

1 新建工作空间

```
mkdir -p ~/catkin_ws/src
cd ~/catkin_ws/
catkin_make
```

2 新建功能包

```
cd ~/catkin_ws/src
# catkin_create_pkg 功能包名 [依赖功能包1] [依赖功能包2]...
catkin_create_pkg msgtest std_msgs roscpp
```

3 新建msg文件

```
cd ~/catkin_ws/src/msgtest/
mkdir msg
cd msg/
vim msg1.msg
```

在msg1.msg中写入以下内容：

```
int32 num
string str
```

4 新建发布文件pub.cpp

```
cd ~/catkin_ws/src/msgtest/src
vim pub.cpp
```

写入以下内容：

```
#include "ros/ros.h"
// msgtest是功能包名，msg1是msg文件名，编译成功后会在devel/include自动生成一个头文件
#include "msgtest/msg1.h"

int main(int argc, char **argv)
{
    ros::init(argc, argv, "msgpub"); // msgpub为节点的名字

    // 创建一个句柄
    ros::NodeHandle n;

    // 新建一个pub对象，<>中是自定义的msg文件，pub_msg为topic的名字
    ros::Publisher msg_pub = n.advertise<msgtest::msg1>("mymsg", 1000);

    // 发送频率
    ros::Rate loop_rate(10);
    while (ros::ok())
    {
        // 自定义的msg类的一个新变量，并赋值
        msgtest::msg1 msg;
        msg.num = 1024;
        msg.str = "hello slam";

        // 发送msg
        msg_pub.publish(msg);
        //ROS的printf
        ROS_INFO("Publish : number = %d string = %s", msg.num, msg.str.c_str());
        //循环刷新
        ros::spinOnce();

        loop_rate.sleep();
    }
    return 0;
}
```

5 新建订阅文件sub.cpp

```
cd ~/catkin_ws/src/msgtest/src
vim sub.cpp
```

写入以下内容：

```
#include "ros/ros.h"
#include "msgtest/msg1.h"

// 回调函数
void chatterCallback(const msgtest::msg1::ConstPtr& msg)
{
    ROS_INFO("I heard: [num = %d, string = %s]", msg->num, msg->str.c_str());
}

int main(int argc, char **argv)
{
    ros::init(argc, argv, "msgsub");
    ros::NodeHandle n;

    //新建一个sub, chatterCallback是回调函数名
    ros::Subscriber sub = n.subscribe("mymsg", 1000, chatterCallback);

    ros::spin();
    return 0;
}
```

6 修改配置文件

CMakelists.txt

```
cd ~/catkin_ws/src/msgtest/
vim CMakeLists.txt
```

在文件中第13行处添加上message_generation:

```
find_package(catkin REQUIRED COMPONENTS
    std_msgs
    roscpp
    message_generation
)
```

将50行处注释取消掉，并且按照下面代码修改：

```
add_message_files(
    FILES
    msg1.msg
)
```

将70行处注释取消掉，如下：

```
generate_messages(
    DEPENDENCIES
    std_msgs
)
```

在文件最后添加如下代码：

```
# msgpub是自定义节点名, pub.cpp是文件名
add_executable(msgpub src/pub.cpp)
# msgpub是节点名
target_link_libraries(msgpub ${catkin_LIBRARIES})
# msgsub是自定义节点名, sub.cpp是文件名
add_executable(msgsub src/sub.cpp)
# msgsub是节点名
target_link_libraries(msgsub ${catkin_LIBRARIES})
```

package.xml

```
cd ~/catkin_ws/src/msgtest/
vim package.xml
```

在58行之后加入：

```
<build_depend>message_generation</build_depend>
<exec_depend>message_runtime</exec_depend>
```

7 编译并运行

```
cd ~/catkin_ws/  
catkin_make  
roscore
```

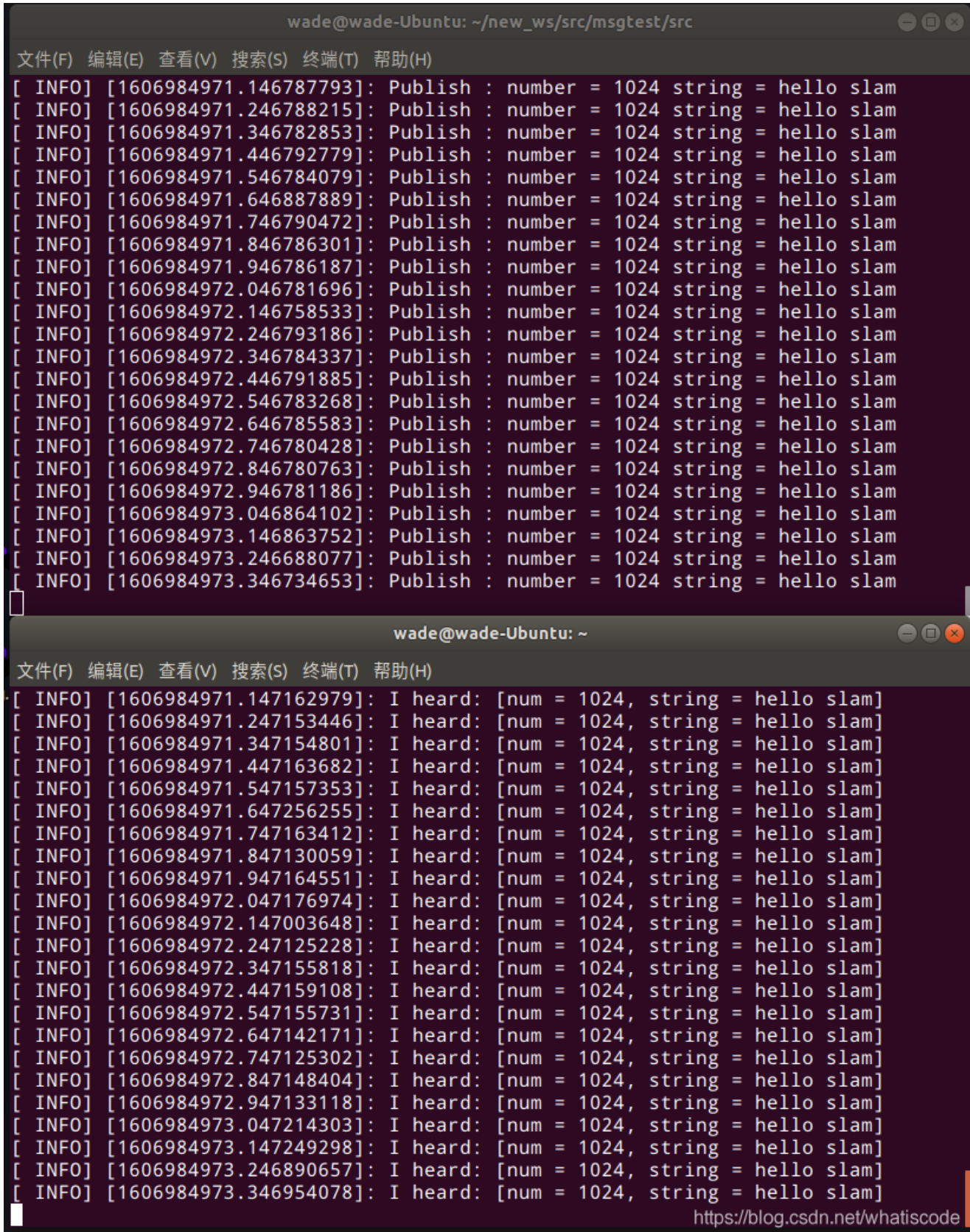
新建一个终端:

```
source ~/catkin_ws/devel/setup.bash  
roslaunch msgtest msgpub
```

再新建一个终端:

```
source ~/catkin_ws/devel/setup.bash  
roslaunch msgtest msgsub
```

大功告成:



The image shows two terminal windows from a Ubuntu system. The top window, titled 'wade@wade-Ubuntu: ~/new_ws/src/msgtest/src', is running the 'roslaunch msgtest msgpub' command. It displays a series of 20 'Publish' messages, each containing a unique timestamp and the text 'number = 1024 string = hello slam'. The bottom window, titled 'wade@wade-Ubuntu: ~', is running the 'roslaunch msgtest msgsub' command. It displays a series of 20 'I heard' messages, each containing the same timestamp and text as the top window, confirming successful message reception. Both windows have a menu bar with options: 文件(F), 编辑(E), 查看(V), 搜索(S), 终端(T), 帮助(H). A URL 'https://blog.csdn.net/whatiscode' is visible in the bottom right corner of the image.

```
wade@wade-Ubuntu: ~/new_ws/src/msgtest/src  
文件(F) 编辑(E) 查看(V) 搜索(S) 终端(T) 帮助(H)  
[ INFO] [1606984971.146787793]: Publish : number = 1024 string = hello slam  
[ INFO] [1606984971.246788215]: Publish : number = 1024 string = hello slam  
[ INFO] [1606984971.346782853]: Publish : number = 1024 string = hello slam  
[ INFO] [1606984971.446792779]: Publish : number = 1024 string = hello slam  
[ INFO] [1606984971.546784079]: Publish : number = 1024 string = hello slam  
[ INFO] [1606984971.646887889]: Publish : number = 1024 string = hello slam  
[ INFO] [1606984971.746790472]: Publish : number = 1024 string = hello slam  
[ INFO] [1606984971.846786301]: Publish : number = 1024 string = hello slam  
[ INFO] [1606984971.946786187]: Publish : number = 1024 string = hello slam  
[ INFO] [1606984972.046781696]: Publish : number = 1024 string = hello slam  
[ INFO] [1606984972.146758533]: Publish : number = 1024 string = hello slam  
[ INFO] [1606984972.246793186]: Publish : number = 1024 string = hello slam  
[ INFO] [1606984972.346784337]: Publish : number = 1024 string = hello slam  
[ INFO] [1606984972.446791885]: Publish : number = 1024 string = hello slam  
[ INFO] [1606984972.546783268]: Publish : number = 1024 string = hello slam  
[ INFO] [1606984972.646785583]: Publish : number = 1024 string = hello slam  
[ INFO] [1606984972.746780428]: Publish : number = 1024 string = hello slam  
[ INFO] [1606984972.846780763]: Publish : number = 1024 string = hello slam  
[ INFO] [1606984972.946781186]: Publish : number = 1024 string = hello slam  
[ INFO] [1606984973.046864102]: Publish : number = 1024 string = hello slam  
[ INFO] [1606984973.146863752]: Publish : number = 1024 string = hello slam  
[ INFO] [1606984973.246688077]: Publish : number = 1024 string = hello slam  
[ INFO] [1606984973.346734653]: Publish : number = 1024 string = hello slam  
[ INFO] [1606984971.147162979]: I heard: [num = 1024, string = hello slam]  
[ INFO] [1606984971.247153446]: I heard: [num = 1024, string = hello slam]  
[ INFO] [1606984971.347154801]: I heard: [num = 1024, string = hello slam]  
[ INFO] [1606984971.447163682]: I heard: [num = 1024, string = hello slam]  
[ INFO] [1606984971.547157353]: I heard: [num = 1024, string = hello slam]  
[ INFO] [1606984971.647256255]: I heard: [num = 1024, string = hello slam]  
[ INFO] [1606984971.747163412]: I heard: [num = 1024, string = hello slam]  
[ INFO] [1606984971.847130059]: I heard: [num = 1024, string = hello slam]  
[ INFO] [1606984971.947164551]: I heard: [num = 1024, string = hello slam]  
[ INFO] [1606984972.047176974]: I heard: [num = 1024, string = hello slam]  
[ INFO] [1606984972.147003648]: I heard: [num = 1024, string = hello slam]  
[ INFO] [1606984972.247125228]: I heard: [num = 1024, string = hello slam]  
[ INFO] [1606984972.347155818]: I heard: [num = 1024, string = hello slam]  
[ INFO] [1606984972.447159108]: I heard: [num = 1024, string = hello slam]  
[ INFO] [1606984972.547155731]: I heard: [num = 1024, string = hello slam]  
[ INFO] [1606984972.647142171]: I heard: [num = 1024, string = hello slam]  
[ INFO] [1606984972.747125302]: I heard: [num = 1024, string = hello slam]  
[ INFO] [1606984972.847148404]: I heard: [num = 1024, string = hello slam]  
[ INFO] [1606984972.947133118]: I heard: [num = 1024, string = hello slam]  
[ INFO] [1606984973.047214303]: I heard: [num = 1024, string = hello slam]  
[ INFO] [1606984973.147249298]: I heard: [num = 1024, string = hello slam]  
[ INFO] [1606984973.246890657]: I heard: [num = 1024, string = hello slam]  
[ INFO] [1606984973.346954078]: I heard: [num = 1024, string = hello slam]  
https://blog.csdn.net/whatiscode
```

