

NIST CLOUD COMPUTING STANDARDS ROADMAP

ORGANIZATIONAL SPECIFICS

Standards Organizations:	ISO, IEC, IEEE, INCITS
Technical Committees:	JTC 1/SC 38
Other Partnering Organizations:	n/a
Government Organizations:	NIST
Industry Sector(s) / Technology:	IT/Cloud Computing
Program / Activity Website URL(s):	NIST Cloud Computing Roadmap https://www.nist.gov/publications/nist-cloud-computing-standards-roadmap

STANDARDS DRIVEN PUBLIC-PRIVATE PARTNERSHIP (PPP) OBJECTIVES

PPP Drivers:

On February 8, 2011, Vivek Kundra (the U.S. Chief Information Officer) released the [Federal Cloud Computing Strategy](#) commonly referred to as “Cloud First.” The federal government’s current information technology (IT) environment was characterized by low asset utilization, a fragmented demand for resources, duplicative systems, environments which are difficult to manage, and long procurement lead times. The Cloud First policy was designed to address those weaknesses using cloud computing.

The National Institute of Standards and Technology (NIST) was identified as a key player and was tasked with finding ways to help accelerate the safe adoption of cloud computing by the United States government (USG). To achieve that goal, NIST formed a public working group comprised of government agencies, private companies, and academia. The public working group worked to identify concerns that the stakeholders had with migrating to cloud computing. Those concerns then became the basis of the [NIST Cloud Computing Roadmap](#) which identified ten concerns that were potentially holding back cloud computing adoption. This roadmap was then used by various standards organizations as a guideline of what to work on to speed the adoption of cloud computing by industry.

PPP Goals:

The scope was to identify major concerns (as identified by stakeholders) that were potentially slowing or preventing the adoption of cloud computing by the USG (and by extension everyone else). The end goal was to create a roadmap that could be used by USG agencies, private industry, academia, and standards bodies that identified the issues and standards needed to be worked on to speed the adoption of cloud computing.

Public Sector Role & Participation:

The NIST public working group was an open forum for participation by various stakeholders that had a vested interest in seeing cloud computing successfully adopted by the USG. NIST staff served as the officers of the public working group. Participants varied over time, but included members of private industry, academia, various USG agencies, members of standards bodies, and individual technical experts. At the time it was created, NIST staff was identified to chair the public working group, a scope was crafted, rules were published for the participants, and a general deadline was set. All other work was largely determined by the participants that operated in a consensus-based format.

Implementation Methods:

NIST established the public working group and set the structure and management. NIST provided advertisement, technically neutral management of the working group, a data repository, and teleconferencing services. The workshops invited the public working group participants and government agencies. NIST's promotional efforts engaged more than 400 participants. The public working group set its own schedule and work goals as determined by consensus of the participating stakeholders. At first, the public working group ran as only one group but later divided into subgroups to address various specific concerns or technical issues as the roadmap discussions advanced. Lastly, the public working group sponsored an in-person workshop at NIST to help advance the work on the project.

Measurement of Success:

The [NIST Cloud Computing Roadmap](#) has been used as a seed document by several standards development organizations (SDOs). For example, the roadmap was submitted to the [ISO/IEC JTC1/SC 38](#) and became the core of their cloud computing roadmap. Over the last several years, industry and SDOs have been addressing those ten concerns identified in the document and by some measures nine of the ten have been addressed. The JTC 1/SC 38 current work program can be reviewed [here](#).

In addition, some JTC 1/SC 38 standards are now referenced in some U.S. Department of Defense (DOD) purchasing lists. This included the [ISO/IEC 18384-1:2016 Information technology — Reference Architecture for Service Oriented Architecture \(SOA RA\) — Part 1: Terminology and concepts for SOA](#).

Key Takeaways:

- 1) A public forum enabled stakeholders to feel invested in the project and they worked together to make it succeed.
- 2) A public forum enabled NIST to get a wide variety of technical expertise ensuring that the project would be a higher quality than if NIST tried to do it by itself.

Rather than trying to solve everything at once, a roadmap provided a guideline that could be used by several organizations at once, enabling quick and substantial progress.

Advice for Others:

When appropriate, public forums can be very successful. The NIST Cloud Computing Technology Roadmap was so successful it became a model that NIST used for other projects including [Smart Cities and Communities](#) and [Internet of Things \(IoT\)](#).

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