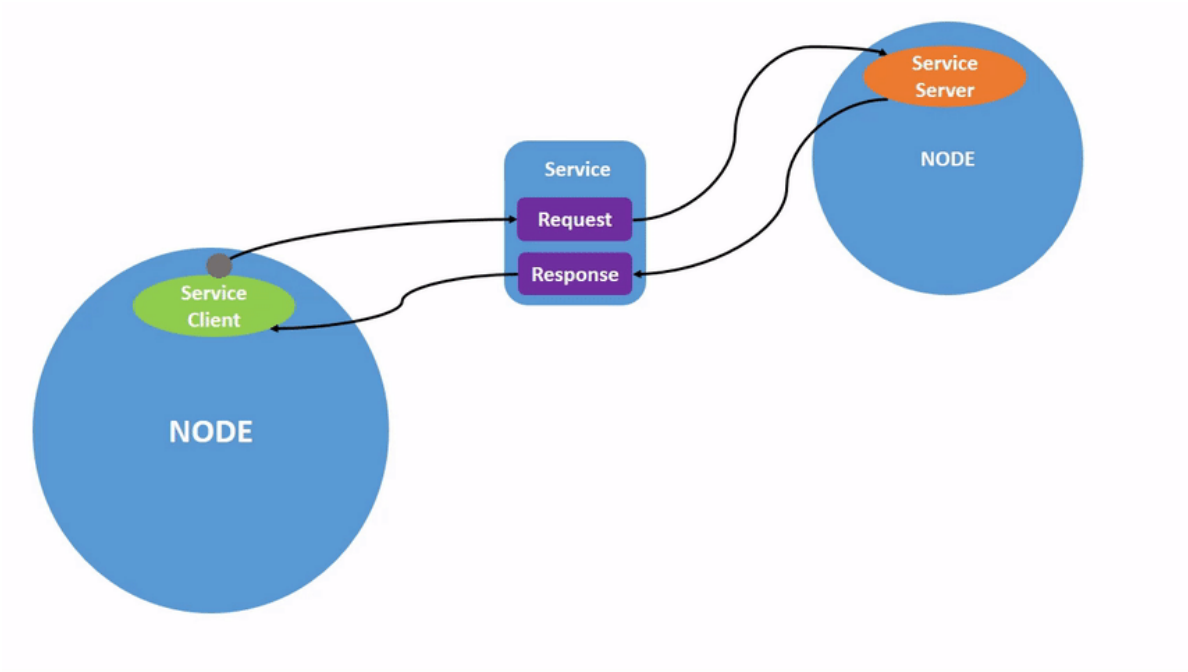
10.ROS2 service communication client

1. Introduction to service communication

Service communication is a communication model based on request and response. Between the two communicating parties, the client sends request data to the server, and the server responds to the client.

The client/server model is as follows:



From the perspective of the service implementation mechanism, this form of question-and-answer is called the client/server model, or CS model for short.When the client needs certain data, it sends request information for a specific service. After the server receives the request, it will process it and feedback the response information.

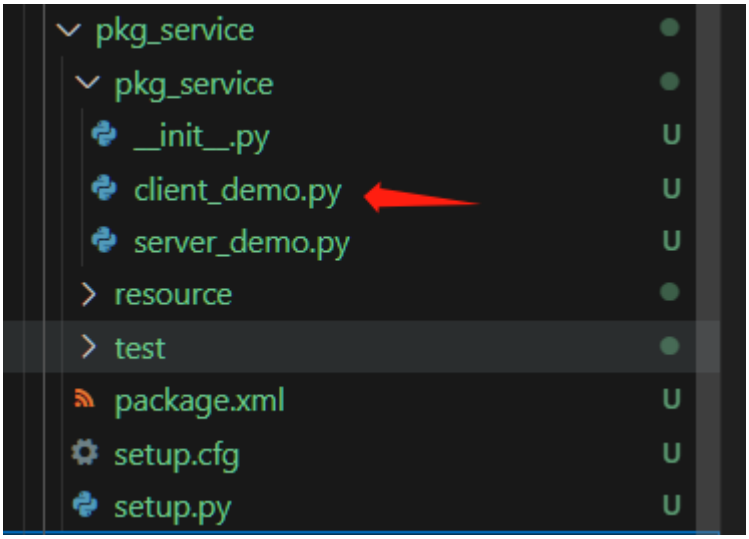
This communication mechanism is also very common in life, such as the various web pages we often browse. At this time, your computer browser is the client.Send a request to the website server through the domain name or various operations. After receiving it, the server returns the page data that needs to be displayed.

This case is located in the factory docker container. The source code location is:

```
/root/yahboomcar_ros2_ws/yahboomcar_ws/src/pkg_service
```

2. Client implementation

Create a new file [client_demo.py] in the same directory as [server_demo.py]

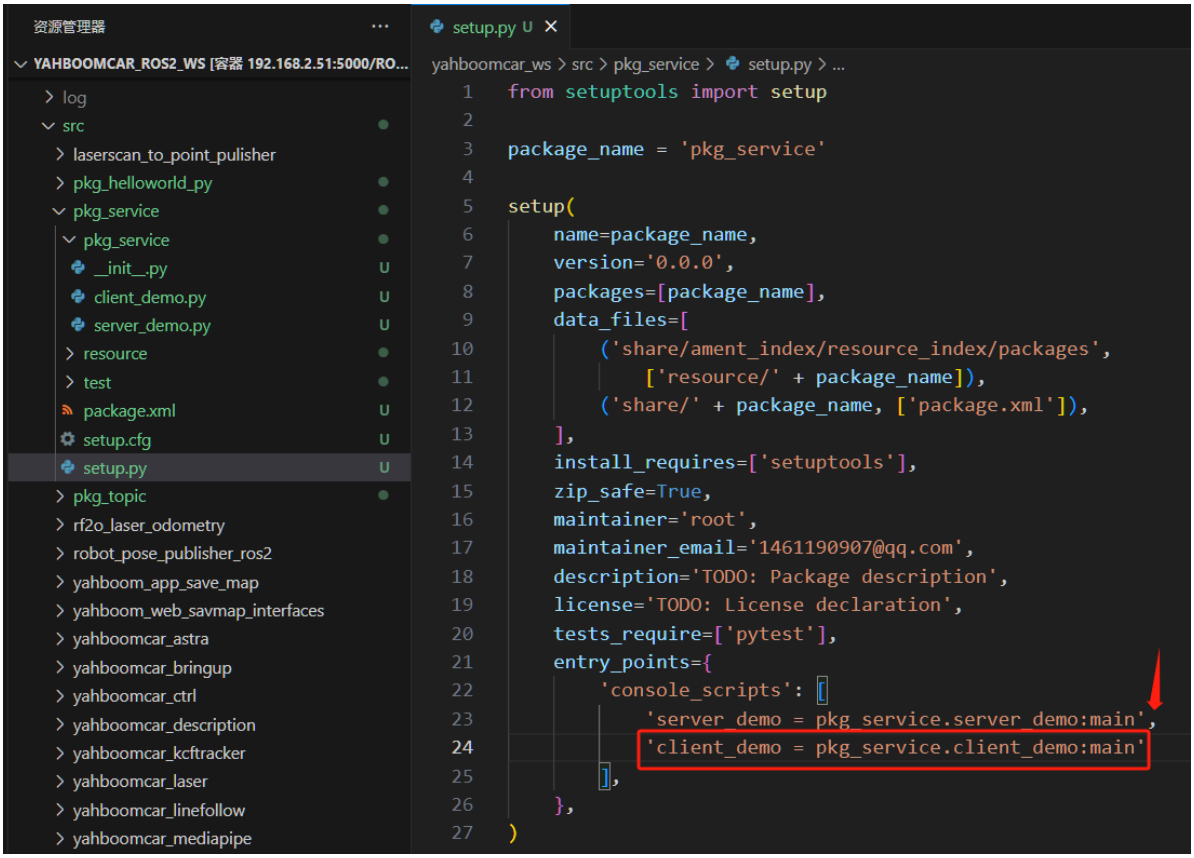


Next edit [client_demo.py] to implement client functions and add the following code:

```
#Import related libraries
import rclpy
from rclpy.node import Node
from example_interfaces.srv import AddTwoInts

class Service_Client(Node):
    def __init__(self,name):
        super().__init__(name)
        #To create a client, use the create_client function. The parameters
passed in are the data type of the service data and the topic name of the
service.
        self.client = self.create_client(AddTwoInts,'/add_two_ints')
        # Loop waiting for the server to start successfully
        while not self.client.wait_for_service(timeout_sec=1.0):
            print("service not available, waiting again...")
        # Create data objects for service requests
        self.request = AddTwoInts.Request()

    def send_request(self):
        self.request.a = 10
        self.request.b = 90
        #send service request
        self.future = self.client.call_async(self.request)

def main():
    rclpy.init() #Node initialization
    service_client = Service_Client("client_node") #Create object
    service_client.send_request() #send service request
    while rclpy.ok():
        rclpy.spin_once(service_client)
        #Determine whether data processing is completed
        if service_client.future.done():
            try:
                #Get service feedback information and print it
                response = service_client.future.result()
                print("service_client.request.a = ",service_client.request.a)
                print("service_client.request.b = ",service_client.request.b)
                print("Result = ",response.sum)
```

```
            except Exception as e:
                service_client.get_logger().info('Service call failed %r' %
(e,))
        break
    service_client.destroy_node()
    rclpy.shutdown()
```

3. Edit configuration file



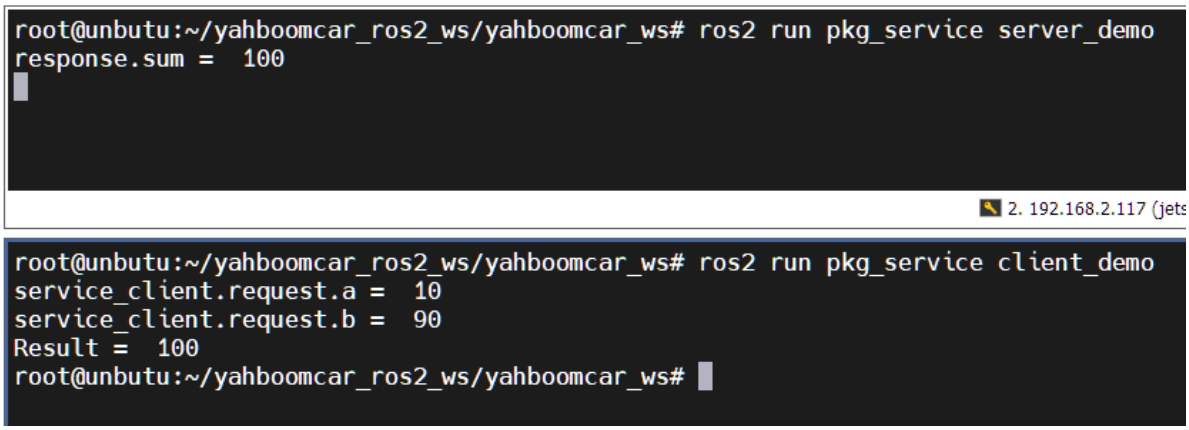
4. Compile workspace

```
cd ~/yahboomcar_ros2_ws/yahboomcar_ws
colcon build --packages-select pkg_service
source install/setup.bash
```

5. Run program

The sub-terminal execution is as follows:

```
#Start server node
ros2 run pkg_service server_demo
#Start client node
ros2 run pkg_service client_demo
```



Run the server first, then run the client. The client provides a=10, b=90. The server performs the sum and the result is 100. The result is printed on both terminals.