MySQL and RabbitMQ

Or: OpenStack's core support softwares

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MySQL's role inside OpenStack

MySQL database assumes a core role in the set of support softwares inside OpenStack and is mainly used:

- for storing the state of the OpenStack cluster (VMs, users, volumes, tokens, etc),
- in the workflow of handling the various service requests (e.g. starting a new instance, creating a volume).

An alternative of MySQL in OpenStack could be any database supported by sqlalchemy.
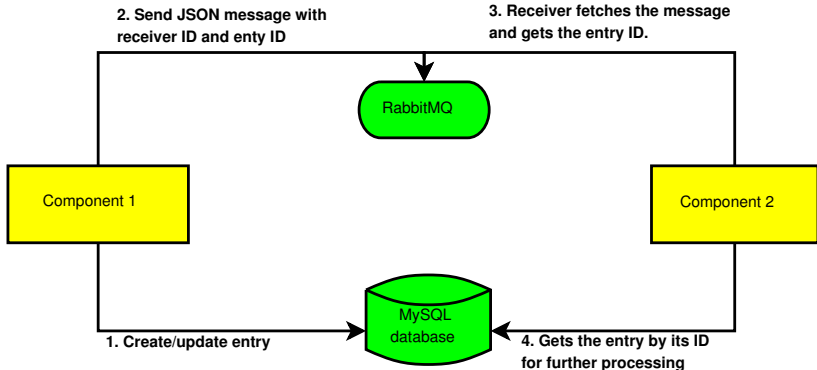
RabbitMQ's role inside OpenStack

The *RabbitMQ* messaging system, used like Remote Procedure Call (RPC), is the second core support software and is mainly used:

- to provide a communication layer between the different stack components,
- as a consequence to enable the collaboration between the components.

The usage of RabbitMQ prevents the processes from polling the DB at every interaction.

Alternatives of RabbitMQ inside OpenStack are Qpid and ZeroMQ.

Example of RabbitMQ and MySQL usage during instance creation

2. Send JSON message with receiver ID and enty ID

3. Receiver fetches the message and gets the entry ID.

RabbitMQ

Component 1

Component 2

MySQL database

1. Create/update entry

4. Gets the entry by its ID for further processing

Example of RabbitMQ and MySQL usage during instance creation

- a client sends a POST request to nova-api for a VM provisioning,
- nova-api writes an entry in the **DB**,
- nova-api posts then a JSON message in **RabbitMQ** queue (the message is for nova-scheduler),
- nova-scheduler reads the JSON message from **RabbitMQ**,
- it examines the overall cluster situation from the **DB**,
- nova-scheduler then decides which compute should start the VM and posts JSON message in its **RabbitMQ** queue,
- nova-compute gathers then the request information (from the **RabbitMQ** and **DB**) and proceeds with the VM provisioning.

MySQL High Availabiltiy

MySQL is one of the most critical components because it contains the state of the whole Stack. Solutions could be:

– OpenStack recommended: DRBD + Pacemaker. Master-slave implementation.

– Galera. Active-active (N+1) implementation.

– MySQL native replication mechanisms. Master-slave implementation.

This link provides more information.

RabbitMQ High Availabiltiy

RabbitMQ can be configured in HA to prevent communication failure between the OpenStack components. Solutions could be:

- – OpenStack recommended: DRBD + Pacemaker.
- – RabbitMQ native replication mechanisms. Active-active (even if implementation is actually an active-slave).

This link provides detailed information.

Notes and Remarks

- – Installation of MySQL and RabbitMQ is really straight forward and requires limited intervention.
- – Configuration of RabbitMQ is limited to changing the default passwd and the bind address.
  - – Conf. file is /etc/rabbitmq/rabbitmq-env.conf
  - – Logs directory is: /var/log/rabbitmq
- – Configuration of MySQL requires a little bit more than RabbitMQ.
  - – Conf. file is: /etc/mysql/my.cnf
  - – Logs directory is: /var/log/mysql
- – We will see everything in more detail during the tutorial.