

Object Transform Protocol: Describing the physical position and characteristics of scenic elements

BY DAN MURFIN

SEVERAL YEARS AGO, Dane Styczynski (University of Wisconsin-Madison, MFA 2015) gave a presentation to the Control Protocols Working Group on his proposal to use existing ESTA standards to communicate motion control data between systems. While much of the lighting industry has standardized around DMX512 (*ANSI E1.11*) and sACN (*ANSI E1.31*), and has experienced the benefits of interoperability, the same cannot be said for automation. A study group was formed to investigate the scope and requirements for improving the situation. The group was a unique collaboration between the CPWG and the Rigging Working Group, ensuring the best minds in communication protocols worked alongside experts in motion control systems.

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It quickly became clear that one of the biggest areas of need was the coordination of production elements, and in particular the desire to observe information describing the physical position and characteristics of scenic elements. *ANSI E1.59 – 2021, Object Transform Protocol (OTP)*, was born. In an article in the Fall 2017 edition of *Protocol*, Dan Lisowski discussed the goals and progress on the project, much of which can be seen in the approved standard.

The project moved quickly from first public review in February of 2019 to ANSI approval in January of 2021, and during this



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Lighting a princess cursed by weightlessness is a technical problem OTP can help solve. *The Light Princess*, performed at the National Theatre London. Director: Marianne Elliott. Designer: Rae Smith. Lighting Designer: Paule Constable.

time, took in comments from the wider industry to improve and craft the final document. OTP now provides an efficient and scalable architecture for transmitting information about Objects in physical space, and even includes extensible features which allow manufacturers to define and include their own data formats, called Modules.

The success of the <https://rdmprotocol.org> website in supporting developers and users of RDM (*ANSI E1.20*) and RDMnet (*ANSI E1.33*) led me to set up a similar site to support OTP. In February 2021, <https://otprotocol.org> was launched. While both websites are privately owned and not officially maintained by ESTA, they are run by members of the CPWG in an interested third-party effort to support adoption of these ESTA standards. The OTP site is aimed at supporting developers, marketing efforts and users, providing helpful information, open-source implementations, and other materials. Many of the site's contributors are active members of the CPWG and have a unique insight into the design of OTP. The site is

full of hints and tips that augment the standard.

So, what is available at <https://otprotocol.org>?

Visitors to the site are greeted by four main sections: About, Software, Users, and Developers.

The “About” section includes introductory information on OTP, such as the basic goals of the project and its benefits over alternative options. These benefits include the ability for accurate prediction, priorities for environments with multiple data sources, component discovery, and manufacturer extensibility.

In the “Software” section are several end-user applications, which can be used by both developers and users for testing and analysis. Some of the applications available provide advanced logging and feedback on protocol errors which are of great benefit to developers in testing their own implementations of OTP.

Users of OTP-enabled equipment will be interested in checking out the “Users” section, where they can find an introduction to some of the naming and addressing conventions. In OTP, there are two types of component: Producers, which transmit transform information about Objects; and Consumers, which listen for, and make use of that information. Users will also find a summary of the current standard Modules (self-contained blocks of information, such as position or rotation), and an explanation of how Objects are addressed and uniquely identified in an OTP system.

Developers may find useful tools and materials in the “Developers” section. First off, it contains links to the official standard on the ESTA website, the first port of call for any developers looking to implement OTP. Visitors will also find open-source libraries supporting both OTP Producers and Consumers in several languages. As OTP gains adoption, and new implementations and languages are made available, these will also be added to the site. A Wireshark dissector is also provided, which, when installed, allows for easier analysis of OTP packets on the wire.

OTP is fully ready for the future, supporting both IPv4 and IPv6, but not all products will necessarily support both. To assist users and manufacturers in identifying OTP products and services, several royalty- and attribution-free logos are provided. These can be used freely in marketing materials, and on packaging and products to indicate that they support OTP, and which versions of the Internet Protocol are supported (IPv4/6).

OTP is ready to coordinate your world, and <https://otprotocol.org> is there to help you discover all about it. Check it out today! ■



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