

NIST and Standards for Cloud Computing

**Dawn Leaf
Senior Advisor for Cloud Computing
Information Technology Laboratory**

February 1, 2011

NIST Definition of Cloud Computing

“Cloud computing is a model for enabling convenient, on-demand network access to a shared pool of configurable computing resources (e.g., networks, servers, storage, applications, and services) that can be rapidly provisioned and released with minimal management effort or service provider interaction.”

Overview

- **Program goal, concept and rationale**
- **Program timeline**
- **Collaborations**
- **Progress**
- **Summary**

NIST Cloud Computing Program Goal

- Accelerate the federal government's secure adoption of cloud computing
 - Build a USG Cloud Computing Standards Roadmap which focuses on the highest priority USG cloud computing security, interoperability and portability requirements
 - Lead efforts to develop standards and guidelines in close consultation and collaboration with standards bodies, the private sector, and other stakeholders

Why NIST?

- US government agencies need Cloud Computing **standards & guidance** to accelerate effective adoption
- Private sector and U.S. government agencies must **work together** to identify highest priority USG Cloud Computing security, interoperability, & portability requirements & gaps
- **Neutral, objective** party is instrumental in encouraging innovation & “a level playing field” for U.S. industry

NIST Cloud Computing Program Concept & Rationale

Strategic Program

How to build a USG Cloud Computing Standards Roadmap

1. Define Target USG Cloud Computing Business Use Cases

2. Define Neutral Cloud Computing Reference Architecture & Taxonomy

priorities
risks
obstacles

3. Generate Cloud Computing Roadmap – Translate Requirements & Identify Gaps

Expand
CC Definition
ref. architecture

Interagency Report: USG Standards Roadmap – list of Tactical Priorities & Deliverables

Concurrent & Iterative 3-step process that drives tactical efforts

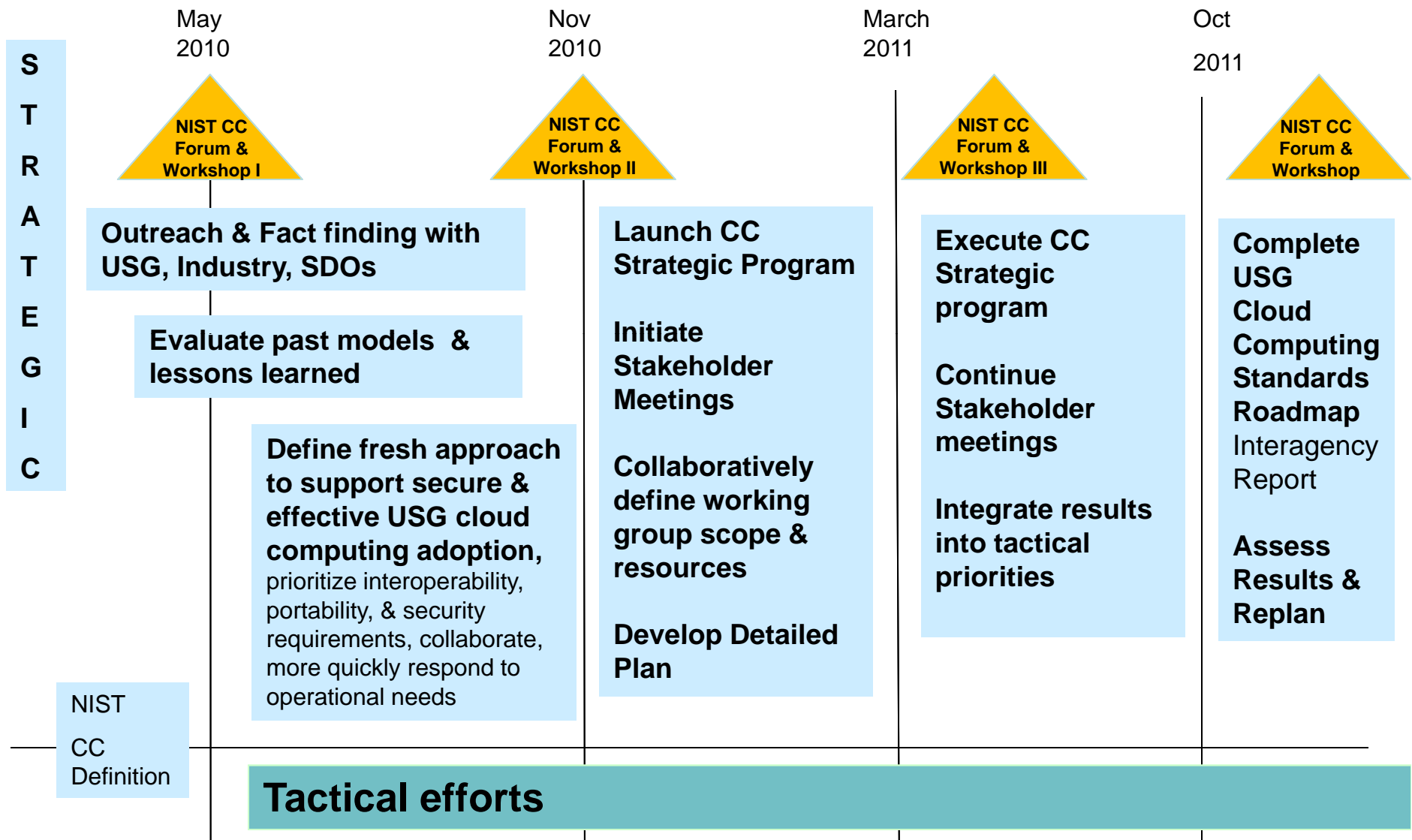
Tactical Program

NIST CC efforts

- SDO submissions & support
- **Guidance** – Special Publications; technical advisor to Fed CIO Council
- **Standards Acceleration to Jumpstart the Adoption of Cloud Computing (SAJACC)** -- through qualitative testing of specifications against interoperability, security, and portability requirements
- **Complex Computing Simulation & Modeling** – Koala IaaS resource allocation algorithms

Beneficial bi-product: Identify priorities for hand-off to other stakeholders – policy makers, prototypes, pilots, R&D organizations

NIST Cloud Computing Program Timeline



NIST Cloud Computing Collaboration Site

<http://collaborate.nist.gov/twiki-cloud-computing/bin/view/CloudComputing/WebHome>

WebHome < CloudComputi... x

collaborate.nist.gov/twiki-cloud-computing/bin/view/CloudComputing/WebHome

Home CloudComputing Web View Edit Account

NIST Cloud Computing Collaboration Site Edit Attach

About Reference Architecture SAJACC Security Standards Roadmap Business Use Cases Documents

CloudComputing

Log In or Register

CloudComputing Web

- Create New Topic
- Index
- Search
- Changes
- Notifications
- RSS Feed
- Statistics
- Preferences

Webs

- CloudComputing
- Main
- Sandbox
- TWiki

Welcome to the NIST Cloud Computing Collaboration Site

Contents of this Topic	Useful Links
<ul style="list-style-type: none">General InformationWorking Groups of NIST Cloud ComputingCloud Computing Events	<ul style="list-style-type: none">Reference Architecture and TaxonomyStandards Acceleration to Jumpstart the Adoption of Cloud Computing (SAJACC)Cloud SecurityStandards RoadmapBusiness Use CasesUpcoming Cloud Computing EventsPrevious Cloud Computing Events

General Information

The National Institute of Standards and Technology (NIST) has been designated by Federal Chief Information Officer Vivek Kundra to accelerate the federal government's secure adoption of cloud computing efforts to develop standards and guidelines in close consultation and collaboration with standards bodies, the private sector, and other stakeholders. Computer science researchers at NIST are working on complementary efforts to speed the government's quick and secure adoption of cloud computing.

NIST's long term goal is to provide thought leadership and guidance around the cloud computing paradigm to catalyze its use within industry and government. NIST aims to shorten the adoption cycle, which will enable near-term cost savings and increased ability to quickly create and deploy safe and secure enterprise applications. NIST aims to foster cloud computing systems and practices that support interoperability, portability, and security requirements that are appropriate and achievable for important usage scenarios.

The NIST area of focus is technology, and specifically, interoperability, portability and security requirements, standards and guidance. The intent is use the strategy to prioritize NIST tactical projects which support US government agencies in the secure and effective adoption of the cloud computing model to support their missions. The expectation is that the set of priorities ("the Roadmap") will be useful more broadly by industry, Standards Development Organizations, cloud adopters, and policy makers.

This wiki is an open collaboration site for the Cloud Computing (CC) community to work with NIST in developing this framework. All material placed here is in the public domain (Please see the intellectual property statement at the bottom of this page). If you want to contribute content to this wiki, please go to [NIST Cloud Computing Program website](#), read the page carefully and follow the instructions.

- More...

Working Groups of NIST Cloud Computing

As part of the NIST plan, Working Groups were created as a public/private ownership to define standards. Follow the links below to go directly to the working group pages.

- Reference Architecture and Taxonomy
- Standards Acceleration to Jumpstart the Adoption of Cloud Computing (SAJACC)
- Cloud Security
- Standards Roadmap
- Business Use Cases

Cloud Computing Events

- Upcoming Cloud Computing Events
- Previous Cloud Computing Events

each strategic & tactical effort is a NIST-led project & working group

Public NIST cloud web site url
<http://www.nist.gov/itl/cloud/index.cfm>

NIST Cloud Computing Program Highlights

May 2010 through January 2011

- **Cloud Computing Forums & Workshops (May & Nov. 2010)**
 - 300-500 attendees with broad industry, SDO, government & international community program participants
- **Voluntary Working Groups with industry, SDOs, USG, academia (launched Nov. 5, 2010)**
 - USG Target Business Use Cases
 - Reference Architecture & Taxonomy
 - Standards Roadmap
 - SAJACC
 - Cloud Security
 - 300+ registered members per working group
 - 40-50 active in weekly teleconference meetings

NIST Cloud Computing Program Highlights

May 2010 through January 2011

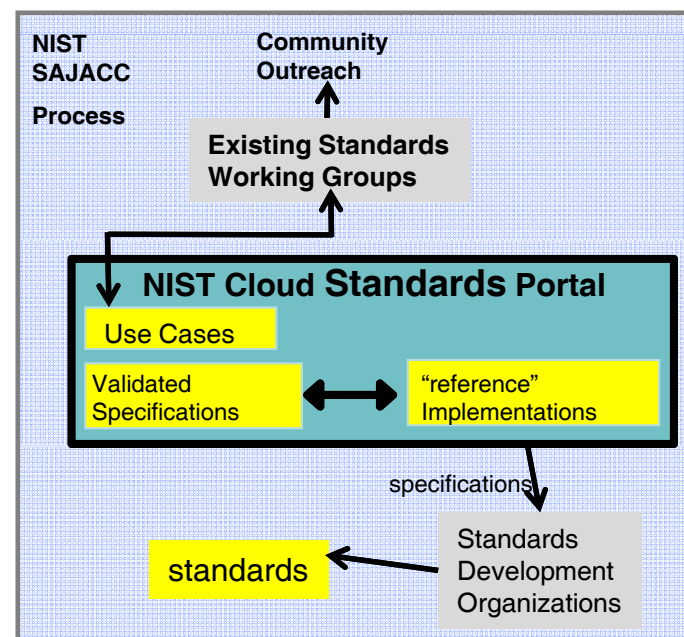
- **Reference Architecture**

- **Surveyed and completed initial analysis of eight cloud reference architecture models proposed by known cloud organizations, providers and federal agencies**
- **Developed reference architecture & taxonomy concepts to facilitate working group efforts**

NIST Cloud Computing Program Highlights

May 2010 through January 2011

- **Standards Development Organizations Participation**
 - (e.g., ISO/ANSI, IEEE, and OMG)
- **Standards Acceleration to Jumpstart Adoption of Cloud Computing (SAJACC)**
 - Launched portal September 2010
 - Developed 24 Interoperability, Security, & Portability requirements as draft use cases; made publically available November 2010



NIST Cloud Computing Program Highlights

May 2010 through January 2011

- **NIST Special Publications**

- Final *Guide to Security for Full Virtualization Technologies*, January 2011
- DRAFT *Guidelines on Security and Privacy Issues in Public Cloud Computing*, January 2011
- DRAFT *NIST Definition of Cloud Computing*, January 2011
- DRAFT *NIST Cloud Computing Synopsis & Recommendations*, March 2011

General Cloud Computing Challenge for all Stakeholders

- The Cloud Computing “space” & community is so broad that it isn’t feasible to cover all relevant work & collaboration opportunities
- NIST Response
 - Use a 3-step strategy to focus resources, consider those standards & guidance priorities which are, in the eyes of USG adopters & industry, most critical
 - Leverage the contributions of stakeholders with the NIST efforts (operational & technical expertise)

NIST Role & Measures of Success

Role:

- **Contributor**, completing standards & guidance work to meaningfully contribute to the advancement of Cloud Computing technology, innovation, & standards
- **Catalyst**, bringing U.S. government agencies together with private sector stakeholders, to identify USG Cloud Computing security, interoperability, & portability requirements, & focusing our work on these priorities
- **Neutral objective party** to encourage innovation & “a level playing field” for U.S. industry

Measures of effectiveness – extent to which

- NIST contributions are adopted & used
- Stakeholders voluntarily participate in NIST led working groups, forums, & actively contribute to objectives & deliverables

Questions?