

How to Monitor and Observe IoT and MQTT Applications with HiveMQ





IoT Observability

Presentation by David Guschakowski

Speaker



David Guschakowski

Sales Engineer

david.guschakowski@hivemq.com

ttps://www.linkedin.com/in/david-guschakowski/

- David is Sales Engineer at HiveMQ and serves customers by identifying their needs and providing them with technical support.
- He has provided project and sales consulting services for many years in the areas of data and application integration, data management and messaging. Using this experience, he is helping HiveMQ customers to achieve best possible outcomes with their IoT solutions.
- His main focus is maintaining a high level of customer satisfaction at HiveMQ.

Agenda

- Differences of observability in classic IT and IoT
- Challenges that come with IoT
- Example production issue
- HiveMQ's capabilities that help customers reduce time to solution
- Live Demo

IT Vs. IoT Observability

IT Applications are:

- Distributed applications at large scale
- Network of well known actors
- Operate over reliable networks
- Mostly persistent access
- Mostly visibility into data flows
- Mostly single node applications

IoT Applications are:

- Distributed applications at massive scale
- Network of black boxes
- Operate over unreliable networks
- No persistent access
- No visibility into data flows
- Crucial components are distributed



IoT Challenges: Identifying Errors in Noise



Many IoT applications are based on messaging

- Lost messages can create problems for an application
- Messages that are late to arrive can also create problems

IoT devices can lose messages

- Programming errors
- Networking error
- Hardware errors

IoT Challenges: Too much data



IoT applications can generate too much data for traditional analysis

- Network Monitoring tools such as Wireshark can be overwhelmed with the amount of IoT Data
- Analysis of live data has impact on performance
- Filters are needed to limit performance impact and reduce time to identify issues in clients or topics

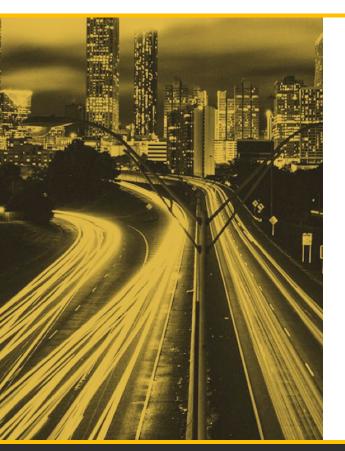
IoT Challenges: System of Systems



IoT applications are made up of many systems

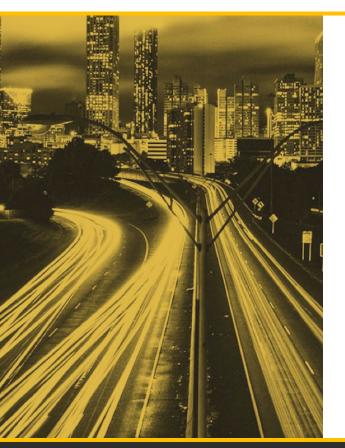
- Need to understand health of each service
- Services should generate metrics that can be used for a single application specific monitoring view
- Expose system related data e.g. memory, CPU, disk usage
- Expose MQTT related data e.g. connections, inbound publish rate, outbound publish rate

Production Issue in Car Sharing Service



- One day 8,000 cars in Frankfurt did not work
- Call center overwhelmed with support calls
- Overall system appears as a black box for the Call center
- They only see that the system is not working and is slow

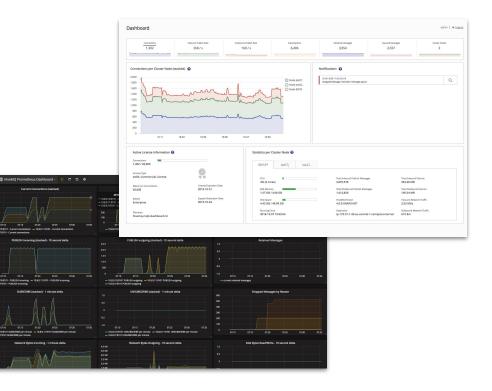
Production Issue in Car Sharing Service



- HiveMQ, the MQTT broker, a central part of the system was able to provide visibility
- Used HiveMQ Control Center to discover the issue was with the cellular network provider not in the application layer

System Monitoring

- HiveMQ Control Center allows for monitoring of system health of the HiveMQ broker
- JMX endpoint and extensions enable integration into any existing application performance monitoring tool



Logging

- HiveMQ uses Logback and therefore supports multiple logging appenders
- Easy to integrate logging consolidation like Syslog
- Multiple log files
- Easy to create separate files for custom extensions

1	<configuration></configuration>
	<configuration></configuration>
2	
3	
4	<appender class="ch.qos.logback.classic.net.SyslogAppender" name="SYSLOG"></appender>
5	
6	// IP-Address of your syslog server
7	<sysloghost>\$IP-Address</sysloghost>
8	
9	<facility>user</facility>
10	// replace X with the actual node
11	<pre><suffixpattern>[nodeX] %-30(%d %level)- %msg%n%ex</suffixpattern></pre>
12	
13	
14	<root level="DEBUG"></root>
15	<appender-ref ref="SYSLOG"></appender-ref>
16	
17	
18	111
19	
20	

Client & Topic Tracing

HiveMQ Trace Recording allows to:

- Specify time frame to record
- Specify range of devices to record
- Set filters for MQTT topics to trace
- Set MQTT Messages to trace
- Enables fine grained diagnostics and debugging of irregular behaviour while dealing with millions of actors and events per second

Basic Settings 🛛		Start Trace Records
Name	Suit End	
Trace, Recordings	2019-06-25 13:29:30	
Filters O		
Current Filters		
ClientD IDSC N		
Client identifier	Tepic	
Add Clientid Filter	 Add Topic Filter 	
Trace Recording Contents @		
note networking contents 🗸		
MQTT Messages 😧		
CONNECT		
CONNACK		
SUBSCRIBE		
SUBACK		
V PUBLISH		
V PUBACK		
PUBREC		
PUBREL		
PUBCOMP		
UNSUBSCRIBE		
UNSUBACK		
PRIVGREQ		

Device Health

- HiveMQ Control Center allows to • query and list all present devices
- Drill down into each to show the • health and connection information of a specific device
- **Client Event history** •

Date 0 Date 0 Pertain Variant Data man data 3 and 2 and 3	P Address
dest Starthanbackgold V serf serf 13.0 d dest Starthanbackgold V V and 1 13.2 d dest StartGoppassMap1 V V and 1 13.2 d dest StartGoppass V V and 4 13.2 d dest StartGophanGCattrin V V and 4 13.2 d dest StartGophanGCattrin V V and 4 13.2 d	
dest Starthambrackel V ver series 33,16 dest Starthambrackel V ver am0 32,26 dest Starthambrackel V Ver aem1 32,36 dest Starthambrackel V Ver aem1 32,36 dest Starthambrackel V Ver aem2 32,36 dest Starthambrackel V Ver aem3 32,36 dest Starthambrackel Ver aem4 32,36 32,36 dest Starthambrackel Ver aem4 32,36 32,36 dest Starthambrackel Ver aem4 32,36 32,36 dest Starthambrackel/Startha	
0er10 %000000000 V ver0 europ 12.0.0 der10 %000000000 V V ver01 12.0.0 der10 %000000000 V V ver01 12.0.0 der10 %0000000000 V V ver01 12.0.0 der10 %00000000000 V V ver01 12.0.0 der10 %00000000000000000 V V ver01 12.0.0 der10 %00000000000000000000000000000000000	
dent 1 standbagewaktit • • weft 12.08	
ent 10 50000503/1044 · · · · · · · · · · · · · · · · · ·	
deter M-senzites.05070C0_0H/ ・・・・・・・・・・・・・・・・・・・・・・・・・・・・・・・・・・・・	
deno15/alg/d0g8m620251mv Image: Control of the second	
diero161x89xdQDRTw 🗸 ver16 10.21.49	
dies172/WH3pPNd5mAQLddQ	
dies:18 KappmoolDis2/ppl/mMD 🖌 🖌 user18 10.21.49	
diem: 19 MUDDahdahbag2.00gbG 🗸 🗸 user19 10.21.49	
dienc2.8ch6WH4EpBK57h2a ✔ ↓ user2 10.21.40	
client 23 kylos/STSWWWWWWWWWW 10.2.1.49	
dime.21-W/2U0WHDpDip/48mH0X 🗸 🖌 upp21 10.2.1.69	
dien 23 JuliSmUH2.ve/NV3dbl 🖌 🖌 use 22 10.2.1.49	
dien 23 r20rx7W0.08gaja/bjF ✔ ✔ user23 162.1.49	
class 24 kt/pd58L26n#tjm/// 🖌 🖌 1021.69	
diers.251.036/u071u0(90/0400 🗸 🗸 use/25 10.21.49	
dienz 26 (vS2pWUStpD6wWii ✓ ✓ user26 10.2.1.40	
dam 27.25x62/2004 MdHq/5550 ✓ ✓ use/27 10.21.40	
publisher	Ct Defrech Dage
connected, dean session = true	2 Refresh Page
connected, dean session = true	2 Refresh Page
g concess clear assor = true Concess clear assor	2 Refresh Page
© connection to sussion = true sion Information sion @ Connection @ TLS @ Restrictions @	2 Refresh Page
Connection (bit residon + true Solon Information Solon (Connection (Q) TLS (Q) Restrictions Restrictions Restrictions Restrictions (Q) Rest	3 Refresh Page
Connection taskon + true Connection (b) siden Information siden Andream siden Andrea	C Refresh Page
Connection for instance Connection @ TLS @ Restrictions @ xdD Centrif TLS @ Restrictions @	₿ Refresh Page
emeters den usion information sion Information sion Information Connection @ TLS @ Restrictions @ ILS Wainin Series ISAN INFORMATION INFORMATIONI	2 Refresh Page
connection tassion + true Connection 0 TLS 0 Restrictions 0 salon Information ILS 0 Restrictions 0 Restrictions 0 salon Information ILS 0 Restrictions 0 Restrictions 0 salon Information ILS 0 Restrictions 0 Restrictions 0 salon Information ILS non TLS 0 Restrictions 0 salon Information ILS non Maximum Messar Stand Holoard Unlineted salon Information Unlineted Unlineted Unlineted salon Information Restrictions 0 Stalf Chine conflictions 0 Unlineted salon Information Restrictions 0 Stalf Chine conflictions 0 Unlineted salon Information Restrictions 0 Stalf Chine conflictions 0 Unlineted salon Information Restrictions 0 Stalf Chine conflictions 0 Unlineted salon Information Restrictions 0 Stalf Chine conflictions 0 Stalf Chine conflictions 0	2 Refresh Page
Connection store true Connection Q TS O Restriction O side Information Case IP TS O Restriction O side and true of the store of the s	2 Refresh Page
Bits method Connection @ 15 0 Petriciton @ 10 0 side in Hormator 15 0 Petriciton @ 10 0 side in Hormator 15 0 Petriciton @ 10 0 side in Hormator 152 0 Tasking Petriciton @ 10 0 side in Hormator 152.10 Tasking Petriciton @ 10 0 side in Hormator 152.10 Chier Side @ 10 0 Mainum Rhapper Section @ 0.000 on 0 side in Hormator Hormator Chier Side @ 10 0 Mainum Rhapper Section @ 0.000 on 0 Mainum Rhapper Section @ 0.000 on 0 side of U11210 Hormator 153 00H (Land fast) Present price condicate 256 00H 12 Side of U11210 Hormator 153 00H (Land fast) 256 00H 12 256 00H 12 Side of U11210 Hormator 153 00H (Land fast) 256 00H 12 256 00H 12	2 Refresh Page
Connection ussion + true Connection © TLS O Restrictions O ability of the true of the tr	2 Refresh Page
Barnerson Connection © 15.5 Restrictions Sile side Information Cline Pion Sile Information Mainton Data per Sine of Nature 10, 10.49 Sile Information side information Barlanni Pion per Sine of Nature 10, 20.49 Sile Information Mainton Data per Sine of Nature Mainton Data per Sine of Nature 10, 20.69 Mainton Data per Sine of Nature Mainton Data per Sine of Nature 10, 20.69 Mainton Data per Sine of Nature Mainton Data per Sine of Nature Mainton Data per Sine of Nature 10, 20.60 Mainton Data per Sine of Nature Mainton Data per Sine of Nature M	C Refresh Page
Connection association store true Connection @ TLS @ Restrictions @ salon Information Salon P TLS @ Restrictions @ salon 2 Camp B TLS P Restrictions @ salon 2 Camp B TLS P Restrictions @ salon 3 Camp B TLS P Restrictions @ salon 4 Camp B TLS P Restrictions @ salon 5 Camp B TLS P Restrictions @ salon 5 Demans Camp B TLS P Restrictions @ salon 5 Demans Demans Camp B Demans salon 6 Demans Demans Camp B Demans salon 7 Demans TLS CAM D Maintee M Demans salon 7 Demans TLS CAM D Maintee M Demans Demans salon 7 Salon 7 Demans Present price on storage Demans Restrictions Camp D Demans salon 7 Not 7 Demans Present price on storage Demans Demans	₿ Refresh Page
Barnet Calculation Hole Connection © T.S. O Restriction © Salar Information Case P T.S. O Restriction © Salar Calculation Restriction © T.S. O Restriction © T.S. O Salar Calculation Restrin T.S. O Restriction © <td< td=""><td>Ø Refrish Page</td></td<>	Ø Refrish Page
sinn Hormston sich Information sich Informatio	Ø Refresh Page
Instruction Connection © TS © Restriction © instruction Call (P) LS void Manual (Sep or Sale) Manual (Sep or Sale) instruction Call (P) LS void TLS Void Manual (Sep or Sale) instruction Call (P) LS void Manual (Sep or Sale) Manual (Sep or Sale) instruction Call (P) LS void Manual (Sep or Sale) Manual (Sep or Sale) instruction Call (P) LS void TLS Void Manual (Sep or Sale) instruction Call (P) LS Void (Sep or Sale) Manual (Sep or Sale) Manual (Sep or Sale) instruction Call (P) LS Void (Sep or Sale) Manual (Sep or Sale) Manual (Sep or Sale) instruction Manual (Sep protocol) Protocol (Sep or Sale) Manual (Sep or Sale) Manual (Sep or Sale) instruction Manual (Sep or Sale) LS VIII (P) Manual (Sep or Sale) Manual (Sep or Sale) instruction Manual (Sep or Sale) Manual (Sep or Sale) Manual (Sep or Sale) Manual (Sep or Sale) instruction Manual (Sep or Sale) Ma	₿ Refrish Page
signed Sector State and Sector State Sector	Ø Refrish Page
Bandward Connection © TS O Restriction © Salar Connection © TS O Restriction © Salar Data P TS O Restriction © Salar TS O Restriction © Maintoin (Res prifered Data P In Scion Data P TS OO (Restriction ©) Maintoin (Res prifered Data P In Scion Data P TS OO (Restriction ©) Maintoin (Res prifered Data P Interest Dire Data P TS OO (Restriction ©) Maintoin (Res prifered Data P Restriction NOTTING TS OO (Restriction ©) Maintoin (Res prifered Data P Restriction NOTTING Specific Note To Not Specific Maintoin (Res prifered Data P Restriction NOTTING Specific Not Specific Maintoin (Res prifered Data P Restriction NOTTING Specific Not Specific Not Not Specific Restriction Not Not Specific	₿ Refrish Page

Dropped Message

HiveMQ Control Center offers analytics functionality of messages not published by a broker, called dropped messages. It can provide information about:

- Reason of dropped message
- Affected clients or shared subscriptions
- Relevant timestamps

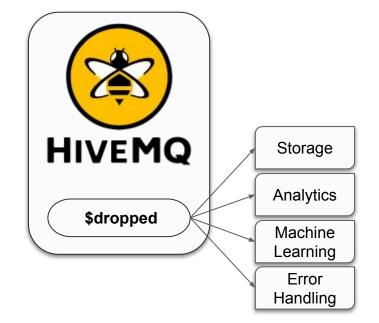
ped Messages								
opped Messages per Reason (stacked)				Dropped Me	essage Reason	0		
.000.000								
1000.000		Client Message Q					t Message Ques	
- 000.000		QoS 0 Memory E					0 Memory Exces	Aritable (0.001%)
		QoS 0 Channel N						
- 000.000		Maximum Packet						
.000.000		Extension Prevent	red					
- 000.000		Internal Error						
- 000.000								
.000.000								
000.000								
.000.000								
ints with Dropped Messages						會 Delete Data	ØF	tefresh Data
	•							tefresh Data
nts with Dropped Messager: 🕢	* Prist Despect Message	Last Dropped Message	Client Message Queue full	QaS 8 Morrery Exceeded	QeS 0 Channel Nec Wrisable	B Delete Data	Ø F	Internal Error
ClentD	Pirst Drapped Message 2019-06-27 17:17:5	Message 0 2019-06-27 17:17:51	Queue full	Deceeded	Not Writable	Maximum Packet Size Exceeded	Extension Prevented	lesternal Error
Chem0 7700 3635-426 564. 2934-6565414	First Drapped Message 2019-05-27-17:17: 2019-05-24 22:35:	Message 20 2019-06-27 17:17:51 5 2019-06-27 20:10:18	Queue Pulí 23 6.579	Deceeded 0	Not Writable	Mastrum Packet Size Exceeded 0	Extension Prevenced	Internal Error D
Cent0 77019 3015-012-544, 594-050414 013249/0017	This Dropped 2019 06:27 17175 2019 06:27 17175 2019 06:27 1723	Message 0 2019-06-27 17:17:51 6 2019-06-27 20:10:18 3 2019-07-01 14:21:40	Queue Puli 23 6.579 7.721	0 0 0	Not Writable	Mastimum Packet Size Exceeded 0 0	Extension Prevented 0 0	Internal Error 0 0 0
CHHO 77079 3075-029 584. 5805-80584 44 5805 34059 5079 5816 35474 581 5816 35474 581	2019-06-27 1973 2019-06-27 1973 2019-06-27 1973 2019-06-27 1993 2019-06-27 1993 2019-06-27 1993	Message 0 2019-06-2717-17:51 5 2019-06-2720-10:18 3 2019-07-0114-21:40 2 2019-06-2719:09:24	Queue Puli 23 6.579 7.721 41	0 0 0 0 0	Net Writable 0 0 0	Mastrum Packet Size Exceeded 0 0 0	Estension Prevented 0 0 0 0 0	Internal Error 0 0 0 0
Court 770% 54%-026-544 54%-026-54 54%-026-54% 94%-026-56% 94%-026-56% 94%-026-56% 94%-026-56% 94%-026-56% 94%-026-56% 94%-026-56% 94%-026%-026%-026% 94%-026%-026%-026%-026% 94%-026%-026%-026%-026%-0	2019 06 27 1323 2019 06 27 1323	Message 0 2019-06-27 17:17:51 5 2019-06-27 2010:18 3 2019-07:01 14:21:40 2 2019-06-27 19:09:24 9 2019-06-28 15:58:59	Queue Puli 23 6.579 7.721 41 9.940	* tecceded * 0 0 0 0 0 0	Net WHIable 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	Maximum Packet Size Exceeded 0 0 0 0	Entension Prevented 0 0 0 0 0 0 0	Internal Error 0 0 0 0 0 0
Centro 27079 3015-014 564. 2019 4006414 with 2guardouthy with 2guardouthy entity gypostage entity gypostage 2019 22120 224811.	2019 06-27 17.17 2019 06-27 17.17 2019 06-27 17.27 2019 06-27 17.27 2019 06-27 17.27 2019 06-27 17.27 2019 06-27 1909; 2019 06-28 15051 2019 06-38 15051	Message 0 2019-06-27 17:17:51 5 2019-06-27 2010.18 3 2019-07-01 14:21:40 2 2019-06-27 19:09:24 9 2019-06-28 15:58:59 2 2019-06-30 09:58:18	Queue Pull 23 6.579 7.721 41 9.940 37.167	* Exceeded * 0 0 0 0 0 0 0 0	Net WHaline	Mastmum Packet Sze Eszceded 0 0 0 0 0 0	Extension Prevented 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	leternal Error 0 0 0 0 0 0 0 0 0
Cum0 7700 3015-019-546. 5814-020014 9816-982-040 9801-982-04 549-14. 9801-982-04 549-14.	Visit Onged Statistics 2019 04-27 17 17 2019 05-27 1524 2019 05-27 1524 2019 05-27 1524 2019 05-27 1524 2019 05-27 1525 2019 05-27 1525 2019 05-28 15255 2019 05-38 0531	Message 0 2019-06-27 17:17:51 5 2019-06-27 20:10:18 3 2019-07-01 14:21:40 2 2019-06-27 19:09:24 9 2019-06-28 15:58:59 9 2019-06-30 10:90:51 5 2019-06-30 10:00:51	Queue Pull 23 6.579 7.721 41 9.940 37.167 37.161	* Exceeded * 0 0 0 0 0 0 0 0 0	Net WHaline	Mastrum Packet Size Exceeded 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	Destension Prevented 0 0 0 0 0 0 0 0 0 0 0 0 0 0	Internal Error 0 0 0 0 0 0 0 0 0 0 0 0 0
Cremb 710% Jorgis-Anja, 404, 55% 45% 45% 416% Jorgis-Anja 416% Jorgis-Anja 111% Jorgis-Anja, 211% Jorgis-Anja, 211% Jorgis-Anja, 211% Jorgis-Anja,	Phil Object 2019 05 27 1717 2019 05 27 1717 2019 05 27 1717 2019 05 27 1712 2019 05 27 1712 2019 05 27 1712 2019 05 27 1722 2019 05 27 1722 2019 05 27 1722 2019 05 27 1722 2019 05 20 172 2019 05 10 021 2019 05 05 0121 2019 05 05 0121 2019 05 05 0121	Message 0 2019-06-27 17:17:51 5 2019-06-27 20:10:18 3 2019-07-07:14-21:40 2 2019-06-27:19:09:324 9 2019-06-27:19:09:324 0 2019-06-28:15:58:39 2 2019-06-28:15:58:39 2 2019-06-30:09:58:18 2 2019-06-30:09:58:18 8 2019-06-27:08:28:49	Queue Pull 23 6.579 7.721 41 9.940 37.167 37.161 2.694	* Exceeded *	Net WHallie	Maximum Paciet Size Exceeded 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	Extension Prevented 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	Internal Error 0 0 0 0 0 0 0 0 0 0 0 0 0 0
Canat 72079 3625-026 584. 584 40504 14 985 42050 97 985 23 72-026 481. 985 23 72-026 481. 995 240 48	Per Conjegati 2001 00.071 17 12. 2001 00.071 17 12. 2019 00.071 17 12. 2019 00.071 18.21. 2019 00.071 18.21. 2019 00.071 18.21. 2019 00.071 18.21. 2019 00.071 18.21. 2019 00.071 18.21. 2019 00.071 18.21. 2019 00.071 18.21.	Missage 0 2019-06-27 17:17:51 6 2019-06-27 20:10:18 1 2019-06-27 20:10:14 2 2019-06-27 19:09:24 0 2019-06-28 15:58:39 2 2019-06-28 15:58:39 2 2019-06-28 15:58:39 2 2019-06-28 10:98:18 5 2019-06-28 10:98:18 6 2019-06-27 00:98:18 8 2019-06-27 10:28:14 9 2019-06-27 12:51:13	Queue fuil 23 6.579 7.721 41 9.940 37.167 37.161 2.094 5.413	- Exceeded - 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	Rec WHIsable 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	Maxtyrum Packet Size Exceeded 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	Extension Prevented 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	Internal Error 0 0 0 0 0 0 0 0 0 0 0 0 0
Court 7107 547-046 548. 544 554 54 544 554 54 544 54 54 54 54 54 54 54 54 54 54 54 54 54 5	Ped Copyed 2016 act 71 111 2019 do 21 213 2019 do 21 213 2019 do 21 203 2019 do 27 2131	Message 0 2019-66-27 17:17:51 5 2019-06-27 20:10:18 3 2019-06-27 20:10:18 2 2019-06-27 19:09:24 0 2019-06-31 19:09:24 2 2019-06-31 19:09:24 2 2019-06-30 09:58:18 5 2019-06-30 10:00:51 8 2019-06-27 08:28:40 9 2019-06-27 08:28:40 9 2019-06-27 08:28:40 9 2019-06-27 18:21:55:13 1 2019-06-27 13:11:12	Queue Full 23 6579 7.721 41 9.940 37.161 37.161 2.024 5.613 105	- Exceeded	Rec WHable 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	Maximum Pater Size Exceeded 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	Extension Prevented 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	Internal Error 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0
Center 2010: b.1/b.4/b.4/b.4/b. 2014-06/b.4/b 4014-06/b.4/b.4/b. 4014-06/b.4/b.4/b.4/b.4/b.4/b.4/b.4/b.4/b.4/b.4	Ped Copyet 2010 40 - 27 117 1 2019 40 - 42 2015 2019 40 - 42 2015	Message 0 2019-06-27 17:17:51 5 2019-06-27 20:10:18 3 2019-07:11:421:40 2 2019-06-27 19:09:24 0 2019-06-27 19:09:24 2 2019-06-27 19:09:24 2 2019-06-27 19:09:24 2 2019-06-27 08:28:49 2 2019-06-27 08:28:49 2 2019-06-27 18:21:11:12 2 2019-06-27 13:11:12 2 2019-06-27 13:11:12	Queue Full 23 6579 7,721 41 9,940 37,167 37,161 2,024 5,413 105 2,428	- Exceeded	Rec WHable 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	Maximum Packet Size Exceeded 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	Extension 0	
Canet 7707 30/5-0/6 404. 98 4 606 44 98 10 20/6 40 98 10 20/6 40 10 98 10 20/6 40 811. 98 10 20/6 40 811. 98 10 20/6 40 811. 98 20 40/6 10/6 10 98 20 40/6 10 90 20 40/6 10 90 20 20 40/6 10 90 20 20 20 40/6	Ped Copyed 2016 act 71 111 2019 do 21 213 2019 do 21 213 2019 do 21 203 2019 do 27 2131	Message a 2019-66-27 17:17:15:11 a 2019-06-27 20:10:18 a 2019-06-27 19:09:24 a 2019-06-27 19:09:24 a 2019-06-27 19:09:24 a 2019-06-27 19:09:24 a 2019-06-28 19:09:58:18 a 2019-06-28 10:00:51:18 a 2019-06-27 10:21:44 b 2019-06-27 12:51:13 a 2019-06-27 13:11:12:12 a 2019-06-27 13:11:12:12	Queue Full 23 6579 7.721 41 9.940 37.161 37.161 2.024 5.613 105	- Exceeded	Not WHIbble	Maximum Pater Size Exceeded 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	Extension Prevented 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	8586mail Error 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0
ence with Dropped Messages	the deget 200 400 427 1117 200 400 427 1117 200 400 427 1117 200 400 427 1117 200 400 427 1107 200 400 427 1007 200 400 427 1007 200 400 427 1007 200 400 427 1007 200 400 427 1007 200 400 427 1007 200 400 427 1007 200 400 427 1007 200 400 427 1007 200 400 427 1007 200 400 427 1007 200 400 427 1007 200 400 427 1007 200 400 427 1007 200 400 427 1007 200 400 427 1007 200 400 427 1007 200 400 427 1007 200 400 427 200 400 200 400 200 400 200 400 200 400 200 400 200 400 200 400 200 400 200 400 200 400 200 400 200 200 400 200 200 400 200 200 200 200	Message a 2019-66-27 17:17:15:11 a 2019-06-27 20:10:18 a 2019-06-27 19:09:24 a 2019-06-27 19:09:24 a 2019-06-27 19:09:24 a 2019-06-27 19:09:24 a 2019-06-28 19:09:58:18 a 2019-06-28 10:00:51:18 a 2019-06-27 10:21:44 b 2019-06-27 12:51:13 a 2019-06-27 13:11:12:12 a 2019-06-27 13:11:12:12	Queue Full 23 6579 7.721 41 9.940 37.167 37.161 2.024 5.413 105 2.428 86.724	- Exceeded	Not WHIbble	Maximum Packet Size Bixeeded 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	Extension Prevenced 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	Internal Error 0 0 0 0 0 0 0 0 0 0 0 0 0

HiveMQ MQTT-Addons

\$dropped Topic

Captures all dropped messages on the system

- Client's message queue full
- QoS 0 message not delivered due to inability to write to client socket or memory being exceeded
- Message size bigger than max size of the receiving client
- Dropped messages due to internal errors or prevented by a Publish Inbound Interceptor

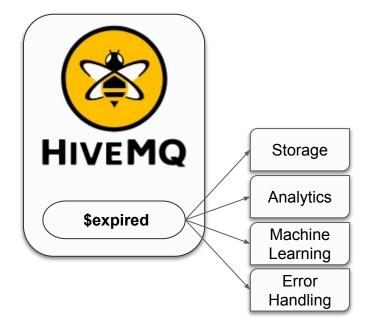


HiveMQ MQTT-Addons

\$expired Topic

Captures all expired messages on the HiveMQ system

- A client takes too long to consume the message
- A message expires before an offline client can consume it
- A retained message that is stored on the broker expires

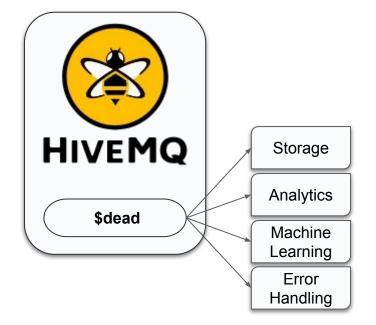


HiveMQ MQTT-Addons

\$dead Topic

Captures all dead messages on the HiveMQ system

• A published message without subscribers is considered a dead message



Live Demo



Resources

Try HiveMQ! https://www.hivemq.com/downloads/

Visit HiveMQ Control Center

https://www.hivemq.com/docs/hivemq/4.6/control-center/introduction.ht ml

Try HiveMQ Cloud! https://www.hivemq.com/cloud/

Poll and Q&A



THANK YOU

Contact David Guschakowski

Sales Engineer

david.guschakowski@hivemq.com

in https://www.linkedin.com/in/david-guschakowski/

