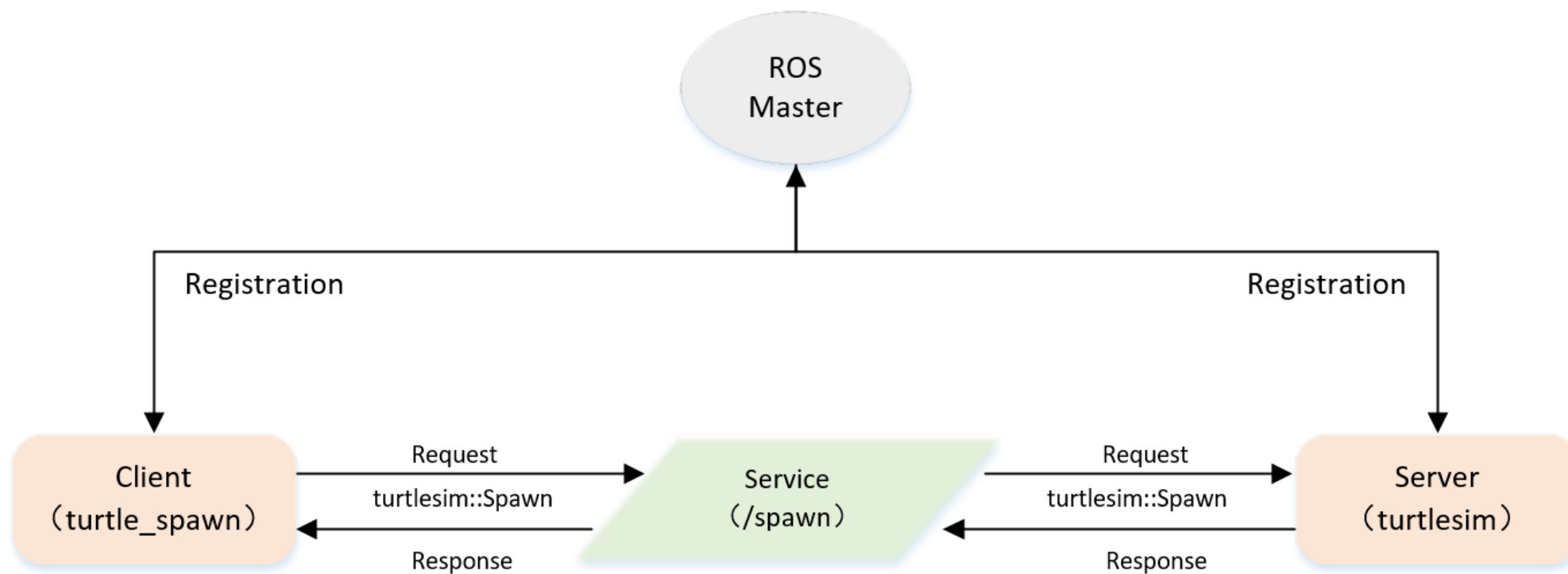


ROS入门
21讲

13.客户端Client的编程实现

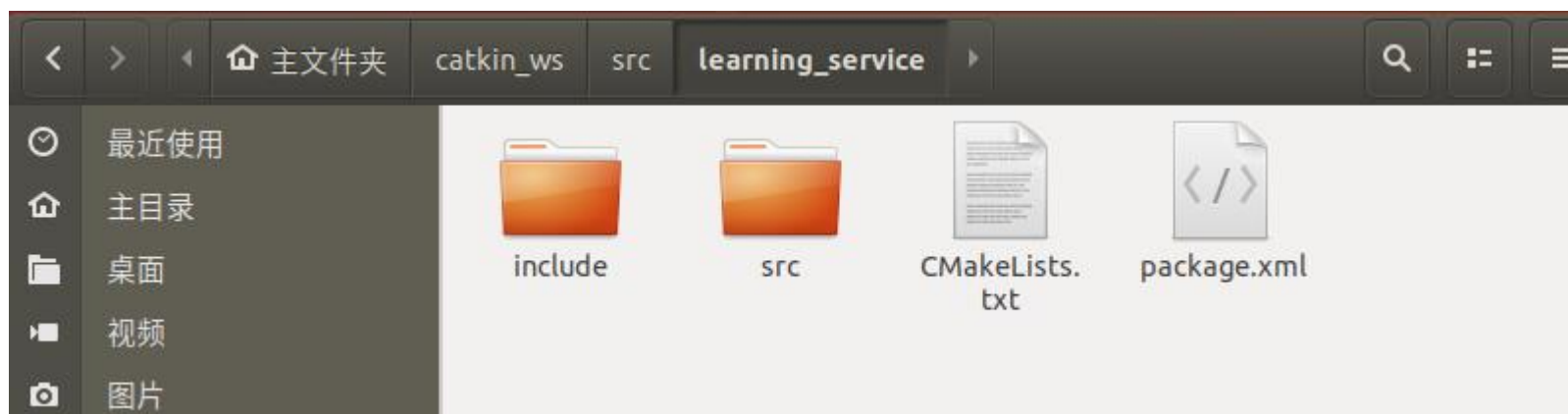
主讲人：古月



服务模型（客户端/服务器）

```
$ cd ~/catkin_ws/src
```

```
$ catkin_create_pkg learning_service roscpp rospy std_msgs geometry_msgs turtlesim
```



```
/**
 * 该例程将请求/spawn服务，服务数据类型turtlesim::Spawn
 */

#include <ros/ros.h>
#include <turtlesim/Spawn.h>

int main(int argc, char** argv)
{
    // 初始化ROS节点
    ros::init(argc, argv, "turtle_spawn");

    // 创建节点句柄
    ros::NodeHandle node;

    // 发现/spawn服务后，创建一个服务客户端，连接名为/spawn的service
    ros::service::waitForService("/spawn");
    ros::ServiceClient add_turtle = node.serviceClient<turtlesim::Spawn>("/spawn");

    // 初始化turtlesim::Spawn的请求数据
    turtlesim::Spawn srv;
    srv.request.x = 2.0;
    srv.request.y = 2.0;
    srv.request.name = "turtle2";

    // 请求服务调用
    ROS_INFO("Call service to spawn turtle[x:%0.6f, y:%0.6f, name:%s]",
            srv.request.x, srv.request.y, srv.request.name.c_str());

    add_turtle.call(srv);

    // 显示服务调用结果
    ROS_INFO("Spawn turtle successfully [name:%s]", srv.response.name.c_str());

    return 0;
};
```

turtle_spawn.cpp

如何实现一个客户端

- 初始化ROS节点；
- 创建一个Client实例；
- 发布服务请求数据；
- 等待Server处理之后的应答结果。

```
## Declare a C++ executable
## With catkin_make all packages are built within a single CMake context
## The recommended prefix ensures that target names across packages don't collide
# add_executable(${PROJECT_NAME}_node src/learning_service_node.cpp)

## Specify libraries to link a library or executable target against
# target_link_libraries(${PROJECT_NAME}_node
#   ${catkin_LIBRARIES}
# )

add_executable(turtle_spawn src/turtle_spawn.cpp)
target_link_libraries(turtle_spawn ${catkin_LIBRARIES})
```

如何配置CMakeLists.txt中的编译规则

- 设置需要编译的代码和生成的可执行文件；
- 设置链接库；

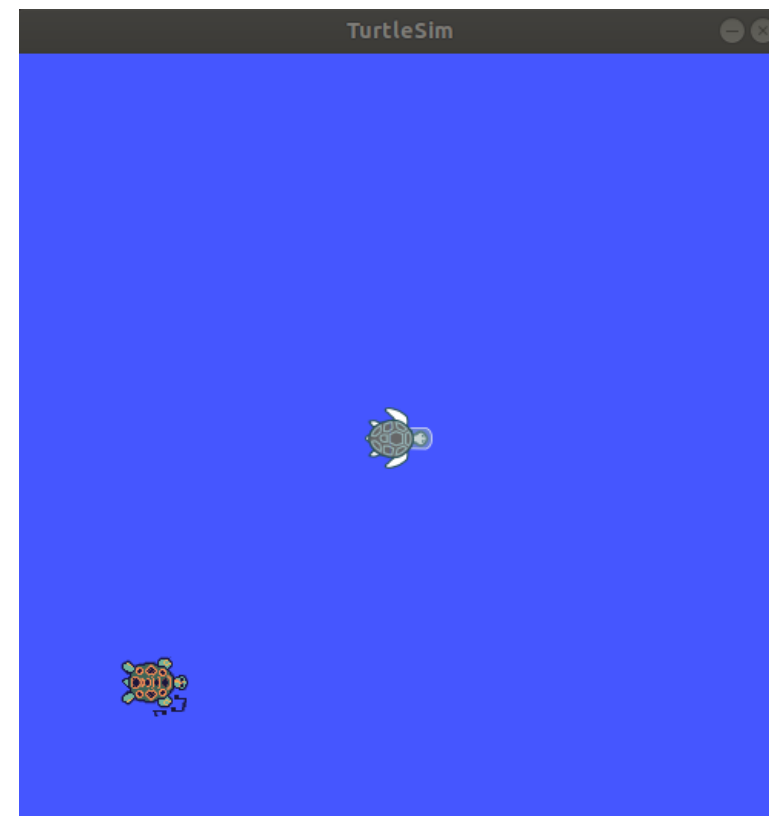
```
add_executable(turtle_spawn src/turtle_spawn.cpp)
target_link_libraries(turtle_spawn ${catkin_LIBRARIES})
```

CMakeLists.txt

- 编译并运行客户端

```
$ cd ~/catkin_ws  
$ catkin_make  
$ source devel/setup.bash  
$ roscore  
$ rosrun turtlesim turtlesim_node  
$ rosrun learning_service turtle_spawn
```

```
hcx@hcx-vpc:~/catkin_ws$ rosrun learning_service turtle_spawn  
[ INFO] [1562229607.294163534]: Call service to spawn turtle[x:2.000000, y:2.000000, name:turtle2]  
[ INFO] [1562229607.310459417]: Spwan turtle successfully [name:turtle2]
```



• 创建客户端代码 (Python)

```
#!/usr/bin/env python
# -*- coding: utf-8 -*-
# 该例程将请求/spawn服务, 服务数据类型turtlesim::Spawn

import sys
import rospy
from turtlesim.srv import Spawn

def turtle_spawn():
    # ROS节点初始化
    rospy.init_node('turtle_spawn')

    # 发现/spawn服务后, 创建一个服务客户端, 连接名为/spawn的service
    rospy.wait_for_service('/spawn')
    try:
        add_turtle = rospy.ServiceProxy('/spawn', Spawn)

        # 请求服务调用, 输入请求数据
        response = add_turtle(2.0, 2.0, 0.0, "turtle2")
        return response.name
    except rospy.ServiceException, e:
        print "Service call failed: %s"%e

if __name__ == "__main__":
    #服务调用并显示调用结果
    print "Spawn turtle successfully [name:%s]" %(turtle_spawn())
```

turtle_spawn.py

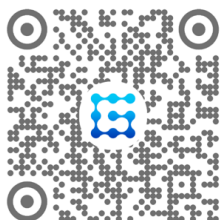
如何实现一个客户端

- 初始化ROS节点;
- 创建一个Client实例;
- 发布服务请求数据;
- 等待Server处理之后的应答结果。

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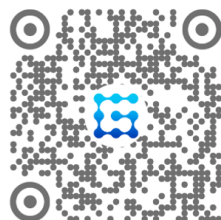
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