NIST Smart Grid and Cyber-Physical Systems Newsletter
October 2015

- NIST Releases Draft Cyber-Physical Systems Framework, Seeks Public Comments
- NIST Hosts Kickoff Event for Transactive Energy Challenge
- Next Round of Global City Teams Challenge Announced at White House Smart Cities Forum
- Smart Grid Interoperability Panel (SGIP) Update

NIST Releases Draft Cyber-Physical Systems Framework, Seeks Public Comments

On September 18, 2015, NIST released a draft Cyber-Physical Systems (CPS) Framework document intended to provide a methodology for understanding, designing, and building CPS, including those with applications in multiple 'smart' domains.

NIST is requesting public comments by November 2, 2015 on the draft Framework for Cyber-Physical Systems, Version 0.8, which was developed in partnership with industry, academic, and government experts in the NIST CPS Public Working Group (CPS PWG).

The draft document reflects more than a year's effort by the public working group, which includes a few hundred members drawn primarily from industry, academia, and government. The draft framework is available for download from the group's website, which has a template for submitting comments.

"Creating a complex device involves a lot of people with varying interests and concerns, from the designers to the engineers to the safety testers," says NIST's Dr. David Wollman, who co-chairs the CPS PWG. "What the framework provides is an organized treatment of these concerns so the group can address and manage them all effectively. It will prompt them to think of concerns they may not as familiar with, and support understanding and integration of different CPS."

Whatever the purpose of a given CPS—from autonomous vehicles to smart homes to smart grid to smart emergency response systems—the draft framework outlines the common attributes that its subparts share with other CPS devices and systems, and indicates what it must do to interact successfully with the broader CPS environment.

Wollman says the framework is likely to undergo a second draft release for further public comment before a final version is published.

Back to Top

NIST Hosts Kickoff Event for Transactive Energy Challenge

Forty transactive energy (TE) experts from industry, academia, and government gathered in Gaithersburg on September 10-11 to launch the NIST Transactive Energy Modeling and Simulation Challenge for the Smart Grid (TE Challenge).

The first morning of the workshop featured presentations from NIST's Chris Greer, David Holmberg, and Sokwoo Rhee outlining the vision, goals, and format of the Challenge. Ron Melton, from DOE's Pacific Northwest National Laboratory (PNNL) and the GridWise Architecture Council (GWAC), provided an overview on the status and direction of TE. The opening sessions were webcast, with 75 off-site participants watching the presentations. (These presentations are archived online.)

Following these opening presentations, the highly engaged participants each introduced themselves and outlined their specific interests in transactive energy. In the interactive afternoon session, the

participants assembled into teams that reflected shared interests. By the time the conference ended at noon on Friday, teams had been formed and had begun planning their projects in the following areas:

- Co-simulation platform development
- Reference grid and scenarios
- TE interoperations and abstract interactions
- Business and regulatory models
- TE for microgrid energy management

In the coming days and months, the teams will further develop their projects, with the goals of advancing TE, building a professional community, and driving collaboration and understanding. A valuable resource, both for team members and others interested in learning more about transactive energy, will be the newly created TE Challenge Collaboration Site.

As interest in the Challenge continues to grow, more teams are expected to form in the next few months, leading up to a December meeting. Additional events will be scheduled in 2016. One of the benefits of the Challenge is to help teams generate publicity for their projects through these various events in the coming months.

"Transactive energy," as defined in GWAC's GridWise Transactive Energy Framework, Version 1.0 (2015), refers to "a system of economic and control mechanisms that allows the dynamic balance of supply and demand across the entire electrical infrastructure using value as a key operational parameter." In the coming months, the TE Challenge will bring researchers and companies with simulation tools together with utilities, product developers, and other grid stakeholders to create and demonstrate modeling and simulation platforms while applying TE approaches to real grid problems. Ultimately, it will help the electricity industry better understand the potential for TE and create a path for real-world trial implementations.

Back to Top

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Next Round of Global City Teams Challenge Announced at White House Smart Cities Forum

On September 14, 2015, at the White House Smart Cities Forum, the Administration announced a new Smart Cities Initiative that will invest over $160 million in federal research. The initiative will leverage more than 25 new technology collaborations to help local communities tackle key challenges such as fostering economic growth, managing the effects of a changing climate, reducing traffic congestion, fighting crime, and improving the delivery of city services.

One of the major efforts highlighted by the White House is NIST's Global Cities Team Challenge (GCTC) 2016. It will bring communities and innovators together to encourage collaboration on a range of issues from energy management to disaster response to mass transit improvement. The goal is to help communities and businesses connect to improve resource management and quality of life by using effective networking of computer systems and physical devices, often called the Internet of Things (IoT) or cyber-physical systems (CPS).

This new challenge will build on the success of GCTC's first round, which began in September 2014 and created 64 teams of more than 50 cities and 230 organizations. The teams demonstrated the tangible benefits of using IoT technologies to improve quality of life, focusing on solutions that could be deployed across multiple cities. More than 1,400 people attended the final expo in June 2015, including the King and Queen of the Netherlands.

The GCTC 2016 challenge round has been expanded to run in two phases over 20 months, and will feature high-profile expos in June 2016 and June 2017.

NIST is inviting representatives from both industry and local governments to join an initial GCTC 2016 team-building workshop on Nov. 12 and 13, 2015, at NIST's campus in Gaithersburg, Maryland. Attendance at the workshop will help participants find the right partners to solve their

specific problems and create smart cities that take advantage of what IoT has to offer. Registration information for this free workshop is available online.

In addition to NIST, the National Science Foundation and a number of other federal agencies are participating in the Smart Cities Initiative. This fact sheet provides a good overview of the extensive set of grants, programs, and activities being undertaken by the federal government, as well as by local governments, universities, and private industry.

Back to Top

Smart Grid Interoperability Panel (SGIP) Update

The SGIP Annual Conference, Nov. 3-5, 2015, New Orleans, Louisiana, will feature a theme of "Advancing through Collaboration." The speaker program will feature utility, vendor, and industry senior executives. NIST's Chris Greer will speak at a panel session titled "Smart Grid and IoT Unite," (Wed., Nov 4, 9:45 a.m.), and NIST's Dave Wollman will moderate a panel on "Management of the Grid," (Wed., Nov 4, 8:45 a.m.).

Registration information and the conference agenda are now available on the SGIP Annual Conference page. Special early bird registration and lodging rates have been extended and are available through Friday, October 2, 2015.

Back to Top