

# Boost Your Environment With Oracle XML DB



**UKOUG 2008**  
**Conference and Exhibition**  
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**02/12/2008**



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# Who Am I

- Started as DBA with Oracle 7 on Windows NT 3.1 (1994)
- Experienced with Oracle 7.x / 8.x / 9.x / 10.x and 11.1
- Started with Oracle XMLDB in 2003 (Oracle 10.1.3)
- Oracle 11g Beta tester for Oracle XMLDB
- Dedicated XMLDB Blog ([blog.gralike.com](http://blog.gralike.com))
- Active Oracle OTN XMLDB Forum Member
- Oracle ACE Award for XMLDB Community Contributions



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# Overview

- The Protocol Server
  - Configuration and Basic Concepts
- HTTP API's
  - PL/SQL Gateways, ORADB, NDWS
- URITypes in the Database
  - DBUri-, HTTPUri- and XDBUriTypes
- Combining Worlds
  - Selecting and Saving Files Outside the Database
- Repository Events
- Troubleshooting

# Technical Details - Concerning the Demo's

During the presentation, I made use of an Oracle version 11.1.0.7.0 database on Windows XP. If using an Windows Vista machine, you be aware that you need an extra security update from Microsoft MSDN while using WebDAV. Details are described in the Oracle 11g XMLDB Developers Guide.

The database was created using the Oracle Database Configuration Assistant. The template used in DBCA was the fullblown sample database including all demo schema's.

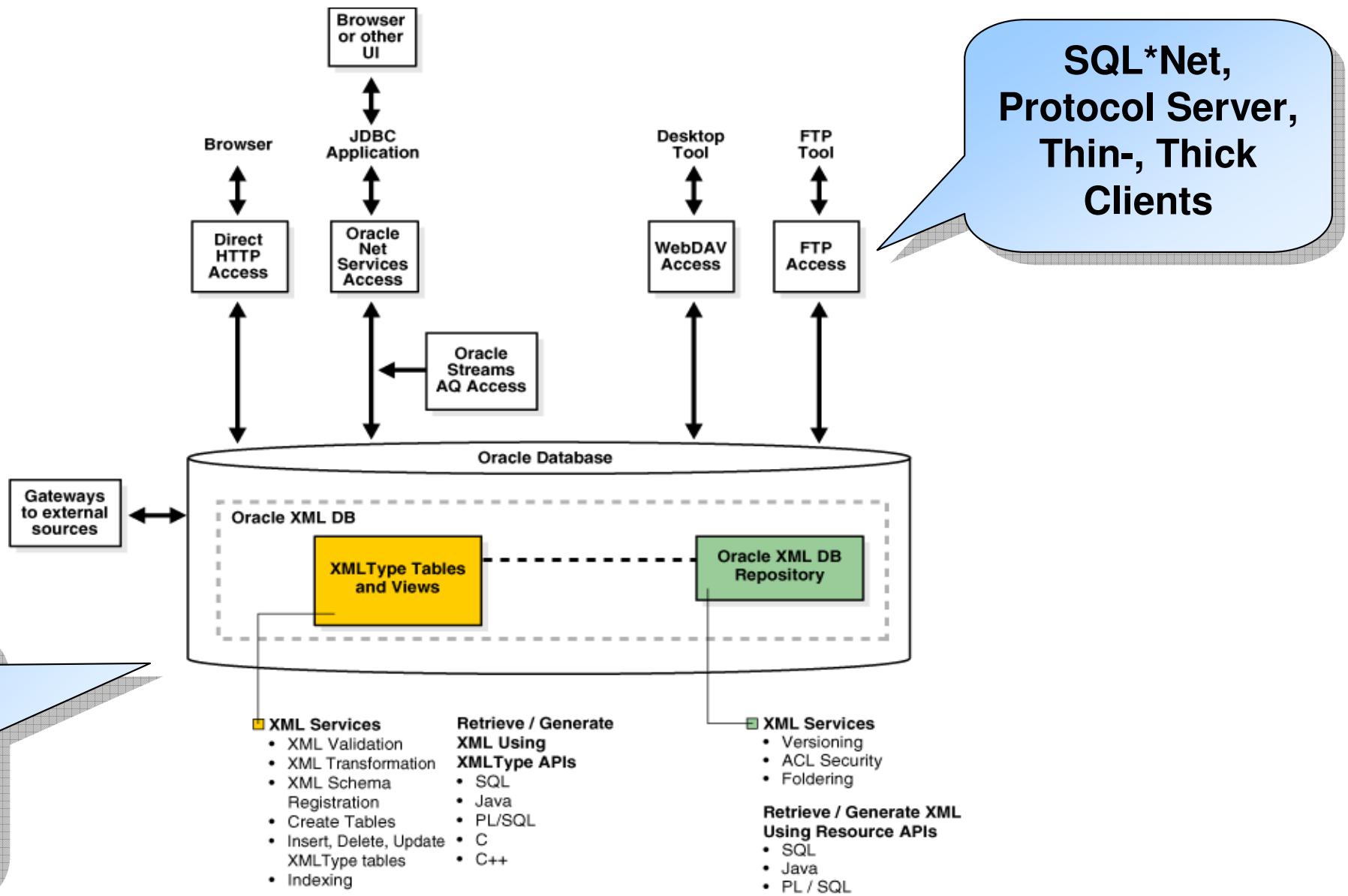
Access to internet and/or a local RSS feed from a website was also used for the DBUri demonstrations.

# Appetizers...

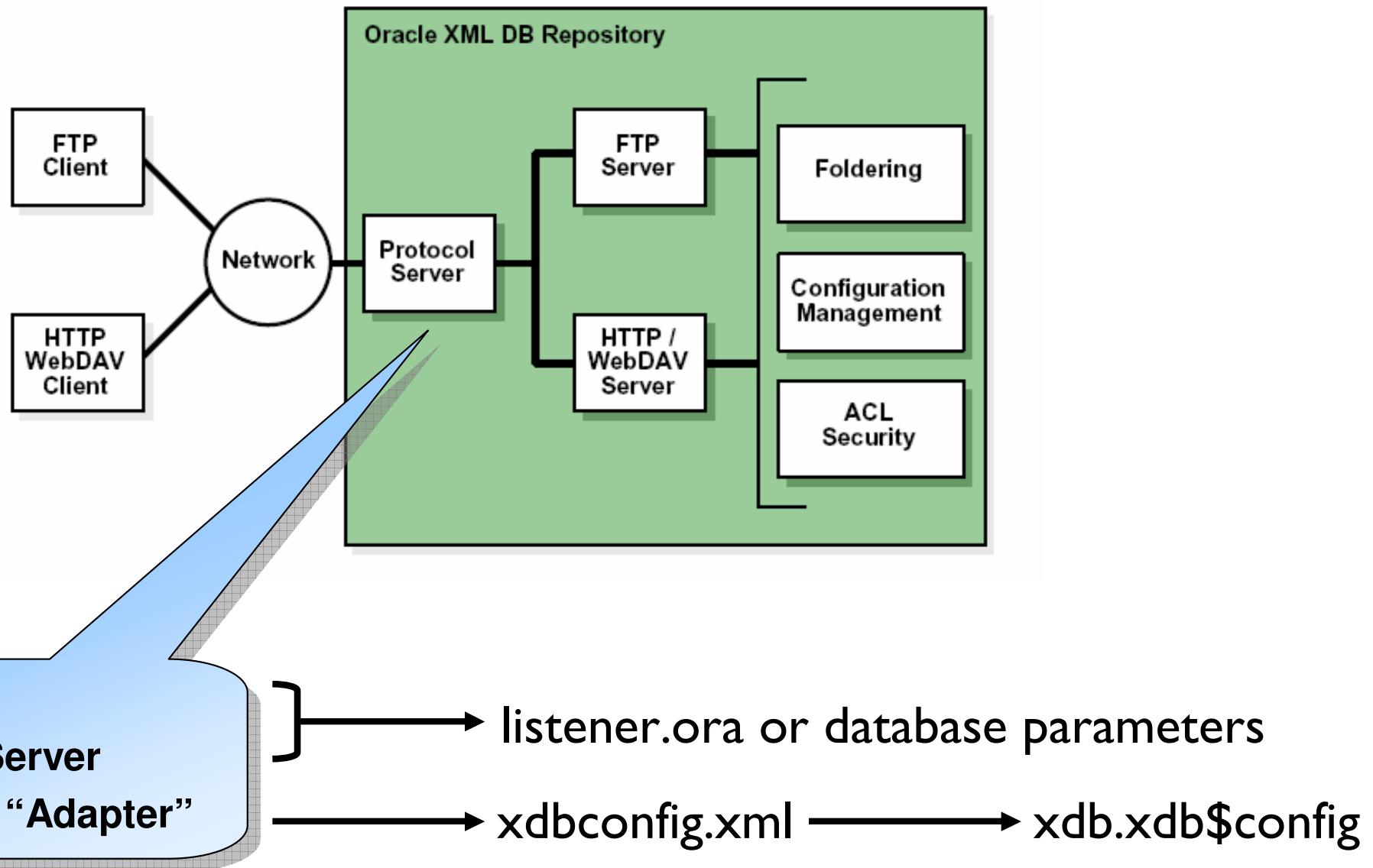


# The Protocol Server

# Oracle XML Database



# Protocol Server - Detail



# Configuration

## ● Shared Server Database Parameters

- LOCAL\_LISTENER = {NOT\_DEFAULT\_LISTENER\_NAME}
- DISPATCHERS = "(PROTOCOL=TCP) (SERVICE={SID}XDB)"
- SHARED\_SERVERS = 5

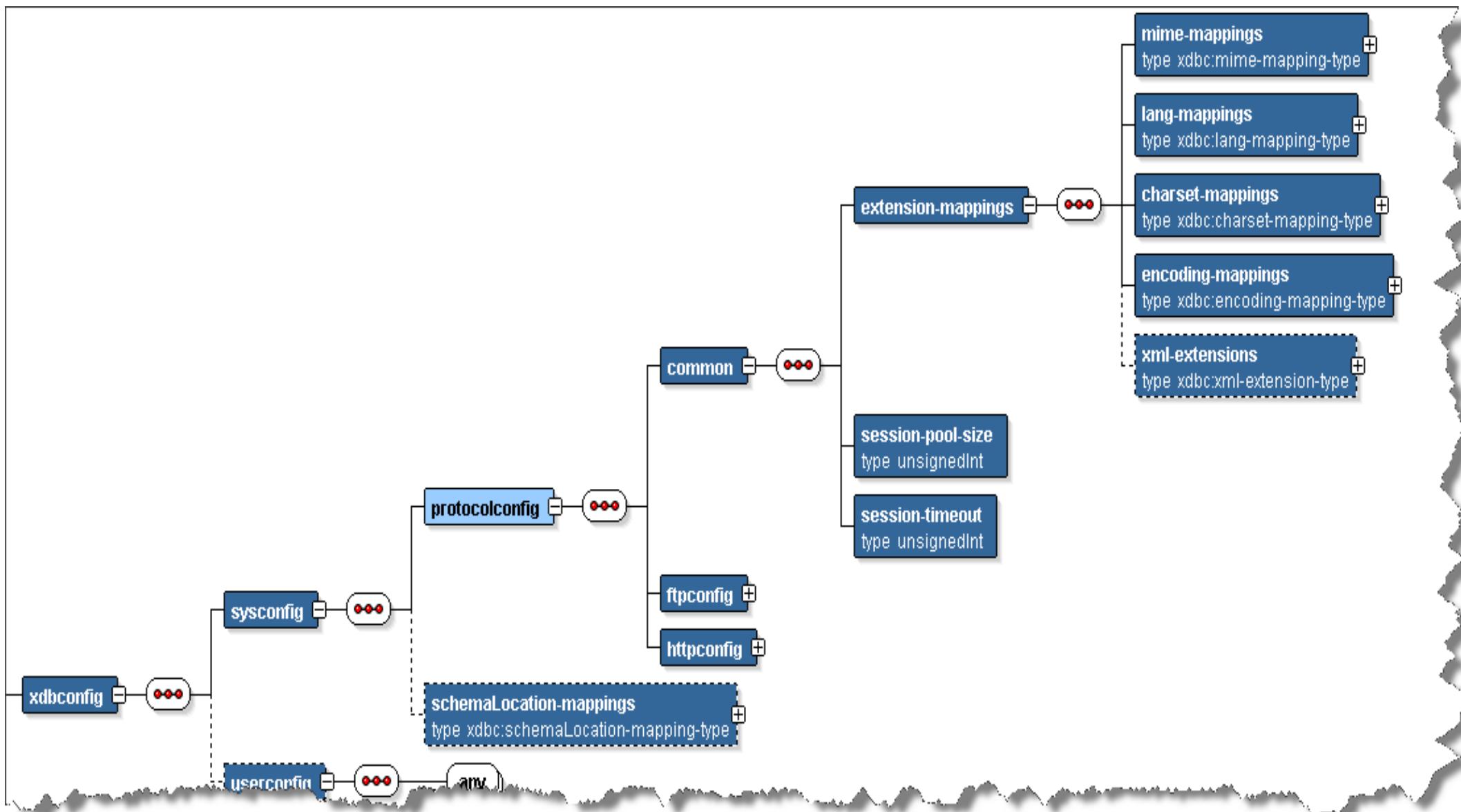
## ● Memory Structure Database Parameters

- JAVA\_POOL (Java Classes, Wrappers)
- LARGE\_POOL (Shared Server)
- PGA\_AGGREGATE\_TARGET (DOM)

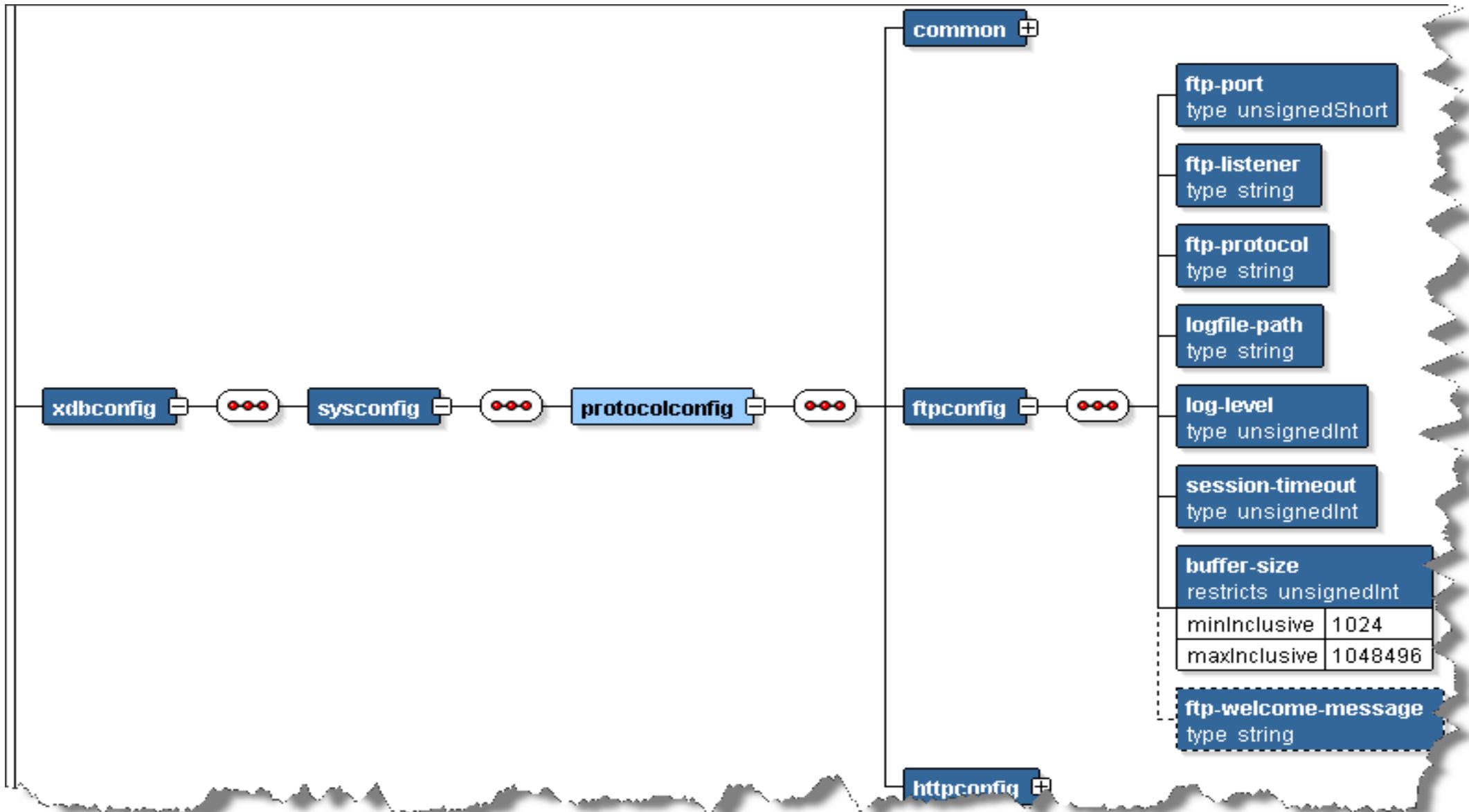
## ● Protocol Server Configuration File

- XDBCConfig.XML → XML Schema: xdbconfig.xsd

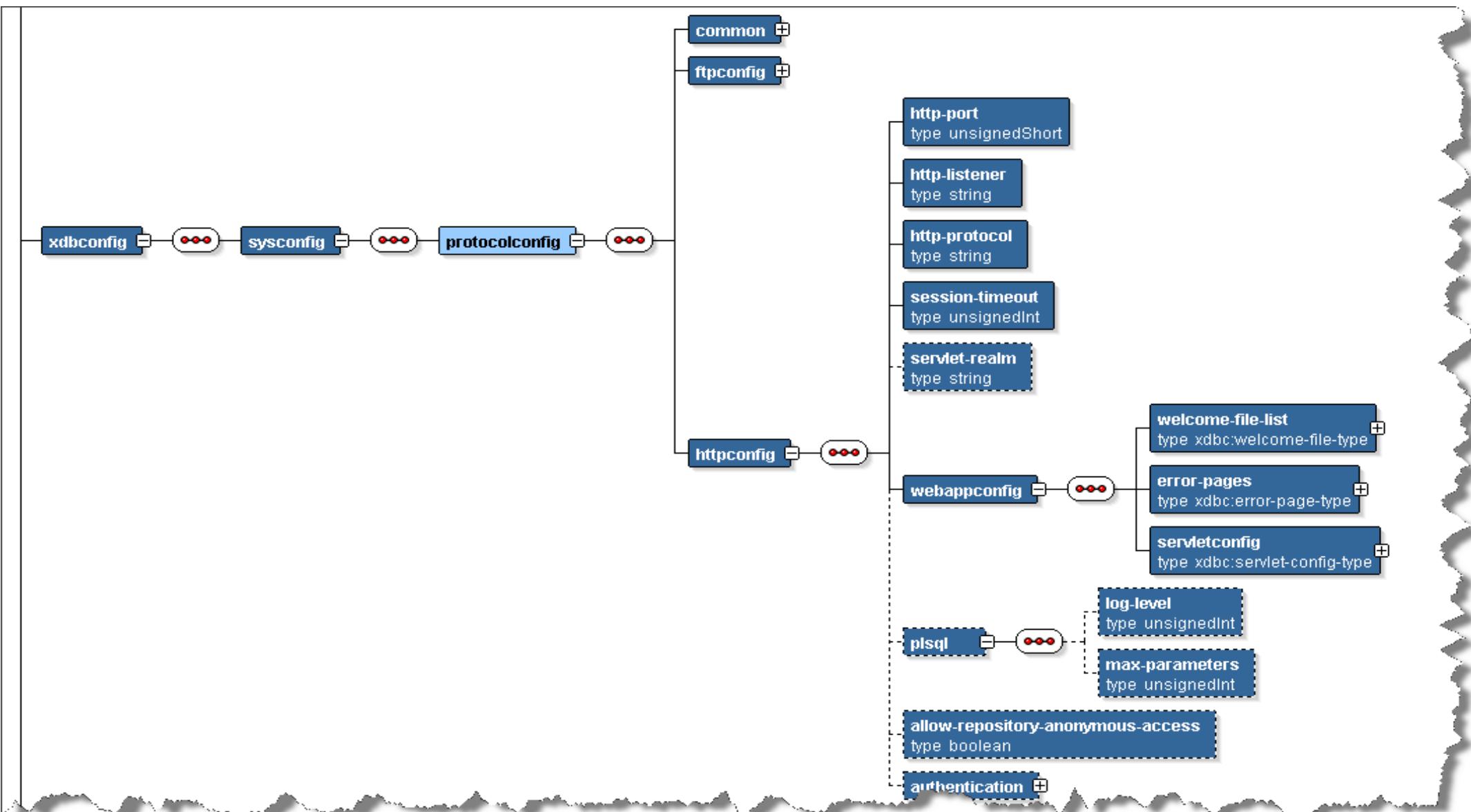
# General Settings (*modified xdbconfig.xsd*)



# FTP Settings (*modified xdbconfig.xsd*)



# HTTP Settings (*modified xdbconfig.xsd*)



# Configuration of XDBCONFIG.xml file

- PL/SQL Control

- DBMS\_XDB.GetHttpPort(), DBMS\_XDB.GetFTPPort()
- DBMS\_XDB.SetHttpPort(), DBMS\_XDB.SetFTPPort()

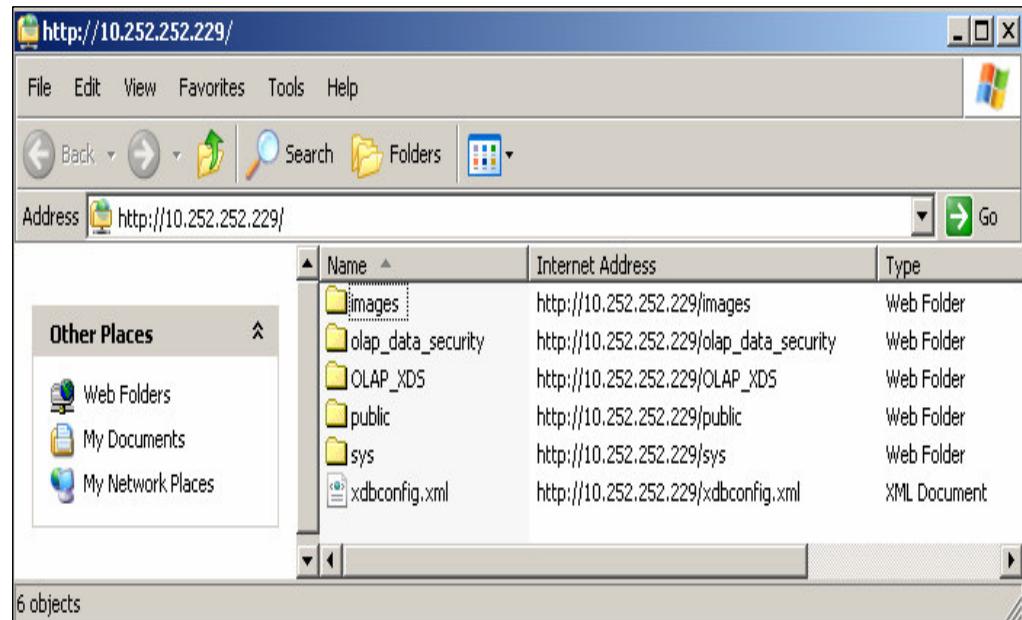
- WebDAV

- XMLSpy
- JDeveloper

- Drag & Drop

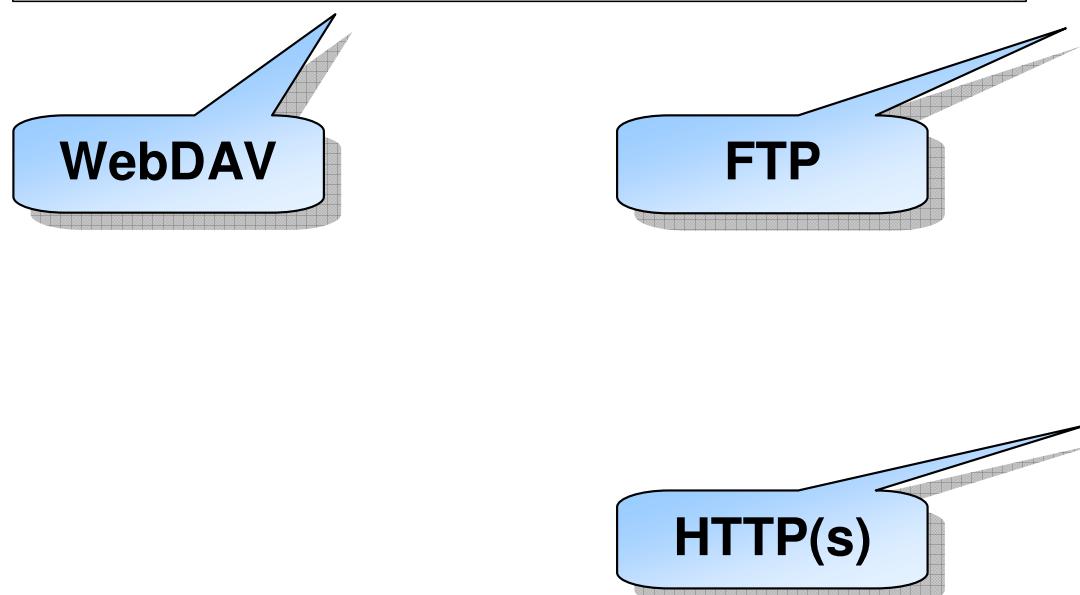
- Notepad
- MS Word

# Protocol Server Access



```
C:\WINNT\system32\cmd.exe - ftp 10.252.252.229
Microsoft Windows XP [Version 5.1.2600]
(C) Copyright 1985-2001 Microsoft Corp.

H:>ftp 10.252.252.229
Connected to 10.252.252.229.
220 UAMISNT01
Unauthorized use of this FTP server is prohibited and may be subject to civil and criminal prosecution.
220 UAMISNT01 FTP Server <Oracle XML DB/Oracle Database> ready.
User <10.252.252.229:<none>>: system
331 pass required for SYSTEM
Password:
230 SYSTEM logged in
ftp> dir
200 PORT Command successful
150 ASCII Data Connection
drw-r--r-- 2 SYS oracle 0 OCT 29 14:59 OLAP_XDS
drw-r--r-- 2 SYS oracle 0 OCT 29 16:01 images
drw-r--r-- 2 SYS oracle 0 OCT 29 14:59 olap_data_security
drw-r--r-- 2 SYS oracle 0 OCT 29 14:39 public
drw-r--r-- 2 SYS oracle 0 OCT 29 14:43 sys
-rw-r--r-- 1 SYS oracle 0 OCT 31 13:46 xdbconfig.xml
226 ASCII Transfer Complete
ftp: 390 bytes received in 0.22Seconds 1.78Kbytes/sec.
ftp>
```



Index of / - Windows Internet Explorer

Name	Last modified	Size
<a href="#">OLAP_XDS/</a>	Mon, 29 Oct 2007 13:59:02 GMT	-
<a href="#">images/</a>	Mon, 29 Oct 2007 15:01:07 GMT	-
<a href="#">olap_data_security/</a>	Mon, 29 Oct 2007 13:59:03 GMT	-
<a href="#">public/</a>	Mon, 29 Oct 2007 13:39:15 GMT	-
<a href="#">sys/</a>	Mon, 29 Oct 2007 13:43:07 GMT	-
<a href="#">xdbconfig.xml</a>	Wed, 31 Oct 2007 12:46:09 GMT	0

# UKOUG01.sql

**DEMO**

# HTTP API's

# Protocol Server HTTP API's

- Your Own...

- Java Servlets, PL/SQL Gateway

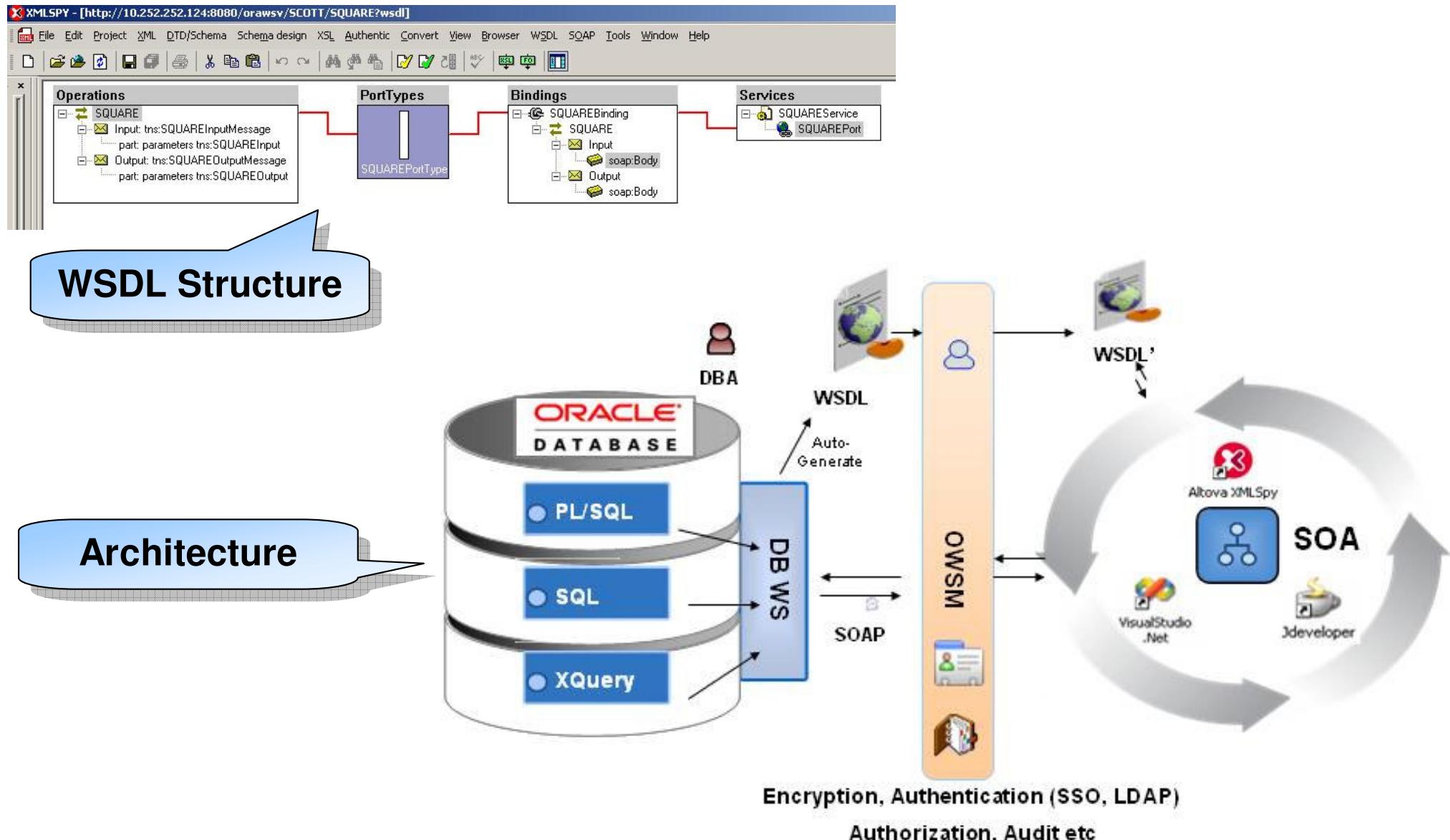
- PL/SQL Gateways

- APEX (/apex/\*) PL/SQL

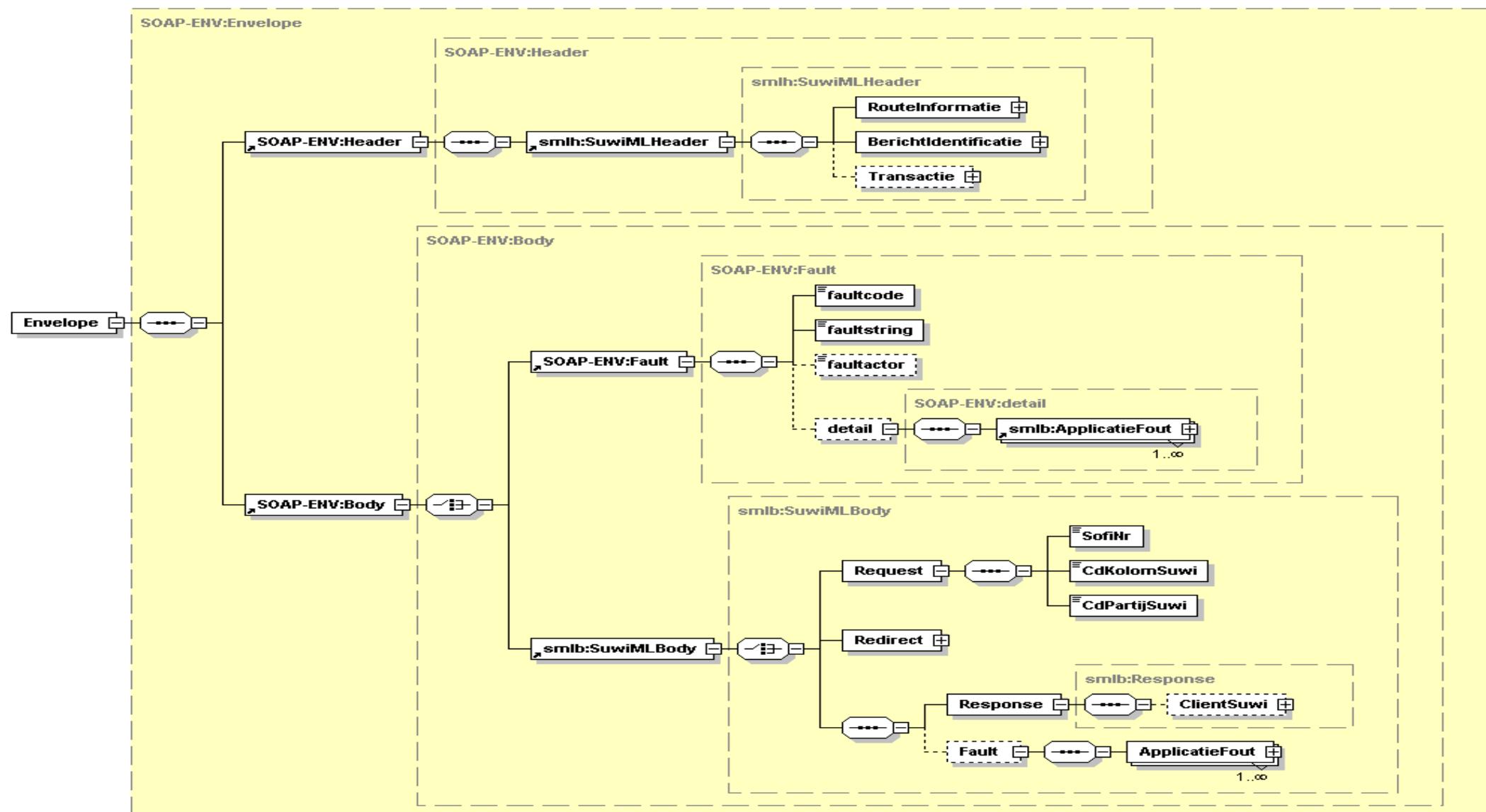
- “Servlets”

- Native Database WebService (/oraws/\*) C
  - ReportFmwkServlet (/orarep/\*) C
  - TestServlet (/Test) Java
  - DBURI (/oradb/\*) C

# Native Database Web Services (NDWS)



# SOAP Envelope and XML Payload



Generated with XMLSpy Schema Editor [www.xmlspy.com](http://www.xmlspy.com)

# Native Database WebService (NDWS)

1. Enable the Protocol Server for HTTP access
2. Enable the **oraws** entry point in **xdbconfig.xml**
3. Create a user and grant access
  - DBMS\_NETWORK\_ACL\_ADMIN
  - XDB\_WEBSERVICES
  - XDB\_WEBSERVICES\_OVER\_HTTP
  - XDB\_WEBSERVICES\_WITH\_PUBLIC
4. Create your procedure
  - For instance a procedure called OBJECTTYPES
5. Test (ukoug02.sql)
  - <http://localhost:8080/home/UKOUG/Examples/ukoug02/>
  - <http://localhost:8080/oraws/SCOTT/OBJECTTYPES?wsdl>



# DBURI Servlet

- Access Any Table or View From a Browser
- DBUriType
- Security is handled via DB roles
- Transformation via XSL
- Query options via XPath Expressions



<http://localhost:8080/home/UKOUG/Examples/ukoug03/>

# URIType's in the Database

# URITypes

- DBUriType
  - Represents an URI that targets database data
  - Tables, Views, etc

- HTTPUriType
  - Represents an URL that starts with http://
  - Uses UTL\_HTTP
  - URL's outside the Database

- XDBUriType
  - Represents an URI that targets a resource in the Repository
  - Files and Folders in the Repository

# HTTPUriType - Google API

```
SQL> SELECT extractvalue(value(t), '/Hostip/gml:name'
  2           , 'xmlns:gml="http://www.opengis.net/gml"
  3             xmlns="http://www.hostip.info/api"'') AS "Name"
  4 ,      extractvalue(value(t), '/Hostip/countryName'
  5           , 'xmlns:gml="http://www.opengis.net/gml"
  6             xmlns="http://www.hostip.info/api"'') AS "CName"
  7 ,      extractvalue(value(t), '/Hostip/countryAbbrev'
  8           , 'xmlns:gml="http://www.opengis.net/gml"
  9             xmlns="http://www.hostip.info/api"'') AS "CAbbrev"
10 ,      extractvalue(value(t)
  11         , '/Hostip/ipLocation/gml:PointProperty/gml:Point/gml:coordinates'
  12           , 'xmlns:gml="http://www.opengis.net/gml"
  13             xmlns="http://www.hostip.info/api"'') AS "Coord."
14 FROM TABLE (XMLSEQUENCE (EXTRACT
  15   (HTTPURITYPE ('http://api.hostip.info/?ip=141.146.8.66').getxml ()
  16     , '/HostipLookupResultSet/gml:featureMember/Hostip'
  17       , 'xmlns:gml="http://www.opengis.net/gml"
  18         xmlns="http://www.hostip.info/api"' ))) t;
```

Name	CName	CAbbrev	Coordinates
Redwood City, CA	UNITED STATES	US	-122.206, 37.5164

# HTTPUriType – Accessing RSS Feeds

```
SQL> SELECT *
  2  FROM XMLTABLE
  3    (XMLNAMESPACES ('http://purl.org/dc/elements/1.1/' AS "MGR")
  4      , '//item'
  5      passing
  6        HTTPURITYPE('http://my.blog.com/blog/?feed=rss2') .getXML()
  7      columns
  8        title varchar2(50)
  9          path '/item/title/text()',
 10        link varchar2(50)
 11          path '/item/link/text()',
 12        publication_date varchar2(50)
 13          path '/item/pubDate/text()',
 14        creator varchar2(50)
 15          path '/item/MGR:creator/text()',
 16        description      varchar2(250)
 17          path '/item/description/text()',
 18        category XMLTYPE
 19          path '/item/category/text()');
```

# XML/SQL Output

TITLE	LINK	PUBLICATION_DATE	CREATOR
-----			
DESCRIPTION	CATEGORY		
-----			

Quering RSS Feeds The XMLDB Way

<http://feeds.feedburner.com/~r/Bloggralikecom/~3/3>

Wed, 25 Jun 2008 16:47:19 +0000

Marco Gralike

Actually this IS old stuff (2006), but it got lost I'

< ! [CDATA[11g]]>< ! [CDATA[Howto]]>



ukoug04.sql

# XDBUriType

- Useful for accessing resources in the XML DB Repository
  - Resources = files and folders
- Helpful during XML Schema and XML Document registration
- Helpful while insert XML document content from the XML DB Repository into XMLType Tables, Columns or Views



ukoug05.sql

# Combining Worlds

# Combining BFileName with XML

- The **bfilename** function returns a BFILE locator for a physical LOB binary file
- Syntax: `bfilename( 'directory', 'filename' )`
- Often used for inserting huge XML documents into the database
- But you can do more with it...

# Selecting XML Data outside the Database

```
SQL> SELECT
  extract((XMLTYPE(bfilename('XMLSTORE','data.xml'),NLS_CHARSET_ID('AL32UTF8'))),'*')
    AS "XDATA"
2  FROM dual;
```

XDATA

```
-----  
<root>
  <id>0</id><info><info_id>0</info_id>
    <info_content>Text</info_content></info>
</root>
```



ukooug06.sql

```
SQL> SELECT xdata
  2  FROM (XMLTABLE('*'
  3           PASSING
  4           (XMLTYPE(bfilename('XMLSTORE','data.xml'),NLS_CHARSET_ID('AL32UTF8'))))
  5           COLUMNS xdata xmltype PATH '/*'
  6           )
```

XDATA

```
-----  
<root>
  <id>0</id><info><info_id>0</info_id><info_content>Text</info_content></info></root>
```

# Using dbms\_xmlDom or dbms\_xslprocessor

- Ways to write to disk

- dbms\_xslprocessor.clob2file
- dbms\_xmlDom.writetofile
- utl\_file
- External tables

- dbms\_xmlDom

- The DBMS\_XMLDOM package is used to access XMLType objects, and implements the Document Object Model (DOM), an application programming interface for HTML and XML documents

- dbms\_xslprocessor

- The DBMS\_XSLPROCESSOR package provides an interface to manage the contents and structure of XML documents

# Saving XML Data outside the Database

```
SQL> declare
2   rc sys_refcursor;
3   BEGIN
4     open rc FOR
5       SELECT * FROM
6         ( SELECT rownum FROM dual connect BY level < 100 );
7      dbms_xslprocessor.clob2file( xmltype( rc ).getclobval( ) , 'STORE', 'anton.xml' );
8    END;
9  /
```

```
SQL> declare
2   rc sys_refcursor;
3   doc DBMS_XMLDOM.DOMDocument;
4   begin
5     open rc for
6       select * from
7         ( select rownum from dual connect by level < 100 );
8     doc := DBMS_XMLDOM.NewDOMDocument(xmltype( rc ));
9     DBMS_XMLDOM.WRITETOFILE(doc, 'STORE/marco.xml');
10 end;
11 /
```



ukooug07.sql

# Repository Events

# Repository Events

- Repository Events are events which get triggered via defined methods on the Repository

For Example:

- creating, deleting, locking, unlocking, placing under version control, checking in, checking out, unchecking out, opening, and/or updating

- Repository Events <> Database Triggers
- Are specially designed to act on Repository actions
- Repository operation can be associated with one or more repository events

# Repository Events

## ● Event Listener

- Java class or a PL/SQL package or an object type
- A repository event listener can be configured for a particular resource or for the entire repository
- It comprises a set of PL/SQL procedures or Java methods, each of which is called an event handler

## ● Event Handler

- Each event handler processes a single event

## ● Resource Configuration File

- Associates a repository event listener with a resource by mapping a **resource configuration file** to the resource (= **folder** or **file**)

# UKOUG08.sql

**DEMO**

# Troubleshooting

# Troubleshooting XMLDB

## ● Use What You Know:

- SET AUTOTRACE ON / DBMS\_XPLAN.DISPLAY
- TKPROF, SQL\_TRACE / EVENTS like 10046 etc.
- Look for errors in Alert{SID}.log and Tracefiles

## ● Schema Registration

- **ALTER session SET events = '31098 trace name context forever'**

## ● Protocol Server

- **ALTER system SET event = '31098 trace name context forever, level 2' scope=spfile**
- Trace files → UDUMP Directory

# Recap

# Recap

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  - DBUri-, HTTPUri- and XDBUriTypes
- Combining Worlds
  - Selecting and Saving of Files Outside the Database
- Repository Events
- Troubleshooting

# References

- Oracle 11g XMLDB Developers Guide
- The XMLDB Forum
  - <http://forums.oracle.com/forums/forum.jspa?forumID=34>
- OTN XML DB FAQ Thread
  - <http://forums.oracle.com/forums/thread.jspa?threadID=410714>
- Technology Blogs
  - <http://blog.gralike.com>
  - <http://technology.amis.nl/blog>
- Thanks to:
  - Mark Drake, Tom Kyte
  - Keith Matthew, Anton Scheffer, Laurent Schneider, Dimitri Gielis

# Questions?

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