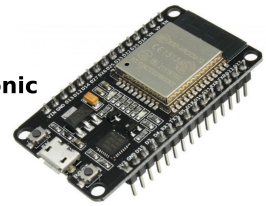
Chapter 9:ESP32_Foxy_Sub_Pub_Topic_by_MicroROS_Serial

ROS2 Foxy | ROS2 Message by Serial | ESP32 | Arduino IDE && micro ros

Pub Topic:
GPS
IMU
Ultrasonic

Sub Topic:
Twist



ROS

Ubuntu 20.04

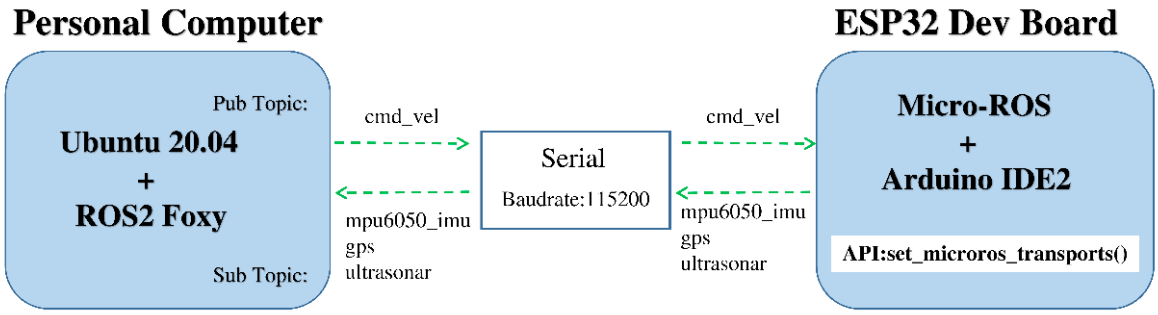
bilibili 照祥同学

09-ESP32_Foxy_Sub_Pub_Serial

URL: https://github.com/ZhaoXiangBox/esp32_ros2_robot

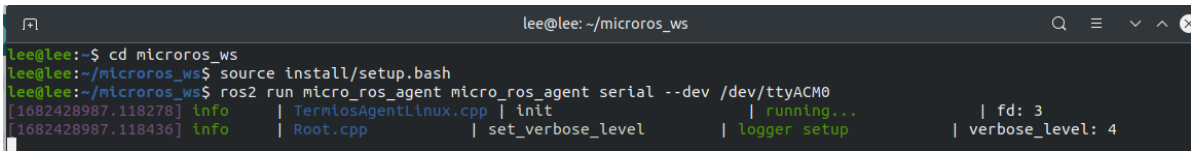
Videos from Bilibili 照祥同学: [第九节：ESP32基于micro-ros通过串口代理发布和订阅ROS2的topic]

ESP32 Communication with Foxy through Micro-ROS

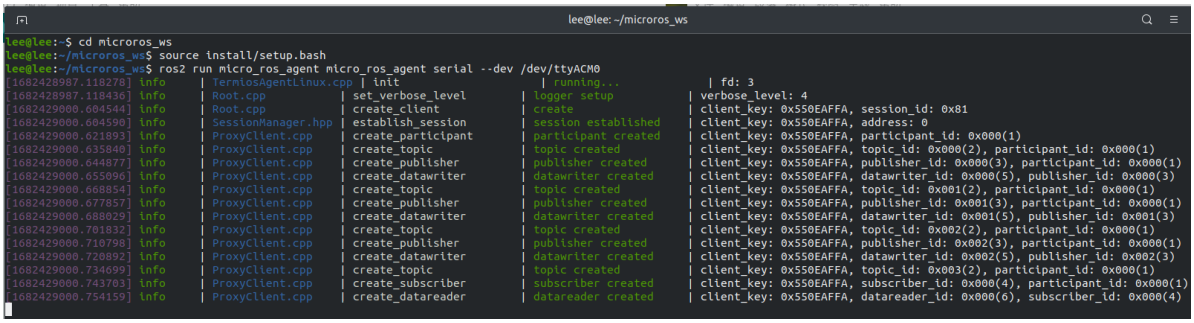


· open a terminal

```
cd microros_ws      // cd in your micros workspace
source install/setup.bash // source
ros2 run micro_ros_agent micro_ros_agent serial --dev /dev/ttyACM0
```



·then press the ESP32 Reset Button.



First : Create a node with default configuration

ESP32 Communication with Foxy through Micro-ROS

1. Create a node with default configuration

https://micro.ros.org/docs/tutorials

```
// Initialize micro-ROS allocator
rcl_allocator_t allocator = rcl_get_default_allocator();

// Initialize support object
rclc_support_t support;
rcl_ret_t rc = rclc_support_init(&support, 0, NULL, &allocator);
if (rc != RCL_RET_OK) {
  ... // Handle error
  return -1;
}

// Create node object
rcl_node_t node;
rc = rclc_node_init_default(&node, "node_name", "namespace", &support);

if (rc != RCL_RET_OK) {
  ... // Handle error
  return -1;
}
```

通过返回值判断对象初始化是否成功

节点的名字　命名空间的名字

初始化节点

通过返回值判断对象初始化是否成功

rcl : ROS 2 client support library ROS2 客户端支持库

Second : Initialize a publisher by best effert

ESP32 Communication with Foxy through Micro-ROS

2. Initialize a publisher by best effert

https://micro.ros.org/docs/tutorials

```
// a micro-ROS node is created.

// Publisher object
rcl_publisher_t imu_publisher;

// Get message type support
  rclc_publisher_init_best_effort(
    &imu_publisher,
    &node,
    ROSIDL_GET_MSG_TYPE_SUPPORT(sensor_msgs, msg, Imu),
    "mpu6050_imu");

if (RCL_RET_OK != rc) {
  ... // Handle error
  return -1;
}
```

声明一个发布者

绑定发布者

绑定节点

待发布的 topic 的类型

待发布的 topic 名字

通过返回值判断对象初始化是否成功

rcl : ROS 2 client support library ROS2 客户端支持库

Third : Initialize a subscriber by default

ESP32 Communication with Foxy through Micro-ROS

3. Initialize a subscriber by default

https://micro.ros.org/docs/tutorials

```
// a micro-ROS node is created.

// Subscriber object
rcl_subscription_t twist_subscriber;          // 声明一个订阅者

// create twist_subscriber
rclc_subscription_init_default(
  &twist_subscriber,                          // 绑定订阅者
  &node,                                      // 绑定节点
  ROSIDL_GET_MSG_TYPE_SUPPORT(geometry_msgs, msg, Twist),
  "cmd_vel");                                 // 待发布的 topic 名字
                                              // 待订阅的 topic 的类型
if (RCL_RET_OK != rc) {
  ... // Handle error                         // 通过返回值判断对象初始化是否成功
  return -1;
}
rclc_executor_add_subscription(&executor, &twist_subscriber, &twist_msg, &subscription_callback, ON_NEW_DATA);
```

rcl : ROS 2 client support library ROS2 客户端支持库

ESP32 Communication with Foxy through Micro-ROS

3. Initialize a subscriber by default

https://micro.ros.org/docs/tutorials


```
// a micro-ROS node is created.

geometry_msgs__msg__Twist twist_msg;

void subscription_callback(const void *msgin) {          // 回到函数
  const geometry_msgs__msg__Twist *msg = (const geometry_msgs__msg__Twist *)msgin;

  Serial.print(msg->linear.x);
  Serial.print("  ");
  Serial.println(msg->angular.z);                        // 串口输出订阅的数据
}

rclc_executor_add_subscription(&executor, &twist_subscriber, &twist_msg, &subscription_callback, ON_NEW_DATA);
                                                         // 绑定订阅者
                                                                                  // 绑定回调函数
```


rcl : ROS 2 client support library ROS2 客户端支持库

URL Link : [Programming with rcl and rclc]

update by zhaoxiangli 2023.04.25