

IBM® Tivoli® Software

Maximo Asset Management

External Report Integration

76 Releases

IBM

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REVISION HISTORY

Date	Version	Revised By	Comments
February 2015		PD	Initial Release

1 External Report Integration (ERI)

Each business has unique requirements which impact your reporting needs. These needs may be driven by your industries, regulatory issues or by your own internal standards. Regardless of the reason, IBM's Maximo Open reporting architecture enables you to utilize your reporting tool of choice.

Maximo's report options available to you include the embedded reporting tool, along with report integration options. While the embedded reporting tool will enable you the deepest level of report system level functionality, integrated reporting options enable you the greatest flexibility in using your reporting tool of choice.

You can choose to use any combination of these reporting tools. You may want to use the embedded reporting tool for the large number of reports delivered out of the box and its deeply embedded application functionality, while also using an integrated reporting tool for your custom report needs.

This document details one of the report integration option known as ERI or External Report Integration. ERI enables you to use your reporting tool of choice, and is not report system and report version dependent.

Additionally, ERI enables your users to access the external reports directly from the Maximo applications. Users can see the list of external reports they have access to, select them, and execute them against either the application query (launch in context) or via user inputted parameters. This saves users considerable amount of time and errors as they do not have to log into a separate reporting portal, find their report, and then re-enter parameter values before executing.

The balance of this document will delve into the details of the integration, including how to enable the integration, and how to administer the external reports – including setting security access. Also, what features are and are not enabled, along with a list of frequently asked questions is provided.

Finally, throughout this guide, the following terminology will be used

V76 = Maximo Version 76 Products and Releases

External Report Server or Report Server = The report server you have selected to integrate Maximo with

2 Overview

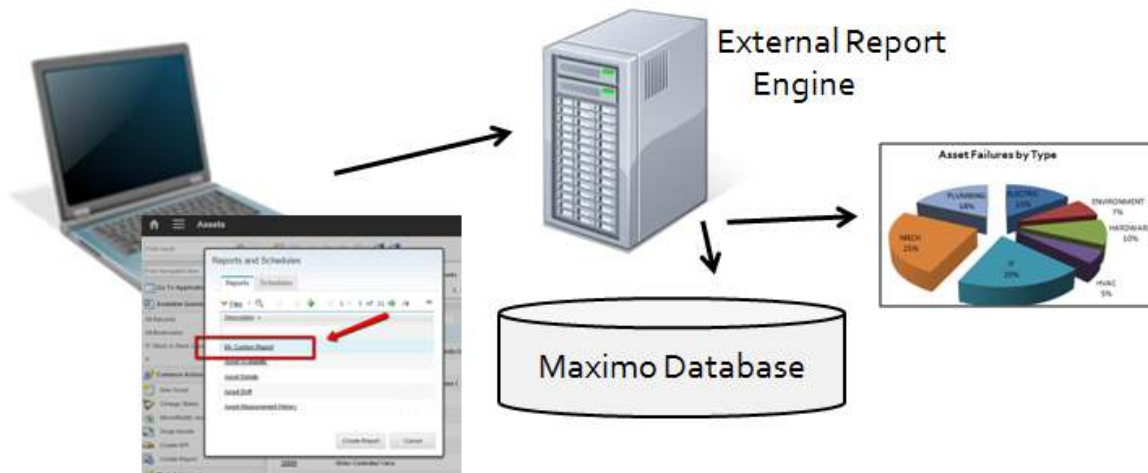
As noted above, the ERI enables you to integrate your reporting tool of choice within Maximo. The diagram below depicts this architecture at a very top level. A Maximo User signs into Maximo and sees a list of the external reports that they have access to. They select a report, and Maximo pushes user and report specific information to the External Report Engine. This engine pulls data from the Maximo database and displays the selected report

The key component to this integration is that the report server is integrated within Maximo. The user accesses Maximo – and then Maximo directly communicates with the External Report Server.

This integration is enabled in two key ways.

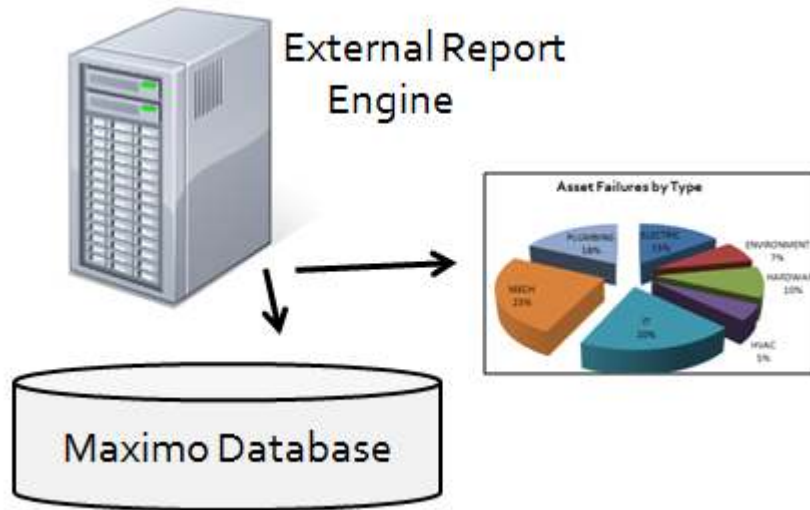
First, the external reports are registered in Maximo's Report Administration application. This enables them to be visible and accessed within the various Maximo applications.

Secondly, a direct launch to the report server is enabled from Maximo. This occurs by passing critical report information from Maximo to the report server url specified in a maximo property file.



The ERI is best suited when you want your users to directly access all of their reports from within the various Maximo applications. If accessing your external reports from within the Maximo applications is not critical to you, you may want to use the ODP (Open Database Platform) option instead.

With the Open Database Platform, you do not utilize the Maximo Framework to execute reports. Report execution is done directly from the user's machine by logging into the separate report server/software. With this simplified process, the user can execute any number of reports directly against the Maximo Database. However, with this approach, your users would not have visibility to these reports from within the various applications, and can not execute these reports via a Launch in Context.



Additional details on all of the reporting options in Maximo 76 can be found in the 'Maximo76 Report Options and Comparison' Guide referenced at the end of this guide.

3 **ERI Requirements**

3.1 **External Report System Requirements**

For you to utilize this integration, the report server you utilize must provide a web-based interface.

This is required as Maximo will send required report-related information via an HTML form post to the report server URL. This report server URL is specified in Maximo's System Properties application. Therefore, there must be a web application running at that URL, which can receive the information, process it accordingly, and communicate with the report server in order to execute a report.

3.2 **Support and Licensing**

IBM does not provide any additional external Reporting System Licenses with Version 7. Clients are responsible for the purchase and maintenance of their own External Report System Licenses.

Additionally, due to the very large variety of reporting tools and versions available, IBM cannot support issues with External Reporting Systems. This includes issues related to the setup or maintenance of the external report server, report development or debug of the system.

4 Integration Installation

The ERI includes three main components you can use to enable integration with your selected Reporting System, which are

1. System Properties
2. customreport.jsp *
3. Password Encryption

* Customreport.jsp is delivered as a sample of how you can enable the integration. This file may not be able to be used in all configurations - so you must evaluate its use before proceeding with its implementation. More details are in the section titled 'Sample Integration File'

4.1 System Properties

To enable the ERI, you must first set values for the two system property values below.

A. Sign into Maximo as an administrator, and access the System Properties application. In the Global Properties table, select New Row and enter the two property values shown below. Leave the default values except when specified otherwise.

Property Name: **mx.e.report.custom.serverURL**

Description: URL of the custom reporting application

Global Value: http://<maximoserver>:<port>/maximo/webclient/utility/customreport.jsp

Global Only: True (checked)

*Note:

This value is the URL where the integration to the external report server is located. The sample global value shown above can be used to run the provided sample integration file. However, before setting this value, be sure to review the section titled 'Configuration options'.

Property Name: **mx.e.report.custom.rptServerLogonPass**

Description: Password used for logging on to external report server administration tool

Global Value: <enter Password>

Encrypted: True (checked)

Global Only: True (checked)

Property Name: mxe.report.sec.useDESede

Description: Should report parameter values be encrypted using the DESede algorithm?

Global Value: 1

*Note:

This value has been added in the Maximo 76 release.

- If you set this value to Yes (which is the default value) the integration will utilize the new encryption method. This is the recommended Value.

- If you set this value to No, the integration will NOT utilize the new encryption method.

If you are upgrading your ERI integration from an earlier Maximo release, reference the 'Upgrading ERI' section for important considerations on the encryption methods in Maximo 76.

B. Depending on your External Reporting System, you may need to pass additional property values from Maximo. To do this, you would add more property settings in the System Properties application.

For example, assume a root folder name for the External Reporting System must be passed. This new property value must be added with the prefix mxe.report.custom so Maximo picks it up and passes it to the report server. Its new value would be:

Property Name: mxe.report.custom.rootFolder

Description: Root folder for external report server

Global Value: maxreports

Global Only: True (checked)

*Note: You must define any additional property values you require to start with mxe.report.custom so that they are passed as parameters to the external report server. In this example, the property above would have a parameter name of customrootFolder.

C. After the property values have been entered, and you have verified that the information is correct, save the values. You can then use the 'Live Refresh' action to make sure the properties value is available immediately.

4.2 Sample Integration file

Due to the wide variety of reporting tools and versions available on the market today, a sample integration file is delivered to you. This sample file, customreport.jsp, is intended to show you how to get report information out of Maximo to pass to your report server

However, your unique report server requirements may not be able to utilize this file for one reason or another.

Therefore, you must determine if your unique integration can utilize this file, or if you will need to create your own integration files.

Before detailing this file, it is important to review how this file can be configured and its relation to the mx.e.report.custom.serverURL system property.

Configuration Options

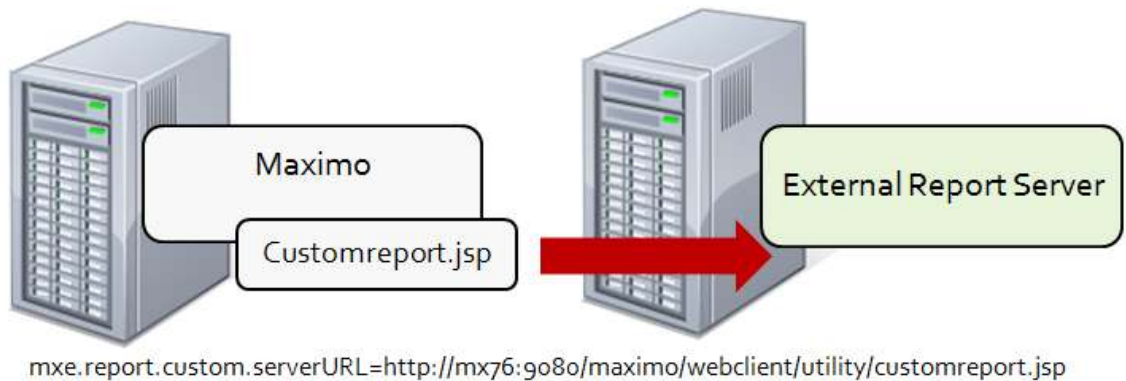
Depending on your report server, you may be able to use the delivered `customreport.jsp` to enable the integration. If you use this file, the location where it is placed and the url of the `mxe.report.custom.serverURL` value will determine what report behavior your users experience as detailed below.

4.2.1 Integration File on Maximo Server

In this configuration, if you leave the `customreport.jsp` file in its default location, and set the `mxe.report.custom.serverURL` to a value within maximo, then the following will occur:

1. When your users execute a report from a Maximo application, the custom report will display in the separate report browser window or tab, depending on your browser settings.
2. If your user leaves the report browser window open, and then goes back to Maximo to execute a second custom report, the second report may not display as expected in the report browser window.

If this occurs, the user must close their report browser or tab each time they execute an external report from the Maximo applications.

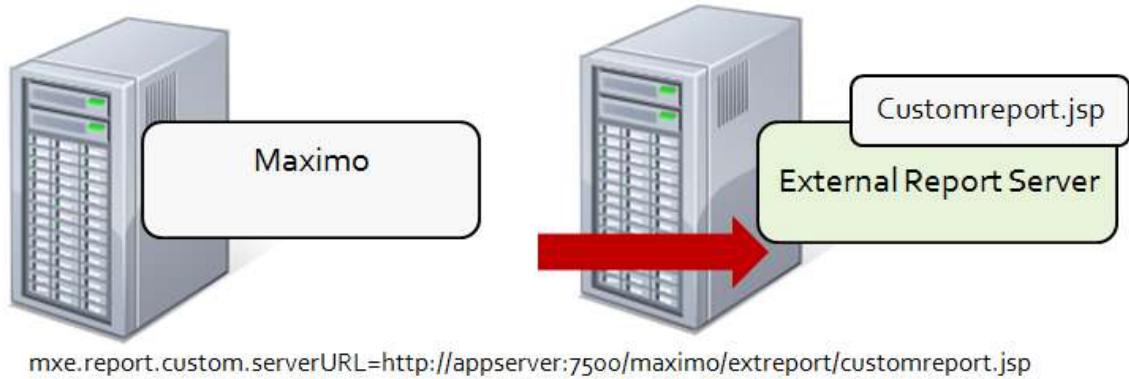


4.2.2 Integration File external to Maximo Server

In this configuration, you place the customreport.jsp file in a location external to Maximo, and set the mxe.report.custom.serverURL to this value. This enables the following to occur:

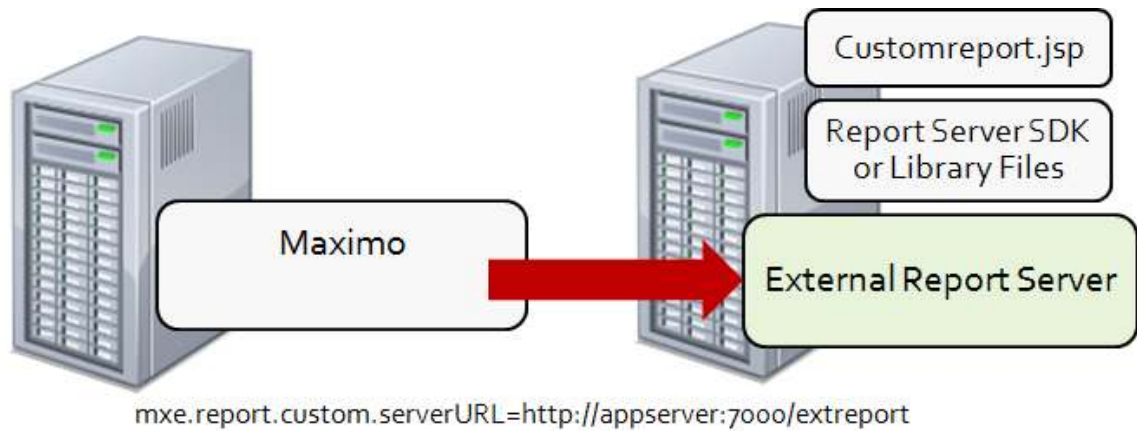
1. When your users execute a report from a Maximo application, the custom report will display in the separate report browser window or tab depending on your browser settings.
2. If your user leaves the report browser window open, and then go back to Maximo to execute a second custom report, the second report will display correctly in the existing report browser window.

Therefore, if you do not want your users to experience unexpected report issues when executing multiple reports, this may be a preferred configuration for you.



4.2.3 Integration Files external to Maximo server – Report Server SDK Libraries

If your report integration requires the use of report server library or SDK file, then you should create a separate web application to include those files. In this scenario, your `mxe.report.custom.serverURL` will point to the web application including those files.



4.3 Sample Integration File Details

As noted in the previous section, the delivered sample integration file is customreport.jsp. The intention of this file is to show you how you can get report information out of Maximo to pass to your report server.

*** Customreport.jsp is delivered as a sample of how you can enable the integration. This file may not be able to be used in all configurations - so be sure to evaluate it thoroughly before proceeding with its implementation.**

1. First, to locate the customreport.jsp file, access this directory

<maximo>\applications\maximo\maximouiweb\webmodule\webclient\utility

2. This file shows the relevant information that is always sent from Maximo to the report server, and provides instructions on how to access that information. This enables you to see how the report server (receiving portion) will receive the information to determine how it will process the information.

Again, note that this is a sample file, and you must determine if it can be used in your unique external report integration.

3. Within the file, a number of values are passed from Maximo to the external report server, including: Report File, Report Folder, Schema and Application Name

These parameters are sent from a hidden form post from Maximo to your External Report Server. The table below lists the Standard Values passed as request parameters from Maximo.

Report File Name	Security_analysis.rep
Report Description	BI Security Analysis Report
Report Folder	SECURGROUP
Report Type	SECURGROUP
Maximo User Name	Wilson
Maximo Password	See encryption section below
Database User Name	Maximo
Database Password	See encryption section below
Schema	Maximo
Maximo Where Clause	((independent = 1))
User Org	EAGLENA
User Site	BUFFALO
App Main Table	MAXGROUP
App Name	SECURGROUP
Language Code	EN
Locale	EN_US
User's Local Time zone	EST
Report Server URL	http://144.23.45:8090/bi
Report Server Password	See encryption section below

4.4 Password Encryption

Maximo always encrypts the following values before being sending them to your External Reporting System:

Maximo Password

Database Password

Report Server Password

It is up to you to determine what security will be implemented on the External Reporting System.

If you choose to use any of these three passwords sent from Maximo, the password values must be decrypted in your web application. The customreport.jsp file provides examples of how you can do this.

To decrypt the password value, the Maximo class file, ReportEncryption, is required. This file must be placed on the receiving web application to enable this.

You can find the ReportEncryption.class here:

```
<Maximo76> \applications\maximo\businessobjects\classes\psdi\util
```

An example of where it could be placed for your external report server to access is

```
<web application directory>\WEB-INF\classes\psdi\util
```


4.5 ERI Upgrade

Maximo releases prior to version 7.6 used an encryption file called CipherPlusBase 64. This file utilized a DES encryption/decryption process.

In Maximo 76, an updated DESede (TripleDES) encryption/decryption process is used.

Therefore, if you are upgrading your ERI integration from an earlier Maximo release, you need to evaluate the encryption files.

- If you want to use the new DESede encryption, you must set the new property setting to true or 1: `mxe.report.sec.useDESede`

Then, you must copy the new ReportEncryption file detailed in section 4.4. Also, you should remove your prior CipherPlusBase 64 file.

- If you do **not** want to use the new DESede encryption, you must set the new property setting to false or 0: `mxe.report.sec.useDESede`

No additional actions are required in this case.

5 Maximo Report Registration and Parameters

5.1 Registering and Running ERI Reports from Maximo

After completing the setup of the ERI, your report administrator needs to register each external report that will be accessed from Maximo. To do this, the administrator accesses the Maximo Report Administration application. The following information is required for every ERI report that will be executed from Maximo:

1. Report File Name: This is the file name of the report, used by the external report server to identify the report to execute. The external report system determines the value of this field, and whether or not a file extension must be included.
2. Report Description: Description which appears to the user when selecting a report.
3. Report Run Type: For the ERI, the report run type must always be CUSTOM.
4. Application: This is the Maximo application where the Report will be accessible from.
5. Report Folder: The Report Folder is the folder name where the report is kept in the external report server. This field defaults to the application folder name.

A sample external report registration is shown below.

The screenshot displays the 'Report Administration' interface. The main form is titled 'Report Administration' and contains the following fields and settings:

- Report File Name:** custom_po_analysis.rpt
- Report Description:** Custom PO Analysis
- Report Type:** CUSTOM (indicated by a red arrow)
- Application:** PO (indicated by a red arrow)
- Report Folder:** PO
- Settings:**
 - Limit Records?:
 - No Request Page?:
 - Browser View?:
 - Max Record Limit: 250
 - Use Both Parameter Options?:
 - Browser View Location: NONE
 - Display Order: 1
 - Schedule Only?:
 - Direct Print?:
 - Priority:
 - Number of request page columns:
 - Direct Print Location: NONE
 - Toolbar Sequence:
 - Direct Print with Attachments?:
 - Direct Print with Attachments Location: NONE

The interface includes a left-hand navigation pane with options like 'Go To Applications', 'Available Queries', 'All Reports', 'All Bookmarks', 'Reports with Limit Records Enabled', 'Ad Hoc Reports', 'Common Actions', 'New Report', 'Clear Changes', 'Create Report', 'More Actions', 'View Report Processing', 'View Scheduled Reports', 'Import Report', 'Export Report', 'View Library File', 'Duplicate Report', and 'Delete Report'. The top navigation bar shows 'Last View', 'Report', 'Security', and 'Performance' tabs. A 'Preview' button is located at the bottom right of the form.

Notes

- A. There is no validation on any of the inputted fields.
- B. Within the report registration page of report administration, many values in the Settings Section are not applicable to ERI reports. The fields are disabled and include
- Use Both Parameter Options
 - No Request Page
 - Toolbar Links to Browser View, Direct Print and Direct Print with Attachments
- C. Fields that are available include limit records, max record limit, display order and priority.

Best Practice: It is highly recommended that you implement the limit records field, if your external report passes the application query as its parameter. This can prevent users from running the report against all or very large record sets, which can cause negative performance impacts.

- D. After registering the ERI reports, you must
1. Generate the report xml or request pages in the Report Administration application
 2. Grant access to the specific security groups who can see and run these reports from Maximo

5.2 Parameter Types

With the ERI, reports can be run against two parameter types(1) Application (2) Parameterized.

5.2.1 Application or Launch in Context

Users may want to execute reports against their current application query. These types of reports are called, application, or launch in context. No parameters for these reports as they execute against the user's application query which is passed to the report server.

The example below highlights an application report. Notice no parameters are listed in its report administration entry. Also, record limits can be set to insure the report is not run against extremely large records sets accidentally. .

The screenshot shows the 'Report' tab in a software interface. The 'Report File Name' is 'custom_po_analysis.rpt' and the 'Report Type' is 'CUSTOM'. The 'Application' is set to 'PO' and the 'Report Folder' is also 'PO'. In the 'Settings' section, 'Limit Records?' is checked with a value of 250. Other settings include 'No Request Page?', 'Browser View?', 'Max Record Limit', 'Use Both Parameter Options?', 'Browser View Location', 'Display Order', 'Schedule Only?', 'Direct Print?', 'Priority', 'Number of request page columns', 'Direct Print Location', 'Toolbar Sequence', 'Direct Print with Attachments?', and 'Direct Print with Attachments Location'. At the bottom, the 'Parameters' section shows a table with columns 'Parameter Name', 'Attribute Name', 'Sequence', 'Display Name', and 'Required?'. The table is empty, displaying 'There are no rows to display'. Two red arrows point to the 'Limit Records?' checkbox and the 'Required?' column header.

When a user accesses this report from its registered application, its report request page will display with no parameter values. The application query passes to the where clause of the report.

Application or launch in context reports can save a significant amount of time. Not only does the user not have to re-input his parameter values, but the administrator also does not have to create multiple versions of the same report – with a variety of parameter scenarios.

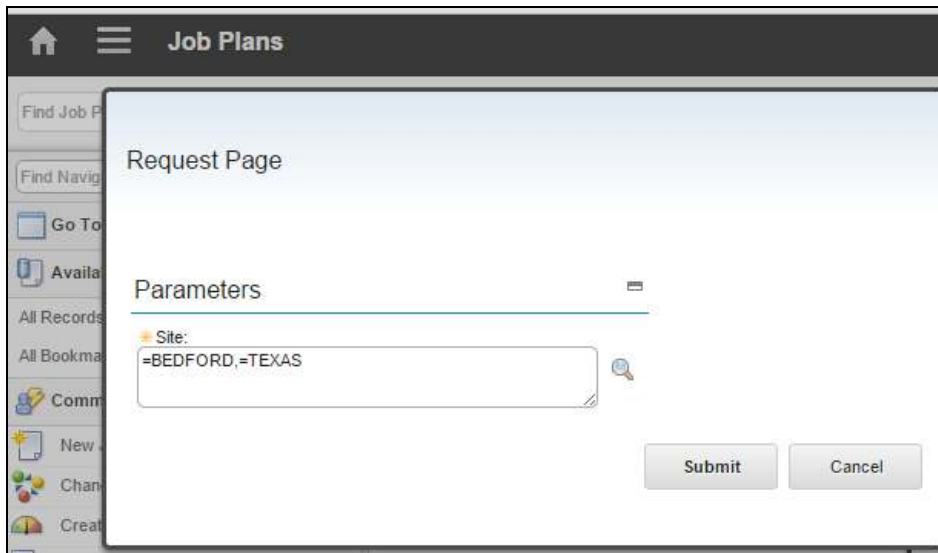
5.2.2 Parameterized Reports

Parameterized reports enable users to explicitly define their parameter values at report run time.

To enable these reports, they must have parameters defined in the Parameter Section in the Report Administration application as shown below.



In this case, when the user selects this report from the application, its report request page will display with the parameter values. The example below shows a single parameter value of Site. After entering the parameter value, the report filters ALL records in the database versus the parameter values entered by the user..



It is important to note that this report will always execute against ALL records – even if the user has a selected record set in his application’s Query.

5.2.3 Parameterized Reports – Bound and Unbound Values

For parameterized reports, you can have two different types of parameter values – bound and unbound. Bound parameters are parameters that have either a relationship to the application's main table or exist via a maxrelationships. Unbound parameters do not have any relationships to the application's main table and they do not exist via a maxrelationship.

Using a Security Group report as an example, independent would be an example of a bound parameter (MAXGROUP.INDEPENDENT). An example of an unbound parameter would be Classification Path. Classification Path is unbound as there is no relationship between that variable and the Security Group application.

If a parameter is bound, its value will be included in the Maximo where clause that is passed to the report. If a parameter is unbound, its value will not be included in the Maximo where clause.

6 Report Security Access

Once you have registered your external reports in Maximo's report administration application, you then define which security groups have access to execute these reports. There are three levels of security access available to you, which include -

1. For All Reports
2. For All Reports within a specific Application or
3. For an Individual Report

All Application Security Access

If you want a security group to have access to all reports for all the applications that they have access to, choose All Application Security access.

To do this, select the 'Set All Application Security' from the Action Menu in the Report Administration application.

Then, select the security group or groups that you want to grant access to. In the Details section, specify the report types that your users can access. Selecting 'ALL' will enable them to execute all report types – or if you only want them to access the ERI reports, select 'Custom'. The screen shot below shows the Bedford Site Security Group which has been granted to access to all BIRT and Custom (ERI) reports for the applications that they have access to.

The screenshot shows a dialog box titled "Set All Application Security". It has two input fields: "Group:" with the value "BEDFORDSITE" and "Description:" with the value "Bedford Site". Below these is a "Details" section with four checkboxes: "All?", "BIRT Reports?", "Cognos?", and "Custom?". The "Custom?" checkbox is checked. At the bottom right are "OK" and "Cancel" buttons.

Application Security Access

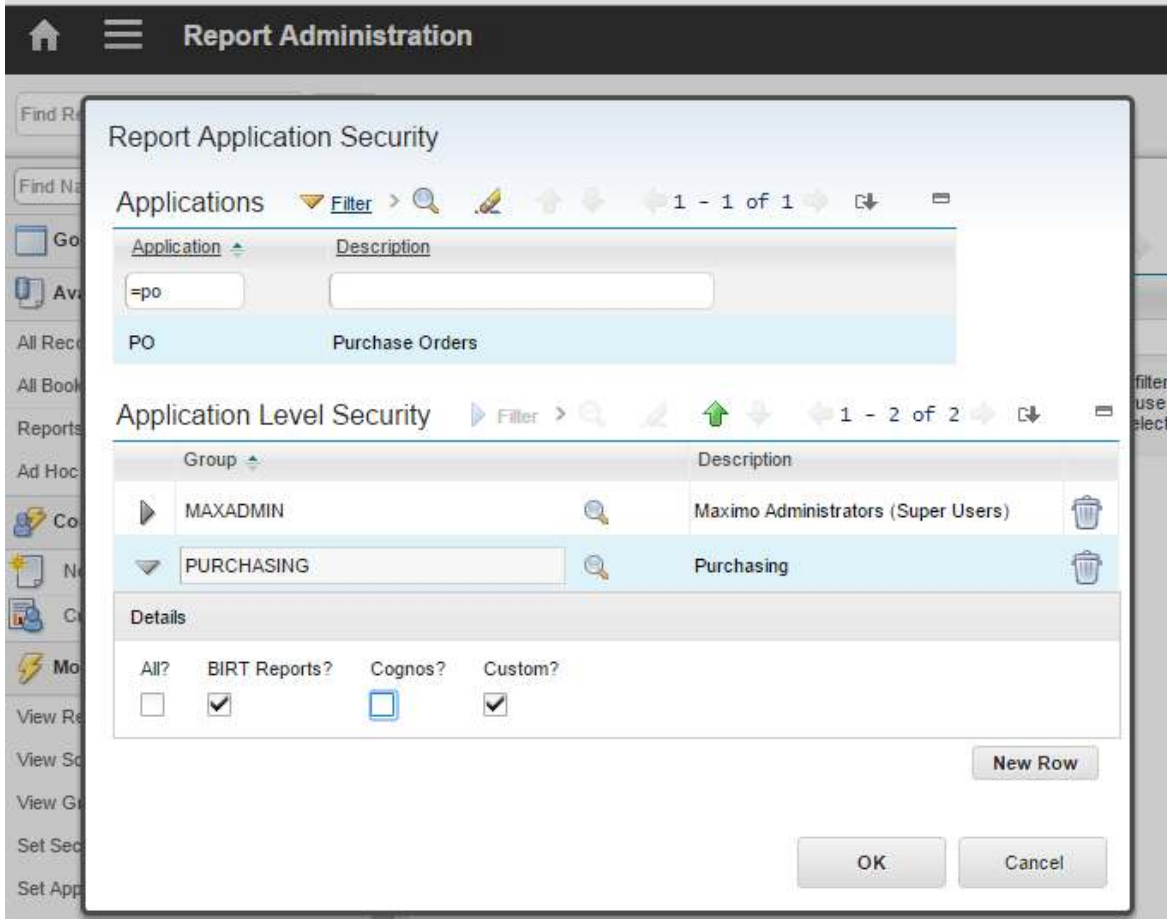
If you want a security group to have access to all reports stored in an application, choose Application Security access.

To set this, select 'Set Application Security' Action from the Report Administration application. Filter in the Applications area for the application you want to grant report access to.

Next, click new row and choose the applicable Security Group from the lookup. The lookup only displays those Security Groups who have been granted 'Run Report' Access to the selected application through the Security Group application.

After selecting the security group, define what types of reports they will have access to and click OK to save your results. As noted above, the report type options include:

- All = Grants access to all reports, regardless of type
- BIRT = Grants access to BIRT Reports
- Cognos = Grants access to Cognos Reports
- Custom = Grants access to Custom ERI Reports

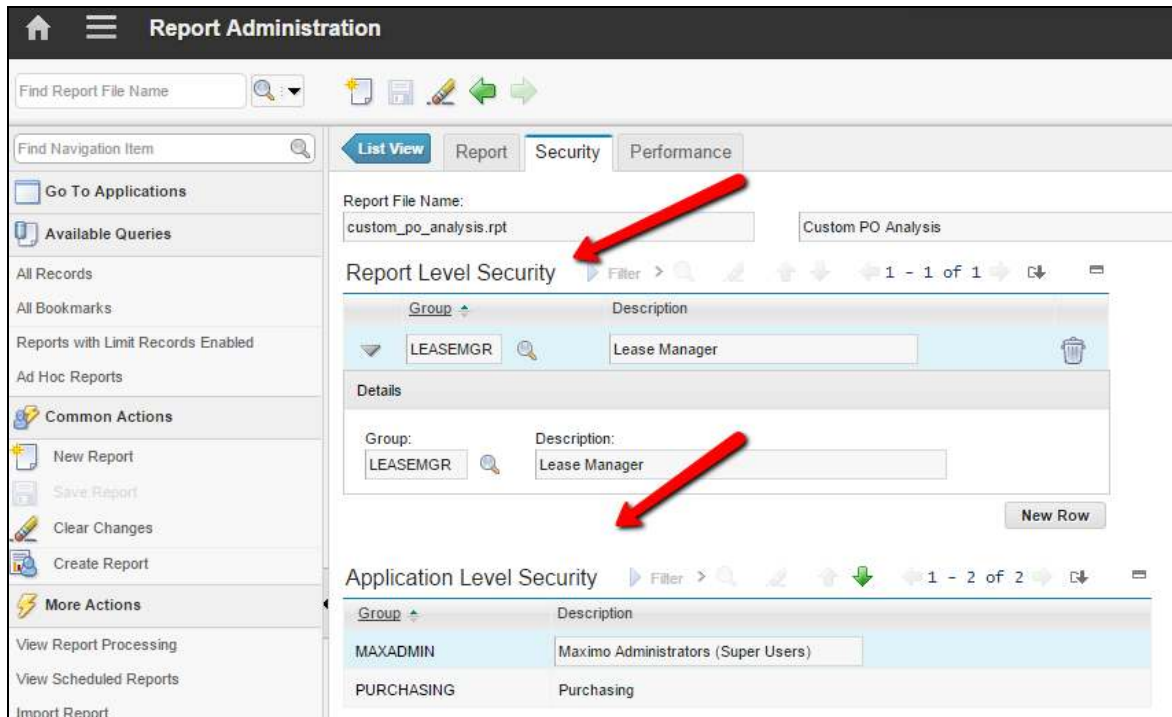


There are no report type limitations on Application level security. For example, one group can have access to ALL reports an application, while another group is limited to Custom reports only

Individual Report Security Access

You may have some security groups who you want to limit the reports they can execute. In this case, you may want to set security access at the report level – which will limit their access to specific report(s).

To set individual report level security, click on the Security Tab for the Report. Click New Row, select the Security Group from the lookup and Save. The custom report is now available to the specified Security Groups from the Security Group application as shown below.



Note: If application level security has been granted to other security groups, it will be displayed in the bottom portion of this page.

7 Frequently Asked Questions

1. **Can I integrate to Business Objects/Crystal reporting with this integration?**

Yes. Because this integration is report server and report version independent, you can integrate with the version of BO/Crystal that you have.

Additionally, unlike earlier Maximo integrations with BO/Crystal, you do not have to utilize command tables in your integration. These Maximo integrations required command tables as your unique database schema was unknown. However, with this type of integration where your schema is identified, you can streamline the integration to launch directly to your BO/Crystal URL.

2. **Can I use multiple reporting tools, including the ERI?**

Yes. You can use any combination of reporting tools. This could include the delivered Maximo or Ad Hoc reports, along with custom reports developed in an external reporting system.

3. **Are DB2, Oracle and SQL Server Databases supported in this integration?**

Yes.

4. **Are there any hardware recommendations?**

Yes. For best performance, IBM recommends that your configuration contain dedicated servers for the (1) Maximo Application Server (2) Report Server and (3) Database Server

5. **What types of product platforms are supported in this integration?**

The specific product platforms that the External Report System supports will most likely vary from those of Maximo. Therefore, it is the client's responsibility to use platforms that are supported by both Maximo and their external Report System.

The latest list of supported Maximo Version 7 platforms can be found at this url:

<http://bit.ly/jHgxTG>

6. **Does ERI have to be utilized to enable the use of external reporting systems?**

No. You can bypass this report integration, and run your reporting tool of choice directly against the Maximo database. This type of integration is known as ODP, and more details on it can be found in the Maximo 7.6 Report Options and Comparison guide available at the end of this guide.

7. **Does the ERI support SSO/LDAP Environments?**

When using the ERI, the client must provide the content for the integration with the reporting server. IBM does not provide any specific functionality to support LDAP/SSO but the client can implement this type of security if they choose.

8 **Report Functionality Not Enabled**

The table below details the report features that are not enabled or supported for Maximo 76 ERI:

Maximo Reporting Functionality Not Enabled/Supported

'Out of the Box' Reports	No ERI Reports are delivered with Maximo Version 76.
Multi Server Configurations	IBM will not support configurations of multiple Maximo servers to multiple External Report Servers
Schedule Reports	Scheduling of reports via the Maximo Report Request Page
Email Reports	Emailing of reports via the Maximo Report Request Page
Localization	Localization of report titles, descriptions or text, and multi language support is not enabled
Application Toolbar Icons	Direct Access to External Reports from the toolbar in the Maximo applications, either for direct print or browser view
Printing of Attached Documents with Report	Not enabled for External Reports

REFERENCE MATERIALS

A variety of materials are available for you for additional information on BIRT, Cognos and the External reporting tools. This section lists new reference materials in Maximo 76, along with other reference materials noted throughout this guide.

1. Maximo 76 Demos

Access this url for a variety of BIRT, QBR and Cognos demos including an introduction to the content, navigation and customization of the workspaces for your environment.

<https://www.ibm.com/developerworks/community/wikis/home?lang=en#!/wiki/IBM%20Maximo%20Asset%20Management/page/Maximo%2076%20BI%20Recordings>

2. Maximo 76 Report Reference materials

This page contains the latest listing of report reference materials, including description, revision levels and hyperlinks to the documentation. Included within these pages are the reference guides listed below

<https://www.ibm.com/developerworks/community/wikis/home?lang=en#!/wiki/IBM%20Maximo%20Asset%20Management/page/Maximo%2076%20BI%20Documentation>

3. Maximo 7.6 Supported Product Matrix

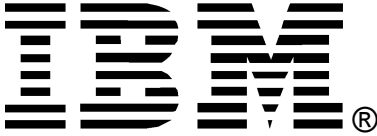
http://www-01.ibm.com/support/docview.wss?rs=3214&context=SSLKT6&q1=language&uid=swg27014419&loc=en_US&cs=utf-8&lang=en

4. Maximo Home BI/Reporting Page

<https://www.ibm.com/developerworks/community/wikis/home?lang=en#!/wiki/IBM%20Maximo%20Asset%20Management/page/Reporting>

5. Maximo 76 Reporting Options and Comparison guide

<http://www-01.ibm.com/support/docview.wss?uid=swg21694285>



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