

# Distributed systems with MsgFlo

Flow-Based Programming over message queues

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# Basic MQTT communication

```
// Motor.cpp
```

```
mqtt.subscribe("motor/start", start_motor);
```

```
// Button.cpp
```

```
mqtt.publish("motor/start", button_pressed);
```

+ Works OK

- Connections hidden in code
- Hardcoded functionality

# MsgFlo participant

```
// Motor.cpp
```

```
mqtt.subscribe("motor/start", start_motor);  
mqtt.publish("msgflo/discover", motor_info);
```

```
// Button.cpp
```

```
mqtt.publish("msgflo/discover", button_info);  
mqtt.publish("button/pressed", button_pressed);
```

+ Devices describe themselves

+ Reusable components

! Something need to connect the topics

# MsgFlo discovery message

```
{  
  "component": "fosdem2017/Button",  
  "role": "button",  
  "id": "button",  
  "label": "This is a button, it can be pressed",  
  "icon": null,  
  "outports": [{  
    "id": "pressed",  
    "type": "boolean"  
  }],  
  "inports": []  
}
```

# Bind topics together

```
# motorcontrol.fbp
```

```
button(Button) PRESSED → START motor(Motor)
```

```
...
```

```
motor RUNNING → RED warninglight(Lamp)
```

```
# bind the queues together
```

```
$ msgflo-setup motorcontrol.fbp
```

# Foreign participants

```
# existingdevice.yml
```

```
# send MsgFlo discovery message  
# on behalf of device  
$ msgflo-register-foreign existingdevice.yml
```

# Live programming

# Full stack

NoFlo on Node.js  
BUILDING NETWORK APPLICATIONS



NoFlo on GNOME  
DESKTOP APPLICATION DEVELOPMENT



MicroFlo  
MICROCONTROLLER PROGRAMMING



JavaFBP  
JAVA AND ANDROID PROGRAMMING



ImgFlo  
IMAGE MANIPULATION





Distributed systems,  
not isolated devices!

[msgflo.org](http://msgflo.org)

 flowhub

[@jononor](https://twitter.com/jononor)