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Introduction to service and client ROS

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What is a Service?

- It is a request/reply communication paradigm.
- It is composed of two pair of messages, one for the request and one for the reply.
- Two nodes participate in the communication process.
- One node offers the service and other node request the service and wait for the response.
- A service is defined using **srv** files

Service type

- The service type is the package resource name of the .srv file, i.e. package name + name of the .srv file.
- E.g. mysrvs/srv/PolledImage.srv has the service type mysrvs/PolledImage

Service Tools

- rossrv - Displays information about .srv data structures.
  - rossrv show - Show service description
  - rossrv info - Alias for rossrv show
  - rossrv list - List all services
  - rossrv md5 - Display service md5sum
  - rossrv package - List services in a package
  - rossrv packages - List packages that contain services
- rosservice - Lists and queries ROS services
  - rosservice list - print information about active services
  - rosservice call - call the service with the provided args
  - rosservice type - print service type
  - rosservice find - find services by service type

1. Services (Theory)

2. Services (Practice)

3. Actions (Theory)

4. Actions (Practice)

5. Reference

Actionlib

- Actionlib stack gives a standardized interface containing reemptable tasks, i.e. tasks capable of being interrupted with the option of resuming the task at a later time.
- Actionlib package allows us to create servers that could perform "long-running" goals.
- Actions gives the ability to cancel a service request during execution.
- Actions are also useful to get periodic feedback about the request.
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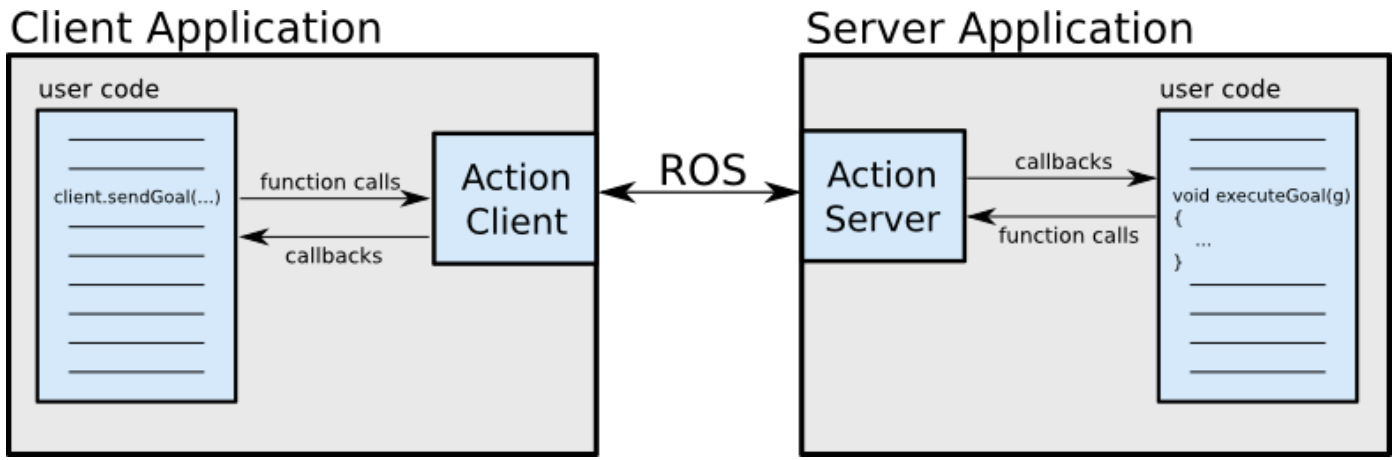
Client-Server Interaction

- The communication composed of two elements: ActionClient and ActionServer.
- The client allows the users to request "goals", while the server execute those goals.



Messages specification

- **Goal:** provides the sense of accomplishment for a certain task. It is sent to the ActionServer by the ActionClient.
  - *E.g. for a moving base, a goal could be a "PoseStamped" message that contains the information about where the robot should move.*
- **Feedback:** Allows the ActionServer to provides information about the current status of a certain goal to the ActionClient.
  - *E.g for a moving base, the current pose of the robot.*
- **Result:** message sent from the ActionServer to the ActionClient when the goal is completed.
  - *E.g. the final pose of our moving base.*

Messages specification

- The elements of the actions are specified in the **.action** file.
- The action files are placed in a **./action** directory inside the package.
- An example of the structure would be

```
#Define the goal
uint32 dishwasher_id
---
#Define the result
uint32 total_dishes_cleaned
---
#Define a feedback message
float32 percent_complete
```

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References

- http://wiki.ros.org/actionlib