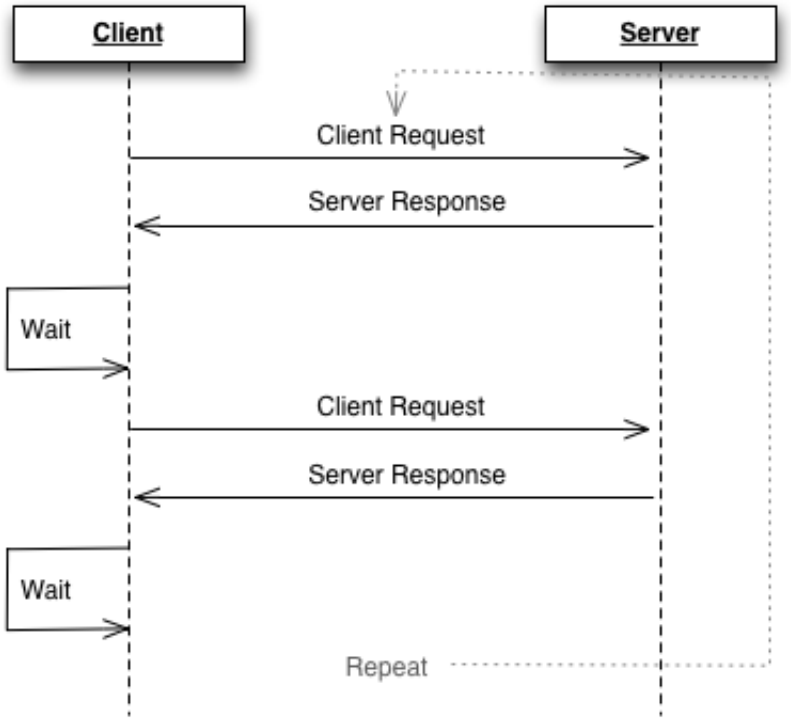
WSDL 2022

What about real-time communication?

WHAT ABOUT REAL-TIME?

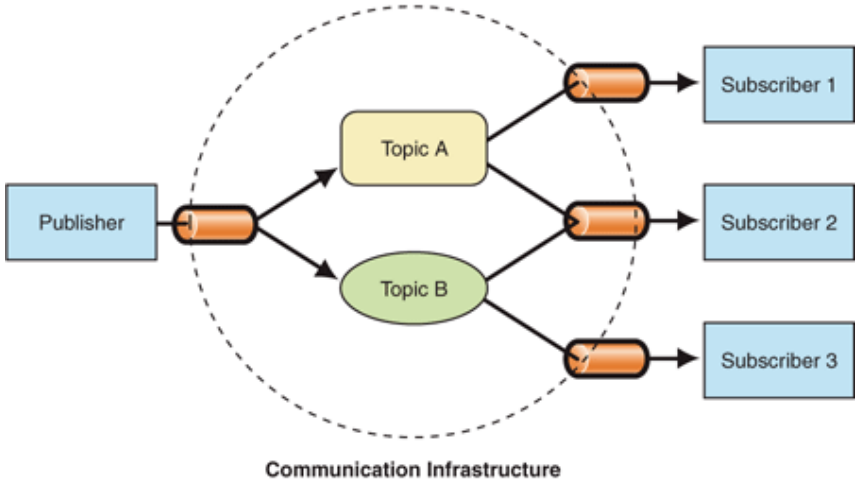
- REST works!
- Not enough for many use cases
- Necessity for an event-driven communication
- Servers need to send information to clients

POLLING



- Periodic requests
- No guarantee the data is recent
- Inefficient
- Dangerous

PUBLISH / SUBSCRIBE



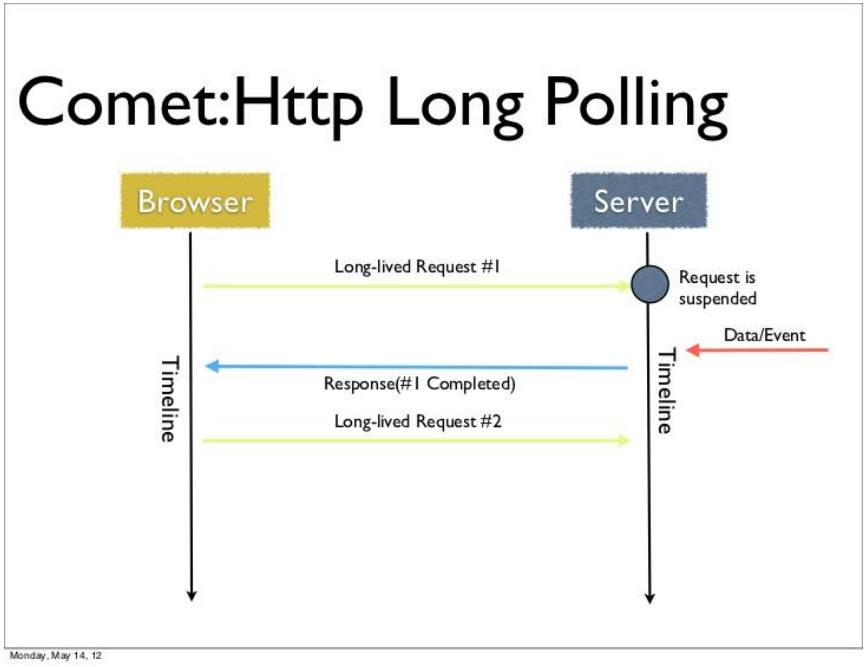
- Exchange of notifications
- Broker responsible for communication
- Subscription to topics
- Asynchronous communication

WEBHOOKS

WEBHOOKS – HTTP CALLBACKS

- Does not break the REST model
- Clients implement a REST API
- Callback URL is provided to the server
- Server calls all the provided URLs when the state changes
- Browsers have a hacky way to have a javascript server running

COMET – LONG POLLING



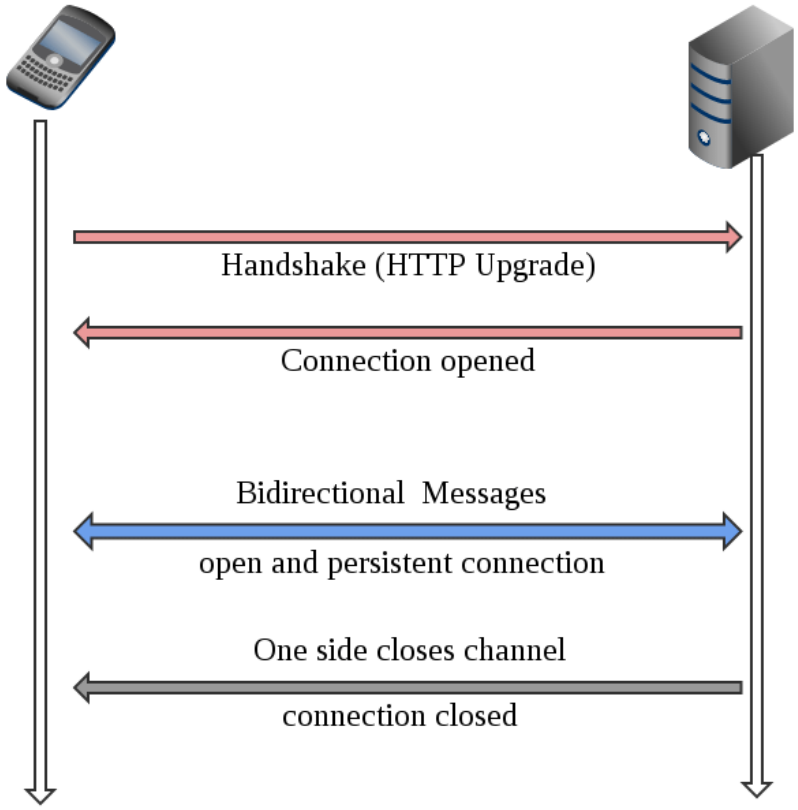
- *Umbrella* for all solutions
- Response is hold by the server
- Polling isn't restarted until response is received
- Browsers have a hacky way to support it

WEBSOCKETS[1]

- Part of the HTML5 specification
- Available for all web apps
- Supports Pub / Sub protocol
- Follows a specific Handshake protocol

1. www.websocket.org

WEBSOCKETS - HANDSHAKE



- GET – UPGRADE
  - 101 – Switching protocols
- TCP socket for bidirectional messages
  - WebSocket Data Frames protocols[2] in the *Sec-WebSocket-Protocol* header
- Less bandwidth-consuming

2. http://www.iana.org/assignments/websocket/websocket.xml

WEBSOCKETS - IOT

- Are not blocked by firewalls and traverse proxies
- All RESTfull API can be reused as-is for WebSockets
- Supported by browsers and other technologies like MQTT[3]
- It allows simple implementation of Publisher / Subscriber technologies
- Still hard to scale on the server side and battery management in client side

MQTT - MOSQUITTO

- mosquitto_pub –h <host> -t <topic> -m “<message>”
- mosquitto_sub –h <host> -t <topic>
- If on windows add .exe
- Paho-mqtt in Python
- etc

REFERENCES

- Building the Web of Things – With examples in Node.js and Raspberry Pi by Dominique D. Guinard and Vlad M. Trifa

- HiveMQ – hivemq.com