



Varroa

MQTT-Scenario-Testing-Tool

Masters Level Study Project, Prof. PhD. Siebert
SS 2018 - WS 2018/2019

R. Atherton, S. Baier, S. Giebl, G. Held, Y. Weber, T. Weiden

Contents

1 Vision	2
2 Requirements	3
3 Scenario Concept	5
4 Architecture	6
4.1 Chunk Handshake	7
List of Figures	8
List of Tables	9

1 Vision

The Name of our MQTT-Testing-Tool (Varroa) is inspired by the varroa mite, which is a species of mite that infects honey bee colonies. This name has been chosen due to it working in a similar way but instead of infesting a hive, it tries to infest a broker. The inspiration for this name came from the broker 'HiveMQ' and it's branding. The basic use-case of Varroa is testing the resilience of brokers by creating load. Hereby load is defined by a number of MQTT-clients sending different sequences of MQTT-messages to the broker. Which sequences get carried out in which order is determined by a Scenario. A scenario defines the temporal execution as well as the amount of actions across a MQTT-network and the topology of the network. The motivation for the creation of this project was the lack of testability of MQTT-systems.

Varroa is organized as a distributed system, due to the impossibility of creating enough MQTT-clients on a single machine to overload a MQTT-broker, especially if the broker is also a distributed system.

2 Requirements

2 Requirements

#	Title	User Story	Importance
1	Transparency	Varroa has to be comprehensible for the user.	Must have high
2	10.000.000 MQTT Clients	Varroa has to be able to generate a large amount of clients.	Must have high
3	Scalability	Varroa should scale vertically with relatively low scaling costs.	Must have
4	Determinism	Varroa has to work in deterministic ways, meaning it should produce the same result for a Scenario every time.	Must have
5	Distributed	Varroa is a distributed System.	Must have low
6	Usability	Varroa has to be easily usable.	Very important
7	Code Quality	Varroa's coding quality should be very high.	Important
8	Stability	Varroa has to run in a stable manner.	Important
9	Resource efficiency	Varroa has to use the available computation and memory resources efficiently.	Important
10	User / Developer Guide	Varroa needs a User / Developer Guide.	Somewhat important
11	Automation capacity	Varroa should be automatable	Somewhat important

3 Scenario Concept

4 Architecture

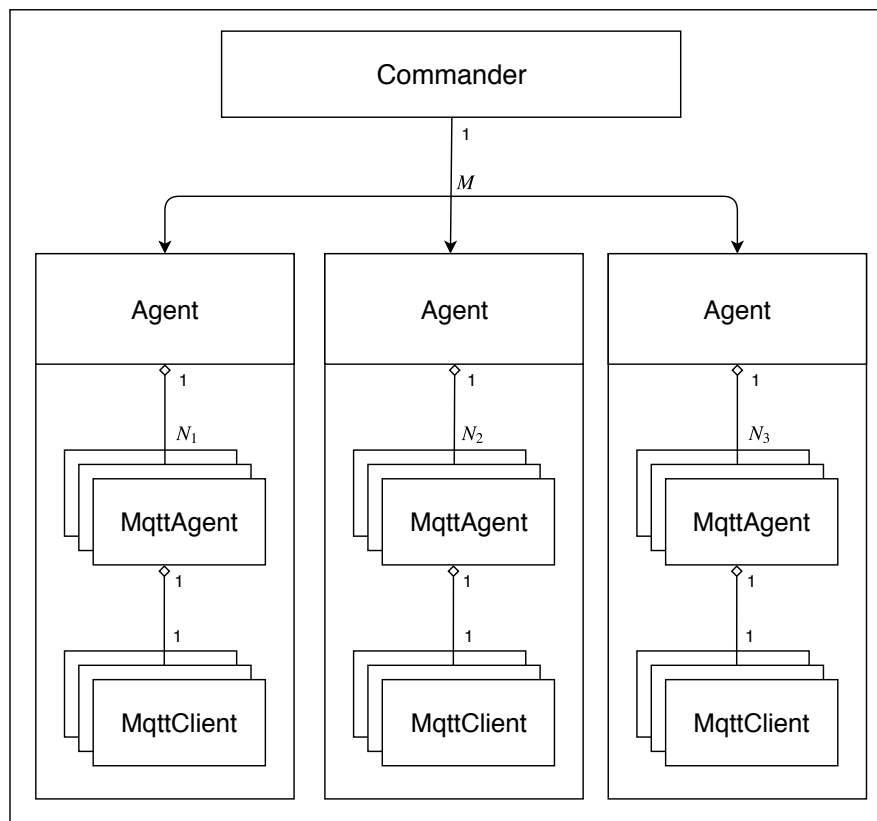


Figure 4.1: Varroa Distributed System Architecture

4.1 Chunk Handshake

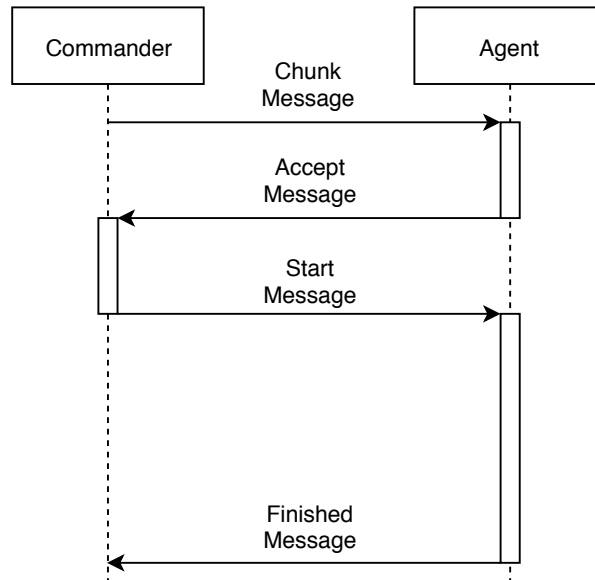


Figure 4.2: Chunk Handshake with Accept

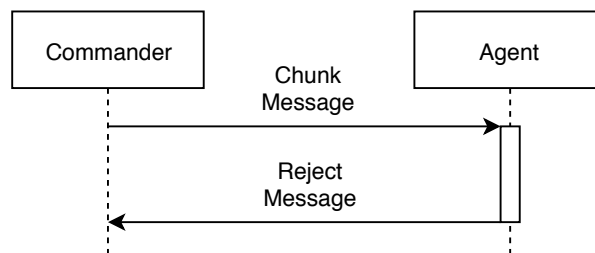


Figure 4.3: Chunk Handshake with Reject

List of Figures

4.1	Varroa Distributed System Architecture	6
4.2	Chunk Handshake with Accept	7
4.3	Chunk Handshake with Reject	7

List of Tables