CHAPTER IV
END-USER ACCESS TO CLOUD COMPUTING

Chapter Overview

Innovation behind the success of cloud services ultimately depends on the acceptance of the offering by the user community. Acceptance of an offering by users changes the economics considerably. As more users embrace such innovation, economies of scale for a product allow imple-menters to lower the costs, removing a barrier to entry and enabling even more widespread adoption of the innovation.

In this chapter, we will present some of the applications that are prov-ing beneficial to end users, enabling them to be "power collaborators." We will take a look at some of the most popular Software-as-a-Service (SaaS) offerings for consumers and provide an overview of their benefits and why, in our opinion, they are helping to evolve our common understand-ing of what collaboration and mobility will ultimately mean in our daily lives. We will be examining four particularly successful SaaS offerings, looking at them from both the user perspective and the developer/implementer perspective. Looking at both sides of these applications will give you a much better understanding of how they are truly transforming our concept of computing and making much of the traditional desktop-type software available to end users at little to no cost from within the cloud.

YouTube

YouTube is the leader in online video, and a premier destination to watch and share original videos worldwide across the Internet through web sites, mobile devices, blogs, and email. YouTube allows people to easily upload and share video clips on the YouTube web site.

On YouTube, people can view first-hand accounts of current events, find videos about their hobbies and interests, and discover the quirky and unusual—all from videos shared by other subscribers. Founded in February 2005, YouTube received funding from Sequoia Capital and was officially launched in December 2005. Chad Hurley and Steve Chen were the first members of the YouTube management team and currently serve as chief executive officer and chief technology officer, respectively. Within a year of its launch, in November 2006, YouTube was purchased by Google in one of the most talked-about acquisitions to date. Since then, YouTube has struck partnership deals with content providers such as CBS, the BBC, Universal) Music Group, Sony Music Group, Warner Music Group, the NBA, and many more.

YouTube has become so popular that it now provides a set of development application programming interfaces (APIs) to enable developers to integrate YouTube functionality into their web sites. The YouTube APIs and tools allow programmers to bring the YouTube experience to their web

pages, applications, and devices. This open-minded approach has paid huge dividends and helped to further propagate the enormous popularity of the site. In the next section, we will provide a short overview of the APIs. Figure 8.2 shows the starting point for using YouTube APIs)

YouTube API Overview

The YouTube APIs and tools enable site developers to integrate YouTube's video content and functionality into their web site, software applications, or devices. First, developers need to decide which APIs and tools best meet their needs. For those familiar with HTML but not so familiar with JavaS-cript, consider looking at the Widgets and custom player. If the development team is comfortable with JavaScript and/or FlashPlayer, they should examine the Player APIs. For those who are programming a device or devel-oping server-side logic for a web site, look at the Data API.

Widgets

Widgets are simple page elements that developers can embed in a web site to give it YouTube functionality. Simply adding a strip of videos or allowing users to perform a video search on your web site can greatly enhance usabil-ity and acceptance from those users. All of this can be done just by adding a few lines of JavaScript to a web page. Widgets are JavaScript components that developers can place in a web page to enhance it with YouTube-based content. However, unlike the custom player, which does not require pro-gramming skills to use, these widgets are for people who are familiar with development using HTML and JavaScript but who may not be familiar with server-side programming. Two ,widgets are currently available, the Video Bar and Video Search Control.

The Video Bar

The Video Bar is a simple way to integrate a strip of video thumbnails into your site. Just clicking on a thumbnail opens a floating player for playing video locally. For integration teams, YouTube provides a simple wizard to help jumpstart the process. A Programming Guide is also available to help developers get the most out of the functionality provided and leverage even more from the Video Bar.

The Video Bar is implemented using the Google AJAX Search API. It is designed to let you easily add a strip of playable videos to web pages and blogs. Control is highly customizable, allowing developers to specify the ori-entation of the video bar, the number of videos displayed, the size of the thumbnails, the location and size of the video player, the list of search expressions that drive the video bar, etc. The locally developed web page controls the selection of videos displayed in the Video Bar. It is very easy to add the Video Bar to a web page. Start with the Video Bar Wizard, which steps through a few simple customization steps and automatically generates all of the code to imbed in your web page.

Video Search Control

The Video Search Control also uses the Google AJAX Search API. It pro-vides the ability to search through massive amounts of You'Iisbc content. Each Video Search Control search box is preconfigured with a set of HTML tags that define and display thumbnails for the video results obtained from the search. Clicking on a thumbnail of video search results will play it with-out leaving the page. Like the Video Bar, you can use a wizard to get started; read the Programming Guide 4 for how to customize the player or search automatically based on site links. The Video Search Control is highly cus-tomizable, allowing you to configure the initial set of video search terms, the size and location of the player, the number of results, color schemes, etc. Your web page can manipulate the control through the supplied search form or through preselected search terms. You can also save user searches for future use.

YouTube Player APIs

The Player APIs let you control the YouTube player using JavaScript or ActionScript. There is a basic embedded player (which is most often used), and there is also a "chromeless' player that lets you create your own player controls. The Player APIs allow you to establish how users can control You-Tube video playback on your web site. By simply configuring some basic settings for the player interface, you can build a highly customized player control. The player APIs provide mechanisms that enable you to control how YouTube videos will look on your site.

It is important to distinguish between the two types of players, the nor-mal "embedded" player you most likely have already seen on the Internet, and a second, chromeless player, which is just a video box without controls. The chromeless player is intended to be implemented by experienced web programmers who want to design a customized video player for their users. Both players have the same API, which is exposed via JavaScript and/or ActionScript. The following sections discuss each option in further detail.

Embedded Player

The embedded player is the simplest way to place YouTube videos on a web page. To customize the behavior and color of the player, developers can use well-documented embedded player parameters. The code needed to display the embedded player and preconfigured parameters can be quickly gener-ated using a wizard. This makes it possible to find a video by leveraging the Data API and subsequently displaying it using the embedded player. Once the embedded player has been added to a web page, it can be controlled using JavaScript. If you are embedding the player in an Adobe FlashPlayer application, you would use ActionScript instead of Javascript. Using either scripting language, you can create actions similar to what a user could do by clicking on the familiar control buttons—pause the video, seek

forward or backward, mute sound, etc. You can use either scripting platform to poll the status of the player and to check for the occurrence of specific events.

Chromeless Player

Interface elements and controls (such as toolbars and buttons) placed around content are sometimes referred to as "chrome," so a chromeless player is, by definition, a YouTube video player without such controls. This makes it easy to customize a player used within a Flash or HTML environ-ment. The chromeless player exposes the same JavaScript and ActionScript APIs as the embedded player. 8.3.3 The YouTube Custom Player The custom player goes even further than just using scripted API calls to paste videos into your site. Developers can easily configure the custom player to show playlists, favorites, or custom, locally available videos. Some-times it's nice to have control over your web site without having to edit it. Many web sites benefit from having video content, but updating this con-tent can be difficult. The YouTube custom player allows you to customize a YouTube player and populate it with videos you specify. Once the custom player is on your site, you can easily update the appearance or content by logging into your YouTube account and clicking on Custom Video Players. In creating a custom player, you can choose from a number of themes for the player. The videos that a custom player displays can be all of the videos on your YouTube channel, all of your favorite videos, or any custom playlist you have created. By creating playlists and hooking them up to a custom player, you can easily control what is displayed on your web site without ever leaving YouTube

YouTube Data API

The YouTube Data API lets you incorporate You Tube functionality into your own application or web site. You can perform searches, upload videos, create playlists, and more. It is possible to search for videos, retrieve stan-', dard feeds, and see related content. A program can also authenticate as a user to upload videos, modify user playlists, and more. The Data API is pri-marily for developers who are used to programming in server-side lan-guages. It is useful for sites or applications that want deeper integration with YouTube. This integration might be a web application to allow users to upload video to YouTube, or a device or desktop application that brings the YouTube experience to a new platform. The Data API gives you program-matic access to the video and user information stored on YouTube. With this, you can personalize your site or application with users' existing infor-mation as well as perform actions on their behalf (such as commenting on and rating videos.) If you are curious about how the Data API works at the basic level using XML and HTTP, you can read the Protocol Guide.8 This guide details the requests and responses that the YouTube API servers expect and return. To learn more about the structure of these requests and responses, read the Reference Guide. This guide defines the API's feed types, HTTP request parameters, HTTP response codes, and XML elements. You may also want to read about the Google Data Protocol and the Atom Pub-lishing Protocol,'° which are the

standards on which the Data API is built. To make working with the API easier, there are a number of client libraries that abstract the API into a language-specific object model. These client libraries are open source and can be used and modified under Apache License 2.0. There are Developer's Guides for Java, .NET, PHP, and Python as well as sample code.

Zimbra

On September 17, 2007, Yahoo! announced that it had entered into an agree-ment to acquire Zimbra, Inc., a company specializing in web-based email and collaboration software, for approximately $350 million. The Zimbra email and calendar server is available for Linux, Mac OS X, and virtualization plat-forms. Zimbra can synchronize with smartphones (such as iPhone and Black•Berry) and desktop clients (such as Outlook and Thunderbird).

Yahoo! Zimbra Desktop is a free, open source email and calendar cli-ent which runs on any Windows, Apple, or Linux desktop computer. It works online and offline, and it works with any POP or IMAP email account, such as Yahoo! Mail, Zimbra Mail, Hotmail, Gmail, AOL, Microsoft Outlook, or any other work or personal email account that uses POP or IMAP. Zimbra provides software for email and collaboration, including email, group calendar, contacts, instant messaging, file storage, and web document management.

Zimbra can be deployed on-premises or as a hosted email solution and imposes no limit on the size of email storage. Advanced web technology adds Conversation Views and Message Tags to automatically highlight important emails in all your email accounts. The visual Search Builder makes it easy to quickly find important pictures, documents, or messages from people you care about. Yahoo! Zimbra Desktop also manages your Contacts and has a Calendar, Document editor, Task list, and Briefcase for storing all your attachments. Zimbra Desktop uses Web 2.0 AJAX technol-ogy and is designed to handle several email accounts with multigigabyte storage (there are no 2-GB mailbox limits!). Zimbra also features archiving and discovery for meeting regulatory compliance guidelines.

Zimbra Collaboration Suite (ZCS)

ZCS version 5.0 is a modern, innovative messaging and collaboration appli-cation. Ajax-based web collaboration is core to ZCS 5.0. The web client integrates email, contacts, shared calendar, VoIP, and online document authoring into a browser-based interface. Open source Zimlet technology makes it easy to include custom mash-ups in the ZCS web client.

ZCS 5.0 includes an Ajax-based administration interface and scripting tools to use with the ZCS server. Full support is provided for standards-based APIs (IMAP/POP/iCal/CalDAV) as well as MAPI and iSync. This approach enables compatibility with third-party clients such as Microsoft Outlook, Apple desktop suite, and Mozilla Thunderbird. Zimbra also offers Zimbra Mobile, which provides

over-the-air push synchronization to smartphones and supports BlackBerry Enterprise Server via a Connector. The Zimbra solution also has a set of security features including antispam and antivirus scanning. Zimbra also features archiving and discovery ser-vices as an optional component to save and search email for various com-pliance issues.

Facebook

Facebook, Inc., is a leading engineering company located in the heart of Sil-icon Valley. Facebook was formerly called Thefacebook and is a free-access social networking web site that is operated and privately owned by Face-book, Inc. While he was a student at Harvard University, Mark Zuckerberg founded Facebook with his roommates, Dustin Moskovitz and Chris Hughes, fellow computer science majors at Harvard. Initially, site member-ship was limited to Harvard students. Later, membership access was expanded to other colleges in the greater Boston area, the Ivy League, and Stanford University. It later expanded to include any university student, then to any high school student, and, finally, to anyone 13 years old and over. Getting onto Facebook is easy. First you create a sign-on identity and provide your email address, A simple three-step pro-cess is all it takes to establish an account.

Once you have completed the account creation process, you are taken to your home page, where you can customize it to suit your interests.

The Facebook web site currently has more than 175 million active users worldwide. Users can join networks organized by city, workplace, school, and region to connect and interact with other people. People can also add friends and send them messages, and update their personal profiles to notify friends about themselves. The web site's name refers to the paper facebooks depicting members of a campus community that some U.S. colleges and preparatory schools give to incoming students, faculty, and staff as a way to get to know other people on campus.

Facebook serves up over 50 billion page views a month while employ-ing fewer than 200 engineers. It is the second most-trafficked PHP hyper-text preprocessor site in the world (Yahoo is number 1), and it is one of the world's largest MySQL installations, running thousands of databases. In terms of total photo page views, Facebook exceeds all of the next-largest photo sites combined. It is the largest photo-sharing site in the United States, with over a billion photos. Facebook is the fourth most-trafficked web site in the United States, and Facebook users upload more than 14 mil-lion new photos every day. It is also the largest user in the world of mem-cached, an open source caching system originally developed by LiveJournal. It is obvious from these statistics that the engineering team at Facebook is pushing the limits of IT engineering. They have created a custom-built search engine capable of processing millions of queries a day, completely distributed and entirely in-memory with real-time updates.

Facebook Development

Facebook provides anyone the ability to create Facebook applications. A user can get a basic application up and running in minutes. To create a Facebook application, you should be well versed in PHP or some other coding lan-guage such as Ruby on Rails, JavaScript, or Python. It is preferable to know one that already has a client library for the Facebook API. You will need to have a basic understanding of the Internet, SSH, MySQL, and Unix

Zoho

Zoho is an office productivity suite from AdventNet, Inc., which was founded in 1996. The Zoho product is supported by over 120 developers. To date, Zoho has launched 15 different applications, and more are in the works or even with other SaaS services. This leads to faster deployments and easier integration projects. CloudSQL is offered as an extension to the existing Zoho web API. It is meant to be used by developers, not end users. Cloud-SQL supports multiple database dialects (e.g., ANSI, Oracle, Microsoft SQL Server, IBM DB2, MySQL, PostgreSQL, and Informix). The main purpose of the SQL Interpreter component is to translate SQL statements that are executed by a third-party application into a neutral dialect that can be understood by any of the individual Zoho services. The federation layer understands and handles service-specific query delegation and result aggre-gation. The federation layer enables a query to span across multiple Zoho services to fetch data in an aggregated manner, thus virtualizing different Zoho services so they appear as a single service.

Each of the specific Zoho services (i.e., Zoho CRM, Zoho Creator, Zoho Reports) comprises the last layer of the CloudSQL architecture. They collect, store, and mine business data consumed by Zoho users and develop-ers. The services execute the query against their data store and pass the results back to the CloudSQL middleware. The services take care of autho-rizing each query to verify whether the user who is executing the query has permission to access or manipulate the data on which the query is executed.

DimDim Collaboration

Dimdim invested more than 15 person-years of engineering development into making a product to support complex web meetings. This free service lets anyone communicate using rich media in real time. Unlike competing web conference products, Dimdim does not require users to install software on their computers in order to attend a web meeting. Users can start or join meetings using only a few mouse clicks.

Dimdim is available as open source software, and it already integrates with CRM and LMS software so it can be extended easily. It is extremely flexible, available in hosted and on-site configurations, and easily customiz-able. Dimdim Open Source Community Edition v4.5, code named "Lib-erty," is

meant for developers and highly technical enthusiasts, and for use in noncritical environments. It has nearly all of the features touted by the commercial version of Dimdim (Enterprise) and is based on open source streaming and media components. Dimdim Enterprise is based on commer-cial streaming and media components (Adobe Flash Server) and runs on top of their SynchroLive Communication Platform. The open source commu-nity supports the Open Source Community Edition.

Dimdim has a simple user interface that is easy for presenters and attendees to learn. Meeting hosts and attendees do not have to install any-thing to broadcast audio or video, because all that is needed is a very tiny plug-in (which is required only if you want to share your desktop.) The free version is not a limited-feature trial product. Dimdim Free boasts a power-ful feature set that allows anyone to host meetings with up to 20 people simultaneously using diversified platforms such as Mac, Windows, and Linux. Signing up to use Dimdim is easy. Simply go to the web site and fill in the requested information.

Provide a name for the meeting and an agenda and then enter the email addresses of the attendees. Next, choose a key to use as Host and one for the attendees to gaina ccess to the meeting and click the Start button.

Dimdim has a fully integrated web browser, which allos you to take your audience to various web sites and show them specific features live on the Internet.

Dimdim is a powerful tool for collaboration in the cloud. Connectors for open source software such as SugarCRM, ,coupled with Dimdim's web conferencing software, means that users, developers, and partners have cloud-based access to advanced browser-based collaboration features that allow them to easily interact with groups large or small across multiple geographies, while simultaneously recording the activity in their SugarCRM application.

Online support for Dimdim includes a complete collection of tools designed specifically to improve the Dimdim experience. First, you can use Forums, where you can join the discussion group relevant to your topic and learn from others in the Dimdim community. Dimdim employees also use the forums to gain better understanding of customer issues. There is an online knowledgebase that is connected to the support database. It is constantly updated and is a great place to get self-help. Dimdim uses an issue tracker and keeps it updated so you can check the status of an issue or view issues for all users. Tools are available to help you check your system, band width, and even test your webcam before you conduct meetings. You can also download any plug-ins if necessary. Other support resources such as product and API documentation, videos, Dimdim support policies, supported platforms, and open source support links can also be found on the support site.

Conclusion

This chapte Provided an overview of end-user access to cloud computing. We first talk about key trends we believe will drive collaboration further into the clouienvironment. We chose five significant entities to present you with an ovepim of the types and levels of capability available in the cloud today—thinzYou can use now. YouTube, an online video repository, has an amazing hol:on the global audience. Collaboration suites such as Zimbra both enhana mobility and allow you to maintain a virtual office in the cloud. Socialetworking with Facebook has become very popular, especially in academicmings. Zoho is a SaaS vendor to watch. Backed by Google, Zoho offers mething for everyone. Finally, for presentations and online sharing, Dinlim is a good choice. With the vast amount of free, open source softwarvailable from the cloud, is it any wonder technology is out-pacing our Miry to keep up? In the next chapter, we will discuss how the new mobile smalization technologies are improving our ability to interact at all levels.