State of the Internet Operating System

Tim O'Reilly

Web 2.0 Expo
San Francisco, CA
May 5, 2010
web 2.0
“Major Strasser has been shot... 
Round up the usual suspects”
- Lightweight startups
- Advertising based business models
- Crowdsourcing
- Social Media
- ....
web 2.0
The Internet as Platform
Building on the momentum and excitement of the O'Reilly Peer-to-Peer and Web Services Conferences

Building the Internet Operating System

MAY 13–16, 2002 • WESTIN SANTA CLARA, SANTA CLARA, CA

“Peer-to-peer and Web Services are only the first steps towards the emergence of a distributed Internet operating system—
“You keep using that word. I do not think it means what you think it means.”

Vizzini: Inconceivable! Inigo Montoya...
Just what does it mean?
Introducing Amazon Virtual Private Cloud
Securely extend your IT infrastructure to the AWS cloud.

Explore Products
Infrastructure Services
- Amazon Elastic Compute Cloud (Amazon EC2)
- Amazon SimpleDB
- Amazon Simple Storage Service (Amazon S3)
- Amazon Simple Queue Service (Amazon SQS)
- Amazon Elastic Hamdware
- Amazon Relational Database Service (Amazon RDS)
- AWS Premium Support
- Virtual Private Cloud
- Payments & Billing
- On-Demand Workforce
- Alexa Web Services
- Merchant Services

News & Events
- What's New?
  - Oct 27, 2009: Introducing Amazon Relational Database Service
  - Oct 27, 2009: Announcing Lower Amazon EC2 Instance Pricing
  - Oct 27, 2009: Announcing Amazon EC2 High-Memory Instances
  - Oct 01, 2009: Amazon Elastic MapReduce now supports Apache Hive
  - Sep 30, 2009: New Lower Prices for Windows Instances with Authentication Services

Get Started
Sign up for a free AWS account.

Developers
- AWS Management Console
- Technical Documentation
- Amazon Machine Images
- Running Databases on AWS
- AWS Community Forums

Business Managers
Learn New Amazon Web Services enables you to reach business goals faster:
- AWS Solutions for Enterprise Customers
- AWS Security Center
- Case Studies & Customer Testimonials
- AWS Blog
Windows® Azure is a cloud services operating system that serves as the development, service hosting and service management environment for the Windows Azure platform. Windows Azure provides developers with on-demand compute and storage to host, scale, and manage web applications on the Internet through Microsoft® datacenters.

Windows Azure is an open platform that supports Microsoft and non-Microsoft languages and environments. To build applications and services on Windows Azure, developers can use their existing Microsoft® Visual Studio® expertise. In addition, Windows Azure supports popular standards and protocols including SOAP, REST, XML, and PHP.

Use Windows Azure to:

- Run commodity processes in the cloud
- Build, modify, and distribute scalable applications with minimal on-premises resources
“Ask yourself for a moment, what is the operating system of a Google or Bing search? What is the operating system of a mobile phone call? What is the operating system of maps and directions on your phone? What is the operating system of a tweet?”
An application that depends on cooperating cloud data services:

- Location
- Search
- Speech recognition
- Live Traffic
- Imagery
- The good: My address book is populated with info from Facebook
- The bad: My phone knows my real social graph better than Facebook does
CabSense analyzes tens of millions of GPS data points from NYC taxis to help you find the best corner to catch a cab.

- Use Map View or Radar View to find the best corner.
- Plan ahead with the Time Slider and see the best locations at a future time.

>> More Features

iPad® free download!

- Find cafes nearby.
Search By Sight With Google Goggles

By MG Siegler on December 7, 2009

84 Comments

Today, at their Search Event in Mountain View, Google demosed a brand new product set to launch in Google Labs: Google Goggles. Humorous name aside, the product looks to be a huge leap forward in the field of visual search — by which I mean, you point a camera at something and Google figures out what it is.

The example that Google VP of Engineering Vic Gundotra showed on stage involved taking a picture of a particular bottle of wine. When he ran it through Google Goggles, the result showed that the particular bottle has a hint of apricots. You also be able to use Goggles to look up things such as CD covers and bar codes (this is likely similar to the popular Android app Shazam). For text, Google Goggles uses optical character recognition (OCR) to try and read things like logos and labels to aid the search.

It seems as if this new functionality, which should be live in Google Labs soon, will be destined for Android phones at least at first.
“I’m an inventor. I became interested in long term trends because an invention has to make sense in the world in which it is finished, not the world in which it is started.”

-Ray Kurzweil
- 1997 - Open source advocates need to be thinking about the internet, not about Linux
- 2000 - The network really is the computer - an early look at “the programmable web”
- 2002 - What do Napster, Seti@Home, and Web services all have in common?
- 2003 - The Open Source Paradigm Shift - how commodity software will lead to new sources of lock-in
- 2005 - What is Web 2.0? Lock-in will come through network effects in data
- 2009 - Web Squared - Sensor nets and collective intelligence
- 2010 - Smart phones as Internet OS clients
What Is Web 2.0

Design Patterns and Business Models for the Next Generation of Software

by Tim O'Reilly
06/30/2005


The bursting of the dot-com bubble in the fall of 2001 marked a turning point for the web. Many people concluded that the web was overhyped, that it was a fad, and that the promise of the web had not been realized.

However, the web is still evolving and continues to be a force for innovation and change. Many of the technologies and concepts that were developed during the dot-com boom are still in use today, and new technologies and ideas continue to emerge.

The concept of "Web 2.0" began with a conference in 2004 that brought together experts from the fields of web development, social media, and online collaboration. The conference was held in San Francisco, California, and it was called "Web 2.0 Conference - 2004: The Next Generation of Internet Applications, Services, and Business Models." The conference focused on the development of new web technologies and the ways in which these technologies could be used to create new business opportunities.

Since then, the concept of "Web 2.0" has become much more widespread and has been adopted by many websites and businesses. The idea behind Web 2.0 is that it is a new generation of internet applications and services that are more social, collaborative, and user-driven. Web 2.0 technologies allow users to create, share, and collaborate with content on the web, and they have the potential to change the way we interact with the internet.

In the year and a half since the term "Web 2.0" was first used, with more than 6.5 million citations in Google, there's still a huge amount of disagreement about just what...
1. The Web As Platform

Like many important concepts, Web 2.0 doesn't have a hard boundary, but rather, a gravitational core. You can visualize Web 2.0 as a set of principles and practices that lie together a veritable solar system of sites that demonstrate some or all of these principles, at a varying distance from that core.

Figure 1 shows a "meme map" of Web 2.0 that was developed at a brainstorm session during POD Camp, a conference at O'Reilly Media. It's very much a work in progress, but shows the many ideas that radiate out from the Web 2.0 core.

For example, at the first Web 2.0 conference, in October 2004, John Battelle and I listed a preliminary set of principles in our opening talk. The first of those principles was "The web as platform." Yet that was also a rallying cry of Web 1.0 during Netscape, which went down in flames after a failed battle with Microsoft. What's more, two of our initial Web 1.0 exemplars, DocuWiki and AllMy elkaar, were both pioneers in touting the web as a platform. People don't often think of it as "web services," but in fact, ad serving was the first widely deployed web service, and the first widely deployed "mashup." Do use another term that
“When attractive profits disappear at one stage in the value chain because a product becomes modular and commoditized, the opportunity to earn attractive profits with proprietary products will usually emerge at an adjacent stage.”

- Clayton Christensen
In the future, being a developer on someone's platform will mean being hosted on their infrastructure.

- Debra Chrapaty, VP Windows Live (2006)
It's crunch time.
Don’t take the open web for granted.
“one of the real wake-up calls was the way that Wall Street firms moved from being brokers to being active players "trading for their own account." ...over time, Wall Street "firms began to trade against their clients for their own account, such that now, the direct investment activities of a firm like Goldman Sachs dwarf their activities on behalf of outside customers," I thought, whither Google, Yahoo! and Amazon?”
Facebook's Eroding Privacy Policy: A Timeline

Commentary by Kurt Opsahl

Since its incorporation just over five years ago, Facebook has undergone a remarkable transformation. When it started, it was a private space for communication with a group of your choosing. Soon, it transformed into a platform where much of your information is publicly available. Today, it has become a platform where you have no choice but to make certain information public, and this public information may be shared by Facebook with its partner websites and used for targeted ads.

To help illustrate Facebook's shift away from privacy, we have highlighted some excerpts from Facebook's privacy policies over the years. Watch closely as your privacy disappears, one small change at a time!

Facebook Privacy Policy circa 2005:

No personal information that you submit to Thefacebook will be available to any user of the Web Site who does not belong to at least one of the groups specified by you in your privacy settings.

Facebook Privacy Policy circa 2006:

We understand you may not want everyone in the world to have the information you share on Facebook, that is why we give you control of your information. Our default privacy settings limit the information displayed in your profile to your school, your specified local area, and other reasonable community limitations that we tell you about.

Facebook Privacy Policy circa 2007:


Facebook iPhone Dev Quits Project Over Apple Tyranny

By Jason Kincaid In November 11, 2009 308 Comments

"My decision to stop iPhone development has had everything to do with Apple's policies." - Joe Hewitt

Facebook developer Joe Hewitt, the man behind the immensely popular Facebook application for iPhone, has just announced that he's done with the project.

"Time for me to try something new. I've handed the Facebook iPhone app off to another engineer, and I'm onto a new project."

We reached out to Hewitt for more details, and he attributed his decision to quit the project entirely on Apple's restrictive App Store approval policies:

My decision to stop iPhone development has had everything to do with Apple's policies. I respect their right to manage their platform however they want, however I am philosophically opposed to the existence of their review process. I am very concerned that they are setting a horrible precedent for other software platforms, and soon-gatekeepers will start infringing the lives of every software developer.

The web is still unrestricted and free, and so I am returning to my roots as a web developer. In the long term, I would like to be able to say that I helped to make the web the best mobile platform available, rather than being part of the transition to a world where every developer..."
New iPhone Developer Agreement Bans the Use of Adobe’s Flash-to-iPhone Compiler

By JOHN GRUBER

Thursday, 8 April 2010

Prior to today’s release of the iPhone OS 4 SDK, section 3.3.1 of the iPhone Developer Program License Agreement read, in its entirety:

3.3.1 — Applications may only use Documented APIs in the manner prescribed by Apple and must not use or call any private APIs.

In the new version of the iPhone Developer Program License Agreement released by Apple today (and which developers must agree to before downloading the 4.0 SDK beta), section 3.3.1 now reads:

3.3.1 — Applications may only use Documented APIs in the manner prescribed by Apple and must not use or call any private APIs. Applications must be originally written in Objective-C, C, C++, or JavaScript as executed by the iPhone OS WebKit engine, and only code written in C, C++, and Objective-C may compile and directly link against the Documented APIs (e.g., Applications that link to Documented APIs through an intermediary translation or compatibility layer or test are prohibited).

My reading of this new language is that cross-compilers, such as the Flash-to-iPhone compiler, is Adobe’s upcoming Flash Professional CCS...
Thoughts on Flash

Apple has a long relationship with Adobe. In fact, we met Adobe's founders when they were in their proverbial garage. Apple was their first big customer, adopting their Postscript language for our new LaserWriter printer. Apple invested in Adobe and owned around 20% of the company for many years. The two companies worked closely together to pioneer desktop publishing and there were many good times. Since that golden era, the companies have grown apart. Apple went through its near death experience, and Adobe was drawn to the corporate market with their Acrobat products. Today the two companies still work together to serve their joint creative customers – Mac users buy around half of Adobe’s Creative Suite products – but beyond that there are few joint interests.

I wanted to jot down some of our thoughts on Adobe’s Flash products so that customers and critics may better understand why we do not allow Flash on iPhones, iPads and iPods. Adobe has characterized our decision as being primarily business driven – they say we want to protect our App Store – but in reality it is based on technology issues. Adobe claims that we are a closed system, and that Flash is open, but in fact the opposite is true. Let me explain.

First, there’s “Open”.

Adobe’s Flash products are 100% proprietary. They are only available from Adobe, and Adobe has sole authority as to their future enhancement, pricing, etc. While Adobe’s Flash products are widely available, this does not mean they are open, since they are controlled entirely by Adobe and available only from Adobe. By almost any definition, Flash is a closed system.

Apple has many proprietary products too. Though the operating system for the iPhone, iPod and iPad is proprietary, we strongly believe that all standards pertaining to the web should be open. Rather than use Flash, Apple has adopted HTML5, CSS and JavaScript – all open
Web 2.0 Summit 2010: Points of Control
The Battle for the Network Economy

The Web 2.0 Summit is the only place, once a year, where leaders of the Internet Economy gather to debate and determine business strategy. Join the leadership of this extraordinary industry this November 15–17 in San Francisco.

Fifteen years and two recessions into the commercial Internet, it's clear that our industry has moved into a competitive phase—a middle game in the battle to dominate the Internet Economy.

At this year's Web 2.0 Summit, we're focusing on these shifting points of control—strategic chokepoints on an increasingly crowded board. The decisions we make as an industry will determine the fundamental architecture of our society.

We’ll use the Summit's program to feature companies who are...
“ecology teaches us that it takes a web of cooperating species to create a truly rich environment. Each of us depends on thousands, if not millions, of other organisms, each pursuing its own selfish goals, yet somehow weaving a cooperative web that, for the most part, benefits all. I believe that open source has many parallels to a functioning ecology. Each developer builds for his own use, and that of his friends, but also makes it easy for collateral benefits to accrue to others he or she doesn't know.”
Microsoft Taps Into Facebook’s Open Graph To Launch Docs.com
by Erick Schonfeld on Apr 21, 2010

If Google Docs is about sharing documents and spreadsheets, Microsoft is now fighting back by tapping into the biggest sharing network on the planet: Facebook. Today at Facebook’s F8 developer conference, Mark Zuckerberg announced that Microsoft is tapping into Facebook to create Docs.com. The app, which was created by Microsoft’s FUSE Labs, is a way for Facebook users to share and collaboratively edit Microsoft Office documents.
After F8: Implementing the Open Graph Protocol around the Web

We shared an update last week about the products launched at F8 and that over 50,000 websites have already implemented the new social plugins to become more personalized. We created the Open Graph protocol in support of social plugins as part of our efforts to help realize the vision of the Open Graph.

Any website can implement the Open Graph protocol. It allows any web page to become a rich object in any social graph, making it easy to find what people are talking about across the Web — from a movie to a blog. To start integrating the Open Graph protocol into your Web pages, read our documentation.

Last week, Facebook's David Recordon gave a presentation at the WWW Conference explaining the design decisions behind the Open Graph protocol, which is embedded below. Additionally, members of the W3C's Linked Data Camp helped to develop a RDF schema file which relates the Open Graph protocol to existing ontologies (such as Dublin Core, FOAF, and OIOdata).

Open Graph Protocol Design Decisions

Scribd

The Open Graph protocol
The Reverse of Spam: Wordpress Integration with SalesForce

Written by Mike Grewood - May 2, 2010 2:30 PM | 0 Comments

This post is part of our ReadWriteCloud channel, which is dedicated to covering virtualization and cloud computing. The channel is sponsored by Intel and VMware. As you are planning your Cloud Architecture, check out this helpful resource from our sponsors: Using a Data Center Relocation To Create A Virtual Infrastructure.

When running blogs for community, and business interests, the important question of "who" has visited has been a big challenge. This problem was one of the inspirations for the creation of OpenID and other approaches for identity sharing.

As corporate blog applications grow as operational business tools, the ability to respond to users who launch comments becomes a critical component of doing business. This requires being able to integrate this information flow into company processes as a natural extension of the blog.

SalesForce.com has been focused on aggregation of customer prospects across all channels a company performs in. So, this is a very natural extension to SalesForce's destiny to consider the corporate blog an important touch point for consumers.

And, with the momentum of SalesForce's Chatter platform - which enables enterprise collaboration and hooks to services like Twitter and Facebook, this integration both helps get comprehensive and in our opinion, increases the value of the blog as a tool for the enterprise.

SalesForce provided us a screenshot of the application, we'll walk through them here.
The State of the Internet Operating System

by Tim O'Reilly (@thereallymost) comments: 69

I've been talking for years about "the internet operating system", but I really have never written an extended post to define what I think it is, where it is going, and the choices we face. This is that missing post. Here you will see the underlying beliefs about the future that are guiding my publishing program as well as the rationale behind conferences I organize like the Web 2.0 Summit and Web 2.0 Expo, the Where 2.0 Conference, and even the Gov 2.0 Summit and Gov 2.0 Expo.

Ask yourself for a moment, what is the operating system of a Google or Bing search? What is the operating system of a mobile phone call? What is the operating system of maps and directions on your phone? What is the operating system of a tweet?

On a standalone computer, operating systems like Windows, Mac OS X, and Linux manage the machine's resources, making it possible for applications to focus on the job they do for the user. But many of the activities that are most important to us today take place in a mysterious space between individual machines. Most people take for granted that these things just work, and complain when the daily miracle of instantaneous communications and access to information breaks down for even a moment.

But peel back the covers and remember that there is an enormous, worldwide technical infrastructure that is enabling the always-on future that we rush thoughtlessly towards.

When you type a search query into Google, the resources on your local computer - the keyboard where you type your query, the screen that displays the results, the networking hardware and software that connects your computer to the network, the browser that formats and forwards your request to Google's servers - play only a small role. What's more, they don't really matter much to the operation of the search - you can type your search terms into a browser on a Windows, Mac, or Linux machine,
## Who Owns What

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<th>Category</th>
<th>Amazon</th>
<th>Apple</th>
<th>Google</th>
<th>Microsoft</th>
<th>Other</th>
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- ● Strong offering
- ○ Medium offering
- ▼ Getting started
- — Not on the board yet
Apple

- The front-end device to beat
- Rich media subsystems (music, video, books)
- An app ecosystem that is the Web’s first real rival as a platform
- A new monetization engine for developers
- Total aesthetic control and a vision of world domination
- Boatloads of cash

- Weaknesses in the data subsystems that will drive many future apps
- A seeming failure even to understand the importance of these data subsystems. Witness MobileMe
Google

- **Richest and most complete data subsystems of any of the players**
  - Search, Advertising, Maps and Directions, Speech Recognition, Automated Translation, Image Recognition, Video, Communications (email, messaging), Payment
- **A front-end device play**
- **A rich mobile app ecosystem**
- **A monetization engine for developers**
- **Unparalleled experience in algorithmic intelligence**
- **Sophisticated strategic use of open source and open standards**
- **Boatloads of cash**

**Weaknesses**
- The new anti-trust target
- Trying to own too much of the pie
Microsoft

- Many of the same data assets as Google
  - Search, Advertising, Maps and Directions, Speech Recognition, Automated Translation, Image Recognition, Video, Communications (email, messaging), Payment

- As the underdog, a willingness to partner. Microsoft is no longer the one trying to own it all

- Boatloads of cash

- Weaknesses:
  - Number two to Google in all the data subsystems
  - Way out of the game in mobile devices (but coming back!)
  - The “strategy tax” from legacy businesses
Amazon

- The leader in cloud computing infrastructure
- The leader in the “thing graph”
- Fabulous payment subsystem
- Deep data and algorithmic intelligence capabilities
  - but not tied to their monetization engine

**Weaknesses**
- Far less cash than rivals
- Weaker device play
- Strategy tax issues
Facebook

- “The fox knows many things, but the hedgehog knows one big thing.” - Archilochus
- A platform strategy of adding value to other sites
- A platform and monetization engine for developers
- Deep data and algorithmic competencies

- Weaknesses:
  - None that aren’t being turned into strengths by partnering
Everyone is stronger than anyone

- Search: Google, Microsoft
- Maps: Google, Microsoft, Nokia, Yelp, Foursquare
- Speech: Nuance, Google, Microsoft
- Social Graph: Facebook, Twitter, Microsoft, Google, Yahoo, Verizon, ATT...
- Payment: Paypal, VISA, Mastercard, Google, Apple
- Cloud infrastructure: Amazon, VMware, Microsoft, Google, Rackspace
- Smartphones: Apple, Nokia, Google, RIM...
- Device Operating Systems: Apple, Google, Microsoft, Nokia, RIM...
If you’ve followed my thinking about Web 2.0 from the beginning, you know that I believe we are engaged in a long term project to build an internet operating system. (Check out the program for the first O’Reilly Emerging Technology Conference in 2002 [pdf].) In my talks over the years, I’ve argued that there are two models of operating system, which I have characterized as “One Ring to Rule Them All” and “Small Pieces Loosely Joined,” with the latter represented by a routing map of the Internet.

The first is the winner-takes-all world that we saw with Microsoft Windows on the PC. a world that promises simplicity and ease of use, but ends up diminishing user and developer choice as the operating system provider.

The second is an operating system that works like the Internet itself, like the web, and like open source operating systems like Linux: a world that is admittedly less polished, less controlled, but one that is profoundly generative of new innovations because anyone can bring new ideas to the market without having to ask permission of anyone.

I’ve outlined a few of the ways that big players like Facebook, Apple, and News Corp are potentially breaking the “small pieces loosely joined” model of the Internet. But perhaps most threatening of all are the natural monopolies created by Web 2.0 network effects.

One of the points I’ve made repeatedly about Web 2.0 is that it is the design of systems that get better the more people use them, and that over time, such systems have a natural tendency towards monopoly.
Create more value than you capture
For more information

- The Open Source Paradigm Shift (2003)
- What is Web 2.0? (2005)
  http://oreil.ly/a0zT65
- Web Squared: Web 2.0 Five Years On (2009)
- Government as a Platform (2010)
  http://opengovernment.labs.oreilly.com/
- Ongoing commentary
  http://radar.oreilly.com
  http://twitter.com/timoreilly
  http://buzz.google.com/timoreilly