

Firehose: a Unified Message Bus for Infra Services

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<https://github.com/mtreinish/firehose/tree/boston-summit>

OpenStack Infrastructure

Imagine a big, complicated diagram here.

Firehose

- ▶ An MQTT broker for the OpenStack community infrastructure
- ▶ Has anonymous, read-only access via MQTT on 1883/tcp
- ▶ SSL/TLS MQTT also available on 8883/tcp
- ▶ Websockets supported (but temporarily disabled)

MQTT

- ▶ Pub/sub messaging protocol
- ▶ Formerly MQ Telemetry Transport
- ▶ ISO/IEC PRF 20922
- ▶ Protocol dates back to 1999
- ▶ Lightweight design, low bandwidth

MQTT Topics

- ▶ Topics are hierarchical
- ▶ Support wild carding

MQTT Brokers

MQTT Clients

The Firehose

Mosquitto

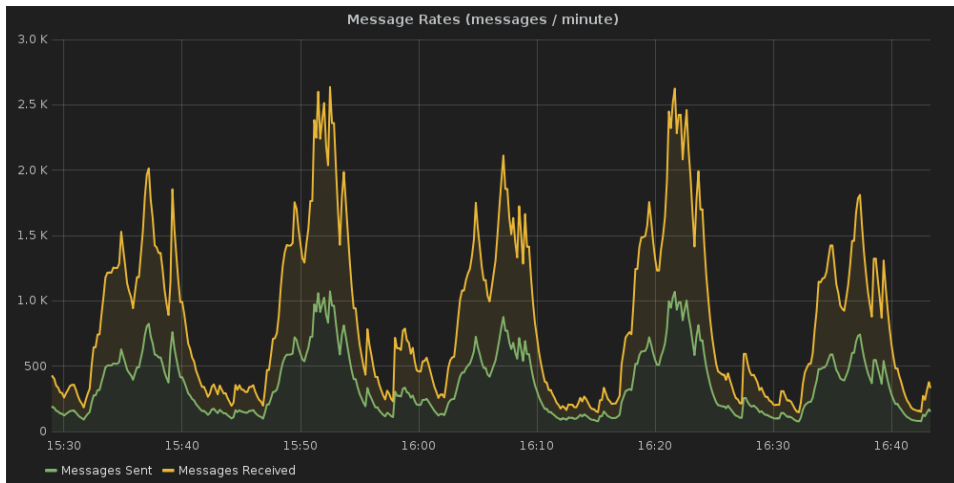
- ▶ MQTT broker implemented in C

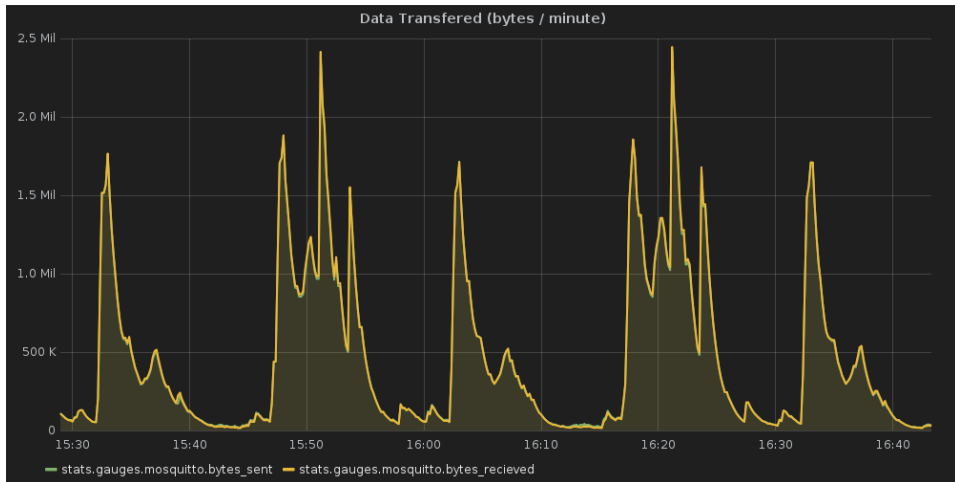


Services Using the Firehose

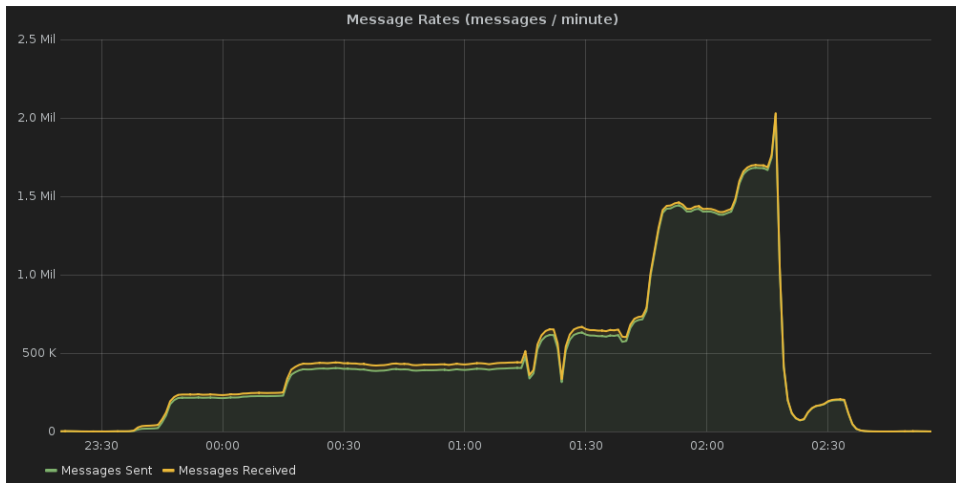
Service	Base Topic	Source of Messages
Ansible	ansible	Ansible MQTT Callback Plugin
Gerrit	gerrit	germqtt
Launchpad	launchpad	lpmqtt
Subunit Gearman Worker	gearman-subunit	subunit-gearman-worker

Typical Firehose Load

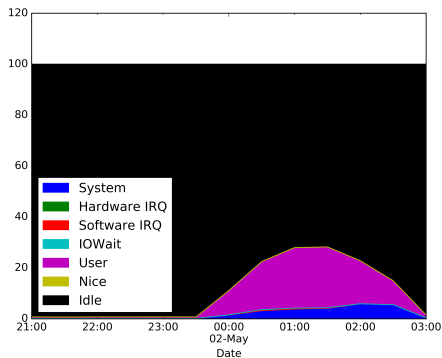




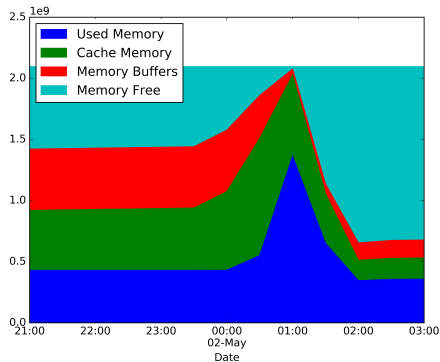
The limits of scaling



CPU Usage:



Memory Usage:



Using Firehose

Example mosquitto client subscriber command line (provided in a mosquitto-clients package on many distros):

```
mosquitto_sub -h firehose.openstack.org --topic '#'
```

Listen for all Nova Comments in python

► CLI:

```
mosquitto_sub -h firehose.openstack.org --topic  
gerrit/openstack/nova/comment-added
```

► Python:

```
import paho.mqtt.client as mqtt

def on_connect(client, userdata, flags, rc):
    print("Connected with result code " + str(rc))
    client.subscribe('gerrit/openstack/nova/comment-added')

def on_message(client, userdata, msg):
    print(msg.topic+" "+str(msg.payload))

# Create a websockets client
client = mqtt.Client()
client.on_connect = on_connect
client.on_message = on_message

# Connect to the firehose
client.connect('firehose.openstack.org', port=1883)

# Listen forever
client.loop_forever()
```


Potential Applications for Firehose

Future Plans

- ▶ Add germqtt subscription support to:
 - ▶ Zuul v3+
- ▶ Add more publishers:
 - ▶ Nodepool daemons
 - ▶ Zuul v3+
 - ▶ (your favorite service here)

Where to get more information

- ▶ openstack-infra ML openstack-infra@lists.openstack.org
- ▶ #openstack-infra on Freenode
- ▶ <http://docs.openstack.org/infra/system-config/firehose.html>
- ▶ https://docs.openstack.org/infra/system-config/firehose_schema.html
- ▶ <http://specs.openstack.org/openstack-infra/infra-specs/specs/firehose.html>
- ▶ <http://mqtt.org/>
- ▶ <https://mosquitto.org/>