Eclipse Amlen

Messaging for IoT/Web/Mobile

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Amlen is designed to make it simple to reliably and securely connect mobile, web and Internet of Things devices.
Often Web/Mobile as well as more typical IoT
1.0 was a major milestone for us
Example Usecases

• Automotive
  - Car to Base communication
  - Factory Monitoring/Automation

• Banks – Mobile Apps
• Garage Door Openers
• White Goods
• Lifts
Installation Options for Linux

- Standard Linux RPM
  - CentOS, UBI or RHEL (look for volunteers to package for other distributions)
- Cloud configurations
- Allows other software to be installed
  - Monitoring, security, administration
- Cloud, Virtualized environments
  - Public or private
- Support for containers – comes with an example Dockerfile
Server Dashboard

An overview of server connections and performance.

Quick Stats

Active connections: 411
Messages / second: 129 K
MessageSight uptime: 3h 13m

Disc: 24%
Memory: 28%
Buffered Messages: 0
Retained Messages: 0
Last Updated: 1/21/19 2:20:41 PM

Active Connections and Throughput
Visit on your phones:
https://mqtt.coralbark.net
Edit Topic Policy
A topic policy authorizes connected clients to perform specific messaging actions, such as which topics the client can access on IBM IoT MessageSight. Each endpoint must have at least one topic policy, subscription policy, or queue policy.

<table>
<thead>
<tr>
<th>Messaging Policy</th>
<th>Endpoints</th>
<th>Max Messages</th>
</tr>
</thead>
<tbody>
<tr>
<td>DeepQ</td>
<td>1</td>
<td>20,000,000</td>
</tr>
<tr>
<td>DemoTopicPolicy</td>
<td>2</td>
<td>5,000</td>
</tr>
</tbody>
</table>

Total: 2 Selected: 1

To restrict the messaging actions that are defined in this policy to specific clients, specify one or more of the following filters. For example, select Group ID to restrict this policy to members of a particular group. The policy allows access only when all of the specified filters are true.

- **Client IP Address:**
- **User ID:**
- **Certificate Common Name:**
- **Client ID:**
- **Group ID:**
- **Protocol:**

Specify the resources and messaging actions that the client is permitted to access:

- **Topic:**
- **Authority:**
  - Publish
  - Subscribe

Subscriber Settings
- **Max Messages:** 20,000,000
- **Max Messages Behavior:** Reject new messages
- **Disconnected Client Notification:**

Publisher Settings
- **Max Message Time To Live:** unlimited

Save | Cancel
Policies can have variables substitution, a small number of policies can apply to many users and topics
Reliability: Highly Available (HA) Pairs

• An HA Pair is consists of a actively running system (“Primary”) and another Amlen ready to take over (“secondary”).

• Communication between Primary & Secondary takes place over two separate Network Interfaces (discovery & replication) to minimise chances of “Split Brain”

• Messages (QoS > 0) are recorded at both systems before ack is sent to client.

• No Shared Storage
Clusters add a link that messages can flow over between Amlen Servers.

“Device-like” subscriptions made on one server are advertised around the cluster and other nodes in the cluster forward publications to a server if it has matching subscriptions.
**Bi-directional Bridge** to MQTT Servers Allows:
- Hierarchies of Amlen Servers
- Connection to other MQTT servers

**Uni-directional message** forwarding to Kafka
(e.g. IBM Event Streams)

Allows *rewriting* topic strings

Allows *message selection* on message properties
A single instance can scale up to 100,000s of connections.

(Rough rule of thumb 4000 connections per 1Gb of RAM)

A single instance can support throughputs of 100,000s messages per second

*Performance Report* (Machine Specs and Test Scenarios)
https://www-01.ibm.com/support/docview.wss?uid=ibm10739413
2022 so far

• Formal 1.0 Release

• Multiple companies offer paid support

• “Donor” Message Gateway product went End-of-Life

• Amlen used in production by a variety of companies

• Embedded into IBM’s Maximo Application Suite.
The Future

- 1.1 release
  - Main feature is a Kubernetes Operator

- Improved How-To Guides
  - Existing Docs good at reference
  - Want “opinionated” – get going quickly

- Submit server component upstream to Linux Distros
  - (starting with Fedora?)
Help Wanted

- Tutorials/Guides
- Website
- Programmers (features/bug fixes/tests)
- Linux Packagers
• Website: https://www.eclipse.org/amlen

• Github: https://github.com/eclipse-iot/amlen

• Slack Channel: #amlen on eclipse-iot-wg.slack.com

• Blog: https://amlen.org
Questions?