

# PUTTING SOAP TO REST

What Google, Amazon, Yahoo!, Oracle and other tech giants know that You don't: web services are better delivered via REST than SOAP. Here's why.

Law enforcement demands access to accurate information in a timely fashion. Whether the data is needed for officer safety during an approach to a stopped vehicle or whether the information is needed by dispatch prior to sending colleagues into harm's way, IT must serve queries from an increasing number of personnel and from an increasingly diverse set of devices.

Standardizing the method of data access in this environment is of paramount importance, and this is where web services truly shines. REST (*Representational State Transfer*) and SOAP (*Simple Object Access Protocol*) are the two most common technologies for exchanging data over web services. In enterprise and public sector organizations, SOAP remains dominant for now, if only to support legacy systems, while in the commercial world, REST has surged ahead dramatically.

The technology analysts at Forrester Research put it bluntly: "If you want your applications to be part of this move forward...SOAP is inadequate for modern applications. You'll have to evolve your integration architecture to REST in 2016."

Major private technology firms are already doing so. Salesforce, after using a SOAP API exclusively for a decade, moved to REST APIs years ago.<sup>i</sup> Google has similarly deprecated SOAP and moved to REST. Now Yahoo and Amazon also use REST architecture.

In fact, REST currently represents about 69% of public APIs, versus 22% for SOAP (see Figure 1). Its market penetration has exploded by nearly 5,000%, from 105 APIs to well over 5000 in five years; and interest in REST continues to spike while SOAP is stagnating, as indicated by *Google Trends* (see Figure 2, next page).<sup>ii</sup>

This paper will explain why REST is the dominant industry choice. It's important for organizations to understand not only why so many companies are waking up to REST, but also why that's exactly the way it should be – and why your organization should most likely do the same.

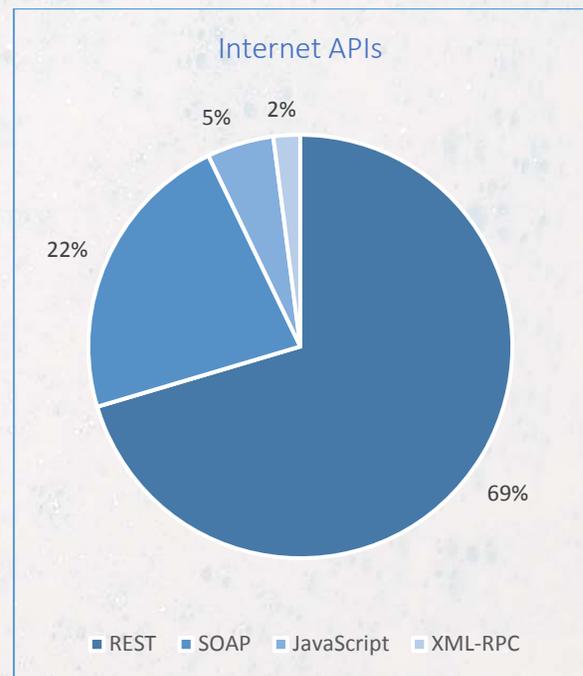


Figure 1. Source: ProgrammableWeb

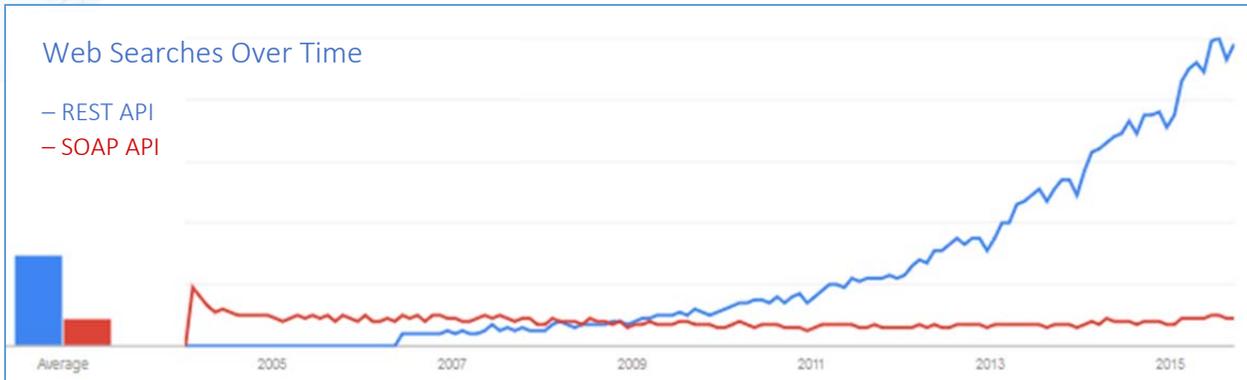


Figure 2. Source: Google Trends

## The Way of the Internet is RESTful

It's not the purpose of this paper to delve into the technical intricacies of SOAP or REST. Suffice it to say that SOAP is a standardized protocol that wraps messages exchanged between machines in an "envelope" that includes an XML header and body and uses a WSDL (Web Services Description Language) file to define elements and attributes.

All of that means that SOAP is a resource hog: XML is verbose, making each message heavy enough to consume more bandwidth and slow down processing. This inefficiency is even more pronounced as the demand for data scales, which is exactly the trend we see in Law Enforcement today. In other words, it takes longer for SOAP to work, and it consumes more bandwidth in the process, while serving the same number of users.

REST works like the Internet itself. Further, it re-uses standard architecture by communicating with URL

resources, doing HTTP transactions. By following the model of the Internet, REST works universally and independently of any vendor or technology.

Like the Internet, REST uses CRUD-type operations: create, read, update, and delete. It puts forth a request, such as POST (create), GET (read) or DELETE, to which the server then responds in the appropriate way with the requested resource. These basic REST operations are also directly analogous to our own LE operations of Enter (POST), Query (GET), Modify (PUT), and Clear/Cancel (DELETE). See Figure 3 below for an illustration.

And that's how the Web itself works: when a user enters a URL into their web browser, they're essentially submitting a GET request for the named resource. The server responds by sending the named resource back to the user via HTTP.

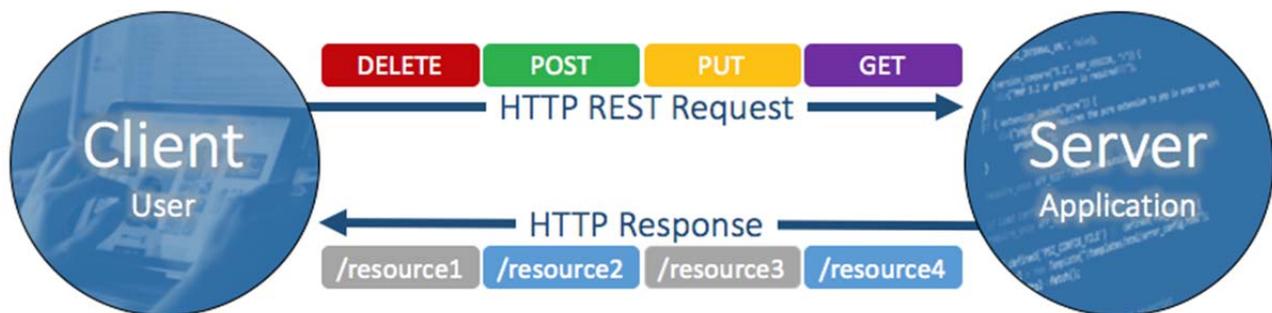


Figure 3. REST works like the rest of the Web.

**“For modern applications...you’ll have to evolve your integration architecture to REST in 2015.”**

Source: Forrester Research

## REST’s result is speed and efficiency.

The result of re-using Internet architecture is familiarity and ease for both users and developers. Yet REST sacrifices little-to-no potency for its simplicity: it’s the same basic interactive logic that powers the entire Internet, after all.

### Ease

Case in point: we developed an online Amber Alert interface to post salient information online every time an alert goes out. If we had used SOAP, we would have had to integrate it with other third-party vendor APIs, which in turn would have necessitated a Microsoft or Oracle development tool kit, and *that* in turn would have forced us to address incompatibilities between different vendors.

Development complications add both cost and time. REST’s interoperability made the project faster, easier and cheaper, both to develop and to support in post-production.

With SOAP creating more compatibility issues, especially in terms of upgrading levels of third-party SOAP software tools, REST means far simpler maintenance, patching and updating.

### Performance

REST also boosts speed in use. When Oracle tested the performance of several applications, they found REST worked between 9 and 30 times faster than SOAP. <sup>iii</sup> REST used with JSON, in fact, worked in a fraction of the time as REST and XML. (We explore JSON more in-depth in our companion white paper).

That’s evidence of XML’s unnecessary weight and exemplifies where REST really shines: It supports other modern, highly efficient data exchange formats. SOAP restricts data exchange to a single, often unwieldy, format even in situations for which it is ill-suited. SOAP will only continue to fall behind as technology evolves.

Researchers for Fujitsu write that SOAP’s complex interactions “consume resources and take longer to process – often unnecessarily, given that relatively few applications actually require that kind of web service. REST...reduces the server’s obligation.”<sup>iv</sup>

As a result, developers who leverage REST can use whatever data format is best suited to the needs of their application, optimizing their products and services for their intended usage: JSON, Atom, RSS, XML and other data formats are supported and can be specified depending on the situation for whichever particular data exchange format best suits the scenario.

Ultimately, that’s the bottom-line behind REST’s strengths: it’s the forward-looking solution.

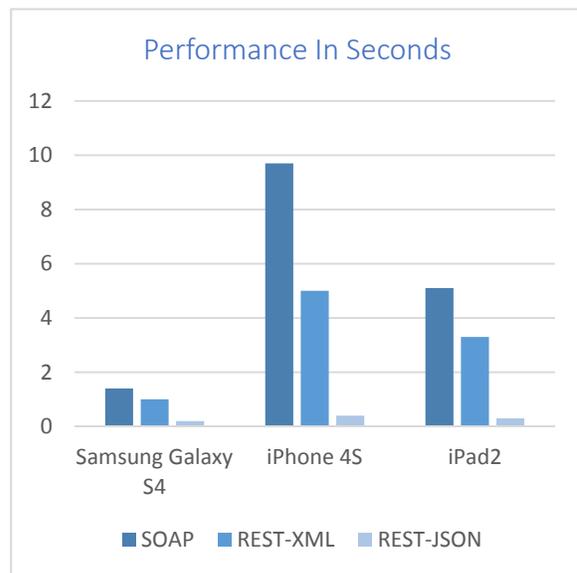


Figure 4. Source: Oracle

## What can you do if you're still using SOAP?

In the B2C world of private companies, REST has already won: 69% versus 22%? It's not even a debate.

But many organizations must still consider which web service to use, and it's important to understand why SOAP persists. It's not because it's the new technology still replacing older technologies. That may have been true 10 years ago, but today private industry is moving toward simpler, quicker, cheaper, better standards.

Rather, the kinds of organizations that favor SOAP tend to be slower to change and more heavily driven by integrating with other government agencies that are behind in technology, or by grant programs tied to a particular technology stack, and they often have legacy systems that require the use of SOAP.

Inertia alone can keep these organizations mired in an old way of doing things, though to be fair, sometimes they may literally have no choice.

Indeed, it doesn't necessarily make sense to re-do existing SOAP services, particularly if your organization lacks control over backend development and/or has other legacy systems still relying on those services.

**"The only real solution is to embrace industry best practices and move to REST-JSON services."**

Source: Oracle

But organizations relying on SOAP do need to realize that they are sacrificing more than efficiency and speed by staying with it; they're also risking a higher cost of maintenance and support as private industry moves towards new technology.

The private sector is moving with greater speed to REST, and it's time for all organizations to look to REST for future needs, just as Salesforce, Google, Amazon and others are doing.

Or as Oracle, in evaluating its performance findings, concludes: "The only real solution is to embrace industry best practices and move to REST-JSON services."

We agree.



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<sup>i</sup> **Williams**, A. (2010, Oct 7). Salesforce.com to adopt REST APIs – what is the significance? *ReadWrite*. Retrieved August 2015 from <http://readwrite.com/2010/10/07/salesforcecom-gets-a-new-api>.

<sup>ii</sup> **Mason**, R. (2011, Oct 20). How REST replaced SOAP on the Web: What it means to you. *InfoQ*. Retrieved August 2015 from <http://www.infoq.com/articles/rest-soap>.

<sup>iii</sup> **Davelaar**, S. (2015, Feb 27). Performance study – REST vs. SOAP for mobile applications. *Oracle*. Retrieved August 2015 from <http://www.ateam-oracle.com/performance-study-rest-vs-soap-for-mobile-applications/>.

<sup>iv</sup> **zur Muehlen**, M., **Nickerson**, J.V., & **Swenson**, K.D. (2004). Developing web services choreography standards – the case of REST vs. SOAP. *Decision Support Systems*, 37. Retrieved August 2015 from <http://www.stevens-tech.edu/jnickerson/MIZU.JENI.KESW-DSS.pdf>.