Mosquitto MQTT broker and clients

START HERE

`mosquitto_sub -t <topic> -v`
Listen, show topic

`mosquitto_sub -t '$SYS/#' -v`
Broker statistics

`mosquitto_pub -t <topic> -m <msg>`
Publish a message

`mosquitto_pub -q 1 -t <topic> -m <msg>`
At-least-once

`mosquitto_pub -r -t <topic> -m <msg>`
Retain last value

`mosquitto_sub -h <host> -p <port> -u <user> -P <pw> -t <topic>`
Remote, with login

`mosquitto_sub -t '#' -v`
Everything (careful)

`mosquitto_passwd -c <file> <user>`
Create a user file

Publisher mosquitto_pub → `topic + payload` → **Broker** mosquitto → `matching filters` → **Subscriber** mosquitto_sub

CONCEPTS

Clients never talk to each other: publishers and subscribers meet at a topic on the broker.

Topic wildcards

Filter	Matches
`+`	exactly one level: a/+/c
`#`	all remaining levels, last only: a/#
`$SYS/#`	broker stats; not matched by a lone #

Quote '#' and '$SYS' in the shell, or it expands or becomes a comment.

PUBLISH

`mosquitto_pub -t <topic> -m <msg>`
Publish one message

`mosquitto_pub -t <topic> -f <file>`
Send a file as the payload

`mosquitto_pub -t <topic> -s < <file>`
Send all of stdin as one message

`<cmd> | mosquitto_pub -t <topic> -l`
Send each stdin line as a message

`mosquitto_pub -t <topic> -n`
Send an empty payload
With -r this clears the retained message on the topic.

`mosquitto_pub -r -t <topic> -m <msg>`
Retain message on the broker
New subscribers get the last retained value immediately.

`mosquitto_pub -q <0|1|2> -t <topic> -m <msg>`
Set delivery guarantee
Default is 0 (at most once); 2 is exactly once.

`mosquitto_pub --repeat <n> --repeat-delay <s> -t <topic> -m <msg>`
Publish repeatedly

SUBSCRIBE

`mosquitto_sub -t <topic>`
Print each payload

`mosquitto_sub -v -t <topic>`
Prefix payloads with the topic

`mosquitto_sub -t <a> -t <b>`
Subscribe to several filters

`mosquitto_sub -q <0|1|2> -t <topic>`
Set subscription QoS

`mosquitto_sub -C <n> -t <topic>`
Exit after n messages

`mosquitto_sub -W <s> -t <topic>`
Exit after s seconds
Exit status 27 means it timed out waiting.

`mosquitto_sub -R -t <topic>`
Skip retained messages

`mosquitto_sub --retained-only -t <topic>`
Only retained messages, then exit

`mosquitto_sub -T <topic> -t <filter>`
Hide matching topics from output
Unsubscribing with -U cannot punch holes in a wildcard.

`mosquitto_sub -F "%t %p" -t <topic>`
Custom output format
%t topic, %p payload, %x hex payload, %r retain flag, %q QoS, %l length, @Y-@m-@d... timestamps.

`mosquitto_sub -E -t <topic>`
Exit once subscribed

`mosquitto_sub -t <topic> --remove-retained --retained-only`
Delete retained messages
Run it on a narrow filter first; '#' clears everything.

CONNECTION & AUTH

`-h <host> -p <port>`
Broker address (localhost:1883)

CONNECTION & AUTH (cont.)

`-u <user> -P <password>`
Username and password
-P shows in the process list and shell history.

`-i <id>`
Fixed client ID
Two clients with the same ID kick each other off.

`-I <prefix>`
Client ID prefix plus PID

`-L mqtt://<url>`
Everything in one URL
Form: mqtt://user:pw@host:port/topic.

`-V <5|311|31>`
MQTT protocol version
Default is 3.1.1.

`-c -i <id>`
Persistent session
Needs -i; the broker queues QoS 1/2 messages while you are offline.

`-k <seconds>`
Keepalive interval

`--ws`
Connect over WebSockets

`-d`
Print protocol debug output

`--will-topic <topic> --will-payload <msg>`
Last will on unexpected disconnect
Add --will-retain and --will-qos as needed.

TLS

`--cafile <ca.pem>`
Trust this CA certificate
Port 8883 turns TLS on automatically.

`--cert <cert.pem> --key <key.pem>`
Client certificate login

`--capath <dir>`
Directory of trusted CAs

`--tls-use-os-certs`
Trust the system CA store

`--insecure`
Skip hostname check, testing only

`--tls-version <tlsv1.2|tlsv1.3>`
Pin the TLS version

TLS (cont.)

`--psk <hex> --psk-identity <id>`
Pre-shared key instead of certificates

USERS & PASSWORDS

`mosquitto_passwd -c <file> <user>`
Create file with a user
-c overwrites an existing file.

`mosquitto_passwd <file> <user>`
Add a user or change password

`mosquitto_passwd -b <file> <user> <password>`
Set password non-interactively
Password lands in shell history.

`mosquitto_passwd -D <file> <user>`
Delete a user

`mosquitto_passwd -U <file>`
Hash a plain-text password file
Never run it on an already hashed file.

`mosquitto_passwd -H sha512 <file> <user>`
Hash for Mosquitto 1.6 and older

Point password_file at the file in mosquitto.conf and set allow_anonymous false; the broker needs a reload (SIGHUP) for changes.

RECIPES

Watch broker status

```
mosquitto_sub -v -t '$SYS/broker/#'
```

Authenticated TLS publish

```
mosquitto_pub -h <host> -p 8883 --cafile ca.pem \
  -u <user> -P <pw> -t home/door -m open
```

Capture one reading

```
mosquitto_sub -t sensors/+/temp -C 1 -W 10
```

Retained status with last will

```
mosquitto_pub -r -t dev/<id>/status -m online \
  --will-topic dev/<id>/status --will-payload offline --will-retain
```