

Jonathan Trevor jtrevor@yahoo-inc.com



How do you find an apartment near a park?





Craigslist apartment listings
For each apartment:

Click on map link
Check distance to a park on the map

Tedious



- Data is available
 - Craigslist apartment <u>RSS</u> feed
 - Yahoo! Local API to find Parks
- Can do it in about 50 lines of Perl code

```
#!/usr/bin/perl -w
use strict;
use LWP::Simple;
use XML::Simple;
```



- Basically combine feeds + web services
- Yet another custom mashup
 - HousingMaps, ChicagoCrime, ...

• Would be nice if there was an easier way...



grep -iv yahoo.com squid.log |
sort | uniq -c | sort -n >
top_sources.txt

- Unix Pipes for the Web
- Build useful applications from simple primitives





- A free service that lets you remix and create data mashups using a visual editor
- No need to host, we do it for you

Craigslist

Yahoo! Local





- A free service that lets you remix and create data mashups using a visual editor
- No need to host, we do it for you







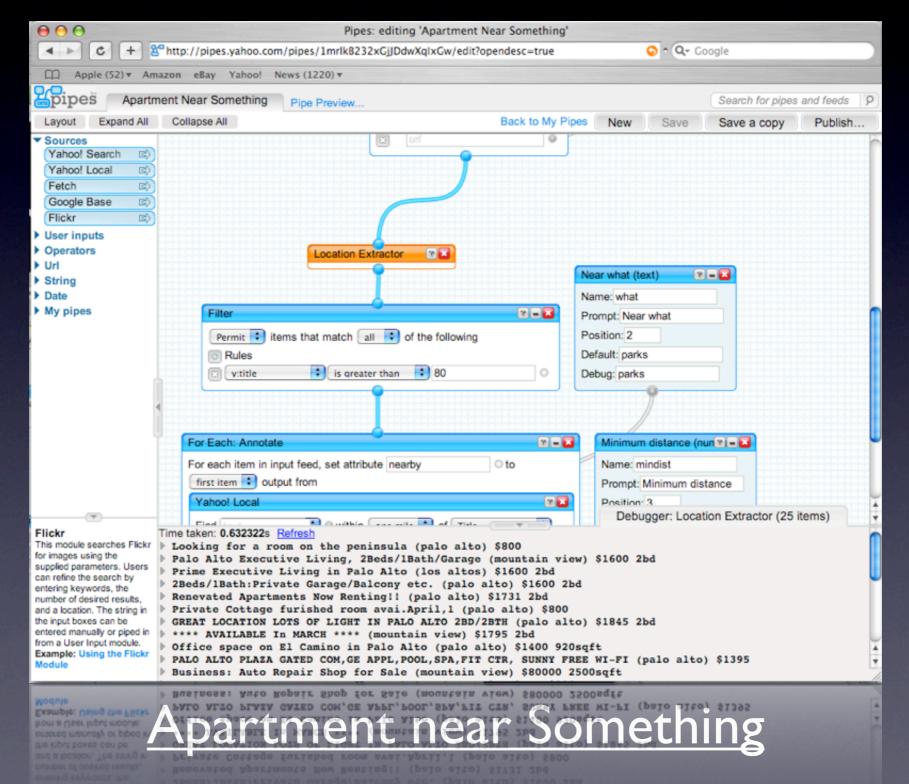
- A free service that lets you remix and create data mashups using a visual editor
- No need to host, we do it for you







Demo





Piecing things together in the cloud

Any Input



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C + Geed://pipes.yaho	oo.com/pipes/pipe.run?what=park&mindist=2&location=san+francisco%2 📀 RSS 🗖 🔍 Inquisitor	
Apartment Near Something		
Apartment Near Some	ething	6 Total
1 br available is 3br/1ba victoria Hello,	an (central and close to water) (SOMA / south beach) \$7 Today, 07:38 PM	Search Articles:
occupied rooms are \$721.27 and \$771.27, for	a total rent of \$2263.81). House bills run roughly \$55/person/mo + about \$35 for cleaning services. Move-	Article Length:
transportation (transbay terminal, Montgomery	or Embarcadero bart, caltrain, highway 80/baybridge). 15 min walk to the financial district, ~20 commute	Date Title Source New
PARKING: street parking is fairly easy to come which costs \$60/yr.	by, although it can be a bit difficult if you commute on a daily basis. A parking permit is recommended,	Recent Articles:
room gets a good amount of sunlight. We also washer and dryer, all new kitchen appliances,	The analysis Second Secon	Today Yesterday Last Seven Days This Month
IENITIES: The room is approx 13"x14" (seen in top 2 pics below), large built-in dresser and cupboards, no closet but it does have an armoire. The om gets a good amount of sunlight. We also have a large shared walk-in storage closet in the hallway. Hardwood floors throughout. We have a new isher and dryer, all new kitchen appliances, and a nice claw foot tub in the bathroom. All rooms have cable tv hook-up and also wireless cable internet class. Shared rooms include the kitchen, living room, and one bathroom. Todat Yest DOMIES: I'm a graphic designer, working at a law firm doing their marketing and PR. In my free time I love salsa dancing and hiking. I also have a very eet and playful medium hair cat, Gauguin. He's still fairly young and has a lot of energy. He loves being around people and often makes his presence II know, although he's not a lap cat. Ying is a grad student at Berkeley. She also enjoys hiking and camping and the occasional shopping spree. We been roommates for about a year and a half now and get along great (we also happen to have a great relationship with the landlord). We're both in dy laid back with easy going personalities. From time to time we have dinners together and also go out to movies, the theater or concerts. We're both in friends at the apt, but no major parties. Sound the figure of the same from our new roomie. We occasionally have small get-togethers in the figure of the same from our new roomie. We occasionally have small get-togethers in the figure of the same from our new roomie. We occasionally have small get-togethers in the figure of the same from our new roomie. We occasionally have small get-togethers	Source: Apartment Near So	
our early 30's. We don't smoke (anything!) or d with friends at the apt, but no major parties.	lo any drugs and we will expect the same from our new roomie. We occasionally have small get-togethers	Actions: Mail Link to This Page
		Add Bookmark
We look forward to hearing from you!		
Thanks,		
Chantal & Ying Read more		
1br APRIL RENT FREE!!! One v	ear lease (haight ashbury) \$825 Today, 07:30 PM	
This is a 4br house and I am leaving the state a soon as April 7th and not pay for April. You will		

Laundry included, hardwood floors, granite countertops, backyard, really nice landlord, and close muni access. Please contact by email asap to set up appointments. Read more...

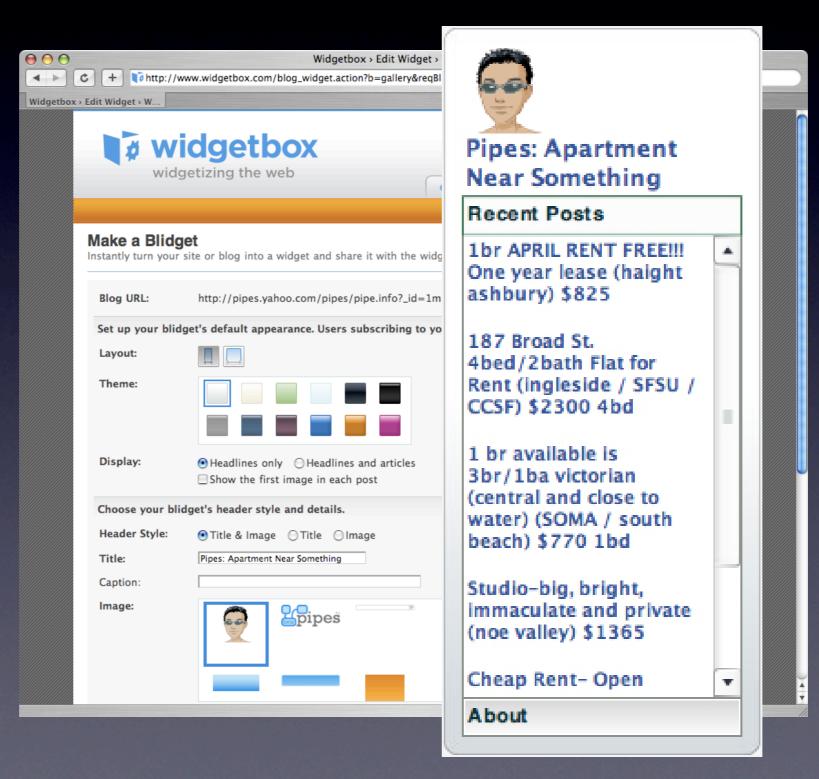
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•	:"Golden Gate Park is a great place to go check out and visit anytime! See the Chinese Garden, the
	Japanese Garden, the great American Bison, the Conservatory of Flowers, the Dutch windmill
	w $\sqrt{flowers}$ and or many of the other things in the parkand then go just down the road a bit to check out Ocean Beach when you are all
	done.","TotalRatings":"7","LastReviewDate":"1172972754","AverageRating":"4","TotalReviews":"3"},"y:
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	St", "postal":null, "lon": "-122.454438", "quality": "100", "state": "CA"}, "Distance": "0.12", "Phone": "(415
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	:"Golden Gate Park - San Francisco"},"dc:title":"1br APRIL RENT FREE!!! One year lease (haight
	ashbury)
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•	his is a 4br house and I am leaving the state at the beginning of April. There is a new lease coming
•	up at the beginning of May. You can move in as soon as April 7th and not pay for April. You will be
	living with a third year law student at Hastings and two other roommates. This is a PRIME location
	for USF students. It is on Oak St two blocks down from Cha Cha's. Security deposit is
•	\$1650. Street parking is available. This is a beautiful location in the Upper Haight and a close
•	walk to school. >\nLaundry included, hardwood floors, granite countertops, backyard, really nice
	landlord, and close muni access. Please contact by email asap to set up
	appointments.","y:location":{"country":"United States","street":"2019 Oak
	<pre>St","lat":"37.771179","postal":"94117","state":"CA","city":"San Francisco","lon":"-122.452583","quality":"87"},"dc:rights":"Copyright \u00a9 2007 craigslist,</pre>
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		Bedrooms (inner richmond) \$1600 2bd				1



Y! Alerts: This is a 4br house and I am leaving the state at the beginning of April. There is a new lease coming up at the...

Options Back

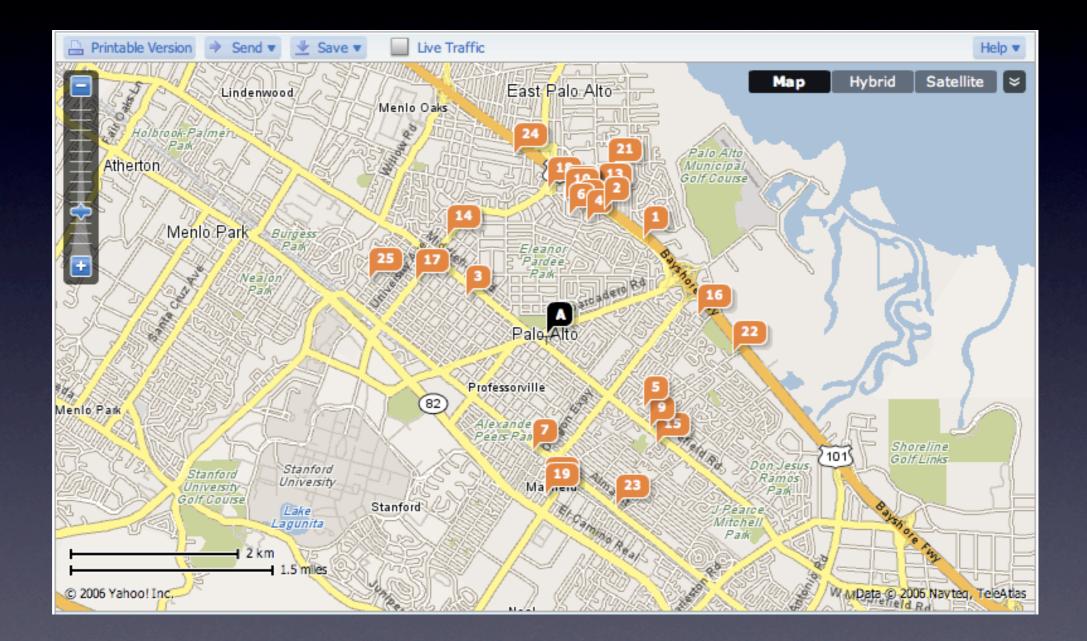


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PARKING: street parking is fa costs \$60/yr.	irly easy to come by, although it can be a bit	difficult if you commute on a daily ba	asis. A parking permit	is recommended,	which
gets a good amount of sunlight	brox 13"x14" (seen in top 2 pics below), large b t. We also have a large shared walk-in storage ses, and a nice claw foot tub in the bathroom. Ing room, and one bathroom.	e closet in the hallway. Hardwood flo	ors throughout. We h	ave a new washer a	and
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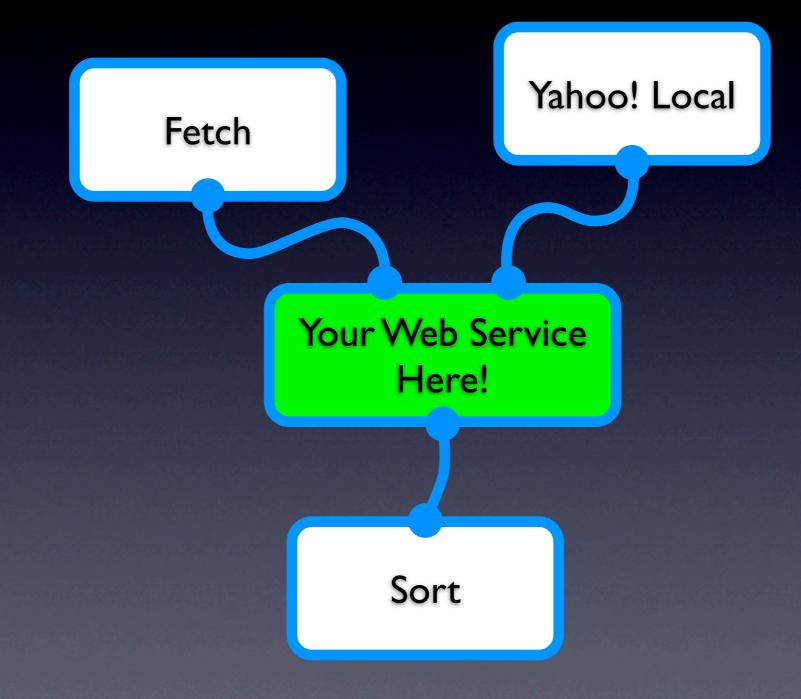
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documentation Search for Pipes Pipes is Hiring! how this pipe was made	 Pipe Preview 1br APRIL RENT FREE!!! One year lease (haight ashbury) \$ This is a 4br house and I am leaving the state at the begin beginning of May. You can move in as soon as April 7th a student at Hastings and two other roommates. This is a P 187 Broad St. 4bed/2bath Flat for Rent (ingleside / SFSU / C Spacious and modern four bedrooms and two full baths wi Wall to wall carpet in bedrooms. Beautiful city view and ne property. No pets. For appointment please call 415.240.54 1 br available is 3br/1ba victorian (central and close to wate Hello, We are going to have an opening in a 3 bedroom vie with a deposit of \$771.27 (the two occupied rooms are \$72 run roughly \$55/person/mo + about \$35 for cleaning service Studio-big, bright, immaculate and private (noe valley) \$136 Ground floor studio in small quiet building. Central Noe Va person. Approximately 650sf. Built-in custom maple cabin closets/drawers and bookcases —is beautiful and space effect of the studies of the studie o	nning of April. There is a new lea and not pay for April. You will be PRIME location CCSF) \$2300 4bd ith open kitchen/living room. har ear SFSU and CCSF. "M" Stree 423 er) (SOMA / south beach) \$770 11 ctorian style apt. Rent for the av 21.27 and \$771.27, for a total re ces 55 alley location with views and priv hetry – with queen size murphy I fificient hursday March 29th. from 7pm f til August. You will be sharing a ou get for	e living with a third year law rdwood floor in living room. et car runs in front of the bd vailable room is \$771.27/mo ent of \$2263.81). House bills vacy. Suitable for one bed, ample cedar lined to 8pm at 871 Innes Ave a three bedroom flat with one
	245K-359K: Remodeled Lower Pacific Heights Studios: OP 245-\$359k: 5 remodeled Lower Pac Heights studios - Ope \$249,000 to \$359,000 mls #32006, 32007, 32011, 32012, http://www.2162pine.com/ * 5 remodeled bright studios * J	en Sat & Sun 2162 Pine Street 5 32013 for more photos and info,	5 TIC studios ranging from

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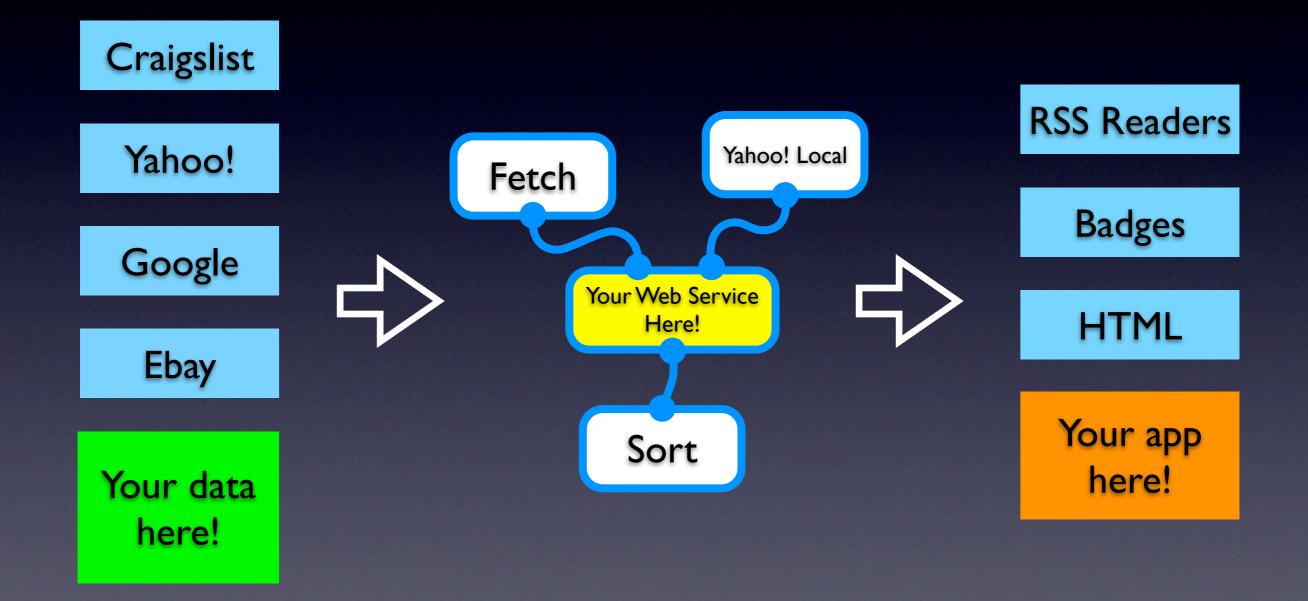




Any Process



Openness





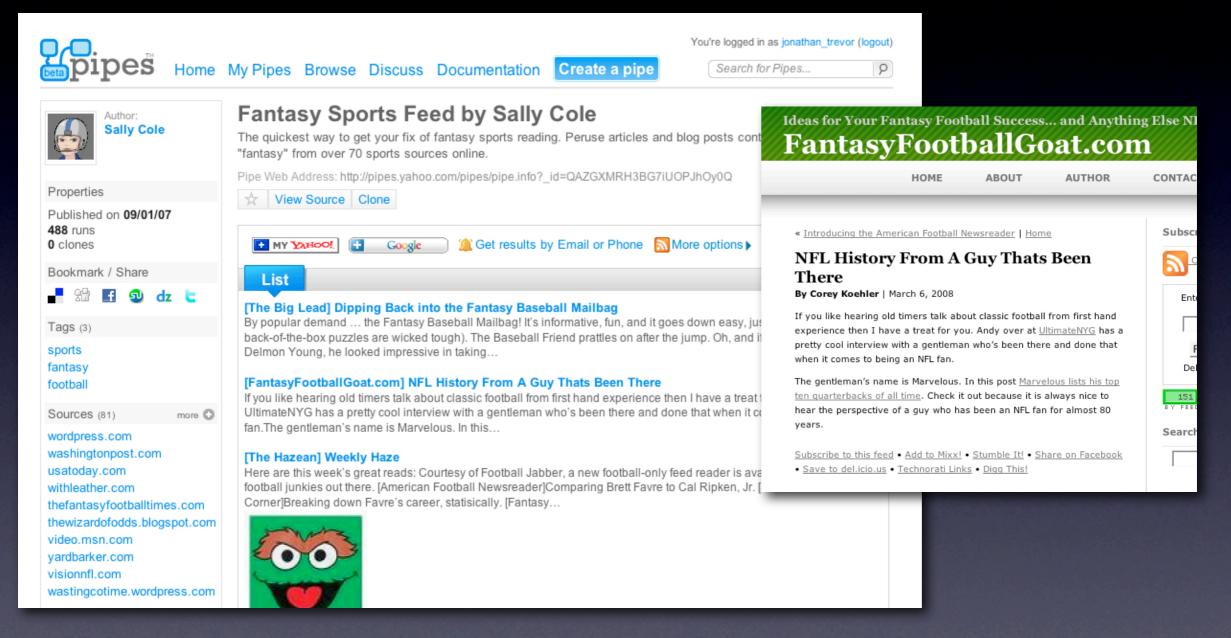
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		****	\$14.99 Add to Cart	
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feedburner.com feeds.feedburner.com	Thu, 01 Nov 2007 19:07:10 GMT]	Overview		2
techbargains.com	Canon PowerShot SD750 7.1 MegaPixel Digital Camera \$250 \$208 with Free Shipping (Capture special moments and cherish memories with PowerShot SD750 Black 7.1 MP 3X Zoom Digital Camera from Canon. This slim, clean-lined, high-grade finish camera features 7.1 MP CCD and 3X optical	3.7 out of 5	
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fatwallet.com	Canon PowerShot SD750 Black 7.1 MP 3X Zoom Digital Camera - \$208 (Published on r	automatically pino the the faces in the scene and chooses the ideal focus point. The camera's 3.0-inch LCD screen gives you the big picture, whether you are shooting, reviewing or showing off your images.	Protect Your Investment! Extended Service Plan for	
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edealinfo.com	Canon SD750 7.1Mpixel Digital Camera \$208 shipped free [Published on roosster at Th	camera shake and sharpen subjects in low-light situations for enhanced shooting flexibility. You can even make a movie using its five movie modes, including 30 fps VGA, Time Lapse and fast frame rate. This	Add to Cart	
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	\$152.99 Canon PowerShot SD1000 Digital ELPH (7.1 MPIX) Camera - Silver +1GB mem	print! You can also use the Print/Share button to transfer images to a computer. Packed with host of other features, this camera offers an ideal photography solution.	Camcorder, \$100-\$349, 2	
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 searches across many different deal hunting sites on the internet looking for the best prices. You can search for particular items or just let the pipe find the best of what's available



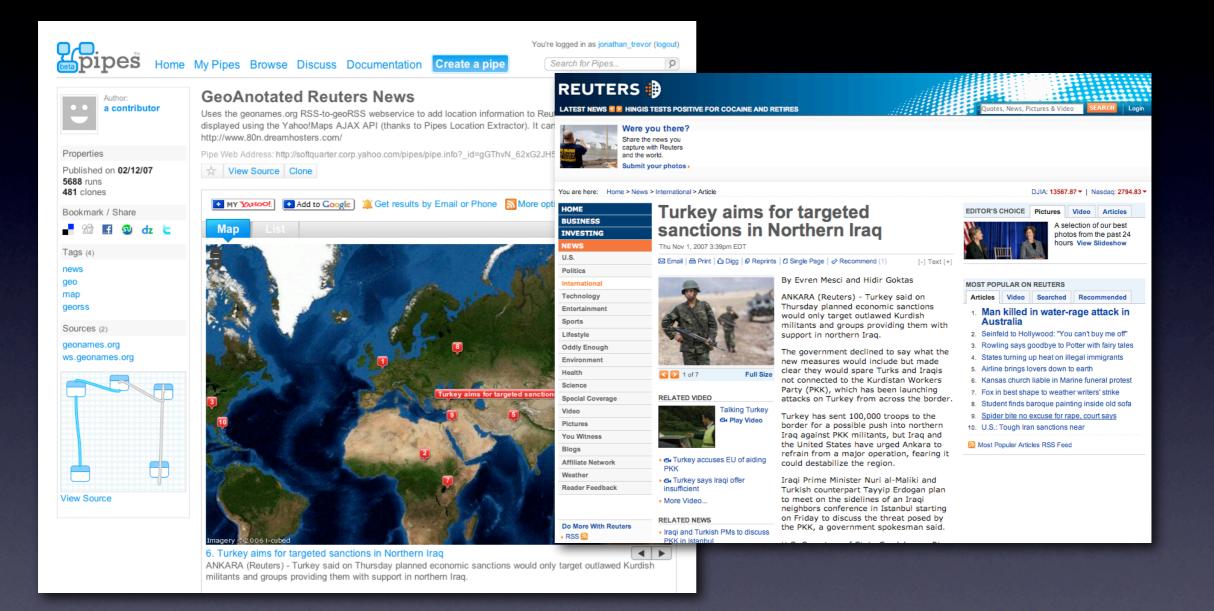
Fantasy Sports search



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Geoannotated Reuters News



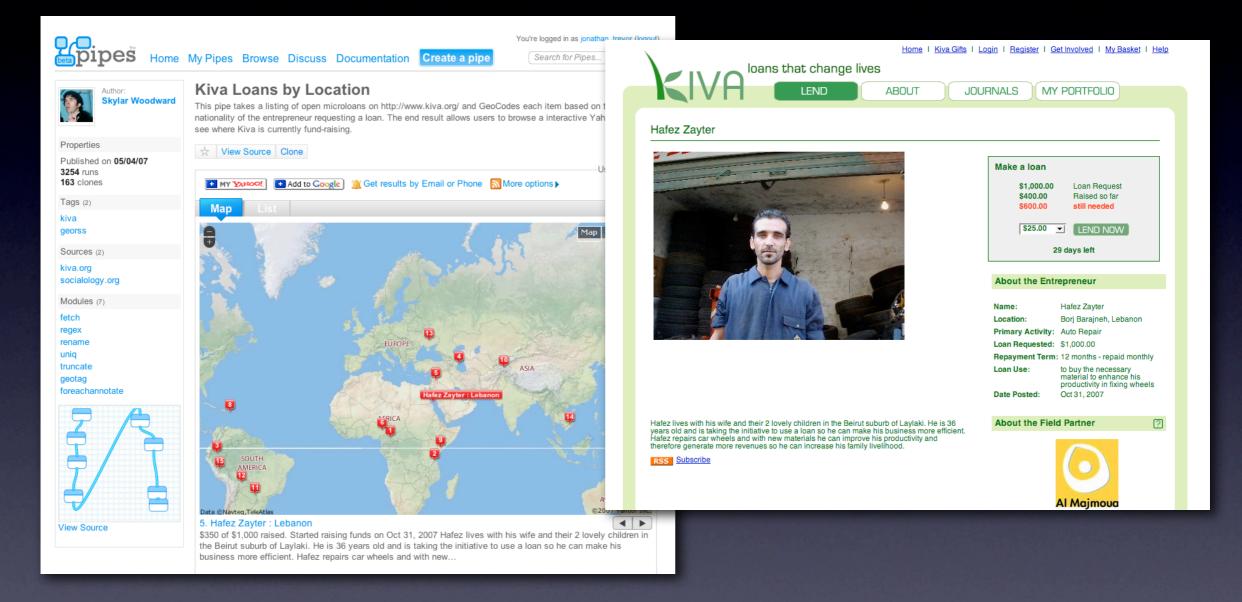
 takes an RSS feed from the Reuters news service, and "geocodes" each item - making it possible to show where that news item is happening on a map of the world.

Who's Viewed My LinkedIn Profile

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fetchdata regex rename	Someone in the Internet industry Someone in the Internet industry		
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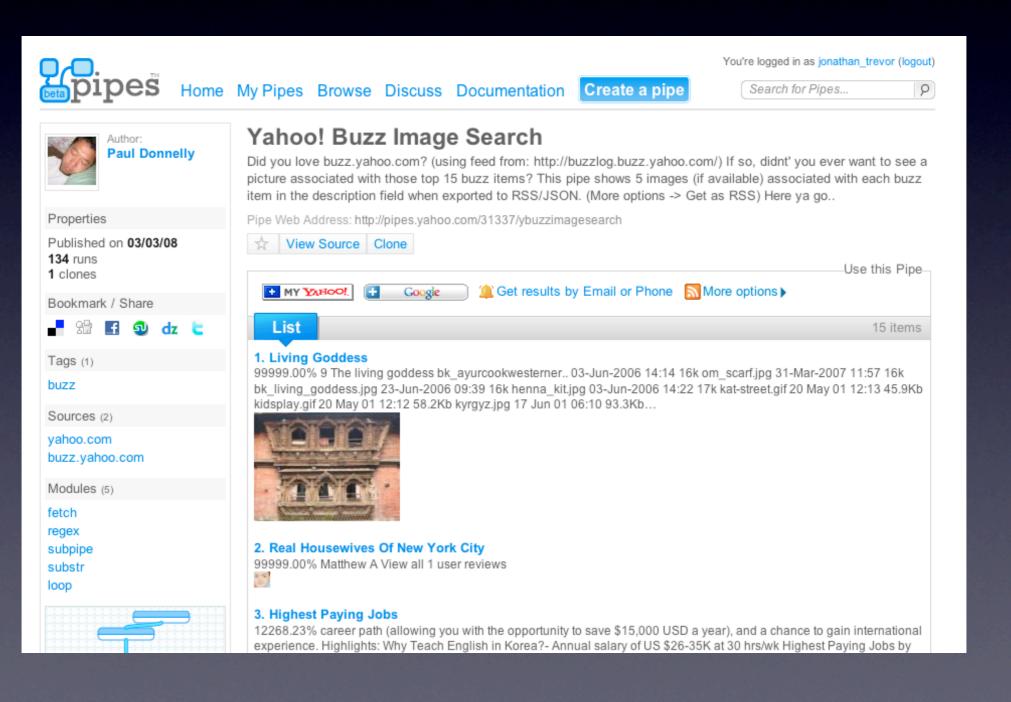
Kiva Loans by Location



 gets a list of the micro-loans people have been making through the Kiva site, and shows the amazing variety of people and places that these loan are helping out.



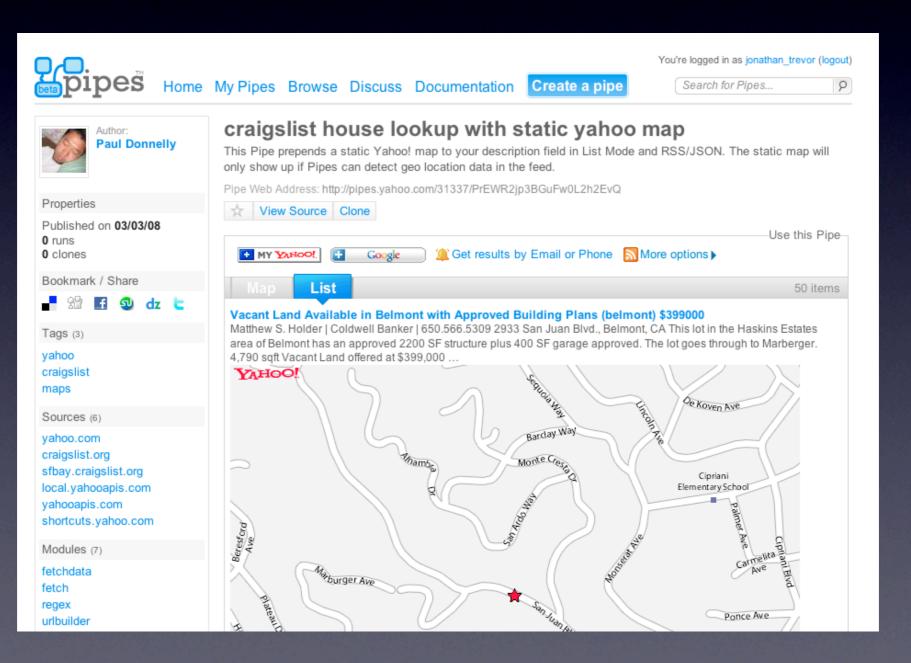
Yahoo! Buzz Image Search







Craigslist house lookup with static Yahoo map





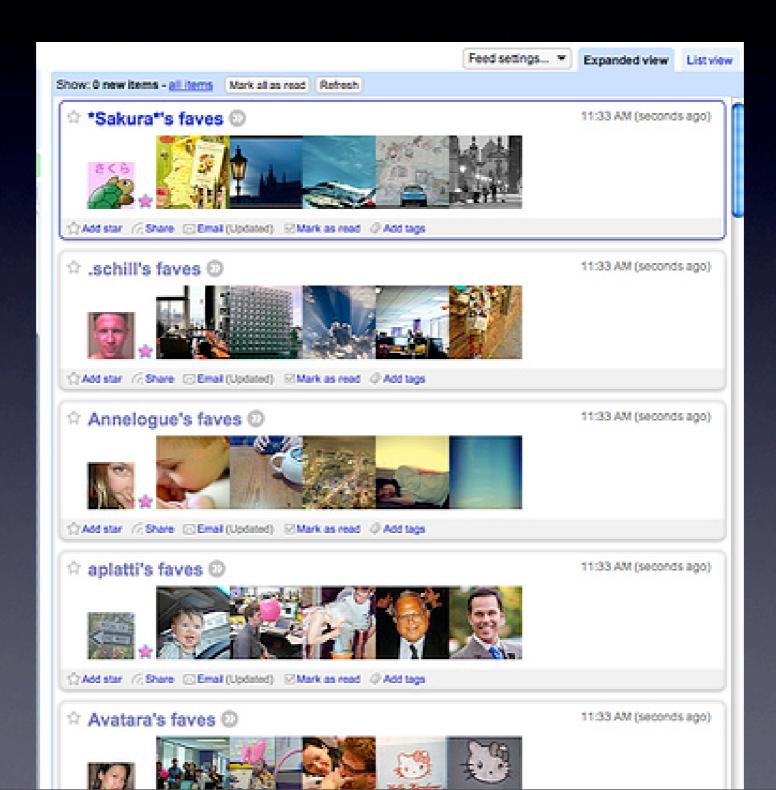
Yahoo Finance Stock Quote Watch List Feed







Contact's Favorite's



Yahoo Unanswered Questions

Dipes Home	My Pipes Browse Discuss Documentation Create a pipe Search	Yahoo! My Yahoo! Mail	Search:		Web Search
		YAHOO! ANSWERS	Welcome, jonathan_trevor [Sign Out, My Account]	Answers Home - F	orum - Blog - H
Author: Patrick Hunt	Yahoo Unanswered Questions				
	The idea behind this mash-up is to find questions that aren't getting answers (usually these answer) - I remove questions from the result that have been asked within the last 5 hrs (I'm that's what I have right now). So if a question is older than 5 hrs and it doesn't yet have an a	ask.	answer. 🙂	discover.	
operties	list.	Search for questions:		Search Advanced	My Profil
ublished on 04/03/07	☆ View Source Clone	Home > Education & Reference > Homework H	Help > Open Question		
22 clones	Query cars Run Pipe	Open Question	Show me another »	Hello jotter Total Points 1	25
ags (3)			e are sliding 390 kg	Level 1	
hoo Iswers Iestion	More options	Paul T bank safe across getaway car.?	ADVERTISEMENT		
urces (2)	List	behind with 390N of force v	stant speed if Clyde pushes from while Bonnie pulls forward on a	Categories	
hooapis.com swers.yahooapis.com	Bonnie and Clyde are sliding 390 kg bank safe across the floor to their getaway car. The safe slides with a constant speed if Clyde pushes from behind with 390N of force while Bonn with 245 N of force. What is the safe's coefficient of kinetic friction on the bank floor?	kinetic friction on the bank	rope with 245 N of force. What is the safe's coefficient of kinetic friction on the bank floor? 20 hours ago - 3 days left to answer.		nce
	Car shakes when backing up and idle is low Camry? hi,my car idle is low when i start it up and when I back up my car it starts to shake. The only way I the gas pedal at least 1 minute and after that the idle goes from low to high. What is the possible	Answer this Question		 Financial Aid Higher Education (Un Home Schooling 	niversity +)
	Toyota Camry 97 and what is the estimate price			» Homework Help	
	Car racing poster title??????	[☆] Interesting! ▼		 Preschool Primary & Secondary 	Education
٤	I have made a poster that contains the cars. the poster is for a game of car race. I want to GET A A for this poster. IT'S URGENT, NEED IT TOMORROW. Please help me out	Answers (0)		 Quotations Special Education Standards & Testing 	
e Source	Which is the best touring car championship in the world and why?	Be the first to answer this question.		Studying Abroad	
w Source	when will u be able to buy the wang car dealer. its colored red now cant buy so, this is a question for GTA san andreas			 Teaching Trivia 	

 finds those questions in the Y! answers site that don't currently have an answer - so you can show how smart you are and answer those tricky questions.

Babbler by Max Case

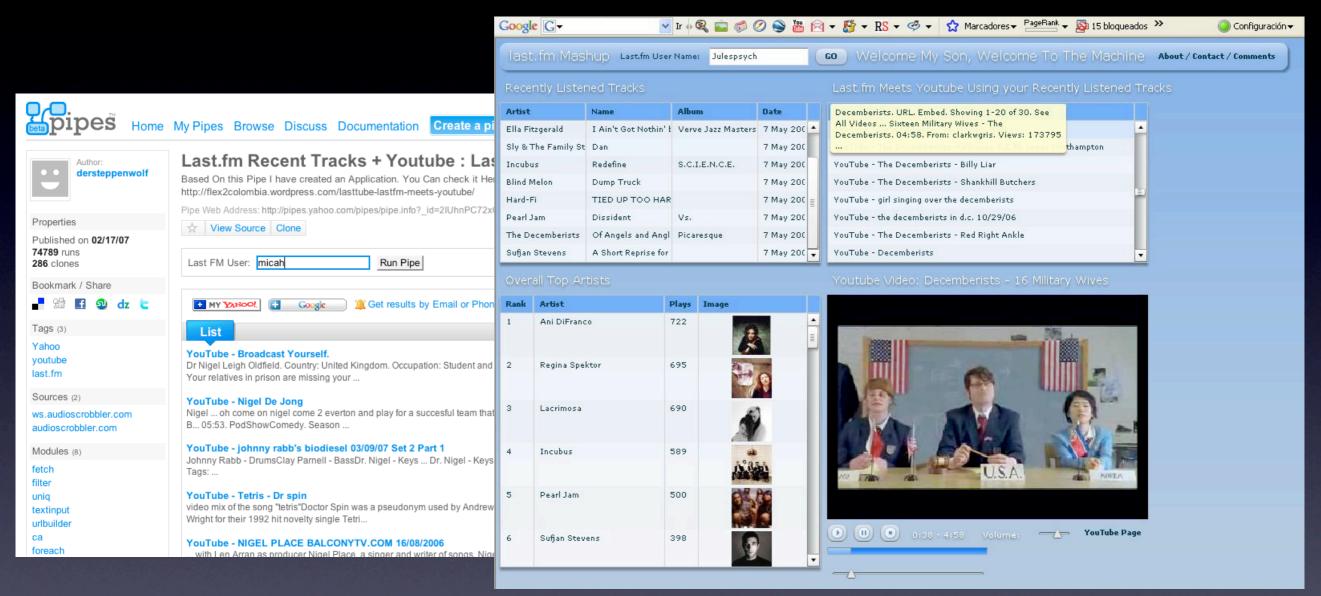


Translates IM messages in Second Life





LastTube



 uses content from Last.fm and YouTube.You can watch Youtube's content based on your Recently Listened Tracks scrobbled to Last.fm.

Advantages to developers (why use an online service to do this?)

(with use all offine service to do this

- Leveraging large infrastructure
 - Faster access to network resources
 - Faster access to network services
- System-wide knowledge
- Leverage inter-organizational agreements
- Easy to "string" together with other services
- Easy to use (REST-style URLs)



Network services

- On Y! network services (fast)
 - Geocoding, Local, Search ...
 - Shortcuts, Term Extraction, Translation
 - developer.yahoo.com
- Off Y!
 - Google, AWS, Dapper etc



Run / Get the data

• Each Pipe gets its own "hosted" page

Apartment Near Something

Ever wanted to find an apartment close to a park, a school or Whole Fo

View Source Clone		
Where	palo alto, ca	
Find an apartment near wh	at parks	
Minimum distance (miles)	2	Run Pipe
Set as RSS	JSON	
Ξ		
Get as RSS MY YAROO! Add to Coogle SUB BLOCLINES	255	84
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Use the REST-style URLs to get the data



Run / Get the data

• Each Pipe gets its own "hosted" page

Apartment Near Something

Ever wanted to find an apartment close to a park, a school or Whole Fo

View Source Clone		
Where	palo alto, ca	
Find an apartment near what	parks	
Minimum distance (miles)	2	Run Pipe
Subscribe - 📿 Get as JS	SON 🕘 Get as KML	
Get as RSS		
MY YABOOL Add to Google SUB BLOCLINES Rosp netvibes onewsgotor MY AOL Get results by Email or Pho	ne Atherton	84 5 to

Use the REST-style URLs to get the data



http://pipes.yahoo.com/pipes/pipe.run?

_id=1mrlkB232xGjJDdwXqIxGw

& render=json

&location=palo+alto%2C+ca
&mindist=2

&what=parks

& callback=foofunction

The ID of the Pipe





http://pipes.yahoo.com/pipes/pipe.run?

_id=1mrlkB232xGjJDdwXqIxGw

& render=json

&location=palo+alto%2C+ca

&mindist=2

&what=parks

&_callback=foofunction

The format of the output (rss, json, kml, ical, csv)





http://pipes.yahoo.com/pipes/pipe.run?

- _id=1mrlkB232xGjJDdwXqIxGw
- &_render=json

&location=palo+alto%2C+ca &mindist=2

&what=parks

&_callback=foofunction

The per Pipe user customizable parameters





http://pipes.yahoo.com/pipes/pipe.run?

- _id=1mrlkB232xGjJDdwXqIxGw
- &_render=json &location=palo+alto%2C+ca &mindist=2
- &what=parks

&_callback=foofunction

Optional JSON callback function





Disadvantages (Why not to use an online service?)

- Away from data
 - personal (desktop)
 - organizational (intranet)
- Security and trust



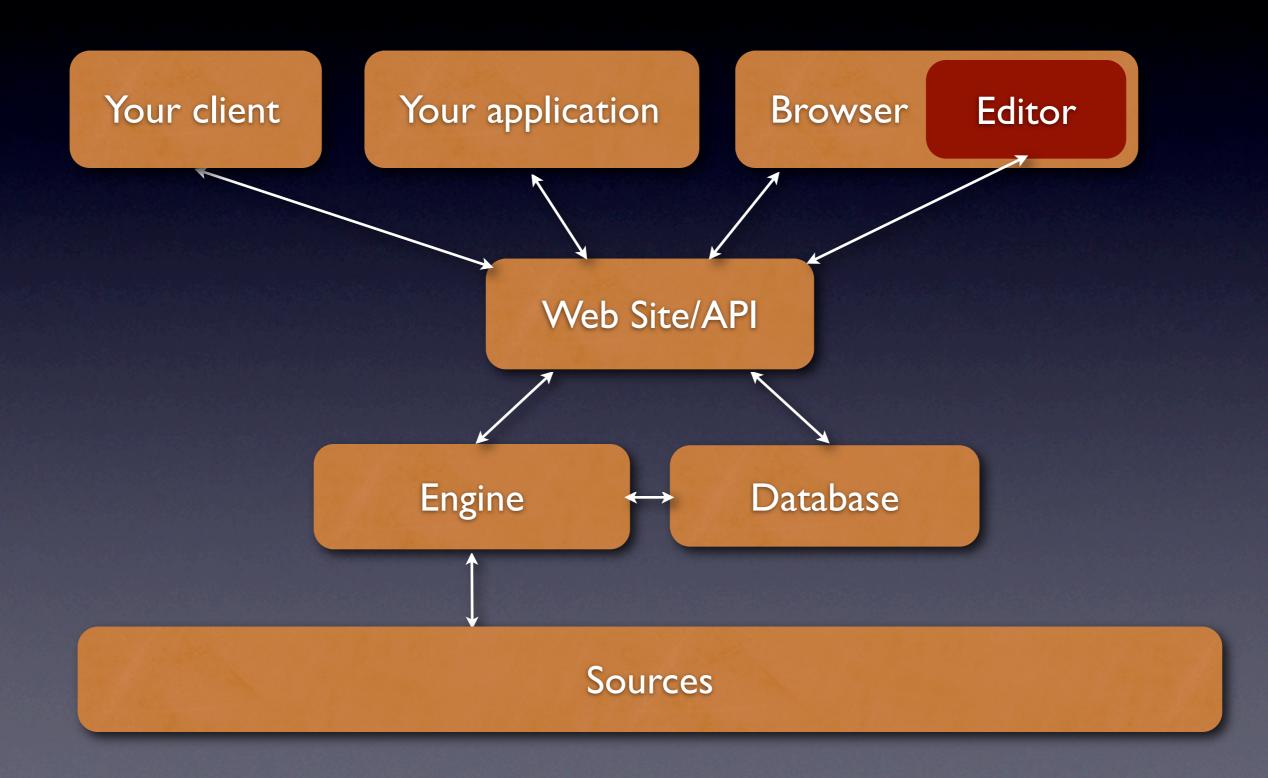
Design and Implementation

Target Users

The top 10% of the web 2.0 pyramid
Coders, re-mixers, bloggers
Assume prior knowledge
Concepts... loops, data types
End-users benefit indirectly



Architecture



Editor

- Edits Pipe definitions
- Heavy lifting performed by Engine
- Rivals a desktop experience
 - Almost everything is now possible in a browser





Editor Design

Instant "ON", no plugins

- "download this" gets in the way
- Data flow applications are well suited to visual programming
- Learn and propagate by "View Source" and "Clone"



Engine

- Executes Pipes
- Pipes are defined by a simple definition format
- Parallelizes as much of the execution as possible
- Not limited to RSS, supports many common web addressable formats
 - but...



Web addressable data

- is very malformed
- can be slow
- needs considerate access
- can be untrustworthy
- can be inaccessible from "here" (behind firewall etc)





Data in the Engine

- is "cleaned" (and repaired) into UTF-8
- is cached for
 - performance
 - playing well with others
 - several HTTP proxy layers
 - serve stale and force caching
- is "sanitized"





A year in the wild (20+ releases, 250k+ Pipes later)

more C

Modules (51) fetch (19036) filter (8582) regex (3344) rename (2360) sort (7996) textinput (3839) truncate (2888) union (6255) uniq (4033) urlbuilder (3273)





Formats (10)

csv (242) georss (1502) ical (43) <u>media</u> (1017) media-application (111) media-audio (94) media-image (484) media-text (1) media-video (82) media-x-audio (2)





Sources (99)

more 🤇

api.flickr.com (4823) api.search.yahoo.com (2331) blogspot.com (2184) feedburner.com (5149) feeds.feedburner.com (5144) flickr.com (4931) google.com (5153) news.google.com (2223) search.yahoo.com (3713) yahoo.com (7104)





Tags (99) more blog (427) digg (184) feed (182) flickr (473) google (235) music (254) news (976) rss (354) search (385) yahoo (195)





Typical Pipes/mashups

• Four types of mashup

- Feed aggregation with filtering
- Two-source mashups
- Data transformation and geocoding
- Complex mashups using REST APIs
- Geocoding remains a "mashup" favorite





Reasons for adoption

• Lower barrier to use

- Graphical editor made it quick to write Pipes, attracted non-developers
- "View Source" for learning/tweaking
- Wide array of data input formats and data output formats enabled Pipes to become a useful "component" in a larger ecology
- Web 2.0 responsiveness to community



Inaccessible data

- Lots of requests for more rich and personal data
 - Text documents, word documents, mail, Excel spreadsheets
- Workarounds (to some) emerged
 - Online spreadsheets, calendars (gcal) with private RSS feeds and so on





Power...

- We started by only supporting RSS
 - high-level building blocks and operations
 - good for common tasks and novice users
- We listened to our user's desires



...vs Complexity

- Added sources for parsing JSON, XML, CSV, ICAL ...
- Added modules that could do more and be combined in many ways
- At the cost of simplicity
 - Harder to explain, use, compose
 - Stretching the capabilities of a visual development environment





Unexpected breadth

- Experts who want to exploit the service
- Non-programers with much simpler needs
- In Pipes
 - Its easy to make useful data in the cloud
 - Its not easy enough to **use** it after
 - Users like things in one place





Making it easy to use

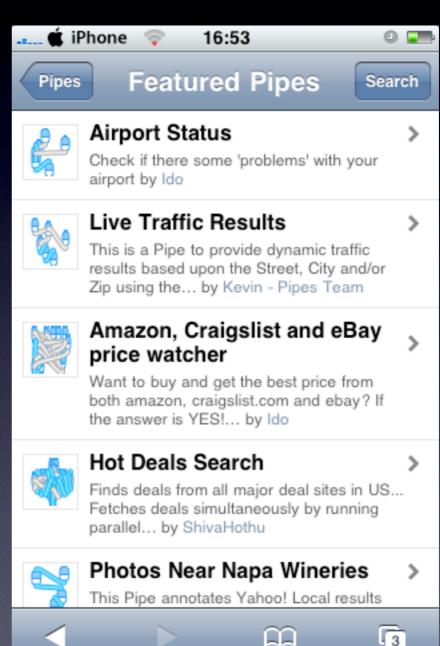
- Many Pipes provide data that's useful while mobile
 - Geosensitive information
 - Time sensitive decisions
- Letting the cloud do the work allows rich thin clients (in addition to thick heavy ones)
 - enable novice...expert developers to create (simple) mobile applications that give the right information at the right time





Doing the mobile mash

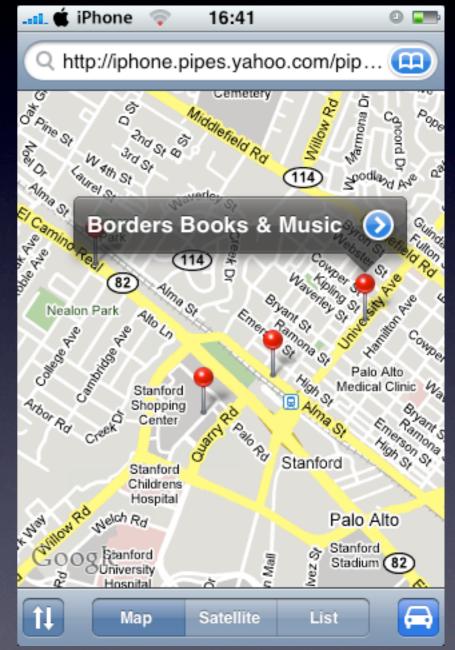
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Doing the mobile mash

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McDonald's 0.50 miles away. This McDonald's is like every othe one, with two major differences. It's	>	Contraction of the contraction o
Hudson's Shell Service 0.87 miles away.	>	Arbor
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Making it easy to use Coming Badges are frequently requested (Very) soon

- Despite other solutions
- Initially three variants visualizing common types of data in Pipes
 - Geo map badge
 - Flickr/Images image badge
 - Aggregators, transformers list badge







Photos Near Napa Wineries

View Source Clone

TT

This Pipe annotates Yahoo! Local results for Napa Wineries with images from Flickr taken nearby!

Pipe Web Address: http://bothafter.corp.yahoo.com/idopipes/bMPFtO342xGrr53VyzUFzw

Search near (e.g. Napa, CA)	Yountville, CA	4		Configure this Pipe
What to Find (e.g. Winery)	winery		Run Pipe	
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Get this Yahoo! Pipes [™] Badge HELP X
Add the eBay Price Watch Pipe (by Ed Ho) to your page as a badge.
What kind of badge would you like? Map
What settings would you prefer?
Where: palo alto, ca
Find an apartment near what: parks
Minimum distance (miles): 2
What dimensions would you like? (in pixels or %)
Width: 300 Height: 300
Where will you put this badge?
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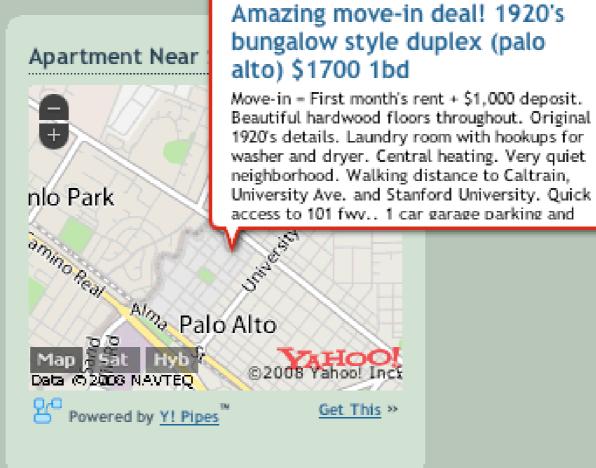


Badges

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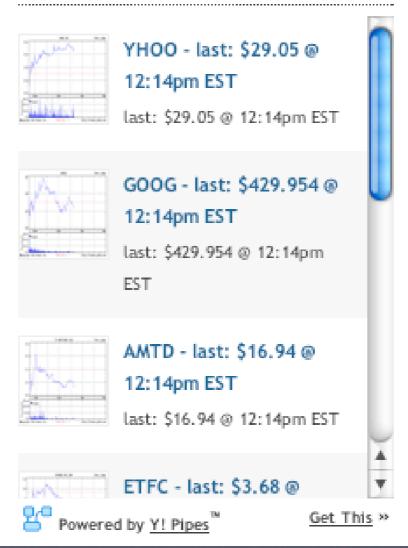


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0 comments



Conclusion 1/2

- Provides powerful data functions to any client
- Consumes data from many services
- Common data formats means any part of the cloud can become the input
 - Dapper, AWS, Google spreadsheets
- ...or take the output
 - I/3 Google mashups are powered by Pipes





Conclusion 2/2

• (Some) outstanding technical issues

- Common authentication API
- Inter-service common rate limiting scheme
- Bridges to local data / dbs





