure;
70  imagesc(im1);
71  colorbar;
72  colormap 'gray';
73  title 'rcred svd from C'
74
75
76  bb(1:n)= grn(1:n);
77  figure
78  stem(bb)
79  title("n S value green image from C img_svd")
80
81  figure;
82  imagesc(im2);
83  colorbar;
84  colormap 'gray';
85  title 'rcgrn svd from C'
86
```

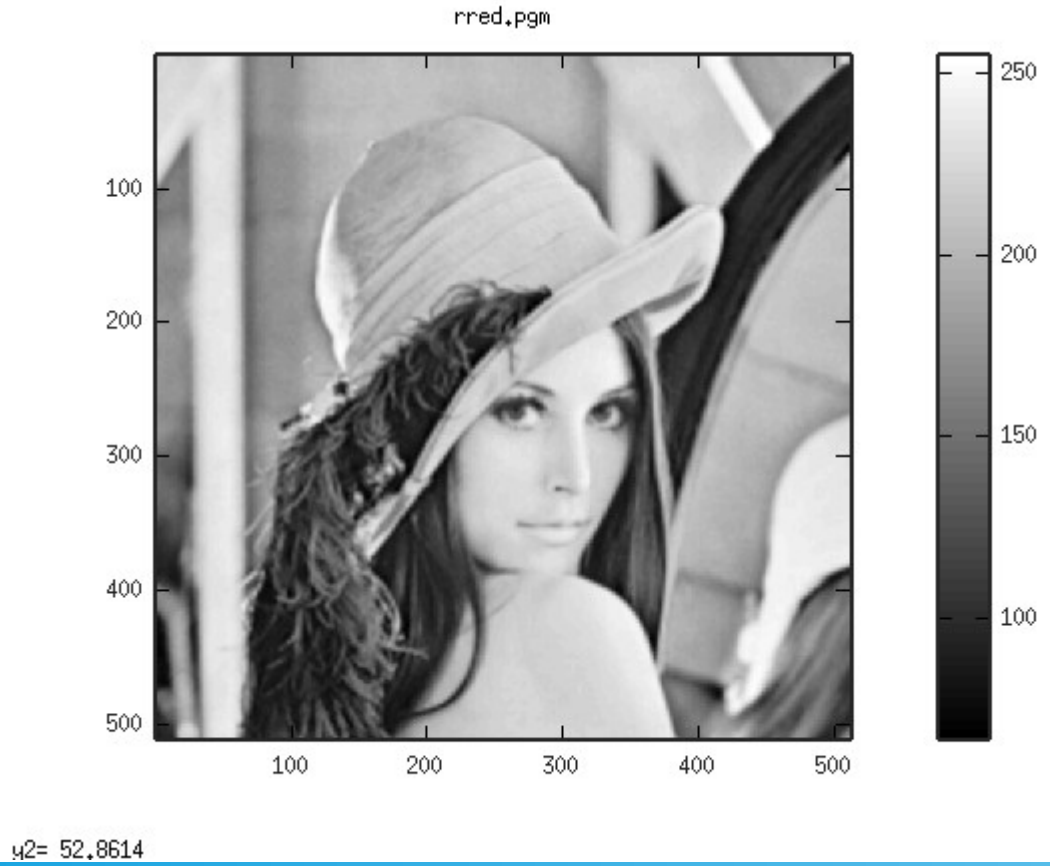
line: 67 / 101 col: 42 sel: 35 INS TAB mode: LF encoding: UTF-8 filetype: Matlab/Octave scope: unknown


File Edit Tabs Help
devel@pi4-20:~/svd_rgb/src $ octave
GNU Octave, version 6.2.0
Copyright (C) 2021 The Octave Project Developers.
This is free software; see the source code for copying conditions.
There is ABSOLUTELY NO WARRANTY; not even for MERCHANTABILITY or
FITNESS FOR A PARTICULAR PURPOSE. For details, type 'warranty'.
Octave was configured for "aarch64-unknown-linux-gnu".
Additional information about Octave is available at https://www.octave.org.
Please contribute if you find this software useful.
For more information, visit https://www.octave.org/get-involved.html
Read https://www.octave.org/bugs.html to learn how to submit bug reports.
For information about changes from previous versions, type 'news'.
octave:1> disp_S
octave:2>

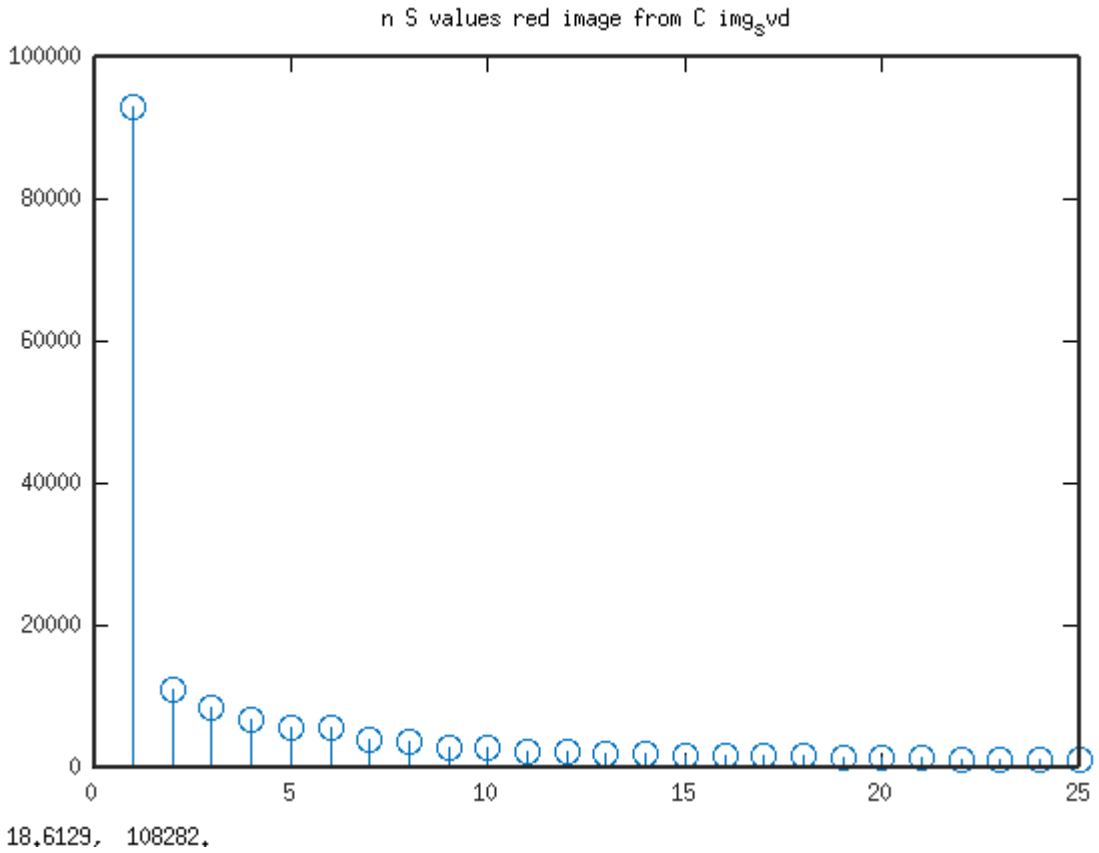
500 x 500 red subband lena



500 x 500 red subband lena reconstructed after perfoming KLT



n S values red image from C img_svd



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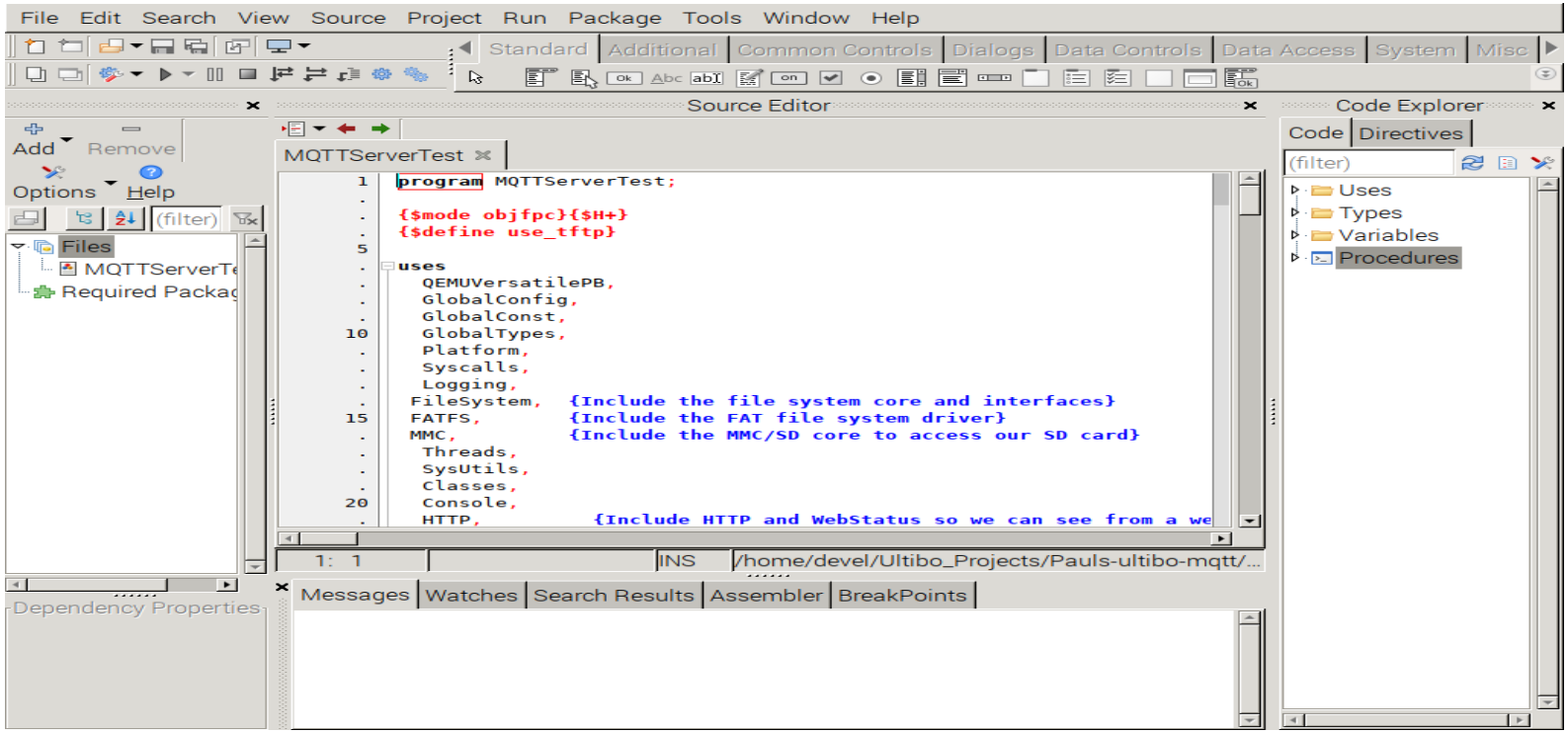

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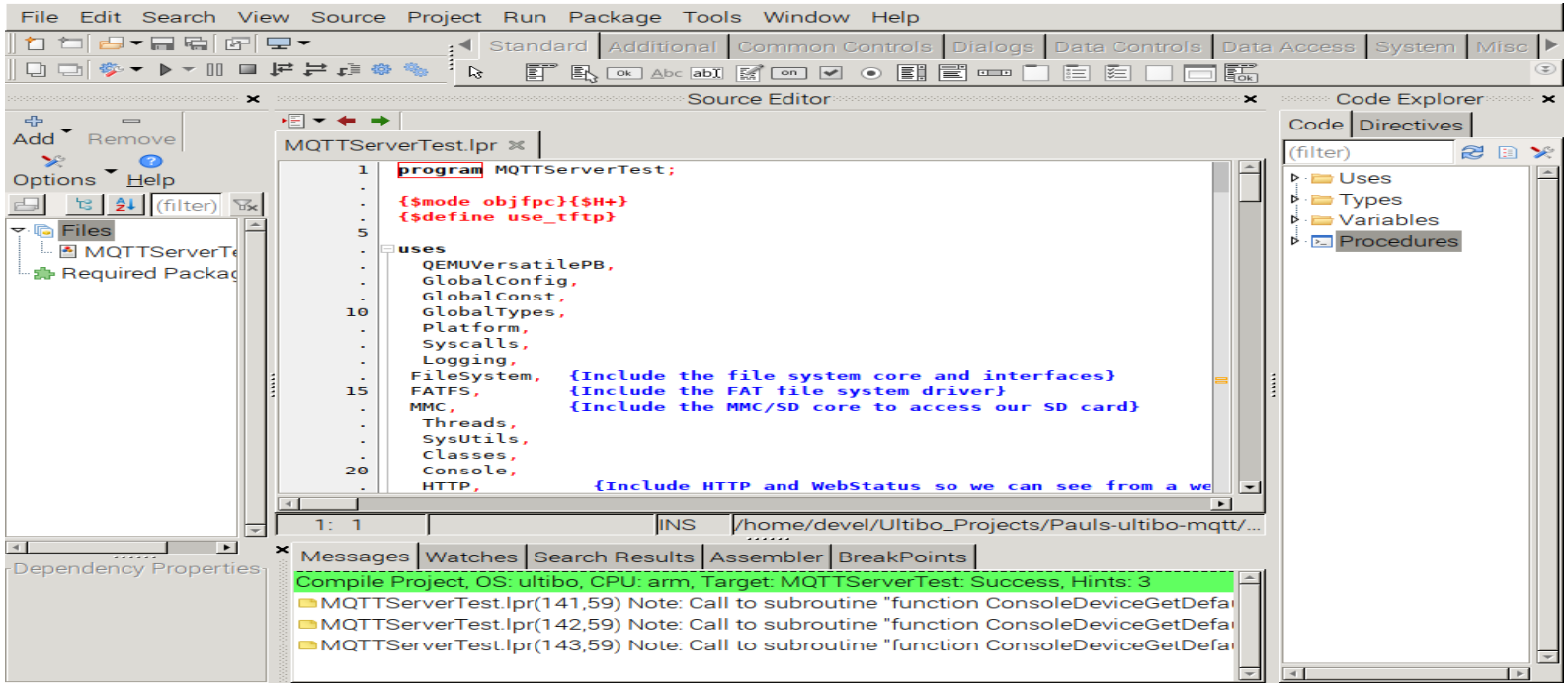

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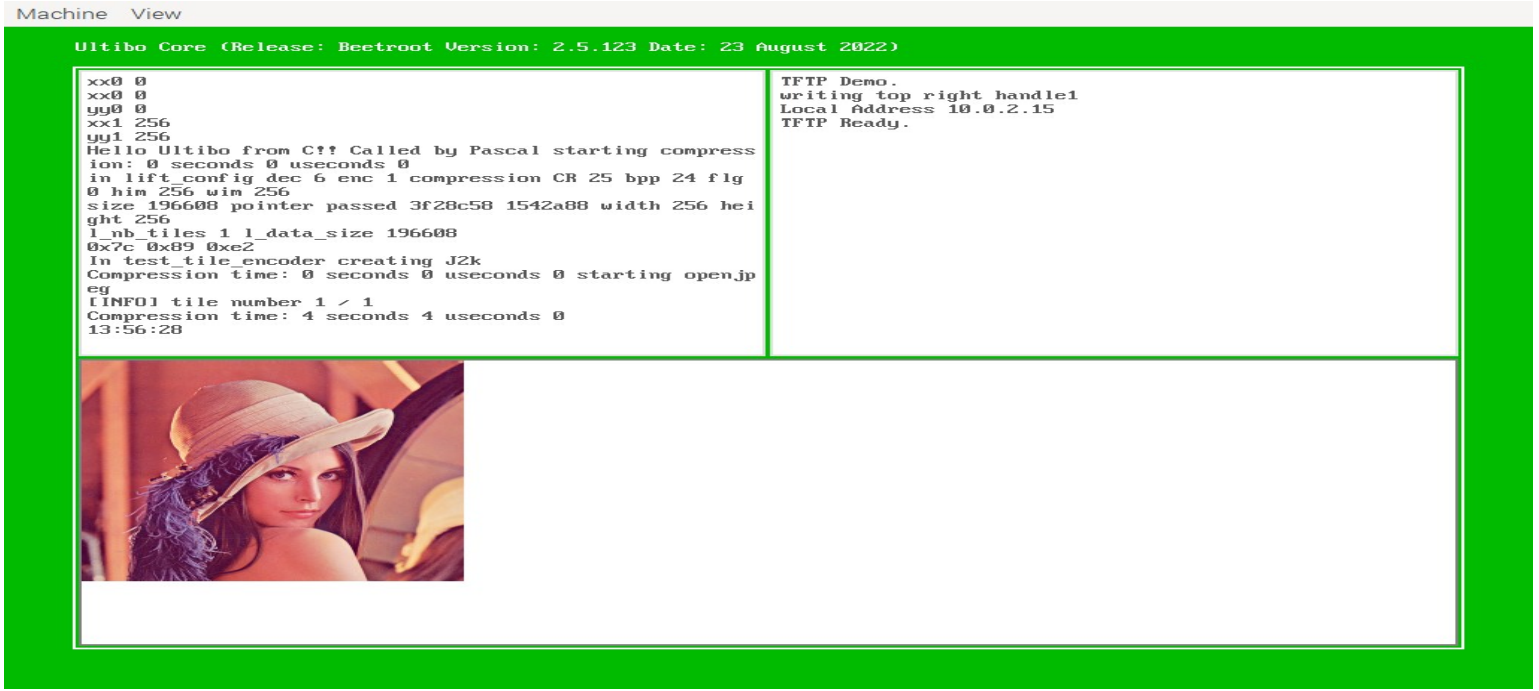
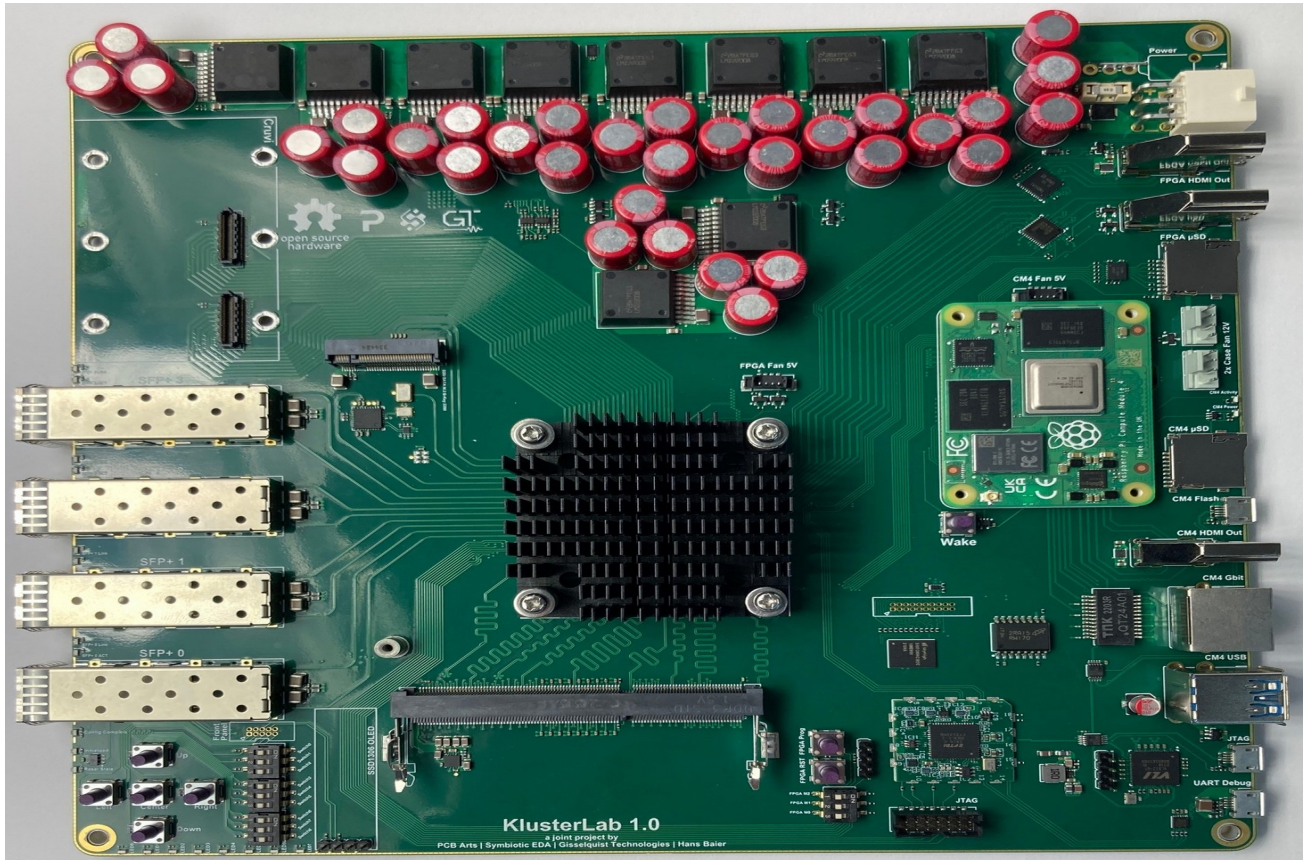
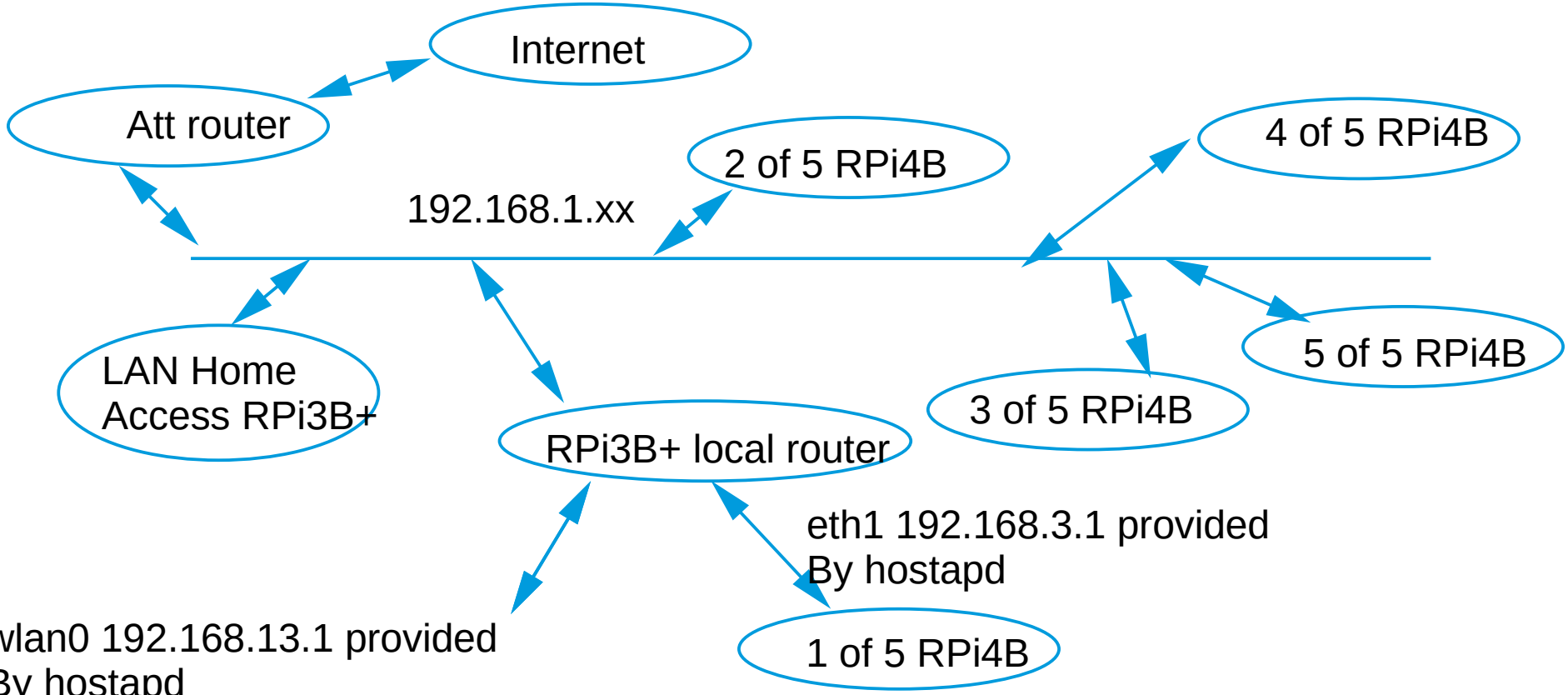
devel@pi4-20:~/Ultibo_Projects/jpeg2000/QEMU $ ./startqemu.s



Rpi CM4 with FPGA Kintex-7 160T with 4 Ethernet 10Gb



ATT Router


Internet
Att router
2 of 5 RPi4B
192.168.1.xx
4 of 5 RPi4B
LAN Home
Access RPi3B+
5 of 5 RPi4B
3 of 5 RPi4B
RPi3B+ local router
eth1 192.168.3.1 provided
By hostapd
wlan0 192.168.13.1 provided
By hostapd
1 of 5 RPi4B