Welcome.
Case study of commercial PHP MapScript site.
Me: math degree from University of Rochester. Research programmer for Naval Research Lab in imaging radar. Texas A&M 6 years, habitat simulation. US EPA contractor 4 years, global climate change. Independent 7 years--Palm handhelds, moving to Mac, publish website for today’s talk.
Session outline

• Overview of problem and solution
• System anatomy
• Performance, business analysis, repercussions, and advice
Weather important to mariners.  
I have spent reasonable amount of time at sea: US Navy, tall ships, rec boating.
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- In this country: NOAA National Data Buoy Center.
Small percentage of ocean traffic. Wide variety of ship types. Limited to major shipping routes. Not coastal. Volunteer effort.
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NOAA NDBC web site as of 2003.
Sailwx.info maps corresponding to previous fax: Ships, air temp, water temp, wind speed, barometer, ships.
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Starting points (2003)

• no MapServer experience
• Very little PHP and MySQL
• Contextual advertising new: Google AdSense June 2003, Yahoo Publishers Network August 2005
• MapServer 4.0: August 1, 2003
Tools

- Maps in forms-based PHP/Mapscript
- Page navigation in Freeway
- Data handling in PHP, some PERL
- Weather data fed by LDM
- Written for MySQL 4.0 ⇒ no geometry/spatial extensions


About 10,000 lines of PHP.
Random numbers

• Two AMD Opteron 270 (dual core, 2.0 GHz) processors, 2 GB RAM (Rackspace managed hosting)
• Red Hat Enterprise Linux 4
• 14,000,000 ship reports, 15,000 ships
• 80,000+ unique visitors/month
• <1,000,000 page views/month

Visitor numbers from Quantcast.com and Google Analytics.
Softpress Freeway example.
<?php
if ($g_call) {
    EmitNameHTML($g_call);
    if ($currentRecord) {
        $spagetitle = ShipPageTitleString($g_call);
        $name = getline($g_call);
        $returnURL = sprintf("%s?call=%s", $SERVER[PHP_SELF], $g_call);
        MSTRackQueryPlotForm($result, $returnURL, $width, $height,
                            $g_latCenter, $g_lonCenter, $g_radius, $g_centerSpecified, $g_duration);
    } else {
        $spagetitle = "Ship report unavailable";
        echo "<p>no position reports received for callsign ", $g_call, "</p>";
    }
    MaybeEMITULSLink($g_call);
}
?>
Modular construction of PHP segments: 2 versions of PHTML file.
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Extra stuff

- HTML snippets for ad modules
- Web bugs
- Javascript for user analysis

  Google Analytics
  Quantcast

Page architecture needs room for adding hidden elements.
Vehicle tracking is different because data is very dynamic relative to number of requests. Simple original idea, but things change.

<advance>
Complicated reality. Will be adding as you go, new technology.
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Vehicle tracking is different because data is very dynamic relative to number of requests. Simple original idea, but things change. <advance>Complicated reality. Will be adding as you go, new technology.
“Jeez, this Google Earth just gets better and better, doesn’t it?”
Software app, not website

- Modularity: data update, query processing, query rendering, auxiliary product production
- Version control (Subversion/SVN)
- Controlled testing and benchmarking
- “Once and only once”

Modularity: each piece is separate. Some are even different user accounts.

Controlled testing: scripts to generate standard maps. Test database results. Unit testing might be overkill.
Subversion is not just for teams

- [http://subversion.tigris.org/](http://subversion.tigris.org/)
- Capture, label, manage, retrieve snapshots of all files of project
- Doesn’t interfere with workflow
- What changed between working and broken versions?
- Return to working version
- Patch existing version while developing great new version
- .MAP files, PHP, graphics

Subversion is software, not sociological process.
Version control: SCCS, CVS, SVN, others.
Any moderately complicated set of interdependent files.
function GenerateCruiseShipsQuery($maxhours) {
    return "SELECT * from cruiseships left join reportsCache using (callsign) 
            order by reportsCache.TIMESTAMP DESC, reportsCache.callsign";
}

function GenerateAlaskaFerriesQuery($maxhours) {
    return "SELECT * from reportsCache 
            where reportsCache.callsign in ( 
                'WCY2920','WDB5604','WDB6180','WI6803','WI941','WNGW','WYM9567','WYR2092','WZE4270' 
            )".
            " order by reportsCache.callsign";
}

function AllShipsQuery($maxhours) {
    $agewherestring = LatestAgeHoursWHEREstring($maxhours);
    return "SELECT * from reportsCache 
            where 1 ".$agewherestring.
            " group by reportsCache.callsign 
            order by reportsCache.callsign";
}

"once and only once"--Kent Beck, programming languages evangelist.

Split SQL queries into their own functions.
Cleaner code, better query optimization.
Performance for dynamic data

- Usual MapServer techniques: indexing, vary layers by scale, tiling
- Optimize the SQL – MapServer is way faster than MySQL
- MySQL issues: indexes, use of indexes in queries, tuning (memory allocation, query cache)
- ShapeFiles
- Geoserver?

Vehicle or other asset tracking, weather, hydrography, other environmental data. Voting results, epidemiology.

SQL (any version) is not “fire and forget”--must measure performance and tune the installation.
“You’re nobody ‘til somebody loves you”
“You’re nobody ‘til Google finds you”
Helping the search engines:

• Good <title> is imperative
• Descriptive text on pages
• Intelligent use of crosslinks
• Use POST variables, not GET
• Emit an automatic Google sitemap

No luck with geographic tagging.
http://www.sailwx.info/wxobs/watertemp.phtml?
lat=38.737201252798
&lon=-68.383506928114
&radius=500

http://www.sailwx.info/shiptrack/shipposition.phtml?
call=NRCB
&radius=312
&duration=72

RESTful a new term for me
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Advertising

- Google Adsense trumps Yahoo
- Tinker with color schemes
- Intermittent ad modules
- Throw in some Yahoo
- Read The Adsense Manual
- Use the optimization service

Big fan of Google Adsense program. Yahoo for visual variety. Use Google’s tools, documentation. RTAM.
JenSense blog: Jennifer Sleg
Users

• Weather visualization, sometimes
• Family members: professionals, students
• Cruise ship fans and travelers
• Research: Hawaii Reef, cruise ships impact, visibility
• NOAA PMO’s!
• Emigrants, car buyers, shippers

Spikes on hurricanes. Worse day this year was NFL opening Sunday.
**Tall Ship Europa (callsign PDZS)**

60 meter steel-hulled bark; cruises worldwide. Rounded Cape Horn 2002. Accepts paying voyage crew (trainees) for short or long trip segments, including an annual voyage to Antarctica and nearby islands. For bookings see [http://www.barkeuropa.com/](http://www.barkeuropa.com/) or phone +31 (0)10 281 0990, fax +31 (0)10 281 0991.

Slide 2
Huge winds, 45 knots, engine failure.
Drift north 2 knots.

Slide 3
Traffic spike, search ship in Google, discovered news of failure.

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Concerns about data

- Voluntary program: ships can withdraw
- NOAA website ships now anonymous
- Europe: shadow callsigns
- Sailwx.info: data embargo boxes

Piracy a big concern.
Ships signed up for weather improvement, not for web tracking.
Oceanweather, coolweather, GUI weather.
Storm Special! View the latest observations near Atlantic Tropical Storm Karen and Atlantic Tropical Depression Thirteen.

New! - RSS Feeds added to NDBC web site. Learn more at NDBC RSS Feeds.

Ship Observations Report

Unit of Measure: English

Not all ships are U.S. Voluntary Observing Ship participants.

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<td>+0.01</td>
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<td>5.0</td>
<td>80</td>
<td></td>
</tr>
</tbody>
</table>
Expansion

- Spatial database extensions
- WMS: probably not
- KML: limited ships, limited information
- GeoRSS: maybe
- Geoserver again

Monday, October 1, 2007

KML timelines are cool. Data has large gaps, animation might not work.
Parting shots

• Database performance dominates, so get that part right, and fast
• Software engineering practices apply
• Plan to succeed and grow

Guy Kawasaki: “let 1000 flowers bloom”
Q & A

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http://www.sailwx.info/ – today’s talk

http://www.mobilegeographics.com/ – Palm and Mac products