A study of the naming convention used for topics in distributed MQTT brokers' environment

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University of Dublin, Trinity College, 2022

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The world revolves around the Internet and accessing information through the Internet. The traditional Internet infrastructure uses a host-centric paradigm. There are various disadvantages that come into notice after different research has been conducted. So, a new paradigm for the future Internet has been introduced that is away from the host-centric paradigm and provides perpetual connectivity, an end-to-end principle. This paradigm is Information-centric networking (ICN). In this type of network architecture focal point is identified information or content or data.

In 2021, there were more than 10 billion IoT devices active. Also, It has been estimated that this number could grow up to 25.4 billion in 2030. These IoT devices use Message Queuing Telemetry Transport (MQTT) protocol for communication purposes. MQTT has been based on the Publish-Subscribe Internet Routing Paradigm (PSIRP), Which ideally a one of ICN architecture.

ICN architecture maps a name to content. That is why naming plays an important role in terms of routing. This research focuses on studying the advantages and disadvantages of different naming conventions in distributed MQTT broker architecture and also observing their effects on naming conventions in different topologies. It involves the implementation of the different naming conventions, such as a hierarchical naming convention and a hybrid naming convention which could be used in real-time scenarios in distributed MQTT broker. As mentioned earlier, It involves studying the effect of this naming convention on different topologies. In terms of topology, namely chaining, i.e. hierarchical topology and clustering, topology took into consideration. The evaluation has been conducted between the topology and naming convention with the help of different evaluation attributes.