



# Oracle BI/Analytics Publisher – Best Practice

Ten things you should know about BI/Analytics Publisher

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# Ten things you should know about BI/Analytics Publisher

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Release Train

# Oracle Publisher - Releases



Naming	Packaging	Application Server	Specific
Oracle XML Publisher	Standalone	OC4J, TomCat, etc.	
Oracle BI Publisher 11g	Part of BI Suite, Trial Edition	WLS	
Oracle BI Publisher 12c	Part of BI Suite		
- Oracle BI Publisher 12.2.1.3	- OBI EE 12.2.1.3	WLS 12.2.1.3	
- Oracle BI Publisher 12.2.1.4	- OBI EE 12.2.1.4	WLS 12.2.1.4	Not installable without BI Suite
Oracle Analytics Publisher	Part of Oracle Analytics Server		
- Analytics Publisher 5.5	- OAS 5.5	WLS 12.2.1.4	
- Analytics Publisher 5.9	- OAS 5.9	WLS 12.2.1.4	
- Analytics Publisher 6.4	- OAS 2022 (6.4)	WLS 12.2.1.4	

How to connect to PL/SQL in the DB ?

# Calling PL/SQL in the Database by Event Triggers

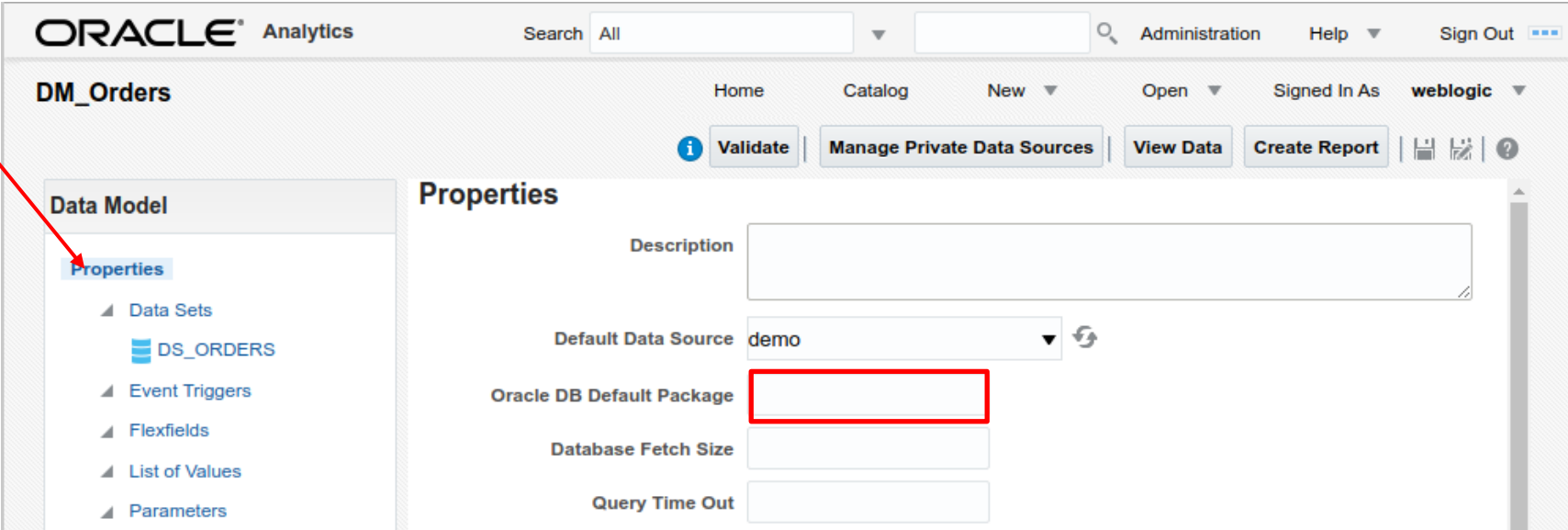
- Execution of Stored Functions in the Oracle DB
- Functions must be bundled into one PL/SQL Package
- Functions must return Boolean datatype
- Interaction between Package Variable and Bind (:name) or lexical Parameter (&name) !!!

## Types of Trigger

Level	Event	Use Case
Data Source	Connecting to database	Set of Context Attributes, Logging
	Disconnecting from database	Reset of Context Attributes
Data Model	Before Data	Dynamic SQL, Temporary Tables, Set of User Context
	After Data	Logging, Notification, Drop of temporary Tables
Schedule	Before a Job is executed	Check if Data exist (SQL Query)

# Data Model-related Packages

- Aggregation of all PL/SQL Functions belonging to a specific Data Model
- Existing Default Package Name for the Data Model forces Declaration of Parameters in Package Spec !!
  - This happens when the Migration Assistant for Oracle Reports was used



The screenshot shows the Oracle Analytics interface for a Data Model named 'DM\_Orders'. The 'Properties' panel is open, and the 'Oracle DB Default Package' field is highlighted with a red box. The interface includes a search bar, navigation tabs (Home, Catalog, New, Open), and a user profile (Signed In As weblogic). The 'Data Model' sidebar on the left lists various components like Data Sets, Event Triggers, Flexfields, List of Values, and Parameters. The 'Properties' panel contains fields for Description, Default Data Source (set to 'demo'), Oracle DB Default Package, Database Fetch Size, and Query Time Out.

# Bind Parameter

- Simple Replacement of Parameter by a Value at Runtime
- Definition of Parameter in Data Model Editor
- Referencing the Parameter in the Query with Colon (:)

```
select ord.order_id, ord.order_mode, ord.customer_id,  
ord.order_status, ord.order_total  
from orders ord  
where ord.customer_id = :p_cust_id
```

- Query must fit to the Parameter Definition !!
- Parameter must be declared in the Package Spec if a Database Package is specified for the Data Modell!!



- Dynamic SQL
- Definition of Parameter in Data Model Editor
- Referencing the Parameter in the Query with Ampersand (&)

```
select ord.order_id, ord.order_mode, ord.customer_id,  
ord.order_status, ord.order_total  
from orders ord  
&where_clause
```

- Parameter must **always** be declared in the Package Spec, i.e. a Package is mandatory !!
- Parameter can get a Value assigned before the Report is executed
  - e.g. global Variable in Package set the Value using the Before Data-Trigger

JDBC or JNDI Data Sources ?

# Analytics Publisher – Database Data Sources

JDBC vs. JNDI

## ■ JDBC

- Connection is defined at the Application Level (Analytics Publisher)
- Various Systems can be accessed as a Data Source
- JDBC Driver is required
- Recommended for Development and Testing

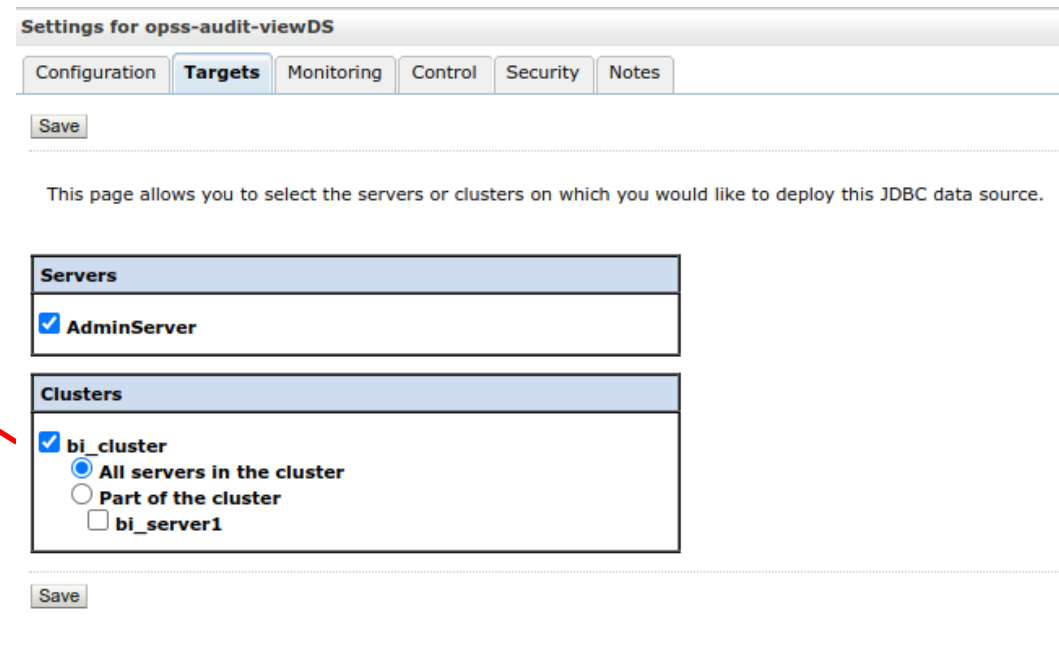
## ■ JNDI

- Connection is defined at the Application Server Level (WebLogic Server)
- Referencing the Data Source by *jdbc/<data\_source\_name>* in Analytics Publisher
- Can use the Connection Pooling of WebLogic Server
- Recommended for Production
- If JNDI is not visible in Analytics Publisher (e.g. in 12.2.5.5)

```
`${BI_DOMAIN_HOME}/config/fmwconfig/biconfig/bipublisher/Admin/Configuration/xmlp-server-config.xml  
<property name="DISABLE_JNDI_DATA_SOURCE" value="false"/>
```

# JNDI Data Source

- Problem:  
Strange Error Message (Syntax Error) when referencing a JNDI Connection
- Solution:  
Targeting of the Data Source to the Managed Server (bi\_server1)



Settings for opss-audit-viewDS

Configuration **Targets** Monitoring Control Security Notes

Save

This page allows you to select the servers or clusters on which you would like to deploy this JDBC data source.

**Servers**

AdminServer

**Clusters**

bi\_cluster

All servers in the cluster

Part of the cluster

bi\_server1

Save

# Word Styles and Table Formatting

# Word Styles and Table Formatting

In Analytics Publisher you can use the Table Formatting Feature of MS Word and MS Word Styles to get a consistent Layout **but ...**

COUNTRY ID	COUNTRY	REGION ID	LOCATION ID	CITY
IT	Italy	1	1000	Roma
IT	Italy	1	1100	Venice
JP	Japan	3	1200	Tokyo
JP	Japan	3	1300	Hiroshima
JP	Japan	3	1300	Hiroshima



Header Style Template Header

ORACLE

**Heading 1 Format**

*Heading 2 Format*

Normal

Conditional Formatting of Analytics Publisher will not work anymore !!

```
<?SAL?><?if:SAL>5000?><?attribute @color;'red'?><?end if?>
```

What happened with my Dates ?

## Problem

- A recorded Date appears on the next Day in a generated Report !

## Cause

- Dates are always Timestamps in the Oracle DB
  - Analytics Publisher Server generates Date Fields in canonical Format (incl. UTC)
  - When the Report is executed the Date will be converted into the Timezone of the Client
  - Check the Timezone Setting of the Account !!
- ⇒ Date can jump to the next Day !!!



# Timezone Conversion between Server and Client

## Solution

- Converting the Date to CHAR in the Query  
(`TO_CHAR(SYSDATE,'DD/MM/YYYY')`)  
or
- Using a Format Mask with Timezone in the Template  
(`<?format-date:SYSDATE;'LONG';'Germany/Berlin'?>`)

Excel Templates can be very useful

# BI Publisher – Excel Templates

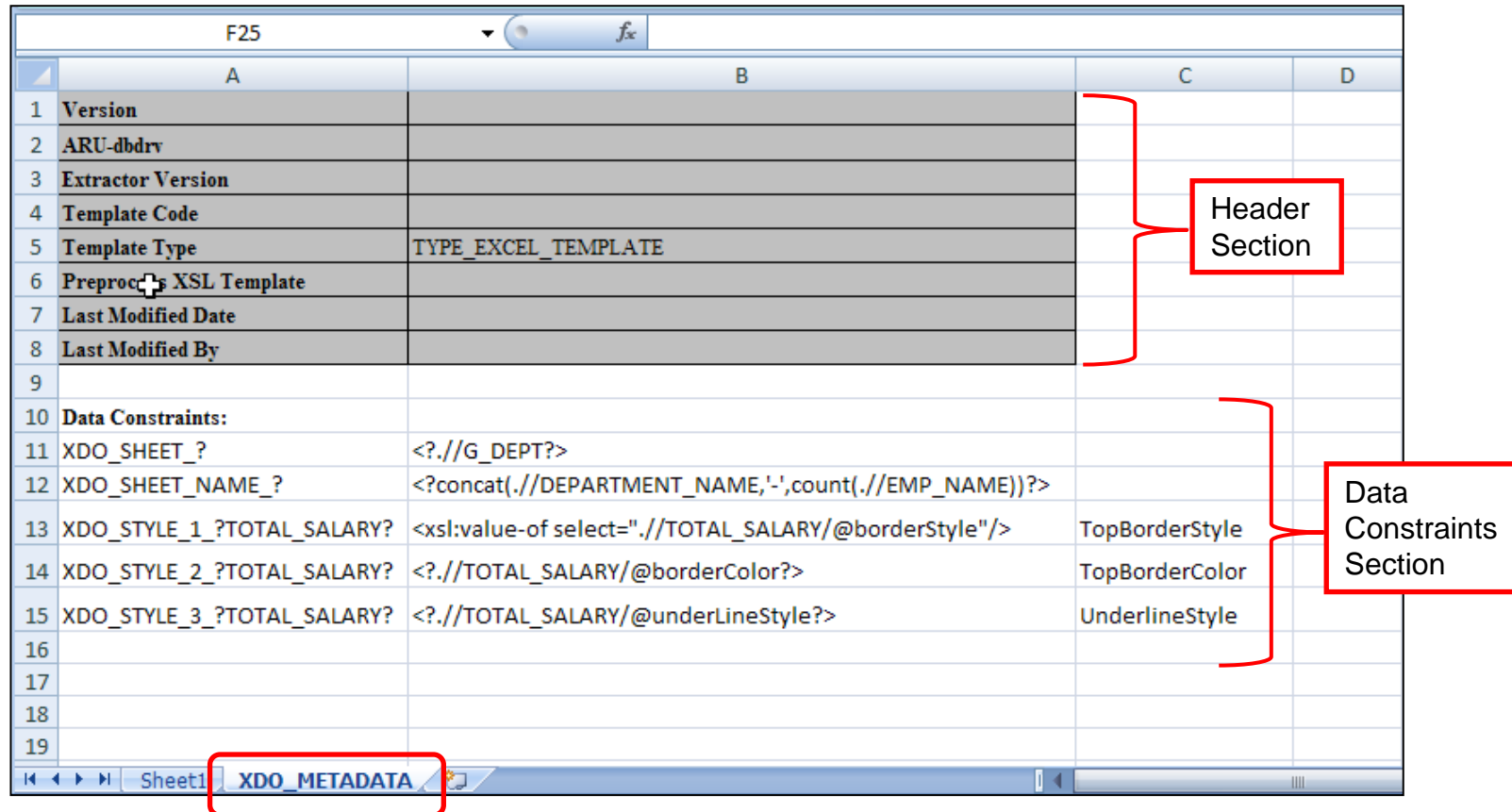
- Excel can be generated from RTF Templates
  - Generates MHTML (Archive Format), Files could be very large
  - Restricted Influence to Layout and Formatting
- Alternative
  - BI Publisher combines XML Data with **Excel Template** to generate Microsoft Excel Files
  - Functions and Macros can be used in Template
  - Works with XLS-Format





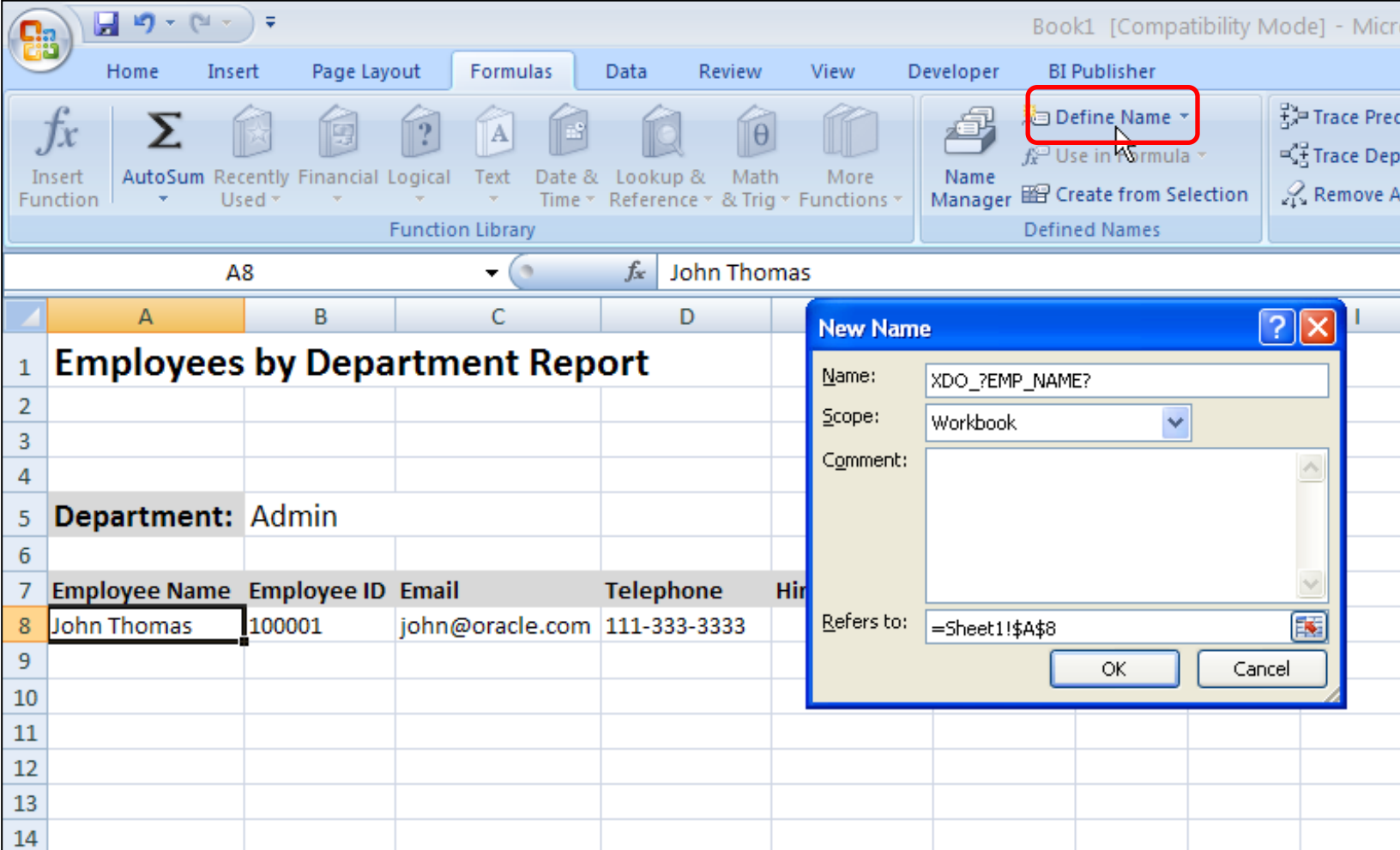
# Create Excel Templates

- Hidden Worksheet XDO\_METADATA



	A	B	C	D
1	Version			
2	ARU-dbdv			
3	Extractor Version			
4	Template Code			
5	Template Type	TYPE_EXCEL_TEMPLATE		
6	Preproc XSL Template			
7	Last Modified Date			
8	Last Modified By			
9				
10	Data Constraints:			
11	XDO_SHEET_?	<?.//G_DEPT?>		
12	XDO_SHEET_NAME_?	<?concat(./DEPARTMENT_NAME,-',count(./EMP_NAME))?>		
13	XDO_STYLE_1_?TOTAL_SALARY?	<xsl:value-of select="./TOTAL_SALARY/@borderStyle"/>	TopBorderStyle	
14	XDO_STYLE_2_?TOTAL_SALARY?	<?.//TOTAL_SALARY/@borderColor?>	TopBorderColor	
15	XDO_STYLE_3_?TOTAL_SALARY?	<?.//TOTAL_SALARY/@underLineStyle?>	UnderLineStyle	
16				
17				
18				
19				

# Excel Templates - Mapping of Data



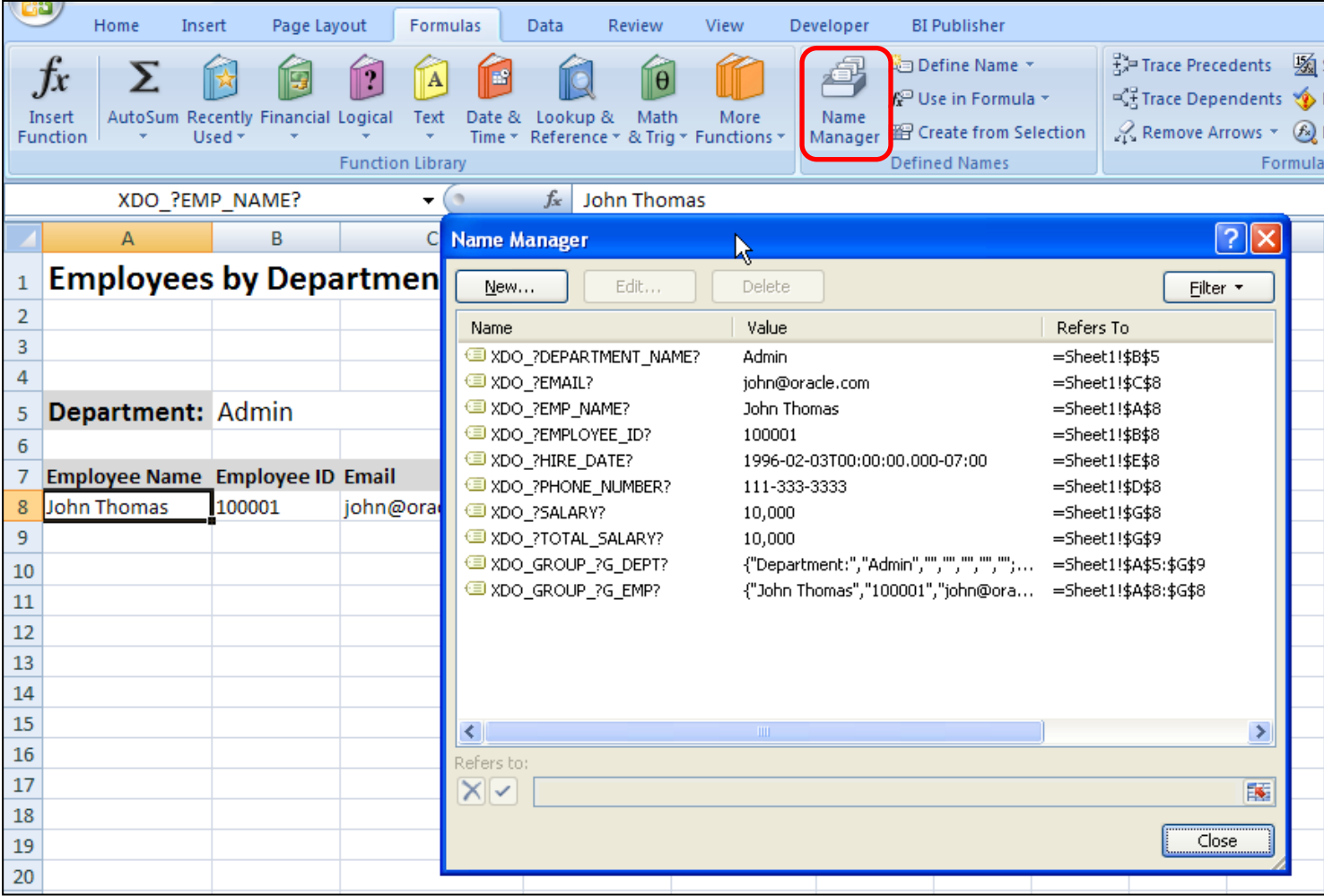
The screenshot shows the Microsoft Excel interface with the 'Formulas' ribbon selected. The 'Define Name' button is highlighted with a red box. A 'New Name' dialog box is open, showing the following details:

- Name: XDO\_EMP\_NAME?
- Scope: Workbook
- Comment: (empty)
- Refers to: =Sheet1!\$A\$8

The spreadsheet data is as follows:

1	Employees by Department Report				
2					
3					
4					
5	Department: Admin				
6					
7	Employee Name	Employee ID	Email	Telephone	Hir
8	John Thomas	100001	john@oracle.com	111-333-3333	
9					
10					
11					
12					
13					
14					

# Excel Templates - Name Manager



The screenshot shows the Microsoft Excel interface with the Name Manager dialog box open. The Name Manager dialog displays a list of defined names, their values, and the cells they refer to. The spreadsheet in the background shows a table with columns for Employee Name, Employee ID, and Email, with the first row containing the data for John Thomas.

Name	Value	Refers To
XDO_DEPARTMENT_NAME?	Admin	=Sheet1!\$B\$5
XDO_EMAIL?	john@oracle.com	=Sheet1!\$C\$8
XDO_EMP_NAME?	John Thomas	=Sheet1!\$A\$8
XDO_EMPLOYEE_ID?	100001	=Sheet1!\$B\$8
XDO_HIRE_DATE?	1996-02-03T00:00:00.000-07:00	=Sheet1!\$E\$8
XDO_PHONE_NUMBER?	111-333-3333	=Sheet1!\$D\$8
XDO_SALARY?	10,000	=Sheet1!\$G\$8
XDO_TOTAL_SALARY?	10,000	=Sheet1!\$G\$9
XDO_GROUP_G_DEPT?	{"Department:","Admin","","","","";...}	=Sheet1!\$A\$5:\$G\$9
XDO_GROUP_G_EMP?	{"John Thomas","100001","john@ora..."}	=Sheet1!\$A\$8:\$G\$8

The spreadsheet data is as follows:

Employee Name	Employee ID	Email
John Thomas	100001	john@ora...

# How to call Publisher Reports (SOAP & REST)?



# Integration of Publisher Reports into Applications

Interface		Besonderheiten
URL (HTTP Call)		<ul style="list-style-type: none"> <li>▪ No scheduled Reports (Jobs)</li> <li>▪ Only synchronized Calls</li> <li>▪ Only without Authentication (Guest-only) or Single Sign-On</li> </ul>
Java API	Java Classes	<ul style="list-style-type: none"> <li>▪ Data Engine</li> <li>▪ Core API</li> <li>▪ Advanced API</li> </ul>
	Servlet, JSP/JSF	
	EJB Session Bean	
Web Service API (SOAP)		<ul style="list-style-type: none"> <li>▪ Lightweight Axis Services (for Technology Customers)</li> <li>▪ Fusion Middleware Services (for Fusion Apps Customers)</li> </ul>
Web Service API (REST)		<ul style="list-style-type: none"> <li>▪ Available with Release 12</li> <li>▪ API seems to be identical to the SOAP Web Service Interface</li> </ul>

- Lightweight Web Services (based on Apache Axis)
  - Report Service .../services/v2/ReportService
  - Scheduling Service .../services/v2/ScheduleService
  - Security Service .../services/v2/SecurityService
  - Catalog Service .../services/v2/CatalogService
- Fusion Middleware Web Services (based on FMW Java Required Files)
  - Public Report Service .../services/PublicReportWSSService
  - Schedule Service .../services/ScheduleReportWSSService
  - Support for Security Policies (WS-Policy, WS-SecurityPolicy)

<https://docs.oracle.com/middleware/12213/bip/BIPDV/webservices.htm#BIPDV110>

# REST Services (JAX-RS)

## Representational State Transfer (REST)

- Based on HTTP
- Objects of Interest are “Resources”
- Resources are identified by URI
- Format of Payloads ist negotiatable
  - Request Header
    - Accept, content-type
  - Media Types
    - "application/xml", "application/json", ...

## HTTP Methods

- GET (Query)
- POST (Create)
- PUT (Modify – Replace)
- PATCH (Modify - Update)
- DELETE (Delete)
  
- HTTP Response Codes are used

# BI Publisher – REST API (1)

- `http://<host>:<port>/xmlpserver/services/rest/...`
- Test using *curl* oder *postman*

HTTP Method	Description
GET	Informations about an Oracle BI Publisher Resource
POST	Create a BI Publisher Ressource Execute a Report
PUT	Update a BI Publisher Ressource
DELETE	Delete a BI Publisher Ressource

*<https://docs.oracle.com/middleware/12213/bip/BIPAP/toc.htm>*

# BI Publisher – REST API (2)

- Steps

- Choose a Method

- Define the URL

http:<host:port>/xmlpserver/services/rest/v1/reports/Samples%2F2.%20Features%2FLast%20Page%20Handling%2FTelecom%20Bill/run

- Set Header Parameters (Authorization, Content-Type, Accept, ...)

- Define Request Body (e.g. Report Parameters)

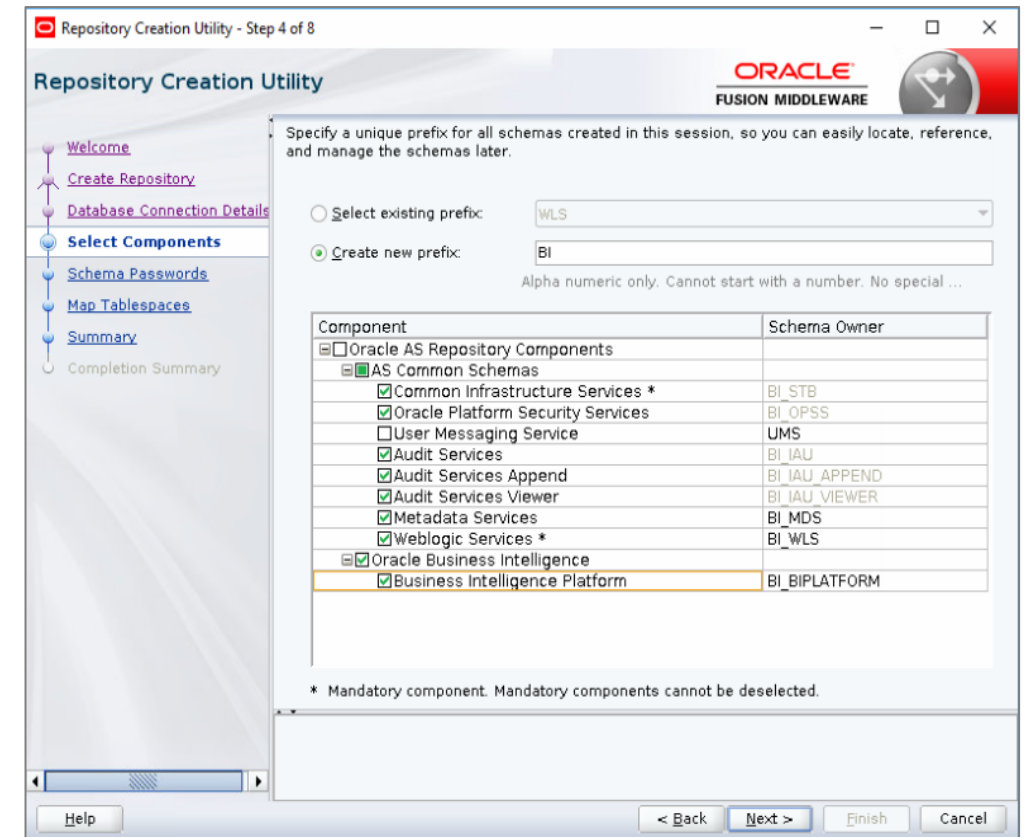
- Submit Request

⇒ Check Response and HTTP Status Code

# The Oracle Middleware Audit Framework









# Fusion Middleware Audit Framework (1)

- Oracle includes an Audit Framework based on Publisher Reports into the Fusion Middleware
- Steps:
  - Configure and activate Auditing in FMW Control (Component, Level, Events)
  - Audit Data will be stored in Metadata Schemata
    - Audit Services
    - Audit Services Append
    - Audit Services Viewer



# Fusion Middleware Audit Framework (2)

- Steps (cont.):
  - Create JNDI Data Source *jdbc/AuditViewDataSource* in BI Publisher
  - Create your own Reports based on this Data Source or use predefined Reports from Oracle
- Download Fusion Apps Reports
  - Correct Schema Name in the SQL Query of Data Model
  - View Columns in View BIPUBLISHER\_V may slightly differ depending from your Release

	<b>BIPCatalogObjectAuditTrailDM</b> undefined Edit More ▼	Last Modified 8/2/22 8:19 PM	Created By weblogic
	<b>BIPReportAuditTrailDM</b> BI Publisher Audit Edit More ▼	Last Modified 8/2/22 8:34 PM	Created By weblogic
	<b>HourlyConcurrencyDM</b> undefined Edit More ▼	Last Modified 8/2/22 8:19 PM	Created By weblogic
	<b>ReportExecutionTimeMetricsDM</b> undefined Edit More ▼	Last Modified 8/2/22 8:19 PM	Created By weblogic
	<b>ReportPerformanceByReportTypeDM</b> undefined Edit More ▼	Last Modified 8/2/22 8:19 PM	Created By weblogic
	<b>ReportPerformanceByReportTypeDM2</b> undefined Edit More ▼	Last Modified 8/2/22 8:19 PM	Created By weblogic
	<b>ReportRunStatisticsDM</b> This is a demo data model Edit More ▼	Last Modified 8/2/22 8:19 PM	Created By weblogic
	<b>ReportRunStatisticsDM2</b> This is a demo data model Edit More ▼	Last Modified 8/2/22 8:39 PM	Created By weblogic

<https://www.oracle.com/technetwork/middleware/bi-publisher/wp-fusionbipauidit-5459609.pdf>



# Using the DB Security Model

# BI Publisher – Security Models

- Different Security Models are available
  - BI Publisher Security `../Admin/Security/principals.xml`
  - **Fusion Middleware** Definition in WLS
  - LDAP Definition in LDAP
  - Oracle E\*Business Suite E\*Business Suite
  - Oracle BI Server Oracle BI Server
  - Siebel Security Siebel CRM
  - Oracle Database Oracle Datenbase

- Tipp:  
Configure local Superuser !



**Local Superuser**

Local superuser can log in to the system independent from the selected security model.

Enable Local Superuser

Superuser name

Password

# BI Publisher Security – Database Security (1)

- Create functional Roles in Database

XMLP_ADMIN	Administrator
XMLP_DEVELOPER	Report Developer
XMLP_SCHEDULER	Schedule of Report Jobs
XMLP_TEMPLATE_DESIGNER	Layout Developer (Templates)
Additional Roles	z.B. Access to specific Folders

- Assign these Roles to othe Roles or Users
- Assign XMLP\_ADMIN to SYSDBA (e.g SYSTEM)

# BI Publisher Security – Database Security (2)

- Configuration of Security Model in BI Publisher
  - Configure Superuser !!
  - Select Security Model *Oracle Database*
  - Specify Connection to Database
  - Specify Credentials for Admin User (e.g. SYSTEM)
- Restart of BI Publisher Server

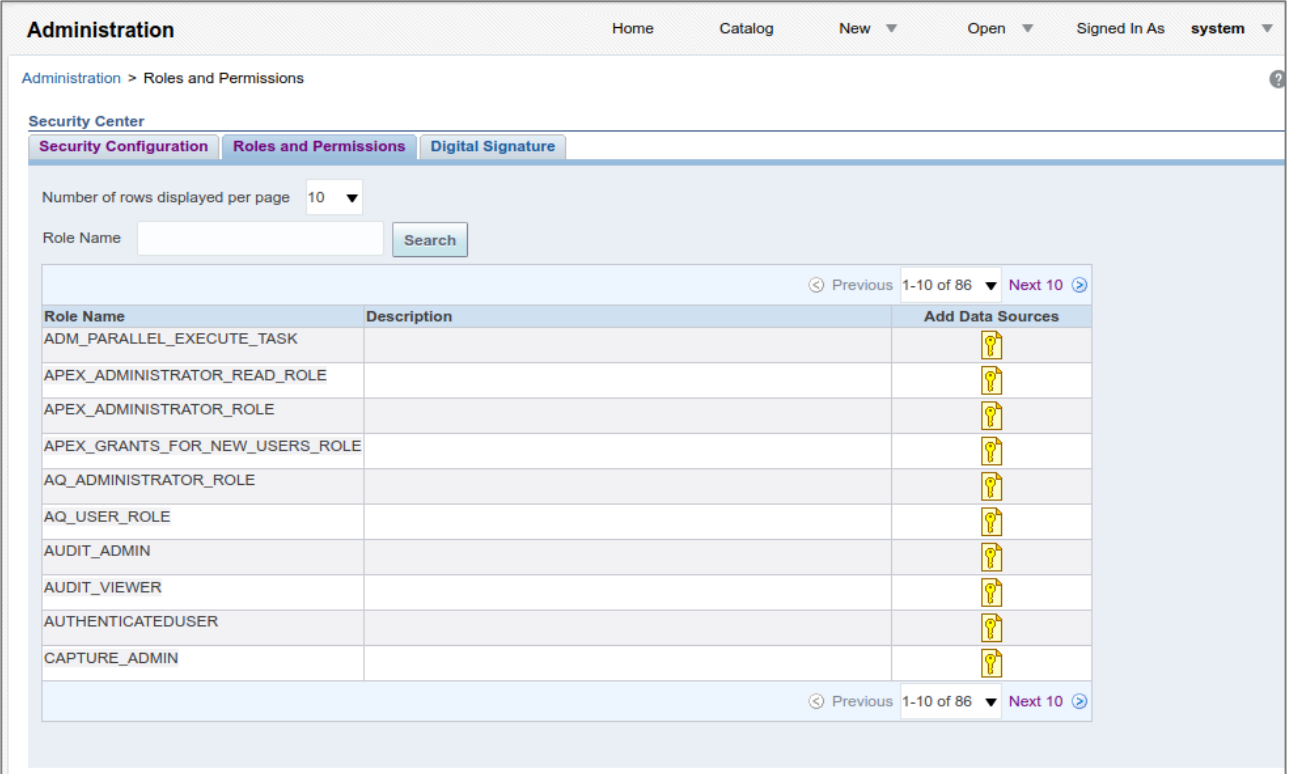


The screenshot shows the 'Authorization' configuration window. It contains the following fields and values:

Field	Value
Security Model	Oracle Database
Connection String	jdbc:oracle:thin:@ora12c:1521/pdb <small>(Example: jdbc:oracle:thin:@example.com:1521:orcl )</small>
Administrator Username	system
Administrator Password	*****
Database Driver Class	oracle.jdbc.driver.OracleDriver <small>(Default Value: oracle.jdbc.driver.OracleDriver )</small>

# BI Publisher Security – Database Security (3)

- Add Data Sources to Roles
  - XMLP-Rollen are suppressed !



Administration Home Catalog New Open Signed In As system

Administration > Roles and Permissions

Security Center

Security Configuration Roles and Permissions Digital Signature

Number of rows displayed per page 10

Role Name  Search

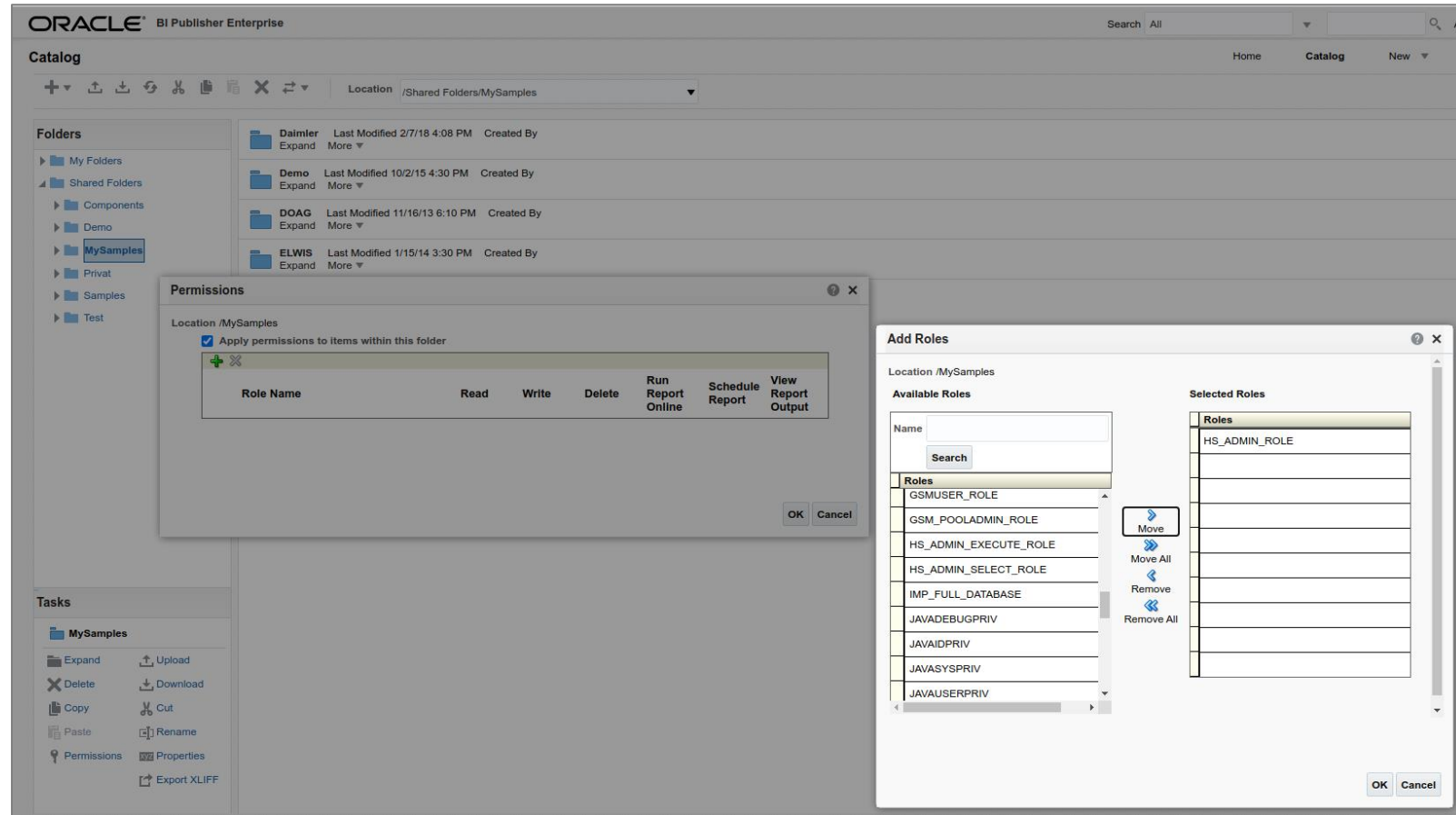
Role Name	Description	Add Data Sources
ADM_PARALLEL_EXECUTE_TASK		
APEX_ADMINISTRATOR_READ_ROLE		
APEX_ADMINISTRATOR_ROLE		
APEX_GRANTS_FOR_NEW_USERS_ROLE		
AQ_ADMINISTRATOR_ROLE		
AQ_USER_ROLE		
AUDIT_ADMIN		
AUDIT_VIEWER		
AUTHENTICATEDUSER		
CAPTURE_ADMIN		

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Previous 1-10 of 86 Next 10

# BI Publisher Security – Database Security (4)

- Hinzufügen von Rollen zu Katalogobjekten (Folder, Berichte)



The screenshot displays the Oracle BI Publisher Enterprise interface. The main window shows a catalog view of folders under the location '/Shared Folders/MySamples'. Two dialog boxes are open over the interface:

- Permissions Dialog:** Shows the location '/MySamples' and a checked option 'Apply permissions to items within this folder'. It contains a table for defining permissions:

Role Name	Read	Write	Delete	Run Report Online	Schedule Report	View Report Output

- Add Roles Dialog:** Shows the location '/MySamples' and a list of available roles. The role 'HS\_ADMIN\_ROLE' is selected and moved to the 'Selected Roles' list.

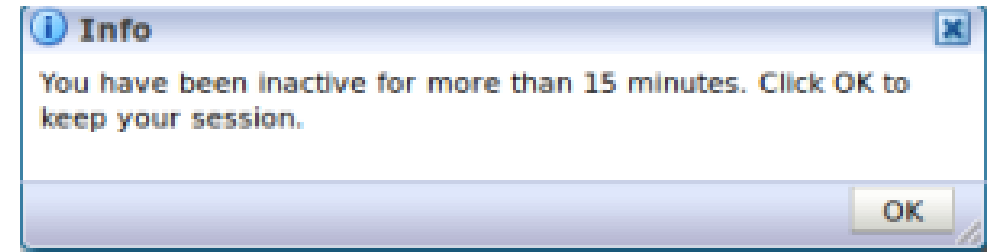
The 'Available Roles' list includes: GSMUSER\_ROLE, GSM\_POOLADMIN\_ROLE, HS\_ADMIN\_EXECUTE\_ROLE, HS\_ADMIN\_SELECT\_ROLE, IMP\_FULL\_DATABASE, JAVADEBUGPRIV, JAVAIDPRIV, JAVASYSPRIV, and JAVAUSERPRIV. The 'Selected Roles' list contains: HS\_ADMIN\_ROLE.

How to Change the Session Timeout ?

# Increase the Session Timeout

Session Timeout hochsetzen

- Session Timeout is set to 20 Minutes per Default
- 5 Minutes before you will get Warnings



- How to increase or deactivate the Timeout ?
  - Relevant Setting in *web.xml* of Application
  - Recommendation: Change the Value by using a Deployment Plan (<https://blog.der-it-macher.de/session-timeout-im-bi-publisher/>)



# Question & Answers

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