

## IBM's Strategy for Clouds of the Future

Cloud computing is a rising trend in the IT arena, where a multitude of vendors promote a dizzying array of cloud offerings. The cloud options are confusing for consumers, who must select from a seemingly endless choice of cloud partners ranging from niche players offering “pieces” of the cloud puzzle, to the large vendors with their broad-based cloud offerings.

With one exception, vendors today tend to exclusively focus on creating vertical cloud stacks, cloud solutions, and large portfolios of cloud services to help their customers accelerate their cloud adoption. Such offerings are designed to address immediate customer needs and interests. However, given Cloud computing's potential impact on business and IT operations; we believe that a tactical focus on vertical stacks without a strategic cloud context risks creating serious longer term, strategic issues.

IBM is the notable exception. It is the only vendor encouraging customers to also consider the longer term impact of today's decisions about Cloud computing. They are also taking active steps to reduce customers' long term risks. Let's see how this is so by first identifying weaknesses in what their competitors are focusing on in their messaging.

### *Today's Focus is Tactical*

Nearly all vendors are providing bundled vertical cloud stack solutions consisting of their own products. These are typically complemented with a boatload of services to help customers develop cloud strategies, roadmaps to getting started with cloud initiatives, etc. This approach is pragmatic because it satisfies the customers' immediate cloud needs. However, when vendor approaches are limited to these tactical approaches, they fail to indicate or make allowance for the need to assure that cloud decisions made today will fit in with future strategic directions.

### *The Exception*

Amidst the abundance of cloud stack solutions and cloud service offerings, IBM stands out by leading the way with a cloud strategy based on open standards that will help facilitate future cloud interoperability, portability and agility. This is after all, the long term goal of cloud computing. IBM's leadership is demonstrated in the broad range of open standards development initiatives that are being led, or initiated, by them.

Before looking at IBM's proposed standards, let's examine why while today's single/limited vendor cloud stack approach may be a good way to get started, it may not be the ideal strategic choice for the long haul.



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### ***Today's Cloud Offerings***

The current trend of bundled vertical cloud stack solutions and services offered by larger vendors makes a lot of sense for today's market. As customers begin dipping their toes in the cloud computing waters, it's faster, simpler and easier to buy and deploy a pre-built single vendor cloud solution for initial cloud deployments or proof-of-concept testing. Today, many private cloud consumers are convinced they just have to select the vendor they prefer to work with, and they can quickly start their new cloud deployment. Lacking experience, this appears to provide an easy and sensible way to launch new standalone private clouds or initial cloud testing. Unfortunately, the reality is very different.

Just for a moment, imagine that you've completed the initial testing and deployment of your private cloud solution. What happens when you have to run and manage your cloud with the rest of the IT technologies and tools that you have? Aside from new green field deployments, the real world of IT is messy – it's typically a hodgepodge of technologies from lots of vendors with different approaches and processes. So, as you begin using your private cloud with its single vendor stack, your operations teams is using tools from one vendor to deploy new servers, a performance tool from another vendor, and a storage management tool from yet a third vendor to manage your other IT environments! Just how can you bring a semblance of order to IT? After all, cloud was supposed to be better, easier, and faster. The customer (and vendor) failed to consider or allow for how the implementation fit long term cloud and IT directions.

What are your options? You can continue to use the single vendor approach for your cloud, while running the rest of your heterogeneous IT infrastructure as it is. Or, you could rip and replace everything with one vendor's stacked solutions, which is highly unlikely. Or integrate the technologies yourself. This is not business agility.

What happens when a cloud provider can deliver their cloud services better and cheaper than you can do it yourself, how do you migrate from your private cloud to theirs? The chances are slim that the cloud provider is using the same vendor's vertical cloud stack that you are. What do you do now?

### ***Cloud Standards for Tomorrow's Clouds***

The examples above are precisely why the industry needs more than vertical cloud stacks. What are missing are standards that facilitate interoperability between clouds, in order to protect customer cloud investments for the long term. The long-term success of Cloud depends on the development of such standards. As seen above, the alternatives are neither pretty nor realistic. Interoperability is critical to delivering cloud services with the speed, automation and agility that cloud adopters demand. The lesson should have been learned before. With some pain, the industry successfully developed interoperability standards for Web Services interoperability. We need similar efforts to ensure Cloud Service interoperability.

In the short term and selected situations, vertical cloud stack offerings are suitable and sufficient. For example, they are appropriate for Proof of Concepts or new standalone cloud initiatives such as dynamically spinning up development test environments, or selected initiatives. But as cloud use expands and evolves, cloud customers risk ending up with a less than ideal situation where they have isolated deployment tools from one vendor for cloud provisioning, while using another vendor's deployment tools for everything else. And if business processes begin to span across hybrid cloud environments, jumping from applications running on existing internal infrastructure, then to internal cloud infrastructure, and then to external cloud services, how do you manage performance, rectify incidents, and have a consistent end to end view without integration between the tools? We've done this before with IT operational silos, and it is neither efficient nor effective.

From what we have seen of the major vendors' cloud initiatives, only IBM appears to be taking a leadership role by looking ahead and addressing cloud interoperability issues. IBM is working through external standards bodies to develop cloud standards that industry vendors can employ. Of the largest management vendors, IBM is the only vendor we have heard articulate the importance of cloud standards, and actively discussing their cloud standards activities. Although customers are not clamoring for cloud standards yet, standards efforts must begin way in advance of when they're really needed. Here is an overview of some of those activities.

### ***Linked Data***

The first cloud standard that IBM would like to see implemented is the use of Linked Data<sup>1</sup>. Linked data is a method of publishing structured data so it can be found and linked with other related but previously unlinked data. By opening access to data, integrations are much easier, faster and simpler to create – a necessity for cloud environments.

An example is the easiest way to explain the value of linked data:

**The Problem that Linked Data Solves:** Integrating management tools have typically involved creating point-to-point integrations between two products. This is an expensive proposition as vendors end up maintaining a multitude of these integrations to connect to all products their solution interacts with. In addition, it's impossible for all vendors to develop all possible integrations immediately. If a customer requires an integration that is not yet available, they have to wait until the vendor develops one.

**How Linked Data Solves It:** Instead of creating point-to-point integrations between products, using linked data, management tools can publish information about the data that they have available for others to use, and other vendor tools can “link” to the data without integrations through an API<sup>2</sup>. For example, they identify the asset with a URI<sup>3</sup> that can be

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<sup>1</sup> IBM is working with W3C to develop linked data standards. ([www.w3c.org](http://www.w3c.org))

<sup>2</sup> API: Application Programming Interface, typically used to develop point-to-point integrations between products

used to retrieve data related to the asset. Then, information about this asset can be made available to other management tools to link to and use that data simply by sharing that URI.

IBM already uses linked data in its Rational family of products, and is beginning their use in Tivoli software. This opens possibilities for integration across heterogeneous management tools without point-to-point integrations. Further, linked data is well-suited to making the connections required for sharing related data between separate toolsets used by distinct user groups, such as between Development and Operations staff. Consider a situation where service desk personnel can see the status of defects (data stored in the developer's tools) from a service desk application. This provides them with visibility into in-progress resolution of a reported software problem, all without leaving their native service desk tool or having to call the developers for status updates. The service desk software uses the linked data stored in the developer's Rational tools, avoiding a point-to-point integration between the two solutions.

### ***Topology and Orchestration Specification for Cloud Applications***

This proposed cloud specification, called TOSCA<sup>4</sup> for short, is the specification that will potentially truly enable cloud services to realize its promise of agility and portability. TOSCA is a model-based approach that standardizes and abstracts how cloud applications are described and managed, and aggregates information about the application into Service Templates. These templates describe the structure of an IT service (topology model) along with operational and manageability descriptors, such as policies for security or plans for building, deploying, patching and shutting down the cloud application.

TOSCA takes a holistic approach, covering applications, middleware and infrastructure, however enabling separation of concerns by the languages modularity. Application designers describe the high level operational characteristics required for the cloud application (high availability, SLAs, security, density/multi-tenancy), without having to deal with the technicalities of middleware setup, configuration and management. Then, operational staff can define models for the core infrastructure components, including how to build, deploy, patch and shutdown.

Service Templates are portable and move with applications, easing the process of moving applications from one cloud environment to another. The specific configurations of the underlying infrastructure offered by the cloud provider can be mapped to the defined cloud application components. This portability enables agility by further facilitating application movement among cloud service providers.

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<sup>3</sup> URI: Uniform Resource Identifier, used to identify a name or resource

<sup>4</sup> IBM is currently working with OASIS to develop TOSCA as a cloud standard. [http://www.oasis-open.org/committees/tc\\_home.php?wg\\_abbrev=tosca](http://www.oasis-open.org/committees/tc_home.php?wg_abbrev=tosca)

The modular nature of TOSCA also facilitates IT processes by distributing the definition of the cloud application's attributes, characteristics, policies and configurations, so the subject matter experts can be responsible for contributing definitions where needed.

Finally, the application model formalizes and captures vital application information that can be used to automate cloud application management and maintenance in a repeatable manner.

### ***Cloud Standards Customer Council***

IBM co-founded the Cloud Standards Customer Council (CSCC)<sup>5</sup> with CA, Kaavo, Rackspace, and Software AG. The CSCC was created to provide customer-centric guidance for cloud standard defining bodies. Their membership already includes over 270 member companies including customers, business partners and vendors, that work together to define interoperability based on concrete use cases. According to the CSCC website, the CSCC will:

- Drive customer requirements into the development process to gain acceptance by the Global 2000
- Deliver customer-focused content in the form of best practices, patterns, case studies, use cases, and standards roadmaps.
- Influence the standards development process for new cloud standards.
- Facilitate the exchange of real-world stories, practices, lessons and insights.

Customer involvement in the CSCC ensures that cloud standards will evolve with the real-world needs of customers, and that the effort is customer driven and not vendor driven.

### **The Final Word**

In years past, interoperability was a fundamental requirement for Web Services' success, which drove the need for defining industry standards so that vendors' solutions would be interoperable and more easily integrated. The same situation holds true for cloud applications and the environments they operate in. Cloud interoperability standards are essential if clouds of the future are to succeed, and the promises of cloud (speed, agility, scalability and flexibility) to be realized.

IBM's commitment to developing cloud standards such as TOSCA and Linked Data through industry standards bodies like OASIS, are noteworthy because they reveal IBM's leadership in the future of cloud. But they cannot do it alone – the rest of the cloud vendors must be part of this effort for it to be successful. If you are a cloud vendor, you should be strongly considering how to engage in the cloud standards effort.

Although “standards” are perceived as tedious and boring by some, cloud customers should be aware of the cloud interoperability efforts and understand what their cloud vendors are doing. If

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<sup>5</sup> The CSCC website can be found at: <http://www.cloudstandardscustomercouncil.org/>

you are a cloud customer, are your cloud vendors committed to or involved in these interoperability standards efforts? If not, you need to have a serious discussion with them about their plans to protect your cloud investments and future interoperability. That is the minimum necessary to protect the investments that you have been and will be investing in cloud technologies.

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