NIST Cloud Computing Program Overview

Presented by Dawn Leaf

NIST Senior Executive for Cloud Computing

November 4, 2010

National Institute of Standards and Technology (NIST) Cloud Computing Role

NIST Cloud Computing efforts are consistent with the NIST mission:

"To promote U.S. innovation and industrial competitiveness by advancing measurement science, standards, and technology in ways that enhance economic security and improve our quality of life."
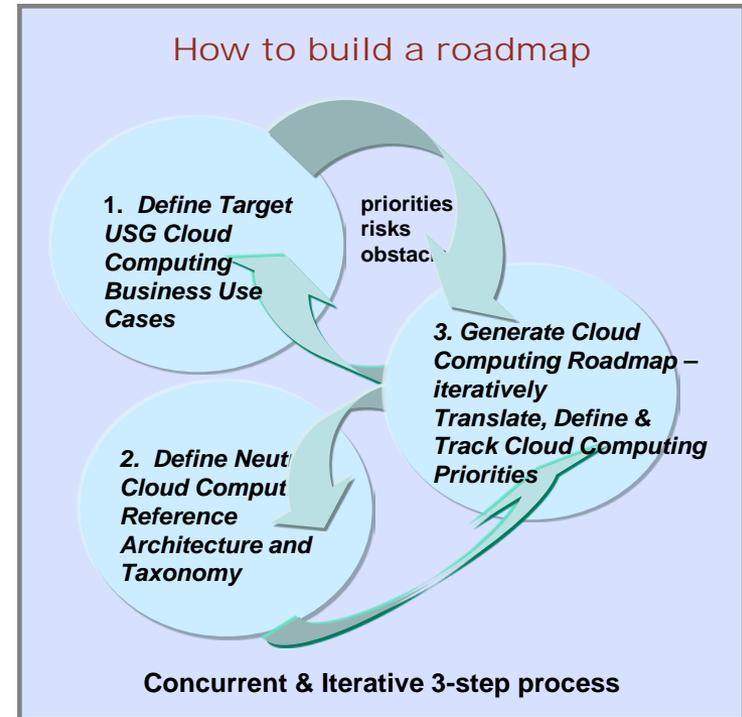
Cornerstone: Advancing Standards Development

• government needs to work collaboratively with private sector

Goal of this briefing – summarize progress since May 2010 & set the stage for the next phase of our work together

Introduce NIST Strategic Cloud Computing Initiative

Goal: Work together with Federal Chief Information Officers, Industry and Standards Developing Organizations to define a USG Cloud Computing Roadmap

How to build a roadmap

1. *Define Target USG Cloud Computing Business Use Cases*

priorities
risks
obstac...

2. *Define Neut... Cloud Comput... Reference Architecture and Taxonomy*

3. *Generate Cloud Computing Roadmap – iteratively Translate, Define & Track Cloud Computing Priorities*

Concurrent & Iterative 3-step process

UPDATE: NIST Tactical projects
what we said we would do in May 2010… and what we've done

Special Publications:

1. SP 800 -125, DRAFT _Guide to Security for Full Virtualization Technologies_, July 2010
2. SP 800 – xxx, <u>Cloud Computing Synopsis & Guidelines</u> – Dec 2010 draft release

Complex Information Systems Measurement Science -- Cloud Computing Simulation Model in Progress

Technical Advisor to Federal CIO Council Cloud Computing Executive Steering Committee, Cloud Computing Advisory Council, Standards & Security Working Groups

Standards Acceleration to Jumpstart Adoption of Cloud Computing (SAJACC)

Cloud Computing Simulation Model goal & approach:
Understand & Predict Behavior in a Cloud Computing System

***Koala*** – simulating an Infrastructure as a service (IaaS) Cloud system

Objectives:

(1) Compare behavior of proposed resource allocation algorithms for IaaS clouds

(2) Discover and characterize complex behaviors that may emerge in IaaS clouds

Early 2011 -- Target timeframe to share initial project findings

Contributors: C. Dabrowski, J. Filliben, D. Genin, K. Mills & S. Ressler

*Previous work investigated proposed Congestion Control Mechanisms or the Internet –
see NIST Special Publication 500-282   http://www.nist.gov/itl/antd/Congestion_Control_Study.cfm
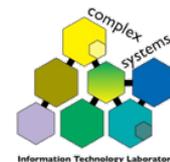
Update: Support to Federal CIO Council
Cloud Computing Advisory Council Security Working Group

Recommendations –
"Federal Risk & Authorization Management Program" concept

Technical Process: aligned to NIST SP 800-37 *Guide for Applying the Risk Management Framework to Federal Information Systems: A Security Life Cycle Approach*

Draft Security controls: selected from NIST SP 800-53 *Recommended Security Controls for Federal Information Systems*

- For low & moderate security impact cloud information systems

- Authorizing officials & information system owners have the authority & responsibility to define requirements and security plans which define how the controls are implemented.

SAJACC goal is to help solve the problem:

"How do we support the adoption of a new complex technology during the interim period between when standards are needed and when they are available, and how do we develop standards more quickly?"

SAJAAC is: Project, Process & Portal

SAJACC: What does it look like? Where are we?

Portal (version 1)

Sept. 2010 -- public Internet accessible website

Nov. 2010 -- populated with draft use cases

Plan -- iteratively & incrementally populate portal

- documented interfaces
- pointers - reference implementations
- test results

NIST Cloud Standards Process

Community Outreach

Existing Standards Working Groups

information

Open, Free Access.

NIST Cloud Standards Portal

Use Cases

Validated Specifications ⟷ "reference" Implementations

specifications

Standards Development Organizations
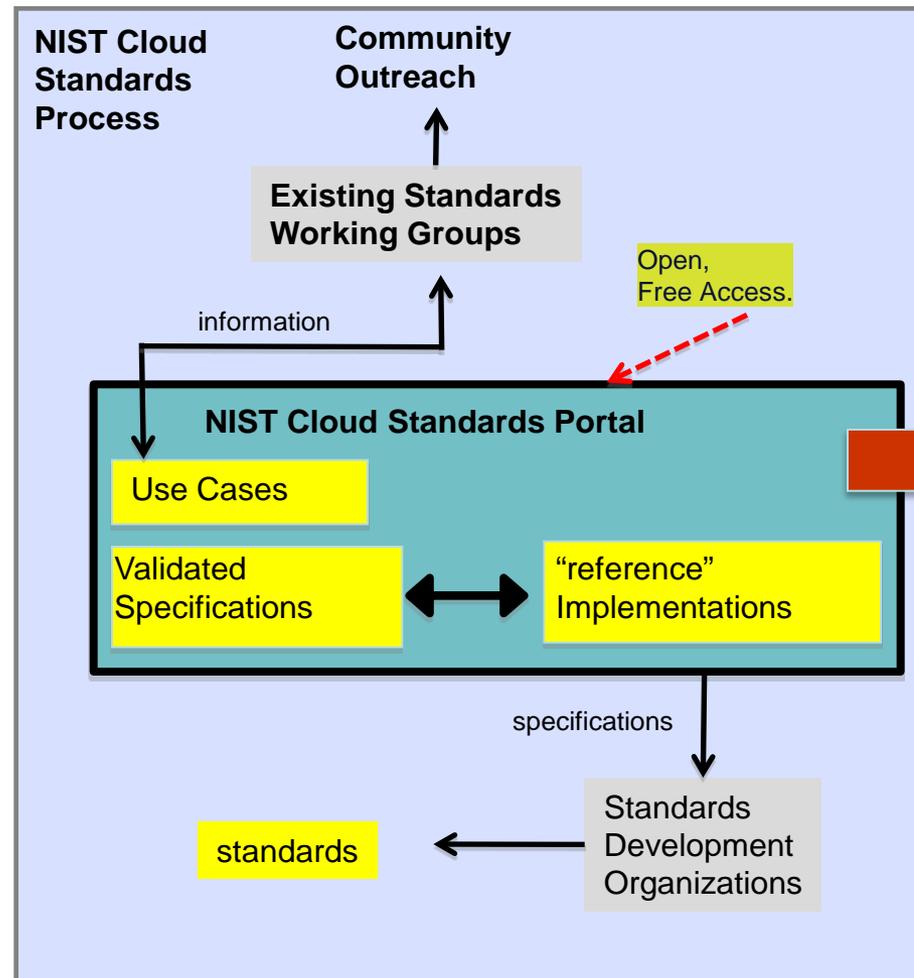
standards

Enable interoperable cloud computing before finalized standards

Faster standards development

NIST Strategy to Develop a Cloud Computing Roadmap
-- Why? Why Now?

- NIST Strategic & Tactical Cloud Computing program initiated in parallel

- Tactical efforts are fundamental to support adoption of any new emerging technology

- Tactical projects are necessary, but not sufficient to aggressively respond to the rapid pace of Cloud Computing services evolution

NIST Strategic Cloud Computing Program Timeline

May
2010

Nov
2010

March
2011

**S
T
R
A
T
E
G
I
C**

Outreach & Fact finding with USG, Industry, SDOs

Evaluate past models & lessons learned

Launch CC Strategic Program

Initiate Stakeholder meetings

Execute CC Strategic program

Continue Stakeholder meetings

Define fresh approach to support secure & effective USG cloud computing adoption, prioritize interoperability, portability, & security requirements, collaborate, more quickly respond to operational needs

Integrate results into tactical priorities

NIST

CC
Definition

Tactical efforts

NIST Strategy to Develop a USG Cloud Computing Roadmap

1. Define Target USG Cloud Computing Business Use Cases

priorities

risks

obstacles

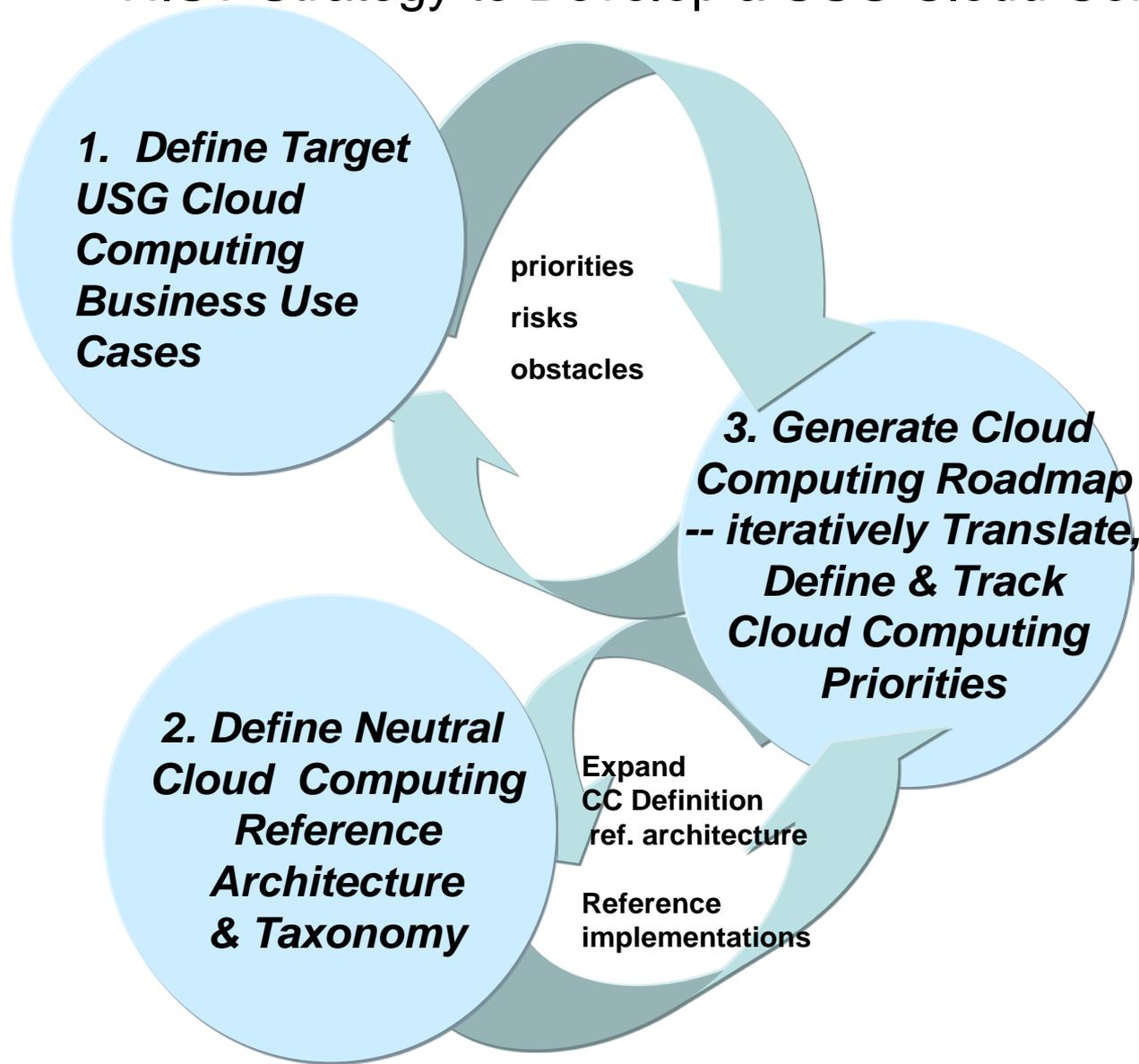# NIST Strategy to Develop a USG Cloud Computing Roadmap

1. Define Target USG Cloud Computing Business Use Cases

priorities

risks

obstacles

2. Define Neutral Cloud Computing Reference Architecture & Taxonomy

Expanded
CC Definition
 ref. architecture

Reference
implementations

NIST Strategy to Develop a USG Cloud Computing Roadmap

1. Define Target USG Cloud Computing Business Use Cases

priorities

risks

obstacles

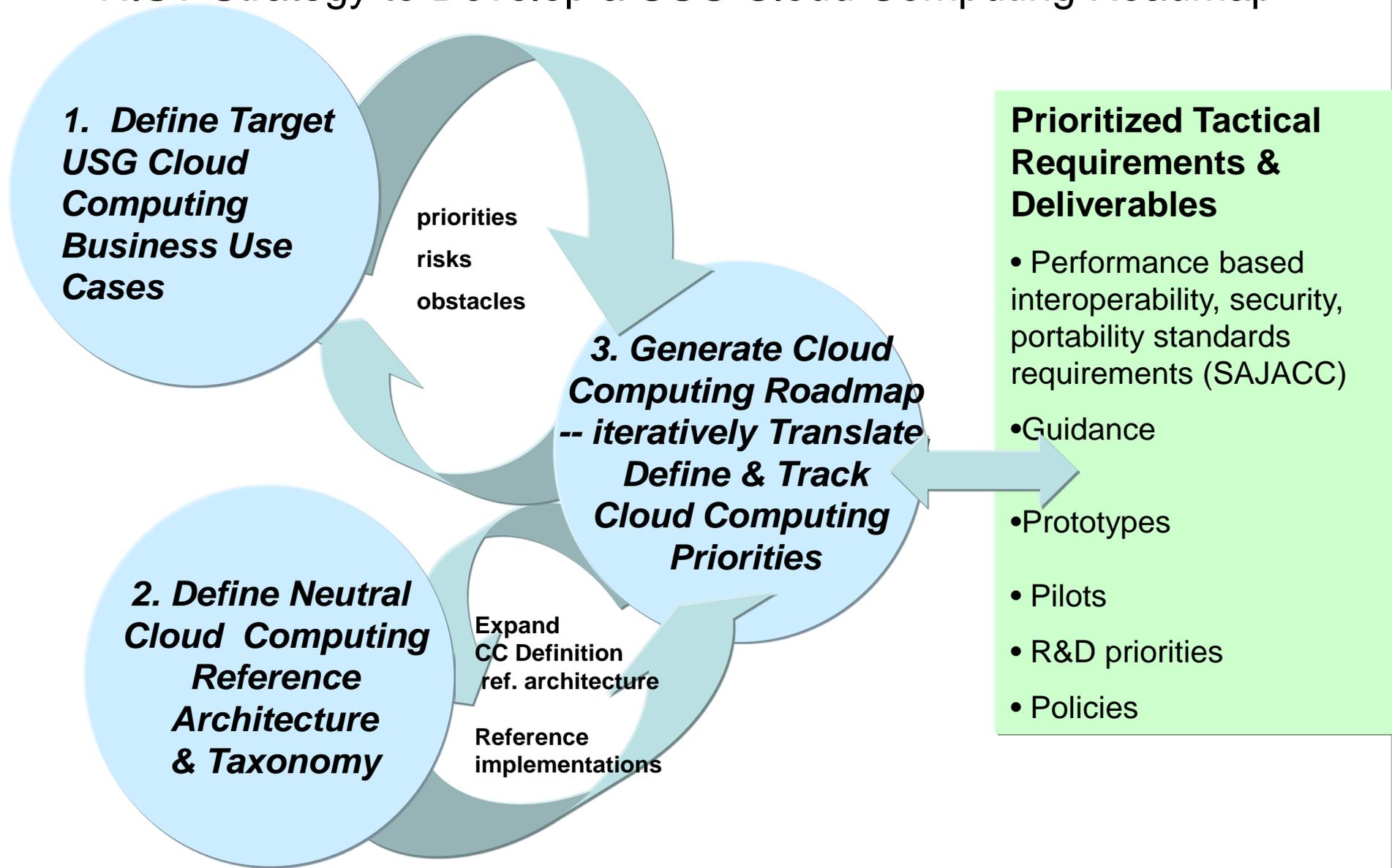**3. Generate Cloud Computing Roadmap -- iteratively Translate, Define & Track Cloud Computing Priorities**

2. Define Neutral Cloud Computing Reference Architecture & Taxonomy

Expand CC Definition
ref. architecture

Reference implementations

NIST Strategy to Develop a USG Cloud Computing Roadmap

1. Define Target USG Cloud Computing Business Use Cases

priorities

risks

obstacles

3. Generate Cloud Computing Roadmap -- iteratively Translate Define & Track Cloud Computing Priorities

2. Define Neutral Cloud Computing Reference Architecture & Taxonomy

Expand
CC Definition
ref. architecture

Reference
implementations

Prioritized Tactical Requirements & Deliverables

• Performance based interoperability, security, portability standards requirements (SAJACC)

•Guidance

•Prototypes

• Pilots

• R&D priorities

• Policies

Getting to Work -- November 5 Workshop

Overview:

- **GSA related efforts,**
- **Lessons Learned,**
- **Review of the NIST Strategy to Develop a Cloud Computing Roadmap; Process & Working logistics**

Please sign up today for a Nov. 5 AM & PM breakout session

TRACK	AM	PM
Strategic	USG Business Use Cases	Reference Architecture
Standards	Cloud Standards	SAJACC
Adoption Considerations	Security	Applications & Issues