Port Forwarding Debug Report

1. Objective

Allow external MQTT clients to publish/subscribe to a Mosquitto broker running on a Raspberry Pi within a home network.

2. Initial Setup

- Raspberry Pi running Mosquitto broker on IP 192.168.1.3:1883
- Public IP of home network: 89.219.255.97
- Laptop connected via mobile hotspot for testing external access
- Router admin panel accessed via 192.168.1.1
- `mosquitto_pub` used to test connection from outside the network

3. Troubleshooting Steps

- Verified Mosquitto is listening on 0.0.0.0:1883 using `netstat` and `ss`
- Checked firewall (UFW) - status: inactive
- Set up a Virtual Server (port forwarding rule) in the router:
    - Local IP: 192.168.1.3
    - Local Port: 1883
    - WAN Port: 1883
    - Protocol: TCP
    - WAN Interface: initially set to pppoe1
- Verified public IP via `curl https://api.ipify.org`
- Used https://www.yougetsignal.com/tools/open-ports/ to check open ports
- Still received 'Connection Refused' and 'Port Closed' messages externally

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4. What Eventually Worked

- Changed the WAN Interface setting from 'pppoe1' to 'any' in the Virtual Server rule.

- After that change, external connections to 89.219.255.97:1883 successfully reached the Raspberry Pi.

- Port reported as OPEN on yougetsignal.com and MQTT messages were received successfully.

5. Final Working Configuration

- Virtual Server / Port Forwarding Rule:

  - Protocol: TCP

  - Local IP: 192.168.1.3

  - Local Port: 1883

  - WAN Port: 1883

  - WAN Interface: any

  - State: Enabled

- Mosquitto broker is bound to 0.0.0.0:1883

- Firewall is disabled or correctly configured

- Public IP is 89.219.255.97

- External command used:

  mosquitto_pub -h 89.219.255.97 -p 1883 -t test/topic -m "hello world"

6. Recommendations

- Set Raspberry Pi IP as static/reserved in router to prevent changes

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- Consider securing MQTT broker with authentication (username/password)

- Optionally enable TLS for encrypted connections if exposed to the public internet