Redefining cloud computing -- again

Hype, misuse, and misplaced aspirations have clouded the term's definition. Here's what it's really about

By David Linthicum | InfoWorld

Back in August, I declared the term "cloud computing" officially meaningless because of its extensive overuse and misuse. No matter what a vendor sold, it was somehow "cloud computing." These days, when somebody wants me to define "cloud computing," I fight the urge to eject them from the conference room. It's so widely defined, and thus so vague, that providing a crisp definition is nearly impossible.

More disturbing, there seems to be an increasing overuse of cloud computing concepts as saviors for all past IT mistakes. Pushing cloud computing as the way to solve all, or even most, computing problems reveals those who make such statements as less than credible.

[ Read InfoWorld's seminal definition of cloud computing. ] In the data center today, the action is in the private cloud. InfoWorld's experts take you through what you need to know to do it right in our "Private Cloud Deep Dive" PDF special report. Also check out our "Cloud Security Deep Dive," our "Cloud Storage Deep Dive," and our...
Cloud Computing and SOA Convergence in Your Enterprise

A Step-by-Step Guide

David S. Linthicum
So, what is cloud computing?

- Architecture?
- Technology?
- Use cases?
- What will it be soon?
From Hype to Growth

Public Cloud Services Market and Annual Growth Rate, 2010-2016

Source: Gartner (February 2013)
Data is the “Killer App” for Cloud
Touchpoints of a Conversation Around Big Data

- **System**
- **Data**
- **Infrastructure**

**Greenplum/Hadoop Architecture**
- How many nodes will be required to deliver the expected results in the expected time frame?
- Do the time frame for job execution warrant high availability of Hadoop?

**Data Structure Analysis**
- Have you analyzed what data needs to be included to achieve your goals?

**Network Architecture**
- How much data will be transported across the network?
- Will the data be transferred between data centers or within a single data center?

**Compute Architecture**
- What time frame does the data need to be processed within?
- What hardware are you planning to use to implement this solution?

**Storage Architecture**
- Will current storage solution provide enough performance to support the goals?

**Bandwidth**

**Switch Architecture**

**Converged HW**

**Blades**

**SAN**

**NAS**

**Security**
- What type of security controls need to be instituted?
- Is there risk of data leakage?
- Does access to the data need to be logged by RBAC?

**Service Management**
- Will this solution consume more resources over time?
- Will the data set grow and by how much?
- Will the data be used by more than one process?

**Operation Management**

**Capacity Management**

**Business Justification**
- What is the expected value of analyzing this data?
- What is the time frame for implementing this solution?
Delivery Models Morphing

• Software as a Service (SaaS)
  – Applications as a Service
  – Utilities as a Service
  – Connected and Disconnected

• Platform as a Service (PaaS)
  – Design as a Service
  – Process as a Service
  – Testing as a Service

• Infrastructure as a Service (IaaS)
  – Database as a Service
  – Management as a Service
  – Middleware as a Service
  – Integration as a Service
  – Information as a Service

• ...And more.
New Stack Emerging

1. Infrastructure-as-a-Service
2. Storage-as-a-Service
3. Database-as-a-Service
4. Information-as-a-Service
5. Process-as-a-Service
6. Application-as-a-Service
7. Management/Governance-as-a-Service
8. Testing-as-a-Service
What Works in the Cloud

- The ability to expand storage quickly, and at a lower cost.
- DevOps, around the use of PaaS.
- Large and highly expandable data systems.
- SaaS-delivered enterprise applications.
- New or small business support.
- High performance computing on-demand.
- Office automation applications.
What Does Not Work in the Cloud

- Most legacy system migrations.
- Systems that require a high degree of security.
- Systems that are subject to a lot of regulatory control.
- Systems that need to be tightly integrated with local systems and data.
- Enterprises that have made a significant investment in hardware and software.
- Enterprises with substandard network infrastructure.
Cloud Computing is Becoming Systemic
Buzzword “cloud computing” is absorbed into computing.
Focus on fit and function, and not the hype.
Security moves to “centralized trust” models.
Centralized data becomes a key strategic advantage.
Mobile devices become more powerful, but thin.
The rise of the “composite cloud.”
The Operational Benefits Are Obvious

Source: Amazon Web Services
Fig. 5.2 Reasons for Moving to Cloud Computing

- Business agility: 49%
- Cost efficiency: 46%
- Leverage core competencies and free IT resources to focus on innovation: 22%
- Disaster recovery and business continuity: 13%
- Part of a green initiative: 3%

Source: Sand Hill Group Cloud Computing Survey 2010
Most Cloud-Based Systems Are Lacking Architecture
JUNE 19, 2012

Cloud failures cost more than $71 million since 2007

The economic impact of cloud outages is probably underestimated, researchers say

By Loek Essers | IDG News Service

A total of 568 hours of downtime at 13 well-known cloud services since 2007 had an economic impact of more than $71.7 million dollars, said the International Working Group on Cloud Computing Resiliency (IWGCR) on Monday.

The average unavailability of cloud services is 7.5 hours per year, amounting to an availability rate of 99.9 percent, according to the group's preliminary results. "It is extremely far from the expected reliability of mission critical system (99.999 percent). As a comparison, the service average unavailability for electricity in a modern capital is less than 15 minutes per year," the researchers noted in their paper.
The Results

• Inefficient utilization of resources.
• Resource saturation.
• Lack of elasticity and scalability.
• Lack of security and governance.
• Frequent outages.
• Bad or no tenant management.
• Other very bad things.
Common Mistakes

• Not understanding how to make architectures scale.
• Not dealing with tenant management issues.
• Not understanding that security is systemic, and impacts performance.
• Not understanding the proper use of services (Yes, that means SOA).
• Tossing technology at the problem.
• Listening to the wrong people.
Can SOA Help?

The core components which make up an SOA implementation:

- **PEOPLE**: Empower decision makers
- **PROCESS**: Align IT with business operations
- **PLATFORM**: Increase operational efficiency
- **PRACTICE**: Employ best practice methodology

SOA (Service Oriented Architecture)
Types of Cloud Architecture Patterns Emerging

- Migration to a Cloud
  - Business Systems
  - Infrastructure
- Building on a Cloud (PaaS)
- Building a Hybrid Cloud
- Building a Cloud
  - IaaS
  - SaaS
  - PaaS
Types of Cloud Architecture Patterns Emerging

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  - SaaS
  - PaaS

We’ll focus here

Complexity
General Architecture Patterns to Follow
Build a solid foundation:

- Determine business drivers
- Understand: data, services, business processes and system integration points
- Design a “cloud-friendly” enterprise architecture roadmap that leverages Services Oriented Architecture (SOA)
- Determine an integration strategy for internal and external systems
- Outline a migration path for legacy systems to the new architecture
“as-is”

For the Cloud | AS-IS | TO BE | DEPLOY

Business Case

SECURITY

Data → Services → Process

GOVERNANCE
“to be”

For the Cloud | AS-IS | TO BE | DEPLOY

SECURITY

Data | Services | Process | Platform
Private, Public, Hybrid

GOVERNANCE
Deploy

For the Cloud

AS-IS  TO BE  DEPLOY

SECURITY

Provider Technology Selection & Validation

Development & Testing

Migration & Testing

Final Deployed Target Architecture

GOVERNANCE
Focus on the primitives.

- The best clouds are sets of low level services that can be configured.
  - Data services
  - Transaction services
  - Utility services

Leverage distributed components that are centrally controlled.

- Build for tenants, not users.
- Don’t lean too much on virtualization.
- Security and governance are systemic.
Use Case:
General Business System Migration to the Cloud
The General Idea

- Break the system down to its component parts, understanding each part.
- Rethink the database, it’s typically a mess.
- Rethink the system as sets of services/API, watch the granularity.
  - Data services, transaction services, utility services
- Create a security and governance plan.
- Consider the user interfaces.
- Consider device interfaces.
- Migrate only the components to the cloud that will provide the best value.
Good News / Bad News

• Good News:
  – Most cloud platforms provide the tenant management features for you.
  – Most cloud platforms manage the resources for you.
  – The cloud platforms are getting better.

• Bad News:
  – Security is still your problem.
  – Application and service design is still your problem.
  – Testing can be a hassle.
  – Watch out for immaturity if standards.
Reference Architecture

Monitoring and Management

Process Management (BPMS)

Rules Management

Composites/Portals

Transactional Services

Data Services/Abstraction

Data

Security & Identity Management & Service Governance
Create the Information Model

- Understand Ontologies
  - Ontologies
  - Data Dictionary & Metadata
  - Data Catalog

- Understand the Data
  - Legacy Metadata
  - External Metadata (B2B)

- Catalog the Data
  - Information Model

- Build Information Model
Data Services/Abstraction

Data
Create a Service Model

- Understand Services
  - Candidate Services
  - Services And Information
- Information to Services
- Build Service Model
  - Service Model

- Data Catalog
- Information Model
Transactional Services

Data Services/Abstraction

Data
Source: Microsoft
Source: Microsoft
Create a Process Model

Understand Processes

Services to Processes

Build Process Model

Data Catalog

Information Model

Service Model

Candidate Processes

Services to Processes

Process Model
Create a Governance Model

Define Policies

Design Policies

Implement Policies

Defined Policies

Policy Designs

Governance Model

Process Model

Information Model

Service Model
Security & Identity

Management & Service Governance

- Monitoring and Management
- Process Management (BPMS)
- Rules Management
- Composites/Portals

Transactional Services

Data Services/Abstraction

Data
Cloud Governance

Process
  - Methodology
  - KPI and monitoring
  - Lifecycle
  - Certification

Cloud Governance
  - QoS
  - Organization
  - Standards
  - Technology
  - People
  - Competency
  - Roles and responsibilities
  - Tools
  - Portfolios
  - Incentives
Select Platforms and Deploy Processes, Services, and Data to Platforms.

List Candidate Platforms

Analyze and Test Candidate Platforms

Select Target Platforms

Deploy to Target Platforms

Process Assignments

Service Assignments

Data Assignments

Candidate Platforms

Test Results

Target Platforms
Thanks!