

NIST Smart Grid and CPS Newsletter

April 2016

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Global City Teams Challenge (GCTC): “Tech Jam” Features 60+ Presentations

With more than 300 participants from four continents in attendance, the GCTC Tech Jam (March 22-23, 2016, Gaithersburg, Maryland) was a beehive of activity. The subjects of the 60+ GCTC projects—discussed in a series of rapid-fire five-minute presentations on the first day of the conference—ranged far and wide, from flood and storm surge prediction to crime prevention, and from smart transit hubs to smart garbage monitoring systems. One of the presentations even focused on how Internet of Things technology is being used for [city bee botany](#).

In addition to the flurry of mini-presentations, there were several sets of keynote presentations and panel discussions that featured federal government officials, industry leaders, non-profit leaders, and financial experts. All presentations during this first day of the conference were webcast, with more than 60 virtual attendees. A video archive of the presentations is now [available online](#), and copies of the presentation slides are also [available online](#).

As in previous GCTC events, the second day was devoted to breakout sessions, where participants introduced their particular smart city interests and sought additional partners for existing or new projects (called “action clusters”)—a process that Dr. Sokwoo Rhee, who leads the GCTC effort at NIST, likened to speed dating.

NIST’s role as match-maker was described by Rhee [in a blog article published March 25 on NIST’s “Taking Measure” blog](#). He wrote, “As you might guess, smart city initiatives require input from people with expertise in a number of areas. A typical action cluster includes experts from municipal governments, cutting-edge technology industries, and academia. These are folks that wouldn’t normally be spending much time together professionally. Through our GCTC program, however, NIST brings teams of cities together, ensuring that the solutions that emerge meet real needs, and connects them to experts in industry and academia to put the private sector in the lead on innovation.”

The next few months will continue to be very busy for GCTC participants as they prepare for the next event, a GCTC Expo to be held June 13-14, 2016, in Austin, Texas. ([Registration information available online](#).)

The next few weeks also bring deadlines for some of the financial assistance opportunities that are available for GCTC teams, including:

- [Travel Assistance Awards](#) (applications due April 15, 2016)
- [GCTC Leadership Awards](#) (applications due April 15, 2016)
- [Replicable Smart City Technologies \(RSCT\) Cooperative Agreement Program](#) (applications due May 12, 2016)

For additional information about the GCTC program, please visit <http://www.nist.gov/cps/sagc.cfm> and www.globalcityteams.org. The just-published [GCTC 2015 report](#) provides additional perspective on the program.

There is still time to register and participate in the GCTC 2016 Challenge. For details on how to participate, please visit the [GCTC Participation Guide](#).

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IoT-Enabled Smart City Framework: U.S. Kick-off Held on March 24-25, 2016

The international technical public working group to help develop an IoT-Enabled Smart City Framework (IES-City Framework) was launched March 24-25 at a kick-off event on the NIST campus in Gaithersburg, Maryland. The U.S. event, held immediately following the GCTC Tech Jam, drew 70 participants. A parallel European kick-off event is planned for April 14-15, 2016, in Rome, Italy.

Describing the purpose and importance of the IES-City Framework, Dr. Martin Burns, NIST lead for this project, said, “Many organizations are currently developing platforms, architectures, and standards for Internet of Things (IoT) and smart city applications. With dozens of unconnected standardization and specification activities competing for attention and market share throughout the world, the likelihood of easy integration of new features from other parties may be impractical due to incompatible technologies and the large technical distance to integration.”

Burns continued, “Our framework effort comes at a key time. We expect to ‘discover’ pivotal points of interoperability (PPIs)—common technical choices addressing stakeholder concerns—which we believe exist but cannot easily be discerned. We won’t be picking winners and losers. Rather, we’ll identify the PPIs that will help the full spectrum of standards and deployment activities to cooperate and harmonize their efforts, thus reducing the technical distance to integration and therefore supporting composable smart cities.”

The first day of the kick-off event featured seven one-hour technical presentations by various organizations, detailing their current IoT and smart city technologies and plans. These presentations were webcast, and a link to the [video archive is available online](#).

During the second day, the participants met in breakout sessions that introduced and organized the three subgroups that will be working on the first stage of the framework process:

- Application Framework Subgroup—an activity designed to enumerate the scope of smart city applications and define metrics for the readiness of cities and municipalities to absorb these applications
- Consensus PPI Subgroup—focused on the technical analysis of smart city and IoT technologies to discover PPIs across stakeholder concerns
- Deployed PPI Subgroup—performing case studies of extensive smart city applications where multiple domains are integrated, such as emergency response and transportation systems, or where multiple smart city technologies have been integrated, in order to discover the PPIs that enabled these integrations

[More details about each subgroup](#), including information on how to participate, is available online on the IES-City Framework’s [collaboration website](#).

The format of the April 14-15 event in Rome will be similar to the U.S. event, with additional one-hour presentations of different technologies, followed by a half-day of subgroup meetings. ([Registration details for the Rome event are available online](#).)

Working in parallel for the next few months—meeting online in regularly scheduled webinars—the three subgroups will prepare working drafts related to their specific focus. During the summer

months, the three drafts will be combined, integrated, and refined. According to Burns, the aggressive goal is to release for comment a first draft of the framework document in the fall.

Participation in the subgroups and framework activity is open to anyone. NIST has set up a [collaboration website](#) for the project and a [briefing paper](#) providing more information on the project. An [email list](#) has been established for interested parties to join to be informed and discuss the project. Project contact: [Dr. Martin J. Burns](#)

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Commerce Department Announces “Request for Public Comment” on IoT

In a [Federal Register Notice published April 6, 2016](#), the Commerce Department’s National Telecommunications and Information Administration (NTIA) requests comment on the benefits, challenges, and potential roles for the government in fostering the advancement of the Internet of Things (IoT). On behalf of the Commerce Department and as part of its Digital Economy Agenda, NTIA is seeking broad input from all interested stakeholders—including private industry, researchers, academia, and civil society—on the potential benefits and challenges of these technologies and what role, if any, the federal government should play in this area.

“The broad range of connected devices, objects, and applications that make up the Internet of Things will have a major benefit in promoting economic growth,” said Deputy Secretary of Commerce Bruce Andrews in the [accompanying press release](#). “The Department’s Digital Economy agenda is aimed at creating the right conditions that will help foster the growth of IoT in partnership with the private sector.”

The Request for Comment includes more than 25 questions covering a wide range of subjects—from technology and infrastructure to policy issues and international engagement. After analyzing the comments, which are due by May 23, the Commerce Department intends to issue a “green paper” that identifies key issues impacting deployment of these technologies, highlights potential benefits and challenges, and identifies possible roles for the federal government in fostering the advancement of IoT technologies in partnership with the private sector.

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Steering Committee to Review Test Plan for IEEE 1588 Precision Time Protocol for Power Systems

With the help of a NIST grant, the [University of New Hampshire InterOperability Laboratory \(UNH-IOL\)](#) is drafting a test plan for the IEC 61850-9-3 IEEE 1588 precision time protocol profile for power utility automation, which will include an updated IEEE C37.238, currently under standards revision.

To ensure comprehensive coverage of industry needs and to accelerate the adoption of conformity assessment efforts and complementary conformance test software, the [IEEE-SA Conformity Assessment Program \(ICAP\)](#) is convening the IEEE 1588 Power Profile Conformity Assessment Steering Committee (CASC) to review and approve the test plan and also to assess the viability of a certification program.

“Through the grant to UNH-IOL and the establishment of the IEEE 1588 Power Profile CASC, NIST is pleased to support the power and energy industry in this important initiative,” said John Messina, Cyber Infrastructure Group Leader, Information Technology Laboratory Software and Systems Division, NIST.

IEEE 1588 defines the Precision Time Protocol (PTP), a network protocol that enables precise synchronization of the real-time clocks of devices in networked distributed systems. In 2011, the IEEE Power & Energy Society’s Power System Relaying Committee (PSRC), through its Power Profile Working Group (H24, subcommittee 7), published IEEE C37.238, an IEEE 1588 profile for

use in power system applications. That working group is currently developing a revision of C37.238 for publication in 2016.

Corresponding test plans for IEC 61850-9-3 and IEEE C37.238 are currently being developed to enable conformity and interoperability testing and certification. The CASC is involved in the review and approval process.

The CASC held its inaugural meeting on January 13, 2016, in Memphis, Tennessee. The CASC consists of experts from the timing and synchronization domain, utilities, and device manufacturers. Aaron Martin from Bonneville Power Administration has been elected as the committee chair. Chan Wong from Entergy Delivery has been elected to serve as vice-chair, and Ya-Shian Li-Baboud from NIST will serve as secretary.

The CASC hopes to complete its work by late 2016, whereupon the final test suite specification will be available for industry use.

To join the IEEE 1588 Power Profile CASC, please contact the ICAP administrator (icap-team@ieee.org).

[More details about this effort are available online.](#)

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Synchrophasor Certification Effort Reaches Milestone

For the past several years, key members of the global synchrophasor community—including NIST, IEEE, and the North American SynchroPhasor Initiative (NASPI)—have been working to fill a gap in the power industry regarding testing and certification of Phasor Measurement Units (PMUs). These organizations have been establishing a program that offers buyers of PMU technology a method to determine compliance of a product to the IEEE C37.118.1a standard before purchase and large-scale deployments.

Another key milestone in this project was just announced at the NASPI Work Group meeting and first International Synchrophasor Symposium (March 22-24, 2016, in Atlanta, GA). At that meeting, IEEE recognized, with a certificate and plaque, the first two companies whose PMUs have successfully completed the requirements of the IEEE [Synchrophasor Certification Program](#). The registry of IEEE-certified PMUs can be found [online here](#).

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New Members of NIST Smart Grid and CPS Teams

As the NIST Smart Grid and CPS Programs continue to evolve, several new scientists and engineers have joined the teams. Both the Smart Grid Interoperability Testbed and the CPS Testbed, in particular, have seen significant development and growth. Here's a list of recent additions to the teams:

- Avi Gopstein is serving as Smart Grid Program Manager and Deputy National Coordinator for Smart Grid Interoperability.
- Tom Roth and Eugene Song, Electronics Engineers, are conducting research in the testbeds.
- Kyle Johnson, Presidential Management Fellow, recently completed his four-month detail to NIST to help with the GCTC program and recent GCTC Tech Jam.

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SGIP Update: Save the Date

SGIP has announced the date, location, and theme for its 2016 Annual Conference, which will be called the 2016 Grid Modernization Summit. It will be held November 7-10, 2016, at the Capital Hilton in Washington, D.C. The conference theme is "Accelerating Transformation." NIST staff members continue to participate actively in SGIP technical sessions and will be contributing to the conference.

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