05/01/24
https://www.circuitbasics.com/basics-of-the-i2c-communication-protocol/

10/01/24

```
// C++ program for Boggle game
#include <cstring>
#include <iostream>
using namespace std;


#define M 3
#define N 3


// Let the given dictionary be following
string dictionary[] = { "GEEKS", "FOR", "QUIZ", "GO" };
int n = sizeof(dictionary) / sizeof(dictionary[0]);


// A given function to check if a given string is present in
// dictionary. The implementation is naive for simplicity. As
// per the question dictionary is given to us.
bool isWord(string& str)
{
    // Linearly search all words
    for (int i = 0; i < n; i++)
        if (str.compare(dictionary[i]) == 0)
            return true;
    return false;
}


// A recursive function to print all words present on boggle
void findWordsUtil(char boggle[M][N], bool visited[M][N], int i,
                int j, string& str)
{
    // Mark current cell as visited and append current character
    // to str
    visited[i][j] = true;
    str = str + boggle[i][j];


    // If str is present in dictionary, then print it
    if (isWord(str))
        cout << str << endl;
    // Traverse 8 adjacent cells of boggle[i][j]
    for (int row = i - 1; row <= i + 1 && row < M; row++)
        for (int col = j - 1; col <= j + 1 && col < N; col++)
            if (row >= 0 && col >= 0 && !visited[row][col])
                findWordsUtil(boggle, visited, row, col, str);


    // Erase current character from string and mark visited
    // of current cell as false
    str.erase(str.length() - 1);
    visited[i][j] = false;
}


// Prints all words present in dictionary.
void findWords(char boggle[M][N])
{
    // Mark all characters as not visited
    bool visited[M][N] = { { false } };


    // Initialize current string
    string str = "";


    // Consider every character and look for all words
    // starting with this character
    for (int i = 0; i < M; i++)
        for (int j = 0; j < N; j++)
            findWordsUtil(boggle, visited, i, j, str);
}


// Driver program to test above function
int main()
{
    char boggle[M][N] = { { 'G', 'I', 'Z' },
                          { 'U', 'E', 'K' },
                          { 'Q', 'S', 'E' } };


    cout << "Following words of dictionary are present\n";
    findWords(boggle);
    return 0;
}
```

```
#include<stdio.h>
#include<stdlib.h>
#include<string.h>


void board(char (*p)[4],char (*w)[4],int col);
int main()
{
        char character[4][4]={{'s','i','s','a'},{'m','g','u','n'},{'o','n','m','d'},{'m','l','i','p'}};
        char word[6][4]={"sign","mom","sum","lip","and","gun"};
        board(character,word,4);
}
void board(char (*p)[4],char (*w)[4],int col)
{
        char search[4][4];
        int i,j,l=0,k=0,m;
        for(i=0;i<4;i++)
        {
                for(j=0;j<4;j++)
                {
                        if(p[i][j]==w[l][k])
                        {
                                for(m=0;m<4;m++)
                                {
                                        if(w[l][k+1]==(p[i][j+4] | p[i][j+1] | p[i][j-1] | p[i][j-4]))
                                        {


                                           search=malloc(sizeof(char));


                                    }
                                }
                                l++;
                        }
                }
        }
        for(i=0;i<6;i++)
        {
                printf("%s",search[i]);
        }
}


#include<stdio.h>
#include<stdlib.h>
#include<string.h>


void board(char (*p)[4],char (*w)[4],int col);
int main()
```

```
{
    char character[4][4]={{'s','i','s','a'},{'m','g','u','n'},{'o','n','m','d'},{'m','l','i','p'}};
    char word[6][4]={"sign","mom","sum","lip","and","gun"};
    board(character,word,4);
}
void board(char (*p)[4],char (*w)[4],int col)
{
    char search[4][4];
    int i,j,l=0,k=0,m;
    for(i=0;i<4;i++)
    {
        for(j=0;j<4;j++)
        {
            if(p[i][j]==w[l][k])
            {
                for(m=0;m<4;m++)
                {
                    if(w[l][k+1]==(p[i][j+4] | p[i][j+1] | p[i][j-1] | p[i][j-4]))
                    {


                      search=malloc(sizeof(char));


                  }
                }
                l++;
            }
        }
    }
    for(i=0;i<6;i++)
    {
        printf("%s",search[i]);
    }
}
```

11/01/24

https://sysprog21.github.io/lkmpg/

```
#include<linux/kernel.h>
#include<linux/init.h>
#include<linux/module.h>
```

```
MODULE_LICENSE("GPL");
static int a[7];
static int count;


module_param_array(a,int,&count,0000);


static int peak_init(void)
{
	int i,j,peak;
	for(i=0;i<6;i++)
	{
		peak=a[i];
		for(j=0;j<2;j++)
		{
			if(a[i+j]>peak)
			{
				printk(KERN_INFO "%d,",a[i+j]);
			}
		}
	}
	printk(KERN_INFO "got %d argument for myintarray.\n",count);
	printk(KERN_INFO "\n");
	return 0;
}
static void peak_exit(void)
{
	printk(KERN_INFO "its done\n");
}


module_init(peak_init);
module_exit(peak_exit);
```

31/01/2024

https://www.youtube.com/watch?v=71LpbmZyzKY

https://github.com/joshnh/Git-Commands

for ssh keys in gerrit use these two commands

```
ssh-keygen -t rsa

cat ~/.ssh/id_rsa.pub
```

06/02/2024

To check ubuntu version on terminal:--------------------lsb_release -r

or

cat /etc/os-release

07/02/2024

for AOSP images understanding

https://source.android.com/docs/core/tests/vts/gsi

09/02/2024

```
pavankumar@Pavan:~/gerrit_code/PTG_RACE_YP$ git fetch -p
remote: Counting objects: 772939, done
remote: Finding sources: 100% (21/21)
remote: Total 21 (delta 0), reused 21 (delta 0)
Unpacking objects: 100% (21/21), 9.67 KiB | 2.42 MiB/s, done.
From ssh://gerrit.rampgroup.com:29418/PTG_RACE_YP
   cb7e600908..f4789def06  matter_dev   -> origin/matter_dev
 * [new branch]            jenkins      -> origin/jenkins
 * [new branch]            test_jenkins -> origin/test_jenkins
pavankumar@Pavan:~/gerrit_code/PTG_RACE_YP$   git pull origin matter_dev
From ssh://gerrit.rampgroup.com:29418/PTG_RACE_YP
 * branch                  matter_dev -> FETCH_HEAD
Updating cb7e600908..f4789def06
error: Your local changes to the following files would be overwritten by merge:
        packages/apps/Diagnostic/res/layout/activity_main.xml
Please commit your changes or stash them before you merge.
Aborting
```

14/02/2024

https://www.google.com/search?q=what+is+difference+for+kernel+in+andriod+and+linux&client=ubuntu&hs=ODs&sca_esv=sca_esv_fallback&sca_upv=1&channel=fs&sxsrf=ACQVn09nqdtX0RRI6w6Re5U79IFq4OcAoQ%3A1707891013026&ei=RVnMZY2YAcWI4-EP3qyIyAM&ved=0ahUKEwjNzpXplaqEAxVFxDgGHV4WAjkQ4dUDCBE&oq=what+is+difference+for+kernel+in+andriod+and+linux&gs_lp=Egxnd3Mtd2l6LXNlcnAiMndoYXQgaXMgZGlmZmVyZW5jZSBmb3Iga2VybmVsIGluIGFuZHJpb2QgYW5kIGxpbnV4MgoQIRgKGKABGMMEMgoQIRgKGKABGMMEMgQQIRgKSNMVUABYyAdwAHgBkAEAmAHGAaAB8wKqAQMwLjK4AQzIAQD4AQHiAwQYACBB&sclient=gws-wiz-serp

The full form of LINUX is **Lovable Intellect Not Using XP**.

15/02/24---------task on kernel logs
about shell scripting
https://www.geeksforgeeks.org/introduction-linux-shell-shell-scripting/#what-is-kernel

to enable data
```
adb shell svc data enable
```
to enable wifi
```
adb shell svc wifi enable
```

```
adb shell am start -a android.media.action.IMAGE_CAPTURE
```

```
adb shell am start -a android.media.action.VIDEO_CAPTURE
```

```
adb shell screencap -p /sdcard/screenshot.png
```

19/02/2024

to find out bug

https://www.kernel.org/doc/html/v5.5/admin-guide/bug-hunting.html

https://www.xda-developers.com/how-to-take-logs-android/

20/02/2024

for pr_debug function it need kernel permissions so by adding below

```
CFLAGS_filename.o := -DDEBUG
```

we get log messages of pr_debug() message

23/02/2024

/gerrit_code/PTG_RACE_YP/out/target/product/AGN_H164YO_MT8788R/obj/KERNEL_OBJ/drivers/input/touchscreen/mediatek/ATMEL

in above path touch_ptg driver path is created

to cross compile------------https://suchprogramming.com/cross-compiling-c-code-for-arm/

to find sim present or not in device--------------adb shell getprop

```
adb shell getprop gsm.operator.orig.alpha
```

to check bluetooth driver present or not-------------------adb shell ls sys/module/ | grep bluetooth

26/02/2024

```
adb shell settings put global euicc_provisioned 1
```

can related commads-----------

```
adb logcat
adb shell logcat > can.txt
adb shell dmesg -w > can.txt
```

```
adb shell dmesg -w | grep -i "mcp"
```

27/02/2024

The system() function is used **to invoke an operating system command from a C/C++ program**.

```
#include <stdio.h>
#include <stdlib.h>


int main() {

    char adb_command[] = "adb shell svc wifi enable";

    int result = system(adb_command);



    if (result == 0) {
        printf("WiFi enabled successfully.\n");
    } else {
        printf("Failed to enable WiFi.\n");
    }


    return 0;
```

28/02/2024

https://www.iloveimg.com/download/Acjnp4mnAb9xk328cAr58c34r50rrw0dmt9mxpw477lx4p343v5mvn170tpbrm5dc3p45jdws8fn6sx3lwv5p75fv1nAwmvbj4qw2t5ppybdkhd078h3whk8vb1cctg2d724cfmlh50sqy0xy9yvrhAn8zrdl9bw7xnhzhlp0hgmAz45frgq/7

05/03/2024

`sudo apt-get install libtool`-------------for can utils

06/03/2024

to apply all adb diff changes at a time we can use command ----------- git apply patch_name

for arduino software downloading steps:

1.wget -c https://downloads.arduino.cc/arduino-1.8.19-linux64.tar.xz
2.tar -xf arduino-1.8.19-linux64.tar.xz

```
3.cd arduino-1.8.19
4.sudo ./install.sh
5.arduino
```

07/03/2024

gyroscope path--------/gerrit_code/PTG_RACE_YP/kernel-4.14/Documentation/devicetree/bindings/iio$

```
msensor@0c {
		i2c_num = <1>;
		i2c_addr = <0xc 0 0 0>;
		direction = <1>;
		power_id = <0xffff>;
		power_vol = <0>;
		firlen = <16>;
		is_batch_supported = <0>;
	};
```

&i2c1

temperature setpoint finding paths

/gerrit_code/PTG_RACE_YP/kernel-4.14/Documentation/devicetree/bindings/thermal/thermal.txt

```
		/* sw jeita */
		jeita_temp_above_t4_cv = <4240000>;
		jeita_temp_t3_to_t4_cv = <4240000>;
		jeita_temp_t2_to_t3_cv = <4340000>;
		jeita_temp_t1_to_t2_cv = <4240000>;
		jeita_temp_t0_to_t1_cv = <4040000>;
		jeita_temp_below_t0_cv = <4040000>;
		temp_t4_thres = <50>;
		temp_t4_thres_minus_x_degree = <47>;
		temp_t3_thres = <45>;
		temp_t3_thres_minus_x_degree = <39>;
		temp_t2_thres = <10>;
		temp_t2_thres_plus_x_degree = <16>;
		temp_t1_thres = <0>;
		temp_t1_thres_plus_x_degree = <6>;
		temp_t0_thres = <0>;
		temp_t0_thres_plus_x_degree = <0>;
		temp_neg_10_thres = <0>;
```

```
/* battery temperature protection */
enable_min_charge_temp;
min_charge_temp = <0>;
min_charge_temp_plus_x_degree = <6>;
max_charge_temp = <50>;
max_charge_temp_minus_x_degree = <47>;
```

/gerrit_code/PTG_RACE_YP/kernel-4.14/arch/arm64/boot/dts/mediatek/AGN_H164YO_MT8788R/mt6771.dts

PTG_RACE_YP/kernel-4.14/Documentation/thermal/x86_pkg_temperature_thermal

Documentation/thermal/sysfs-api.txt

PTG_RACE_YP/external/perfetto/src/traced/probes/ftrace/test/data/android_walleye_OPM5.171019.017.A1_4.4.88/events/thermal/thermal_temperature/format

PTG_RACE_YP/external/chromium-trace/catapult/devil/devil/android/cpu_temperature.py

PTG_RACE_YP/packages/apps/Car/Hvac/src/com/android/car/hvac/ui/TemperatureBarOverlay.java

```
private int getTemperatureColor(int temperature) {
        if (temperature >= 78) {
            return mTempColor1;
        } else if (temperature >= 74 && temperature < 78) {
            return mTempColor2;
        } else if (temperature >= 70 && temperature < 74) {
            return mTempColor3;
        } else if (temperature >= 66 && temperature < 70) {
            return mTempColor4;
        } else {
            return mTempColor5;
        }
    }
```

```
cd /sys/class/thermal/thermal_zone1
```

to check temperature in terminal command-------------

acpi -t

lrwxrwxrwx ----------------------l means Linux file

12/03/2024

To find a variable size without using sizeof() operator-------

```
#include<stdio.h>
int main()
{
	int var;
	printf("%d\n",(char*)(&var+1)-(char*)(&var));
}
```

15/03/2024

https://www.javatpoint.com/can-protocol

https://www.circuitbasics.com/basics-of-the-spi-communication-protocol/

https://www.circuitbasics.com/basics-of-the-i2c-communication-protocol/

19/03/2024

https://www.javatpoint.com/cpp-tutorial

nm command for storage of file

20/03/2024

Drivers using in YP_code for matter

-->first we have to go through dts file to find exact drivers which are integrated in our device then find the file related to it and check whether the compatible string is matched or not.

Touch driver-----------

kernel-4.14/drivers/input/touchscreen/mediatek/ATMEL/atmel_maxtouch.c

can driver-----

gerrit_code/PTG_RACE_YP/kernel-4.14/drivers/net/can/spi

display_driver----------

kernel-4.14/drivers/misc/LT8912B/i2c_driver.c

22/03/2024

```
#include <stdio.h>


int main() {
   // Write C code here

   int a[3]={[0]=3,[2]=4};
   printf("%d",a[1]);



  return 0;
}
```

- uname -r   -------linux version
- uname -n --------user

ls -aR   -------------------display all the files including hidden files

hostname -I --------------------- 172.11.7.235

https://www.sanfoundry.com/technical-interview-questions/

What is the default maximum number of processes that can exist in Linux?

Ans) 32768

What is sysfs?
a) it is a virtual filesystem
b) users use it to get the information about the running kernel
c) it is used for exporting kernel objects.
d) all of the mentioned

Answer: d

can driver ---------------

kernel-4.14/drivers/net/can/spi/mcp25xxfd/mcp25xx_base.c

https://profile.iiita.ac.in/bibhas.ghoshal/lab_files/System%20calls%20for%20files%20and%20directories%20in%20Linux.html

above link for linux system calls

27/03/2024

/vendor/mediatek/proprietary/external/libnvram/nvram_daemon/nvram_wifi.c

commented

/vendor/mediatek/proprietary/custom
AGN_H164YO_MT8788R/cgen/inc/Custom_NvRam_LID.h

```
grep -r "AP_CFG_RDEB_WIFI_CUSTOM_LID" proprietary
```

in above to grep a string in a directory

proprietary/external/nvram/libcustom_nvram/CFG_file_info.c

02/04/2024

check addresses in serial port while sending data from device to arduino

```
// demo: CAN-BUS Shield, send data
// loovee@seeed.cc


#include <SPI.h>
#define CAN_2515


// #define CAN_2518FD
// Set SPI CS Pin according to your hardware


#if defined(SEEED_WIO_TERMINAL) && defined(CAN_2518FD)
// For Wio Terminal w/ MCP2518FD RPi Hat：
// Channel 0 SPI_CS Pin: BCM 8
// Channel 1 SPI_CS Pin: BCM 7
// Interupt Pin: BCM25
const int SPI_CS_PIN  = BCM8;
const int CAN_INT_PIN = BCM25;
#else


// For Arduino MCP2515 Hat:
// the cs pin of the version after v1.1 is default to D9
// v0.9b and v1.0 is default D10
const int SPI_CS_PIN = 10;
const int CAN_INT_PIN = 2;
#endif
```

```
#ifdef CAN_2518FD
#include "mcp2518fd_can.h"
mcp2518fd CAN(SPI_CS_PIN); // Set CS pin
#endif


#ifdef CAN_2515
#include "mcp2515_can.h"
mcp2515_can CAN(SPI_CS_PIN); // Set CS pin
#endif


void setup()
{
    SERIAL_PORT_MONITOR.begin(115200);
    while(!Serial){};
    while (CAN_OK != CAN.begin(CAN_500KBPS))// init can bus : baudrate = 500k
    SERIAL_PORT_MONITOR.println("CAN init ok!");
}


unsigned char park_to_lock[8]= {0, 0, 0x01, 0, 0x01, 0x20, 0, 0x91};      //Park to Lock
unsigned char lock_to_park[8]= {0, 0, 0x01, 0, 0x01, 0x20, 0, 0x92};           //Lock to Park
unsigned char vehicle_mode_ride[8]= {0, 0, 0, 0, 0, 0, 0, 0x03};
unsigned char vehicle_mode_charging[8]= {0, 0, 0, 0, 0, 0, 0, 0x15};
unsigned char park_mode[8]= {0, 0, 0, 0, 0, 0, 0, 0x12};
unsigned char lock_mode[8]= {0, 0, 0, 0, 0, 0, 0, 0x11};
unsigned char Battery_10[8]= {0xA, 0, 0, 0, 0, 0, 0, 0};
unsigned char Battery_20[8]= {0x14, 0, 0, 0, 0, 0, 0, 0};
unsigned char Battery_40[8]= {0x28, 0, 0, 0, 0, 0, 0, 0};
int speed=0;
unsigned char actual_speed[8]= {0, 0, 0, 0, 0, 0, 0, 0};
    int sum = 0;
    int count;
void loop()
{
    //     if (count % 2 == 0) {
  //  CAN.sendMsgBuf(0x350, 0, 8, park_to_lock);
    //     SERIAL_PORT_MONITOR.println("CAN BUS str1 ok!");

    //       delay(10000);
    //     } else {
    //CAN.sendMsgBuf(0x350, 0, 8, lock_to_park);
    // SERIAL_PORT_MONITOR.println("CAN BUS str2 ok!");
      //     delay(10000);
    //    }
    // //    else {
     /* if(speed>150){
           speed=0;
        }
        speed+=1;
        actual_speed[2]=speed<<8;
        actual_speed[3]=speed;*/
   //CAN.sendMsgBuf(0x350, 0, 8, vehicle_mode_ride);

    //delay(4000);
   CAN.sendMsgBuf(0x350, 0, 8, vehicle_mode_charging);
    delay(1000);
    CAN.sendMsgBuf(0x306, 0, 8, Battery_10);
    delay(1000);
    CAN.sendMsgBuf(0x306, 0, 8, Battery_20);
    delay(1000);
  //CAN.sendMsgBuf(0x350, 0, 8, park_mode);
  //delay(4000);
   // CAN.sendMsgBuf(0x350, 0, 8, lock_mode);
    //delay(1000);
   //CAN.sendMsgBuf(0x306, 0, 8, Battery_40);
    // CAN.sendMsgBuf(0x399, 0, 8, actual_speed);


    SERIAL_PORT_MONITOR.println("CAN BUS str2 ok!");
        // }
        // count++;

      //  delay(100);
}
// END FILE
```

This Arduino sketch demonstrates how to use a CAN-BUS Shield to send various messages over a CAN bus. Below is an explanation of the code:

1. The code begins with including necessary libraries, defining constants, and setting up the SPI communication.
2. In the setup() function:
    - Serial communication is initiated.
    - The CAN bus is initialized with a baud rate of 500 kbps.
3. Several arrays are defined to store different types of messages to be sent over the CAN bus:
    - park_to_lock: Message to command "Park to Lock".
    - lock_to_park: Message to command "Lock to Park".
    - vehicle_mode_ride: Message indicating vehicle mode as "ride".
    - vehicle_mode_charging: Message indicating vehicle mode as "charging".

- park_mode: Message indicating park mode.
- lock_mode: Message indicating lock mode.
- Battery_10, Battery_20, Battery_40: Messages indicating different battery levels.

4. In the loop() function:
    - Messages are sent over the CAN bus at specific intervals using the CAN.sendMsgBuf() function.
    - vehicle_mode_charging message is sent to indicate the vehicle is in charging mode.
    - Battery level messages (Battery_10, Battery_20, Battery_40) are sent sequentially with delays of 1 second between each transmission.
    - Additional messages like park_mode, lock_mode, and actual speed messages (actual_speed) are commented out, indicating they are not currently being used.
    - Serial messages are also printed to indicate the progress of message transmission.
5. The code includes some commented-out code blocks, indicating alternative functionalities like switching between different messages or incrementing a speed value. These blocks are not currently used in the loop.
6. The delay() function is used to introduce delays between message transmissions.
7. The code is commented for better understanding of each section.

03/04/2024

Types of CANoe

There are two main types:

1. **CAN Base Frame (CAN 2.0A):** Uses an 11-bit identifier and can handle up to 2048 different messages.
2. **CAN Extended Frame (CAN 2.0B):** Uses a 29-bit identifier, offering more message IDs, which is vital for complex systems.

To copy only images other than directories command:------

cp out/target/product/AGN_H164YO_MT8788R/* images/

here what present in out/target/product/AGN_H164YO_MT8788R directory files copying into images

08/04/2024

```
//structure with a pointer
typedef struct
{
  char age;
  char gender;
  char *name;
} pointer_member;
```

```
pointer_member member =
{
  .age = 28,
  .gender = 'M',
};

member.name = (char *) malloc( sizeof(char) * strlen("David") );
strcpy(member.name, "David");

free(member.name);
```

15/04/2024

https://www.instructables.com/Yes-We-CAN-BUS-With-Arduino-in-30-Seconds/

https://en.wikipedia.org/wiki/CAN_bus

https://wiki.seeedstudio.com/CAN-BUS_Shield_V1.2/

25/04/2025

FYI --- For Your Information

```
ssh-keygen
pavankumar@Pavan:~$ cd .ssh
pavankumar@Pavan:~/.ssh$ cat id_rsa.pub
```

25/04/2024

The "^M" you're seeing in the code snippet is a representation of a carriage return character followed by a newline character (CR LF). It's a way that some text editors or systems represent line breaks. These characters are part of the C standard for line endings in text files on some systems, particularly older ones like Windows.

In Unix-based systems (like Linux and macOS), the convention is to only use the newline character (LF) for line endings. However, in Windows, the convention is to use both carriage return (CR) and newline (LF) characters for line endings.

The "^M" you see is a representation of the carriage return character (CR), which is not normally visible but can sometimes appear when viewing files created on Windows systems in text editors on Unix-based systems.

If you want to remove these characters, you can do so using various text editing tools or commands, such as `dos2unix` on Unix-based systems or find-and-replace functionalities in text editors like Notepad++.

Commands to pull recent build into our YP code:

```
git fetch -p
git pull origin matter_dev
```

Code::Blocks compiler

https://wiki.seeedstudio.com/CAN-BUS_Shield_V1.2/#apis

30/04/2024

WeCAN (Wireless Energy Control Area Network)

02/05/2024

I have started adding a sample driver into kernel statically by following the steps regarding to it and compiled successfully today I will go through dynamical adding of driver.

03/06/2024

Which sensor is used to measure weight?

A load cell is essentially a force transducer or force sensor. It is used principally to measure weight

21/05/2024

about EC200U and how it will works and what commands are used

how to flash code to esp32 using ft232rl

how EC200U will works

https://www.youtube.com/watch?v=bis6-O4QXpU

https://www.youtube.com/watch?v=zt0reg9aygc

HOW TO SEND MESSAGE/MAKE CALL USING GSM AND ARDUINO

LORA to esp32 communication

EC200U ------The module integrates various features such as TCP/IP stack, AT commands interface, digital audio, USB, UART, GPIO, and more, simplifying the development process and enabling easy integration into IoT devices.

FT232RL-----The FT232RL is a popular USB-to-serial UART interface chip made by Future Technology Devices International (FTDI). It's commonly used to add USB functionality to microcontroller-based projects or to interface with devices that communicate over serial protocols. It provides an easy way to connect microcontrollers or other serial devices to a computer via USB, allowing for serial communication without the need for a dedicated serial port on the computer. The FT232RL is widely used in hobbyist electronics, prototyping, and various industrial applications.

ESP32-----The ESP32 is a powerful microcontroller chip developed by Espressif Systems. It is part of the ESP family of chips, which are known for their low cost, low power consumption, and built-in Wi-Fi and Bluetooth capabilities. The ESP32 builds upon the success of its predecessor, the ESP8266, with added features, increased processing power, and improved performance.

Key features of the ESP32 include:

1. Wi-Fi and Bluetooth connectivity: The ESP32 comes with built-in Wi-Fi and Bluetooth capabilities, making it easy to connect to wireless networks and communicate with other devices.
2. Integrated development environment (IDE) support: The ESP32 can be programmed using various development environments, including the Arduino IDE, Espressif's official ESP-IDF (IoT Development Framework), and platforms like MicroPython and ESP32-IDF.

22/05/2024

sd card partition:-------------

```
lsblk
```

```
sudo fdisk -l
```

```
$df -h
```

```
Command (m for help): m


Help:


  DOS (MBR)
   a   toggle a bootable flag
   b   edit nested BSD disklabel
   c   toggle the dos compatibility flag


  Generic
   d   delete a partition
   F   list free unpartitioned space
   l   list known partition types
   n   add a new partition
   p   print the partition table
   t   change a partition type
   v   verify the partition table
   i   print information about a partition
  Misc
   m   print this menu
   u   change display/entry units
   x   extra functionality (experts only)


  Script
   I   load disk layout from sfdisk script file
   O   dump disk layout to sfdisk script file


  Save & Exit
   w   write table to disk and exit
   q   quit without saving changes


  Create a new label
   g   create a new empty GPT partition table
   G   create a new empty SGI (IRIX) partition table
   o   create a new empty DOS partition table
   s   create a new empty Sun partition table
```

```
sudo fdisk /dev/sdb
```

```
Command (m for help): m
```

```
Command (m for help): p
```

```
Command (m for help): d
Partition number (1,2, default 2): 1
```

```
Command (m for help): d
Selected partition 2
```

```
Command (m for help): p
```

```
Command (m for help): n
```

```
Select (default p): p
Partition number (1-4, default 1): 1


Command (m for help): a


Command (m for help): p


Command (m for help): t


Changed type of partition 'Linux' to 'W95 FAT32 (LBA)'.


Command (m for help): p


Command (m for help): w
```

esp32---connected to gps

lora   ----connected to bluetooth

ft232rl

esp-12E

23/05/2024

about lora to lora communication

https://www.youtube.com/watch?v=jp_2gwBrQc8

https://www.youtube.com/watch?v=jnvik7sUosw

https://www.youtube.com/watch?v=rTXIinShVpI

24/05/2024

About servo motor

A servo motor is a rotary actuator that allows for precise control of angular position, velocity, and acceleration. It consists of a motor coupled with a feedback sensor that provides information about the motor's current position. This feedback allows the servo motor to adjust its position accurately in response to commands from a controller. Servo motors are widely used in various applications such as robotics, automation, CNC machinery, and remote-controlled vehicles, where precise control of movement is required.

andriod automotive os

https://www.youtube.com/watch?v=nNfX4sA2y4o

https://source.android.com/docs/automotive/feature-control

28/05/2024

```
cp arch/arm/boot/zImage /media/pavankumar/boot/
cp arch/arm/boot/dts/imx6dl-sabresd.dtb /media/pavankumar/boot/
```

https://community.nxp.com/t5/i-MX-Processors-Knowledge-Base/Installing-Ubuntu-Rootfs-on-NXP-i-MX6-boards/ta-p/1108497

change uart pins:

imx6/linux-fslc/arch/arm/boot/dts/imx6qdl-sabresd.dtsi

```
pinctrl_usdhc3: usdhc3grp {
                fsl,pins = <
                        MX6QDL_PAD_SD3_CMD__SD3_CMD             0x17059
                        MX6QDL_PAD_SD3_CLK__SD3_CLK             0x10059
                        MX6QDL_PAD_SD3_DAT0__SD3_DATA0          0x17059
                        MX6QDL_PAD_SD3_DAT1__SD3_DATA1          0x17059
                        MX6QDL_PAD_SD3_DAT2__SD3_DATA2          0x17059
                        MX6QDL_PAD_SD3_DAT3__SD3_DATA3          0x17059
                        //MX6QDL_PAD_SD3_DAT4__SD3_DATA4        0x17059
                        //MX6QDL_PAD_SD3_DAT5__SD3_DATA5        0x17059
                        //MX6QDL_PAD_SD3_DAT6__SD3_DATA6        0x17059
                        //MX6QDL_PAD_SD3_DAT7__SD3_DATA7        0x17059
>;
        };
```

here we have to comment 4 lines because

Note :- here comment SD3_DAT6 and SD3_DAT7 pins elesewhere used. Because in Sabresd board these pins are used for SDCard (**8 bit mode**) but in kiwi board we are using SDCard pins as (SD3_DAT0 to SD3_DAT3) i.e. **4 bit mode only**.

```
inctrl_uart1: uart1grp {
                fsl,pins = <
                        MX6QDL_PAD_SD3_DAT7__UART1_TX_DATA      0x1b0b1
                        MX6QDL_PAD_SD3_DAT6__UART1_RX_DATA      0x1b0b1
>;
        };
```

here we have to replace SD3_DAT7 & SD3_DAT6 in place of SD3_DAT10 & SD3_DAT11

```
uboot >  mmc list     //This command will show us mmc list

uboot >  mmc dev 0   //It will switch to mmc 0

uboot > fatls mmc 0:1   //It will show all files on mmc0 partition1 (if it is fat formated)

 --->>>   0(device number):1(partition number)

uboot > fatls mmc 0:2  //It will show all files on mmc0 partiition 2 (if it is fat formated)

uboot > ext2ls mmc 0:1   //It will show all files on mmc0 partition1 (if it is ext2/3/4 formated)

uboot > ext2ls mmc 0:2 //It will show all files on mmc0 partiition 2 (if it is ext2/3/4 formated)
```

```
-rw-r--r-- 1 pavankumar pavankumar   39671 May 28 13:09 imx6dl-sabresd.dtb
```

```
sudo apt install gcc-arm-linux-gnueabihf g++-arm-linux-gnueabihf
```

for linux-fslc

For cross compiling:--------

```
i) cd linux-fslc-5.10.x-fslc

ii) sudo apt update

iii) sudo apt upgrade

sudo apt-get install gcc-arm-linux-gnueabihf=4:9.3.0-1ubuntu2
iv) sudo apt install libc6-armel-cross libc6-dev-armel-cross binutils-arm-linux-gnueabi libncurses5-dev build-essential bison flex libssl-dev bc

v) sudo apt install gcc-arm-linux-gnueabihf g++-arm-linux-gnueabihf
vi) export ARCH=arm

vii)arm

viii) export CROSS_COMPILE=arm-linux-gnueabihf

ix) make imx_v6_v7_defconfig

x) make zImage dtbs  modules
```

You can add the cross-compiler directory to your PATH temporarily by running a command like this:export **PATH=$PATH:/path/to/arm-cross-compiler/bin**
Replace '/path/to/arm-cross-compiler/bin' with the actual path to your cross-compiler binaries directory.

30/05/2024

https://programmersought.com/article/86163814229/

for hidl and aidl service creation

For copying modules and hearders into root partition:

```
sudo make modules_install firmware_install INSTALL_MOD_PATH=/media/pavankumar/root
sudo make headers_install INSTALL_HDR_PATH=/media/pavankumar/root
```

Boot switches Position on Gateway Board (imx)---

For dumping images in Emmc :-

6 5 4 3 2 1 (here one white dot is mark near pin 1 and sw1 is written)

on --- on --- off --- on ---- off ---- on

on -- means move switch to position on (on is written on the sw1 switch).

For Booting images in Emmc :-

6 5 4 3 2 1 (here one white dot is mark near pin 1 and sw1 is written)

on --- on --- off --- on ---- on ---- off

on -- means move switch to position on (on is written on the sw1 switch).

For booting from SD card on Gateway board --- sw1 switches position should be as below --

6 5 4 3 2 1 (here one white dot is mark near pin 1 and sw1 is written)

off --- on --- on --- off --- on ---- off

on -- means move switch to position on (on is written on the sw1 switch).

linux-fslc-5.10.x-fslc/arm/boot/dts/imx6dl-pinfunc.h

```
#define MX6QDL_PAD_CSI0_DAT10__IPU1_CSI0_DATA10     0x04c 0x360 0x000 0x0 0x0
#define MX6QDL_PAD_CSI0_DAT10__AUD3_RXC             0x04c 0x360 0x000 0x1 0x0
#define MX6QDL_PAD_CSI0_DAT10__ECSPI2_MISO          0x04c 0x360 0x7f8 0x2 0x0
#define MX6QDL_PAD_CSI0_DAT10__UART1_TX_DATA        0x04c 0x360 0x000 0x3 0x0
#define MX6QDL_PAD_CSI0_DAT10__UART1_RX_DATA        0x04c 0x360 0x8fc 0x3 0x0
```

In above (.h) file define explains ------

MX6QDL is board name

PAD_CSI0 is pad name(here pad nothing but pinsel as lpc2148)

DAT10 is pin number

IPU1_CSI0_DATA10, AUD3_RXC, ECSPI2_MISO----are functionalities for pad0 pin10

06/06/2024

Also changed in menuconfig -> General setup -> Kernel compression mode -> LZO to LZ4

```
iv) [ ] Enable loadable module support  ----
 v) │ │    [ ] Enable the block layer  ----
  vi) [ ] Networking support  ----
```

In imx6qdl-sabresd.dtsi commented

i) touchscreen driver

ii) light-sensor

iii) sound

iv) accelerometer

v) magnetometer

vi) egalax_ts@4

In imx_v6_v7_defconfig

```
#CONFIG_INPUT_TOUCHSCREEN=y
#CONFIG_TOUCHSCREEN_ADS7846=y
```

```
#CONFIG_TOUCHSCREEN_AD7879=y
#CONFIG_TOUCHSCREEN_AD7879_I2C=y
#CONFIG_TOUCHSCREEN_ATMEL_MXT=y
#CONFIG_TOUCHSCREEN_DA9052=y
#CONFIG_TOUCHSCREEN_EGALAX=y
#CONFIG_TOUCHSCREEN_GOODIX=y
#CONFIG_TOUCHSCREEN_ILI210X=y
#CONFIG_TOUCHSCREEN_MAX11801=y
#CONFIG_TOUCHSCREEN_IMX6UL_TSC=y
#CONFIG_TOUCHSCREEN_EDT_FT5X06=y
#CONFIG_TOUCHSCREEN_MC13783=y
#CONFIG_TOUCHSCREEN_TSC2004=y
#CONFIG_TOUCHSCREEN_TSC2007=y
#CONFIG_TOUCHSCREEN_STMPE=y
#CONFIG_TOUCHSCREEN_SX8654=y
#CONFIG_TOUCHSCREEN_COLIBRI_VF50=y


#CONFIG_VIDEO_MUX=y

#CONFIG_VIDEO_CODA=m
#CONFIG_VIDEO_IMX_PXP=y

#CONFIG_MEDIA_CAMERA_SUPPORT=y
#CONFIG_MEDIA_CONTROLLER=y
#CONFIG_VIDEO_V4L2_SUBDEV_API=y
#CONFIG_MEDIA_USB_SUPPORT=y
#CONFIG_USB_VIDEO_CLASS=m

#CONFIG_MEDIA_CAMERA_SUPPORT=y

#CONFIG_VIDEO_ADV7180=m
#CONFIG_VIDEO_OV2680=m
#CONFIG_VIDEO_OV5640=m
#CONFIG_VIDEO_OV5645=m


#CONFIG_LCD_CLASS_DEVICE=y
#CONFIG_LCD_L4F00242T03=y
#CONFIG_LCD_PLATFORM=y


#CONFIG_CAN_MCP251X=y


#CONFIG_USB=y
#CONFIG_USB_ANNOUNCE_NEW_DEVICES=y
#CONFIG_USB_EHCI_HCD=y
```

```
#CONFIG_USB_EHCI_MXC=y
#CONFIG_USB_ACM=m
#CONFIG_USB_STORAGE=y
#CONFIG_USB_CHIPIDEA=y
#CONFIG_USB_CHIPIDEA_UDC=y
#CONFIG_USB_CHIPIDEA_HOST=y
#CONFIG_USB_SERIAL=m
#CONFIG_USB_SERIAL_GENERIC=y
#CONFIG_USB_SERIAL_FTDI_SIO=m
#CONFIG_USB_SERIAL_OPTION=m
#CONFIG_USB_TEST=m
#CONFIG_USB_EHSET_TEST_FIXTURE=m
#CONFIG_NOP_USB_XCEIV=y
#CONFIG_USB_MXS_PHY=y
#CONFIG_USB_GADGET=y
#CONFIG_USB_FSL_USB2=y
#CONFIG_USB_CONFIGFS=y
#CONFIG_USB_CONFIGFS_SERIAL=y
#CONFIG_USB_CONFIGFS_ACM=y
#CONFIG_USB_CONFIGFS_OBEX=y
#CONFIG_USB_CONFIGFS_NCM=y
#CONFIG_USB_CONFIGFS_ECM=y
#CONFIG_USB_CONFIGFS_ECM_SUBSET=y
#CONFIG_USB_CONFIGFS_RNDIS=y
#CONFIG_USB_CONFIGFS_EEM=y
#CONFIG_USB_CONFIGFS_MASS_STORAGE=y
#CONFIG_USB_CONFIGFS_F_LB_SS=y
#CONFIG_USB_CONFIGFS_F_FS=y
#CONFIG_USB_CONFIGFS_F_UAC1=y
#CONFIG_USB_CONFIGFS_F_UAC2=y
#CONFIG_USB_CONFIGFS_F_MIDI=y
#CONFIG_USB_CONFIGFS_F_HID=y
#CONFIG_USB_CONFIGFS_F_UVC=y
#CONFIG_USB_CONFIGFS_F_PRINTER=y
#CONFIG_USB_ZERO=m
#CONFIG_USB_AUDIO=m
#CONFIG_USB_ETH=m
#CONFIG_USB_G_NCM=m
#CONFIG_USB_GADGETFS=m
#CONFIG_USB_FUNCTIONFS=m
#CONFIG_USB_MASS_STORAGE=m
#CONFIG_USB_G_SERIAL=m


#CONFIG_CAN=y
#CONFIG_CAN_FLEXCAN=y
```

```
#CONFIG_BT=y
#CONFIG_BT_BNEP=m
#CONFIG_BT_HCIUART=y
#CONFIG_BT_HCIUART_LL=y
```

Certainly! Kernel compression techniques such as LZ4 and LZO are used to reduce the size of the kernel image, which can lead to faster boot times and lower memory usage. Here's an explanation of how these compression techniques work:

1. **LZ4 (Lempel-Ziv 4)**:
   - LZ4 is a lossless data compression algorithm known for its fast compression and decompression speeds. It's designed to be extremely fast while still providing reasonable compression ratios.
   - In the context of kernel compression, LZ4 compresses the kernel image during the build process, reducing its size before it's stored on disk or in memory.
   - When the kernel needs to be loaded into memory during boot, it's decompressed on-the-fly by the bootloader or the kernel itself before execution.
   - The key advantage of LZ4 is its speed, both in compression and decompression. This can lead to faster boot times, especially on systems with slower storage devices or limited CPU resources.
2. **LZO (Lempel-Ziv-Oberhumer)**:
   - LZO is another fast compression algorithm known for its speed and low memory usage during decompression.
   - Similar to LZ4, LZO compresses the kernel image during the build process, reducing its size.
   - During boot, the compressed kernel image is decompressed on-the-fly before execution, typically by the bootloader or the kernel itself.
   - LZO offers a good balance between compression ratio and speed, making it suitable for systems where fast boot times are important but with slightly higher compression requirements than LZ4.

In summary, both LZ4 and LZO are kernel compression techniques that reduce the size of the kernel image, leading to faster boot times and lower memory usage. They achieve this by compressing the kernel image during the build process and decompressing it on-the-fly during boot. LZ4 is known for its exceptional speed, while LZO provides a good balance between compression ratio and speed. The choice between them depends on the specific requirements of the system and the desired trade-offs between compression efficiency and decompression speed.

follow this link if apt-get update will not work, we have to add this three lines in /etc/apt/sources.list

through link

```
deb http://ports.ubuntu.com/ubuntu-ports/ $distro main restricted universe multiversedeb
http://ports.ubuntu.com/ubuntu-ports/ $distro-updates main restricted universe
multiversedeb http://ports.ubuntu.com/ubuntu-ports/ $distro-security main restricted
universe multiverse
```

https://community.nxp.com/t5/i-MX-Processors-Knowledge-Base/Installing-Ubuntu-Rootfs-on-NXP-i-MX6-boards/ta-p/1108497#:~:text=1.,own%20Ubuntu%20rootfs%20with%20debootstrap.

07/06/2024

uboot

#CONFIG_BOOTDELAY=0

commented all USB related configs

11/06/2024

#CONFIG_KERNEL_LZO=y
CONFIG_KERNEL_LZ4=y

https://www.baeldung.com/linux/boot-faster

with CONFIG_KERNEL_LZ4=y

Startup finished in 6.427s (kernel) + 16.231s (userspace) = 22.659s

CONFIG_KERNEL_LZO=y

Startup finished in 6.405s (kernel) + 15.887s (userspace) = 22.293s

12/06/2024

https://www.youtube.com/watch?v=68GfQDTjJks

sudo systemctl disable serial-getty@ttymxc0.service

systemctl status serial-getty@ttymxc0.service

systemd-analyze --no-pager critical-chain

```
[19886.06h.28m.08s.343] The time when unit became active or started is printed after the "@" character.
[19886.06h.28m.08s.343] The time the unit took to start is printed after the "+" character.
[19886.06h.28m.08s.343]
[19886.06h.28m.08s.343] multi-user.target @15.828s
[19886.06h.28m.08s.343] `-getty.target @15.792s
[19886.06h.28m.08s.343]   `-serial-getty@ttymxc0.service @15.752s
[19886.06h.28m.08s.343]     `-systemd-user-sessions.service @15.406s +159ms
[19886.06h.28m.08s.343]       `-network.target @15.183s
[19886.06h.28m.08s.343]         `-wpa_supplicant.service @14.675s +456ms
[19886.06h.28m.08s.343]           `-basic.target @5.977s
[19886.06h.28m.08s.343]             `-sockets.target @5.946s
[19886.06h.28m.08s.343]               `-rpcbind.socket @5.908s
[19886.06h.28m.08s.380]                 `-sysinit.target @5.613s
[19886.06h.28m.08s.380]                   `-systemd-udev-trigger.service @2.183s +3.415s
```

```
[19886.06h.28m.08s.380]                   `-systemd-udevd-kernel.socket @1.898s
[19886.06h.28m.08s.380]                     `-system.slice @1.276s
[19886.06h.28m.08s.380]                       `--.slice @1.276s
```

13/06/2024

```
sudo apt-get update
sudo apt-get install chrpath diffstat gawk texinfo
bitbake -k radxa-minimal-image
```

14/06/2024

https://wiki.radxa.com/Yocto-layer-for-radxa-boards

in above yocto project both Dunfell and Zues steps are not working for 20.4 and 22.4 versions

For kernel module programming:

```
sudo apt-get install build-essential linux-headers-`uname -r`
```

https://iq.opengenus.org/types-of-bootloaders/

types of bootloaders

20/06/2024

https://imxdev.gitlab.io/tutorial/How_to_boot_imx_using_ramdisk/

25/06/2024

https://wiki.yoctoproject.org/wiki/Releases

01/07/2024

https://www.youtube.com/watch?v=5SnXJTwIunY&list=PL7UUBavsBdHNxXTa0CRSD0Bc3HMYuyBF-

for qt5 enable in imx8 buildroot:

make menuconfig

i)Target packages->Graphic libraries and applications (graphic/text) --->   [] vulkan-headers

ii)Legacy config options->[ ] qt5quick1 package removed

```
git fetch -p
pavankumar@Pavan:/media/pavankumar/NewVolume/1_pavan/PTG_RACE_YP$ git clean -xfd
Removing .gitignore
Removing Android.bp
Removing Jenkins/
Removing Makefile
Removing agenew/
Removing art/
Removing bionic/
Removing bootable/
Removing bootstrap.bash
Removing build/
pavankumar@Pavan:/media/pavankumar/NewVolume/1_pavan/PTG_RACE_YP$ git reset –hard
```

```
uname -a
```

```
ifconfig -a
```

/home/pavankumar/Downloads/buildroot-2024.02.3/.config - Buildroot 2024.02.3 Configurat→ Target packages → Interpreter languages and scripting → External python modules/python-pyqtrcode

/home/pavankumar/Downloads/buildroot-2024.02.3/.config - Buildroot 2024.02.3 Configurat→ Target packages → Libraries ───

/home/pavankumar/Downloads/buildroot-2024.02.3/.config - Buildroot 2024.02.3 Configurat→ Target packages → Miscellaneous/[*] Google font directory

for adding package to buildroot

https://bootlin.com/~thomas/site/buildroot/adding-packages.html

03/07/2024

```
ps -alx
```

Types of init processes are:--

i) busybox init

ii) systemv init

iii) systemd init(newest working init)

For init:

/etc/init.d

04/07/2024

```
cp  /home/pavankumar/PTG_LDD/*   .
```

here ''.'' indicates present directory

Robotics useful videos:

https://www.youtube.com/watch?v=lVjFhNv2N8o

https://www.youtube.com/watch?v=8P9qVDZIDq8

https://www.youtube.com/watch?v=nThxqbXJVGw

https://www.youtube.com/watch?v=Is50EWYF99I

Robotics arm inverse kinematics perfect and imp videos

https://www.youtube.com/watch?v=Ad5DLd8vrbQ

https://www.youtube.com/watch?v=rJx_XZ8xz6w

https://www.youtube.com/watch?v=gXX-4rrB4tw&list=PLQ3sZ7NCnFlEej8AWH_BfO9W7xlirvK6l&index=1

https://www.youtube.com/watch?v=wDus2EKLg3s

https://www.youtube.com/watch?v=unwUt3kkgvE

https://www.rosroboticslearning.com/inverse-kinematics

https://www.youtube.com/watch?v=t6EGMvL6lE0&list=PLyqSpQzTE6M_XM9cvjLLO_Azt1FkgPhpH&index=14

https://www.youtube.com/watch?v=lVjFhNv2N8o&t=584s

https://www.rosroboticslearning.com/inverse-kinematics

06/07/2024

https://www.youtube.com/watch?v=VeCRh-t9hfM&list=PLNX7fogrcaPLlaHoQMGVMbBE05OyyiQQG&index=8

https://www.youtube.com/watch?v=D93iQVoSScQ&list=PLNX7fogrcaPLlaHoQMGVMbBE05OyyiQQG&index=9

09/07/2024

https://www.youtube.com/watch?v=qanW3u7fe7w&list=PL2idcbvRB1CN0GlPl2ZVlZAjracsYzgNn&index=53

https://www.youtube.com/watch?v=RO_DaYSW_J8

https://www.youtube.com/watch?v=VeCRh-t9hfM&list=PLiKZmh4IhSftTaJgFAdRC_NcMZVNPcTZ2&index=20

https://github.com/IntelRealSense/librealsense/blob/master/wrappers/python/examples/opencv_viewer_example.py

https://trac.gateworks.com/wiki/buildroot/qt

https://www.youtube.com/watch?v=MwEXX6a-TWw&list=PLLSegLrePWgJudpPUof4-nVFHGkB62Izy&index=6

https://labs.dese.iisc.ac.in/embeddedlab/getting-started-with-buildroot/

https://www.youtube.com/watch?v=be-5DPuDtO8

Lidar sensor---is used to measure distance

-->is used to light detection and ranging distance

15/07/2024

2 Release Version

The release version and maintenance cycle corresponding to ROS2 and Ubuntu.

ROS2 version	release date	Maintenance deadline	Ubuntu version
Dashing	2019.5	2021.5	Ubuntu 18.04 (Bionic Beaver)
Eloquent	2019.11	2020.11	Ubuntu 18.04 (Bionic Beaver)
Foxy	2020.6	2023.5	Ubuntu 20.04(Focal Fossa)
Galactic	2021.5	2022.11	Ubuntu 20.04(Focal Fossa)
Humble	2022.5	2027.5	Ubuntu 22.04(Jammy Jellyfish)

16/07/2024

https://www.youtube.com/watch?v=JkjOB8YsJIY

https://www.youtube.com/watch?v=i5Hx4_7l7gU

Python tutorials:--

https://www.tutorialspoint.com/python/python_variables.htm

18/07/2024

runqemu qemux86-64 core-image-minimal

```
source poky/oe-init-build-env
```

```
bitbake core-image-minimal
```

```
runqemu core-image-minimal
```

```
runqemu qemuarm nographic
```

22/07/2024

yocto imx6 useful doc

https://www.nxp.com/docs/en/user-guide/IMX_YOCTO_PROJECT_USERS_GUIDE.pdf

https://www.slideshare.net/slideshow/embedded-multiple-choice-questions/229398565

to copy any file or directory from one pc to other pc

```
scp localfile.txt user@remotehost:/path/to/destination/
```

```
~/yocto_imx6/build/tmp/work-shared/imx6dlsabresd/kernel-source$
```

25/07/2024

```
/yocto_imx6/build/tmp/work/imx6dlsabresd-poky-linux-gnueabi/linux-imx/
5.15.71+gitAUTOINC+50912be386-r0/build
```

linux source code

```
bitbake -c clean core-image-minimal
```

```
./meta-imx/meta-v2x/recipes-kernel/linux
./meta-imx/meta-bsp/recipes-kernel/linux
./meta-imx/meta-cockpit/recipes-kernel/linux
./meta-openembedded/meta-oe/recipes-kernel/linux
./meta-freescale-3rdparty/recipes-kernel/linux
```

To find file name:-----

```
find . -name "filename"
```

05/08/2024

ubuntu user creation

https://www.google.com/search?q=how+create+user+in+ubuntu&client=ubuntu&hs=K3y&sca_esv=c0b955b0d7f1ad2c&channel=fs&biw=1848&bih=968&tbm=vid&sxsrf=ADLYWIL-9P5j4VC2XW_HKQndZtQNC3r4Yw%3A1722852017728&ei=saKwZu6SLMDn2roPkpvwuA4&oq=how+create+user+in+u&gs_lp=Eg1nd3Mtd2l6LXZpZGVvIhRob3cgY3JlYXRlIHVzZXIgaW4gdSoCCAAyBRAAGIAEMgYQABgWGB4yBhAAGBYYHjIGEAAYFhgeMgYQABgWGB4yBhAAGBYYHjIGEAAYFhgeMgYQABgWGB4yBhAAGBYYHjIGEAAYFhgeSO4wUKQFWLMkcAJ4AJABAJgBnwSgAboQqgEJMC42LjIuNS0xuAEDyAEA-AEBmAIJoALBDcICBBAjGCfCAggQABgWGB4YD8ICCxAAGIAEGIYDGIoFwgIIEAAYCBgNGB7CAggQABiABBiiBJgDAIgGAZIHCTIuNS4xLjAuMaAHwVY&sclient=gws-wiz-video#fpstate=ive&vld=cid:ddf774df,vid:YED1zeM8eQY,st:0

https://github.com/nxp-imx/meta-nxp-desktop/blob/lf-5.15.71-2.2.0-kirkstone/README.md

07/08/2024

to open menuconfig in yocto

https://www.youtube.com/watch?v=5BmEig-D2lA

https://www.youtube.com/watch?v=KEyi_m3X3Zc&t=234s

https://www.youtube.com/watch?v=yl_Q91xYTD4

https://www.youtube.com/watch?v=VtXNIy_noWg&list=PL2WlOKghhsn1TTGmz4NvSuS-G1p9dvgrP&index=1

https://variwiki.com/index.php?title=Jailhouse_Guide

08/08/2024

https://software-dl.ti.com/processor-sdk-linux/esd/docs/06_03_00_106/linux/Foundational_Components/Virtualization/Jailhouse.html

https://www.youtube.com/watch?v=-BAmGiVl6kg&list=PLWPirh4EWFpEvXF17ROZgIkV2WRp_WlQq

error logs:

```
/media/mohit/4TB_SSD/Workspace/AM62b-p1/new/tisdk/build/arago-tmp-default-glibc/work/am62xx_evm-oe-linux/linux-my-custom/6.1-r0/temp/log.do_configure.*
```

```
PREFERRED_PROVIDER_virtual/kernel = "linux-my-custom"
```

```
MACHINE=am62xx-evm bitbake linux-my-custom
```

14/08/2024

https://www.youtube.com/watch?v=M27i0H228KE https://youtu.be/6Q8YoNmeLQA

https://wiki.yoctoproject.org/wiki/System_Update

https://mender.io/blog/yocto-and-ota-software-updates

new kernel version in jailhouse hypervisor for am62xx-evm yocto

screenshot shortcut

shift+PrintScrn

https://www.youtube.com/watch?v=M27i0H228KE&t=1048s

https://www.youtube.com/watch?v=5fj05BWryhM&list=PLwqS94HTEwpQmgL1UsSwNk_2tQdzq3eVJ

21/08/2024

https://baylibre.pages.baylibre.com/ti/android/doc/ota.html

File Handing programs in linux:--

1. How do you create and open a file in linux using system calls?

2. How do you read from a file in C?

3. How do you list files in a directory using linux using systemcall?

Using vfork, fork, exec :---

1.Write a program on how to create a child process and kill parent process.

2.Create a program that uses the fork() system call to create a child process. The parent process should print its own PID and PPID, and the child process should print its own PID and PPID.

3.Write a C program that demonstrates the use of wait() and waitpid() to synchronize
the parent and child processes.

4. Difference between fork() and vfork , Demonstrate with sample program.

5. Using exec write a program.

6. Demonstrate Zombie process and Orphan Process.

Mutex, Semaphore and Spinlock

1. Implement a program with multiple threads that can only access a resource a fixed number of times concurrently. Use a semaphore to limit the number of threads accessing the resource simultaneously.

2. Create a program where multiple threads increment a shared counter using a spinlock to ensure mutual exclusion.

3. Write a program where multiple threads increment a shared counter. Use a mutex to ensure that the counter is safely incremented by each thread without race conditions.

https://youtu.be/3x-xwm-mZPM?si=vj3lkMbFxc5n2p0J

https://youtu.be/Mf0CtUXlryc?si=-400oJeJMr699omA

https://www.youtube.com/watch?v=8mfnZjT2UhU

https://software-dl.ti.com/processor-sdk-linux/esd/AM62X/09_00_00_03/exports/docs/linux/Foundational_Components/Hypervisor/Jailhouse.html#running-jailhouse-demos-on-am62x

28/08/2024

To extract .zst file :

```
zstd -d core-image-minimal-imx8qxpmek.wic.zst
```

```
IMAGE_INSTALL += " jailhouse"
DISTRO_FEATURES = " jailhouse"
```

Andriod booting video for TI-AM62

https://www.youtube.com/watch?v=E0EIXdtgoZU

02/09/2024

https://www.ti.com/tool/PROCESSOR-SDK-AM62X

https://software-dl.ti.com/processor-sdk-linux/esd/AM62X/09_00_00_03/exports/docs/linux/Foundational_Components/Hypervisor/Jailhouse.html#enabling-hypervisor-on-am62x-platform

https://www.youtube.com/watch?v=AKAq2LGu_zs

To run jailhouse hypervisor on imx8 board

https://www.youtube.com/watch?v=BnMEhfEnUlA

To run ros in Rpi4 board

https://www.youtube.com/watch?v=sK14eRHZayQ&t=1598s

03/09/2024

https://www.youtube.com/watch?v=MG7-S_88nDg

https://www.youtube.com/watch?v=UDFnebCd50Q

https://www.youtube.com/watch?v=2wmfcYioDgk

https://www.youtube.com/watch?v=gY0ho_kAt-0

05/09/2024

uboot:

1) Workspace/tisdk/build/arago-tmp-default-glibc/work/am62xx_evm-oe-linux/u-boot-ti-staging/1_2023.04+gitAUTOINC+8366064208-r0_tisdk_3_edgeai_4/build$

2) /Workspace/tisdk/build/arago-tmp-default-glibc/work/am62xx_evm-oe-linux/u-boot-ti-staging/1_2023.04+gitAUTOINC+8366064208-r0_tisdk_3_edgeai_4/git$

rootfs path:

/arago-tmp-default-glibc/work/am62xx_evm-oe-linux/jailhouse/0.12+gitAUTOINC+603819ef9a-r0_tisdk_0/sysroot-destdir/usr/share/jailhouse/cells/k3-am625-sk-linux-demo.cell

```
bzip2 -d core-image-weston-raspberrypi5.wic.bz2
```

```
./Test
qt.qpa.xcb: could not connect to display
qt.qpa.plugin: Could not load the Qt platform plugin "xcb" in "" even though it was found.
This application failed to start because no QT platform plugin could be initialized. Reinstalling the application may fix this problem.
Available platform plugins are : minimal, offscreen, vnc, wayland-egl, wayland , wayland-xcomposite-gix, xcb.
Aborted
```

for above error solution is

```
export QA_QPA_PLATFORM=wayland
./test -platform wayland
```

https://www.youtube.com/watch?v=2HyUCWOQhr8

adding qt5 application

```
IMAGE_FEATURES:append += " wayland "
IMAGE_INSTALL:append += " qtbase_qtwayland "
CORE_IMAGE_EXTRA_INSTALL += "wayland weston "
```

https://www.youtube.com/watch?v=TTcP3xeLrEY

12/09/2024

```
# apt-get update Reading package lists... Error! E: flAbsPath on /var/lib/dpkg/status failed - realpath (2: No such file or directory) E: could not open file - open (2: No such file or directory) E: Problem opening E: The package lists or status file could not be parsed or opened.
```

15/09/2024

https://youtu.be/52VKpt2nRmw?si=jWbcfKB-QwO2DvkG https://youtu.be/h7PyE8ADqMQ?si=PVGs6S1C_e53iQ2i

```
IMAGE_INSTALL:append = " qtbase qtdeclarative qtquickcontrols qtwayland"
IMAGE_INSTALL:append = " qtbase-tools qtbase-plugins qtgraphicaleffects qttools"


IMAGE_INSTALL:append = " packagegroup-core-x11 packagegroup-core-x11-base packagegroup-core-x11-sato"
IMAGE_INSTALL:append = " apt"
IMAGE_INSTALL:append = " dpkg"



IMAGE_INSTALL:append = " sudo"


# Enable X11 support
DISTRO_FEATURES:append = " x11 libxcb-cursor"


# Enable OpenGL support
DISTRO_FEATURES:append = " opengl"


# Include X.Org server and related packages in the image
IMAGE_INSTALL:append = " xserver-xorg  xserver-xf86-config"
PACKAGE_CLASSES = "package_deb"
EXTRA_IMAGE_FEATURES += "package-management"


IMAGE_INSTALL:append = " libxcb libxcb-xinerama libxcb-xkb libxkbcommon"
PACKAGECONFIG:append = " xcb"


IMAGE_INSTALL:append = " libx11 libxext libxrender libxi libxrandr libxfixes"



IMAGE_INSTALL:append = " libx11-xcb libxext xcb-util xcb-util-image xcb-util-keysyms xcb-util-wm"
```

16/09/2024

https://pythonprogramming.net/introduction-raspberry-pi-tutorials/

17/09/2024

To configure Weston in Yocto with KMS (Kernel Mode Setting) support, you need to adjust the `DISTRO_FEATURES` and possibly the `PACKAGECONFIG` settings to ensure Weston is built with the correct features.

```
IMAGE_INSTALL_append = " qtwayland qtbase-plugins qtdeclarative qtwayland-compositor"


IMAGE_INSTALL_append = " libxcb xcb-util xcb-util-image xcb-util-keysyms xcb-util-renderutil xcb-util-wm"


IMAGE_INSTALL_append = " libxkbcommon"


IMAGE_INSTALL_append = " qtbase-plugins qtwayland qtwayland-compositor libxcb xcb-util xcb-util-image xcb-util-keysyms xcb-util-renderutil xcb-util-wm libxkbcommon"


IMAGE_INSTALL_append = " wayland wayland-protocols wayland-egl qtwayland qtwayland-compositor"



DISTRO_FEATURES_append = " x11"


GLIBC_GENERATE_LOCALES = "en_US.UTF-8"
IMAGE_LINGUAS = "en-us"


IMAGE_INSTALL_append = " packagegroup-qt5-full"


IMAGE_INSTALL_append = " qtbase-plugins"
IMAGE_INSTALL_append = " qtwayland qtwayland-plugins"
IMAGE_INSTALL_append = " libx11 libxcb xcb-util xcb-util-wm xcb-util-keysyms"
IMAGE_INSTALL_append = " libxcomposite libxcursor libxi"



export QT_QPA_PLATFORM=wayland
export QT_QPA_PLATFORM=xcb
```

qt6 application for Rpi 5

```
file Test
Test: ELF 64-bit LSB shared object, ARM aarch64, version 1 (GNU/Linux), dynamically linked, interpreter /lib/ld-linux-aarch64.so.1, BuildID[sha1]=8dcf502e8c5130c58fe6c4f7225f8bc7aa5a9166, for GNU/Linux 3.14.0, with debug_info, not stripped
```

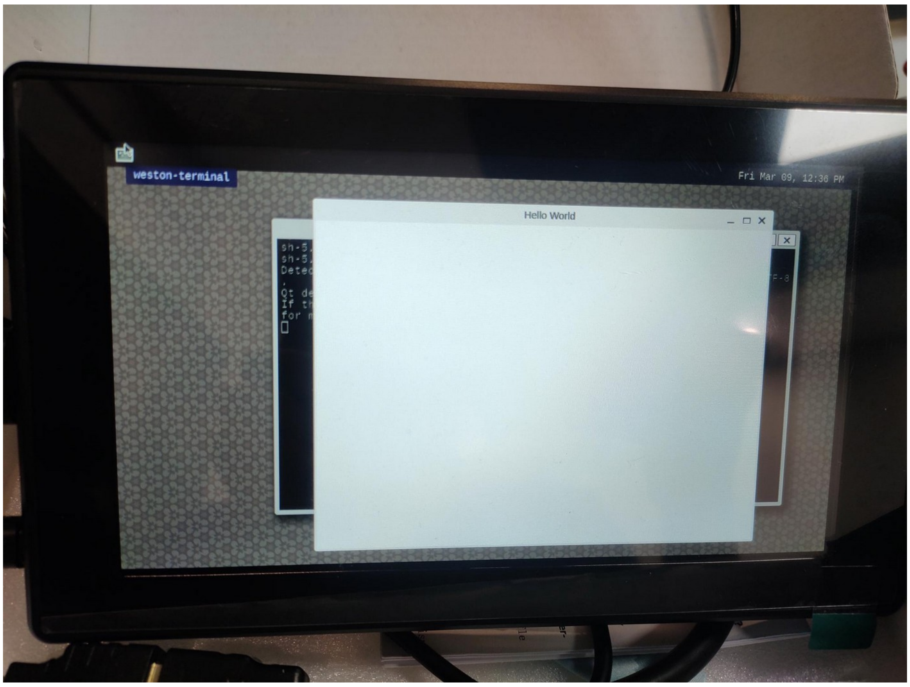
18/09/2024

```
bitbake -c populate_sdk core-image-weston(to create sdk in build/tmp/deploy
```

```
bitbake meta-toolchain-qt5
```

```
bitbake -c cleanall core-image-weston
```

git clone https://github.com/meta-qt5/meta-qt5.git



https://code.qt.io/cgit/yocto/meta-qt5.git

```
git clone http://code.qt.io/yocto/meta-qt5.git
```

19/09/2024

```
scp -r core-image-weston-raspberrypi5.wic.bz2 pavankumar@172.18.6.190:/home/pavankumar/images/
```

Steps to run sample qt application with qt5 in rasperry pi 5 board

```
export QT_QPA_PLATFORM=wayland
./Test -platform wayland
```

Yocto is an open-source project that provides tools and resources for creating custom Linux distributions for embedded systems. It allows developers to create tailored Linux images suited for specific hardware and application needs. The project includes a build system, a set of metadata, and a framework for managing packages and dependencies.

To configure different applications on two displays in Yocto for Raspberry Pi 4, you need to modify your `local.conf` to properly handle the display outputs as separate entities. Raspberry Pi 4 supports dual displays, but the configuration depends on how the displays are recognized and utilized by the software stack.

Here’s what you can try to add to your `local.conf`:

### 1. Enable Dual Display:

Make sure the kernel and device tree support dual display output. You can add the following lines in `local.conf`:

```bash
# Enable the use of two HDMI displays
ENABLE_DUAL_DISPLAY = "1"
```

### 2. Configure the X Server (if using X11):

If you are using X11, you need to configure the X server to support two screens. You can define multiple screens and run different applications on each.

You can try setting up the X configuration by adding this to the `local.conf` or create a custom `xorg.conf`:

```bash
```

```
XSERVER = "xserver-xf86-config"
```

And, modify the `xorg.conf` to configure multiple screens:

```bash
Section "ServerLayout"
    Identifier     "Layout0"
    Screen      0  "Screen0"
    Screen      1  "Screen1" RightOf "Screen0"
EndSection

Section "Screen"
    Identifier "Screen0"
    Device     "HDMI-1"
    Monitor    "HDMI-1"
EndSection

Section "Screen"
    Identifier "Screen1"
    Device     "HDMI-2"
    Monitor    "HDMI-2"
EndSection
```

### 3. Modify the Application Launching Logic:

You will need to modify how the applications are launched to specify which screen they should appear on. For example, to launch an application on a specific display, you can run:

```bash
DISPLAY=:0 app1   # For screen 0 (HDMI-1)
DISPLAY=:1 app2   # For screen 1 (HDMI-2)
```

### 4. For Wayland or Weston:

If you are using Wayland/Weston, you need to configure Weston for dual display by editing the `weston.ini` file, either through `local.conf` or by modifying the image:

```ini
[output]
name=HDMI-A-1
mode=1920x1080

[output]
name=HDMI-A-2
mode=1920x1080
```

### Summary of Changes in `local.conf`:

1. Add dual display support if needed:
   ```bash
   ENABLE_DUAL_DISPLAY = "1"
   ```

2. Set the proper display server (`XSERVER` or Wayland).

3. If using X11, set up the X server for dual displays, as shown above.

By doing this, the system should recognize both displays as separate entities, allowing you to run different applications on each one.

Let me know if you need more guidance on any specific part!

To get mirror image for rpi 4 board

```
IMAGE_INSTALL:append = " packagegroup-core-x11 packagegroup-core-x11-apps"
```

```
IMAGE_INSTALL:append = " mesa-dri"
IMAGE_INSTALL:append = " mesa-gl"
IMAGE_INSTALL:append = " libgles1 libgles2"
IMAGE_INSTALL:append = " lightdm"
IMAGE_INSTALL:append = " packagegroup-lxqt"
IMAGE_INSTALL:append = " packagegroup-xfce"
IMAGE_INSTALL:append = " gtk+3"
IMAGE_INSTALL:append = " chromium"
IMAGE_INSTALL:append = " gstreamer1.0 gstreamer1.0-plugins-base gstreamer1.0-plugins-good"
# Sample local.conf modifications
IMAGE_INSTALL:append = " packagegroup-core-x11 packagegroup-lxqt mesa-dri mesa-gl libgles1 libgles2 xserver-xorg lightdm qtbase gtk+3 gstreamer1.0 gstreamer1.0-plugins-base gstreamer1.0-plugins-good"
```

23/09/2024

```
LIC_FILES_CHKSUM = "file://${COREBASE}/meta/COPYING.MIT;md5=3da9cfbcb788c80a0384361b4de20420"
```

```
bitbake -c populate_sdk core-image-weston
```

executables path in rpi 5

```
/media/vasavi/4TB_SSD/Workspace/raspberrypi5/out/tmp/work/cortexa76-poky-linux/example/0.1-r0$
```

```
SUMMARY = "This is a test QT program"
DESCRIPTION = "This is a test QT program"
LICENSE = "MIT"


LIC_FILES_CHKSUM = "file://${COREBASE}/meta/COPYING.MIT;md5=3da9cfbcb788c80a0384361b4de20420"


DEPENDS = "qtbase qtdeclarative qtquickcontrols wayland"
```

```
SRC_URI = "file://qtapp.cpp \
           file://qtapp.pro"

S ="${WORKDIR}"

do_compile() {
   qmake ${S}/qtapp.pro
   make
}

do_install() {
   install -d ${D}${bindir}
   install -m 0755 ${S}/qtapp ${D}${bindir}/
}

FILES_${PN} += "${bindir}/qtapp"

inherit qmake5
```

26/09/2024

```
IMAGE_INSTALL:append = " qtbase qtdeclarative qtquickcontrols"

      # Enable OpenGL support
      #DISTRO_FEATURES:append = " opengl"

      # Enable X11 support
      #DISTRO_FEATURES:append = " x11"

      # Include X.Org server and related packages in the image
      #IMAGE_INSTALL:append = " xserver-xorg  xserver-xf86-config"

      IMAGE_INSTALL:append = " qtwayland qtbase-plugins "
```

```
    #IMAGE_INSTALL:append = " libxcomposite libxcursor libxi"


    #IMAGE_INSTALL:append = " libxkbcommon"


    QA_QPA_PLATFORM=wayland
```

```
setenv bootdelay 0
saveenv
```

screenrecorder download commands:

```
sudo apt update
sudo apt install kazam
```

or we can use ctrl+alt+shift+R (same command to start and stop)

To enable uart port to get gtk term in rpi 5 board

pin number	**pin name**
6	gnd
8	tx(white)
10	rx(green)

enable below line in config.txt file(boot partition)

```
dtparam=uart0=on
```

add this in cmdline.txt

```
console=ttyAMA0,115200
```

01/10/2024

Raspberry_Pi_5 os-release specifications:

```
ID=poky
NAME="Poky (Yocto Project Reference Distro)"
VERSION="4.0.21 (kirkstone)"
VERSION_ID=4.0.21
PRETTY_NAME="Poky (Yocto Project Reference Distro) 4.0.21 (kirkstone)"
DISTRO_CODENAME="kirkstone"
```

07/10/2024

Below video shows how to add qt app in rc.local file

https://www.youtube.com/watch?v=m3rfls00OtY

09/10/2024

https://stackoverflow.com/questions/77939540/yocto-build-unable-to-find-a-match

15/10/2024

https://www.youtube.com/watch?v=DcIq7uS1fpQ

https://www.android-x86.org/source.html
https://groups.google.com/g/android-x86/c/ptzY-veKgYY?pli=1

https://wiki.xenproject.org/wiki/Xen_ARM_with_Virtualization_Extensions

16/10/2024

```
kernel = "/home/root/Image"
cmdline = "console=ttyAMA0 earlyprintk=xen sync_console root=/dev/mmcblk0p2"
memory = "256"
name = "rpi4-xen-guest"
vcpus = 1
serial="pty"
disk = [ 'phy:/dev/loop0,xvda,w' ]
#vif=[ 'mac=00:11:22:66:88:22,bridge=xenbr0,type=netfront', ]
```

above is used for enabling domu(xen concept)

https://wiki.yoctoproject.org/wiki/images/archive/d/d7/20200702162800%21DD10_Xen_Hypervisor_NA20.pdf

https://wiki.xenproject.org/wiki/Xen_Project_Software_Overview

```
sudo brctl addbr xenbr0
```

https://youtu.be/alqWgcmpjfU?si=VHa2AjC4CrvoZEQr

https://vadion.com/xen-hypervisor-setting-up-xen-userland-and-running-domu-guests-part-3/

27/10/2024

https://odroid.com/dokuwiki/doku.php?id=en:xu4_xen

https://wiki.xenproject.org/wiki/Xen_ARM_with_Virtualization_Extensions/OdroidXU

https://forum.odroid.com/viewtopic.php?t=6370 andriod_13_rpi4

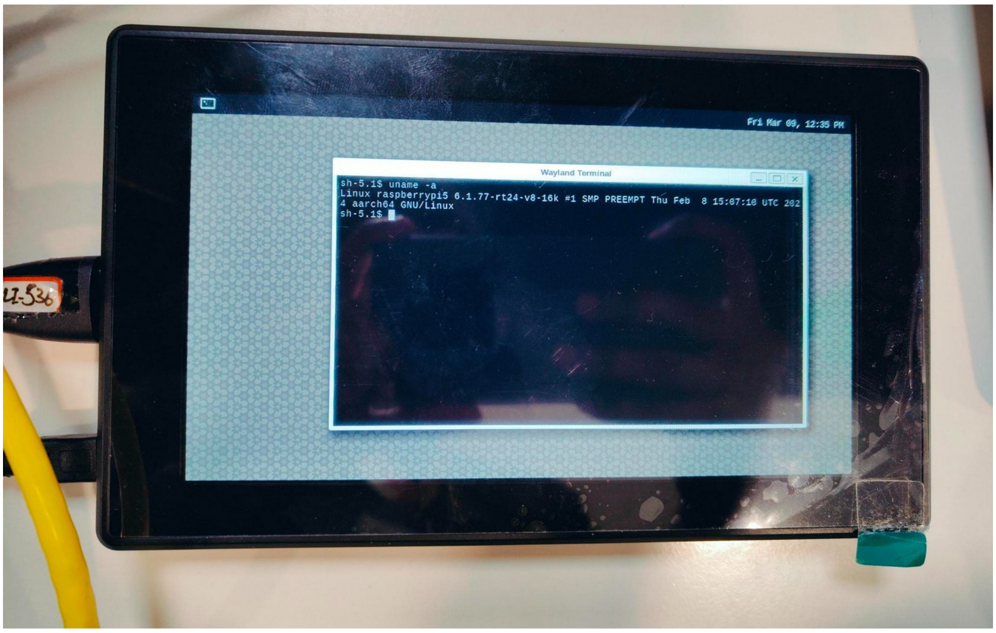
https://github.com/raspberry-vanilla/android_local_manifest/tree/android-13.0

https://github.com/raspberry-vanilla/android_local_manifest/tree/android-13.0

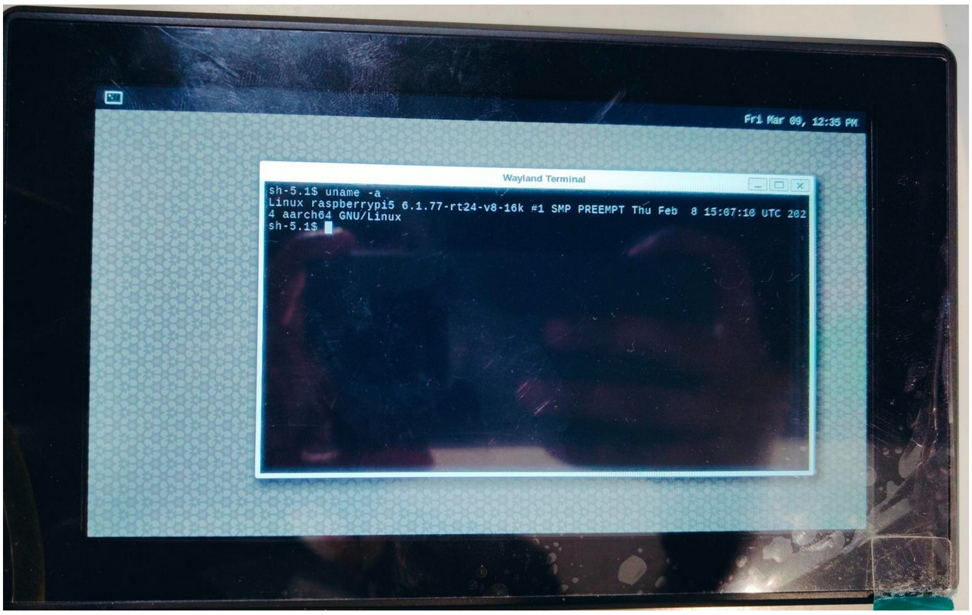
GitHub - raspberry-vanilla/android_local_manifest at android-13.0
Contribute to raspberry-vanilla/android_local_manifest development by creating an account on GitHub.

To compress .bmp image

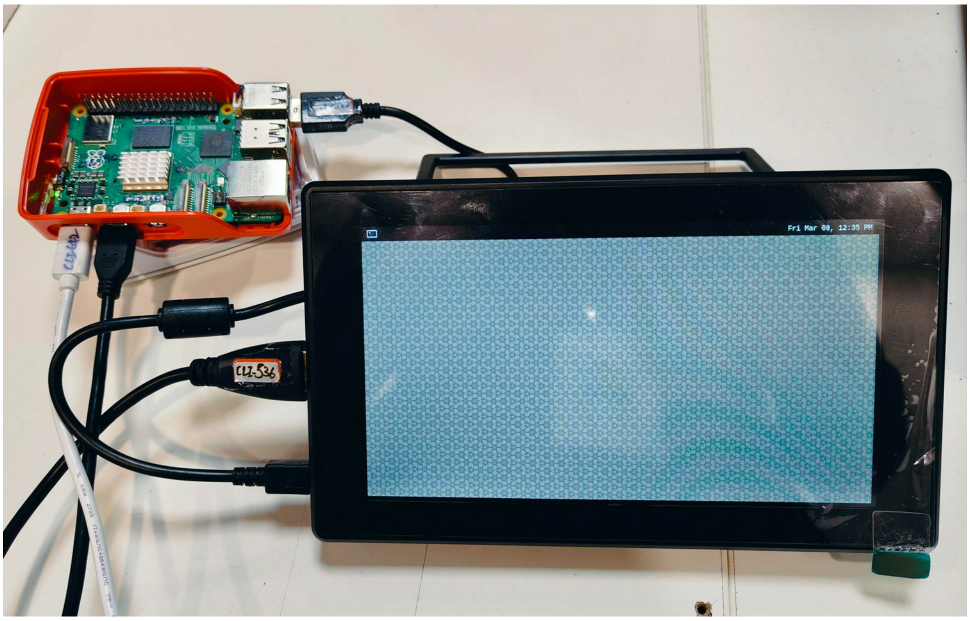
https://onlineconvertfree.com/compress-image/



```
sh-5.1$ uname -a
Linux raspberrypi5 6.1.77-rt24-v8-16k #1 SMP PREEMPT Thu Feb  8 15:07:10 UTC 202
4 aarch64 GNU/Linux
sh-5.1$ █
```



```
sh-5.1$ uname -a
Linux raspberrypi5 6.1.77-rt24-v8-16k #1 SMP PREEMPT Thu Feb  8 15:07:10 UTC 202
4 aarch64 GNU/Linux
sh-5.1$ █
```



26/10/2024

Autolaunch qt app

https://community.toradex.com/t/how-to-replace-start-up-qt-app-with-own-qt-app/15447

https://forum.qt.io/topic/133449/starting-qt-app-as-a-systemd-service/15

https://developer.toradex.com/linux-bsp/os-development/boot/how-to-autorun-application-at-the-start-up-in-linux/

ota using rauc in yocto linux

https://rauc.readthedocs.io/en/latest/integration.html

30/10/2024

https://bootlin.com/blog/tag/flutter/

https://www.phytec.de/cdocuments/?doc=A4AGG

https://www.phytec.de/cdocuments/?doc=eYBcD

https://rauc.readthedocs.io/en/latest/scenarios.html

07/11/2024

ota

https://www.youtube.com/watch?v=3nWXtTFziP0

https://www.konsulko.com/getting-started-with-rauc-on-raspberry-pi-2

https://www.youtube.com/watch?v=hS3Fjf7fuHM

- YouTube
Enjoy the videos and music you love, upload original content, and share it all with friends, family, and the world on YouTube.

ota for rpi5:

https://qbee.io/docs/tutorial-rpi5-rauc.html

https://github.com/ahmedkassem56/meta-qemuarma9/tree/master

https://www.youtube.com/watch?v=6WaqvCeE1Es&t=278s

https://www.youtube.com/watch?v=2k73RVpbjjw

https://www.youtube.com/watch?v=lEWG3eiOss0

ota using swupdate

https://www.youtube.com/watch?v=ePRTTfGJUI4

15/112024

ota using swupdate

https://www.youtube.com/watch?v=ePRTTfGJUI4

https://www.youtube.com/watch?v=RJNgpVQVv1s

Using mender

https://www.youtube.com/watch?v=mIPD8JPll7E

https://www.youtube.com/watch?v=cIC8emRwTt0

19/10/2024

mender.io

gmail:--- pavankumar.krishna22@gmail.com

password :- Pavan@222@22

https://jfrog.com/connect/post/ota-updates-for-embedded-linux-in-2019-method/

Quest global learning hub

https://quest-global.csod.com/client/quest-global/default.aspx

mail: pavan.kotha@rampgroup.com

passwd: Pavan@123

22/11/2024

measuring temperature and humidity using bluetooth module:

https://www.youtube.com/watch?v=CJwgsLMJkJ0

wiringpi

Integrated in rpi5 board:

i) kernel rt patch

ii) qt libraries

iii) custom helloworld program

iv) custom helloworld qt application

v) gpiod libraries

vi) compilers and debugging support

vii) led gpio program as recipe

viii) sdk support

```
pavankumar@Pavan:~/raspberry_5_yocto/build$ bitbake -e core-image-weston | grep PREFERRED_PROVIDER_virtual/kernel
# $PREFERRED_PROVIDER_virtual/kernel
PREFERRED_PROVIDER_virtual/kernel="linux-raspberrypi"
```

```
pavankumar@Pavan:~/raspberry_5_yocto/build$ bitbake -e core-image-weston | grep PREFERRED_VERSION_linux-raspberrypi
# $PREFERRED_VERSION_linux-raspberrypi [2 operations]
PREFERRED_VERSION_linux-raspberrypi="6.1%"
```

```
pavankumar@Pavan:~/raspberry_5_yocto/build/tmp/work/raspberrypi5-poky-linux/linux-kernel/6.1-r0$ ls
build  linux-6.1.79  recipe-sysroot  recipe-sysroot-native  temp
```

03/12/2024

commands to check libc version:

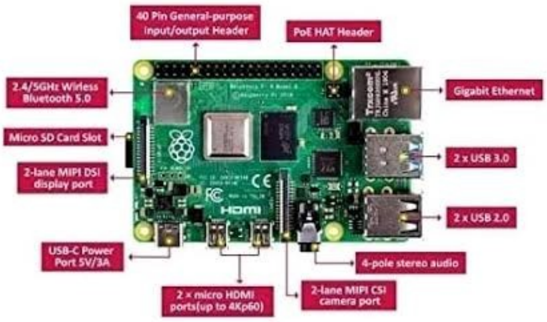
- **During Build**:
  - Use `bitbake -e virtual/libc | grep "PV="` to find the `glibc` version during the build process.
- **On the Target Device**:
  - Use `ldd --version` to print the `glibc` version.

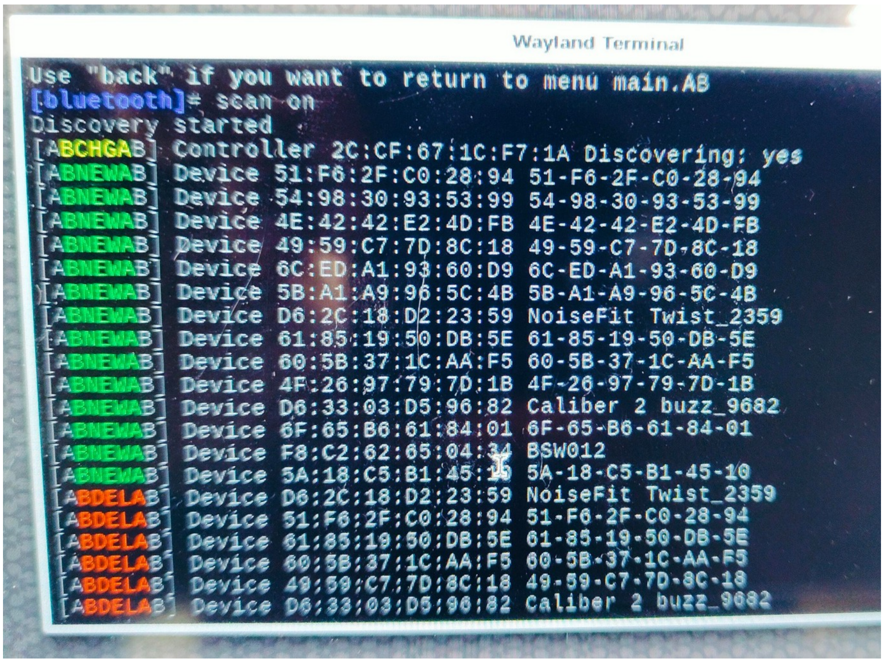
- Use `strings /lib/libc.so.6 | grep "version"` for more detailed version info.

for rpi4 board glibc version in 2.35

PeopleTEch wifi password:

SvP$%137@R!S


40 Pin General-purpose input/output Header
PoE HAT Header
2.4/5GHz Wirless Bluetooth 5.0
Gigabit Ethernet
Micro SD Card Slot
2 x USB 3.0
2-lane MIPI DSI display port
2 x USB 2.0
USB-C Power Port 5V/3A
4-pole stereo audio
2 × micro HDMI ports(up to 4Kp60)
2-lane MIPI CSI camera port



```
Use "back" if you want to return to menu main.AB
[bluetooth]# scan on
Discovery started
[ABCHGAB] Controller 2C:CF:67:1C:F7:1A Discovering: yes
[ABNEWAB] Device 51:F6:2F:C0:28:94 51-F6-2F-C0-28-94
[ABNEWAB] Device 54:98:30:93:53:99 54-98-30-93-53-99
[ABNEWAB] Device 4E:42:42:E2:4D:FB 4E-42-42-E2-4D-FB
[ABNEWAB] Device 49:59:C7:7D:8C:18 49-59-C7-7D-8C-18
[ABNEWAB] Device 6C:ED:A1:93:60:D9 6C-ED-A1-93-60-D9
[ABNEWAB] Device 5B:A1:A9:96:5C:4B 5B-A1-A9-96-5C-4B
[ABNEWAB] Device D6:2C:18:D2:23:59 NoiseFit Twist_2359
[ABNEWAB] Device 61:85:19:50:DB:5E 61-85-19-50-DB-5E
[ABNEWAB] Device 60:5B:37:1C:AA:F5 60-5B-37-1C-AA-F5
[ABNEWAB] Device 4F:26:97:79:7D:1B 4F-26-97-79-7D-1B
[ABNEWAB] Device D6:33:03:D5:96:82 Caliber 2 buzz_9682
[ABNEWAB] Device 6F:65:B6:61:84:01 6F-65-B6-61-84-01
[ABNEWAB] Device F8:C2:62:65:04:34 BSW012
[ABNEWAB] Device 5A:18:C5:B1:45:10 5A-18-C5-B1-45-10
[ABDELAB] Device D6:2C:18:D2:23:59 NoiseFit Twist_2359
[ABDELAB] Device 51:F6:2F:C0:28:94 51-F6-2F-C0-28-94
[ABDELAB] Device 61:85:19:50:DB:5E 61-85-19-50-DB-5E
[ABDELAB] Device 60:5B:37:1C:AA:F5 60-5B-37-1C-AA-F5
[ABDELAB] Device 49:59:C7:7D:8C:18 49-59-C7-7D-8C-18
[ABDELAB] Device D6:33:03:D5:96:82 Caliber 2 buzz_9682
```

IMAGE_INSTALL:append = " libxcb libxcb-glx libxcb-shm libx11-xcb libxcb-shape0 libxcb-xfixes0"

Task Related to HW in Yocto (Done)	GPIO – libgpiod adding, Testing and Validating in Yocto build
done	UART – Console and other UART Testing and Validating in Yocto build
done	I2C – LM75 Testing and Validating in Yocto build
done	CAN – MCP2515 CAN Integrating and Testing in Yocto build
done	Audio – Speaker Testing and Validating in Yocto build
done	Audio – Microphone Testing and Validating in Yocto build
done	Display – HDMI Display Testing and Validating in Yocto build
	Display – DSI Display Testing and Validating in Yocto build
done	Camera – USB Camera Testing and Validating in Yocto build
	Camera – CSI Camera Testing and Validating in Yocto build
done	Ethernet – Ethernet Testing and Validating in Yocto build
done	WiFi – Wifi Testing and Validating in Yocto build
done	Bluetooth – BT Testing and Validating in Yocto build, Checking Bluetooth AT Commands and Bluetooth Profiles
	GPS – GPS Testing and Validating in Yocto build
	4G --- 4G Module Testing and Validating in Yocto build
	FM Radio – FM integration, Testing and validating in Yocto build
done	SDCard – Sdcard and Pen Driver Testing and Validatin in Yocto build
done	SPI – Testing and Validating SPI devices in Yocto build
done	USB Keyboard – Testing and Validating USB keyboard in Yocto build
done	USB Mouse – Testing and Validating USB Mouse in Yocto build
	Keypad – Matrix Keypad interfacing with Keydebouncing in Yocto build

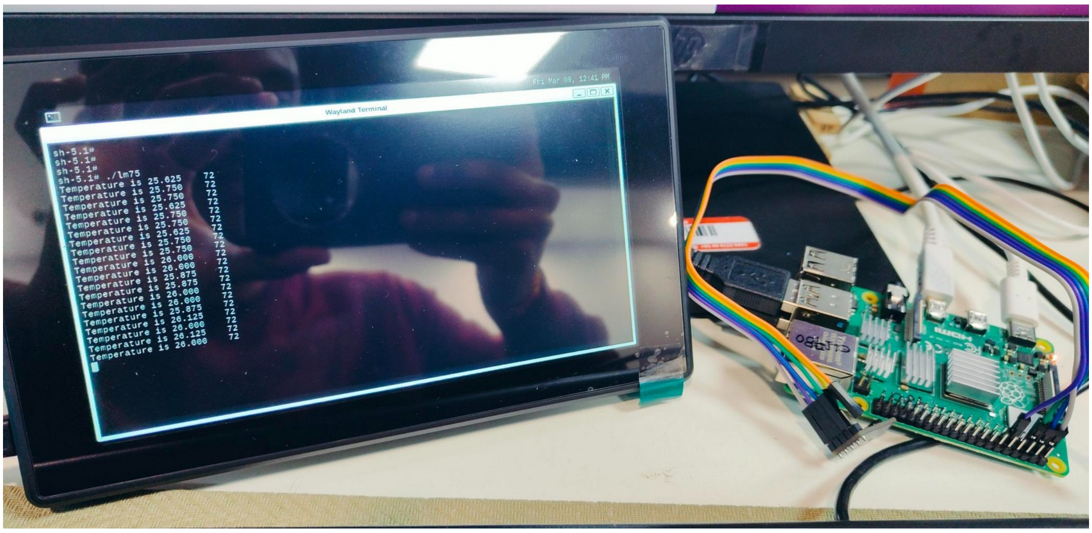
05/12/2024

To capture video with QQSI-8809-v1.0 Q camera module in rpi 4:

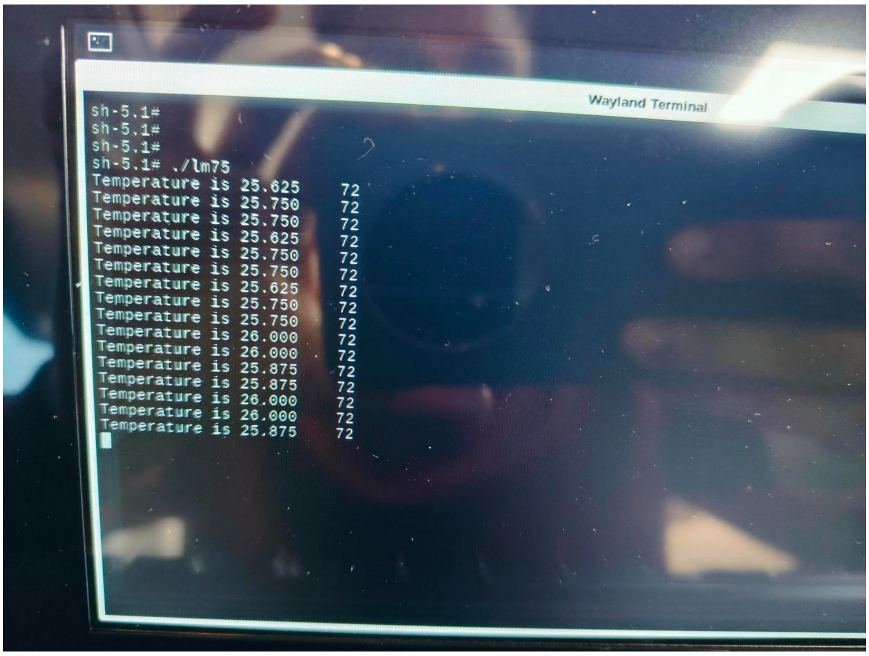
v4l2-ctl --device=/dev/video0 --stream-mmap --stream-count=300 --stream-to=test_video.mjpg
camera:

ffmpeg -f v4l2 -i /dev/video0 -vframes 1 test_image.jpg

06/12/2024



```
sh-5.1#
sh-5.1#
sh-5.1#
sh-5.1# ./lm75
Temperature is 25.625      72
Temperature is 25.750      72
Temperature is 25.750      72
Temperature is 25.625      72
Temperature is 25.750      72
Temperature is 25.750      72
Temperature is 25.625      72
Temperature is 25.750      72
Temperature is 25.750      72
Temperature is 26.000      72
Temperature is 26.000      72
Temperature is 25.875      72
Temperature is 25.875      72
Temperature is 26.000      72
Temperature is 26.000      72
Temperature is 25.875      72
Temperature is 26.125      72
Temperature is 26.000      72
Temperature is 26.125      72
Temperature is 26.000
```



```
sh-5.1#
sh-5.1#
sh-5.1#
sh-5.1# ./lm75
Temperature is 25.625      72
Temperature is 25.750      72
Temperature is 25.750      72
Temperature is 25.625      72
Temperature is 25.750      72
Temperature is 25.750      72
Temperature is 25.625      72
Temperature is 25.750      72
Temperature is 25.750      72
Temperature is 26.000      72
Temperature is 26.000      72
Temperature is 25.875      72
Temperature is 25.875      72
Temperature is 26.000      72
Temperature is 26.000      72
Temperature is 25.875      72
```

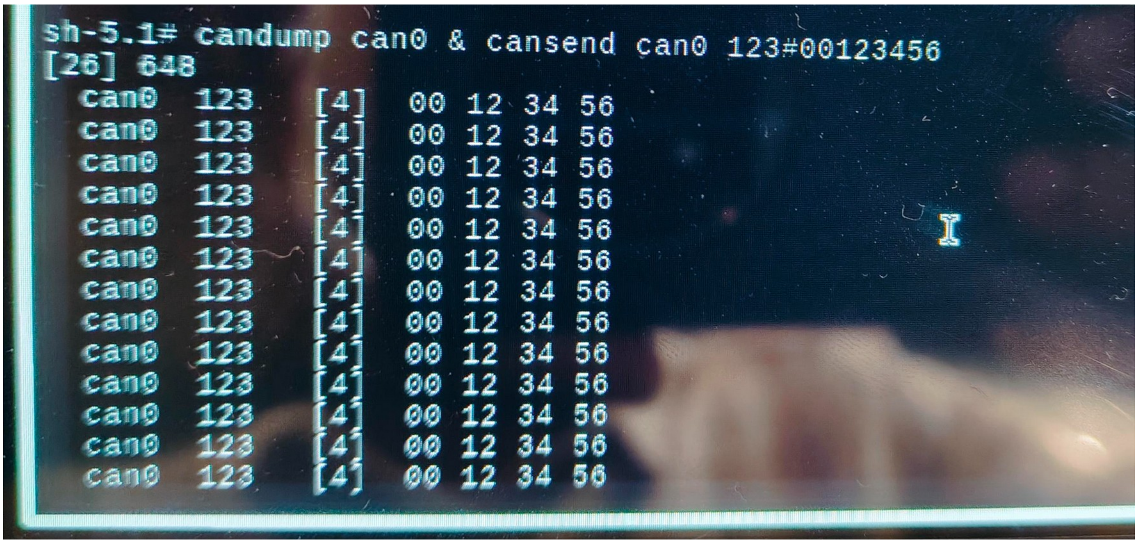
10/12/2024

https://youtu.be/rOL-T31l0lQ?si=zBXdwIfDiR_vCrDr

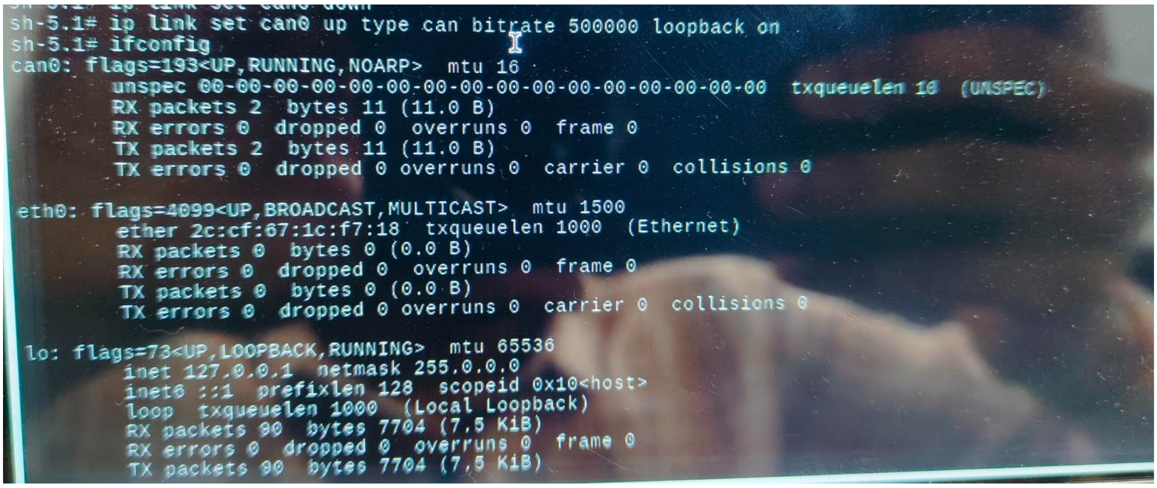
https://youtu.be/TGcvLGTOm6c?si=YNfmtkE_kFiSwA-X

12/12/2024

echo $DBUS_SESSION_BUS_ADDRESS
export DBUS_SESSION_BUS_ADDRESS=unix:path=/run/user/1000/bus
export DBUS_SESSION_BUS_ADDRESS=unix:path=/run/user/1000/bus
dbus-monitor --session "interface='org.mpris.MediaPlayer2.Player'"
dbus-launch --exit-with-session
dbus-monitor --session
qdbus org.mpris.MediaPlayer2.spotify /org/mpris/MediaPlayer2



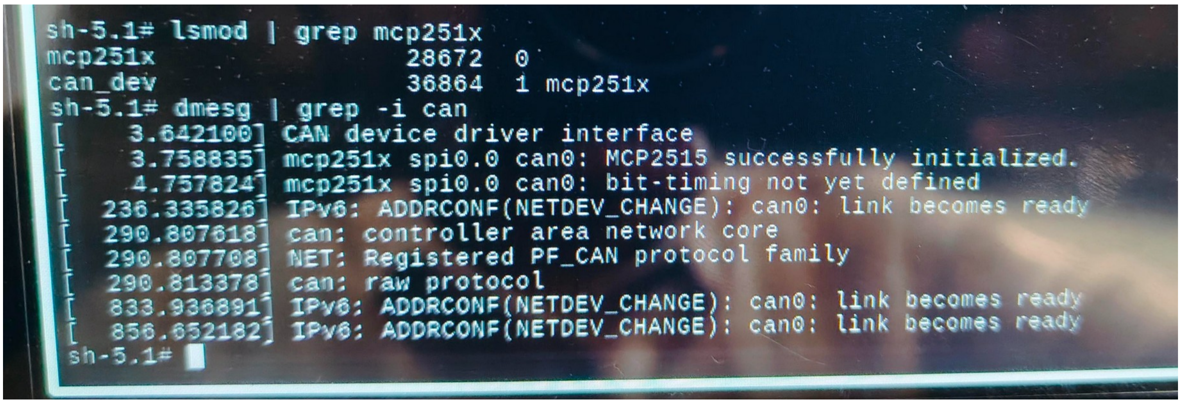
```
sh-5.1# candump can0 & cansend can0 123#00123456
[26] 648
  can0  123   [4]  00 12 34 56
  can0  123   [4]  00 12 34 56
  can0  123   [4]  00 12 34 56
  can0  123   [4]  00 12 34 56
  can0  123   [4]  00 12 34 56
  can0  123   [4]  00 12 34 56
  can0  123   [4]  00 12 34 56
  can0  123   [4]  00 12 34 56
  can0  123   [4]  00 12 34 56
  can0  123   [4]  00 12 34 56
  can0  123   [4]  00 12 34 56
  can0  123   [4]  00 12 34 56
  can0  123   [4]  00 12 34 56
```



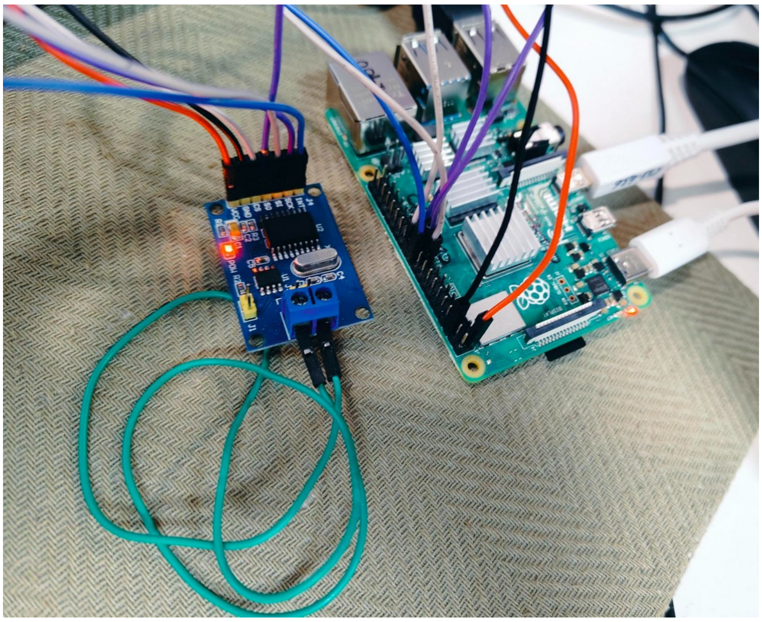
```
sh-5.1# ip link set can0 down
sh-5.1# ip link set can0 up type can bitrate 500000 loopback on
sh-5.1# ifconfig
can0: flags=193<UP,RUNNING,NOARP>  mtu 16
        unspec 00-00-00-00-00-00-00-00-00-00-00-00-00-00-00-00  txqueuelen 10  (UNSPEC)
        RX packets 2  bytes 11 (11.0 B)
        RX errors 0  dropped 0  overruns 0  frame 0
        TX packets 2  bytes 11 (11.0 B)
        TX errors 0  dropped 0 overruns 0  carrier 0  collisions 0

eth0: flags=4099<UP,BROADCAST,MULTICAST>  mtu 1500
        ether 2c:cf:67:1c:f7:18  txqueuelen 1000  (Ethernet)
        RX packets 0  bytes 0 (0.0 B)
        RX errors 0  dropped 0  overruns 0  frame 0
        TX packets 0  bytes 0 (0.0 B)
        TX errors 0  dropped 0 overruns 0  carrier 0  collisions 0

lo: flags=73<UP,LOOPBACK,RUNNING>  mtu 65536
        inet 127.0.0.1  netmask 255.0.0.0
        inet6 ::1  prefixlen 128  scopeid 0x10<host>
        loop  txqueuelen 1000  (Local Loopback)
        RX packets 90  bytes 7704 (7.5 KiB)
        RX errors 0  dropped 0  overruns 0  frame 0
        TX packets 90  bytes 7704 (7.5 KiB)
```



```
sh-5.1# lsmod | grep mcp251x
mcp251x                28672  0
can_dev                36864  1 mcp251x
sh-5.1# dmesg | grep -i can
[    3.642100] CAN device driver interface
[    3.758835] mcp251x spi0.0 can0: MCP2515 successfully initialized.
[    4.757824] mcp251x spi0.0 can0: bit-timing not yet defined
[  236.335826] IPv6: ADDRCONF(NETDEV_CHANGE): can0: link becomes ready
[  290.807618] can: controller area network core
[  290.807708] NET: Registered PF_CAN protocol family
[  290.813378] can: raw protocol
[  833.936891] IPv6: ADDRCONF(NETDEV_CHANGE): can0: link becomes ready
[  856.652182] IPv6: ADDRCONF(NETDEV_CHANGE): can0: link becomes ready
sh-5.1# 
```



19/12/2024

https://gerrit.rampgroup.com

Errors I got while building sdv image in 20.04 version to solve this I have upgraded the gcc version

Binutils.bb

gcc.bb

gettext.bb

bluez.bb

Anydesk

1895750282

27/12/2024

wifi requirement for 2nd floor

added below binary and library

usr/lib/libnl-genl-3.so.200
usr/sbin/wpa_supplicant

worked with udhcpc instead of dhcpcd

08/01/2025

```
[   51.618565] usb 1-1.1: New USB device strings: Mfr=1, Product=2, SerialNumber=3
[   51.626151] usb 1-1.1: Product: FT232R USB UART
[   51.630796] usb 1-1.1: Manufacturer: FTDI
[   51.634883] usb 1-1.1: SerialNumber: A50285BI
[   51.693621] usbcore: registered new interface driver usbserial_generic
[   51.700381] usbserial: USB Serial support registered for generic
[   51.716388] usbcore: registered new interface driver ftdi_sio
[   51.722353] usbserial: USB Serial support registered for FTDI USB Serial Device
[   51.729934] ftdi_sio 1-1.1:1.0: FTDI USB Serial Device converter detected
[   51.736943] usb 1-1.1: Detected FT232RL
[   51.744873] usb 1-1.1: FTDI USB Serial Device converter now attached to ttyUSB0
root@raspberrypi4-64:~# lsusb
Bus 002 Device 001: ID 1d6b:0003 Linux Foundation 3.0 root hub
Bus 001 Device 004: ID 0461:0010 Primax Electronics, Ltd HP PR1101U / Primax PMX-KPR1101U Keyboard
Bus 001 Device 003: ID 413c:301a Dell Computer Corp. Dell MS116 USB Optical Mouse
Bus 001 Device 005: ID 0403:6001 Future Technology Devices International, Ltd FT232 Serial (UART) IC
Bus 001 Device 002: ID 2109:3431 VIA Labs, Inc. Hub
Bus 001 Device 001: ID 1d6b:0002 Linux Foundation 2.0 root hub
root@raspberrypi4-64:~# ls /dev/ttyUSB*
/dev/ttyUSB0
root@raspberrypi4-64:~# ls -l /dev/ttyUSB*
```

09/01/2014

```
Software =
{
   version = "1.0.1";
   raspberrypi4-64 = {
      Hardware-compatibility: [ "1.0" ];
      images: (
         {
            filename = "core-image-minimal-raspberrypi4-64.ext4.gz";
            type = "raw";
            compressed = "zlib";
            device = "/dev/mmcblk0p3";
         },
      );
   };
}
```

command to check size of any directory/file

```
$ du -sh directory_name/file_name
```

for offline build task related

```
# In warn_fetch.bbclass


python do_fetch_warning() {
    # Get the recipe name from the Bitbake environment (task metadata)
    recipe_name = d.get('PN')


    # Print a warning message using Bitbake's bb.warn() function
    bb.warn(f"Warning: You are fetching the recipe: {recipe_name}")
}


# Hook the function to the fetch task
addtask do_fetch_warning before do_fetch





python do_compile_warning() {
    # Get the recipe name and file from the BitBake environment
    recipe_name = d.getVar('PN')  # Recipe name
    recipe_file = d.getVar('FILE', False)  # Recipe file path


    # Parse variables from the recipe file
    vars_from_file = bb.parse.vars_from_file(recipe_file, d)
    package_name = vars_from_file[0] or 'defaultpkgname'


    # Construct the warning message
    warning_message = f"Warning: You are compiling the recipe: {package_name}  RECIPE NAME
= {recipe_name}"


    # Print the warning message to the console
    bb.warn(warning_message)
    # Save the warning message to a log file
    log_file = d.getVar('TOPDIR') + "/compile_warnings.log"
    with open(log_file, "a") as f:
        f.write(warning_message + "\n")
}


# Hook the function to the compile task
addtask do_compile_warning before do_compile
```

```
bitbake -e core-image-weston | grep ^DEPLOY_DIR_IMAGE=
bitbake -e core-image-weston | grep ^D=
```

```
bitbake multiconfig:raspberrypi4-64:core-image-weston \
    2>&1 | awk '
BEGIN { start = systime(); fflush() }
{
    elapsed = systime() - start
    hours = int(elapsed / 3600)
    minutes = int((elapsed % 3600) / 60)
    seconds = elapsed % 60
    printf("%02d:%02d:%02d %s\n", hours, minutes, seconds, $0)
    fflush()  # Ensure output is flushed immediately
}' | tee $LOGFILE1
```

30/01/2025

==> To take /create patch file from git follow below steps:

1. Add and Commit Changes

```
$ git add .
$ git commit -m “commit_purpose_of_change”
```

2. View Commit History

```
$ git log
```

3. Generate a Patch File

```
$ git format-patch <commit_id>
```

==> To Pull the Latest Changes from Remote:

```
$ git pull origin <branch-name>
```

2. Fetch Changes Without Merging

```
$ git fetch origin
```

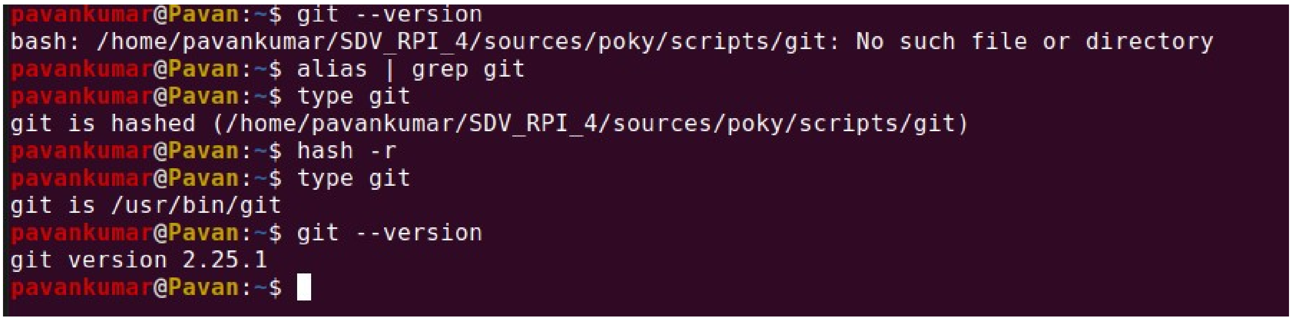
3. Check for Remote Updates

$ git status

4. Reset to the Latest Remote Version (Hard Reset, Use with Caution!)

$ git fetch origin

$ git reset --hard origin/<branch-name>



```
pavankumar@Pavan:~$ git --version
bash: /home/pavankumar/SDV_RPI_4/sources/poky/scripts/git: No such file or directory
pavankumar@Pavan:~$ alias | grep git
pavankumar@Pavan:~$ type git
git is hashed (/home/pavankumar/SDV_RPI_4/sources/poky/scripts/git)
pavankumar@Pavan:~$ hash -r
pavankumar@Pavan:~$ type git
git is /usr/bin/git
pavankumar@Pavan:~$ git --version
git version 2.25.1
pavankumar@Pavan:~$ 
```