# Serendipitous Services

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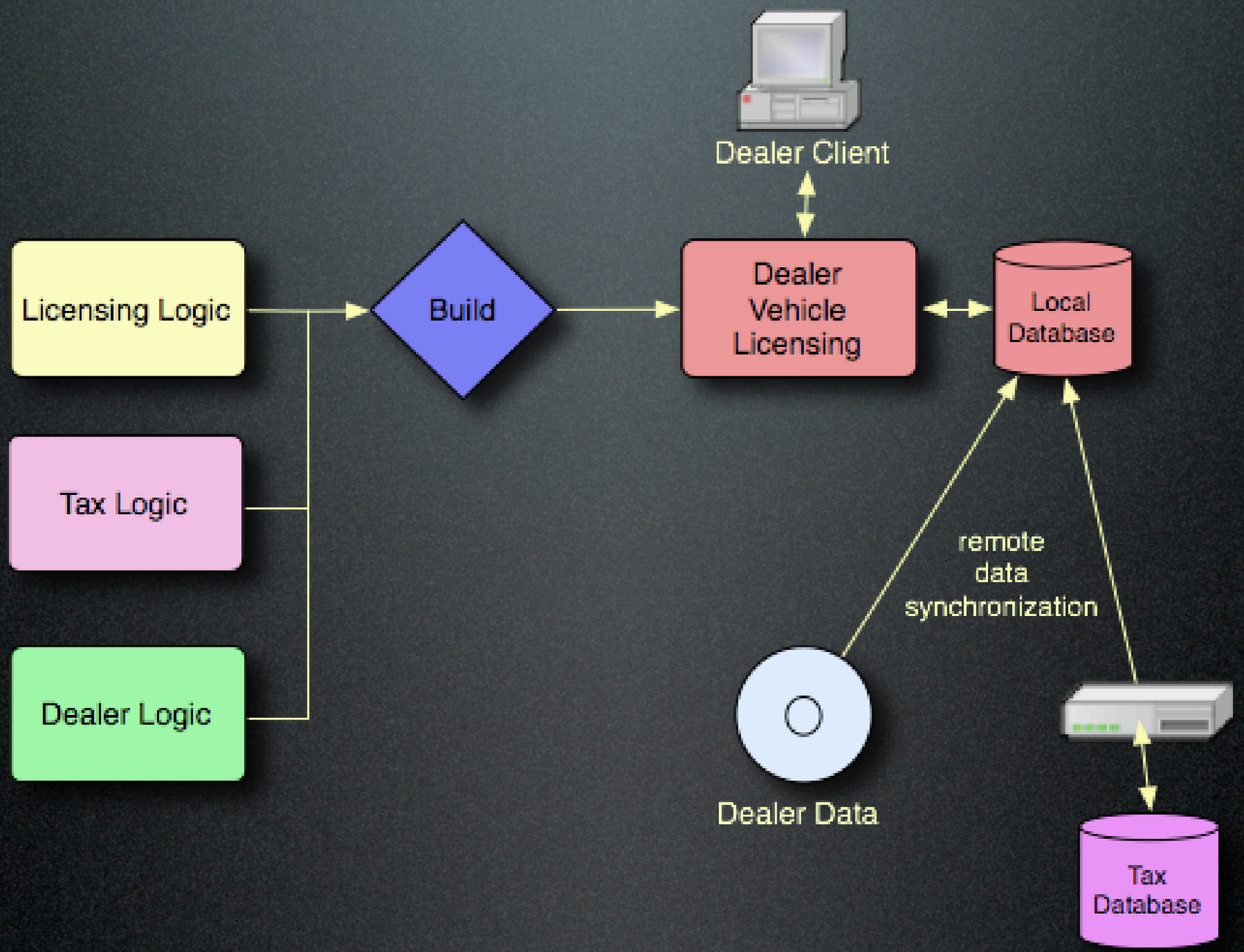
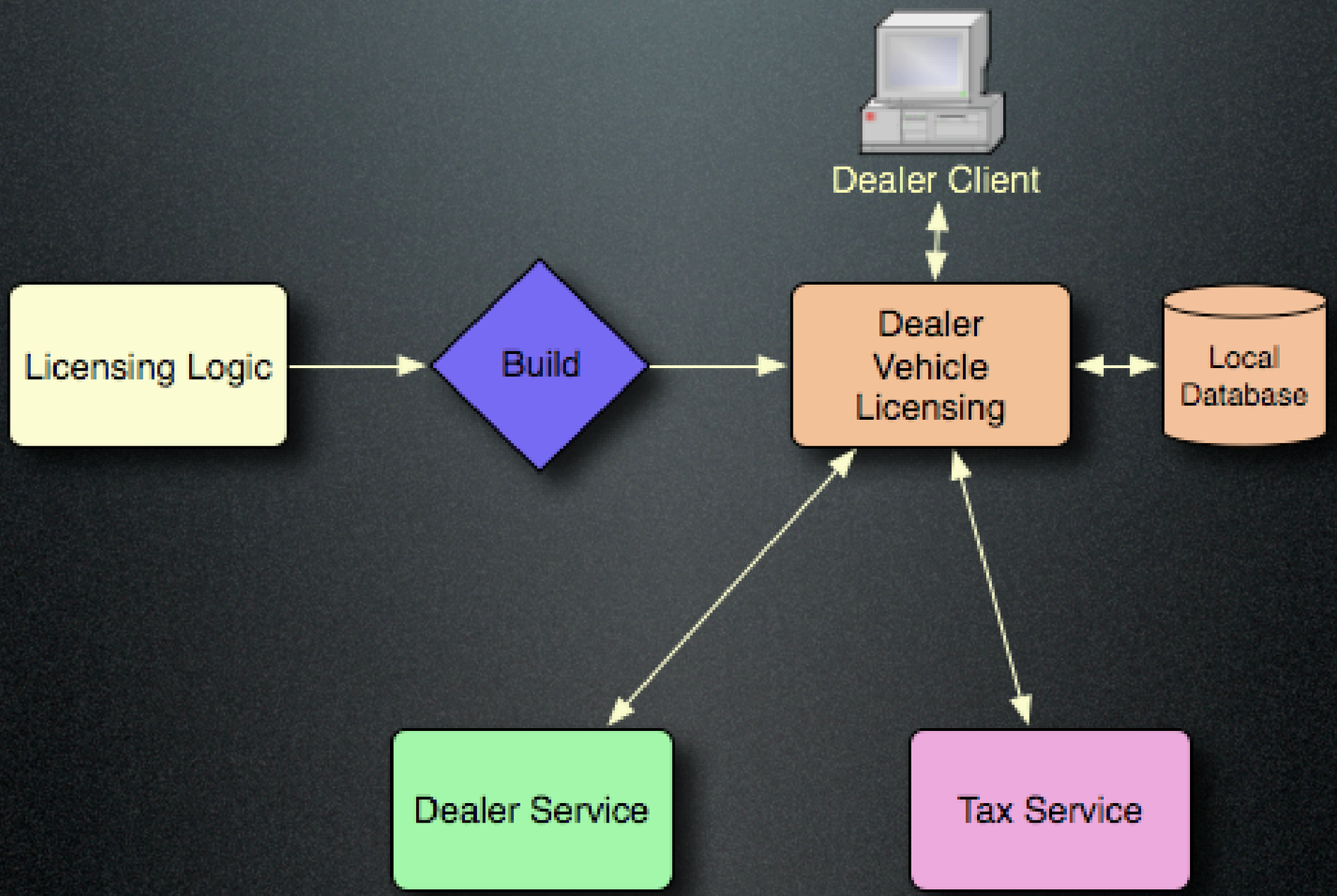
www.windley.com

# Railroad and Highways

# Traditional Architecture



# Service Oriented Architecture



# Web Services

- Web services are self-contained pieces of code with three distinguishing properties:
  - Communicate in an interoperable XML protocol, such as SOAP.
  - Describe themselves in an interoperable XML meta-format, such as WSDL.
  - Federate globally through XML based registry services, such as UDDI.
- Not defined in terms of SOAP, WSDL, and UDDI.

# Key Differences

- Creating applications by
  - integrating network services
  - that are very far away
    - and owned by strangers
- Primary abstraction:
  - network services
  - not subroutines or objects

# Decentralized Computing

- Decentralized computing is different from distributed computing
- Decentralization means crossing organizational boundaries
- Extending a system to achieve consensus and cooperation between several separate organizations

# Scaling in the Internet

- Effective services scale in three ways:
  - across time
  - across space
  - across organizations
- Level-3 routers (TCP) solve these problems for connectivity

# Passenger Name Records

“PNRs unlock data stored in tickets, tariff filings, baggage claim checks, catering orders, security profiles, credit records, and myriad other components of this half-real, half-virtual distributed system called an airline”

# Service Oriented Architecture Properties

- Discoverable and dynamic
- Loosely coupled
- Locationally transparent
- Diversely owned
- Interoperable
- Composable
- Network addressable
- Self healing

# Loose Coupling

| | Tight Coupling | Loose Coupling |
|---|---|---|
| Interface | Classes/methods | Fixed verbs |
| Messaging | Procedure call | Document passing |
| Typing | Static | Dynamic |
| Synchronization | Synchronous | Asynchronous |
| References | Named | Queried |
| Ontology | By prior agreement | Self describing |
| Schema | First-order | Higher-order |
| Communications | Point to point | Pub/Sub |
| Interaction | Direct | Brokered |
| Evaluation | Eager | Lazy |
| Motivation | Efficiency, performance | Interoperability |
| Behavior | Planned | Adaptive |
| Coordination | Centralized | Distributed |
| Contracts | Implicit | Explicit |

# Service Oriented Architecture Benefits

- Code Re-use
- Correctness
- Maintainability
- Productization
- Security
- Focused developer roles
- Better alignment with business goals
- Scalability
- Feature augmentation

# A Word of Warning

- Good architects should do everything they can to avoid data serialization.
  - Web services is nothing but serialization.
- When serialization cannot be avoided, it can be mitigated through caching in some cases.
  - SOAP over HTTP makes caching difficult (uses POST).

# Latency

- Absolute limit of system architecture
- One of the few physical limits on computation


- New York is always going to be 30ms from London regardless of Moore's Law

# Lifestyle Services

# The Williams Family

# The Williams Family

# The Williams Family

**Life Event: Moving to Utah**

# The Williams Family

**Life Event: Moving to Utah**

- Change of address

# The Williams Family

**Life Event: Moving to Utah**

- Change of address
- Register car

# The Williams Family

**Life Event: Moving to Utah**

- Change of address
- Register car
- Register to vote

# The Williams Family

**Life Event: Moving to Utah**

- Change of address
- Register car
- Register to vote
- Enroll child in school

# The Williams Family

**Life Event: Moving to Utah**

- Change of address
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- City services

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- Change of address
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- Health information

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- Child safety

# The Williams Family

**Life Event: Moving to Utah**

- Change of address
- Register car
- Register to vote
- Enroll child in school
- Bussing
- City services
- Health information
- Child safety
- Check the commute

# The Williams Family

**Life Event: Moving to Utah**

- Change of address
- Register car
- Register to vote
- Enroll child in school
- Bussing
- City services
- Health information
- Child safety
- Check the commute
- Tax information

# The Williams Family

**Life Event: Moving to Utah**

- Change of address
- Register car
- Register to vote
- Enroll child in school
- Bussing
- City services
- Health information
- Child safety
- Check the commute
- Tax information

# Federating Services

Moving to Utah
Real estate
Taxes
Register car
Register to vote
Enroll child in school
Bussing
City services
Utilities
Health information
Banking
Child safety
Change of address
Check commute

# Federating Services

## Moving to Utah

Real estate
Taxes
Register car
Register to vote
Enroll child in school
Bussing
City services
Utilities
Health information
Banking
Child safety
Change of address
Check commute

## Child in School

Enrollment
Health information
Grades
Tuition and fees
Books
Child safety
Bussing
Federal programs
Check commute

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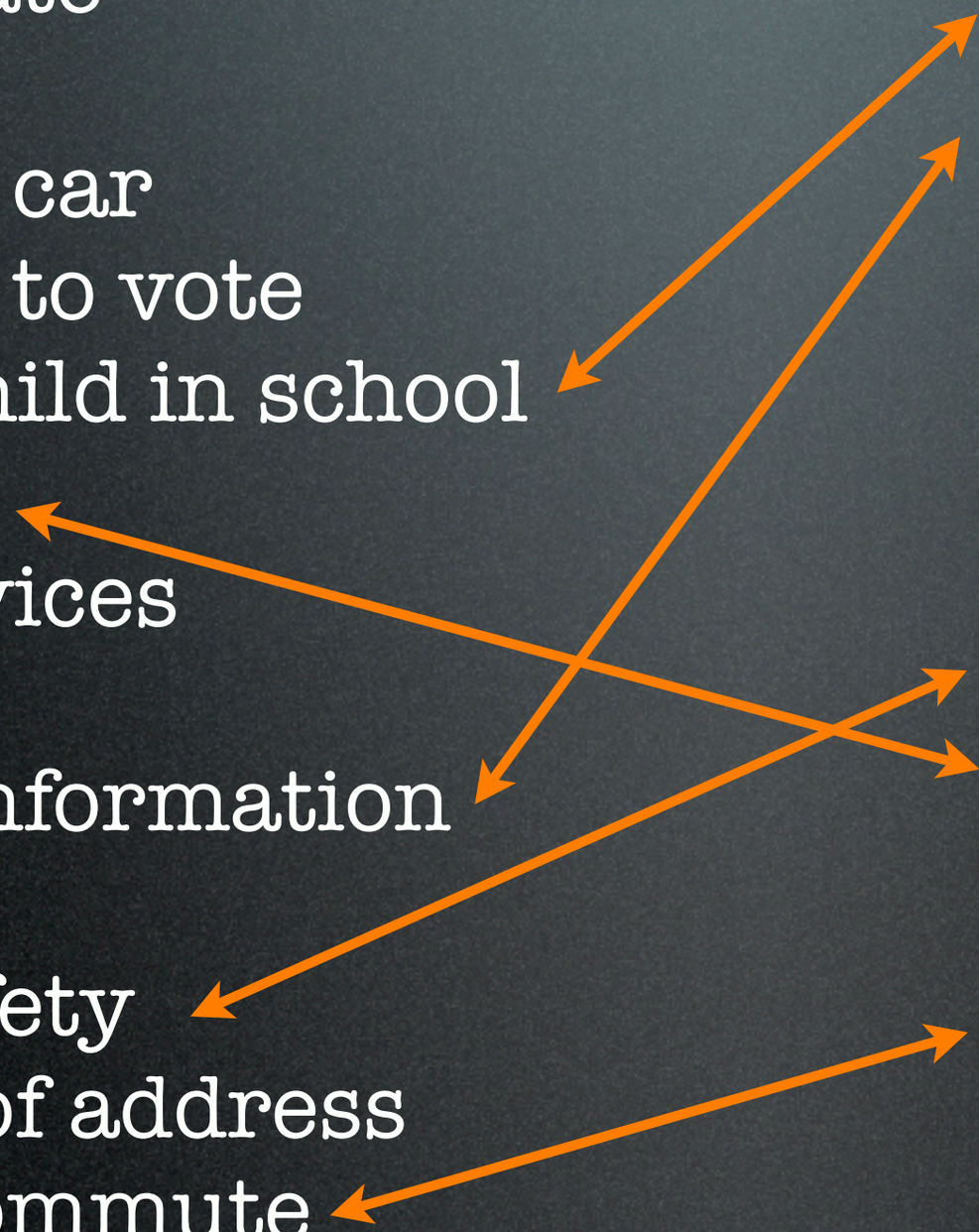

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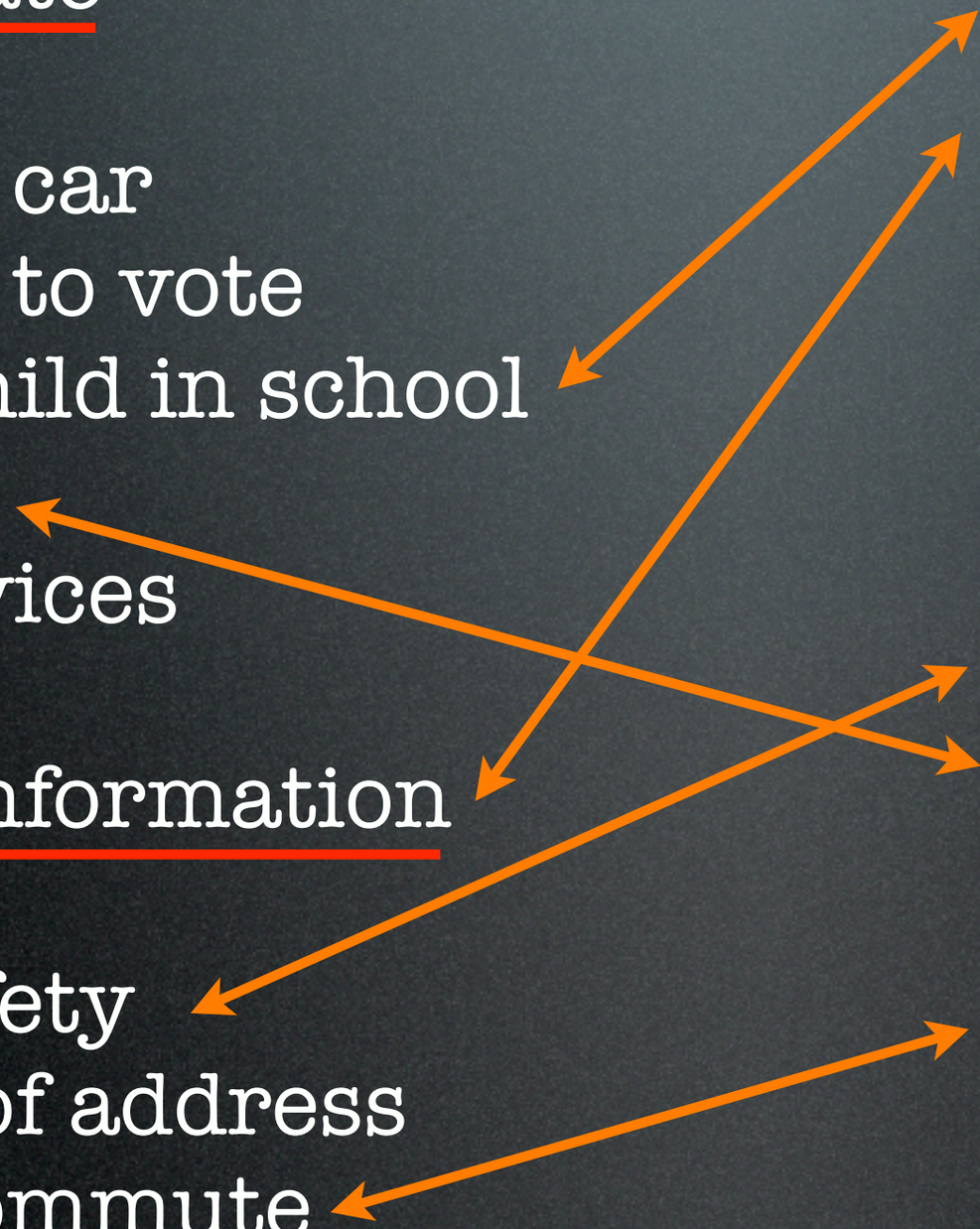
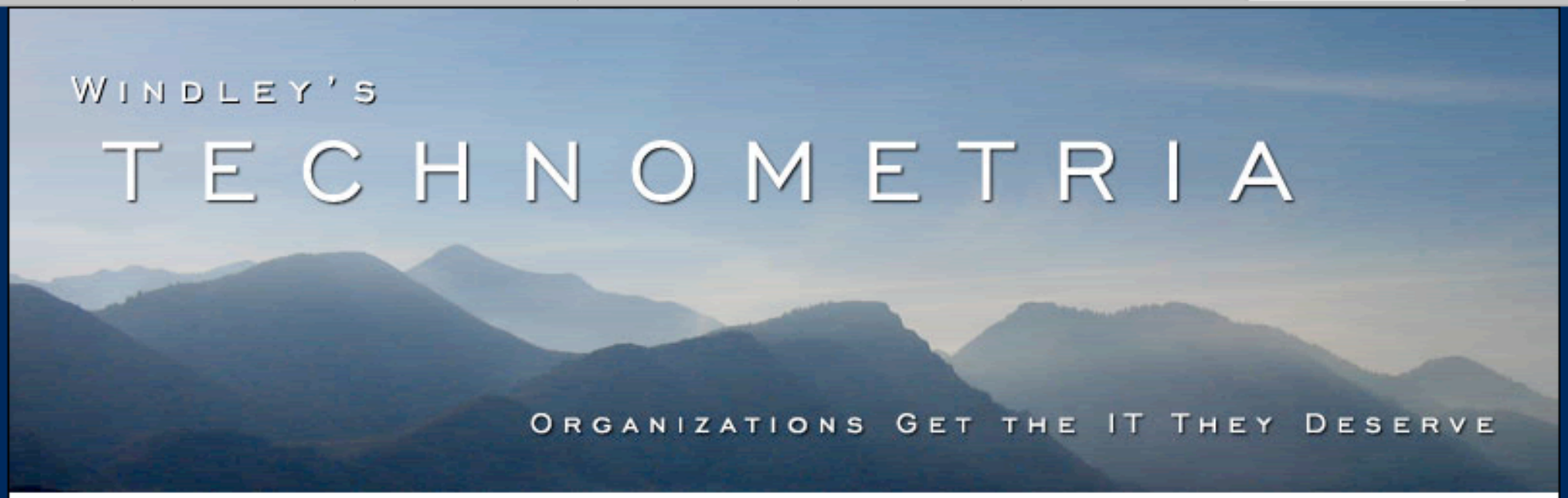


# Legacy Data

# Serendipitous Applications

# Library Lookup Demo

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November 08, 2006

## A Lisp Interpreter in Haskell

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It's been too long since I've known monads well enough to decipher what he does at the end. I'm going to have to go back and review and then look at his article again—if you don't understand monads before, I doubt you'll get why they're so powerful.

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**DIGITAL IDENTITY**

# How Does This Work?

- Amazon and most library software follows principles I'll outline in a minute
- As a result, the bookmarklet can coordinate two different Web services to produce a useful application
  - Just Javascript
  - Small, incremental effort

# Serendipitous Services

- Start Web services now:
  - Incrementally expose your data
  - Incrementally expose your APIs
- The more data and APIs that you expose the greater the potential interoperability
- Small marginal cost and high return, but...design is important

# A POX on Your House

(with any luck)

every data element and collection is a resource

every resource must have a URI

cool URI's don't change

return XML

preserve the structure of data
until the last possible moment

describe data

make XML schemas

available online

# adhere to existing data standards

RSS and Atom are de facto formats

use metadata for XML (RDF)

# use HTTP correctly

data queries on existing resources

should be done with a GET

use POST to create new resources

# document your service API

advertise the presence of the service

use WSIL

use <link/> tags

use HTTP

authentication

adopting these principles is cheap and easy...

...but it can have big rewards

# Brainstorming Two Websites

this is happening in spite of poor design and even official contempt

# Sex Offender Registries Demo

Phil Windley's Technometria

http://www.windley.com/

pwd WECW UtahPpolitics.org BTL Blogtools BYU mine SS POA Hold CES Documentation

Phil Windley's Technometria

# WINDLEY'S TECHNOMETRIA

ORGANIZATIONS GET THE IT THEY DESERVE

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## Managing Your Online Reputation--With a

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# does this work?

# CTG (NY) Study:

- Five government agencies switch from HTML to XML
  - One agency saved 5hrs/week in production time
  - Easier to share data because of standards
  - Improved workflow and content creation

# Case Study: RSS

- Rich Site Summary
- XML-based content syndication
- Used by feedreaders as well as Web sites

# Why RSS

Work Portal

NYT

Local Paper

Park District

Fav Blog

Gadget News

CNN

School Site

2nd Fav Blog

FCW

Info World

c|net News

YABlog

Yahoo!

# Why RSS

| Work Portal | NYT | Local Paper | Park District | Fav Blog | Gadget News | CNN |
|---|---|---|---|---|---|---|
| 1 → | 2 → | 3 → | 4 → | 5 → | 6 → | 7 |

| School Site | 2nd Fav Blog | FCW | Info World | c\|net News | YABlog | Yahoo! |
|---|---|---|---|---|---|---|
| 8 → | 9 → | 10 → | 11 → | 12 → | 13 → | 14 |

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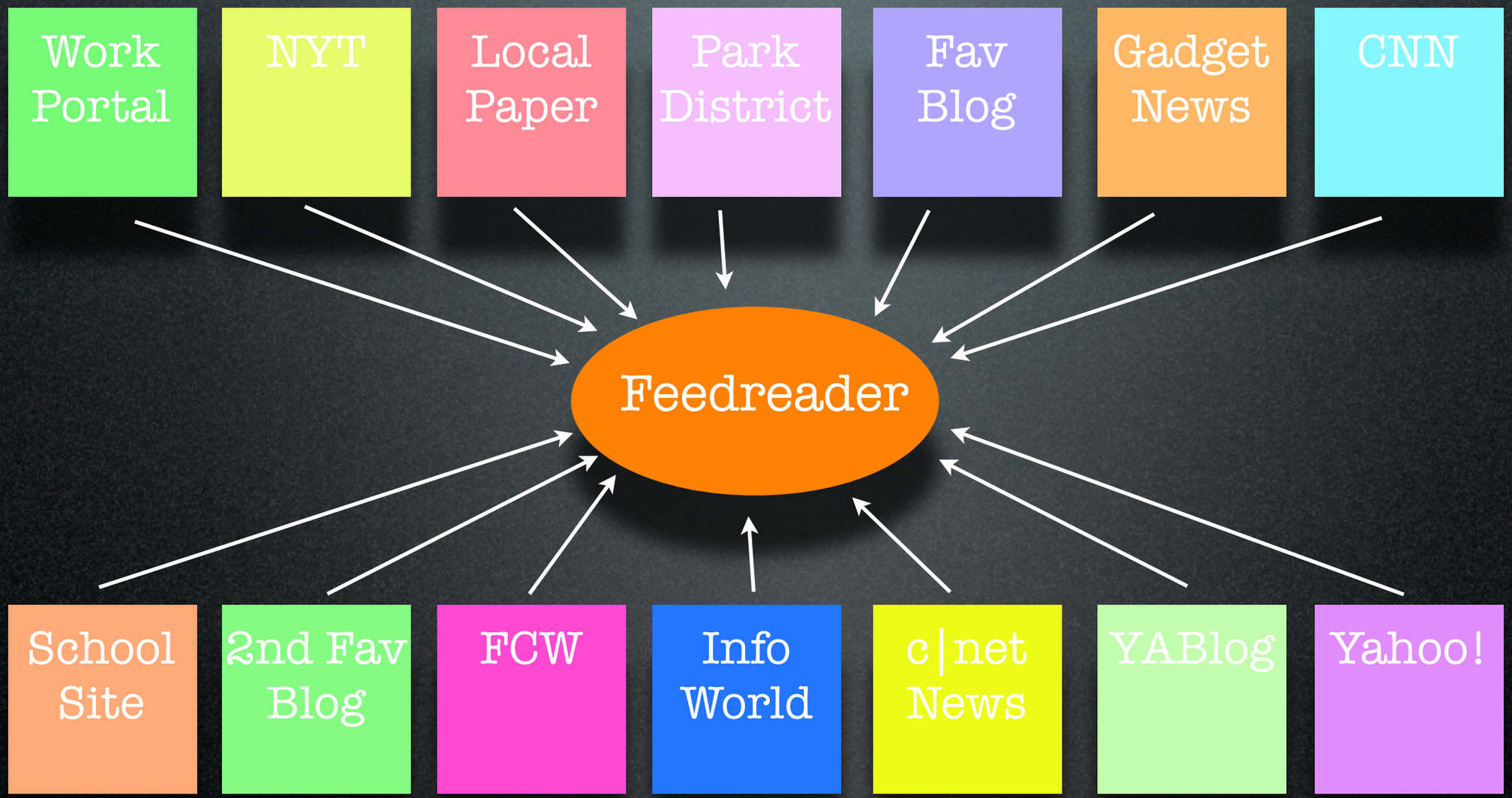

Work Portal
NYT
Local Paper
Park District
Fav Blog
Gadget News
CNN
Feedreader
School Site
2nd Fav Blog
FCW
Info World
c|net News
YABlog
Yahoo!

# Who Has RSS?

The New York Times ON THE WEB

TIME ONLINE EDITION

YAHOO!

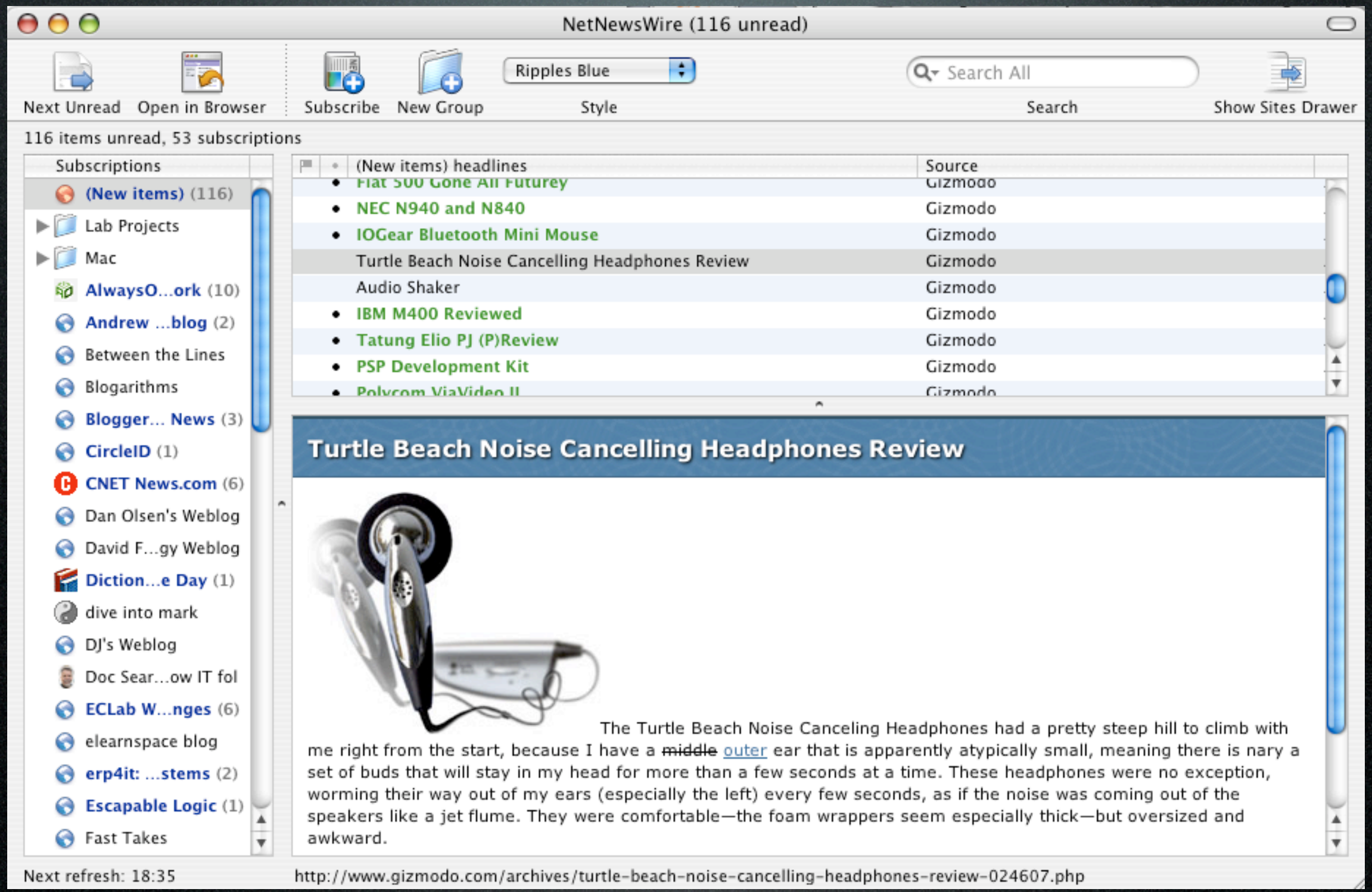
utah dot gov

DEPARTMENT OF DEFENSE UNITED STATES OF AMERICA

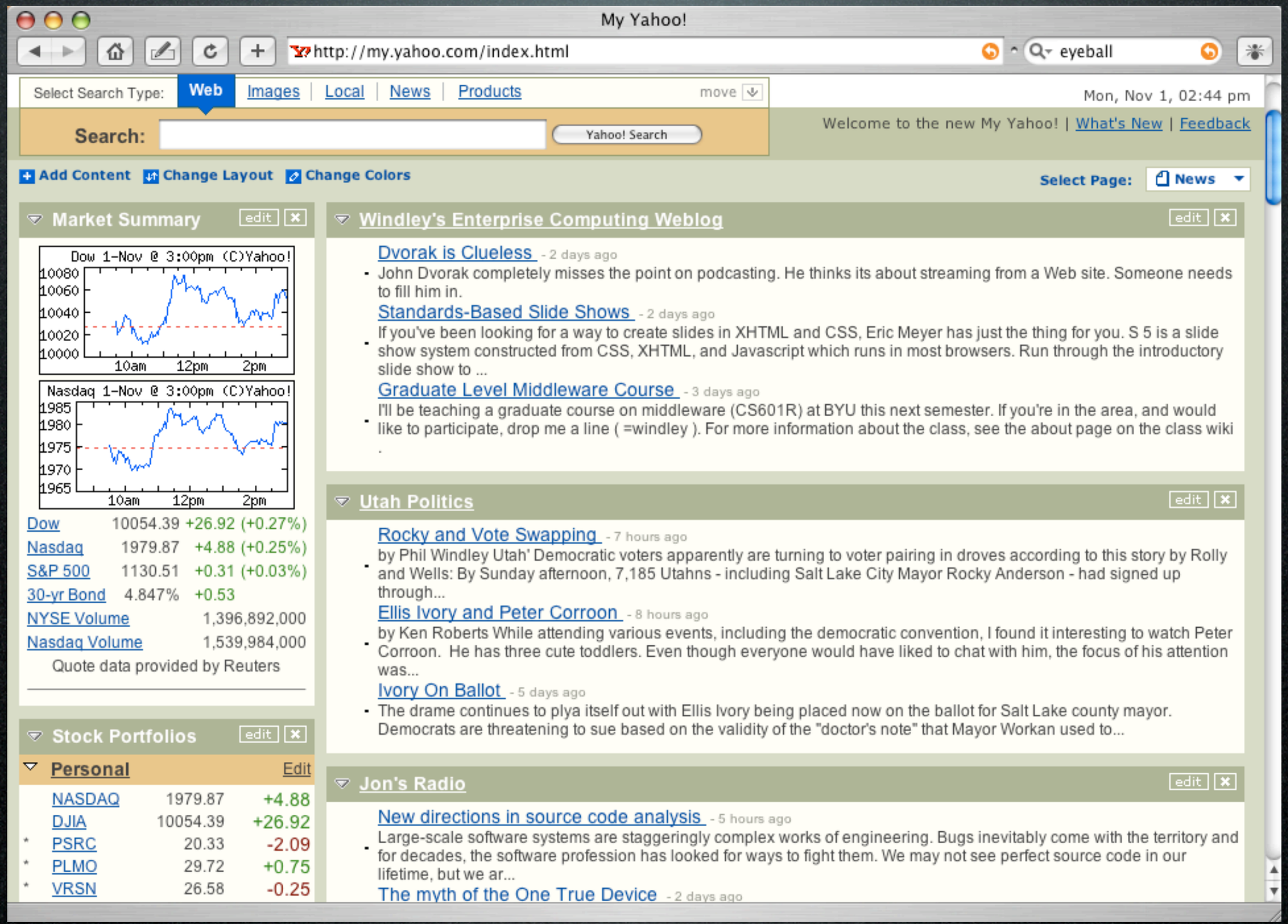
amazon.com

MOVABLETYPE Publishing Platform

# Feedreaders



# My Yahoo!


My Yahoo!
http://my.yahoo.com/index.html
eyeball
Select Search Type: Web Images | Local | News | Products move
Mon, Nov 1, 02:44 pm
Search:
Yahoo! Search
Welcome to the new My Yahoo! | What's New | Feedback
Add Content Change Layout Change Colors
Select Page: News
Market Summary edit
Dow 1-Nov @ 3:00pm (C)Yahoo!
10080
10060
10040
10020
10000
10am 12pm 2pm
Nasdaq 1-Nov @ 3:00pm (C)Yahoo!
1985
1980
1975
1970
1965
10am 12pm 2pm
Dow 10054.39 +26.92 (+0.27%)
Nasdaq 1979.87 +4.88 (+0.25%)
S&P 500 1130.51 +0.31 (+0.03%)
30-yr Bond 4.847% +0.53
NYSE Volume 1,396,892,000
Nasdaq Volume 1,539,984,000
Quote data provided by Reuters
Stock Portfolios edit
Personal Edit
NASDAQ 1979.87 +4.88
DJIA 10054.39 +26.92
* PSRC 20.33 -2.09
* PLMO 29.72 +0.75
* VRSN 26.58 -0.25
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I'll be teaching a graduate course on middleware (CS601R) at BYU this next semester. If you're in the area, and would like to participate, drop me a line ( =windley ). For more information about the class, see the about page on the class wiki .
Utah Politics edit
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by Phil Windley Utah' Democratic voters apparently are turning to voter pairing in droves according to this story by Rolly and Wells: By Sunday afternoon, 7,185 Utahns - including Salt Lake City Mayor Rocky Anderson - had signed up through...
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by Ken Roberts While attending various events, including the democratic convention, I found it interesting to watch Peter Corroon. He has three cute toddlers. Even though everyone would have liked to chat with him, the focus of his attention was...
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# <xml/>

www.windley.com

# What's RSS Look Like?

Source of http://www.windley.com/rss.xml

```
<?xml version="1.0"?>
<!-- RSS generated by Radio UserLand v8.0.8 on Sat, 30 Oct 2004 00:45:24 GMT -->
<rss version="2.0">
    <channel>
        <title>Windley&amp;apos;s Enterprise Computing Weblog</title>
        <link>http://www.windley.com/</link>
        <description>Organizations Get the IT They Deserve&amp;lt;sup class=&amp;quot;realsmall&amp;quot;&amp;gt;SM&amp;lt;/sup&amp;gt;</description>
        <language>en</language>
        <copyright>Copyright 2004 Phil Windley</copyright>
        <lastBuildDate>Sat, 30 Oct 2004 00:45:24 GMT</lastBuildDate>
        <docs>http://backend.userland.com/rss</docs>
        <generator>Radio UserLand v8.0.8</generator>
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        <webMaster>phil@windley.com</webMaster>
        <category domain="http://www.weblogs.com/rssUpdates/changes.xml">rssUpdates</category>
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            <hour>0</hour>
            <hour>1</hour>
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        <ttl>60</ttl>
        <item>
            <title>Dvorak is Clueless</title>
            <link>http://www.windley.com/2004/10/29.html#a1499</link>
            <description>&lt;p&gt;
John Dvorak &lt;a href=&quot;http://www.pcmag.com/article2/0,1759,1682993,00.asp&quot;&gt;completely misses the point&lt;/a&gt; on podcasting.
He thinks its about streaming from a Web site.  Someone needs to fill him in.
&lt;/p&gt;</description>
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            </item>
        <item>
            <title>Standards-Based Slide Shows</title>
            <link>http://www.windley.com/2004/10/29.html#a1498</link>
            <description>&lt;p&gt;
If you&amp;apos;ve been looking for a way to create slides in XHTML and CSS, Eric Meyer has just the thing for you.  &lt;a href=&quot;http://
www.meyerweb.com/eric/tools/s5/&quot;&gt;S&lt;sup&gt;5&lt;/sup&gt; is a slide show system&lt;/a&gt; constructed from CSS, XHTML, and Javascript
which runs in most browsers.  Run through the &lt;a href=&quot;http://www.meyerweb.com/eric/tools/s5/s5-intro.html&quot;&gt;introductory slide
show&lt;/a&gt; to get a feel for its features (including slide advance when the space bar is pressed and a disappearing navigation menu).  All
the slide content is in a single file, so once its loaded it&amp;apos;s loaded.  What&amp;apos;s more, since its based on CSS, printable slides are
constructed from the same source file automatically.  I don&amp;apos;t think I&amp;apos;m ready to give up Keynote and Powerpoint just yet, but for
some things, this might come in real handy.
&lt;/p&gt;</description>
            <guid>http://www.windley.com/2004/10/29.html#a1498</guid>
```

# How Do I Find RSS?

**TECHNOMETRIA**
Home
Why Technometria?
RSS
Atom
add to YAHOO!
Recommend This Site

**ABOUT PHIL**
Brief Bio
Contact Info
(hCard)
Speaking
InfoWorld
Photo Albums
CTO Breakfast

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November 07, 2006

## FCW Government CIO Conference

I've been at the Federal Computer Week Government CIO conference today in San Diego. I was asked to speak on Digital Identity and they were even good enough to give away some copies of my book. Here are the slides from my talk. I wish I'd had more time to develop some of the themes. The conference was at the Hotel Del Coronado, a lovely place on the beach. I took a few pictures. Tomorrow I heard to Chicago to talk about Web services and data sharing.

Hotel Del Coronado (click to enlarge)

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## Voting Machine Troubles in Utah County

Voters in Utah County are having trouble voting this morning. The problem seems to be poll workers not knowing how to bring the machines up and make them work.

> *Robert Nelson was among those in Provo and other locations in Utah County who were unable to cast their votes using the new voting machines when the polls*

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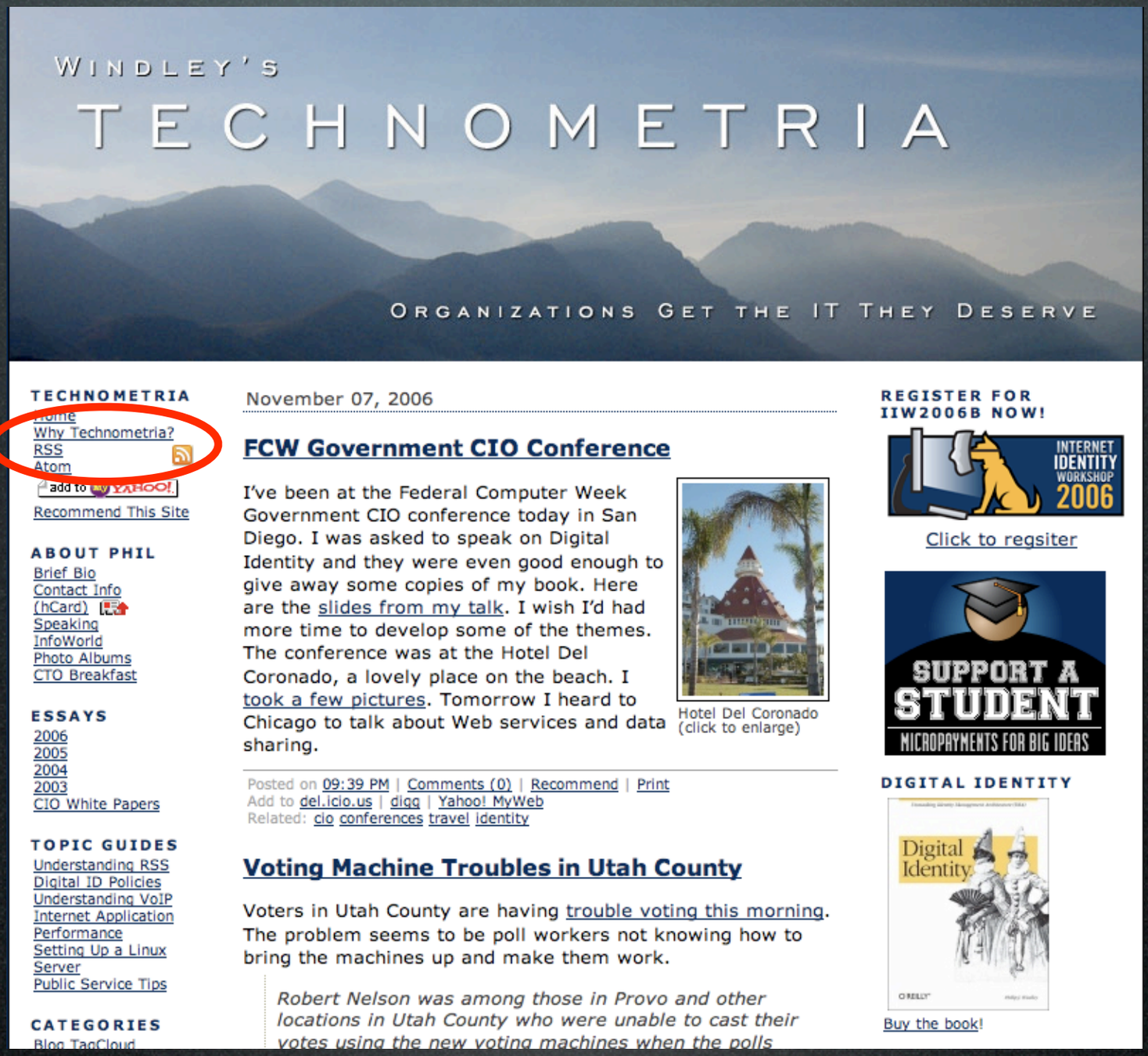



```
<link rel="alternate" type="application/rss+xml" title="RSS" href="http://www.windley.com/rss.xml" />
```

# How Do I Create RSS?

- Edit by hand (not recommended)
- Blog and content management software
- Calendaring tools
- Custom applications
  - RSS libraries for most programming languages

# RSS Uses

- Aggregate feeds onto Web sites
- Portals
- Press releases
- Calendars
- Del.icio.us
- Enclosures and podcasting

# RSS Web Services

- Simple, HTTP-based Web service
- Easy to create, easy to use
  - RSS is an email replacement for many applications
    - No Spam, pull instead of push
  - Works for infrequent updates (and frequent ones)

# RSS and ATOM

Adam Bosworth on RSS:

- General data interface
- Represent sets
- ATOM API provides CRUD functionality

# Cautions

- What about security?
- What about privacy?

# Cautions

- What about security?
- What about privacy?

- Identity!!!
- Start with public data and learn skills

# What Haven't We Talked About?

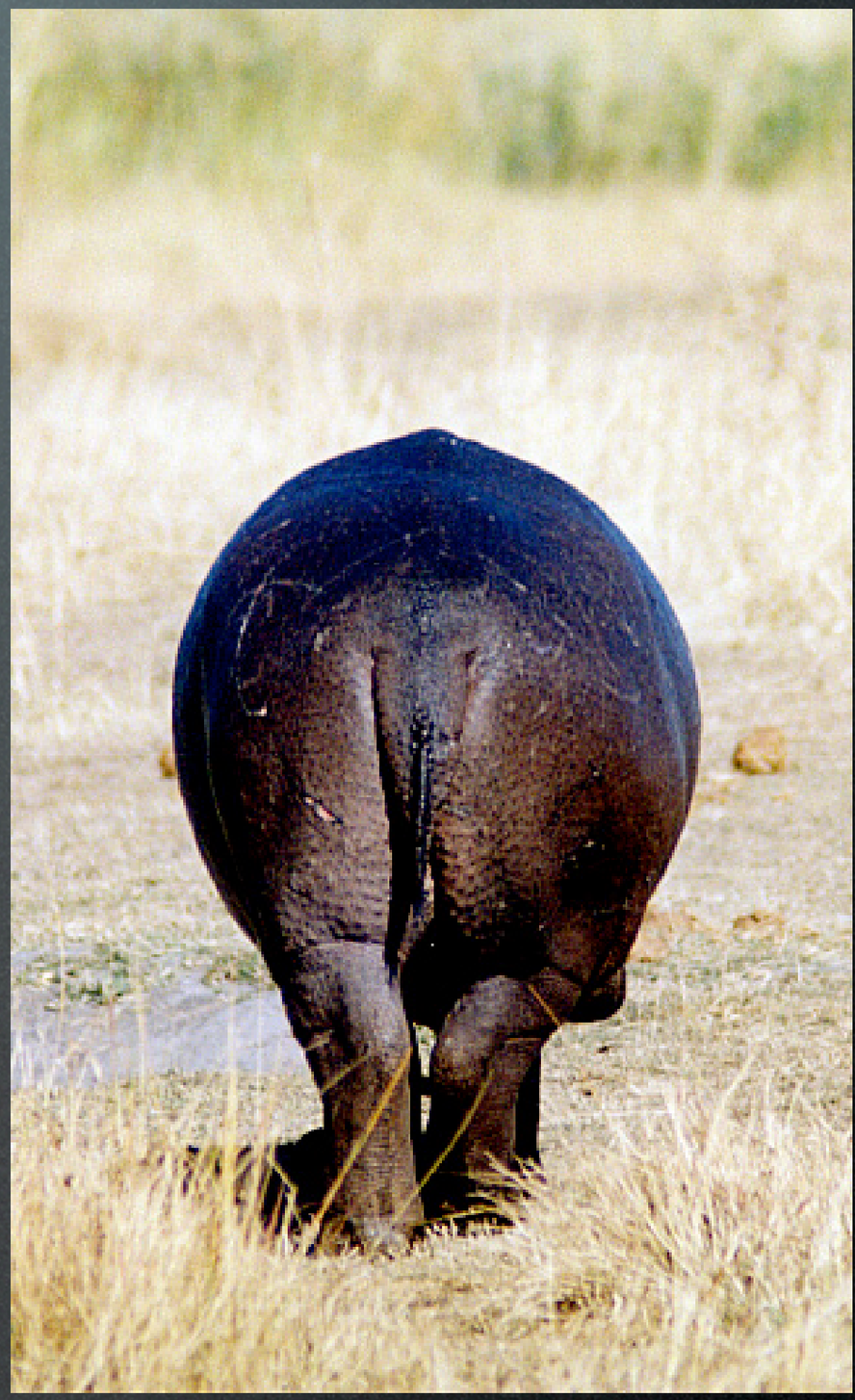
- Digital identity
- SOAP-based SOA
- Governance
- Registries, intermediaries
- Formal organizations

# Summary

- First steps:
  - Don't let the hype scare you
  - Don't try to boil the ocean
  - Adopt simple principals
  - Jump in and do something
  - Start with public data
- The keys are
  - Plain Old XML (POX)
  - Incrementally exposing data and APIs

# The End

## Questions?



Contact me:

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www.windley.com