

## Technical priorities for Smart Grid development outlined in new report

Report seen as a blueprint for a high-level architecture for intelligent power grid

- By [William Jackson](#)
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Developing a consensus for the architecture of a secure, interoperable next-generation power distribution system might not be a simple process, according to a preliminary report produced for the National Institute of Standards and Technology.

After meeting with hundreds of stakeholders and evaluating contributions from more than 1,000, the Electric Power Research Institute (EPRI) found that industry understanding of existing technical standards and issues facing a nationwide Smart Grid tends to be incomplete and parochial.

"These patterns make rapid consensus difficult," EPRI [concluded](#) in the "Report to NIST on the Smart Grid Interoperability Standards Roadmap." "So, it is appropriate that these results be built upon through further analysis and refinement. NIST desires to accommodate existing technology while relying on technical experts that aid in successfully developing a standards roadmap to achieve an innovative smart grid."

Comments on the report can be submitted to NIST at [smartgridcomments@nist.gov](mailto:smartgridcomments@nist.gov), or mailed to George Arnold, 100 Bureau Drive, Stop 8100, NIST, Gaithersburg, MD 20899-8100.

The report is the "beginning of a high-level architecture for the Smart Grid," said Arnold, NIST's national coordinator for Smart Grid interoperability. EPRI said industry understanding of the infrastructure's challenges is akin to blind men trying to describe an elephant, Arnold said. Each has his own idea of the portion of the leg, trunk or tail he can feel, but there is little overall understanding of the whole animal.

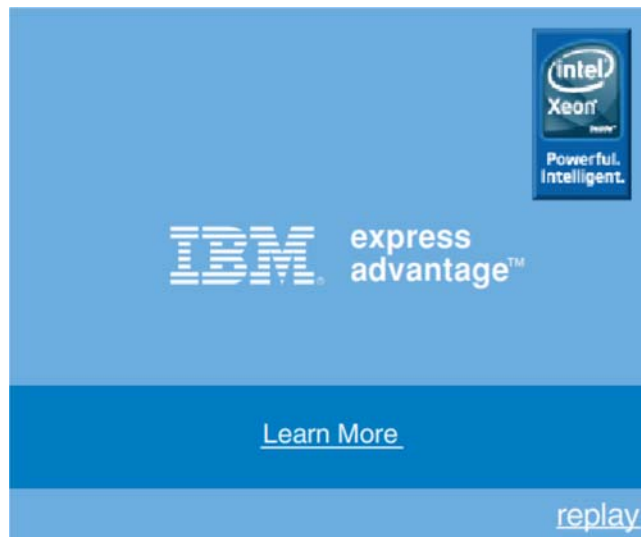
The report is one of the first steps in an aggressive three-phase program by NIST to develop key technical standards for the Smart Grid by the end of the year. The Smart Grid program was established in the Energy Independence and Security Act of 2007 and has been identified as an important element of the Obama administration's economic recovery program, given its promise for creating jobs, contributing to energy independence and curbing greenhouse gas emissions.

The Smart Grid would use intelligent networking and automation to better control the delivery of electricity to consumers while also enabling a two-way flow of information between the power plant and the appliance and points in between. With money for developing and fielding new electric grid technology becoming available under the American Recovery and Reinvestment Act, industry now needs standards for interoperability and security.

The Energy Independence and Security Act made DOE the overall lead for the Smart Grid program and assigned NIST the job of developing a framework of standards and protocols to ensure interoperability and security. Final standards will be approved by the Federal Energy Regulatory Commission (FERC), which has regulatory authority over the interstate industry.

The three-phase approach to standards development adopted by NIST consists of:

- Developing a consensus among utilities, equipment suppliers, consumers, standards developers and other stakeholders on needed standards and producing a Smart Grid architecture, an initial set of standards to support implementation and plans for developing remaining standards by early fall.
- Launching formal partnerships to develop the remaining needed standards.



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- Developing a program for testing and certification to ensure that Smart Grid equipment and systems comply with the standards.

In the first phase, NIST awarded a \$1.3 million contract to EPRI, of Palo Alto, Calif., to create an interim report on Smart Grid architecture and a standards strategy.

"It is at least a start on a common concept," Arnold said. "There are a lot of people involved. There is a high level of interest in both government and industry."

A May workshop on the Smart Grid architecture attracted nearly 700 participants, and the White House hosted a meeting that was chaired by the secretaries of Commerce and Energy. "This is such a large undertaking that it is only going to work with that level of support," he said.

Because of the limited time available to develop the interim road map, EPRI focused on a handful of applications that will underlie an intelligent grid. These include the four priority functionalities identified by FERC in its draft Smart Grid policy issued March 19: "Wide-Area Situational Awareness, Demand Response, Electric Storage and Electric Transportation." Automated metering and distribution grid management also were included due to feedback.

NIST will use the report in drafting its Smart Grid Interoperability Framework to describe a high-level architecture and identify an initial set of existing key standards to support it. The agency will also outline a strategy for developing new or revised standards. The framework is expected to be released in September.

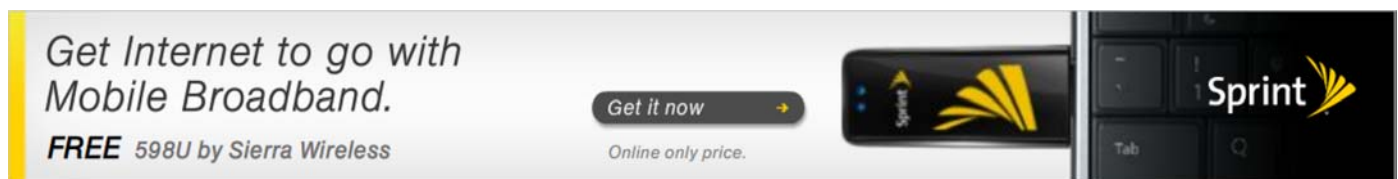
Arnold said the EPRI report identified about 80 necessary standards that either exist already or are in development, and about 70 gaps or issues that must still be addressed. He said the top 10 or so of those gaps will be identified at a workshop of standards-developing organizations this summer and a plan will be put in place to address them.

NIST has established a [wiki collaboration site](#) with technical documents to support the working groups on standards and interoperability issues. There also is a Smart Grid [interim road map wiki](#) site to support collaboration on that effort.

"It is not the most easy-to-use tool," Arnold said of the wikis. "It was developed by a lot of geeks. On our to-do list is to put a better interface on it."

#### About the Author

William Jackson is a senior writer for GCN.



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