

Earthquake Maps and Spinning Photos: What is a Mashup?

Mashups combine content or data from different web sites into new applications. In this lesson you will learn about different kinds of mashups, understand where the data for mashups comes from, and create two simple mashups: one to display flickr photos on a spinning sphere, and another to display the locations of the 30 most recent earthquakes in the world on a map.

In this lesson, you will learn how to build simple mashups to display photographs and interact with earthquake data.



Prepared by Mark Frydenberg
Computer Information Systems Department
Bentley College, Waltham, MA
mfrydenberg@bentley.edu

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Professor Popfly Mashups Referenced in this Lesson:

- Earthquakes (<http://www.popfly.com/users/professorpopfly/Earthquakes>)
- FlickrPhotoSphere (<http://www.popfly.com/users/professorpopfly/FlickrPhotoSphere>)

Learning Outcomes

After completing this lesson, you should be able to:

- Explain what a mashup is
- Identify real world mashups on the web
- Describe differences between portals and mashups
- Illustrate why APIs are important for sharing data between two applications
- Explain the distributed nature of mashup applications
- Create a web page to display your mashups
- Create an Earthquake mapping mashup using Microsoft Popfly
- Create a flickr Photosphere mashup using Microsoft Popfly



Overview

Mashups combine content or data from different web sites into new applications. In this lesson you will learn about different kinds of mashups, understand where the data for mashups comes from, and create two simple mashups: one to display flickr photos on a spinning sphere, and another to display the locations of the 30 most recent earthquakes in the world on a map.

Mashups have become popular recently because many web sites which host applications for social networking, photo and video sharing, searching and mapping provide application programming

interfaces (APIs) for software developers to use in order to access the original data and make use of it in their own applications.

In this lesson, you will learn how to build simple mashups to display photographs and interact with earthquake data.

What Kinds of Mashups are there?

Mapping and photo mashups are the most common types of mashups. You may have seen web sites that display weather, real estate, crime information, and other items on interactive maps.

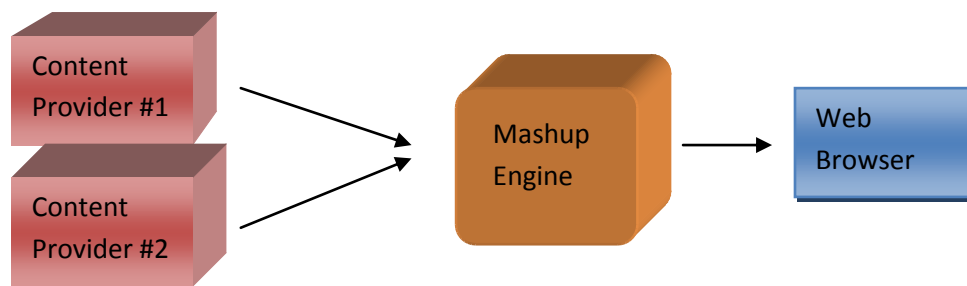
Examples of mashups include Zillow.com (<http://www.zillow.com>), a web application that plots real estate listings on a map, and LastFace (<http://www.dcs.shef.ac.uk/~mrowe/lastface.html>), a mashup of data from Facebook and the Last.fm music site, allowing you to see what music your Facebook friends have listened to recently.

Many photo sharing sites such as flickr.com allow photos from their sites to be embedded within other web sites in interesting ways. Check out <http://mapito.eu> to see pictures of Europe displayed in a spiral, and <http://randomchaos.com/games/fastr/> a game where you have to guess the tag for a randomly displayed picture. These are two of several mashups that have been developed using photos from flickr. Check out a long list of others at <http://www.programmableweb.com/api/flickr/mashups>.

Some mashups are really portal pages, web sites that display content from several different sources, but the content on the combined page doesn't interact with each other. For example, <http://www.msn.com> is a portal: you can specify the different sites from which it might obtain customized content, such as MSNBC News, Fox Sports, MSN Weather, and Hotmail all in one place. However, there is usually no interaction between each of these items. The portal web page is simply a container for all of them.

Creating Mashups

Creating mashups usually requires significant web development experience, as programmers must write source code in a programming language such as Java or C# to access APIs and web services from the various content providers, and then write the connecting software (the mashup "engine" or middleware) to "mash up" the data from the chosen applications. A mashup that is being processed on one web server may access data on from several other web servers, before being displayed in your browser.



The mashup engine (such as Microsoft Popfly) is the middleware that is responsible for connecting the data sources to create the mashup, and then send back the results over the Internet to the user's web browser so that the user can view or interact with them. A mashup may make use of data from one or more content providers.

One of the reasons why it is possible to combine data from different sources is because most of these services provide data in a standard XML-based format which can be easily transferred over the Internet. XML, eXtensible Markup Language, is a standard format for describing information, making it easy to share with other applications. XML is about describing information, while HTML (hypertext markup language) is the tool for displaying information on the web.

Content for mashups often comes from RSS feeds, standard XML-formatted data that contains information about a series of specific items. Software developers might also make use of a content provider's application programming interfaces (APIs) when creating mashup applications. Many organizations provide APIs that allow developers to access their data at no or little cost. For example, flickr has an open API located at <http://www.flickr.com/services/api/>. That site lists all of the different methods (operations) that are available for developers to access data from flickr.

The data being mashed (photos, RSS feeds, specific business objects exposed by calling a company's APIs) actually live on remote servers maintained by the respective companies. The mashup engine accesses and processes the data before sending the results back to the user's browser.

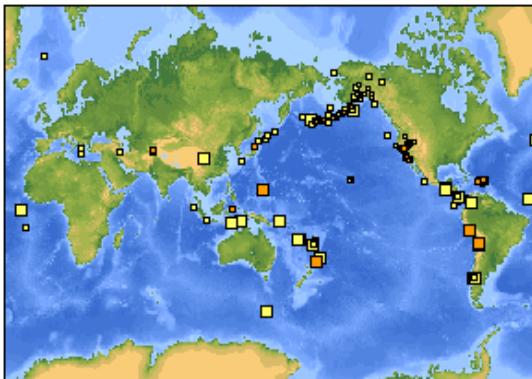
Example 1: An Earthquake Map Mashup

Look at the U.S. Geological Survey Earthquake Hazard s Program's web site at (<http://earthquake.usgs.gov>). It displays a map of the most recent earthquakes in the world. Professor Popfly created a version of this mashup by accessing earthquake data from the Earthquake ShakeMaps RSS feed (<http://earthquake.usgs.gov/eqcenter/catalogs/shakerss.xml>) on the Earthquake web site and then displaying the data on a Virtual Earth map.

Latest Earthquakes - Last 7 Days

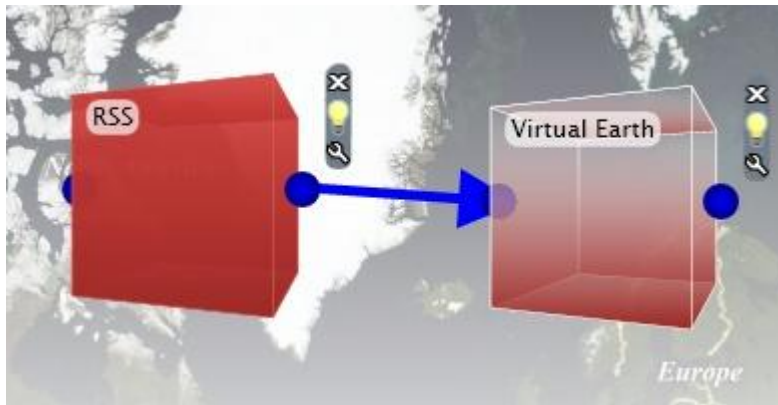
World (Magnitude 4+)

Thu May 29 04:27:40 GMT



Here are the steps to create the Earthquakes mashup in Popfly.

1. Create a new mashup in Popfly.
2. Drag an RSS block and a Virtual Earth block on to the design surface.
3. In the RSS block, select the getItem operation and enter <http://earthquake.usgs.gov/eqcenter/catalogs/shakerss.xml> as the name of the RSS feed.
4. Connect the RSS block to the Virtual Earth block.
5. Run the mashup.

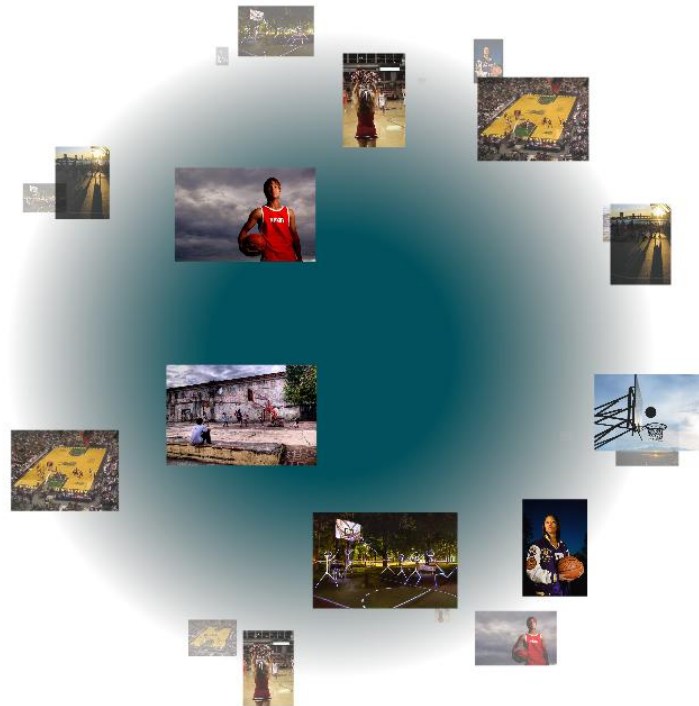


Example 2: Create a Photo Mashup

The Tag Galaxy mashup at <http://taggalaxy.de> displays a photosphere of flickr photos based on the tag a user enters. It also displays related tags by which to search for photos.



Consider a similar mashup in Popfly to display a photosphere of images tagged with the word basketball:

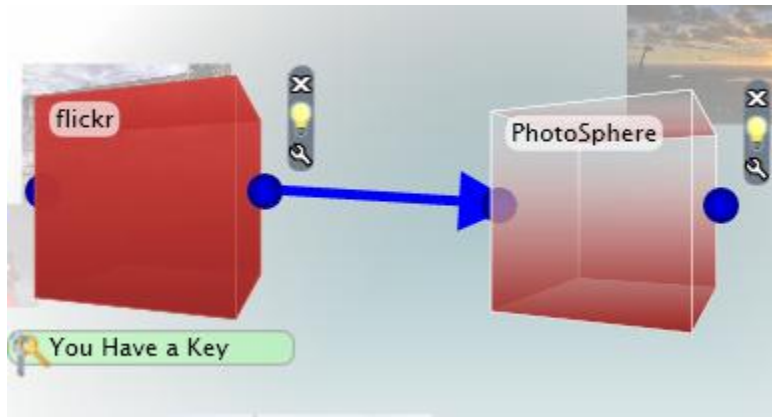


Notice that while the visualization is different, some of the images are the same in both mashups. Both mashups make use of the flickr API to access the same set of flickr images tagged with the word basketball. The images are stored on flickr, but the mashup engines (the TagGalaxy application in the first case; Popfly, in the second) access the images and display them in different ways on a spinning sphere. The resulting mashup runs in a user's browser.

Here are the steps to create the flickr Photosphere mashup in Popfly:

1. Create a new mashup in Popfly.
2. Drag a flickr block and PhotoSphere block on to the design surface.
3. In the flickr block, select the getPhotos operation and enter the tag for which you'd like to search for photos (i.e., "basketball") and the number of photos you want back from flickr. Sort by relevance.
4. Connect the flickr block to the PhotoSphere block.
5. Preview the mashup.

Note: You will need to get a developer key in order to save a mashup that uses the flickr block.



A Look Inside: Calling an API

Popfly uses JavaScript to invoke the different methods from the flickr API. Read this section only if you'd like to see what JavaScript source code looks like, and how it can call an API.

To view the JavaScript source code that the Popfly team wrote for the flickr block, create a new **block** in Popfly and drag the flickr block onto the design surface. This will expose its JavaScript source code. Click on the Block Code tab to view the JavaScript.

```

Block Description | Block Code | Block Files | Generate from WSDL

FlickrClass.prototype.getGeotaggedPhotos = function(text, number, sort) {
  // Retrieves geotagged photos marked with the specified text in the title, descri
  //
  // text (required): The desired text
  // number (optional): The maximum number of photos to return (default=30)
  var apikey = "{{KeyEnc:_PGKY7AV1NyJGYphAbAaNg2600giHs5FQ8YVU3LfxgnjDGgS3DeK0SN

  var params = "&sort=" + (sort || "interestingness-desc") + "&text=geotagged+"
  var photos = this._getFlickrPhotos("flickr.photos.search", number, params, api

};

FlickrClass.prototype.getInterestingPhotos = function(date, number) {
  // Retrieves photos flickr considers interesting
  //
  // date (optional): The date (empty for today)
  // number (optional): The maximum number of photos to return (default=30)
  var apikey = "{{KeyEnc:_3*YFI1f5cJFBL1WxIAvLR4MbgX3TfZnQ7glapH8yP*AzSvVS9T1und

  var params = "&date=" + escape(date || "");
  var photos = this._getFlickrPhotos("flickr.interestingness.getList", number, p

  // if there are no interesting photos for today, try yesterday
  if(number > 0 && photos.length == 0 && (!date || date == ""))
  {
    var yesterday = new Date(new Date() - (1000*60*60*24));
    this.getInterestingPhotos(yesterday.format("yyyy-MM-dd"), number);
  }

  return photos;
};

```

Notice that the flickr block invokes several of the API methods listed on the flickr API page. <http://www.flickr.com/services/api/> . Two of the methods and their corresponding Popfly operations are highlighted in the screenshot above.

Popfly PopQuiz

1. Explain the difference between a mashup and a portal web site.
2. What is an API? (Say more than what the abbreviation stands for.) Why do you think companies would allow other applications to access internal data for free by means of an API?
3. Name the two content providers in the Earthquakes mashup.
4. View the earthquakes RSS feed from EMSC in your browser by visiting <http://earthquake.usgs.gov/eqcenter/catalogs/shakerss.xml>. View the source code of that page and you will notice that it is given in XML. (Try Firefox if your version of Internet Explorer doesn't display the XML for the RSS feed in a nicely formatted way.) What information do the <geo:lat> and <geo:long> tags convey? Why do you think that is important?
5. Look at some of the mashup examples on Webmashup.com (http://www.webmashup.com/Mashup_Examples/index.php). Identify the content providers whose data they use.
6. Think about a mashup that might be possible for a web developer to create using some of the API's that are listed at http://www.webmashup.com/Mashup_APIs/index.php. Select at least two APIs and describe how it might be possible to combine them to create a useful, original mashup. For example, a mashup might use the DirectTextbook price comparison API to find a low price for a book, and then display a picture of the book cover from Amazon.com.

Try It in Popfly

Modify or build these Popfly mashups to demonstrate your understanding of this lesson. The more ducks, the bigger the challenge.



View Professor Popfly's Earthquakes mashup in Popfly as well as the one on the USGS web site at <http://earthquake.usgs.gov/>. There's another earthquake map on the EMSC web site at <http://www.emsc-csem.org>.

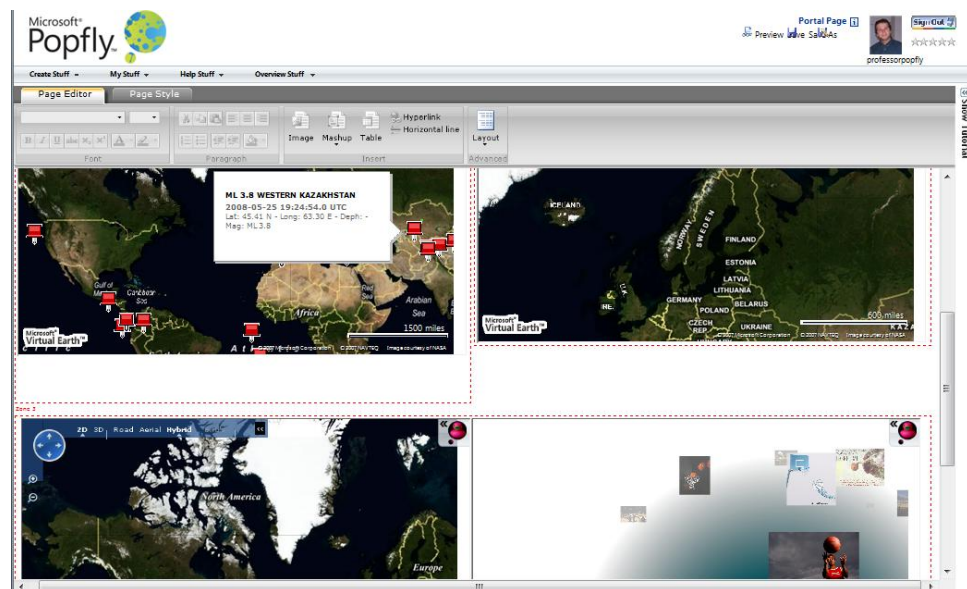
1. Name two ways in which these mashups are similar.
2. Name two ways in which these mashups are different.



1. Build the Earthquakes mashup yourself using Popfly.
2. Build the flickr PhotoSphere mashup yourself using Popfly.
3. Save your mashups when done.



Using Popfly Web Page creator, make your own portal page in which you embed the Earthquakes mashup and the flickrPhotoSphere mashup, or others that you have made.



Look at the operations available in Popfly's flickr block and then look at the flickr API page at <http://www.flickr.com/services/api/>. In addition to the methods shown in this lesson, which additional methods from the flickr API did the Popfly team implement as operations in the flickr block? Note: Some of the Popfly operation names are not exactly the same as the API method names from flickr.

Learn More about Mashups

Background Information

- Mashups are Breaking the Mold at Microsoft (<http://www.nytimes.com/2008/02/10/business/10slipstream.html>)

This February 10, 2008 New York Times article by John Markoff describes how Microsoft Popfly was developed as a tool for those with little or no programming experience to create real-world mashups.

- Web Application Hybrid (Wikipedia) ([http://en.wikipedia.org/wiki/Mashup_\(web_application_hybrid\)](http://en.wikipedia.org/wiki/Mashup_(web_application_hybrid)))

This Wikipedia article gives a good overview of different kinds of mashups, as well as how they might be used in industry.

Mashup Blogs and Web Sites

- Mashable Social Networking News (<http://mashable.com>)

Mashable is a blog that has news about the latest mashups, technology, and the companies that create them.

- Programmable Web (<http://www.programmableweb.com/>)

ProgrammableWeb gets you the latest on what's new and interesting with mashups, Web 2.0 APIs, and the Web as a platform. It's a directory, a news source, a reference guide, and a community. You can register and then rate and comment on the mashups on this site.

- WebMashup.com (<http://www.webmashup.com/>)

This site contains a directory of mashup API's and examples, and a blog discussing them

- Current Mashup Trends (http://www.readwriteweb.com/archives/current_mashup_api_trends.php)