



SAGE Computing Services

Customised Oracle Training Workshops and Consulting

JDeveloper 11g JAX-WS web services:

....as easy as 1-2-3: XSD, WSDL, Generate!

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♠ Oracle ACE Director - Fusion Middleware

Agenda

- Part I: Web Services
- Part II: JAX-WS & JAXB
- Part III: Demo time!



Part I: *Web Services*

Why web services?

- System to system data integration
- Consumer (client) & Publisher

Key Benefits



- Share data
- System interoperability
- Standardized
- Low cost internet delivery
- Loosely coupled

SOAP vs REST Web Services

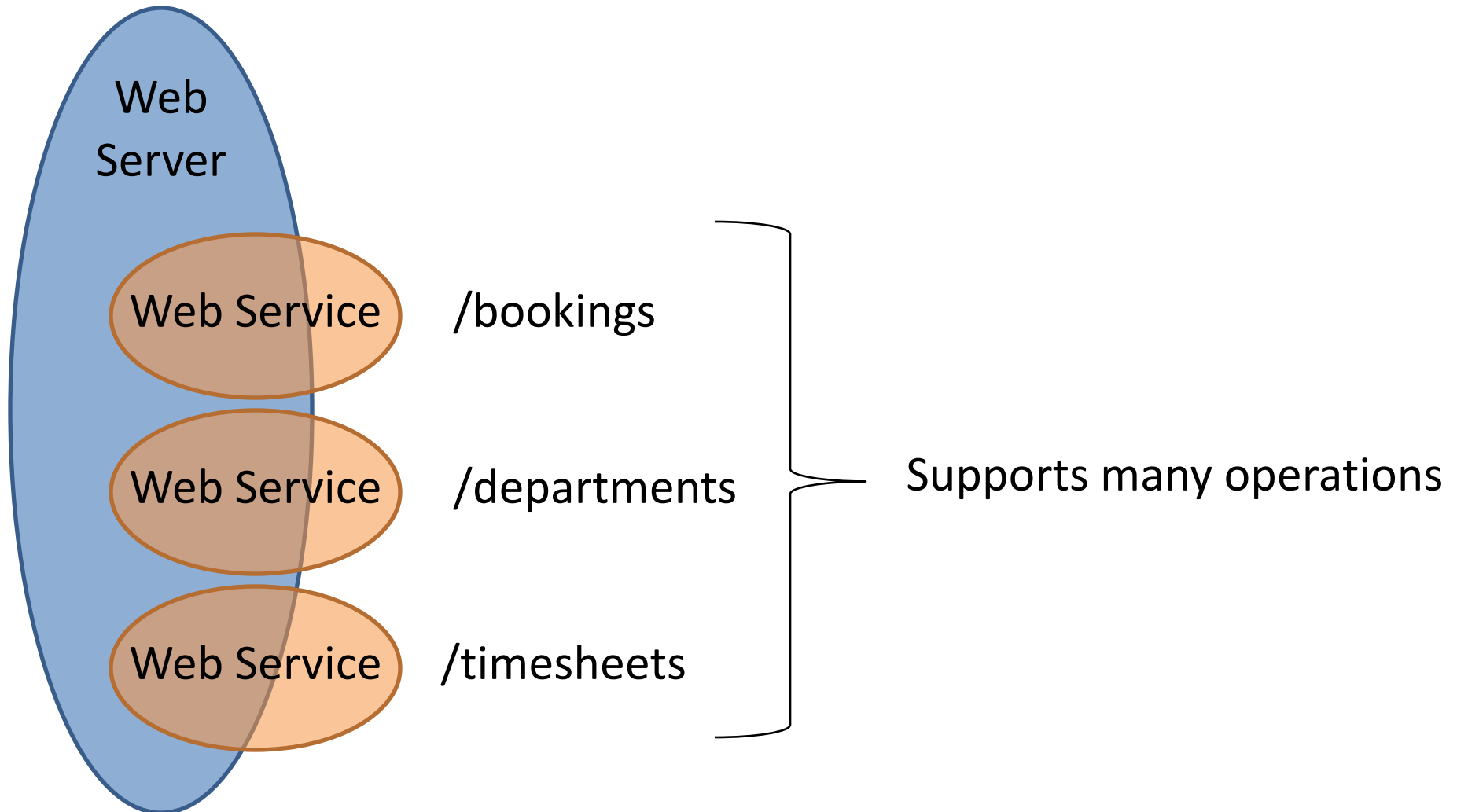


SOAP RPC vs Document Style



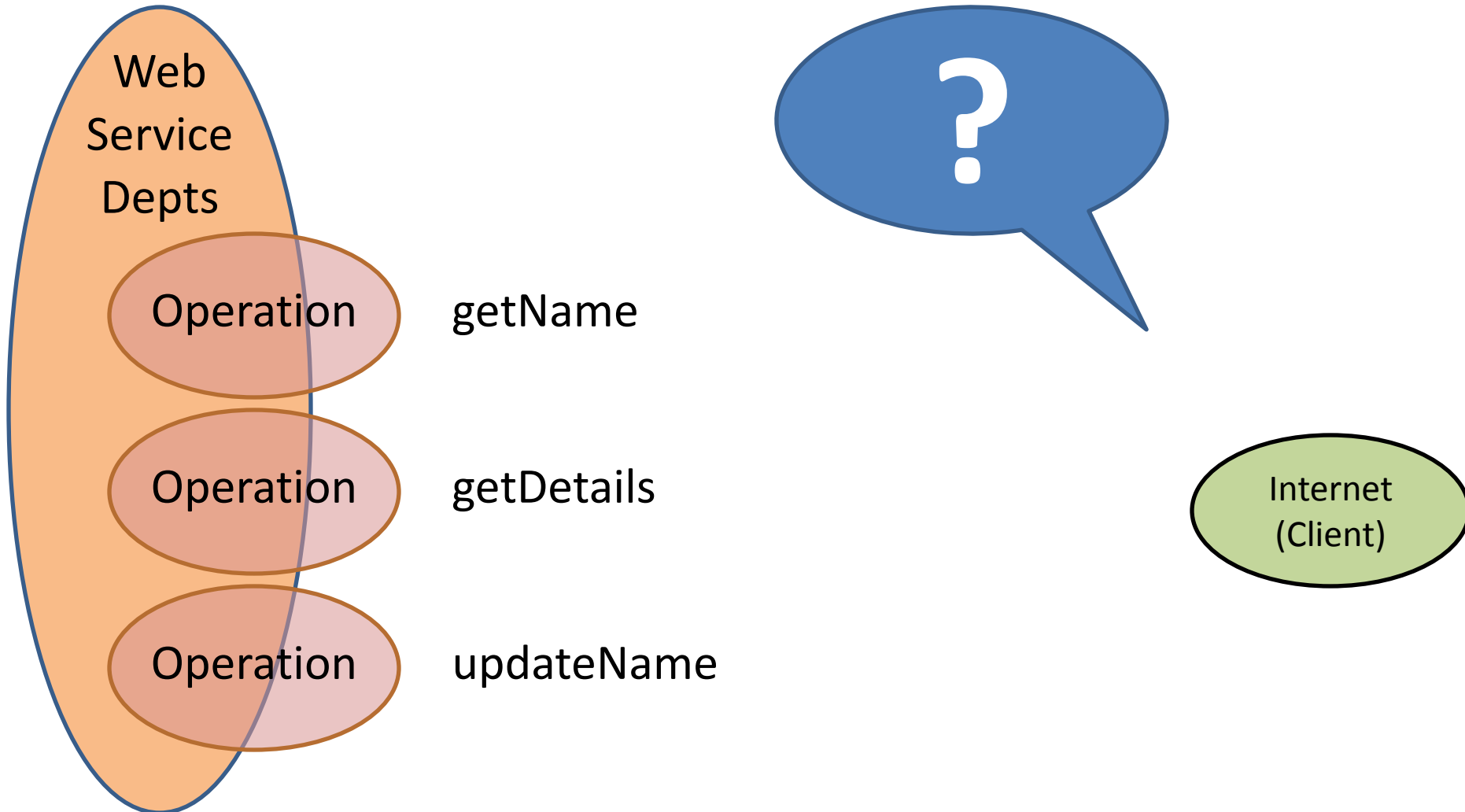
SOAP Web Services Defined

Host: <http://www.sagecomputing.com.au>



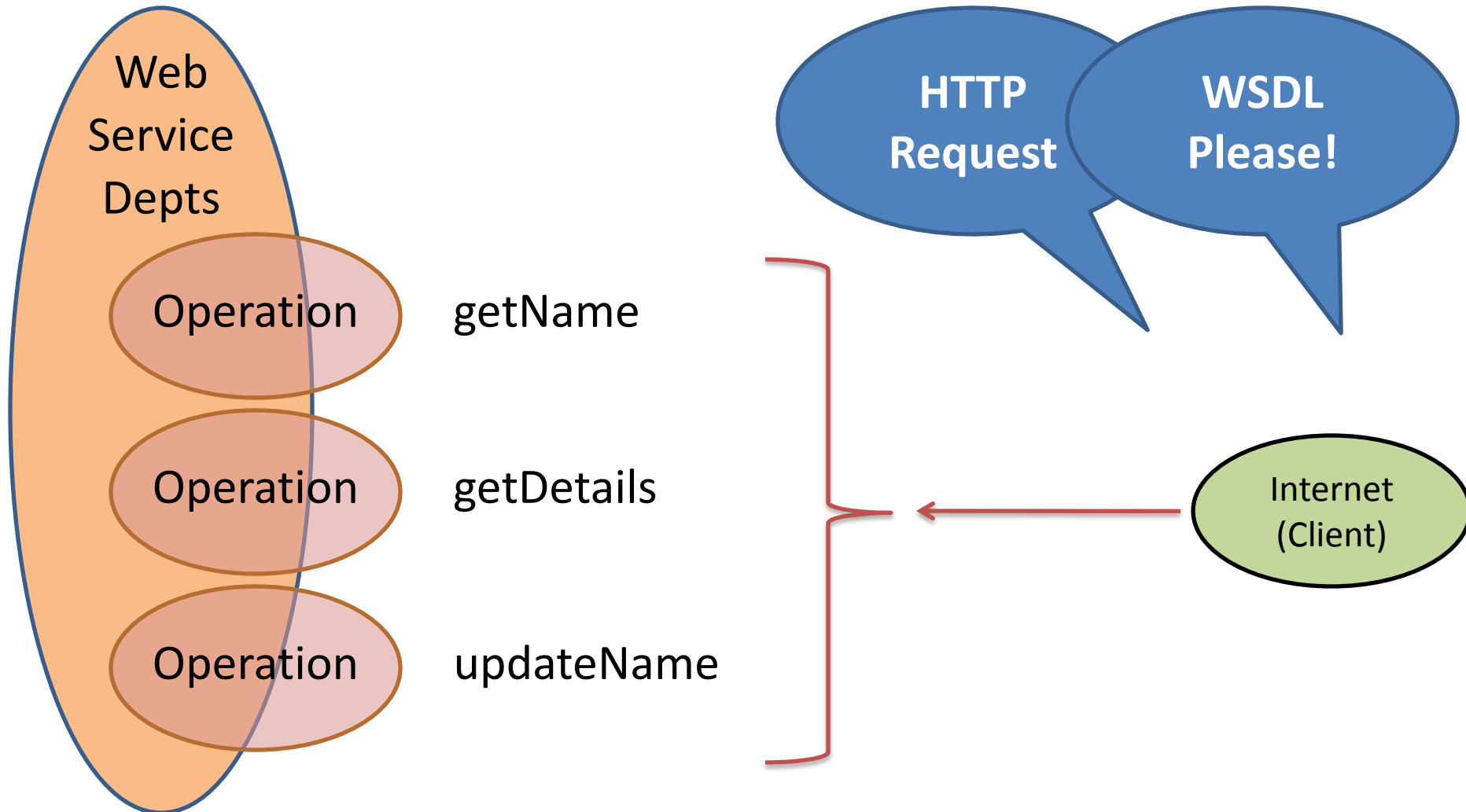
SOAP Web Services Defined

Service: <http://www.sagecomputing.com.au/departments>



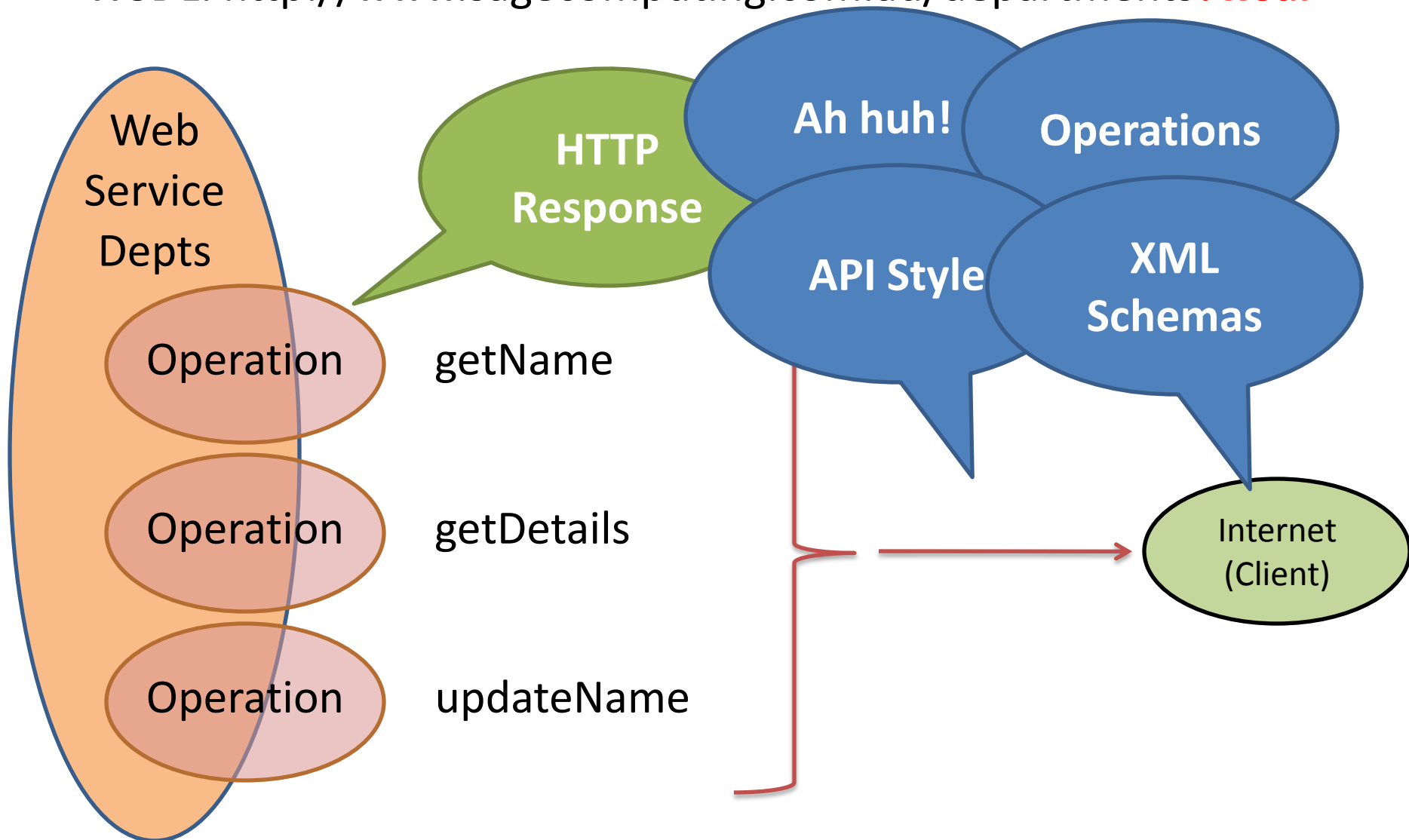
SOAP Web Services Defined

WSDL: <http://www.sagecomputing.com.au/departments?wsdl>



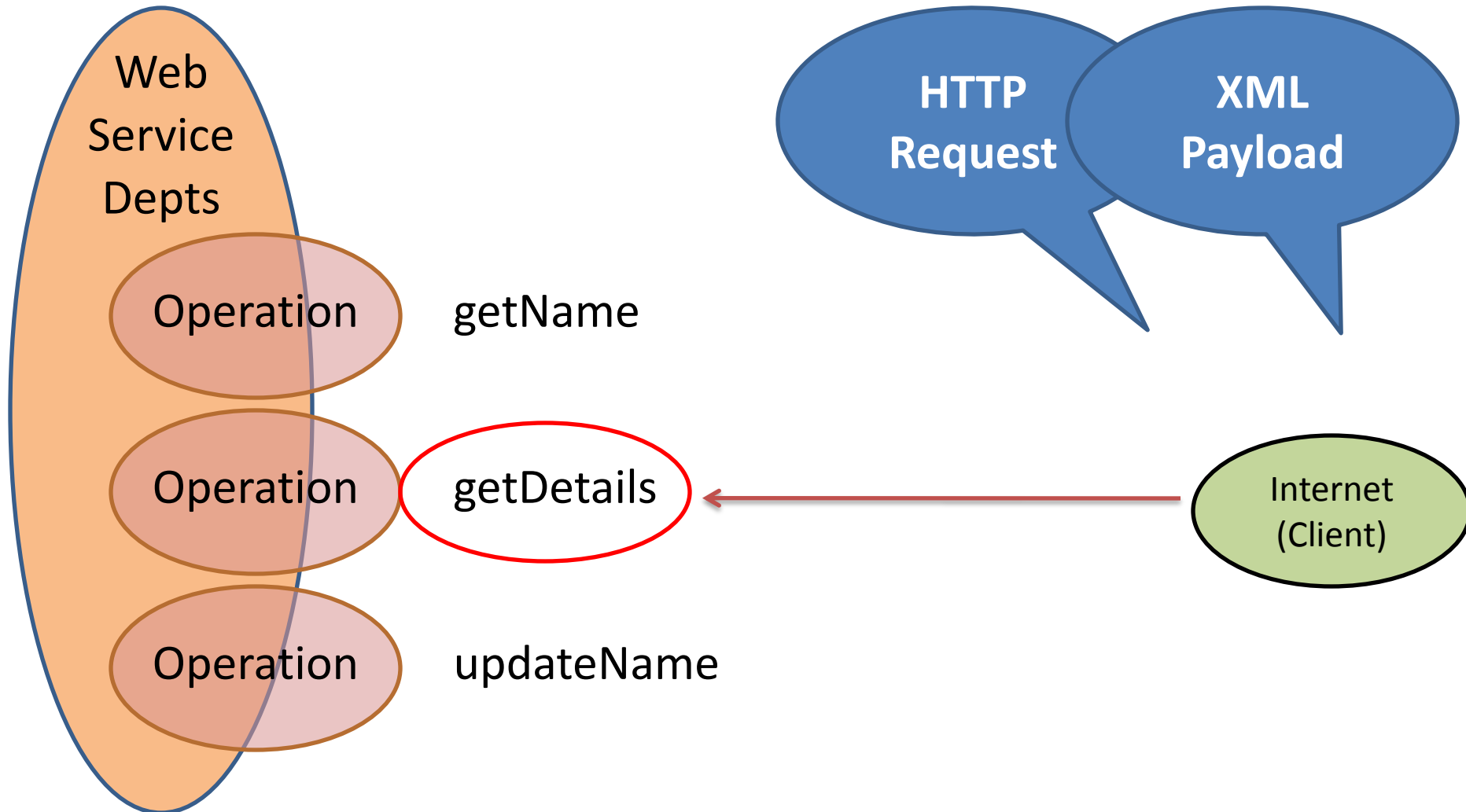
SOAP Web Services Defined

WSDL: <http://www.sagecomputing.com.au/departments?wsdl>



SOAP Web Services Defined

Service: <http://www.sagecomputing.com.au/departments>



SOA Services Defined

Service

computing.com.au/departments

Thinking
thinking
thinking

Web
Service
Depts

HTTP
Response

XML
Payload

Thank you!

Operation

getName

Operation

getDetails

Operation

updateName

Internet
(Client)



SOAP Core Concepts

- HTTP
 - URL
 - Web Services (aka. endpoints)
 - Operations
 - » Parameters
 - Based on XML Schemas
 - XML Payloads
- WSDL

Part II: JAX-WS & JAXB



WS Framework Challenges

- Obscure underlying implementation detail from programmer:
 - HTTP request/responses
 - SOAP envelope
- XML to native language datatype mapping
- WSDL/SOAP mapping to code



JAX-WS

- Java API for Web Services
 - JAX-WS 2.x replaces JAX-RPC in JEE5
 - Standards based
 - Apart of the Glassfish "Metro" web service stack of technologies
-
- Simplified POJOs
 - Uses annotation
 - Easy to understand
 - No code for HTTP
 - No code for transport layer
 - Focus on the data rather than mechanics



JAX-WS Implementation

- Can create both the publisher (aka. provider or web service) and client (aka. consumer)
 - Publisher = JEE5.0 + Client = JSE6.0
 - Primarily SOAP based web services
 - Also supports RESTful based web services
 - Support for SOAP 1.1/1.2
 - Support for binary attachments (MTOM)
- RI includes command line tools for generating artefacts
 - WSImport - top down - create service from WSDL
 - WSGen - bottom up - create service from Java code
- JDeveloper IDE provides an easier wizard driven interface

JAX-WS XML 2 Java binding

- Incoming request - XML "unmarshalled" into Java objects
- Outgoing response - Java objects are "marshalled" into XML
- JAX-WS supports multiple XML 2 Java binding technologies
 - map XML to Java equivalent
 - provide Java the ability to consume/create XML data
 - JAX-WS support multiple binding types:
 - XML Source (DOM)
 - SAAJ (SOAPMessage)
 - Activation data sources (Streams - raw text - similar i/o)
 - Java Architecture for XML Binding (JAXB)
- JAXB object structure is familiar to Java programmers
- No more XML

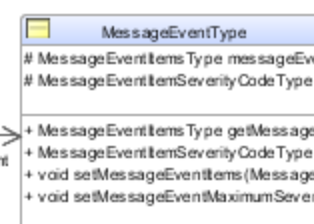
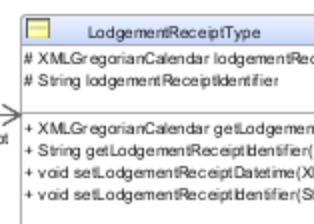
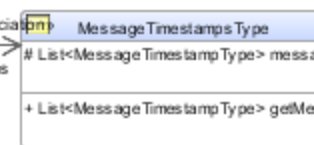
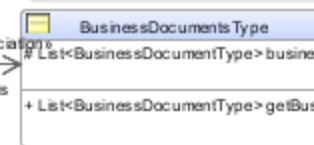
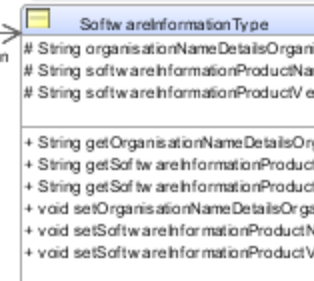
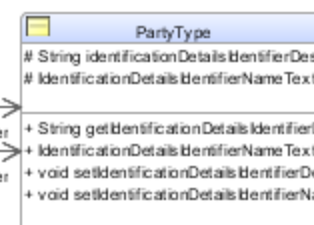
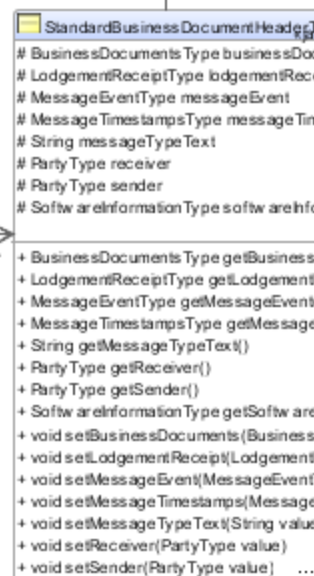
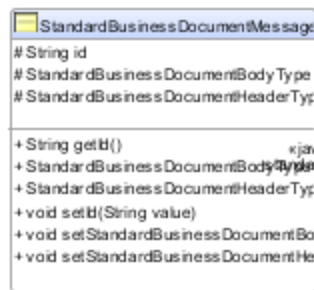
<?xml
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«java association»

«java association»

sender

receiver

softwareInformation

«java association»

«java association»

businessDocuments

«java association»

messageTimestamps

«java association»

«java association»

lodgementReceipt

«java association»

messageEvent



Part III: JDeveloper Demonstration

....as easy as 1-2-3: XSD, WSDL, Generate!



Create your XML
Schema

Create the web
service WSDL





Generate the code



Ah, test it

Bottoms up!





But I'm a PL/SQL programmer!

CRYING IS

OKAY HERE

```
01 CREATE TABLE dept (deptno NUMBER(2,0), dname VARCHAR2(14));
02
03 CREATE TYPE dept_type AS OBJECT
04 (deptno    NUMBER
05 ,dname     VARCHAR2(14)
06
07 CREATE TYPE dept_list_table IS TABLE OF dept_type;
08
09 CREATE OR REPLACE PACKAGE ws_package AS
10     FUNCTION test_dept_table RETURN dept_list_table;
11 END ws_package;
12
13 CREATE OR REPLACE PACKAGE BODY ws_package AS
14     FUNCTION test_dept_table RETURN dept_list_table IS
15         all_depts dept_list_table := dept_list_table();
16         dRecType  dept_type;
17         i         NUMBER := 0;
18 BEGIN
19     FOR r_list IN (SELECT * FROM dept) LOOP
20         i := i + 1;
21         dRecType      := dept_type(null, null, null, null);
22         dRecType.deptno := r_list.deptno;
23         dRecType.dname  := r_list.dname;
24         all_depts.extend;
25         all_depts(i) := dRecType;
26     END LOOP;
27
28     RETURN all_depts;
29 END test_dept_table;
30 END ws_package;
```







SAGE Computing Services

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Questions and Answers?

Presentations are available from our website:

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chris.muir@sagecomputing.com.au

<http://one-size-doesnt-fit-all.blogspot.com>

JDeveloper Web Services References

Pas Apicella blog

<http://theblasfrompas.blogspot.com>

(Many thanks to Pas for the PL/SQL example:

<http://theblasfrompas.blogspot.com/2009/08/jdeveloper-11g-plsql-web-service.html>)

Edwin Biemond's blog

<http://biemond.blogspot.com>

Gerard Davison blog

<http://kingsfleet.blogspot.com>