MQTT-SN

Angelo Corsaro, PhD

CTO, ADLINK / PrismTech
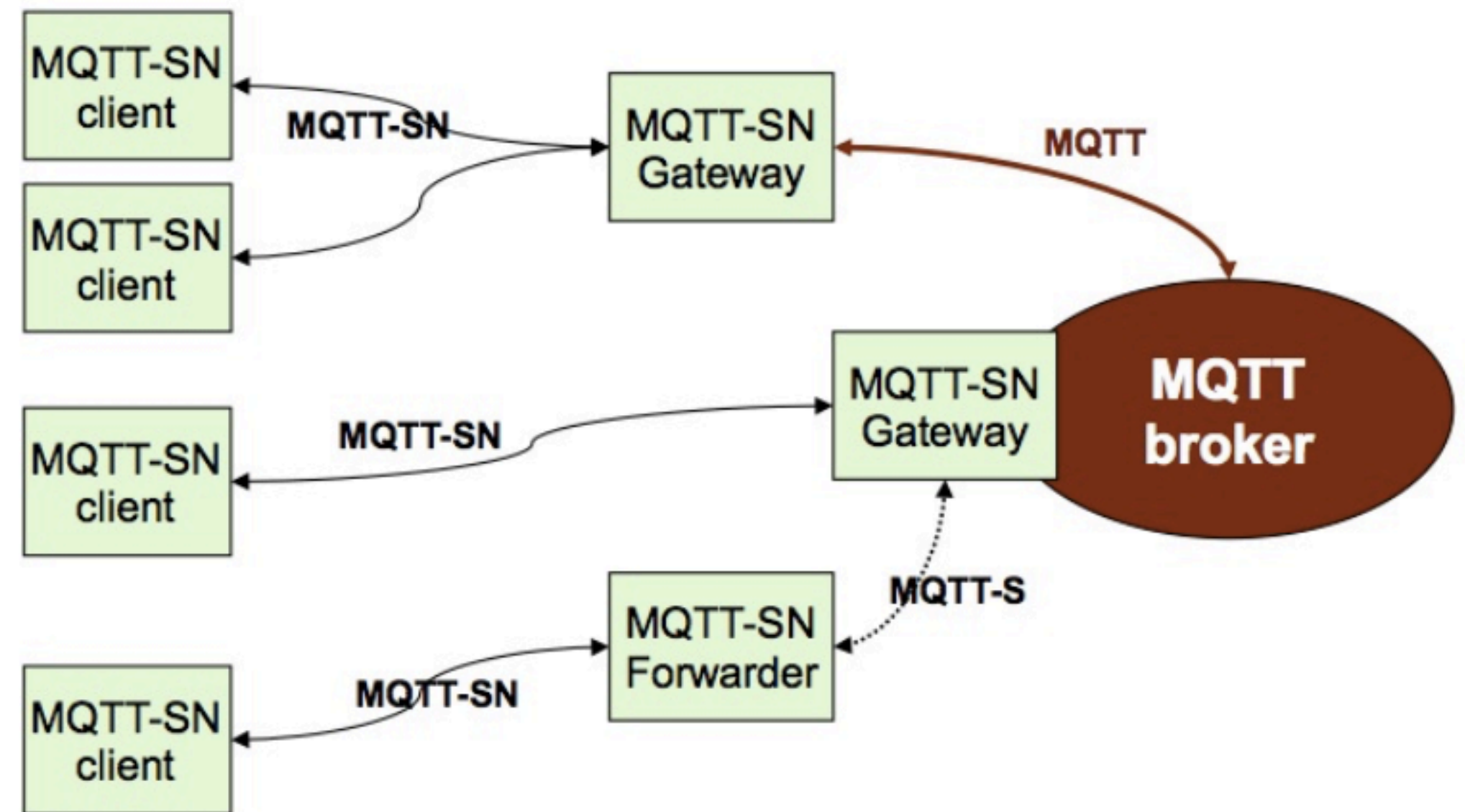
angelo.corsaro@adlinktech.com

OBJECTIVE

Improve MQTT applicability to constrained environments.

The use of TCP/IP and UTF8 topic-id as part of the Publish message make MQTT ill-suited for constrained environments

MQTT-SN MODEL

Leverage a gateway to connect to MQTT-based systems.

MQTT-SN VS MQTT

Support for UDP/IP

The CONNECT message is split into three messages. The two additional ones are optional and used to transfer the Will topic and the Will message to the server.

MQTT-SN VS MQTT

To cope with the short message length and the limited transmission bandwidth in wireless networks, the topic name in the PUBLISH messages is **replaced** by a short, two-byte long "topic id". A registration procedure is defined to allow clients to register their topic names with the server/gateway and obtain the corresponding topic ids. It is also used in the opposite direction to inform the client about the topic name and the corresponding topic id that will be included in a following PUBLISH message.

MQTT-SN VS MQTT

A discovery procedure helps clients without a pre-configured server/gateway's address to discover the actual network address of an operating server/gateway. Multiple gateways may be present at the same time within a single wireless network and can co-operate in a load-sharing or stand-by mode.
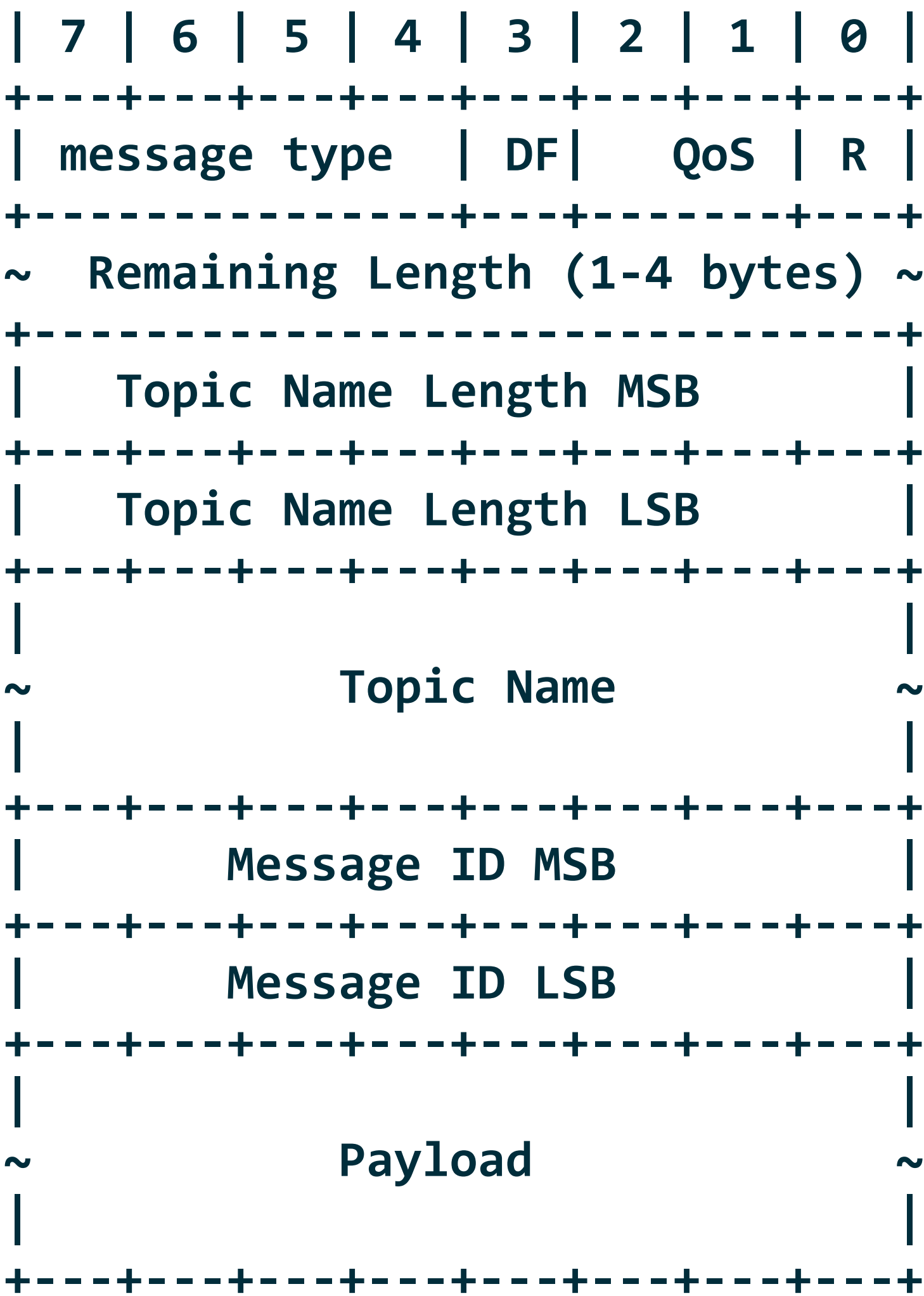
A new offline keep-alive procedure is defined for the support of sleeping clients.

PUBLISH MESSAGE

MQTT

```
| 7 | 6 | 5 | 4 | 3 | 2 | 1 | 0 |
+----+----+----+----+----+----+----+----+
| message type  | DF|  QoS  | R |
+----+----+----+----+----+----+----+----+
~     Remaining Length (1-4 bytes)     ~
+----+----+----+----+----+----+----+----+
|     Topic Name Length MSB             |
+----+----+----+----+----+----+----+----+
|     Topic Name Length LSB             |
+----+----+----+----+----+----+----+----+
|                                       |
~             Topic Name              ~
|                                       |
+----+----+----+----+----+----+----+----+
|     Message ID MSB                    |
+----+----+----+----+----+----+----+----+
|     Message ID LSB                    |
+----+----+----+----+----+----+----+----+
|                                       |
~              Payload                ~
|                                       |
+----+----+----+----+----+----+----+----+
```

MQTT-SN

Length (octet 0)	MsgType (1)	Flags (2)	TopicId (3-4)	MsgId (5-6)	Data (7:n)

MQTT-SN VS XRCE

MQTT-SN

Length (octet 0)	MsgType (1)	Flags (2)	TopicId (3-4)	MsgId (5-6)	Data (7:n)

```
  7 6 5 4 3 2 1 0
 +-+-+-+-+-+-+-+-+
 |R|S|B|  DATA   |
 +---------------+
 |               |
 +      SN       +
 |               |
 +---------------+
 ~      WID      ~
 +---------------+
 ~    payload    ~
 +---------------+
```