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Database Native Web Services with Oracle XML DB

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Agenda

- “Why” Web Services
- “Why” Web Services in Oracle XMLDB
- “How” Web Services in Oracle XMLDB
- Demo
- Q&A





The Move to Service Oriented Architectures (SOA)

- Turning the Internet into a computing platform
- Interoperability and reusability
- Based on Industry standards (XML, SOAP, etc.)
- Over the widely popular HTTP protocol
- Integral part of Web 2.0



Why Web Services

An Integral part of SOA

- Provide services and information remotely
- Based on industry standards (XML and HTTP)
- Typically used to refer to SOAP messages over HTTP
- Defined by a (machine operable) Web Services Description Language (WSDL)
- Provides an encapsulated computing paradigm (as demonstrated later)



Traditional View of Web Services

- Means for implementing business logic in an Enterprise (often large scale deployments)
- Typically use a database at the backend as solely a data store
- Implement much of the business logic in the mid-tier or in the application layer



What's Changed?

- CPUs have steadily become cheaper and faster
- Grid Computing adds scalability and parallelism
- Database CPU cycles are much less expensive than they once were
- Network speeds have increased and information is more “distributed” than before
- Lots of business logic is stored in the database itself (XQuery and PL/SQL)

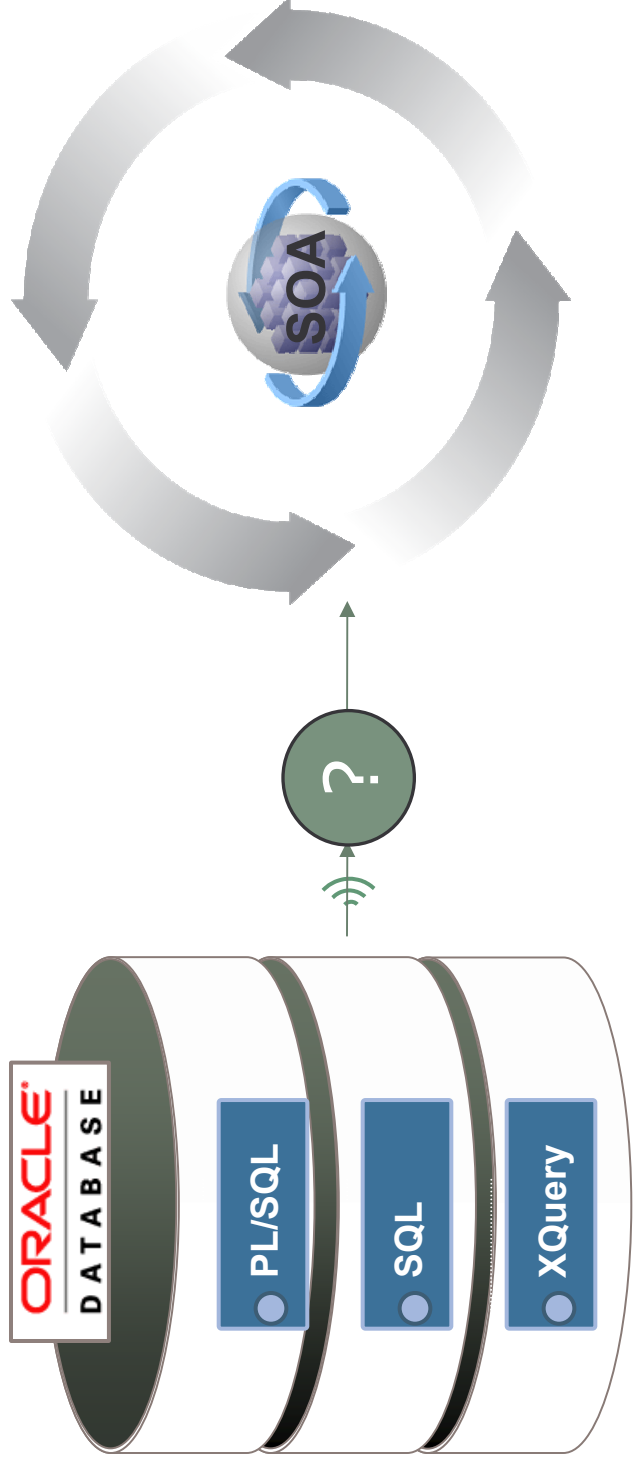


Why Web Services in Oracle XMLDB?

- Integrated with the database
 - No extra footprint
 - Sits close to where the data and business logic reside
- Has a powerful XML processing engine (XPath and XQuery)
- Has a built-in full-function HTTP server



The Problem Definition





DBURI: REST Web Services in Oracle XMLDB

- Oracle XML DB includes an HTTP server
- Servlet infrastructure built into the HTTP server, servlets listed in xdbconfig.xml
- Specify anonymous or authenticated user access
- The DBURI servlet allows access of relational content over HTTP
- Supported out-of-the-box prior to 11g



DBURI contd.

- Maps a relational query to a URL
- select ename from scott.emp where empno = 1000
- [http://host:port/oradb/SCOTT/EMP/ROW/EMPNO=1000/ENAME/text\(\)](http://host:port/oradb/SCOTT/EMP/ROW/EMPNO=1000/ENAME/text())
- URL generated by sys_dburigen:

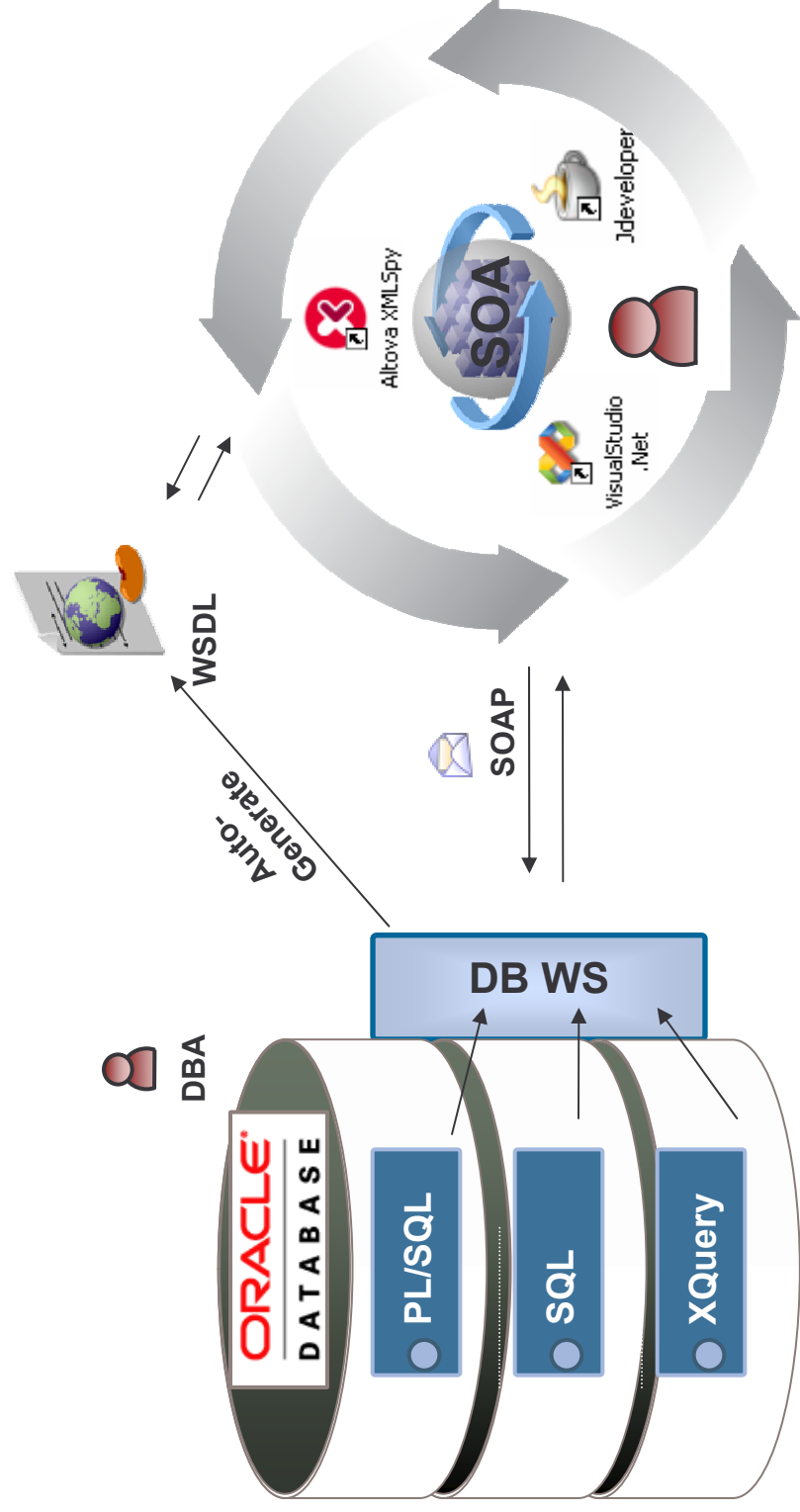
```
select sys_dburigen(ename, data,  
'text()') .getUrl() from scott.emp  
where empno=1000;
```



New Native Oracle DB Web Services

- Web Services hosted natively in the database
 - Servlet on the XDB HTTP server
- Easily expose business logic in the database as a Web Services
- Database functionality deployable as web services
 - SQL Queries
 - XQuery
 - Stored PL/SQL procedures and functions
- Available in Oracle Database 11gR1
- Supports SOAP 1.1

How Web Services





Security

- Web Services Not enabled by default
 - Add code to servlet configuration file (xdbcconfig.xml)
 - Grant *xdb_webservices* role to a user by SYS
- HTTP(S) only by default
 - Grant HTTP access role by SYS (*xdb_webservices_over_http*)
- No access to *public* objects by default
 - Grant Public object access for web services role by SYS (*xdb_webservices_with_public*)
- HTTP authentication
 - Goes through HTTP authentication layer



Query Web Service

- Static WSDL at [http\(s\)://host:port/orawsv?wsdl](http(s)://host:port/orawsv?wsdl)
- The endpoint is `http(s)://host:port/orawsv`
- Support for SQL and XQuery
- Executed as the authenticated user in a new session



PL/SQL Stored Procedures as Web Services

- No additional deployment effort
- Top level procedures or within a package
- WSDL URLs:
 - <http://host:port/orawsv/<schema>/<package>?wsdl>
 - <http://host:port/orawsv/<schema>/<proc>?wsdl>
 - <http://host:port/orawsv/<schema>/<package>/<proc>?wsdl>
- Dynamically generated WSDLs

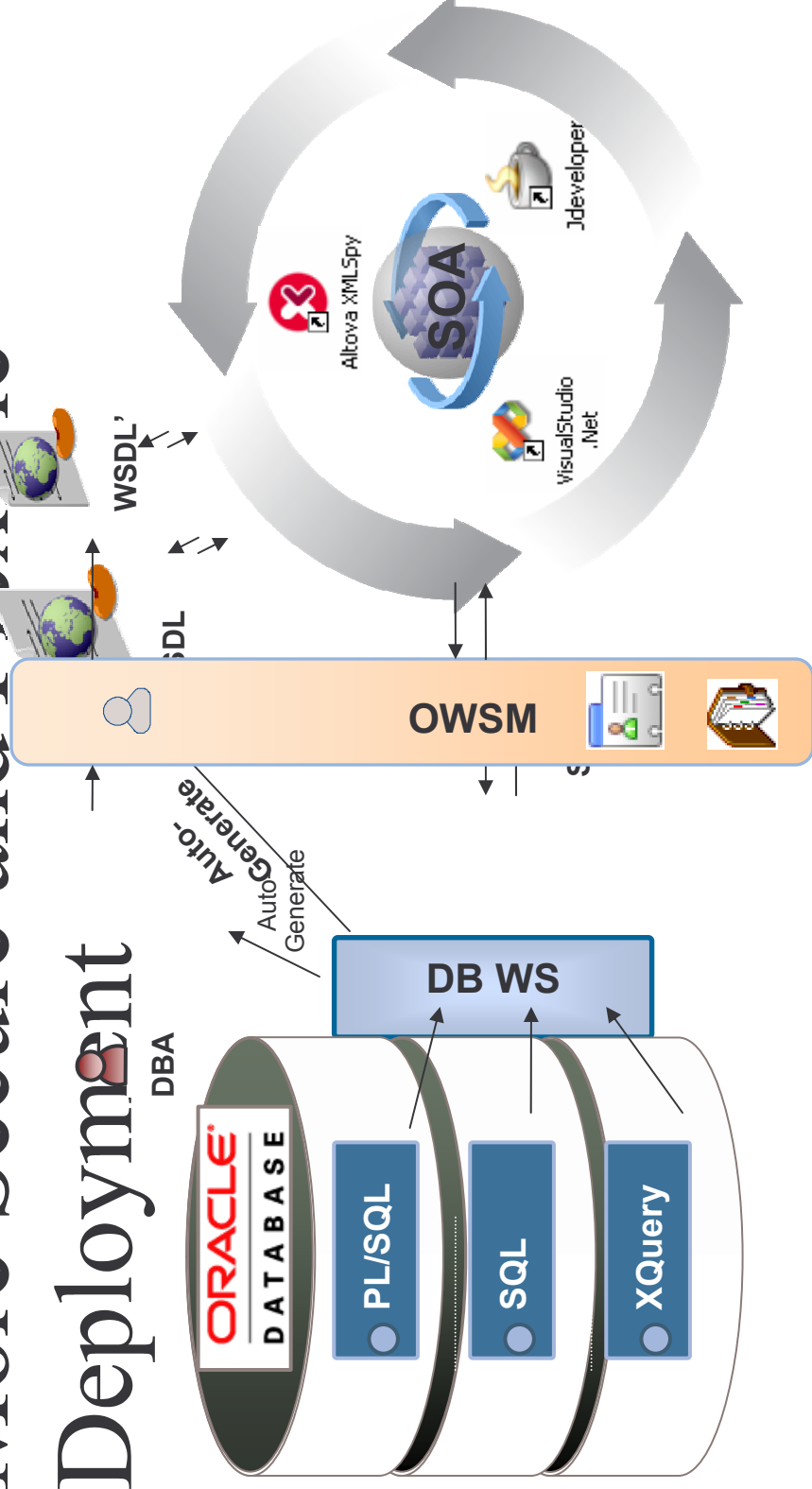


More Complex Deployments

- Large number of specifications, not all implemented in Oracle XML DB Native Web Services
- Can be coupled with a Web Services Management Framework to accomplish additional Functionality
- OWSM, for example



Integrating with OWSM for More Secure and Flexible Deployment



Encryption, Authentication (SSO, LDAP)
Transformation, Audit etc




Why Native Database Web Service?

- Seamlessly Integrate with Oracle XML DB
- Standards-based
- Low management cost
- High performance
- Easy to Deploy: Zero Coding



Q&A



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