



Content Management System to Electronic Display Standard Interface

December 2021

Transport for Wales (TfW) would like to specify a standard interface between the Content Management System (CMS) and real time information Displays, that suppliers would need to comply/work with to enable TfW to procure a single CMS that can interface to multiple displays from a number of vendors.

The standard will specify the minimum capability that is to be expected of all displays supported through the interface (i.e. be able to represent real time vehicle arrival/departure information, text-based messages and hold the scheduled timetable for at least that day's services).

The interface will cater for the following:

- Basic text-based displays
- Graphical displays - in addition to the minimum capability, also be able to provide additional information such as weather, news feeds, advertising, information videos etc.
- Off grid displays - these will not have ready access to power and may not have significant data bandwidth available to show graphical content.

The interface should also cater for fault management data to be passed back to the CMS to enable monitoring and fault rectification.

Initial workshops were held (online) in September 2021 to build a high-level understanding among industry practitioners of what Transport for Wales would like to achieve.

Governing Principles

Abstraction – “no need to re-invent the wheel”.

Lower-level concepts should be abstracted away using existing standards wherever possible; this document focuses solely on the application-level detail.

Clarity – “grey areas should be minimised”.

Committee-designed standards often evolve to support multiple different mechanisms of achieving the same result, leading to grey areas in compatibility between products that can all legitimately claim to support the standard – although in many cases, interoperability is limited.

Simplicity – “less is more”.

The more complex the interface protocol becomes, the less likelihood there is of industry-wide uptake. Conversely, by keeping the rules to a bare minimum, we hope to encourage wider adoption and compatibility by PID and CMS suppliers.

Document Structure

To minimise versioning complexity, the interface protocol is split into multiple parts:

Part 1

- Communications Infrastructure
- Network Architecture

Part 2

- Common Data Structures
- Core Content Messages (applicable to all display types)

Part 3

- Additional Message Types for Graphical Displays

Part 4

- Additional Message Types for Low Power Displays

Part 5

- Additional Services (e.g. Fault Management, Reporting)

Part 6

- Additional requirements yet to be defined e.g.
 - Accessibility Support

Architecture

Due to the “real-time” nature of the communication required between the CMS and PIDs, this standard will be using an Internet-of-Things (IoT) approach, using the standard MQTT communication protocol to provide a publisher-subscriber messaging technology.

This choice has been made as it enables interoperability of devices and services (as both data providers and data consumers) from multiple vendors within a well-documented and well-understood standard framework.

The interface protocol will prescribe the interactions that should occur between connected devices and services, together with the data structures that should be used to exchange standardised information – while fully supporting extensibility of a system through the addition of new classes of device, new classes of message or extensions of standard messages. The core technology behind the interface will be a messaging service called MQTT.

This has not got widespread adoption in the UK public transport market and will be new to some suppliers but is being rapidly adopted in Europe and elsewhere.

Progress

Part 1 and Part 2 documents are in late review with version 1 expected to be published in early January.

Part 3 will be developed during January.