high-value data sources. oneM2M's modular CSFs fit into a coherent framework, making it straightforward to use other CSFs as application and use case deployment requirements change.

oneM2M's Open Standard Approach

oneM2M is an international initiative which promotes a scalable and interoperable standard for IoT systems. It brings together major telecom standards developing organizations (SDOs) from the Americas, China, Europe, Japan, Korea, and India.

The organization has more than 200 members who contribute to standardization activities and launched Release 1 in 2015. oneM2M's certification and interoperability testing activities are important aspects of a robust standard. Members continue to add new capabilities with support for edge computing, industrial, railway and vehicular needs in Release 3 and the soon to be published Release 4.

Building a Flexible Standard to Deliver a Thriving IoT Ecosystem

Dr. Ken Figueredo, InterDigital Inc.

The concept of connected devices has been around for a long time and really took off soon after the term 'Internet of Things' (IoT) was coined. As IoT devices began to proliferate, a standard was required to address emerging IoT requirements without reinventing elements where tried and tested specifications already existed. When launched in 2012, oneM2M was built around these ideas with the aim of enabling interoperability and economies of scale between IoT devices and applications.

Building the Foundations

oneM2M began by defining a horizontal architecture using middleware technology to connect many different types of IoT devices and applications. It equips organizations to invest and develop their applications, without fear of vendor lock-in or needing to commit to one connectivity technology.

Extensibility and modularity were key principles in the inception of Release 1 of the standard that oneM2M published in 2015. This version established a framework and horizontal architecture that is applicable in any IoT vertical. Members contributing to the standard anticipated the need to establish the bedrock on which future improvements and developments would be added. The scene was set for oneM2M users to cut development costs, reduce deployment complexity and speed up time to market.

Enhancing the Foundations

oneM2M continues to evolve as a stable standard and to address new IoT requirements. In 2016, oneM2M published Release 2 which enables interworking with different types of IoT devices such as those conforming to lightweight machine to machine (LWM2M), Open Connectivity Foundation, and 3GPP specifications. It also contains end-to-end security, dynamic authorization and content security features.

Having established the technical foundations, Release 3 focused on application and revenue opportunities in industrial, smart-home and cellular segments. The layering of services on top of 3GPP networks places better IoT-enablement tools at the disposal of mobile network operators. Other standardization developments include support for time-series data and advanced semantic queries.

Standardizing New Features

As more organizations and national agencies advocate IoT standardization, oneM2M is preparing its next release, scheduled for early 2021. In keeping with the original modular concept, Release 4 addresses new priorities in the IoT market. These include requirements to support fog and edge computing and the industrial, railway and vehicular domains. With support from the EU and Korea, oneM2M is also organizing its seventh interoperability testing event which is an important forum to improve the standard.