

Performance Testing and Analysis of Qpid-Dispatch Router

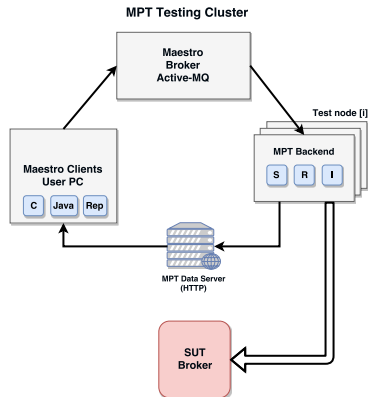
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June 18, 2018

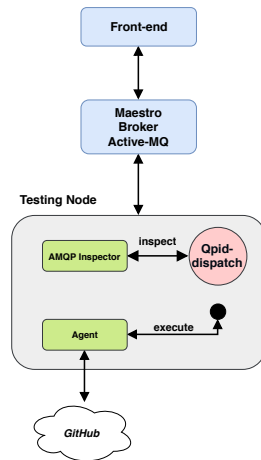


- What is Maestro?
 - ▶ Performance tool for **Message-oriented middleware**.
 - ▶ Automated, provides reporting.
 - ▶ Single node, multi node or cluster testing.
- Capabilities
 - ▶ **Throughput** measurements.
 - ▶ **Latency** measurements.



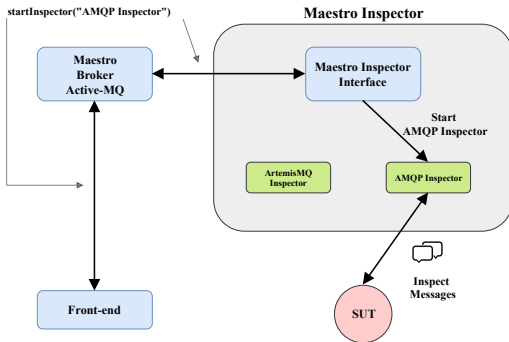
Extensions: Maestro-Agent

- Enables automatic **SUT** (Software Under Test) changes during the test.
- Implements **Groovy** code handler.
- Can fetch and process the **external repositories**.
- The agent tries to execute all scripts in the repository directory.
- The repository URL and directory is specified in the test script.



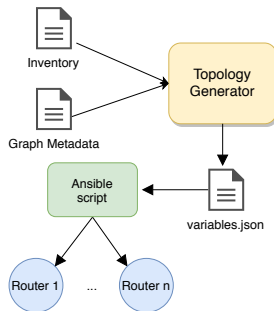
Extensions: AMQP Inspector

- Enables the automatic monitoring of **Qpid-dispatch** router.
- Request-response mechanism over **AMQP**.
- AMQP Inspector sends requests to the **AMQP Management** continually every few seconds.
- AMQP Inspector specification can be changed in the test script.



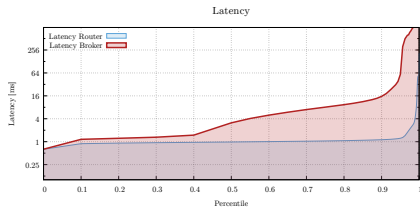
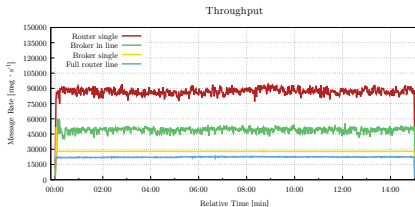
Extension: Topology Generator

- Simplifies the test preparation steps.
- Semi-automatic generation of the configuration files for the routers.
- Metadata are transformed into variables for the configuration files.
 - ▶ Inventory
 - ▶ Graph File
- Automatic deployment of the configuration files by **Ansible**.



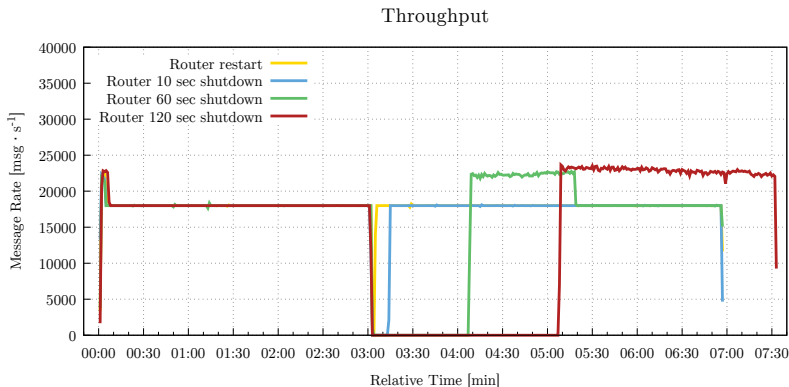
Experimental Evaluation

- **Latency vs. Throughput vs. Behavioral** testing.
- The figure shows the throughput and latency comparison of **Apache ActiveMQ Artemis** and **Qpid-Dispatch**.



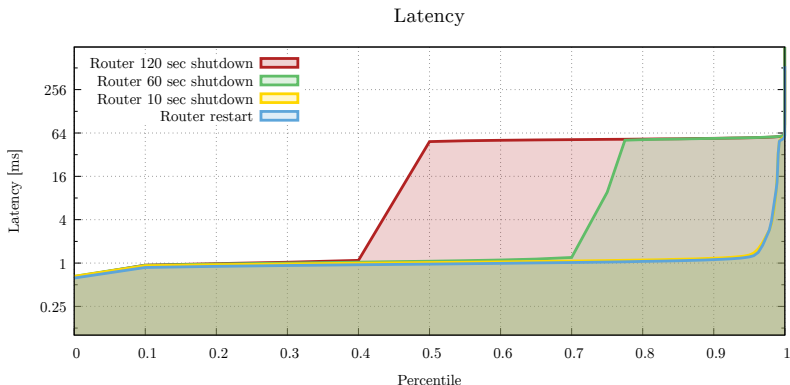
Experimental Evaluation with the Agent

- Latency and throughput can be affected by the **Agent**.
- The figure shows the throughput of the several test scenarios with the agent.



Experimental Evaluation with the Agent

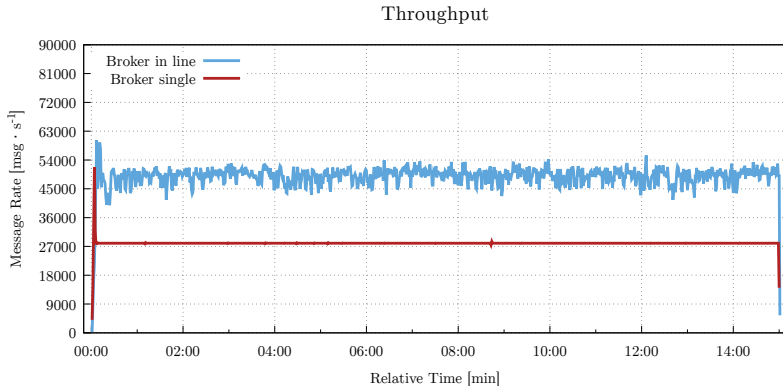
- The figure shows behavioral test case, during which one node of the topology is shut down.



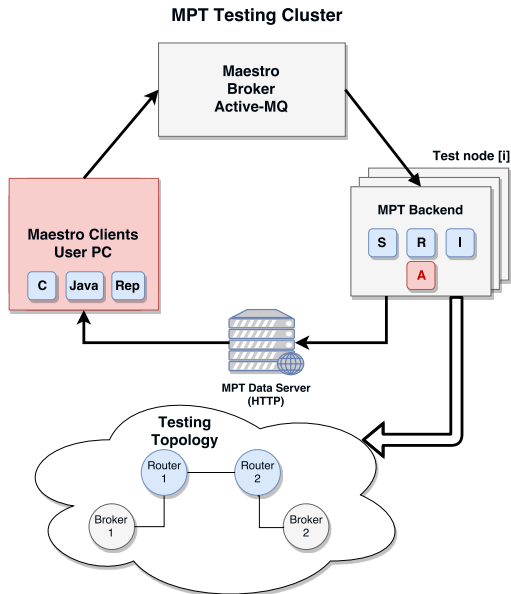
- Extensions of the Maestro
 - ▶ **Maestro-Agent**
 - ▶ **AMQP Inspector**
 - ▶ **Topology Generator** (external tool)
- Experimental Evaluation
 - ▶ **Throughput** and **latency**, **behavioral** testing.
 - ▶ Single node, multi node or cluster topologies.
 - ▶ Topologies consists of **Qpid-Dispatch** and **Apache ActiveMQ Artemis**.
 - ▶ Automatic generation of specific topologies.

Reviewer's Question

- Jak si vysvětlujete to, že **Apache ActiveMQ Artemis** má při společném zapojení s **Qpid-Dispatch** routery větší výkon, než když je zapojen samostatně?

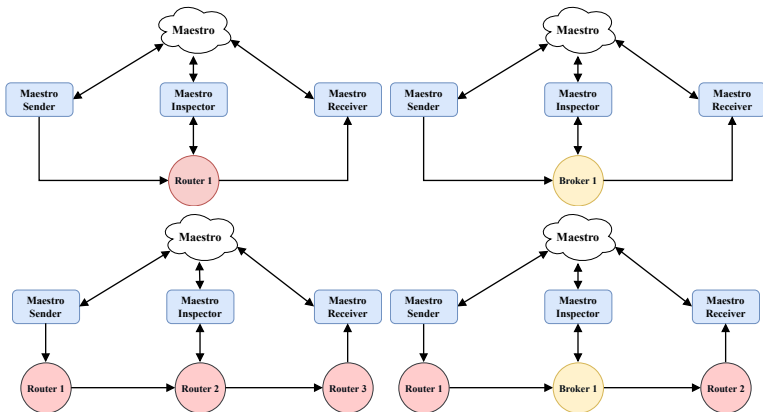


Final Architecture



Experimental Evaluation Topologies

- Used for **Latency, Throughput, Behavioral** testing.
- The figures shows topologies used for the experimental evaluation.



Agent Topology

- The topology used for the behavioral testing and analysis.

