Standards Based Cloud Clients

Abstract

Cloud Management and Storage specifications can be used by clients such as web applications, phone, and other mobile computing devices. We explored how client devices can use standards to interact with cloud services. We developed against recent specifications which have been produced in the cloud standards space, namely Open Cloud Computing Infrastructure (OCCI) and Cloud Data Management Interface (CDMI).

Motivation

The computing industry is experiencing a huge shift in the way we use computers at home, at work, and especially in-between as we use handheld mobile computing devices. The phone is now a computer that is part of the internet and is a first class citizen of the web. The mobile computing potential motivated us to work with standards to build a client capable of running in the web and on mobile phones.

Our Approach

Our team worked within the Open Grid Forum (OGF) and the Storage Networking Industry Association (SNIA) standards organizations to contribute to the specifications. This provided:
- An understanding of the specifications
- Team building toward a common demo

We shall continue to work with these and other organizations such as the Distributed Management Task Force (DMTF).

Cloud Storage with CDMI

The Cloud Data Management Interface (CDMI) is developed by Storage Networking Industry Association (SNIA). It provides a RESTful API set to manage storage in the cloud.

Cloud Computing with OCCI

The OCCI specification is developed by the Open Grid Forum (OGF) Standards Development Organization (SDO). OCCI is a boundary protocol/api that acts and fronts as a service front-end to your current internal infrastructure management framework. OCCI consists of a set of specifications (Core and models, HTTP header rendering, Infrastructure models, and an XHTML5 rendering).

The OCCI specification, while written to address a standard interface for cloud computing, are in fact directly applicable to any distributed computing architecture. They represent the "State of the Art" in terms of internet computing today. They support Rich Internet Application Development, Service Oriented computing, and offer a scalable and dynamic approach to creating semantic oriented services.

Lessons Learned

Lessons learned during the development and testing of the client:
- The network is not always present. A recommendation for cloud storage standards would be to add support for cache synchronization.
- Remote administration tools were valuable. These included the obvious tools such as SSH access, but also included tools with provided full screen remote desktop access such as Oracle’s Secure Global Desktop.
- Share code earlier for additional development support and promote standards

Interactions

The design of the application developed included a login component, a presentation layer, and parsers for both XML and JSON documents that are received from the cloud based services.

Using both CDMI and OCCI together, the client performs a mashup of the data for presentation to the user.

Mobile Cloud Computing

More and more users are utilizing services from their mobile computing devices. Storage is a huge requirement as users exchange email, images, video, and documents of various kinds. Mobile devices are not always connected – and therefore the use of cached data with synchronization support is needed. Next, we’ll port the JavaFX client to an Android and/or an iPhone device.

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References