



MQTT BROKER

BENCHMARK

ABE.CHUA 2020 01 11

MQTT BENCHMARK TOOL RUN ON THE MAC OS X (TOPIC 16 MESSAGE 1000)

MQTT BROKER RUN IN A LINUX DOCKER CONTAINER ON THE MAC BOOK PRO

Throughput <message/sec>	HiveMQ	Mosquitto	EMQX	Beacon
QOS0 P1:S1	65,020 5,174	58,971 7,201	63,384 8,839	71,036 13,230
QOS0 P1:S5	65,954 7,089	64,379 11,698	53,944 15,560	57,223 31,754
QOS0 P5:S1	82,561 6,897	78,501 8,859	84,783 10,203	83,336 11,117
QOS1 P1:S1	1,405 1,411	3,535 3,546	2,863 2,874	5,107 5,146
QOS1 P1:S5	400 2,003	1,244 6,230	1,006 5,041	2,532 12,696
QOS1 P5:S1	2,310 2,314	5,940 (T6) 2,771 (T6)	3,906 3,911	6,957 6,964

MQTT BENCHMARK TOOL RUN ON THE MAC OS X (TOPIC 16 MESSAGE 1000)

MQTT BROKER RUN IN A LINUX DOCKER CONTAINER ON THE MAC BOOK PRO

Throughput <proportion>	HiveMQ	Mosquitto	EMQX	Beacon
QOS0 P1:S1	0.9153 0.3911	0.8302 0.5443	0.8923 0.6681	1.0000 1.0000
QOS0 P1:S5	1.0000 0.2232	0.9761 0.3684	0.8179 0.4900	0.8676 1.0000
QOS0 P5:S1	0.9738 0.6204	0.9259 0.7969	1.0000 0.9178	0.9829 1.0000
QOS1 P1:S1	0.2751 0.2742	0.6922 0.6891	0.5606 0.5585	1.0000 1.0000
QOS1 P1:S5	0.1580 0.1578	0.4913 0.4907	0.4210 0.3971	1.0000 1.0000
QOS1 P5:S1	0.3320 0.3323	0.8538(T6) 0.3979 (T6)	0.5614 0.5616	1.0000 1.0000
SCORE	5.6532	8.0508(T6) 7.2745	7.8463	11.8505
PERFORMANCE	1.0000	1.2868	1.3879	2.0962

MQTT BENCHMARK TOOL RUN ON THE MAC OS X (TOPIC 16 MESSAGE 1000)

MQTT BROKER RUN IN A LINUX DOCKER CONTAINER VS MAC OS X ON THE MAC BOOK PRO

Throughput <message/sec>	HiveMQ LDC	Mosquitto LDC	EMQX LDC	Beacon LDC	Beacon OSX
QOS0 P1:S1	65,020 5,174	58,971 7,201	63,384 8,839	71,036 13,230	37,789 30,223
QOS0 P1:S5	65,954 7,089	64,379 11,698	53,944 15,560	57,223 31,754	17,276 50,410
QOS0 P5:S1	82,561 6,897	78,501 8,859	84,783 10,203	83,336 11,117	57,311 32,003
QOS1 P1:S1	1,405 1,411	3,535 3,546	2,863 2,874	5,107 5,146	17,677 17,730
QOS1 P1:S5	400 2,003	1,244 6,230	1,006 5,041	2,532 12,696	8,580 43,096
QOS1 P5:S1	2,310 2,314	5,940 (T6) 2,771 (T6)	3,906 3,911	6,957 6,964	18,353 18,387

DETAIL INFORMATION

THE WORKER PERFORMANCE METRICS OF THREE CHANNELS Q0S0 P1:S1 TOPICS: 48
PUBLISHERS [48] MESSAGES [48,000] => SUBSCRIBERS [48] MESSAGES [48,000]

Performance <message/sec>	HiveMQ	Mosquitto	EMQX	Beacon
REGULAR PUBLISH	1557/1650/1767	1310/1433/1490	1426/1531/1613	798/868/939
SPECIAL PUBLISH	1588/1680/1750	1351/1444/1509	1481/1586/1635	802/917/945
SUPREME PUBLISH	1588/1680/1750	1351/1444/1509	1481/1586/1635	802/917/945
REGULAR SUBSCRIBE	115/187/285	151/151/152	189/216/368	650/666/716
SPECIAL SUBSCRIBE	115/207/329	151/151/151	185/213/353	633/644/712
SUPREME SUBSCRIBE	115/207/329	151/151/151	185/213/353	633/644/712

THE WORKER PERFORMANCE METRICS OF THREE CHANNELS QOS0 P1:S5 TOPICS: 48

PUBLISHERS [48] MESSAGES [48,000] => SUBSCRIBERS [240] MESSAGES [240,000]

Performance <message/sec>	HiveMQ	Mosquitto	EMQX	Beacon
REGULAR PUBLISH	1631/1692/1757	1448/1514/1594	1251/1284/1312	1282/1327/1410
SPECIAL PUBLISH	1652/1705/1754	1438/1503/1579	1228/1280/1328	1283/1320/1354
SUPREME PUBLISH	1652/1705/1754	1438/1503/1579	1228/1280/1328	1283/1320/1354
REGULAR SUBSCRIBE	29/56/104	49/49/50	65/69/87	121/150/263
SPECIAL SUBSCRIBE	27/59/93	49/49/49	65/69/88	118/141/181
SUPREME SUBSCRIBE	27/59/93	49/49/49	65/69/88	118/141/181

THE WORKER PERFORMANCE METRICS OF THREE CHANNELS Q0S0 P5:S1 TOPICS: 48

PUBLISHERS [240] MESSAGES [240,000] => SUBSCRIBERS [48] MESSAGES [240,000]

Performance <message/sec>	HiveMQ	Mosquitto	EMQX	Beacon
REGULAR PUBLISH	366/386/409	348/362/445	372/387/422	368/379/424
SPECIAL PUBLISH	371/386/418	348/360/393	375/387/422	371/381/424
SUPREME PUBLISH	371/386/418	348/360/393	375/387/422	371/381/424
REGULAR SUBSCRIBE	165/218/366	185/186/187	219/245/278	253/258/261
SPECIAL SUBSCRIBE	101/201/388	186/186/186	218/255/313	232/237/240
SUPREME SUBSCRIBE	101/201/388	186/186/186	218/255/313	232/237/240

THE WORKER PERFORMANCE METRICS OF THREE CHANNELS QOS1 P1:S1 TOPICS: 48
PUBLISHERS [48] MESSAGES [48,000] => SUBSCRIBERS [48] MESSAGES [48,000]

Performance <message/sec>	HiveMQ	Mosquitto	EMQX	Beacon
REGULAR PUBLISH	29/33/45	74/75/76	60/60/61	107/108/110
SPECIAL PUBLISH	30/33/41	74/75/77	60/60/62	107/108/110
SUPREME PUBLISH	30/33/41	74/75/77	60/60/62	107/108/110
REGULAR SUBSCRIBE	29/33/45	74/75/76	60/60/61	107/108/110
SPECIAL SUBSCRIBE	30/33/41	74/75/77	60/60/62	107/108/110
SUPREME SUBSCRIBE	30/33/41	74/75/77	60/60/62	107/108/110

THE WORKER PERFORMANCE METRICS OF THREE CHANNELS QOS1 P1:S5 TOPICS: 48
PUBLISHERS [48] MESSAGES [48,000] => SUBSCRIBERS [240] MESSAGES [240,000]

Performance <message/sec>	HiveMQ	Mosquitto	EMQX	Beacon
REGULAR PUBLISH	8/9/11	26/26/26	21/21/22	53/53/54
SPECIAL PUBLISH	8/9/11	26/26/26	21/21/22	53/53/55
SUPREME PUBLISH	8/9/11	26/26/26	21/21/22	53/53/55
REGULAR SUBSCRIBE	8/9/11	26/26/26	21/21/22	53/53/54
SPECIAL SUBSCRIBE	8/9/11	26/26/26	21/21/22	53/54/55
SUPREME SUBSCRIBE	8/9/11	26/26/26	21/21/22	53/54/55

THE WORKER PERFORMANCE METRICS OF THREE CHANNELS QOS1 P5:S1 TOPICS: 48

PUBLISHERS [240] MESSAGES [240,000] => SUBSCRIBERS [48] MESSAGES [240,000]

Performance <message/sec>	HiveMQ	Mosquitto	EMQX	Beacon
REGULAR PUBLISH	10/12/23	Unbearable	16/17/17	29/29/30
SPECIAL PUBLISH	10/11/21	-	16/16/17	29/29/30
SUPREME PUBLISH	10/11/21	-	16/16/17	29/29/30
REGULAR SUBSCRIBE	48/57/94	-	82/82/83	145/146/147
SPECIAL SUBSCRIBE	48/53/82	-	82/82/82	145/146/147
SUPREME SUBSCRIBE	48/53/82	-	82/82/82	145/146/147

BEACON METRICS CORE MODULE

▼127.0.0.1

▼\$SYS

▼Broker

Memory = {"memory used percent (%)":64.70,"memery used (MB)":5300.54}

▼Stream

▼TopK

▼Regular

Last_Minute = {}

Last_Hour = {"New Hot (16)":{"TOP0":{"value":"SB-FSA8id","count":4},"TOP1":{"value":"SB-1cjXaP","count":4},"TOP2":{"value":"SB-U45isd","co...

Last_Day = {}

Online_Period = {}

▼Special

Last_Minute = {}

Last_Hour = {"New Hot (16)":{"TOP0":{"value":"SB-OsFDGf","count":2},"TOP1":{"value":"SB-qhSDQS","count":2},"TOP2":{"value":"SB-0AdTb2",...

Last_Day = {}

Online_Period = {}

▼Supreme

Last_Minute = {}

Last_Hour = {"New Hot (16)":{"TOP0":{"value":"SB-cVUkf7","count":2},"TOP1":{"value":"SB-HMrExD","count":2},"TOP2":{"value":"SB-4HFr27",...

Last_Day = {}

Online_Period = {}

▼Task_Queue

▼Metrics

▼Regular = {"Total Submitted Tasks":302942,"Total Executed Tasks":302942,"Total Failed Executed Tasks":0}

▼Worker = {"Worker_0":{"Submit_Tasks":18701,"Execute_Tasks":18701,"Failed_Execute_Tasks":0,"In_Queue_Tasks":0},"Worker_1":{"Submit_Tasks...

Status_Stat = {"Worker_0":{"Size":37402,"Min":0.000000,"Mean":1.843030,"Max":33.000000,"PopulationVariance":12.270345,"SampleVari...

▼Special = {"Total Submitted Tasks":300251,"Total Executed Tasks":300251,"Total Failed Executed Tasks":0}

▼Worker = {"Worker_0":{"Submit_Tasks":9364,"Execute_Tasks":9364,"Failed_Execute_Tasks":0,"In_Queue_Tasks":0},"Worker_1":{"Submit_Tasks":...

Status_Stat = {"Worker_0":{"Size":18728,"Min":0.000000,"Mean":0.994340,"Max":16.000000,"PopulationVariance":2.039908,"SampleVarianc...

▼Supreme = {"Total Submitted Tasks":300250,"Total Executed Tasks":300250,"Total Failed Executed Tasks":0}

▼Worker = {"Worker_0":{"Submit_Tasks":4706,"Execute_Tasks":4706,"Failed_Execute_Tasks":0,"In_Queue_Tasks":0},"Worker_1":{"Submit_Tasks":...

Status_Stat = {"Worker_0":{"Size":9412,"Min":0.000000,"Mean":0.727157,"Max":11.000000,"PopulationVariance":0.740899,"SampleVariance":...

▼Connection

►Clients (300 topics, 604 messages)

Topic 📄 🗑

\$SYS / Broker / Stream / TopK / Supreme / Last_Hour

Value 📄

<> ☰

QoS: 0

10/01/2020 17:19:37

```
{
  "New Hot (16)": {
    "TOP0": {
      "value": "SB-cVUkf7",
      "count": 2
    },
    "TOP1": {
      "value": "SB-HMrExD",
      "count": 2
    },
    "TOP2": {
      "value": "SB-4HFr27",

```

History 2

\$SYS_Broker_Task_Queue_Metrics_Supreme_Worker_Status_S

\$SYS_Broker_Stream_TopK_Regular_Last

```
{
  "New Hot (16)": {
    "TOP0": {
      "value": "SB-h7h8HO",
      "count": 4
    },
    "TOP1": {
      "value": "SB-Zbg1IN",
      "count": 4
    },
    "TOP2": {
      "value": "SB-qQKg3X",
      "count": 4
    },
    "TOP3": {
      "value": "SB-9FYGMc",
      "count": 4
    }
  }
}
```

\$SYS_Broker_Task_Queue_Metrics_Supreme_Worker

```
{
  "Worker_0": {
    "Submit_Tasks": 4706,
    "Execute_Tasks": 4706,
    "Failed_Execute_Tasks": 0,
    "In_Queue_Tasks": 0
  },
  "Worker_1": {
    "Submit_Tasks": 4763,
    "Execute_Tasks": 4763,
    "Failed_Execute_Tasks": 0,
    "In_Queue_Tasks": 0
  },
  "Worker_2": {
    "Submit_Tasks": 4731,
    "Execute_Tasks": 4731,
    "Failed_Execute_Tasks": 0,
    "In_Queue_Tasks": 0
  }
}
```

\$SYS_Broker_Task_Queue_Metrics_Supreme_Worker_Status_St

```
{
  "Worker_0": {
    "Size": 1618,
    "Min": 0.000000,
    "Mean": 0.561805,
    "Max": 3.000000,
    "PopulationVariance": 0.315401,
    "SampleVariance": 0.315596,
    "PopulationStandardDeviation": 0.561606,
    "SampleStandardDeviation": 0.561780,
    "PopulationSkew": 0.404739,
    "SampleSkew": 0.405115,
    "PopulationKurtosis": -0.435760,
    "SampleKurtosis": -0.433392
  },
  "Worker_1": {
    "Size": 1560,
    "Min": 0.000000,

```

\$SYS_Broker_Task_Queue_Metrics_Supreme_Worker_Status_St

```
"300s Interval": {
  "Stats Size": {
    "Size": 64,
    "Min": 8996.000000,
    "Mean": 9382.812500,
    "Max": 9618.000000,
    "PopulationVariance": 17119.964844,
    "SampleVariance": 17391.710317,
    "PopulationStandardDeviation": 130.843284,
    "SampleStandardDeviation": 131.877634,
    "PopulationSkew": -0.576738,
    "SampleSkew": -0.590673,
    "PopulationKurtosis": 0.115091,
    "SampleKurtosis": 0.224563
  },
  "Stats Min": {
    "Size": 64,

```