

Oracle® Transportation Management

Report Designer's Guide

Release 6.4.2

Part No. E81546-01

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Oracle® Transportation Management Report Designer's Guide, Release 6.4.2

Part No. E81546-01

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Preface

This document is intended for Oracle Transportation Management clients, Oracle Transportation Management System administrators, or Oracle Transportation Management Consultants who have an interest in creating or customizing reports intended for use within the Oracle Transportation Management Application.

Change History

| Date | Document Revision | Summary of Changes |
|-------------|--------------------------|---------------------------|
| 12/2016 | -01 | Rewrote the document. |
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1. Overview

Oracle Transportation Management's (OTM) report infrastructure uses Oracle Business Intelligence Publisher as a report generation component. It enables you to extract data from OTM/GTM, create a template to layout the data in a report, and generate the report to numerous formats. The OTM report infrastructure also enables you to schedule reports and deliver the reports to any delivery channel (email, printer, or store it in a content management system) required by your business. This guide is for report consumers and report designers.

Report Consumer

A report consumer may perform the following tasks

- Run and view reports from within OTM.
- Schedule reports to run at selected intervals and to be delivered via channels defined by your administrators.
- Link the report to a document definition in OTM.
- Configure the report to run on occurrence of an event using agent action.

Report Designer

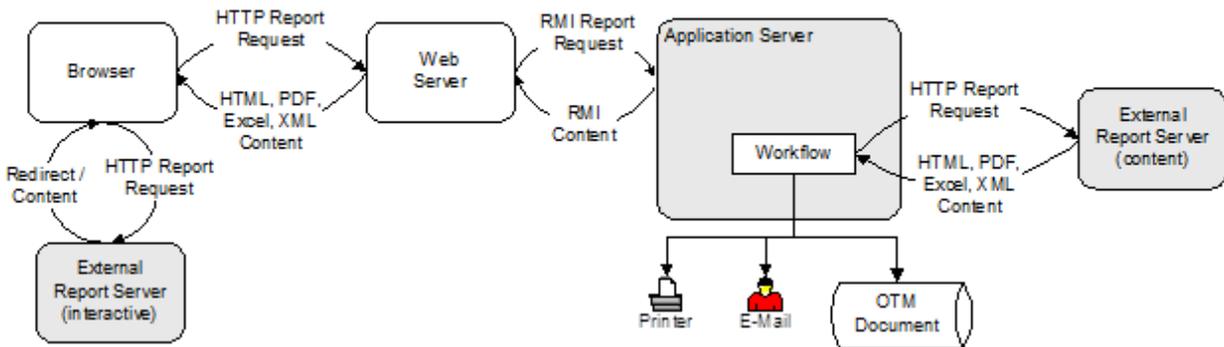
A report consists of a data model, a layout, a set of properties, and a link to the report in OTM. A report designer may perform the following tasks:

- Create the report data model, including parameters and a list of values, using BI Publisher's report editor.
- Design the layout template of the report. The layout can be created using different tools depending on your output requirements, including Microsoft Word, Adobe Acrobat, Microsoft Excel, and Adobe Flex Builder.
- Set up runtime configuration properties for the report.
- Establish a link between OTM reports to BI Publisher's report.

It is strongly recommended that you refer to [BI Publisher Installation](#), [BI Publisher Administration Guide](#), [BI Publisher Report Designer's Guide](#), [BI Publisher User's Guide](#), the [OTM Administration Guide](#), and the [OTM Installation Guide](#) before you proceed with the below guide.

2. Architecture

Oracle Transportation Management supports generation of reports using an external reporting system such as BI Publisher. Report requests are sent via HTTP to an external report server. The report server may begin an interactive session or simply return the report content.



2-1: Reporting Architecture

Report System

Reports in OTM are always associated with a report system type that defines the communication type between OTM and the external report server. The following report systems are supported in Oracle Transportation Management:

- **BI Publisher:** A SOAP request is sent to the BI Publisher service and the SOAP response is parsed for content and errors. It includes details of the BI Publisher Server, such as report path prefix, host, port, and user credentials. These account for format, locale, and VPD user information.
- **Other via HTTP:** Use Other via HTTP for non-BI Publisher integration. It is assumed that the report path is a URL to the report with an optional {report} parameter that is replaced with the report path. This URL report parameter is appended as HTTP request parameters. Each request parameter name matches the name of the report parameter. This includes setting **&P_DESIRED_MIME_TYPE=<requested MIME type>**.

It is strongly recommended that you use BI Publisher as the report system type. This document describes the information pertaining to the BI Publisher report system type.

Report Content

The report content returned by the external report server can be used in different ways within OTM. You have to specify the report content type for each report in OTM. The following types of report content are supported in OTM.

- **Embedded:** Embedded content means that report content returned by the external report server can be distributed to a browser, email, printer, or stored in content management systems without needing links or nested frames. You may, however, get back an HTML page that references other URLs from the report server. If a third party generator returns embedded content, it can be used as a replacement for BI Publisher.

- **Browser Only:** Browser-only content means that report content returned by the external report server will be piped to a browser. Selecting this option lets you optionally include links or fields applicable to report content. OTM does not support distribution or storing of content for this option.
- **None:** This means that report content is not generated and returned by external report server, and an alternative URL link is used to generate the report on the report manager. These reports cannot be transactional as they do not accept business object information from OTM. The standard Run/Schedule links to the report are not supported, nor are the reports included on any action menu. Instead, there is a single Report link in the Third Party Reports section of the Report Manager that directs the browser directly to the third party URL. OTM does not add any implicit or explicit query parameters to the URL.

Report Generation

Report generation in Oracle Transportation Management can be triggered as follows:

- **Ad Hoc Reports:** For ad hoc reports, an HTTP request is sent to a web server which passes the request via Remote Method Invocation (RMI) to an application server. The application server sends an HTTP request to the report server and assumes the response, if successful, contains report content. This content is piped back through RMI to the web server, and then through HTTP to the browser. The content may also be distributed via email, IPP printing, and/or stored with an associated business object.
- **Scheduled Reports:** Scheduled report requests, or requests triggered by a workflow agent, similarly send a HTTP request to the report server. The response content is distributed via email, printed via IPP, or stored with an associated business object.

The scheduling of the reports has nothing to do with the scheduling capabilities of the external report server. The scheduling is OTM's own scheduling which is used for forming the report requests and receiving the response.

Streamlined support is available when generating reports on a remote BI Publisher server or a server farm. Requests are sent directly from the application server to BI publisher via a SOAP web service call. Results or errors are returned by the service.

Important Notes

- All the report content generation only happens on the external reporting server. The support for embedded report content generation within OTM using query and format template has been removed.
- OTM no longer supports the use of the "Use Parameters Operator" on the Report manager. This means reports parameters do not have operators like "Begins With", "Same As", or "Ends With". Instead it is free-form text that you enter.
- Consolidated reports are not supported.
- It is strongly recommended to use the OTM reporting capability only for transactional reports¹. All analytical reports should be generated directly on the BI Publisher server and should not be triggered from OTM.
- By default, all reports are executed with "Use Report Parameter as Bind Variable" as Yes. This change in behavior was done to prevent performance and security issues. Additionally, the parameter operators give the query wild cards, make the query to hard parse, and may not go through indexes properly.

¹ A transactional report is one that is focused on a single business object. A shipment document, such as a Bill of Lading, is an example of a transactional report.

3. Create a New Report in BI Publisher

This section provides general guidelines to design new reports and use them in Oracle Transportation Management. Refer to [BI Publisher Report Designer's Guide](#) for more options and details.

Process Overview

Note: You must be assigned the BI Publisher Developer or BI Publisher Administrator role to create or edit the reports.

Creating a new report consists of the following steps:

1. Create the report data source. Your report data would come from the OTM operational database or archive database.
2. Create the report entry in the desired folder on the **Reports** page.
3. Open the **Report Editor**.
4. Specify the general properties for the report.
5. Define the **Data Model**. Your report data may come from a SQL query, an HTTP feed, a Web service, an Oracle BI Answers request, or a file.
6. Define the parameters that you want users to pass to the query and define lists of values for users to select parameter values.
7. Test your data model.
8. Design the layout template.
9. If you are designing an RTF template, load the data to the Template Builder for Word. Use the Template Builder in conjunction with the instructions in [Creating an RTF Templates](#) to build your report layout.
10. If you are designing a PDF template, follow the instructions in [Creating a PDF Templates](#) to build your report layout.
11. If you are using a predesigned PDF form (such as a government form), follow the instructions in [Creating a Layout from a Predefined PDF Form](#).
12. Upload your templates to the **Report Editor**.
13. (Optional) Add translations for your reports. See [Translating Reports](#).

Data Source

Follow the instruction at [Setting Up Data Sources](#). A typical setup uses the JDBC connection.

You can create a new data source to read the data from OTM. It is recommended that you create two data source as follows:

- OTMOLTP: To connect to OTM OLTP Schema
Data Source Name: **otmoltp**
Driver Type: Oracle **11g**
Database Driver Class: **oracle.jdbc.OracleDriver**
Connection String: **<otm oltp database connection string>**
Username: **globalreportuser**
Password: **<password for globalreportuser>**
- OTMARCHIVE: To connect to OTM Archive Schema
Data Source Name: **otmarchive**
Driver Type: Oracle **11g**
Database Driver Class: **oracle.jdbc.OracleDriver**

Connection String: <otm archive database connection string>
Username: **archive schema user**
Password: <password for archive schema>

Notes

It is highly recommend for security reasons to use the "globalreportuser" database user, provided by default, for the "otmoltp" data source. That user has the minimal rights needed to create and run reports.

- The above data source connections are defined for viewing standard reports and for designing any new reports using the globalreportuser and archive databases schema users.
- When the system connects from OTM, it does not send the same DB credentials that are defined above.
- For Online reports the system sends the database credentials defined by the PRIMARY_THIN data source.
- For Offline reports the system sends the database credentials defined by the ODS data source.
- For Archive Reports the system sends the database credentials defined by the ARCHIVE data source.
- Since the users with which the report is designed and accessed may be different, any custom tables need to be provided with necessary grants. For example, if you are designing an online report that involves any custom table or view (other than the table or view provided by OTM), then you will have to provide grants for the table or view for both globalreportuser and the schema defined by the PRIMARY_THIN data source.
- You will need to provide grants for custom packages if they are used in any of the queries.
- Reports run from BI Publisher server will not have any VPD context applied.
- Reports run from OTM run with the VPD Context of the user running the report.

Report

Create the report entry in the desired folder and specify the appropriate report properties. All sample reports shipped with OTM are created in the **Reports** folder under **Shared Folders**. It is highly recommended to create a **Custom** folder under **Shared Folders** and create all new reports in a separate folder (like Invoice Summary) under **Custom**. This will enable you to move the report artifacts across environments, such as Stage to Prod.

For more information on creating the folders please refer to the section [Creating a Folder or Subfolder](#) in the chapter [Managing Objects in the BI Publisher Catalog](#) in [Oracle® Fusion Middleware User's Guide for Oracle Business Intelligence Publisher](#).

Data Model

A data model is an object that contains a set of instructions for BI Publisher to retrieve and structure data for a report. Data models reside as separate objects in the catalog.

At the very simplest, a data model can be one data set retrieved from a single data source (for example, the data returned from the columns in the employees table). A data model can also be complex, including parameters, triggers, and bursting definitions as well as multiple data sets.

The data model editor is the tool for building your data models.

For more information on the data modeling, refer to the [Oracle® Fusion Middleware Data Modeling Guide for Oracle Business Intelligence Publisher](#).

Utility Packages

OTM provides a number of PL/SQL functions/procedures that can be used in BI Publisher Data Models. Table 3-1 summarizes the available procedures and functions. For more information, please review the `create_rpt` scripts in `OTM_INSTALL_DIR>\glog\oracle\script8`.

| Package | Procedure/Function | Description | Parameters | Returns |
|---------|--------------------|---|---|--|
| vpd | set_user | Sets the user for VPD data security | Oracle Transportation Management user GID | -- |
| | set_user_r | Sets the user and user role for VPD data security | Oracle Transportation Management user GID Oracle Transportation Management user role GID | -- |
| | set_user_fct | Sets the user for VPD data security. Designed for use as the first query in a Data Template | Oracle Transportation Management user GID | true |
| | set_user_r_fct | Sets the user and user role for VPD data security. Designed for use as the first query in a Data Template | Oracle Transportation Management user GID Oracle Transportation Management user role GID | true |
| | get_gl_user | Returns the current user for VPD data security | -- | Oracle Transportation Management user GID |
| | fnc_set_user_r | Sets the user and user role for VPD data security | Oracle Transportation Management user GID Oracle Transportation Management user role GID | true |

| Package | Procedure/Function | Description | Parameters | Returns |
|----------------|---------------------------|---|--|--|
| utc | get_local_date | Converts a UTC timestamp to a location time zone | UTC Timestamp Location GID | Timestamp in the location's time zone |
| | get_utc_date | Converts a local timestamp to a UTC timestamp based on a location time zone | Local Timestamp Location GID | UTC Timestamp |
| | get_time_zone | Returns the time zone for a location | Location GID | Time Zone |
| rpt_general | p_insert_log | Logs a record to REPORT_LOG | Unique Filename Report GID Report Job # User Domain up to 3 (name, value) pairs | -- |
| | f_uom_base | Returns the default storage type for a unit of measure | Unit of measure | Default storage type |
| | f_date_diff | Returns a readable string representing the duration difference of two dates | Ending date Starting date | Duration string |
| | f_remove_domain | Strips the domain from a GID | GID | XID |
| | f_format_address | Returns a formatted address for a location | Location GID | Formatted, multi-line address for the location |
| | f_corporation | Returns the corporation for a location | Location GID | Corporation GID |
| | f_location_refnum | Returns the value of a specific location reference number | Location GID Reference number qualifier | Reference number value |

| Package | Procedure/Function | Description | Parameters | Returns |
|----------------|-------------------------------|--|--|---|
| rpt_order | f_ob_refnum | Returns the value of a specific order base reference number | Order Base GID Reference number qualifier | Reference number value |
| rpt_ship | f_commodity | Returns the commodity name for a specific item | Item GID | Commodity name |
| | f_ob_party_location | Returns the location for a specific order base involved party | Order Base GID Involved party qualifier | Location GID |
| | f_or_party_location | Returns the location for a specific order release involved party | Order Release GID Involved party qualifier | Location GID |
| | f_order_base_gid | Returns the order base associated with an order release | Order Release GID | Order Base GID |
| | f_party_address | Returns a formatted address for an order release involved party | Order Release GID Involved party qualifier | Formatted, multi-line address for the location |
| | f_tender_accepted_by | Returns the carrier that accepted a shipment tender | Shipment GID | Service Provider GID |
| | f_packaging_form_code | Returns the packaging form code for a ship unit specification | Ship Unit Specification GID | Packaging Form Code GID |
| | f_capacity_rate_offering | Returns the rate offering for a capacity usage | Capacity Usage GID | Rate Offering GID |
| | f_capacity_time_period | Returns the time period type for a capacity limit | Capacity Limit GID | Time Period Type |
| f_lane_source | Returns the source for a lane | XLane GID | Source | |

| Package | Procedure/Function | Description | Parameters | Returns |
|--------------|------------------------------|---|--|--|
| | f_lane_destination | Returns the destination for a lane | XLane GID | Destination |
| | f_equipment_type_name | Returns the name for a equipment type | Equipment Type GID | Equipment Type Name |
| | f_sellside_cost | Returns the sell-side cost for a shipment | Shipment GID | Sell-side cost |
| | f_transport_mode_name | Returns the transport mode for a shipment | Shipment GID | Transport Mode |
| | f_get_ship_inv_party_address | Returns a formatted address for a shipment involved party | Shipment GID Involved Party Qualifier | Formatted, multi-line address for the involved party |
| | f_get_country_name | Returns the origin or destination country name for a shipment | Shipment GID 'O' for origin, 'D' for destination | Country name |
| | f_get_pol | Returns the port of lading for a shipment | Shipment GID | Port of lading |
| rpt_invoice | f_party_location | Returns an involved party location on the invoice | Invoice GID Involved Party Qualifier | Involved party location |
| | f_party_address | Returns a formatted address for an invoice involved party | Invoice GID Involved Party Qualifier | Formatted, multi-line address for the involved party |
| rpt_servprov | f_servprov_gid | Returns the Service Provider GID for a particular alias | Service Provider Alias Service Provider Alias Qualifier | Service Provider GID |
| | f_alias | Returns the Service Provider alias | Service Provider GID Service Provider Alias Qualifier | Service Provider Alias |

Table 3-1: PL/SQL Report Functions

Custom Packages and Custom Tables

You should create custom tables and packages in a custom schema. Your DBA will have to provide the necessary privileges to the custom schema for objects which are used by the custom package and owned by GLOGOWNER and REPORTOWNER. Also your DBA will have to provide privileges to OTM schemas (glogdba, globalreportuser) for custom objects as per customization requirements. In addition, your DBA needs to create private synonyms for custom objects in the OTM schemas (glogdba, globalreportuser) and create private synonyms for OTM objects used by the custom packages in the custom schema. Here is brief sample of the SQL statements.

```
CUSTOM_PACKAGE created in CUSTOM_SCHEMA; CUSTOM_TABLE created in CUSTOM_SCHEMA.
Grant execute on custom_schema.custom_package to glogdba;
Grant execute on custom_schema.custom_package to globalreportuser;

-- if package is reading data from shipment and report tables

Grant select on glogowner.shipment to custom_schema;
Grant select on reportowner.report to custom_schema;

Create synonym glogdba.custom_package for custom_schema.custom_package;
Create synonym globalreportowner.custom_package for
custom_schema.custom_package;
Grant select on custom_schema.custom_table to globalreportuser;
Grant select on custom_schema.custom_table to glogdba;
Create synonym glogdba.custom_table for custom_schema.custom_package;
Create synonym globalreportowner.custom_table for custom_schema.custom_package;
```

Parameters

Adding parameters to your data model enables users to interact with data when they submit or view reports. OTM passes standard and ad hoc parameters to the report generator². Table 3-2 summarizes the standard parameters passed to every report.

| Name | Description | Comments |
|---------------|---------------------------------|---|
| P_REPORT_GID | The requested report | External systems are responsible for mapping the Oracle Transportation Management report GID to a valid report. Alternatively, the report URL can embed the mapping within a request parameter. |
| P_DBCONN_TYPE | The data schema | OLTP for the Oracle Transportation Management transactional database; ODS for the offline analytical database; ARCHIVE for the archived data. |
| P_GL_USER | The user requesting the report | This may be used by external systems to enforce VPD data security on report queries. |
| P_ROLE_ID | The role of the requesting user | This may be used by external systems to enforce VPD data security on report queries. |

² If external report generators do not support these parameters, their content type should be set to **None**.

| Name | Description | Comments |
|--------------------|--|--|
| P_DOMAIN | The domain of the requesting user | |
| P_LANGUAGE | The ISO language code requested for the report | For embedded reports, XLIFF translations are automatically applied. |
| P_COUNTRY | The ISO country code requested for the report | For embedded reports, XLIFF translations are automatically applied. |
| P_DISPLAY_NAME | A user-readable name for the report. | |
| P_DATE_FORMAT | The Oracle date format for both input parameters and output fields. | <p>For input parameters, use the <code>TO_DATE(:P_MY_DATE, :P_DATE_FORMAT)</code> function.</p> <p>For output parameters, use the <code>TO_CHAR(field, :P_DATE_FORMAT)</code> function.</p> <p>This should be reserved for fields that are date-only.</p> |
| P_DATE_TIME_FORMAT | The Oracle timestamp format for both input parameters and output fields. | <p>For input parameters, use the <code>TO_DATE(:P_MY_TIMESTAMP, :P_DATE_TIME_FORMAT)</code> function.</p> <p>For output fields, use the <code>TO_CHAR(field, :P_DATE_TIME_FORMAT)</code> function.</p> <p>This should be reserved for fields that have both date and time.</p> |

Table 3-2: Standard Parameters

The above defined list of standard parameters can be used in any of the report you are designing. If you define any of these standard parameters as a parameter for the report, you do not have to define it as a parameter when defining the report in OTM.

You will have to define any other parameter required for the report apart from the standard parameters as a report parameter when defining in Oracle Transportation Management.

Date and Timestamp Handling

Report designers should take special care when writing queries involving DATE columns. This includes:

- Converting date parameters for where clause comparison. All date parameters are sent as strings, formatted according to your date preferences. To compare one to a data field, the designer should use Oracle's `TO_DATE` function, applying the standard `P_DATE_FORMAT` parameter:

```

where accessorial_cost.effective_date > TO_DATE(:P_EARLIEST_DATE,
:P_DATE_FORMAT)
    and accessorial_cost.effective_date < TO_DATE(:P_LATEST_DATE,
:P_DATE_FORMAT)

```

- Converting timestamp parameters for where clause comparison. Like dates, timestamp parameters are sent as strings, formatted according to your date/time preferences³. To compare one to a timestamp field, the designer should use Oracle's TO_DATE function, applying the standard P_DATE_TIME_FORMAT parameter:

```

where shipment.start_time > TO_DATE(:P_EARLIEST_START, :P_DATE_TIME_FORMAT)
    and shipment.start_time < TO_DATE(:P_EARLIEST_START,
:P_DATE_TIME_FORMAT)

```

- Applying date and time preferences. Depending on the use case, designers may want to apply user preferences to dates displayed on the final report. If so, the SQL query should convert selected date and timestamp values using Oracle's TO_CHAR function:

```

select TO_CHAR(accessorial_cost.effective_date, :P_DATE_FORMAT) ...
select TO_CHAR(shipment.start_time, :P_DATE_TIME_FORMAT) ...

```

- Accounting for UTC storage. Nearly all timestamp fields in Oracle Transportation Management are converted to UTC before persisting to the database. A report designer who simply queries shipment.start_time, for example, receives the time in UTC. To convert the stored time to the application or report server's time zone, use the vpd.gmt_offset function:

```

select TO_CHAR(shipment.start_time-(vpd.gmt_offset/24), :P_DATE_TIME_FORMAT)
...

```

- Accounting for UTC storage. To compare timestamp fields to some offset of current time, designers can either convert the field or use vpd.gmt_sysdate. This function returns the current time in UTC. E.g. to query shipments starting in the next three days:

```

select shipment.gid
where shipment.start_time > vpd.gmt_sysdate
and shipment.start_time < vpd.gmt_sysdate+3

```

Layout

The BI Publisher Layout template enables end users to:

- View Dynamic HTML output and perform lightweight interaction with their report data from within a browser.
- Generate high fidelity, pixel perfect reports to PDF, RTF, Excel, PowerPoint, and static HTML.

BI Publisher Layout Templates are created using the BI Publisher Layout Editor - a design tool that provides a WYSIWIG, drag and drop interface for creating pixel perfect reports in PDF, RTF, Excel, PowerPoint, and HTML. It also provides dynamic HTML output that supports lightweight interaction through a browser.

For more information on designing the Layouts refer to [Oracle® Fusion Middleware Report Designer's Guide for Oracle Business Intelligence Publisher](#).

³ Note that the reporting has never applied user time preference. Time preference is assumed to be HH24:MI:SS.

4. Use BI Publisher Report in OTM

This section provides general guidelines to use the newly created report in Oracle Transportation Management. You would need to refer to Oracle Transportation Management online help topics about Reports for more options and details.

Process Overview

Note: You must be assigned the OTM Administrator role to use the newly created report in Oracle Transportation Management.

Using a new report consists of the following steps:

1. Create the report systems that represent the connection to BI Publisher Server.
2. Create the report, by specifying report details like content type, report system, report URL, default format type, report parameters, and other details.
3. Test your Oracle Transportation Management Report.

Report System

The report system is used to define the BI Publisher host, port, user, password, and report path prefix common to all reports sent to that host. Oracle Transportation Management provides a report system named "DEFAULT". This report system uses property macros to substitute property values at run time. These properties facilitate easy move from Stage to Prod BI Publisher instances. The following properties should be configured:

- glog.bip.externalFarm.host=
- glog.bip.externalFarm.port=9704
- glog.bip.externalFarm.user=bipreportuser
- glog.bip.externalFarm.password=
- glog.bip.externalFarm.reportPath=/

Report

The report is used to define the link to BI Publisher report from Oracle Transportation Management by specifying the report path. Additional details that are specified include report system, content type, display format type, report parameters, and other details. You can use "Select via UI" to allow the report to explicitly run as an OTM user.

Report Parameters

Oracle Transportation Management passes standard and ad hoc parameters to the report generator⁴. For more details on the standard parameters please refer to the **Parameters** section under the **Data Model** section of Chapter 3.

The report designer may add additional, ad-hoc parameters to a report using the Report Parameters grid of the Report Manager. Before submitting a report request, you are presented with a list of these additional parameters and must enter information for any marked as **mandatory**.⁵

⁴ If external report generators do not support these parameters, their content type should be set to **None**.

⁵ Note that transactional reports have at least one mandatory parameter matching the business object type. If requested from a transactional manager, the system automatically populates this parameter.

For external reports other than BI Publisher, report parameters are added as HTTP request parameters to the URL.

Data Security

Oracle Transportation Management implements data security via Oracle's Virtual Private Database (VPD). Given a user and their role, the system limits row access to tables. The default VPD policies implement a domain model, where a user's domain determines their read/write privileges. Specific implementations, however, can enhance this model to restrict access based on other columns and grant access across domains.

When running BI Publisher reports from within OTM, VPD security is automatically enforced by the system. The database credentials passed to the BI Publisher web services has the user and role in context, applying VPD policies on any queries that are executed for the report.

External report generators other than BI Publisher, however, have two options regarding data security:

- Suppress it. The standard `glogdba` database user requires a VPD context. If a report logs in as `glogowner`, however, VPD is suppressed. The report queries have access to all data. This may be appropriate for transactional reports where the data is restricted to a particular business object. Alternatively, each report can implement its own data security model independent of Oracle Transportation Management.
- Set the user context before issuing any queries. The `GLOGOWNER.VPD` package provides the following procedures and functions to set the context for VPD:

```
procedure set_user (user VARCHAR2);  
procedure set_user_r (user VARCHAR2, user_role varchar2);  
  
function set_user_fct (user VARCHAR2);  
function set_user_r_fct (user VARCHAR2, user_role varchar2);
```

By passing the standard `P_GL_USER` (and optionally `P_ROLE_ID`) parameter to one of these functions, VPD returns the proper rows.

E.g., a shipment document with one mandatory `P_SHIPMENT_ID` parameter with a `Query Name` of `BUY_SHIPMENT` can be selected from the shipment manager. The `P_SHIPMENT_ID` parameter is automatically populated with the relevant shipment `GID`.

5. Sample OTM Reports

Some sample reports are included as part of the OTM software installation. Since Oracle Transportation Management does not automatically install BI Publisher, loading the sample reports into the BI Publisher repository is a post-installation process. The sample reports are located in the OTM installation in the following directory, where <otm_install> is the directory where OTM is being installed:

```
<otm_install>/otm/
```

The BI Publisher catalog utility enables administrators and report developers to import Reports into the BI Publisher catalog. For more details on this subject, please refer to the "Moving Catalog Objects between Environments" section of the Oracle Fusion Middleware Administrator's Guide for Oracle Business Intelligence Publisher. The following section gives sample instructions used to do the import the reports.

If the Oracle Transportation Management app server and BI Publisher report server are on two different machines, make sure to copy the report artifacts from the app server to a folder on the BI Publisher report server, e.g. temp_otm_reports.

6. Export and Import Reports to BI Publisher Repository

This chapter provides general guidelines on how to move report between environments. One can use the same guidelines to import the sample reports. There are two major artifacts for any report once completely designed.

- Report.xdo files with corresponding configuration files
- Report.xdm files with corresponding configuration files

More detailed explanation of the report artifacts is given in section "[What Files Are Moved](#)" in the chapter [Moving Catalog Objects between Environments](#) in [Oracle® Fusion Middleware Administrator's Guide for Oracle Business Intelligence Publisher](#).

Configure the BI Publisher Catalog Utility

The below steps are provided only for the reference purpose. Please refer to section [Preparing to Use the BI Publisher Catalog Utility](#) in the chapter [Moving Catalog Objects between Environments](#) in [Oracle® Fusion Middleware Administrator's Guide for Oracle Business Intelligence Publisher](#).

Assume [BI Publisher Home] to be the directory where BI Publisher is installed. The following steps and commands are given for Linux machine with bash shell.

1. Make a directory "BIPCatalogUtil" under [BI Publisher Home]/.

```
mkdir [BI Publisher Home]/BIPCatalogUtil
```
2. Go to [BI Publisher Home]/Oracle_BI1/clients/BI Publisher.
3. Extract contents of BIPCatalogUtil.zip in the above location to go to [BI Publisher Home]/BIPCatalogUtil.
4. Unzip BIPCatalogUtil.zip -d [BI Publisher Home]/BIPCatalogUtil
5. Edit xmlp-client-config.xml. This configuration file is located in the BIPCatalogUtil/config directory.
6. Specify the BI Publisher instance URL ("bipurl") and the user name and password of the BI Publisher instance from which you must export or to which you must import.

```
<?xml version="1.0" encoding="UTF-8"?>
<!DOCTYPE properties SYSTEM "http://java.sun.com/dtd/properties.dtd">
<properties>
  <comment>BIP Server Information</comment>
  <entry key="bipurl">http://sta00XXX.example.com:14001/xmlpserver/</entry>
  <entry key="username">OPERATIONS</entry>
  <entry key="password">welcome</entry>
</properties>
```

If you do not want to store this information in the configuration file, then at the time of import/export you can also set the bipurl, username, and password as parameters in the command line to overwrite values defined in xmlp-client-config.xml.

7. Add below variables to your environment

```
export BI_EXPORT_HOME=[BI Publisher Home]/BIPCatalogUtil
export PATH=$BI_EXPORT_HOME/bin:$PATH
export BIP_LIB_DIR=$BI_EXPORT_HOME/lib
export BIP_CLIENT_CONFIG=$BI_EXPORT_HOME/config
```

Add the above commands into your .bashrc file if you are using a batch shell, so that every time a user logs into a shell, these commands are automatically executed.

8. Close the terminal and launch a new Terminal.

Command Line Utilities to Import and Export Report Artifacts

The following commands are used to export and import reports:

Export Command

```
BIPCatalogUtil.sh -exportfolder catalogpath=/[folder-name-to-export]
basedir=[dest-folder-to-place-exported] subfolders=true extract=true
overwrite=true
```

Import Command

```
BIPCatalogUtil.sh -import basedir <temp_otm_reports> /otm/ subfolders=true
overwrite=true
```

<temp_otm_reports> is the directory where the report artifacts are placed.

Other Options to Move the Report Artifacts

For many users and report designers, the command line utilities are difficult to use. They may not have access to the environments where they will have to execute these commands. In such case you can use the Download and Upload tools in the report UI.

For more information on this please refer to the section [Performing Tasks on Catalog Objects](#) and [Downloading and Uploading Catalog Objects](#) in the chapter Managing Objects in the BI Publisher Catalog in [Oracle® Fusion Middleware User's Guide for Oracle Business Intelligence Publisher](#).

7. Intermediate File Persistence

During report generation, content and report files are written to the disk before being distributed. By default, these files have a short lifespan. Once the report is generated, the content file is deleted. Once the report is distributed, the report file is deleted. For troubleshooting, it may be useful to view these files. They can be persisted via the following properties:

| Property | Description | Default |
|---|---|----------------|
| glog.bipreports.content.persist | If true, content files are not removed. | false |
| glog.bipreports.report.persist.browser | If true, report files used for browser views are not removed. | false |
| glog.bipreports.report.persist.attachment | If true, report files used for email attachments are not removed. | false |
| glog.bipreports.report.persist.printer | If true, report files used for IPP printing are not removed. | false |

Table 7-1: Intermediate File Persistence

8. Printing Reports

Oracle Transportation Management supports the printing of reports to an Internet Printing Protocol (IPP) compliant printer with specific support for a Common UNIX Printing System (CUPS) printer.

To add a printer for reports, use the Printer manager⁶. Table 8-1 lists all printer properties, their values, defaults and description.

| Field | Use | Options | Default | Comments |
|----------------|------------------------------|---------------------------------|---------|--|
| Host | IPP host | | | |
| Port | Port number | | 631 | |
| Path | IPP printer path | | | For CUPS servers, this is typically /printers/<printer name>. For Windows servers, this is typically /printers/<printer name>/printer |
| Authentication | HTTP Authentication | None Basic Digest | None | |
| User | HTTP Authentication User | | | |
| Password | HTTP Authentication Password | | | |
| Encryption | Message encryption type | None SSL | None | |
| Character Set | Request character set | | UTF-8 | |
| Language | Request language | | en | This does not define the language of the report, only the language for print logs. |

⁶ Accessed from the main Oracle Transportation Menu via **Business Process Automation > Power Data > Printers**.

| Field | Use | Options | Default | Comments |
|-------------|---------------------------------------|--|-----------|---|
| Orientation | Image orientation on the printed page | Portrait Landscape | Portrait | Orientation can be counter-intuitive when using OS utilities to convert content to Postscript. E.g. CUPS use of gs to convert PDF to Postscript automatically reorients the PDF to landscape if its margins exceed portrait. The IPP orientation property is applied after this conversion. Thus, specifying a Landscape orientation for a PDF report can result in reorienting it to Portrait. On some printers this will print cropped; on others, the user may be prompted to feed special size paper into a manual feed. Generally, explicit orientation should be reserved for Postscript content. |
| Sides | Instructions on two-sided printing | One sided Two sided – Long edge Two sided – Short edge Duplex Tumble | One sided | Duplex = Two sided – Long edge Tumble = Two sided – Short edge |
| # Copies | Number of document copies to print | | 1 | |
| Media | Paper tray/size specification | Tray 1 Tray 2 Tray 3 A3 A4 A5 B4 B5 | Tray 1 | Many printers will force the paper tray based on orientation and content size. |

| Field | Use | Options | Default | Comments |
|------------------|---|---|------------|---|
| Printer Format | Document format expected by the printer | Postscript PDF Text Octet Stream | Postscript | Generally, this should be left at Postscript. For printers with native PDF support it can be set to PDF, especially for those reports or documents with PDF content. |
| CUPS | Set for CUPS servers | | unset | This should be set for CUPS, unset for Windows IPP. CUPS servers provide automatic format support for text, PDF and image (gif, jpeg, png, tiff) content. |
| Use Chunked Body | Set if the IPP HTTP message supports chunking | | unset | |
| Use Full URL | Set if the IPP HTTP message should use a full URL in the request header | | unset | |
| Page Ranges | Page ranges for printing | | all pages | Supports specification of multiple comma-delimited ranges: <ul style="list-style-type: none"> • "3" : only print page 3. • "2-5" : print page 2-5. • "1,3-5" : print page 1 and 3-5. |

Table 8-1 - Printer Fields

Handling Document Formats

To spool general content to an IPP printer, IPP may need to convert the content from a document format into a format understood by the printer. For example, a Postscript printer requires a PDF document be converted before it is spooled to the printer. OTM and BI Publisher support the following type of printers:

- **Postscript:** understands application/postscript documents without conversion
- **PDF:** understands application/pdf documents without conversion
- **Text:** understands text/* documents without conversion
- **Octet Stream:** understands a proprietary document type (e.g. application/ms-word) without conversion

Most IPP and CUPS printers are Postscript printers and all documents must be converted to Postscript before spooling to the printer.

IPP supports the following types of conversions:

- **implicit.** CUPS implementations of IPP automatically convert PDF to Postscript via the pdftops utility. They also support direct rendering of text and image files to the CUPS printer^{7,8}
- **explicit.** By passing a command-line to IPP, the server can apply a caller-specified transformation utility to the document, resulting in printer-compliant content.

To utilize the implicit CUPS format conversions, a CUPS printer should be specified with the CUPS Server box checked. This leverages conversions configured directly in CUPS to map document content to the native printer format.

If your IPP implementation does not support the conversion of a particular document format to native printer format, you must add an explicit conversion via the Printer Conversions power data. These are global conversion utilities, invoked by BI Publisher, to convert your content to something the printer can understand. Each printer conversion represents a command-line utility taking a document input file {infile} to create a printer spool file {outfile}. e.g.:

```
gs -sOutputFile={outfile} {infile}
```

This could be used on a Windows platform to convert PDF documents to Postscript via the Ghostscript open source utility.

If an explicit converter cannot be found to map a document format to printer format, the print request fails.

⁷ OTM uses BI Publisher to interact with IPP. As such, an OTM user cannot directly configure the CUPS printers. Text and image rendering may require tuning via the CUPS printer configuration file (printers.conf). This file allows the user to specify text and image parameters like characters per inch, lines per inch and percent scaling.

⁸ OTM uses BI Publisher to interact with IPP. As such, an OTM user cannot directly configure the CUPS printers. Text and image rendering may require tuning via the CUPS printer configuration file (printers.conf). This file allows the user to specify text and image parameters like characters per inch, lines per inch and percent scaling.

9. BI Publisher 10g Migration

Oracle Transportation Management updated the following reports to BI Publisher 11g.

- BILL_OF_LADING
- DOMESTIC_PACKING_LIST
- INVOICE
- DEMURRAGE_FINANCIAL
- AES_FILING
- CUSTOMER_COMMERCIAL_INVOICE
- PICKUP_SUMMARY
- AWARD_BY_CARRIER
- AWARD_BY_LANE
- BID_ROUND_STATUS
- LTL_LANE_SUMMARY
- LTL_SHIPMENT_HISTORY
- MANUAL_AWARDS_REPORT
- OUTLIER_BIDS
- SAVINGS_BY_LANE
- WINNING_VS_OTHER_BIDS

These reports are available for new installations and systems that were migrated from a version prior to 6.4. However, these reports need to be loaded into the BI Publisher instance installed by the customer.

Migrating from Stand-alone BI Publisher 10g

If you have an existing external BI Publisher 10g instance, you can migrate the existing reports to BI Publisher 11g. Please refer to the [Upgrading Oracle BI Publisher](#) in the [Oracle® Fusion Middleware Upgrade Guide for Oracle Business Intelligence](#) for more details. Particular attention should be paid to the "Post Upgrade Considerations for BI Publisher 11g" section.

Migrating from Embedded BI Publisher 10g

If you are migrating from the embedded BI Publisher, you will need to do more work to migrate existing reports. The SQL queries defined in BI Publisher 10g Data Templates will need to be rebuilt as BI Publisher 11g Data Models. It may be possible to upload the BI Publisher 10g Format Template into the BI Publisher 11g catalog, however it is highly recommended that you re-create reports using the new 11g Layout Template whenever possible. The 11g Layout Template is a WYSIWYG report designer which can greatly simplify report design and maintenance.

In addition to migrating the report itself, it will be necessary to modify the existing Report Registration in Oracle Transportation Management. The follow changes should be made to have a report execute using the external BI Publisher instance.

1. Log into Oracle Transportation Management.
2. Navigate to **Business Process Automation > Power Data > Document Generation > Reports**.
3. Select an existing report.

4. Select the **Report System** created previously. See BI Publisher Configuration section for more detail.
5. Specify the **Report Path** corresponding to the Report in BI Publisher.
6. Click **Finish**.

10. Troubleshooting

When generating a report, errors can occur in BI Publisher. If fatal, an exception is thrown to Oracle Transportation Management. For an ad-hoc report request, the exception is shown to the user; for scheduled or automated reports, it is written to the exception log.

Report Logging

Two types of logging are available to diagnose report issues:

- Oracle Transportation Management logging. The `Report` log ID outputs the major steps of report creation. The `ReportDetails` log ID provides more detailed information.
- BI Publisher logging. The BI Publisher engine maintains a separate logging subsystem to track data generation and transformation progress. Please refer to BI Publisher documentation for more details on this topic

Oracle Transportation Management Logging

As mentioned above, you can enable logging in Oracle Transportation Management by enabling the `Report` and `ReportDetails` log IDs. This logging will can give the details of which report is being accessed and the SOAP request being posted to the BI Publisher external server web service.

The log can be enabled on both the web server and app server. On the web server you will have enable these logs for the log file using the `WEB` log.

BI Publisher Logging

You can enable detailed logging on the BI Publisher server to track what is being done by BI Publisher while generating the report. For more information on the type of log files, the categorization of the log levels, and configuration of the log files refer to chapter 12 [Diagnostics and Performance Monitoring](#) in the administrators guide at [Oracle® Fusion Middleware Administrator's Guide for Oracle Business Intelligence Publisher](#).

Frequently Asked Questions

How do I configure BI Publisher reports in Oracle Transportation Management?

This guide talks about this in more detail. Below are the high level steps.

1. Configure the BI Publisher Data Source.
 - a. Give data source name as `otmoltp`
 - b. Give the database username as `globalreportuser`.
2. Design Report in BI Publisher.
 - a. Define a data model.
 - b. Define a report with layout for the data model.
 - c. Test the report using BI Publisher server directly.
3. Define a report system for connecting to the BI Publisher server or use the report system `DEFAULT` with property macros pointing to `glog.bip.externalFarm.*` properties.
 - a. The bi publisher user with which you created a report and user with which you want to access the report need not be the same. Please refer to [section 2.3 Permission Grants](#) and section [3.8 Configuring Users and Roles](#) in the [Oracle® Fusion Middleware Administrator's Guide for Oracle Business Intelligence Publisher](#).

4. Define the report definition with the report system.
 - a. Provide the report absolute path. This will be the path in the URL for accessing the report from the BI Publisher server.
 - b. Take the Report path prefix defined in the report system into consideration since the absolute path provided for the web service will be a concatenation of the report path prefix and the absolute path given in the report definition.
 - c. Define report parameters. The parameter name should match the parameter name defined for the data model in BI Publisher.

Which database user is used for generating reports?

The application uses the database user pointed by the PRIMARY_THIN data source defined in OTM for generating online reports. Typically it is glogdba.

For generating offline reports which connect to a replicated offline database, the application uses the database user pointed by the ODS data source defined in OTM.

For generating archive reports which connect to an archive schema, the application uses the database user pointed by the ARCHIVE data source defined in OTM.

Another important point to note here is the reports run from the BI Publisher server will not have any VPD context applied. Reports run from OTM run with the VPD Context of the user running the report.

I am upgrading from pre 6.4 releases to 6.4.2. What are the steps I need to follow?

In pre 6.4 releases, reports are generated in two ways:

Embedded Report Generation

A report definition is linked to a data template (query template) and the format template. Using the Java API provided by the BI Publisher we used to generate the reports with in OTM. This was available from release 6.1 to 6.3.7.

In this case we used to have a data template or query template which used to generate the structured data i.e. xml data and a format template which defines the layout of the report.

When upgrading from 10g to 11g reports one will have to understand the changes made to the report architecture. The following link provides more details on the upgrade from 10g to 11g.

https://docs.oracle.com/middleware/11119/core/FUGBI/upgrade_bip.htm#FUGBI308

Follow the steps given under section 6.5.2 for migrating the data templates to data models given in the below link

https://docs.oracle.com/middleware/11119/core/FUGBI/upgrade_bip.htm#FUGBI589

In step 4, please use the Upgrade E-Business Suite Data Template Directory option to specify the path of the data templates to be upgraded.

You can use the same format template as before provided the path to access the elements are same as before.

Using the data model and format template you will have to create a BI Publisher 11g report.

Integration with External BI Publisher Stand Alone Server

Integration is provided with a standalone BI Publisher report server which has the report artifacts (data template and format template). OTM will call into the stand alone server using web services and get the report.

The following link provides details on BI Publisher upgrade.

https://docs.oracle.com/middleware/11119/core/FUGBI/upgrade_bip.htm#FUGBI308

Can I use the data template and format template I have in pre 6.4 releases for reports in 6.4.2?

No. Please follow the steps outlined in the section **"I am upgrading from pre 6.4 releases to 6.4.2. What are the steps I need to follow?"**

Can I use Parameter Operators in 6.4.2?

No. Every report defined in 6.4.2 or migrated to 6.4.2 is assumed to be a report with parameters being used as bind values. If you have reports with parameter operators, you should migrate these reports to use the parameters as bind values.

Can I use configure consolidated reports?

In pre 6.4 releases the consolidated reports are used to run the report for multiple business objects using the One Of operator. These reports are used only when using the Run Report web action. Since the parameter operators are deprecated, this functionality will not work in 6.4.2. It is assumed that all of the reports configured with OTM are transactional reports. So any use of consolidated reports is currently not supported.

Why do I get Invalid format requested error when trying to view selected format of the report?

After designing the report and registering it with OTM, when trying to generate the report for a particular format, if there is an error like:

```
oracle.xdo.webservice.exception.OperationFailedException:  
PublicReportService::generateReport for reportAbsolutePath  
[/Reports/pickup_summary/pickup_summary.xdo] failed: due to  
oracle.xdo.servlet.data.DataException: Invalid format requested: excel2000  
[000717] Invalid format requested: excel2000
```

This is because the report is not enabled for the format being requested.

Follow the steps as per the below link.

https://docs.oracle.com/middleware/11119/bip/BIPRD/create_report_new.htm#valid_output

How do I send multiple values for a parameter of the report?

Follow the steps as per the below link

https://docs.oracle.com/middleware/11119/bip/BIPDM/add_params_lovs.htm#BIPDM310

When defining a new parameter enable the check box for Text field contains comma-separated values.

How do I move report artifacts from one server to another?

Once a report is designed in the test environment, we will want to move the report from test environment to production environment.

Please follow the steps as outlined in chapter 6 of this guide.

Why do I get Proxy Error or Remote timeout issues?

When generating reports, you might run into some timeout issues based on the performance of the report. For this you will need to understand how OTM generate the reports.

For ad hoc reports:

1. First the request is made from Oracle Transportation Management web server to app server.
2. The app server prepares a SOAP request and sends it to the external BI Publisher server over HTTP.
3. The report is generated in the BI Publisher server and the content is read using the web service SOAP response in the app server.
4. This response is then piped back to from app server to web server and piped to the web server.

In this case, there can be timeouts that can occur with the request from app server to BI Publisher server. There can be a timeout that can occur between the web server and app server. The reason can be a network issue or it can be because of the performance of the report that it is taking a lot of time to generate the report.

For scheduled reports,

1. The app server prepares a SOAP request and sends it to the external BI Publisher server over HTTP.
2. The report is generated in the BI Publisher server and the content is read using the web service SOAP response in the app server.
3. This response is then piped back to from app server to web server and piped to the web server.

In this case, the timeout can occur between the app server and the BI Publisher server.

Why do I get OutOfMemoryError: Java heap space?

Oracle Transportation Management is integrated with BI Publisher to send the report requests and receive the generated output as response. OTM is not equipped to manage very large responses that can be received from the BI Publisher server. Typically OTM assumes that transactional reports which tie to one business object are configured.

If analytical reports are configured, these reports can return a large amount of data which in turn can occupy the space in the java heap and can lead to OutOfMemoryError.

While OTM can receive a small amount of data for the transactional reports, it may not have enough space to handle the large amount data that can be generated in case of analytical reports.

It is recommended that you use transactional reports within OTM for this reason. The analytical report can still be used by leveraging the BI Publisher report server capabilities.

How do I view all of the scheduled reports?

Use the menu link **View Scheduled Jobs** at **Business Process Automation > Reporting > View Scheduled Jobs**.

Use **Business Process Automation > Reporting > View Completed Jobs** to view the report jobs which were generated during the scheduled period.

Note that the scheduling that happens in the application has no relation with the scheduling that BI Publisher provides. OTM uses the BI Publisher server only to send the report generation SOAP requests.

Scheduled reports are not being received as emails, what should I check?

A scheduled report, even though it got generated, can back up on the mail queue in the application if the mail queue does not have enough threads to process the queued items. The report once generated will be queued up for email processing. The queue used for this is "transport - SMTP". Check the number of threads given for this queue and check the backlog on this queue. If there are backlog items on the queue, please increase the number of threads for this queue using the following property.

```
glog.process.threadGroup.mail
```

By default it has a value of 1. Please increase this value but do not increase it to a high value which will result in burdening of the mailing system.

Why are scheduled report received as a link and not as an attachment?

Read the online help for Security Level that can be configured for each of the report.

Even if the security level allows you to attach, there is a limit of size of the reports which can be attached. The property that governs this is

```
glog.notify.report.maxPdfSize
```

You should also check the property

```
glog.mail.maxContentSize
```

This property defines the maximum content of the email size. So if you decide to increase the first property you should check that the limit does not exceed the second property.

How do I generate reports with a bar code?

For information on how to create reports which need to print barcodes, please refer to the "Using the Barcode Fonts Shipped with BI Publisher" section in the "Oracle Fusion Middleware Report Designer's Guide for Oracle Business Intelligence Publisher".

https://docs.oracle.com/middleware/11119/bip/BIPRD/create_rtf_tmpl.htm#BIPRD2587

Why does the report give me the same output for the same set of parameters even though I change the user?

When a report is designed in BI Publisher, you need to pay attention to the caching properties of the reports. If the caching is enabled when you have the same set of parameter the report can be cached for a certain period of time. Please refer to the following link for more details.

https://docs.oracle.com/middleware/11119/bip/BIPRD/create_report_new.htm#BIPRD2125

Though it is a different application user, the report has no way of telling that it is different user unless, the user is also defined as one of the report parameters.

How do I disable report caching?

Please refer to the section "Why does the report give me the same output for the same set of parameters even though I change the user?"

11. Additional Resources

Oracle Business Intelligence Suite Enterprise Edition Documentation Library:

- http://download.oracle.com/docs/cd/E10415_01/doc/nav/portal_booklist.htm

A BI Publisher developer's diary

- <http://blogs.oracle.com/BIDeveloper/>

BI Publisher Forum

- <http://forums.oracle.com/forums/forum.jspa?forumID=245>

