



# INTRODUCTION TO THE OPEN DATA CENTER ALLIANCE<sup>SM</sup>

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The hype around cloud computing has set some lofty and potentially unachievable goals for the IT industry. Gartner estimates that the worldwide cloud services revenue, which includes both public and private cloud services, will top \$148 billion in 2014 . While cloud computing promises greater agility in delivering services and the potential for increased efficiency, today's IT management is grappling with significant challenges in cloud adoption and deployment such as security, federation and automation. To address these challenges, a group of global IT leaders recognizing the need for greater data center security and compliance, more efficient infrastructure, improved manageability and services that support interoperability created a group called the Open Data Center Alliance.

The Open Data Center Alliance was formed in October 2010 as a unique organization of leading global IT organizations who came together to deliver a unified voice for the emerging IT requirements for data centers and cloud computing. The mission of the organization is to accelerate the transformation to cloud computing by enabling a broad ecosystem of solution and service providers to address IT requirements with the greatest level of interoperability and standards possible. The Open Data Center Alliance enables member companies in the planning and procurement considerations of next-generation data center technologies, cloud infrastructure and services.

The output of this organization is aimed at enabling those who deploy clouds or consume cloud services the ability to do so in a more secure, interoperable and efficient manner. Moreover, the output should enable suppliers of technology and cloud services to deliver products that are easier to consume across a broader customer base. The specific Open Data Center Alliance output includes the definition of technical requirements for specific use cases, a usage model roadmap and the advocacy and linkage to other relevant standards being developed by standards bodies and other organizations. The work products are delivered initially to Open Data Center Alliance members for review and feedback and then offered to the public for broader adoption in support of the Alliance's principle of driving open dialog among IT managers.

Today, the Alliance has more than 280 members from across the globe and multiple vertical industries including a Steering Committee that includes BMW, Capgemini, China Life, China Unicom, Deutsche Bank, JPMorgan Chase, Lockheed Martin, Marriott International, Inc., National Australia Bank, Terremark, The Walt Disney Co. and UBS.

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The purpose of this paper is to outline the challenges the Open Data Center Alliance is addressing, the goals for industry impact, the technology vision and the guiding principles and deliverables of the Open Data Center Alliance.

## CLOUD COMPUTING AND DATA CENTER CHALLENGES

Cloud Computing has two elements in its most distilled sense. First, it is an IT service that is elastic to a large range of demand fluctuations. Second, it represents a data center infrastructure that is automatically provisioned and treated as a pool of compute, network and storage. While these are simple in statement, there can be complexities in using or deploying a cloud due to varied usages, technologies, interoperability considerations, regulations, compliance, management and other factors. The challenges facing adoption of cloud computing include, but are not limited to:

### **Security**

Clouds are designed to be multi-tenant, shared infrastructure for efficiency. The counterpoint to this efficiency is the concern of other entities gaining access to a company's data or processes in this shared infrastructure. An IDC market survey illustrates that 70% of IT respondents identify security as a top concern in moving to a public cloud service . The high degree of security customization in most IT organizations has traditionally made security difficult to implement in a cloud environment. There is an opportunity to define standards and practices across IT organizations that enable a level of cloud security that exceeds current practices in IT organizations.

## **Manageability**

Whereas management of physical compute, network and storage has had its own complexity, management of virtual resources has added yet another layer. Moreover, as workloads or virtual machines cross the boundaries between data centers, managing data, physical and virtual assets, software licenses and other objects adds further challenges. This complexity of management is further complicated based on legacy application requirements and challenges to integrate these applications into a dynamic cloud infrastructure. Regulatory and compliance requirements have also added barriers to cloud deployment and in many cases, these aspects have not yet been fully comprehended. It is estimated, by Bain & Company, that between 2010 and 2015 IT will spend up to \$2 trillion in deployment and operations unless management practices can be automated and simplified. Moreover, application development for cloud computing and resiliency will require better tools and best practices.

## **Availability**

The management and automation of cloud infrastructure requires substantial investment to achieve successful results. Even the industry's best experts in providing cloud services have had unanticipated downtime. Whether caused by application issues, network failures or human error, there is opportunity for improvements in design for application and infrastructure resiliency as well as processes and approaches to monitoring.

## **Interoperability and Multi-Vendor Capability**

For those that are using cloud services, federation between public and private clouds is a top priority. For those that are deploying their own cloud infrastructure, the ability to easily deploy applications across compute, network and storage in a multi-vendor, heterogeneous environment is important. Both of these perspectives place a high degree of focus on interoperability of services and infrastructure. Moreover, beyond interoperability, there is a desire for infrastructure and services to be flexible, customizable and multi-vendor which translates into a need for open solutions. Interoperability and open standards at multiple levels of the cloud stack will enable the choice and flexibility required. The Open Data Center Alliance advocates increased use of standards to enable the industry where companies can deploy best of breed technologies without sacrificing choice and flexibility.

## **Efficiency and Affordability**

By 2015, it's estimated that another one billion people will be connected to the Internet and the number of Internet-ready devices will grow from four billion to 15 billion. Moreover, the growth of data and content will drive annual bandwidth to exceed over 1,000 exabytes. Without cost and power efficiency, the financial and environmental costs of cloud computing will be prohibitive. The opportunity is not only for applications to be more aware of the infrastructure in order to provide the greatest power efficiency, but also to make the consumers of cloud services aware of the power consumption and resulting carbon footprint.

The impacts of these challenges represent lost opportunity. The industry has the opportunity to accelerate the delivery of new capabilities and drive greater data center efficiency by addressing these challenges. The vendor community will also benefit from the innovation opportunities and economic growth unleashed by a more highly-efficient IT industry.

### INDUSTRY VISION AND GOALS

The Open Data Center Alliance seeks to drive positive change for the IT industry for both users and suppliers. By 2015, the organization seeks to enable major impact including the following outcomes:

- Seamless and secure interaction between cloud data centers so that companies are able to federate and migrate between cloud service providers seamlessly. Moreover, the bursting from private data centers to public clouds is simple, as is the ability to on-board workloads from cloud services back to the private data center. Security will be fundamentally integrated to support this intra-data center computing.
- An open marketplace for ubiquitous and affordable computing, whether deploying a service or infrastructure, so that the attributes, features and pricing will be identified in a consistent manner and easily comparable. By providing this level of transparency, the barriers to cloud computing service adoption and infrastructure deployment will be lowered. Products and technologies will be offered consistently with cloud deployment models, including the pricing and licensing to support pay-as-you-go and elastic, variable usage.
- Dramatically simpler data centers with more agile infrastructure that dramatically reduces the complexity to deploy and manage applications, servers, storage and networking in the data center and associated costs. Services deployment times should be reduced by an order of magnitude. With the breakthroughs in making cloud computing simpler to deploy, the IT industry could see \$25B in annual cost reduction by 2015.
- Accelerated industry innovation to drive breakthroughs in IT services and capability by simplifying and accelerating the deployment of cloud computing. Expected industry benefits include easier creation of new services for media delivery, social networking, and automation of IT functions or business intelligence. With increased innovation and IT confidence, there will be greater availability of cloud services and the opportunity to accelerate \$100B of cloud services revenue to the IT industry in the next five years.
- Global efficiency of cloud computing by proliferating best practices for infrastructure deployment and building awareness of carbon footprint. This ensures that cloud services efficiently use resources and the industry can avoid a 45 GW power impact by 2015, which is enough energy to power up to 15 million homes.

### TECHNOLOGY VISION

To achieve the industry vision, there is a corresponding technology foundation required to enable industry enhancements in efficiency, growth and capability. The Open Data Center Alliance provides direction to its members for adoption, but also to the vendor community to outline the technology requirements needed today and in the future for cloud and next-generation infrastructure. The key tenets of the technology vision include:

#### **Secure federation between data centers.**

The standards, management functions and security will need to be developed to enable the seamless interaction between cloud data centers, from private cloud to public cloud and between public service providers.

#### **Agility of business processes,** applications and infrastructure.

Cloud usage models require that services are elastic, automatically scalable and can respond to the rapid increases and decreases in demand while meeting service level agreements (SLAs) and managing cost and efficiency. To enable this infrastructure and service agility, applications must be aware of all data center resources and automatically find the optimal infrastructure to run on most efficiently in terms of cost and power while also ensuring that SLAs are met and regulations and policies are adhered to. The infrastructure should be flexible and dynamically allocated to meet SLAs or increases in demand supported by intelligent root cause and forensics tools.

**Common, simplified management model.**

Greater consistency will be required to manage across cloud services, service providers and infrastructure especially in a multivendor environment. Cloud services will be realized by a set of management disciplines (sensors, actuators, data models and management processes) that are applied to well-defined physical or virtual infrastructure elements including compute, network, storage, facilities or higher-level elements like applications and abstract artifacts such as licenses. This environment must also manage SLAs and compliance seamlessly.

**Service transparency**

Services from independent vendors or services that are internally built should be easy to compare across features, performance/efficiency and cost. To do this, a means for consistently articulating service catalogs and identifying levels of security implemented is required to streamline cloud adoption for IT and enable greater visibility and control over the environment.

The Open Data Center Alliance has developed an organizational structure and operational approach to enable a progression toward the vision. The organization includes five workgroups that cross security, manageability, infrastructure, services and regulation, which are developing a roadmap toward the technology vision. The output of these groups, once published, will be made available publicly to IT and end users for the planning of cloud services and data center infrastructure. The output will also be used by solution providers and vendors as a reference in their product development plans.

**PRINCIPLES OF THE OPEN DATA CENTER ALLIANCE**

The Open Data Center Alliance was formed to provide a clear set of requirements and guidance representing the viewpoints of consumers of cloud services and those who are deploying cloud data centers. The resulting output is intended for end user deployment planning and solution provider development toward the principles of the industry and technology visions. The Alliance operates based on a core set of principles:

**Address meaningful problems**

By bringing together more than 300 industry leaders in IT and soliciting input from the solutions provider community, the Alliance seeks to identify and prioritize requirements for the most pressing challenges facing IT consumers today as they deploy cloud and next-generation data center infrastructure.

**Enable flexibility and choice**

Services and infrastructure that support industry standards and multi-vendor interoperability will be strongly preferred and are the basis for the term “Open” in Open Data Center Alliance.

**Commit to prioritize Open Data Center Alliance output in implementation decisions**

Members of the Open Data Center Alliance plan to make purchase and deployment decisions based on the requirements, roadmap and other output published by the organization and, as a result, will request solution providers to support the organization output and direction.

### **Be as inclusive of the industry as possible**

The goal of the organizational output is to foster innovation and include as many industry consumers and providers of IT as possible. While inputs need to be prioritized and addressed efficiently, the organization strives to accommodate as many perspectives as possible.

### **OPEN DATA CENTER ALLIANCE STRUCTURE**

In alignment with the principles of the organization, the Alliance has established member classes, a detailed review process and a liaison engagement process for collaboration with industry standards groups and consortia where applicable. There are four membership classes: the steering committee that runs the organization and is the voting body; the contributors who actively work on the alliance output; the adopters who provide feedback and momentum behind the alliance direction; and the solution providers which are vendors ranging from hardware to software to systems integrators and which provide technical expertise and feedback. For more information on the membership tiers, qualifications and responsibilities or to join, please visit [www.opendatacenteralliance.org](http://www.opendatacenteralliance.org).

### **OPEN DATA CENTER ALLIANCE OUTPUT AND APPROACH**

There are three key components that the Open Data Center Alliance delivers to the industry. The first is a specific usage model and requirements document, the second is a usage model roadmap providing a cadence for deployment and third is the input to and advocacy of other industry standards and standards bodies.

### **USAGE MODEL DEVELOPMENT**

The Alliance's primary work product is publication of usage models and documents that provide a detailed definition of IT requirements to address specific IT challenges and priorities. Usage models will communicate, in a vendor-agnostic fashion, the specific technology and service requirements for IT deployment of a use case, and are expected to be used by Alliance members to guide internal planning and procurement of IT resources. The process of usage model development integrates workgroup discussion input, engagement with solutions provider members and industry standards groups where applicable, and broad membership review in order to capture both IT requirements and feasibility of solutions delivery in a targeted timeframe.

### **THE USAGE MODEL ROADMAP**

The Alliance Usage Model Roadmap provides a cadence for deployment and a planning horizon for the usage models publically available today as well as those in development in workgroups. The roadmap is expected to be used for deployment planning by all members and as an industry resource for requirements tracking of future Alliance publications. In subsequent releases, additional usage models will be added and existing usage models will be refined and expanded based on feedback and key learnings from members as they deploy these usages in their environments.

All Alliance members have a role in publication of organizational documents. Development of usage model definition is executed by Alliance workgroups and a Technical Coordination Committee that provides oversight and coordination for the five workgroups. These groups work in synergy to outline use requirements that reflect a unified voice to all workgroup members. When a .7 roadmap document is reached, it is issued to all members for input and comment. The document is refined to a final draft .95 version that is sent to the steering committee for final review and approval prior to being delivered publically as an official 1.0 Alliance publication. Further iterations of documents will follow the same process being published as 1.x revisions.

## **ADVOCACY AND LINKAGE TO RELEVANT STANDARDS**

Alliance publications call out existing standards that are seen as relevant to the final solutions delivered by usage models. These standards will be recommendations and not binding on the solution or technology provider unless explicitly stated. In addition, the Alliance will highlight areas where new or additional standards are required and engage with appropriate industry forums to address. This is to create an actionable focus for the industry to deliver technology required by the usage models as well as assurance of open, industry standard alternatives.

The Alliance is actively reviewing opportunities for formal liaison engagements with industry standards bodies and other organizations which complement the Alliance charter. It is not the intent of the Alliance to create its own standards specifications. Rather we expect to work with industry standards bodies to identify those that best meet the principles of the Alliance and support delivery of the Usage Models in an open, multi-sourced way.

## **LEARN MORE ABOUT THE ALLIANCE**

One aspect of the Alliance's charter is education on Alliance mission and the usage model roadmap. This education takes many forms including web communications, public webcasts, event presentations and other engagements to deliver broad awareness of the Alliance and its publications. To learn more about the Alliance and apply for membership please visit [www.opendatacenteralliance.org](http://www.opendatacenteralliance.org).