

Chapter 14

Setting Some Standards

In This Chapter

- ▶ Understanding the importance of standards
- ▶ Figuring out why standards are needed in the cloud
- ▶ Understanding what standards exist today

Ask knowledgeable companies about their top worries about moving to the cloud. Two major reasons would no doubt be security and vendor lock-in. Read more about security in Chapter 15. This chapter tackles *vendor lock-in*: being stuck with one cloud provider because of interoperability or portability issues. Standards and best practices address these two concerns.

If standards are the directions, *best practices* are the blueprint for creating techniques or methods that result in predictable outcomes in the real world. For example, you might have a best practice designed to ensure security in cloud environments.

Understanding Best Practices and Standards

Best practices and standards provide a starting recipe, appropriate tools, required ingredients, and some tips and tricks.

The idea is fewer errors will occur if organizations follow best practices (because the processes, techniques, and methodologies they're using have been repeatedly tested). The same holds true for standards. Standards mean that you don't need to constantly reinvent the same thing. And, best practices and standards for managing critical aspects such as data security and privacy help ensure quality for crucial workloads in the cloud.

Best practicing makes perfect

Best practices are accumulated knowledge that can help individuals and organizations avoid mistakes others have made.

They provide

- ✓ A starting point for planning
- ✓ A common language
- ✓ A set of concepts that help you communicate and coordinate with large groups of people

Best practices range from recommendations for specific coding specifications to describing enterprise-wide management processes that have shown proven success.

Best practices can be found in many places:

- ✓ Industry organizations
- ✓ Independent books
- ✓ Training materials
- ✓ Vendor Web sites
- ✓ Consulting practices

Setting your sites on standards

Standards are a core set of common and repeatable best practices that have been agreed upon by a business or industry group. Typically, different vendors, industry user groups, and end users collaborate to develop standards based on the broad expertise of a large number of stakeholders. Organizations can leverage these standards as a common foundation and build on top of them.

Standards, or agreed-upon approaches, let you

- ✓ Move your infrastructure or applications from one cloud provider to another.
- ✓ More easily integrate applications between your on-premise data center and private and public cloud environments.



Standards are useless unless you implement them.

Standards are made two ways:

- ✓ **A big standards body develops it.** The International Organization for Standardization (ISO) is an example of a standards organization. This group is made up of representatives from countries all over the world. ISO has developed over 17,500 standards covering many subject areas, and more standards are developed every year. These standards are well documented so people can learn what they need to adopt a standard. ISO standards cover many areas of IT, including standards for IT service management and the governance of IT services.
- ✓ **A best practice becomes a *de facto* standard.** A *de facto* standard emerges because a product or approach is used enough that it becomes a standard. For example, the networking protocol called TCP/IP was adopted by so many vendors that over time it became the networking standard.

Clouding the Standards and Best Practices Issue

Cloud standards are in the early phases of being developed and implemented. Some are coming along, but, to many watching the development of these standards, it can seem like the Wild West.



Despite some potential hurdles, standards and best practices are important — especially in the cloud — because they help improve choice, reduce cost, and improve quality.

Standards are important for the cloud in a number of areas:

- ✓ Interoperability
- ✓ Portability
- ✓ Integration
- ✓ Security

Interoperability

Interoperability refers to cloud users being able to take their tools, applications, virtual images, and so on and use them in another cloud environment without having to do any rework. Say one application runs in one environment and you need that application to operate with a partner's application in another cloud environment. If the right interoperability standards are in place, you can do this without needing multiple versions of this application.

Simple Object Access Protocol (SOAP), Representational State Transfer (REST), and Atom Syndication Format and Atom Publishing Protocol (both standards referred to as Atom) are all examples of widely used interoperability standards and protocols.

Portability

Portability lets you take one application or instance running on one vendor's implementation and deploy it on another vendor's implementation. For example, you might want to move your database or application from one cloud environment to another.



Standards examples

One example of a standard that has gotten some traction in the cloud environment is the *Open Virtual Format (OVF)* developed by the Distributed Management Task Force (DMTF). It was developed jointly by the likes of Citrix, Dell, HP, IBM, Microsoft, and VMWare. The idea is to streamline the installation of a virtualized platform. This standard addresses interoperability issues for virtual machines. The multivendor format includes a set of *metadata* (virtual machine hard drives, information about resource requirements, a digital signature, and so on) that enables virtual machines to be used in multiple environments.

Another example of a standard that's getting some attention is ISO 27001 for information management. This existing standard was developed by the International Organization for Standardization (ISO) (www.iso.org). This specification for information security management system consists of policies and procedures that include legal, physical, and technical controls over an information infrastructure. The specification includes a six-part planning process that includes defining a security policy, conducting risk assessments, establishing control objectives, and preparing a statement of applicability.



Open Cloud Manifesto

The notion of an open cloud is so critical to the long-term success of the cloud that more than 200 vendors have already signed on to support a document called the Open Cloud Manifesto (www.opencloudmanifesto.org). The group realizes that although the cloud presents

a great opportunity, a series of challenges must be overcome. These challenges include security, interoperability, portability, management and metering, and governance. The manifesto has a series of statements related to standards.

Integration

When you think *integration*, you generally think of combining various hardware and software components together to create something. The same idea applies in the cloud. One example of integration: easily integrating your data with a Software as a Service application. This is an example of taking some of your internal IT capability and integrating it into the cloud environment.



Portability and integration become major issues when cloud vendors have different platforms. This can lead to vendor lock-in, which means that moving to another cloud provider is so difficult that you don't even bother trying.

Security

Cloud security is such a big concern that we devote Chapter 15 to it. You need to make sure that the right controls, procedures, and technology are in place to protect your corporate assets. Your organization has invested a lot internally to protect your assets, and it's reasonable to assume that your cloud provider should do the same.

Cloud security standards are a set of processes, policies, and best practices that ensure that the proper controls are placed over an environment to prevent application, information, identity, and access issues (to name a few).

Two organizations that are very active in this area are the Cloud Security Alliance and a think tank called the Jericho Forum. These are profiled later in this chapter.

Standards Organizations and Groups

A number of organizations and informal groups are addressing standards issues in the cloud environment — we detail several in this section. Some of these organizations have been around for years; others are relatively new.

It is important to note that some of these standards bodies aren't necessarily looking to create new standards. One idea is to leverage existing best practices and standards such as those used in implementing the Web and service oriented architectures.



Several standards organizations have gotten together to create a cloud standards coordination *wiki* — a Web site that uses collaborative software (also called wiki) to allow many people to work together to post and edit content. All groups can post their work in one spot: www.cloud-standards.org.

Cloud Security Alliance



The Cloud Security Alliance (www.cloudsecurityalliance.org) formed in late 2008 when cloud security became important in user's minds. Its founding members include PGP, QualSys, Zscaler, and the Information Systems Audit and Control Association (ISACA).

The CSA's goal is to promote a series of best practices to provide security assurance in cloud computing. Its objectives include

- ✓ Promoting understanding between users and providers of cloud computing regarding security requirements
- ✓ Researching best practices for cloud security
- ✓ Launching awareness campaigns about cloud security solutions
- ✓ Creating consensus lists of issues and guidance for cloud security assurance

The Cloud Security Alliance recently published "Guidance for Critical Areas of Focus in Cloud Computing," which is available at www.cloudsecurityalliance.org/guidance.

Recently, the CSA announced that it will work together with Jericho Forum (www.opengroup.org/jericho), an independent security expert group, to promote best practices for secure collaboration in the cloud. The groups will provide guidance on how to operate securely in the cloud. Both groups recently published initial guidelines for cloud computing. The Jericho Forum

published a Cloud Cube Model designed to be a tool to help businesses evaluate the risk and opportunity associated with moving in to the cloud. The paper is available at the Jericho Forum Web site at www.opengroup.org/jericho/cloud_cube_model_v1.0.pdf.

Distributed Management Task Force (DMTF)

The DMTF (www.dmtf.org) has been around for about 15 years, and may best be known for its common information model, which is a common view of IT equipment. In the cloud space, it focuses on IaaS (Infrastructure as a Service), and providing standards that enable IaaS to be a flexible, scalable, high-performance infrastructure. Part of this is to try to separate the infrastructure from the applications. Members include pretty much every major hardware, systems software, and networking vendor, as well as smaller companies and at least 50 universities.



The DMTF is the group that developed the OVF standard that is formally known as DSP0243 Open Virtualization Format (OVF) V1.0.0. It describes an open, secure, and portable format for packaging and distribution of software that will be run in virtual machines.

The DMTF has also launched the Open Cloud Standards Incubator, which will focus on standardizing interactions between cloud environments by developing cloud resource management protocols, packaging formats, and security mechanisms to facilitate interoperability. Of specific interest are specifications that can facilitate interoperability between public and private clouds.

National Institute of Standards and Technology (NIST)

NIST (www.nist.gov), which has been around since 1901, is a nonregulatory federal agency that is part of the U.S. Department of Commerce. Its goal is to promote innovation and U.S. competitiveness by advancing standards, measurement science, and technology. NIST has a hand in standards everywhere, from the fire-related standards that your mattress had to pass to the auto emissions your car must (not) pass on the road.

Recently, NIST has formed a cloud computing team to help federal agencies understand cloud computing and to determine the best way to secure those agencies implementing the technology. The team is creating a special

publication that includes information for the government agencies around various cloud models, security issues including application security, cloud monitoring, and service level agreements, among others.

Open Cloud Consortium (OCC)

The OCC (www.opencloudconsortium.org) was formed in 2008. One of its goals is to support the development of standards for cloud computing and frameworks for interoperating between clouds. Members include Cisco and Yahoo as well as a number of universities including Northwestern.

The OCC has a number of working groups. Two in particular deal with cloud standards:

- ✓ **Working Group on Standards and Interoperability for Clouds That Provide On-Demand Computing Capacity:** The focus for this group is on developing standards for interoperating clouds that provide on-demand computing capacity. The group is developing standards for interoperability between storage clouds and compute clouds.
- ✓ **Working Group on Information Sharing, Security, and Clouds:** This group focuses on standards and standards-based architecture for sharing information between clouds. The emphasis is on clouds belonging to different organizations and subject to different policies. The group is also examining security in the cloud.

Open Grid Forum (OGF)

The OGF (www.ogf.org) is an open community that focuses on driving the adoption and evolution of distributed computing. This includes everything from distributed high-performance computing resources to horizontally scaled transactional systems supporting SOA as well as the cloud. The community shares best practices and drives these best practices into standards. It consists of more than 400 companies in 50 countries, including AT&T and eBay.

The Open Cloud Computing Interface Group (OCCI), formed in 2009, is a working group within the OGF that focuses on the creation of an API for interfacing infrastructure cloud facilities. The group is looking to deliver an API specification for remote management of cloud infrastructure that enables common tasks such as provisioning and managing virtual environments. It will also define these infrastructure cloud services.

The Object Management Group (OMG)

The OMG (www.omg.org) is an international group focused on developing enterprise integration standards for a wide range of industries including government, life sciences, and healthcare. The group provides modeling standards for software and other processes. These include embedded and specialized systems and architecture driven modernization and middleware. Its task forces have developed modeling standards including the *Unified Modeling Language (UML)* and *Model Driven Architecture (MDA)*.

OMG has recently begun efforts focusing on modeling deployment of applications and services on clouds to enable interoperability, portability, and reuse.

Storage Networking Industry Association (SNIA)

The SNIA (www.snia.org) has focused for more than ten years on developing storage solution specifications and technologies, global standards, and storage education. This organization's mission, according to the SNIA members, is "to promote acceptance, deployment, and confidence in storage-related architectures, systems, services, and technologies, across IT and business communities".

Very recently, the SNIA created the Cloud Storage Technical Work group to develop SNIA Architecture and best practices related to system implementation of cloud storage technology. It will act as a technical entity to help SNIA to identify and develop cloud standards for cloud storage. It also will produce a set of standards interface specifications and document system-level requirements under the guidance of the SNIA Technical Council and in cooperation with the SNIA Strategic Alliances Committee.

Cloud Computing Interoperability Forum (CCIF)

The Cloud Computing Interoperability Forum (CCIF at www.ccif.org) provides discussion forums to create a cloud computing ecosystem where organizations can work together for wider adoption of cloud computing technology and services. A major focus is on creating a framework that enables two or more cloud platforms to exchange information in a unified way.

Some experts state that the CCIF is not a standards body, per se. Rather, it's more of a discussion forum, focused on building community consensus, exploring emerging trends, and advocating best practices/reference architectures for the purposes of standardized cloud computing.

Vertical groups

In addition to these standards groups and discussion groups, *vertical industry groups* — groups comprised of members from a particular industry such as technology and retail — are also beginning to look at cloud standards.

Examples include

- ✔ **Telemanagement Forum (TM Forum):** This large group has more than 700 members in 75 countries including service providers, cable and network operators, software suppliers, equipment suppliers, and systems integrators. Its goal is to improve business effectiveness for service providers and their suppliers. The TM Forum serves the information, communications, and entertainment industries. It produces educational information such as industry research, road maps, best practices, training, and standards. Recently, it began working in the telecommunications initiative for cloud computing.
- ✔ **Association for Retail Technology Standards (ARTS):** This group is part of the National Retail Federation and its goal is to create an open environment where retailers and technology vendors can work together to create international retail technology standards. This includes the UnifiedPOS (a specification for point-of-sale, or POS, device interfaces). Recently, this group also started looking at researching this space and developing white papers to address cloud issues for this vertical.