Dare Obasanjo's weblog

"You can buy cars but you can't buy respect in the hood" - Curtis Jackson

Scalability: I Don't Think That Word Means What You Think It Does

July 14, 2008
@ 12:40 PM

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Via **Mark Pilgrim** I stumbled on an article by Scott Loganbill entitled **Google's Open Source Protocol Buffers Offer Scalability, Speed** which contains the following excerpt

> The best way to explore Protocol Buffers is to compare it to its alternative. What do Protocol Buffers have that XML doesn't? As the **Google Protocol Buffer blog post mentions**, *XML isn't scalable*:
>
> *"As nice as XML is, it isn't going to be efficient enough for [Google's] scale. When all of your machines and network links are running at capacity, XML is an extremely expensive proposition. Not to mention, writing code to work with the DOM tree can sometimes become unwieldy."*
>
> *We've never had to deal with XML in a scale where programming for it would become unwieldy, but we'll take Google's word for it.*
>
> *Perhaps the biggest value-add of Protocol Buffers to the development community is as a method of dealing with scalability before it is necessary. The biggest developing drain of any start-up is success. How do you prepare for the onslaught of visitors companies such as Google or **Twitter have experienced**? Scaling for numbers takes critical development time, usually at a juncture where you should be introducing much-needed features to stay ahead of competition rather than paralyzing feature development to keep your servers running.*
>
> *Over time, Google has tackled the problem of communication between platforms with Protocol Buffers and data storage with **Big Table**. Protocol Buffers is the first open release of the technology making Google tick, although you*

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can utilize Big Table with **App Engine***.*

It is unfortunate that it is now commonplace for people to throw around terms like "scaling" and "scalability" in technical discussions without actually explaining what they mean. Having a Web application that scales means that your application can handle becoming popular or being more popular than it is today in a **cost effective manner**. Depending on your class of Web application, there are different technologies that have been proven to help Web sites handle significantly higher traffic than they normally would. However there is no silver bullet.

The fact that Google uses **MapReduce** and **BigTable** to solve problems in a particular problem space does not mean those technologies work well in others. MapReduce isn't terribly useful if you are building an instant messaging service. Similarly, if you are building an email service you want an infrastructure based on message queuing not BigTable. A binary wire format like Protocol Buffers is a smart idea if your applications bottleneck is network bandwidth or CPU used when serializing/deserializing XML. As part of building their search engine Google has to cache a significant chunk of the World Wide Web and then perform data intensive operations on that data. In Google's scenarios, the network bandwidth utilized when transferring the massive amounts of data they process can actually be the bottleneck. Hence inventing a technology like Protocol Buffers became a necessity. However, that isn't Twitter's problem so a technology like Protocol Buffers isn't going to "help them scale". Twitter's problems have been **clearly spelled out by the development team** and nowhere is network bandwidth called out as a culprit.

Almost every technology that has been loudly proclaimed as unscalable by some pundit on the Web is being used by a massively popular service in some context. Relational databases don't scale? Well, **eBay seems to be doing OK**. PHP doesn't scale? I believe it **scales well enough for Facebook**. Microsoft technologies aren't scalable? **MySpace begs to differ**. And so on…

If someone tells you "technology X doesn't scale" without qualifying that statement, it often means the person either doesn't know what he is talking about or is trying to sell you something. Technologies don't scale, services do. Thinking you can just sprinkle a technology on your service and make it scale is the kind of thinking that led Blaine Cook (former architect at Twitter) to publish **a presentation on Scaling Twitter** which claimed their scaling problems where solved with their adoption of memcached. That was in 2007. In 2008, let's just say the **Fail Whale** begs to differ.

If a service doesn't scale it is more likely due to bad design than to technology choice. Remember that.

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