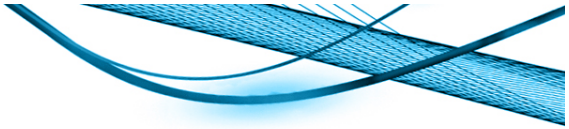
ThoughtWorks®



Lessons Learned in Large HTTP-Centric Systems

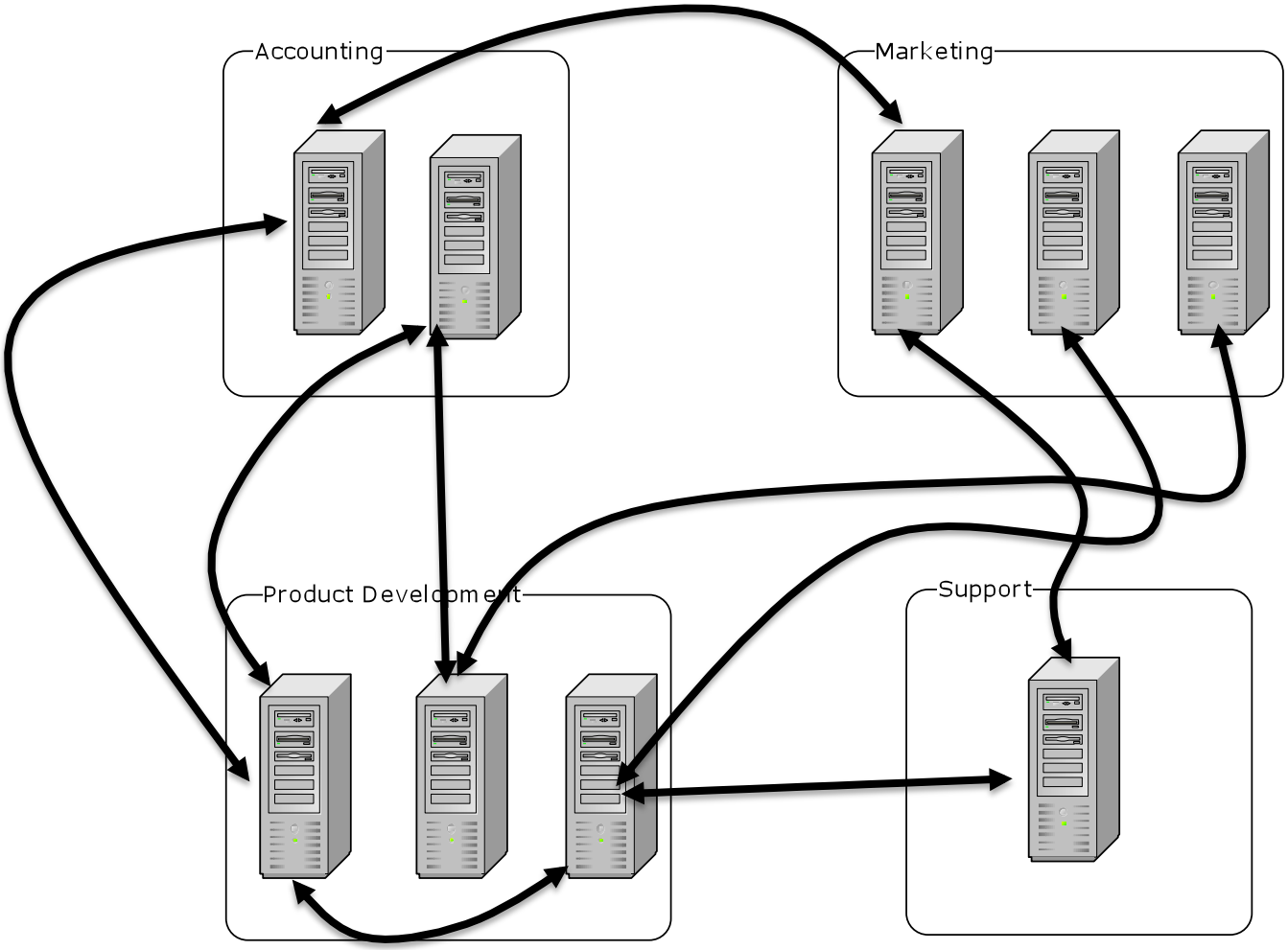
Jim Webber

http://jimwebber.org

@jimwebber

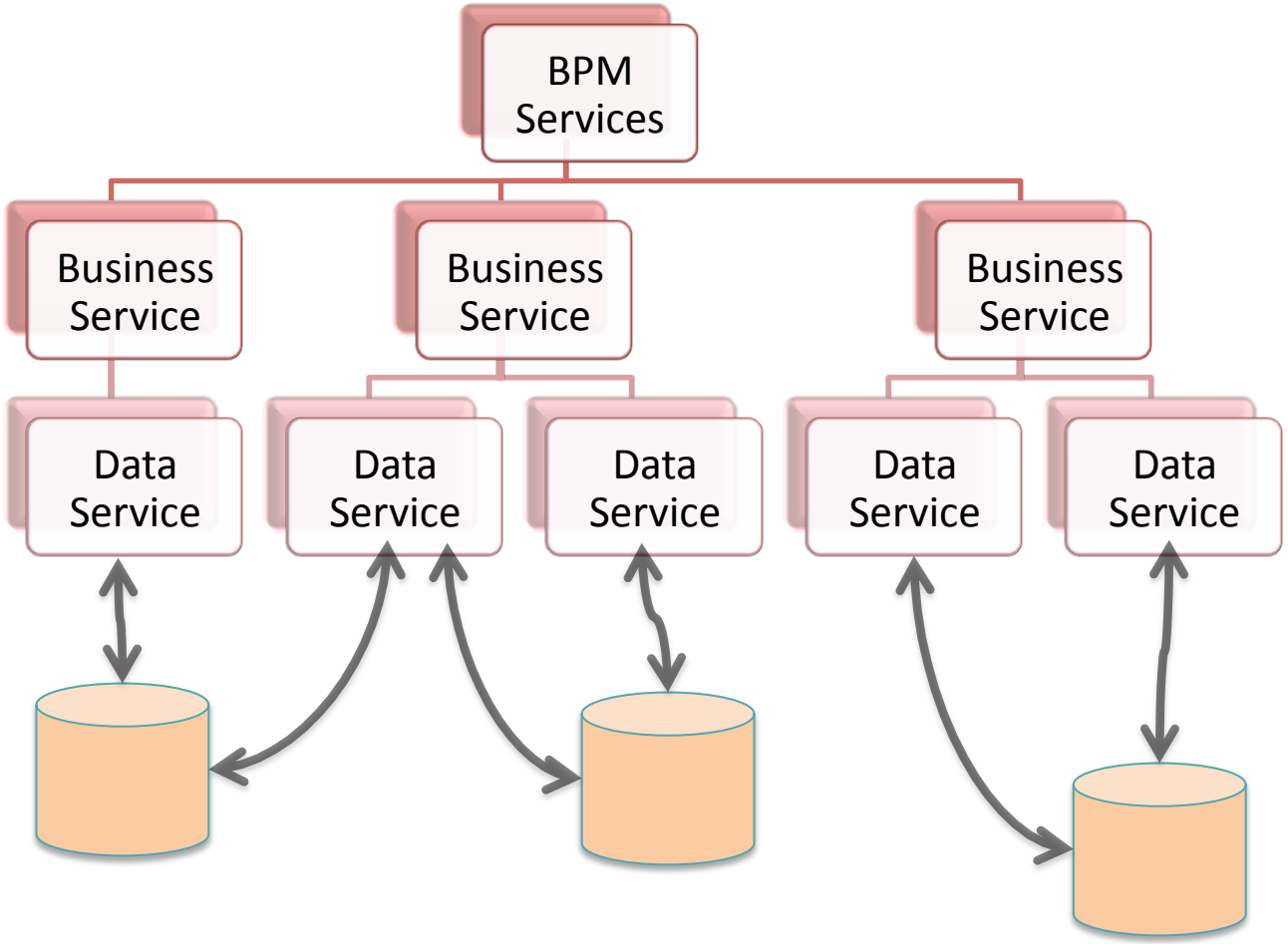
I WANT TO
BELIEVE

Today's Enterprise Architecture

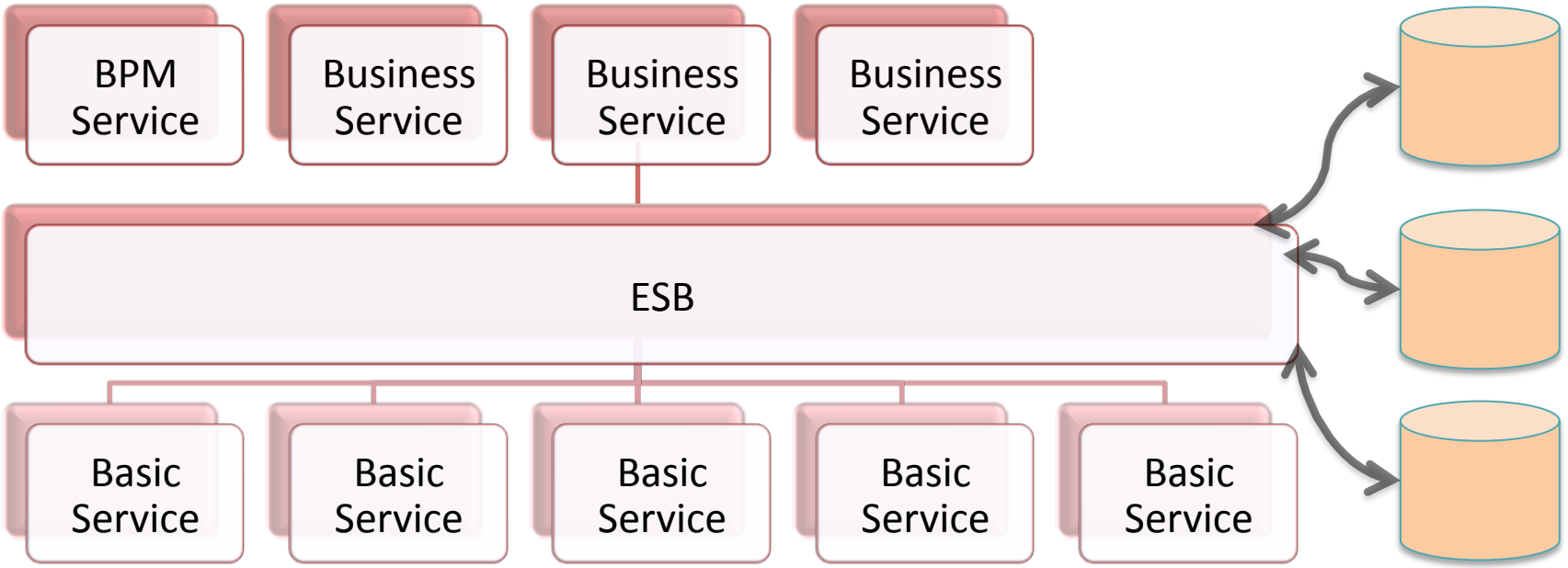


SURF LIFE SAVING
QUEENSLAND
SURF LIFE SAVING QUEENSLAND
9 NATIONAL NINE NEWS
SOA to the rescue!

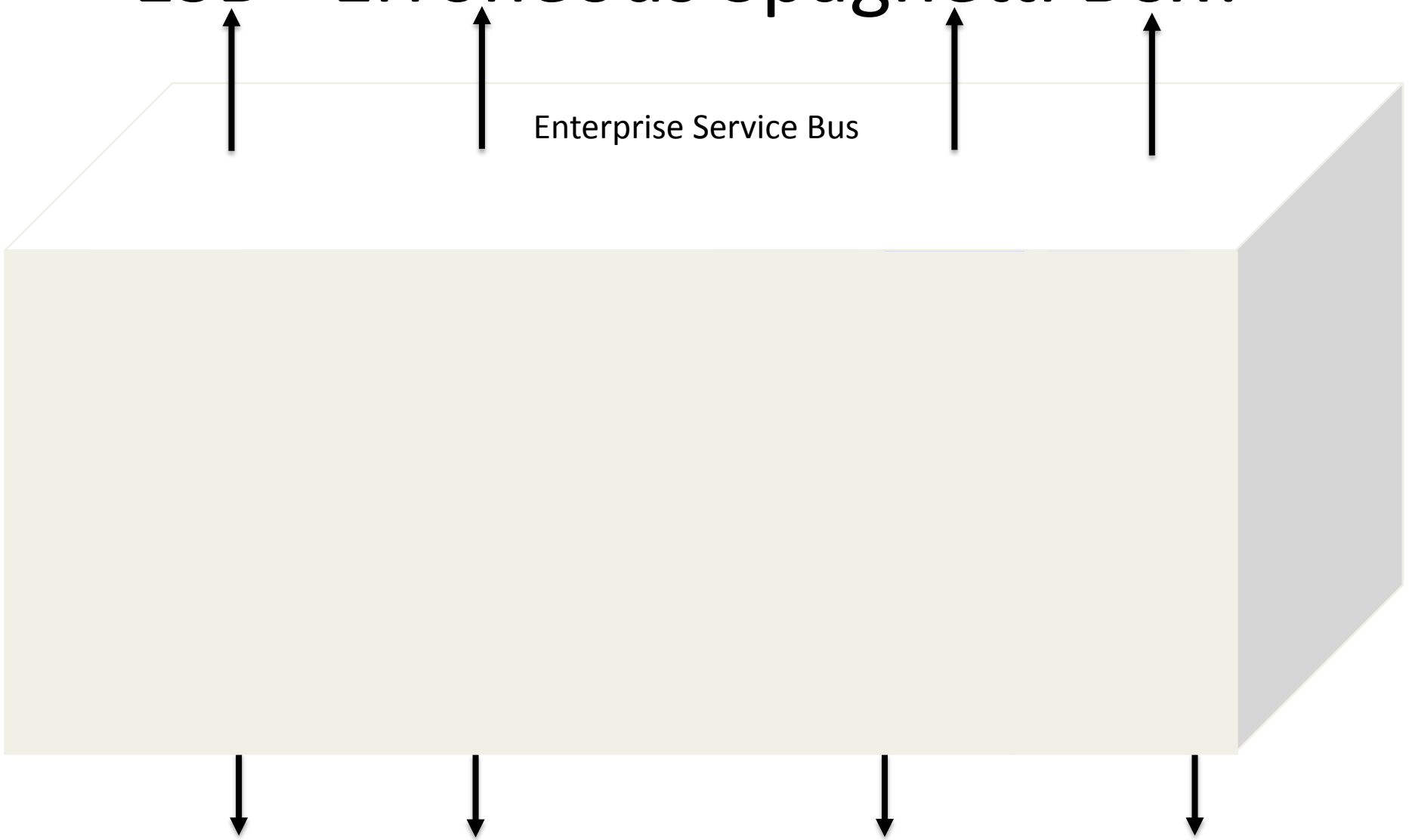
Tomorrow's Enterprise Architecture



Nirvana Enterprise Architecture, or…



ESB - Erroneous Spaghetti Box?



Architectural Fantasy
THE LORD OF THE RINGS
THE RETURN OF THE KING
WWW.LORDOFTHERINGS.NET

Ungovernable

Doesn't Scale

But we still do it.

Why?

Because it’s “less risky”

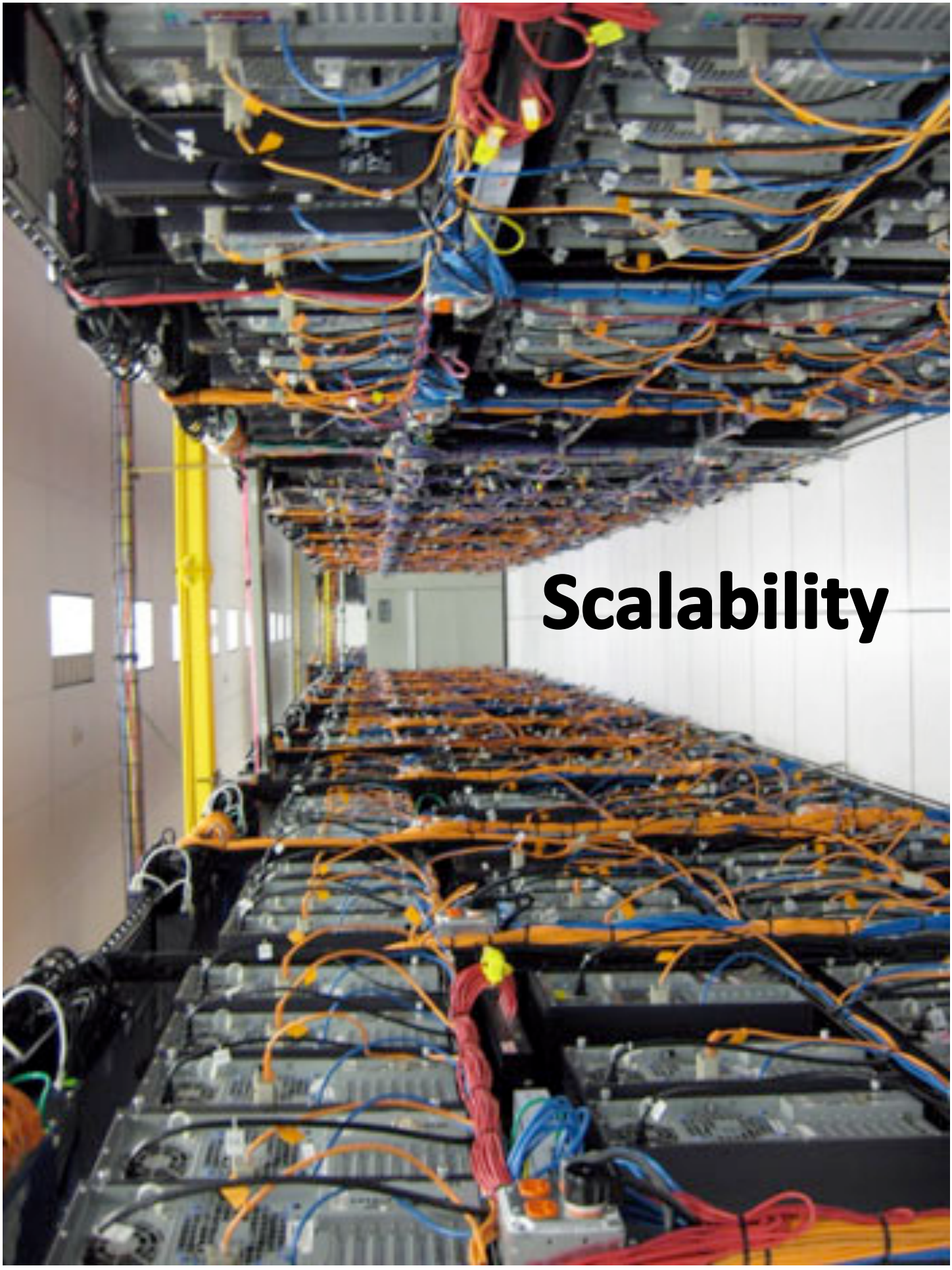
Why?

Because that’s what the market does

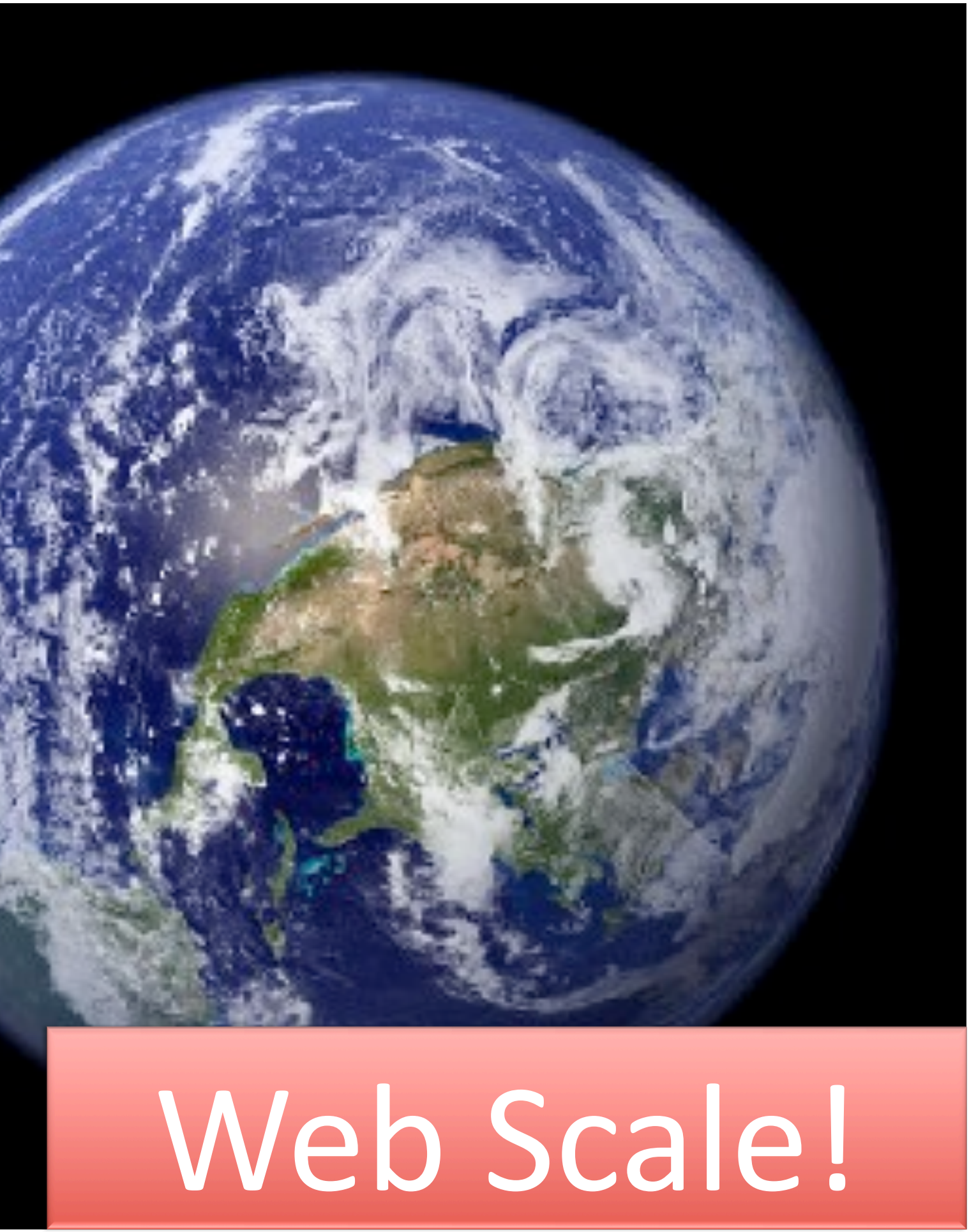
Why?

Because we need the -ilities

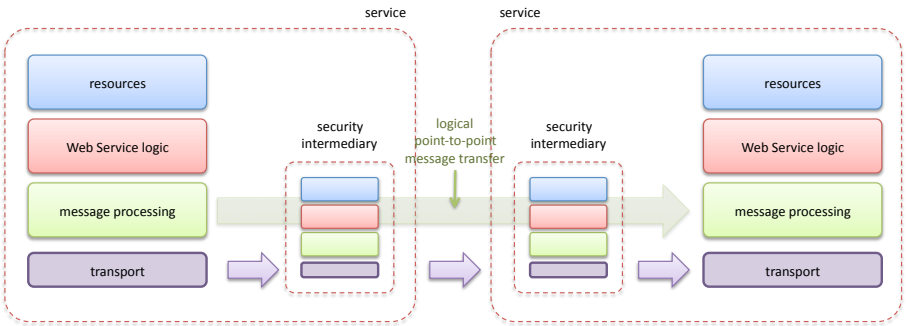
So let’s talk about those -ilities


Scalability

Enterprise Scalability?

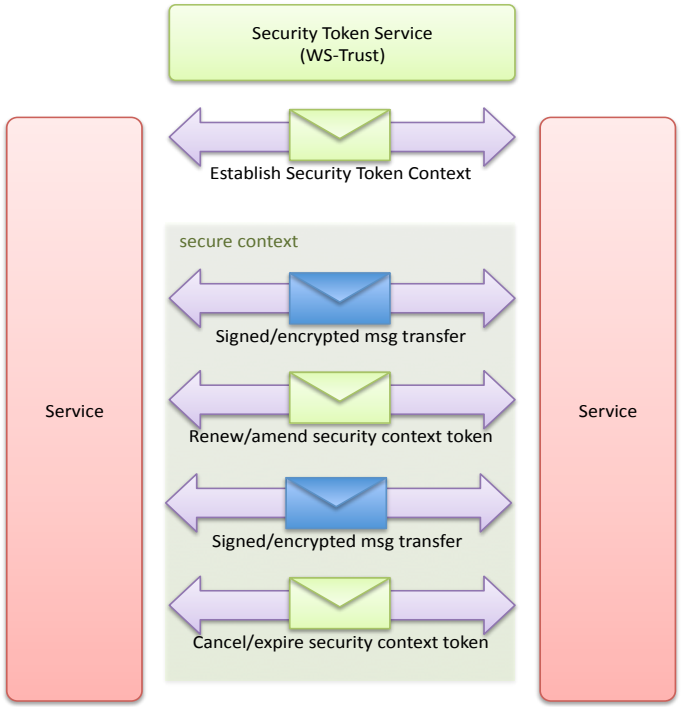

Web Scale!

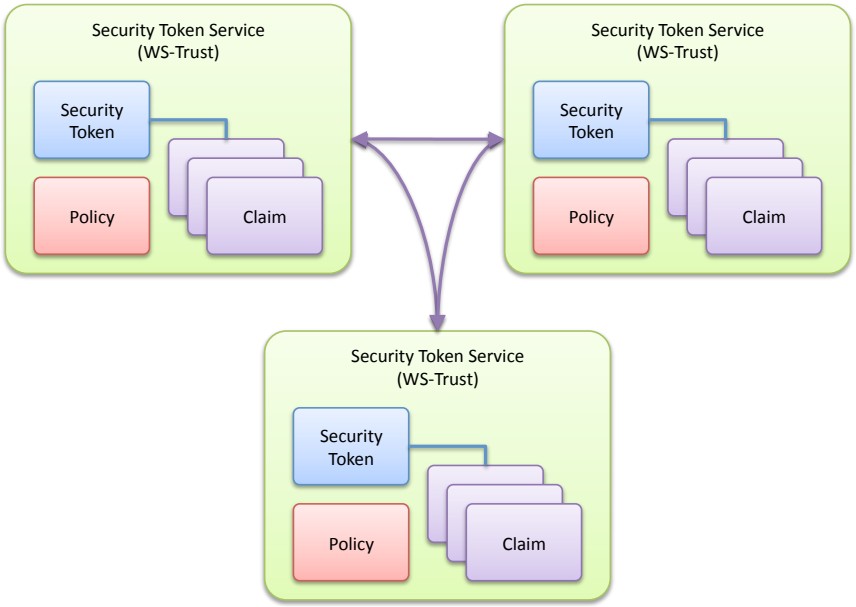
at&t
www.AppleInsider.com
Traditional Enterprise Security



End to End Secure Messaging

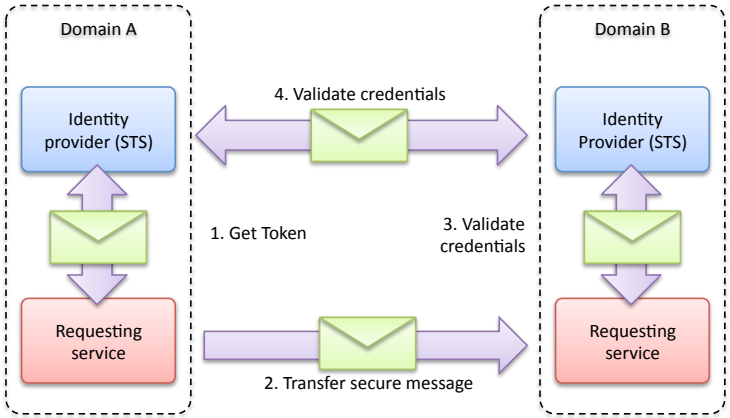
End to End Secure Conversations





Security Tokens and claims

Federating access with tokens

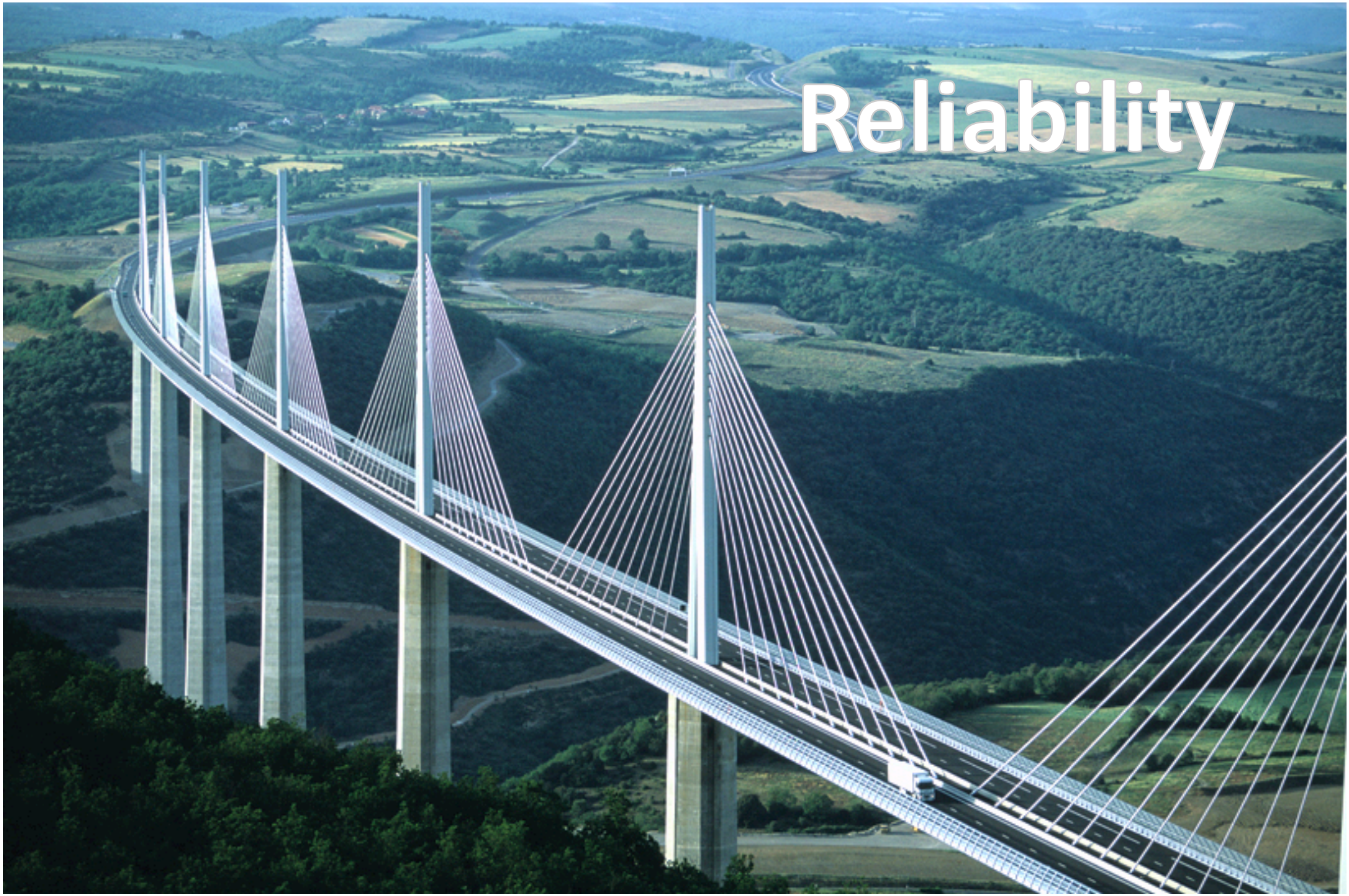


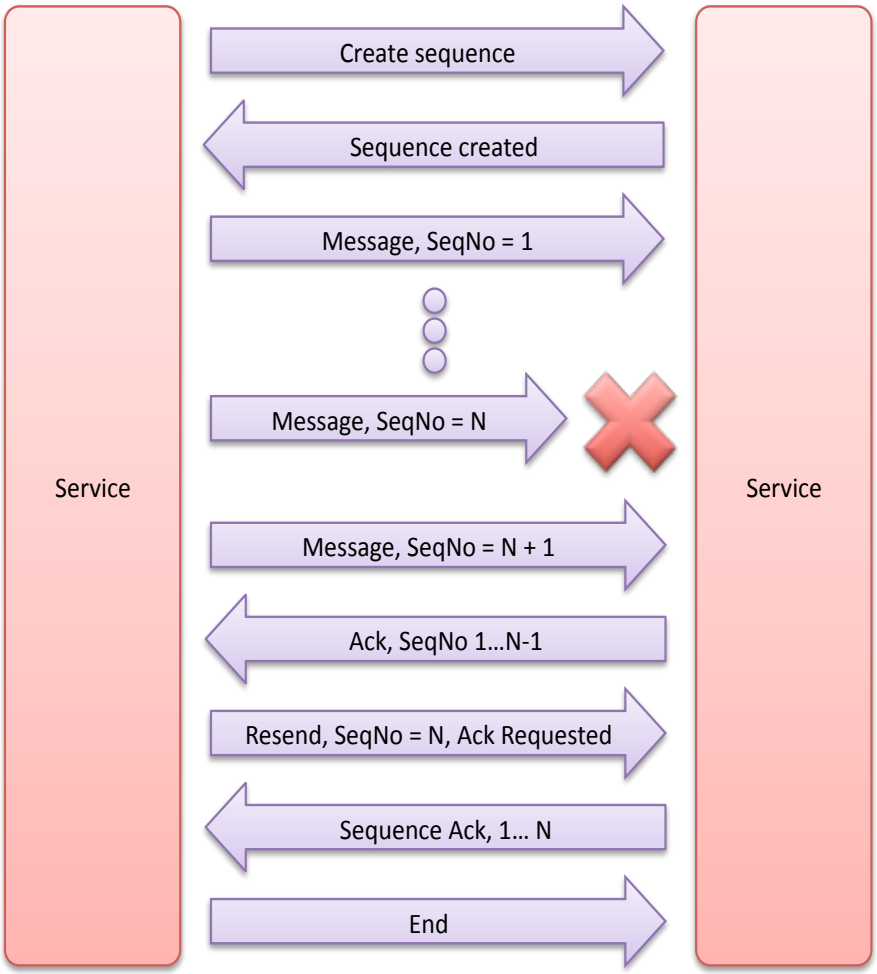
Enterprise security is awesome, but…

…you wouldn't use it at home!

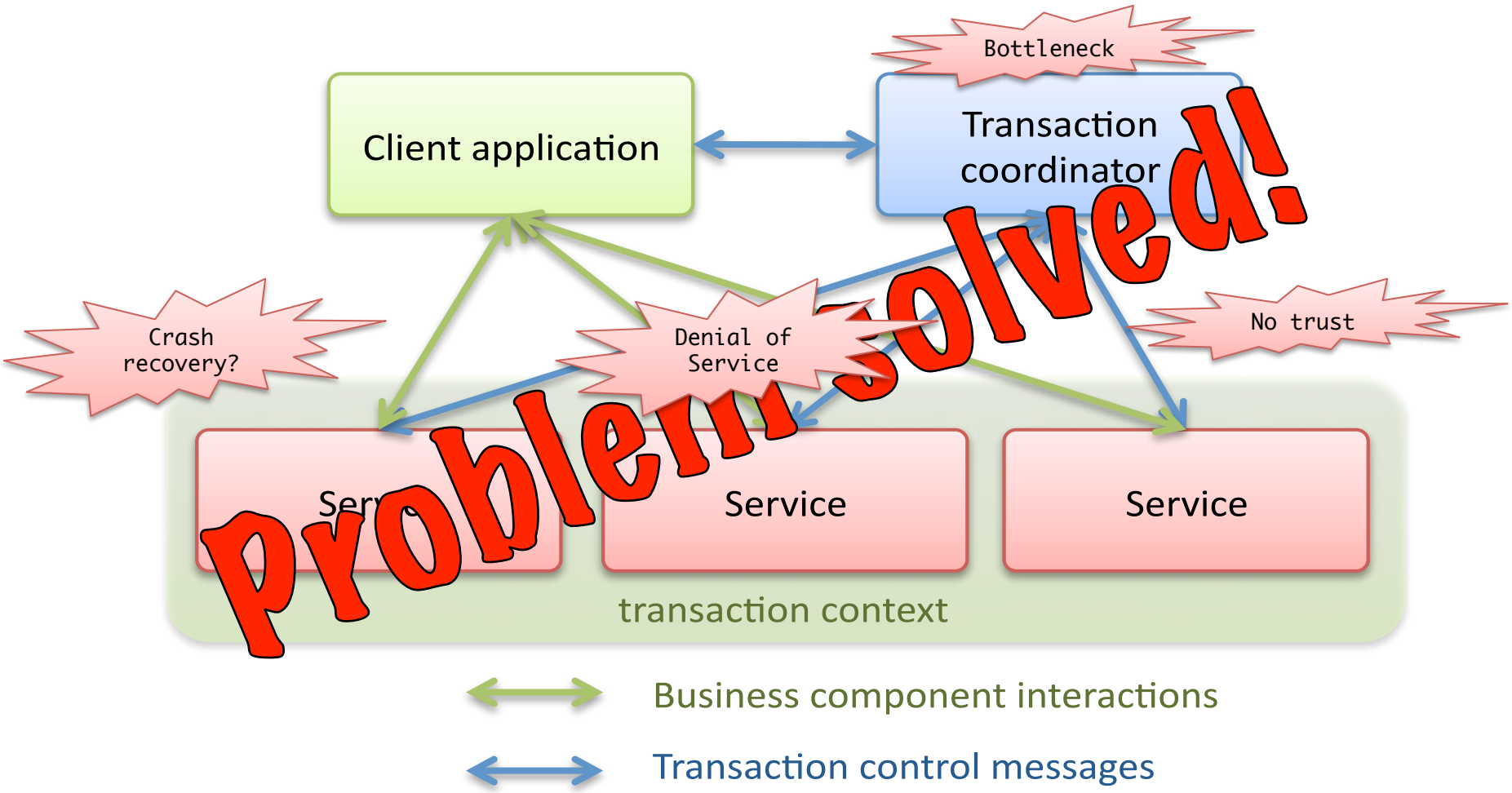
OpenID

OAUTH


Reliability


Service
Create sequence
Sequence created
Message, SeqNo = 1
Message, SeqNo = N
Message, SeqNo = N + 1
Ack, SeqNo 1…N-1
Resend, SeqNo = N, Ack Requested
Sequence Ack, 1… N
End
Service

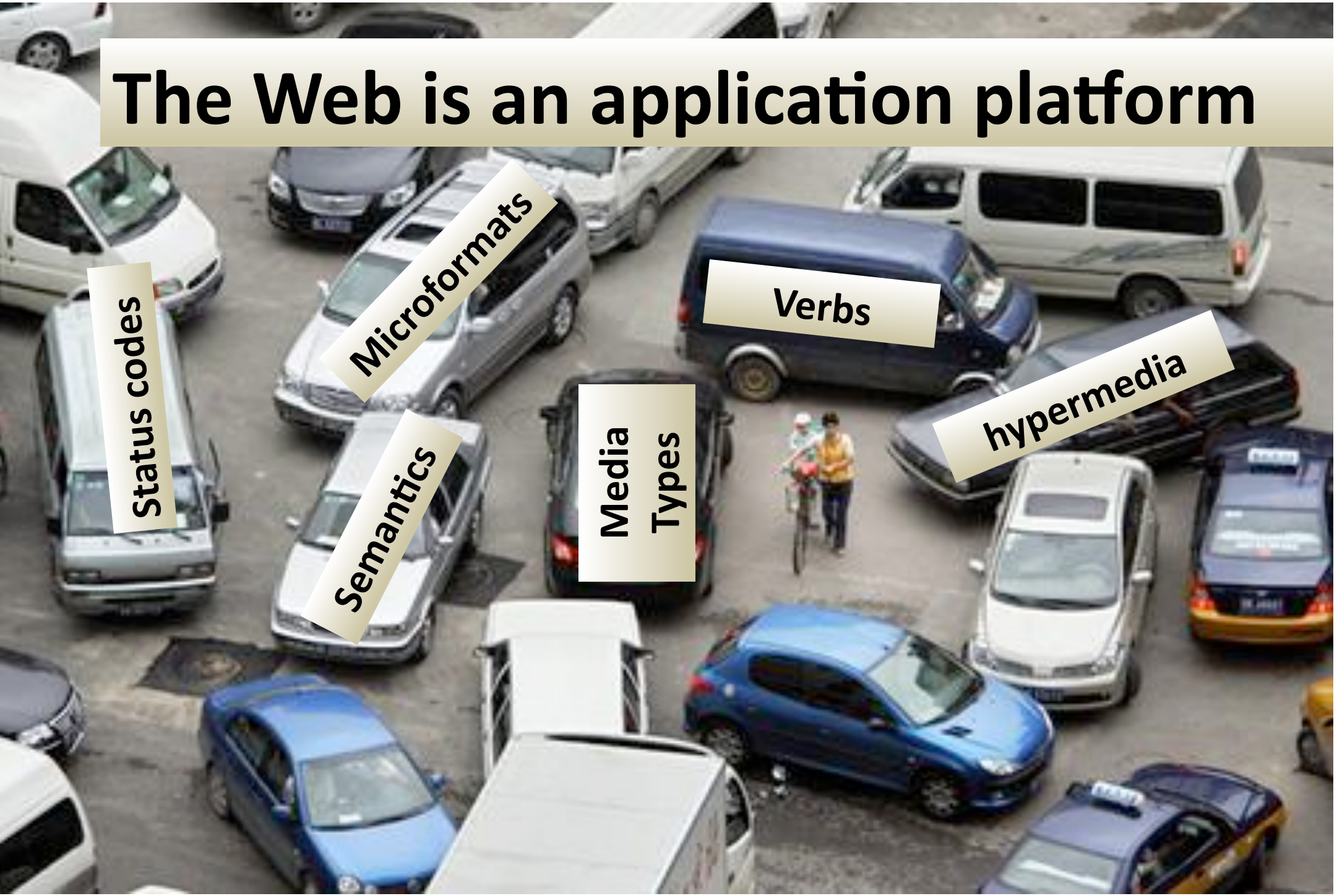
Transactions


Bottleneck
Client application
Transaction coordinator
Crash recovery?
Denial of Service
No trust
Service
Service
transaction context
Business component interactions
Transaction control messages

Contracts

```
<?xml version="1.0" encoding="UTF-8"?>
<definitions name="HelloService"
   targetNamespace="http://www.ecerami.com/wsdl/HelloService.wsdl"
   xmlns="http://schemas.xmlsoap.org/wsdl/"
   xmlns:soap="http://schemas.xmlsoap.org/wsdl/soap/"
   xmlns:tns="http://www.ecerami.com/wsdl/HelloService.wsdl"
   xmlns:xsd="http://www.w3.org/2001/XMLSchema">

   <message name="SayHelloRequest">
      <part name="firstName" type="xsd:string"/>
   </message>
   <message name="SayHelloResponse">
      <part name="greeting" type="xsd:string"/>
   </message>

   <portType name="Hello_PortType">
      <operation name="sayHello">
         <input message="tns:SayHelloRequest"/>
         <output message="tns:SayHelloResponse"/>
      </operation>
   </portType>

   <binding name="Hello_Binding" type="tns:Hello_PortType">
      <soap:binding style="rpc"
         transport="http://schemas.xmlsoap.org/soap/http"/>
      <operation name="sayHello">
         <soap:operation soapAction="sayHello"/>
         <input>
            <soap:body
               encodingStyle="http://schemas.xmlsoap.org/soap/encoding/"
               namespace="urn:examples:helloservice"
               use="encoded"/>
         </input>
         <output>
            <soap:body
               encodingStyle="http://schemas.xmlsoap.org/soap/encoding/"
               namespace="urn:examples:helloservice"
               use="encoded"/>
         </output>
      </operation>
   </binding>

   <service name="Hello_Service">
      <documentation>WSDL File for HelloService</documentation>
      <port binding="tns:Hello_Binding" name="Hello_Port">
         <soap:address
            location="http://localhost:8080/soap/servlet/rpcrouter"/>
      </port>
   </service>
</definitions>
```

The Web is an application platform



A Case Study

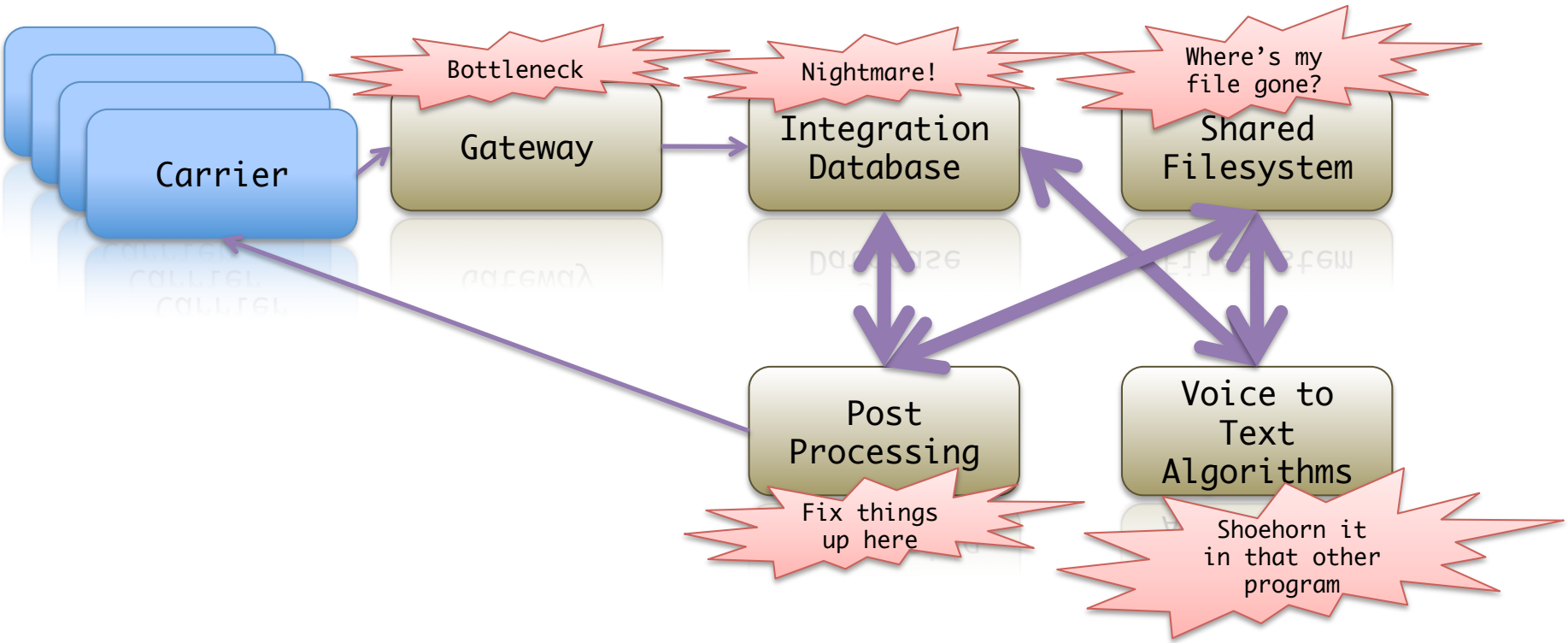
Client

- UK telecoms service provider
- Voice messages to text/email
- Global customers (no easy downtime)

Problem

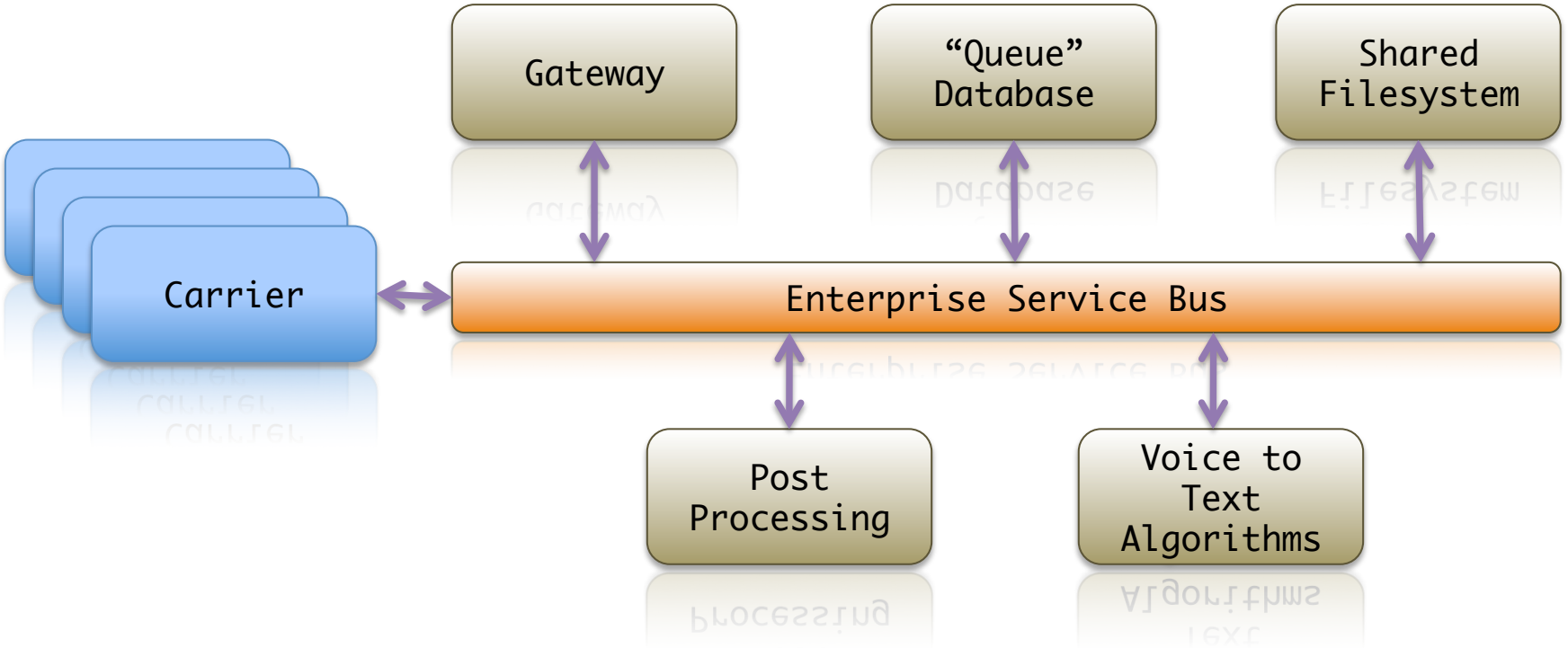
- Scalability and system resilience issues
- Huge growth curve to from a million to a billion messages per month
- Costs

Platform Architecture

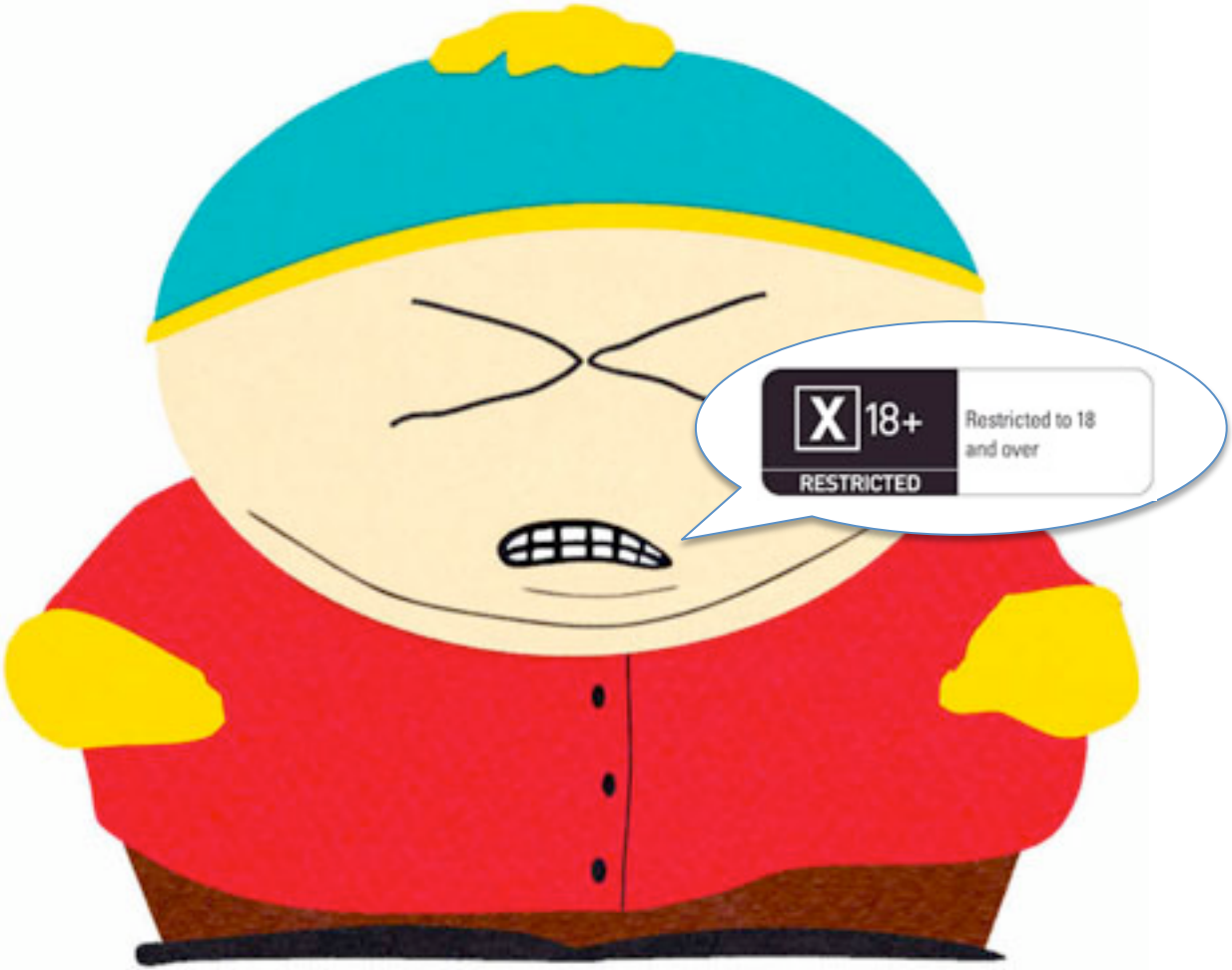


Three Months' Enterprise Consulting
Later…

The £10,000,000 Solution*



* Solution does not include actual implementation

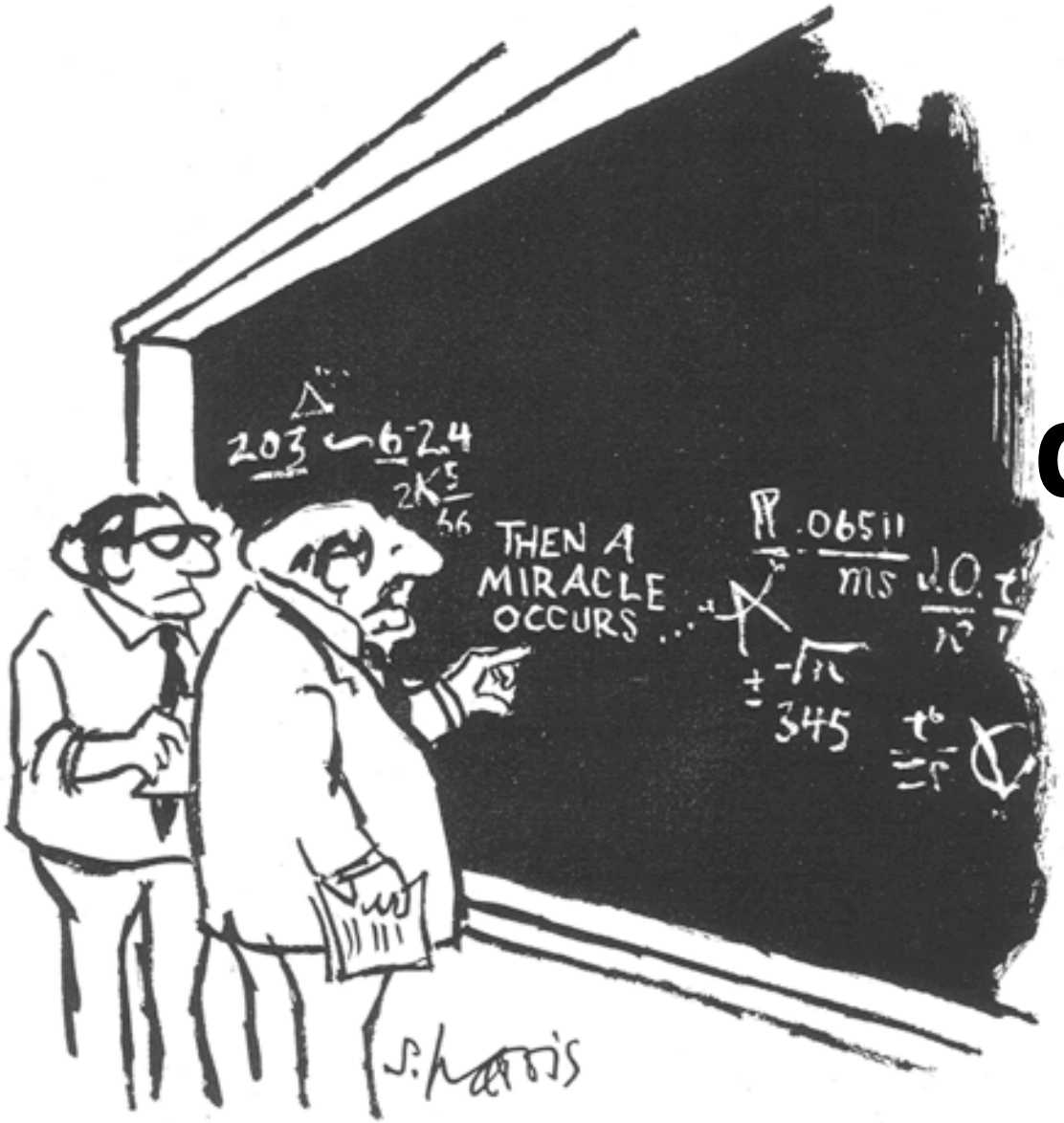


CEO’s Response

My team was given the enterprise consultancy findings…

…and told to “do that, but cheaper”

X 18+
RESTRICTED
Restricted to 18 and over
Jim’s Response



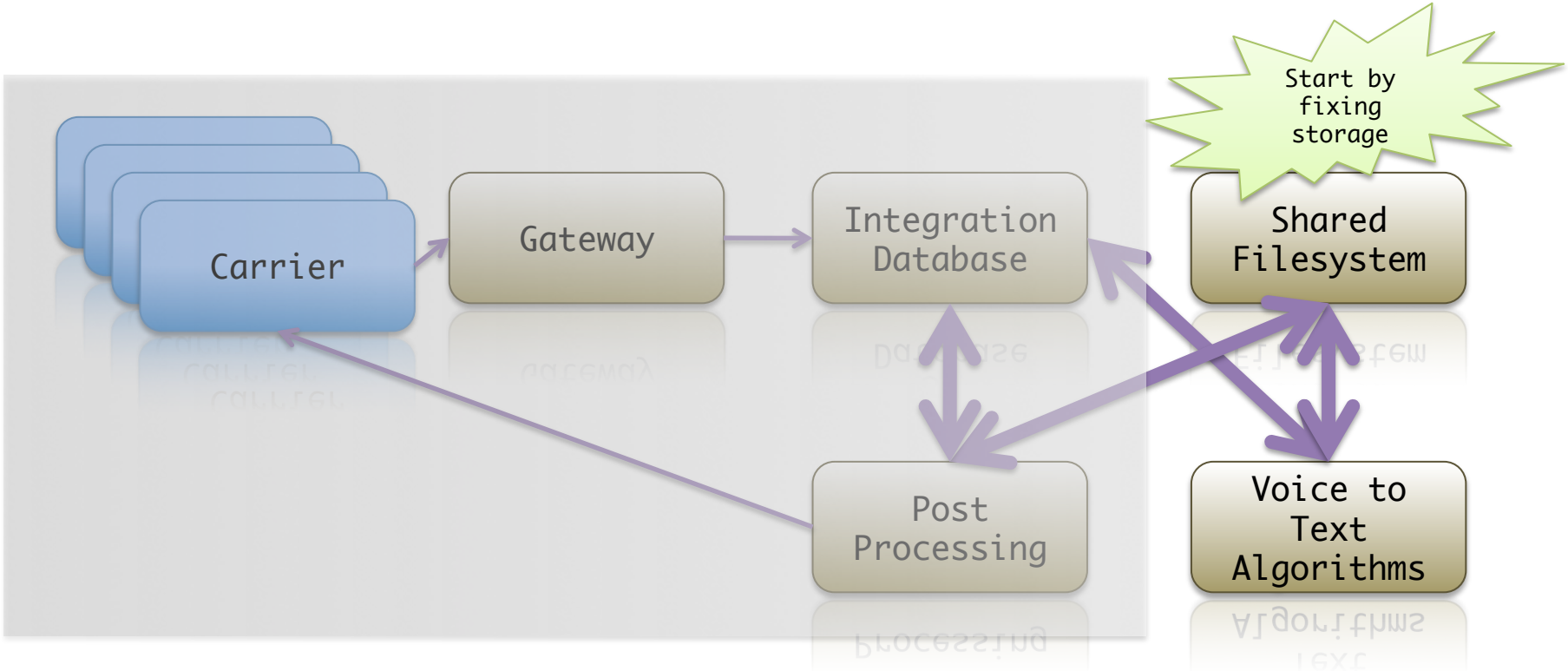
"I THINK YOU SHOULD BE MORE EXPLICIT HERE IN STEP TWO."

Think differently!

(or even just stop and think)

Architecture is still important

Agile EA: Prioritise Service Delivery



56
57
58
59
12
1
13
14
15
16

MODERN
SCIENCE
will
save
the
world
kill
us
all
This is how risk is mitigated.
Not by buying
middleware up-front!

Storage Manager Project Delivery

Small team

3 Week Inception

14 iterations

Java solution

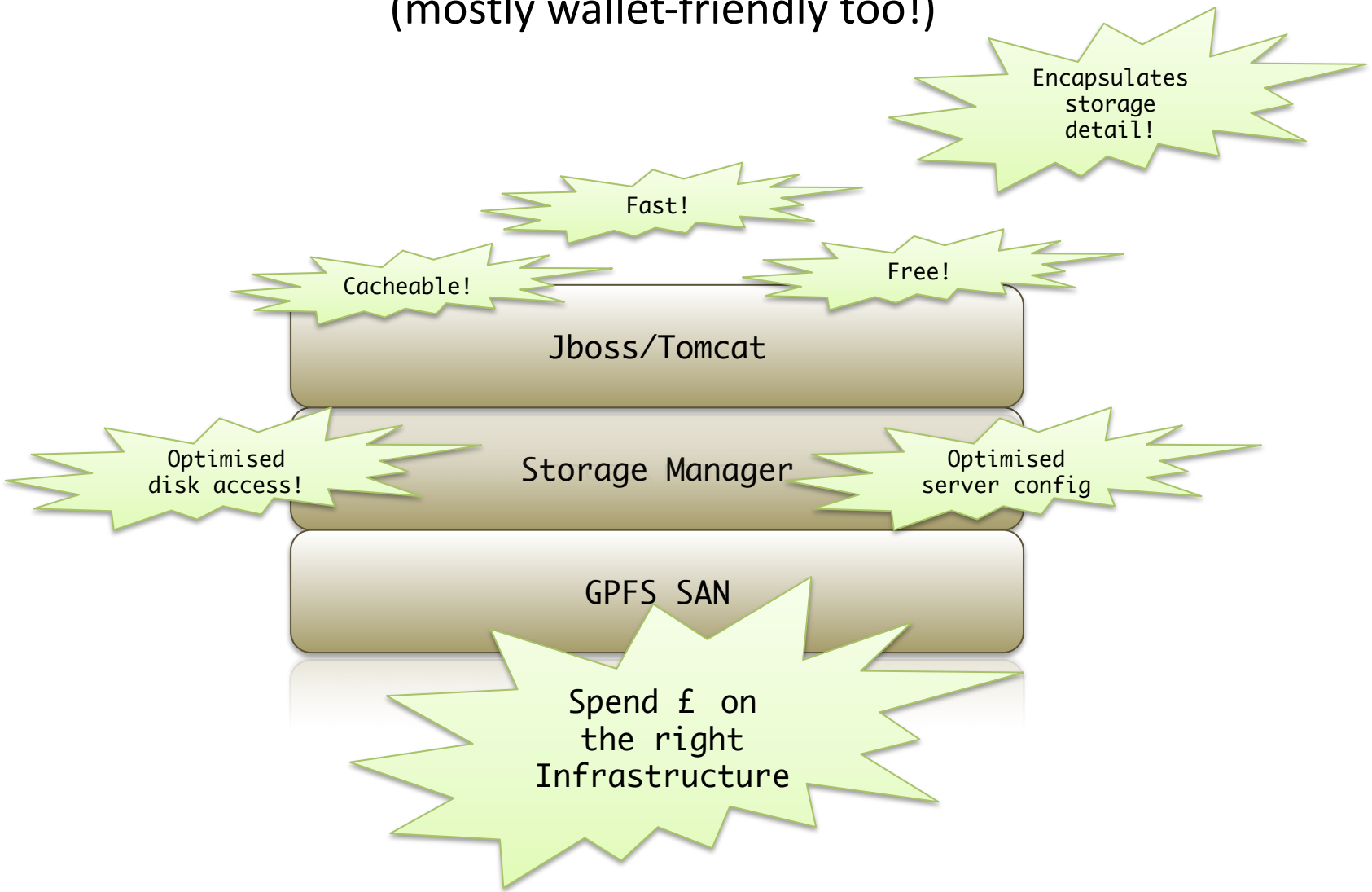
Performance testing throughout

- See Jones and Kua paper, Agile 2009

Continuously built and deployed for testing

Web-friendly Architecture

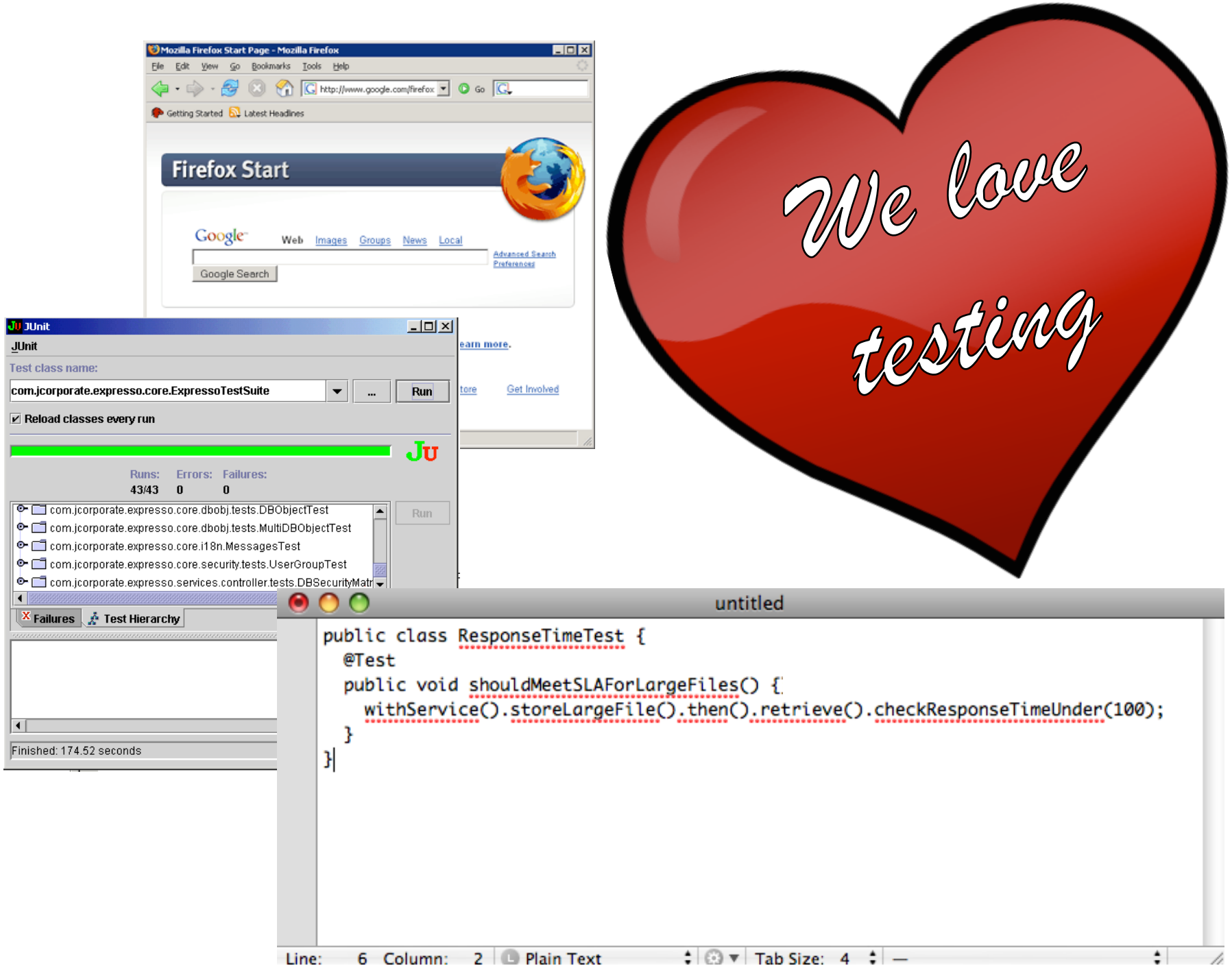
(mostly wallet-friendly too!)



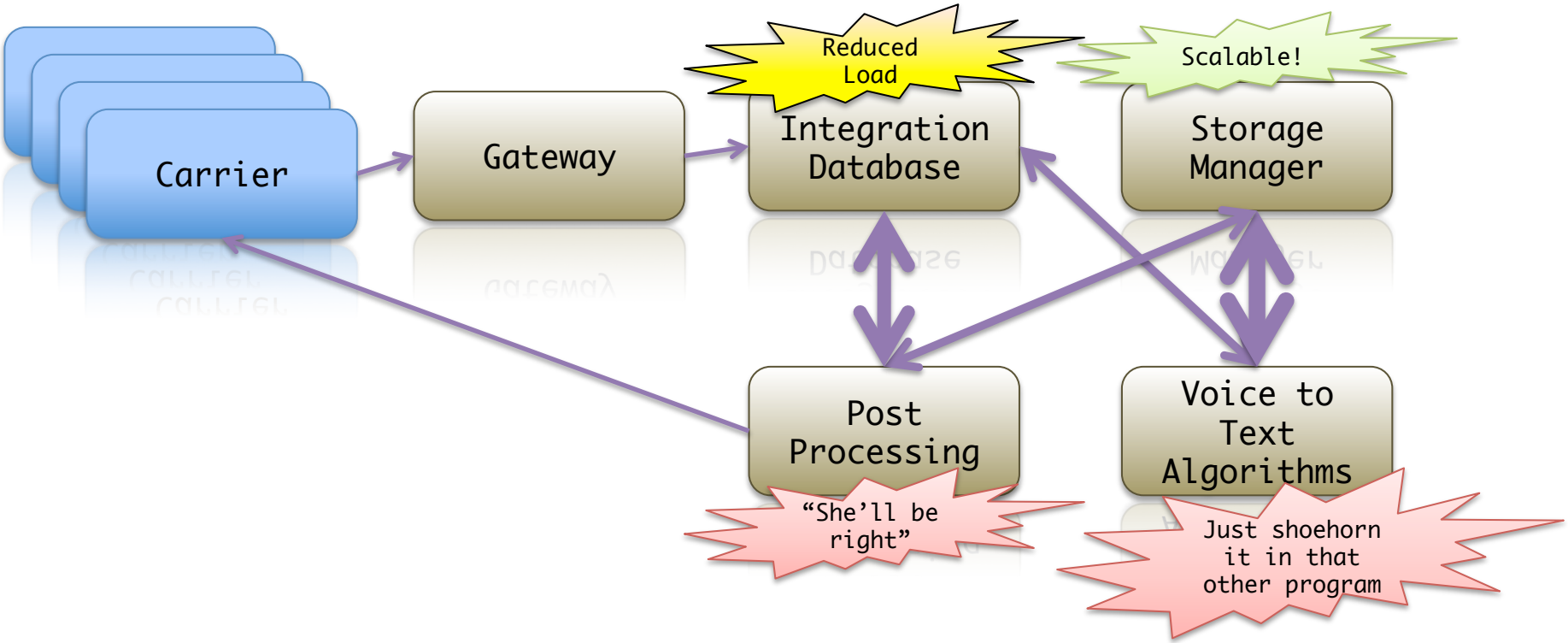
TESTING

I FIND YOUR LACK OF TESTS DISTURBING.

DIYDESPAIR.COM


Mozilla Firefox Start Page - Mozilla Firefox
File Edit View Go Bookmarks Tools Help
http://www.google.com/firefox
Getting Started Latest Headlines
Firefox Start
Google
Web Images Groups News Local
Google Search
Advanced Search
Preferences
JUnit
JUnit
Test class name:
com.jcorporate.expresso.core.ExpressoTestSuite
...
Run
Reload classes every run
Runs: Errors: Failures:
43/43 0 0
com.jcorporate.expresso.core.dbobj.tests.DBObjectTest
com.jcorporate.expresso.core.dbobj.tests.MultiDBObjectTest
com.jcorporate.expresso.core.i18n.MessagesTest
com.jcorporate.expresso.core.security.tests.UserGroupTest
com.jcorporate.expresso.services.controller.tests.DBSecurityMatr
Failures
Test Hierarchy
Finished: 174.52 seconds
We love testing
untitled
public class ResponseTimeTest {
@Test
public void shouldMeetSLAForLargeFiles() {
withService().storeLargeFile().then().retrieve().checkResponseTimeUnder(100);
}
}
Line: 6 Column: 2
Plain Text
Tab Size: 4

Improving Enterprise Architecture

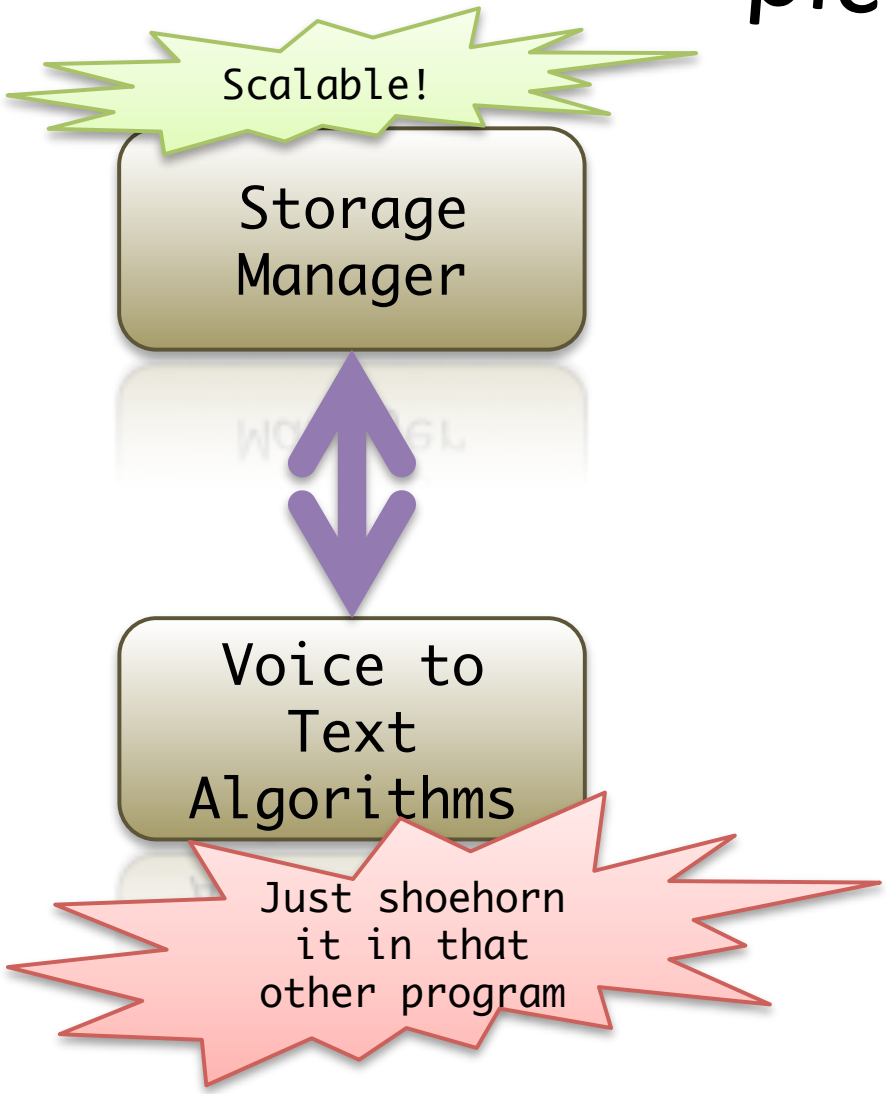


Storage Manager Benefits

- Immediate reduced load on integration database
- Enabled removal of code from systems
- **Delivered business value by keeping customers happy**

- "The best software we have ever deployed"
  - Operations director ← I'll come back to this

What's wrong with this picture?



What if…

We took our inspiration from successful Web-scale companies?

What if…

And took the time to understand our SLAs?

What if…

And picked the right technology solution?

Not just the one we're being sold?

What if…

We built a scalable compute platform?

Grid Project Delivery

Larger team

3.5 Week Inception

18 iterations

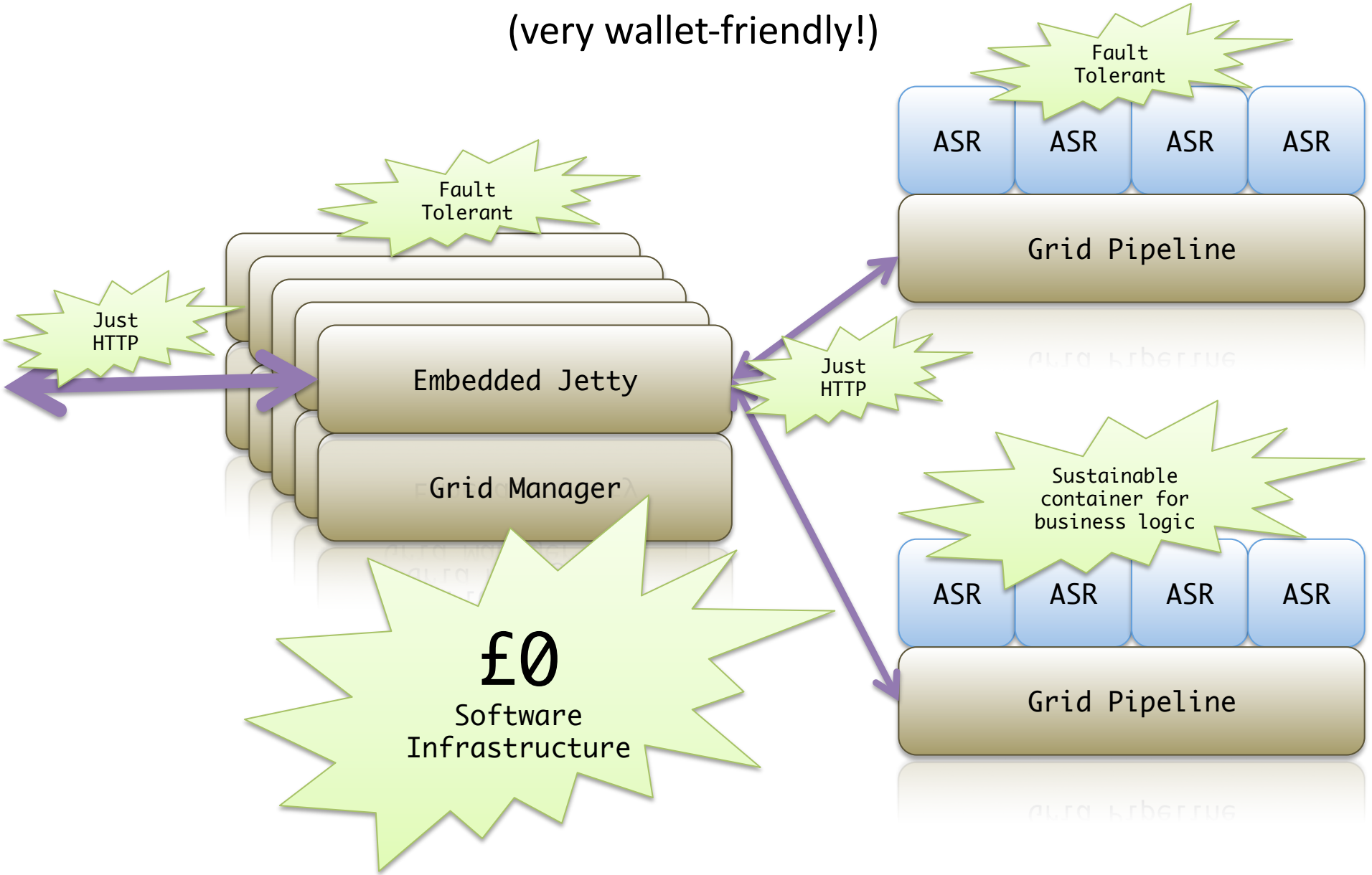
Java solution

Performance testing throughout

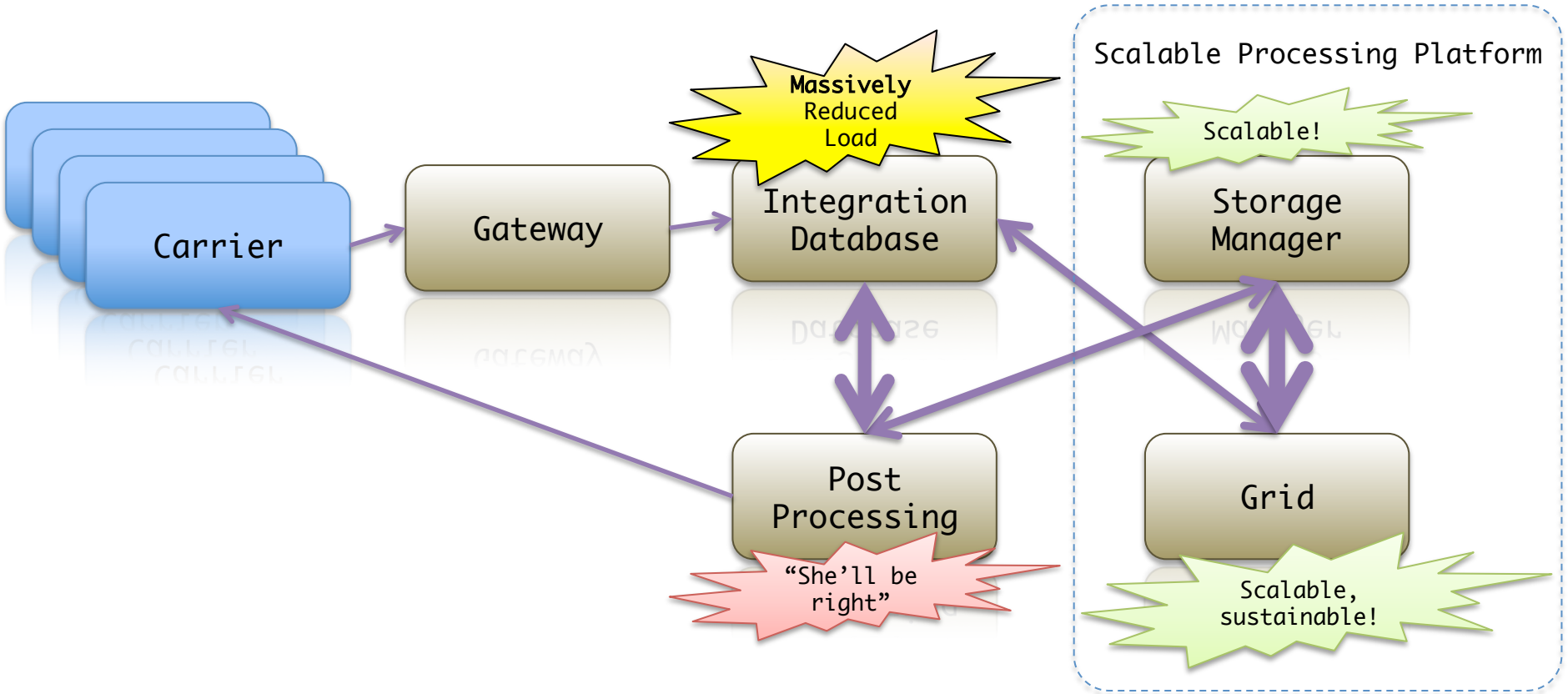
Continuously built and deployed for testing

Web-friendly Architecture

(very wallet-friendly!)



Improving Enterprise Architecture



Grid Benefits

- Scalable, resilient platform
- Aligned with business goals
- Further reduced load on integration database
- Set architectural patterns
- **Deliver business value by processing more messages at lower cost than ever before**

- "The best software we have ever deployed"
  - Operations director

Better every time!

Let’s do the sums

£10,000,000
Up-Front Cost of Bus Architecture

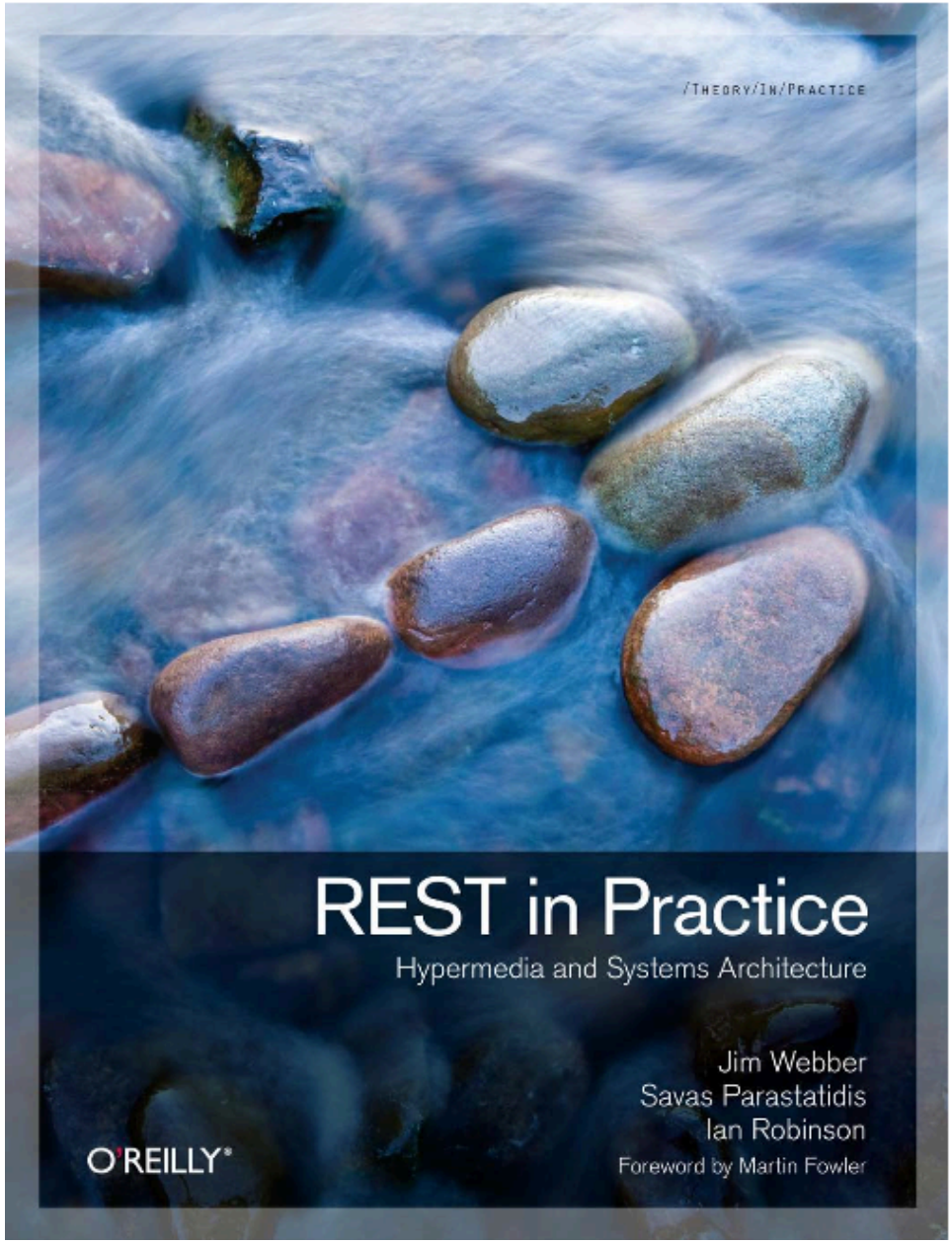
≥ £10,000,001
People Cost for Bus Architecture
http://tech.groups.yahoo.com/group/service-orientated-architecture/message/13905

~£20,000,000
Big SOA Costs

£1,000,000
Actual Cost of Completed Project

£0
Cost of Middleware

ThoughtWorks®



The Web works

And its economies of scale eclipse your vendors'