HyperCat Seeks to Grow Specification Through Collaborations

In 2014, a consortium of companies, including ARM, British Telecom, IBM, Intel and Neul, and led by IoT platform provider Flexeye, developed HyperCat, a specification designed to

support interoperability between Internet of Things services and applications. HyperCat is based on the catalogs (the “Cat” in HyperCat, with “Hyper” referencing hypertext) that establish a common language for resources—using a format called uniform resource identifiers (URI)—that are referenced in multiple systems that may have dissimilar data structures, but which all use the hypertext transfer protocol (HTTP). HyperCat is based on the JavaScript Object Notation (JSON) data interchange format and RESTful application programming interfaces (APIs).

HyperCat is designed to make data from a connected thing or device discoverable, searchable and addressable over the Internet.

Justin Anderson

Application developers can use HyperCat to create applications that interoperate with multiple IoT systems. For example, a smart-home platform, a municipal sensor network (to support street lights or safety systems, for instance) and building-automation system are three examples of solutions that collect temperature data but likely employ different data structures to reference temperature. With HyperCat, URIs would be used to indicate temperature data even if the applications utilize different data structures. This would enable the developer to build an application that is interoperable with those existing systems, but without requiring that new code be written.

The HyperCat Consortium, which has received a total of £8 million ($12.3 million) in grants from the U.K. government’s technology innovation arm, is now in the early stages of working with two U.S.-based organizations that also promote

interoperable, standards-based IoT systems: the Open Interconnect Consortium and the Industrial Internet Consortium (IIC).

Last month, the HyperCat Consortium became a member of the IIC, which AT&T, Cisco Systems, General Electric, IBM and Intel formed last year in order to accelerate the deployment of IoT technology in the industrial sector (or the Industrial Internet, as the firms framed it) by "identifying, assembling and promoting best practices."

"The IIC is investing in building out testbeds and reference architecture to bring together players focused on driving value of IoT into industry," says Justin Anderson, Flexeye's CEO and the HyperCat Consortium's lead. "What we're looking to do is to get HyperCat used within the IIC testbeds in order to demo interoperability within that environment."

IIC spokeswoman Julie Pike tells IOT Journal that none of the IIC testbeds are using HyperCat at this time. However, she notes, the group looks forward to utilizing the specification in a future testbed.

Both the IIC and the OIC are promoting the use of open, standards-based approaches to IoT deployments. The OIC, whose board includes representatives from Intel, Samsung, MediaTek and Cisco, is creating IoT standards and certification testing methods to ensure interoperability. Today, HyperCat issued a press release saying it will be working collaboratively with the OIC.

Reached for comment on what shape this collaboration might take, Mike Richmond, the OIC's executive director, explains that the first step will be to "understand if we're generally going in the same direction"—and to do that, he says, he and software engineers from both organizations will meet in Boston next month to discuss how the OIC might integrate HyperCat into its specifications.

In August, the OIC issued its candidate specification 1.0, which will be under review until the end of October.

“There are some device descriptions in our spec,” Richmond says, when asked whether HyperCat is redundant to any part of the OIC specification. But he believes the OIC spec describes devices in far more general terms than HyperCat does. “As I understand it, [the HyperCat Consortium] has gone to a great deal of trouble to think through problems that will be generated” when IoT platforms begin to scale and many systems need to talk to each other and exchange data or query each other.

“So we’re intrigued,” Richmond says.

According to Anderson, companies that plan to deploy IoT networks in compliance with the OIC specification will be able to use HyperCat where they find it appropriate. “We recognize that [device naming management] is a subset of what the OIC is doing,” he says. “But the OIC is specifying down to communications level, and that’s a much more complex game, frankly, than what we’re doing. What we’re doing is decoupled from that.”

Anderson believes that the OIC could use HyperCat to define relationships between resource types, catalog them, and make them searchable, all as part of the larger OIC standards specification.

It is important that companies developing, and aiming to make money from, IoT technology build interoperability into their systems from an early stage, Anderson adds, citing a recent McKinsey report which estimated that interoperability is essential to unlock 40 percent of the $11 trillion potential value of the Internet of Things.

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