NIST Aims to Become Leader in Smart-City Innovation

The standards agency is looking to combine private-public partnerships with a regimented approach to the internet of things.

Adam Patterson

Thu, 10/17/2019 - 12:02

The National Institute of Standards and Technology hopes establishing guidelines for smart-city technology will allow the agency to become a leader in large-scale "internet of things" implementation.

Defining the best practices for developing smart cities has been one of NIST’s foremost challenges and fundamental to the technology's long-term success.

“When I first started working at NIST, we asked what exactly are the standards for
smart cities,” Associate Director of the Cyber-Physical Systems Program Shokwoo Rhee said Wednesday at the ACT-IAC Networks and Telecommunications Community of Interest and Federal Insights Exchange event.

Broadly defined, smart cities are large population centers whose essential functions — public transit, traffic management, water supply and waste management, among others — are guided by large-scale analytics enabled by the implementation of internet of things devices. This nascent field has led to range of methodology.

“Every city is doing their own thing,” said Rhee. NIST’s central role, he said, rests in finding a way to codify best practices for developing smart city technology. “How do we find the momentum to create a consensus?” he added.

This question was the primary motive behind the Global City Teams Challenge, an initiative Rhee currently oversees. The initiative is a NIST-led project focused on building intra-agency collaboration toward the development of smart-city technology, with a special focus on codifying best practices. The project’s output has already proven fruitful — creating “200 projects across 200 cities... 40% of which are outside the U.S.,” Rhee said.

The initiative has been especially productive in guiding technical standards for smart city development.

“Over the past five years, we have seen some best practices emerge — some of which are being adopted across multiple cities,” Rhee said.

Much of this has been facilitated by public-private partnerships NIST has dubbed "superclusters." Rhee said nine of these are currently ongoing and are focused on subject areas like transit, cybersecurity and agriculture.

It is important to codify best practices quickly since “68% of the world’s population will live in urban centers by 2050," Rhee said.

However, internet of things technology can be applied in any domain with heavy infrastructure demands — including rural agriculture to analyze the spread of crop diseases and also improve irrigation systems to maximize yields.

“Farming is all about logistics," Rhee said. "They want some kind of data system that can streamline this.”
Despite the promise of large-scale internet of things applications, developers should remain methodical in their approach.

“We do not want to support new standards unless they are proven in the field,” Rhee said. He emphasized that in light of its central mission, NIST has a role in codifying successful internet of things standards that guide the development of smart cities along known, productive avenues.

“I want to see standards that are actually being adopted,” he added.

Still there are some inherent tensions in guiding internet of things development through private-public partnerships. Primarily, it can be difficult to reconcile whether developers should use standards to shape technology or shape standards around breaking tech innovation, Rhee said. One of the potential concern areas is that private sector tech advances can occur so quickly without broader oversight that the risks of their adoption are not adequately measured and anticipated.

One potential solution could lie in the NIST private-public supercluster projects.

"The goal of superclusters is to create blueprints ... a list of case studies, applications and best practices,” Rhee said, adding that NIST has already been successful in leveraging its central mission toward building a consensus for smart-city internet of things standards. “Some of the blueprints are mature enough to put into a NIST framework ... we will start turning them into standards this year.”

“We are in a position to be neutral ... we bring in cities, we bring in companies, we bring in universities,” Rhee said about NIST being uniquely well suited to guiding large-scale internet of things application and standards development. “The bottom-up approach will not work unless everyone participates.”