Utilities User Guide

FortiDB
Version 3.2

www.fortinet.com

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Version 3.2
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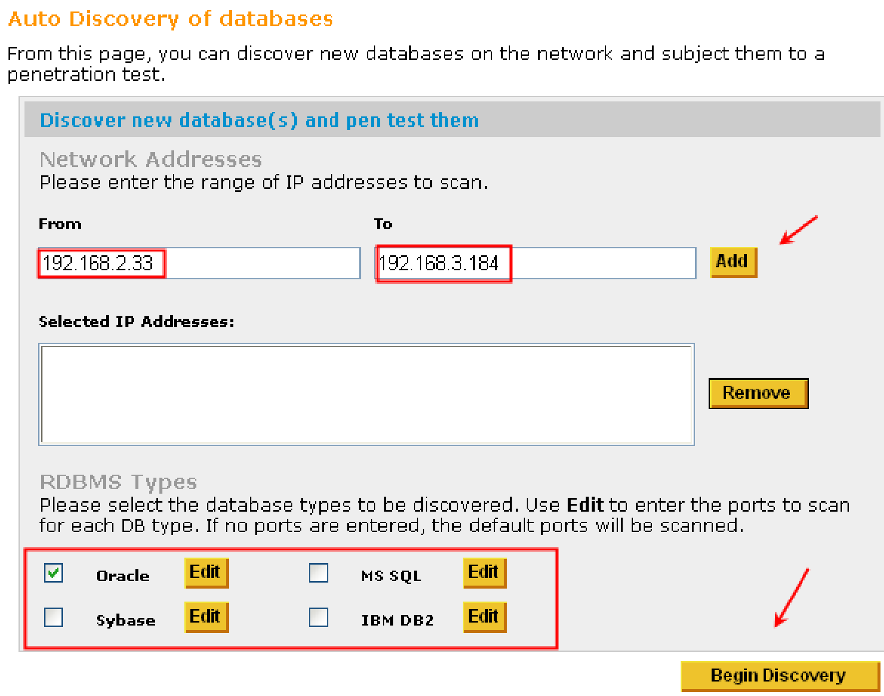
FortiDB MA Utilities

FortiDB MA provides several utilities to help you use other modules:

- **Auto Discovery** to ease the burden of manually setting up database connections
- **Connection Summary** to show which database connections are Open or are Open and Running
- **Rule Chaining** to trigger one rule based upon another
- **Report Manager** for custom, offline reports

Auto Discovery

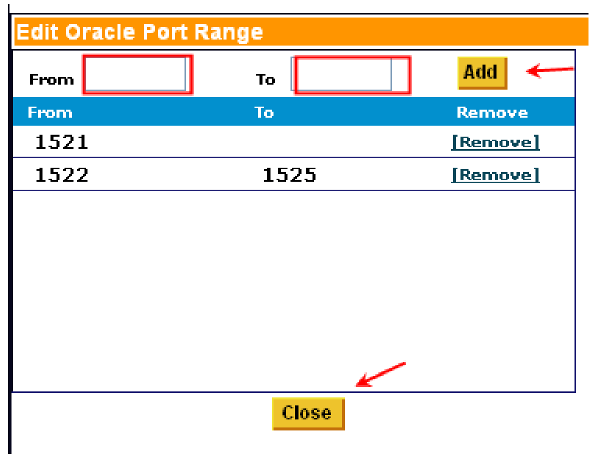
FortiDB MA provides the ability to search for, and establish connections to, databases on your network. Rather than manually entering all of the connection information, you can have FortiDB MA automatically discover it for you.



Selecting Addresses for Auto-Discovery

In order to use this feature:

1. Select the Database->New menu, and click the Auto Discovery button on the Create New Database Connection screen. Or you can just select Auto Discovery from the Main page.
2. Enter an IP address range and specify the RDBMS type you are interested in.
3. By clicking the **Edit** button next to the desired type of database, you can enter a range of ports, in case there are databases listening on non-default ports.
4. Click Close to close the Edit Port Range screen.



Selecting Non-Standard Ports for Auto-Discovery

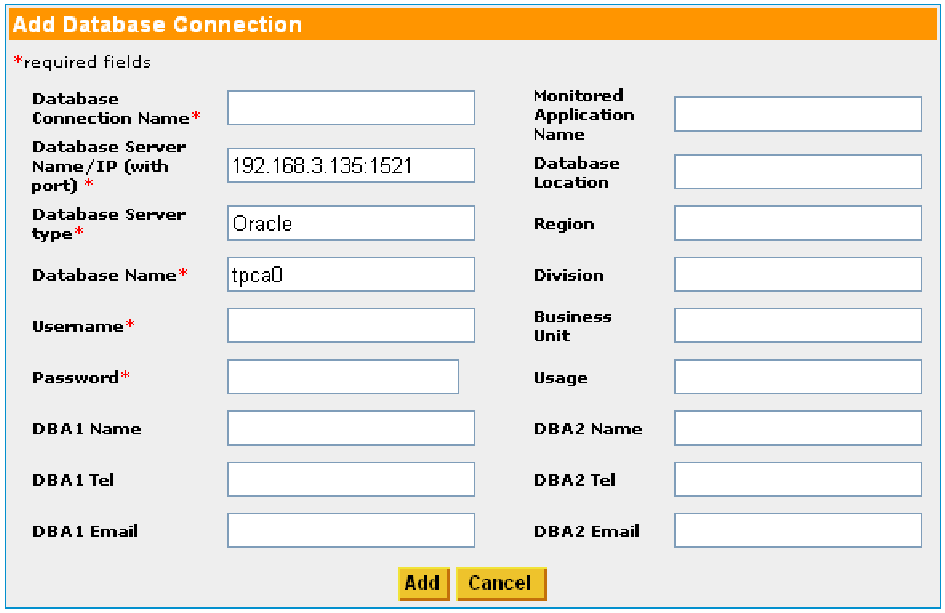
5 Click the **Begin Discovery** button.

Pen Test the Discovered database(s)

This page displays the list of databases which have been discovered, ten connections to a page. Use the **Add** button to create Database Connections to the databases you wish to monitor.

IP Address	Port	DB Type	Version	DatabaseName/Instance	Add
172.30.63.34	1521	Oracle	Version 10.2.0.1.0		Add
172.30.63.35	1521	Oracle	Version 9.2.0.1.0	ora92	Add
172.30.63.38	1521	Oracle	Version 9.2.0.1.0	dan	Add
172.30.63.38	1521	Oracle	Version 9.2.0.1.0	ora92	Add
172.30.63.40	1521	Oracle	Version 9.2.0.7.0	atdb92	Add
172.30.63.40	1521	Oracle	Version 9.2.0.7.0	lchen92	Add
172.30.63.40	1521	Oracle	Version 9.2.0.7.0	localdb	Add
172.30.63.40	1521	Oracle	Version 9.2.0.7.0	notimezn	Add
172.30.63.40	1521	Oracle	Version 9.2.0.7.0	qatst92	Add
172.30.63.40	1521	Oracle	Version 9.2.0.7.0	qautf8	Add
172.30.63.45	1521	Oracle	Version 9.2.0.1.0	iplocks	Add
172.30.63.45	1521	Oracle	Version 9.2.0.1.0	or9201	Add
172.30.63.45	1521	Oracle	Version 9.2.0.1.0	jgor9201	Add
172.30.63.45	1521	Oracle	Version 9.2.0.1.0	jgor92lx	Add
172.30.63.34	50000	DB2	DB2/NT 8.2.0	SAMPLE	Add

Results from Auto-Discovery



Discovered Database Information Populating Connection Form

The process will automatically return:

- Database Type and version
- IP address (with port if applicable)
- Database name/instance

Once the Auto Discovery list is returned, you can create, by clicking the **Add** button on the **Discovered Database Applications** screen, the database connections you wish to assess or monitor.

The additional required and recommended fields will need to be completed manually. (See the *FortiDB MA Administration Guide* for more information on setting up connections)

DB2

Auto Discovery does not return the database name and version for DB2 UDB with V8 Fix Pack 10.

MS-SQL

It is sometimes necessary to temporarily open another port in your firewall to make sure the Auto Discovery program communicates with all SQL Server versions. You should configure the firewall on your target machine so that it allows UDP packets:

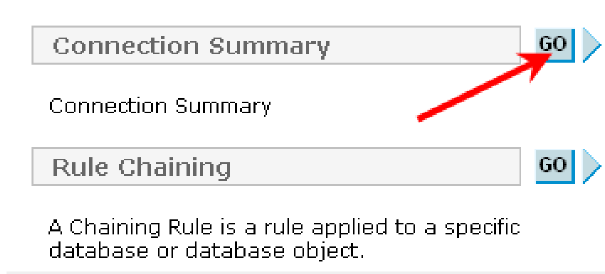
- Destined for port 1434

Note: FortiDB MA sends a packet to port 1434, which MSSQL uses in order to return information about itself such as instance name, version, etc. (Even though this is an MSSQL-specific port number, FortiDB MA uses it for all Auto-Discovery-related transmissions.)

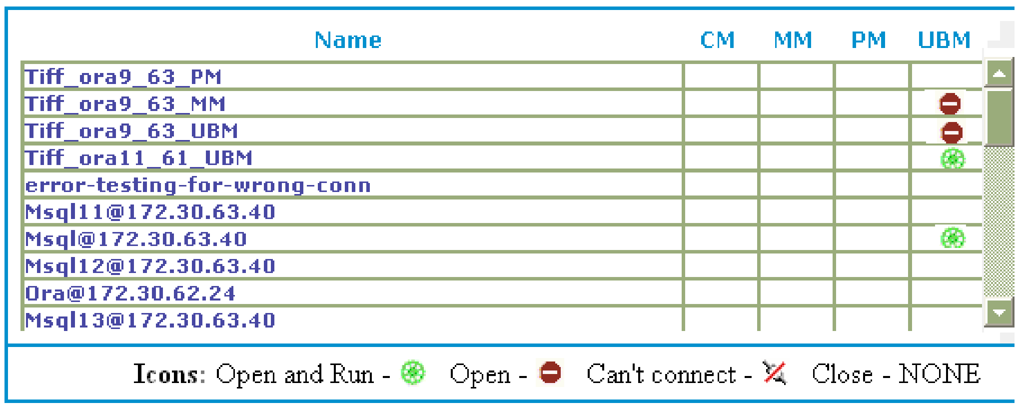
- Originating from the port whose number is specified in the `dss.udpport` property in *dssConfig.properties*.

Connection Summary

The Connection Summary utility allows you to see, by FortiDB MA module and in one place, a dashboard view of all of your database connections.



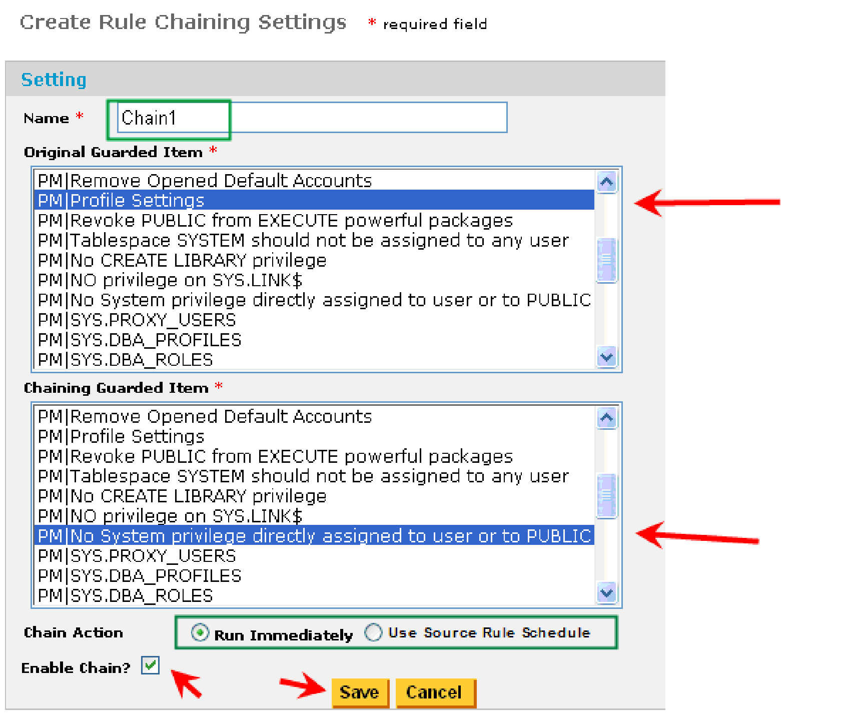
Connection Summary Button



Connection Summary Output

Rule Chaining

The Rule Chaining module allows you to associate rules so that one, the source[1] rule, can influence the execution of another, the target[2] rule. Both rules are established with the same target database.



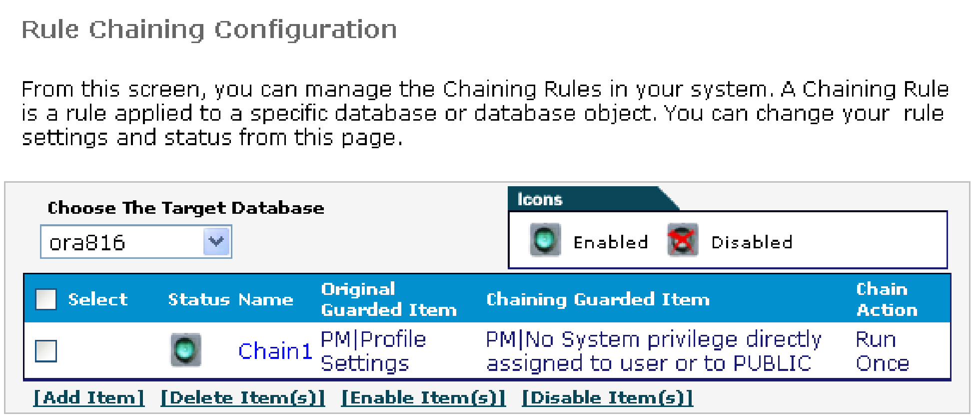
Rule Chaining Setting Screen

FortiDB MA offers two types of chained-rule pairs:

- Rule pairs in which there are no parameters passed. (In this case, you may use Guarded Items from Privilege Monitor (PM), Metadata monitor (MM), Content Monitor (CM), and User Behavior Monitor (UBM))
- Rule pairs in which there are parameters passed(In this case, you may use Guarded Items only from User Behavior Monitor (UBM))

You invoke Rule Chaining from the tree navigator on the left.

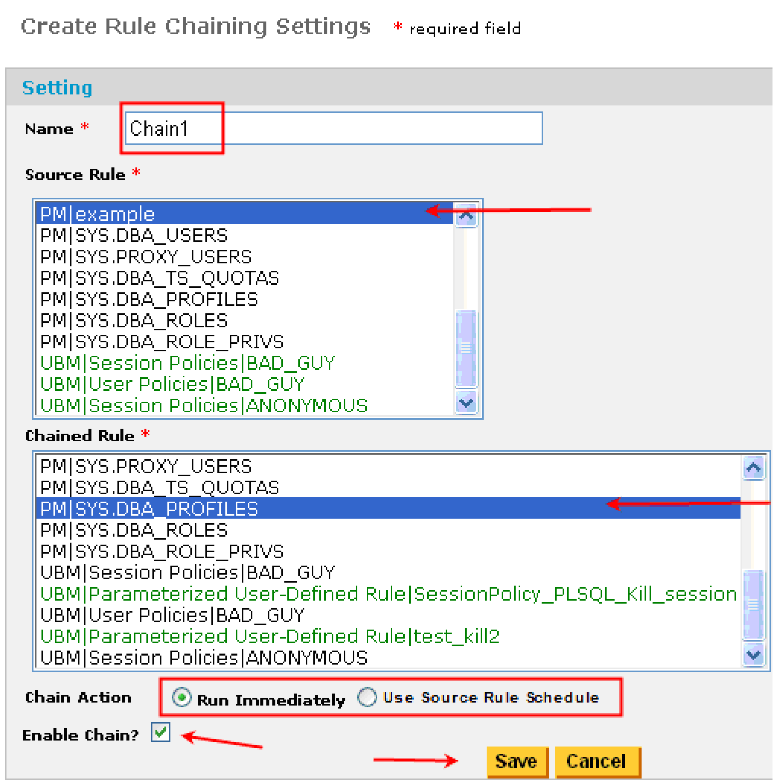
1. This is sometimes called the *original* rule.
2. This is sometimes called the *chained* rule.



Configuring a Rule Chain for a Specific Target Database Connection

You can perform the following:

- Choose the target database (the database you want to run the rules against)
- Add item (new chain)
- Delete item
- View/Modify item (make changes to an existing chain)
- Enable item (a chain does not have to be enabled when it is created)
- Disable item



Rule Chaining Setting Screen

After the database has been specified and you have clicked on **[Add Item]**, you will be presented with the **Create Rule Chaining Settings** page.

Here, you need to:

- Name the Rule Chain
- Select the policy you want to use as the **Source Rule**
- Select the target rule (**Chained Rule**) you want to execute, once the first rule had been violated.
- Specify whether you want the chain to run immediately upon source-rule violation or not. **Run Immediately** means that the target rule will run as soon as there is a source-rule violation. **Run as Scheduled** means that the target rule will run according to the module-, database-, or item-specific schedule that is in effect for the source rule.
- Decide whether you want to immediat[1]ely enable the chain or not. Unless you check the **Enable Chain?** checkbox, the chain won't be in effect. This allows you to create the chain and then only use it when needed.

You can see the Module and the name of the available guarded items for all policies. For example, 'PM|' or 'UBM|' preceding the rule name indicates the PM, or UBM module, respectively.

After the Rule Chain is invoked, alerts will appear with those of other policies.

Note: For UBM policies, which are indicated in green, you can pass parameters from the Source Rule to the Chained Rule, if the latter is a Parameterized User-Defined Rule (PUDR) and if the Chain meets certain other conditions. For more information on how to create a PUDR see the FortiDB MA User Behavior Monitor (UBM) User Guide. For more information on using PUDRs in a chain, see Chaining with Parameterized User-Defined Rules).

Chaining with Parameterized User-Defined Rules

Parameters, specific to the RDBMS type of your target database, can be passed from the source to the target in order to permit the target to perform specific tasks, such as to kill the session of a suspicious user.

The source rule can be a UBM User, Object, or Session Policy. The target rule can only be a User-Defined Rule (UDR) and specifically one that can accept parameters: a Parameterized User Defined Rule (PUDR). The PUDR functionality can be accessed within the UBM module. (See the *FortiDB MA User Behavior Monitor (UBM) User Guide*)

When there is a violation of the source rule, the target UDR gets executed, with the parameters passed from the source rule. An alert is generated both for the source violation and for the PUDR execution.

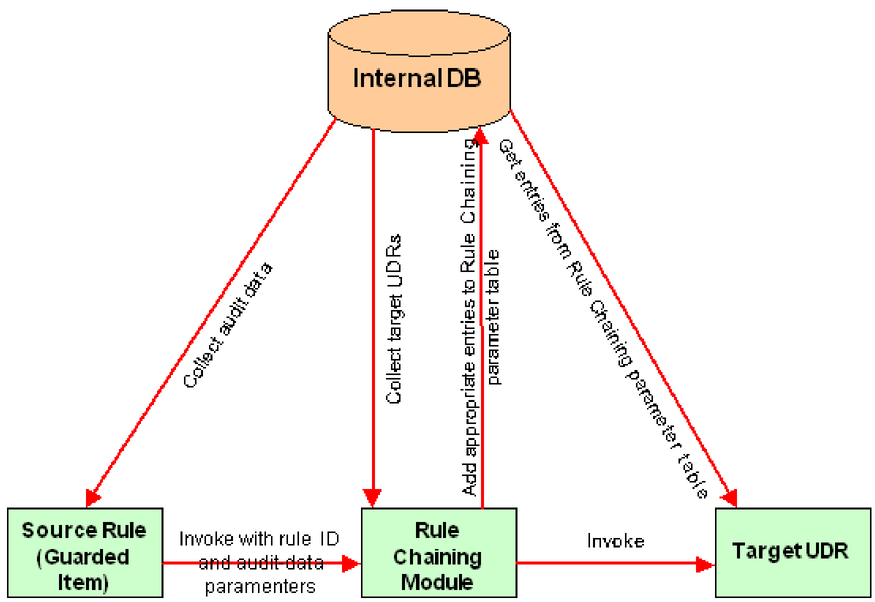
1. A module schedule will be overridden by a database-specific schedule, if one is set. A database-specific schedule will be overridden by an item-specific schedule if one is set.

General PUDR Steps

The general step for creating a chain that uses a PUDR are:

1. In UBM, define an Object, User, or Session policy that will be your Source Rule.
2. In UBM, define a PUDR that will be your Target Rule
3. In the Rule Chaining module, define a chain which associates the UBM policy and the PUDR.

PUDR Process

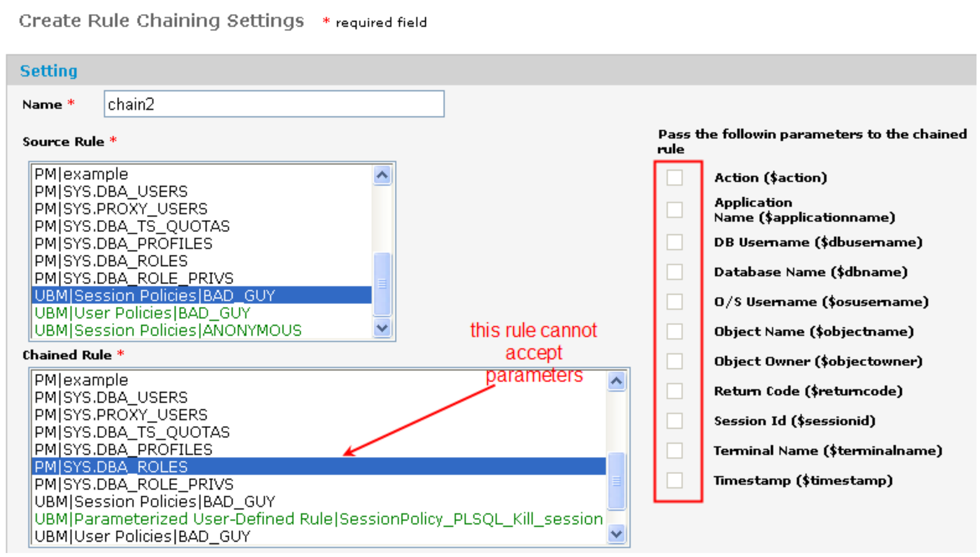


Parameterized User-Defined Rule Flow Diagram

The PUDR process involves these steps.

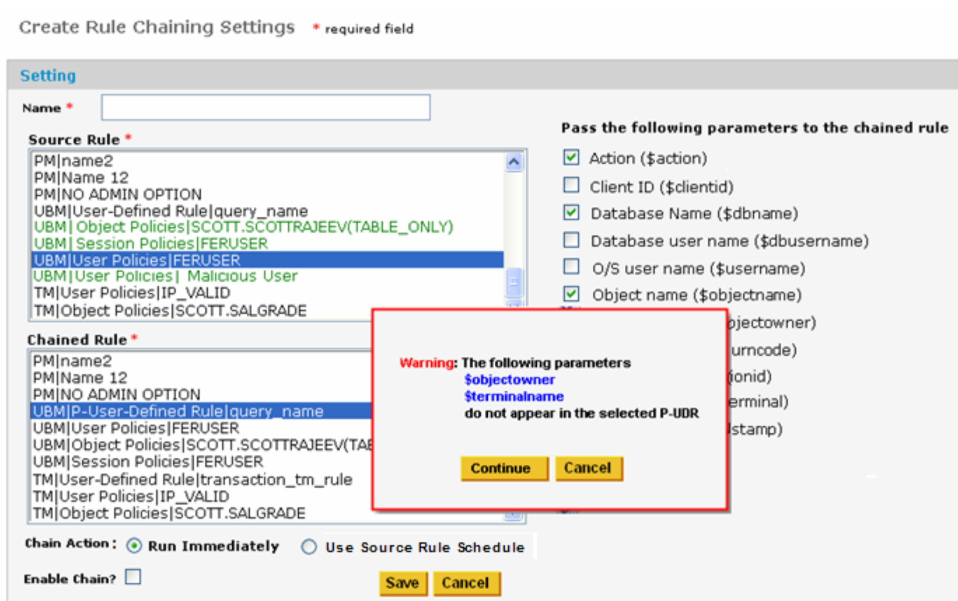
1. The source rule is violated and an alert is generated.
2. FortiDB MA determines if there is a PUDR that is chained to the source rule.
   • If a rule is chained, FortiDB MA fetches the information on the chain relationship
3. FortiDB MA checks to see if the source rule is to be run immediately or not.
4. FortiDB MA checks to see if the chained rule is a PUDR vs. a regular policy
   a. If a regular UDR, FortiDB MA runs the UDR without passing any variables.
   b. If the rule is a PUDR and is set to be run immediately, FortiDB MA passes the parameters defined in the rule chain to the PUDR.
   c. If the rule is a PUDR and is set to be run with the schedule settings of the source rule, FortiDB MA indicates that parameters have to be passed for the successful execution of the PUDR.
5. An alert is generated for the PUDR.

PUDR Eligible Rules



Disabled Parameter Checkboxes

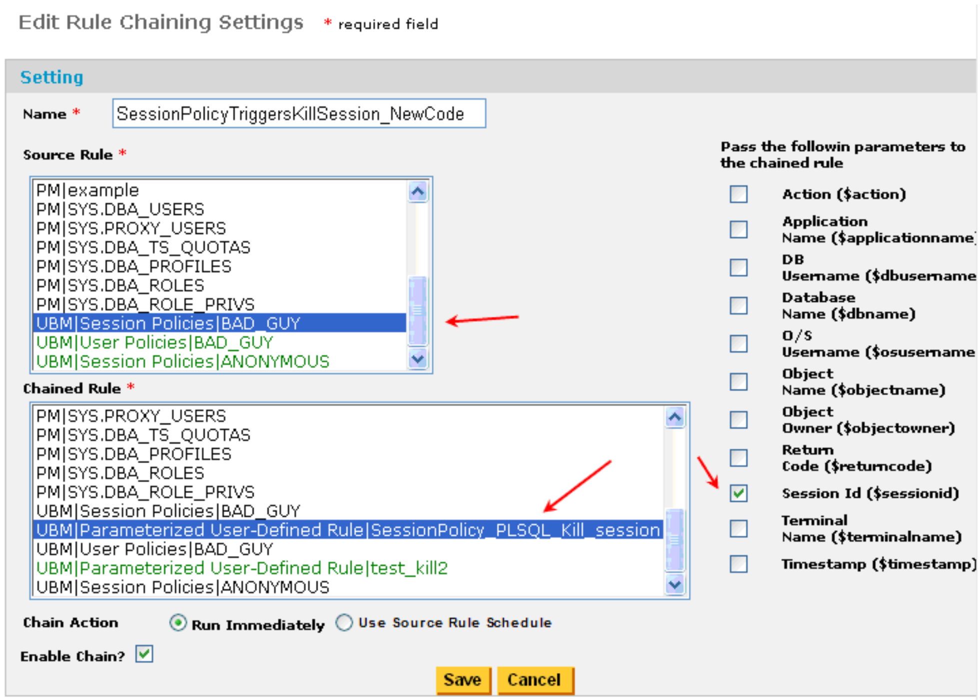
If the chosen target rule cannot accept parameters, they will be grayed out.



Validating the PUDR before Saving

If one or more variables selected do not appear in the PUDR, FortiDB MA presents a warning message.

Chaining the UBM Policy and PUDR Together

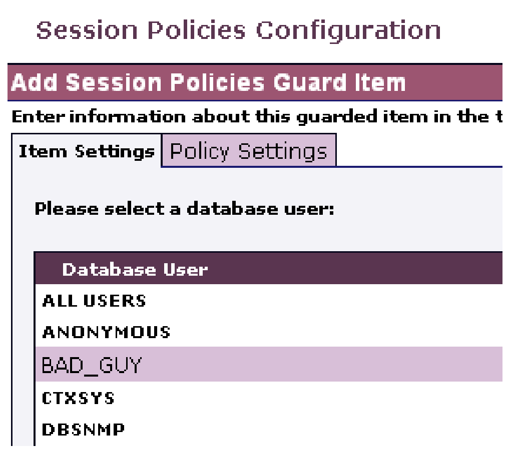


Associating a Source Rule That Can Pass parameters with a PUDR

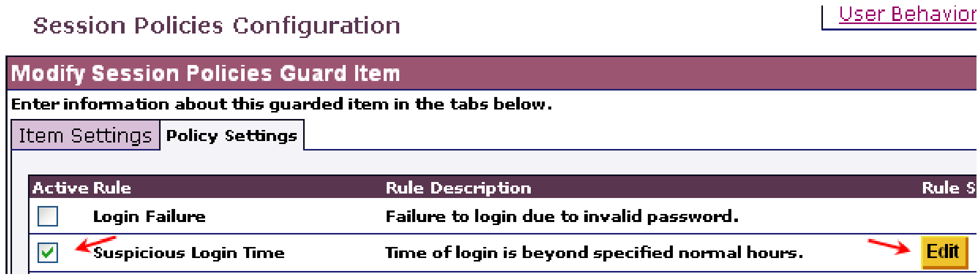
Example of Chaining to a PL/SQL-based PUDR

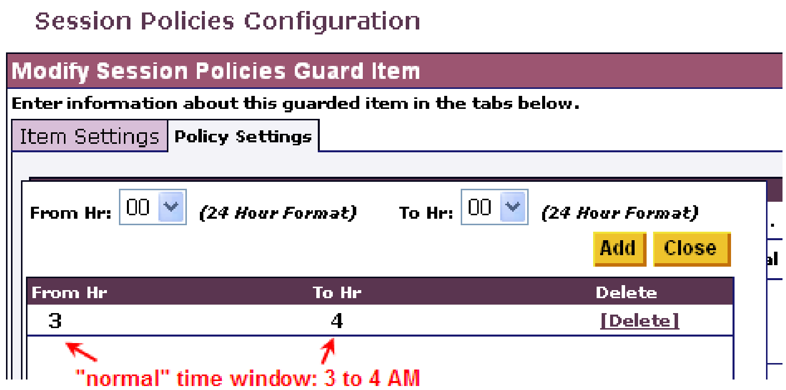
In this Oracle PL/SQL kill-session example, we:

1 Create a DB user, `BAD_GUY`, whose session we will monitor, in our Oracle target database.



Item Setting for Session Policy





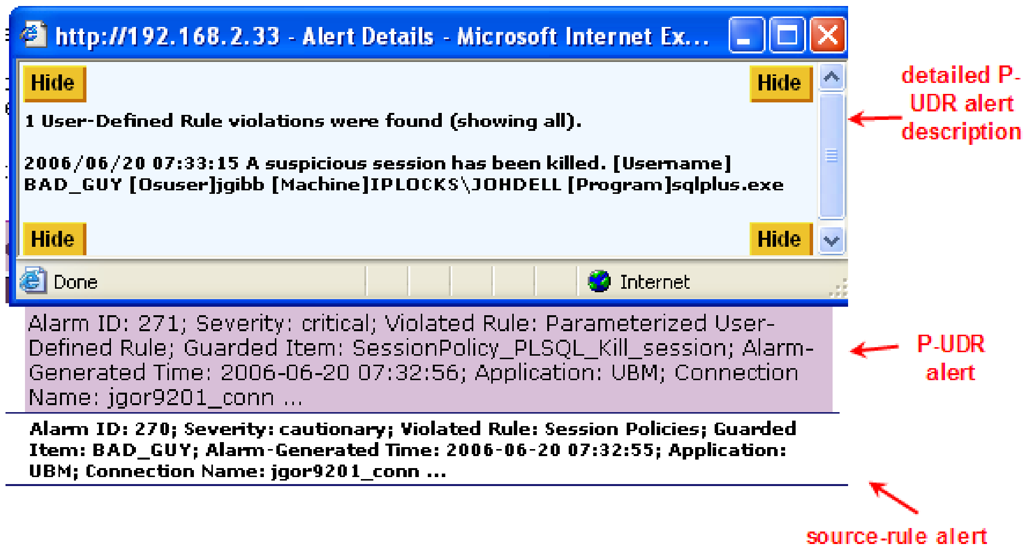
Policy Settings for Suspicious Login Time

2 Create a UBM Session Policy, our Source rule, in order to monitor BAD_GUY and generate an alert to trigger our Target rule, a PUDR. We will pass the Session ID from the Source to the Target rule.

3 Create a Target PUDR, in the UBM module, which will contain the following kill-session code. That code, in turn, will accept our passed Session ID parameter (shown in red):

```
DECLARE
      v_str     VARCHAR2(80)  := 'ALTER SYSTEM KILL SESSION
'||chr(39);
      v_statementVARCHAR2(80);
      sesid     NUMBER;
      serial    NUMBER;
      usernameVARCHAR(50);
      osuser    VARCHAR(50);
      machine    VARCHAR(50);
      program    VARCHAR(50);
BEGIN
      SELECT sid, serial#,username,osuser,machine,program
    INTO sesid,serial,username,osuser,machine,program
    FROM v$session
    WHERE audsid =$sessionid;
      v_statement := v_str||sesid||','||serial||chr(39)||'
IMMEDIATE';
      EXECUTE IMMEDIATE v_statement;
      DBMS_OUTPUT.PUT_LINE
    (TO_CHAR
            (SYSDATE,'YYYY/MM/DD HH24:MI:SS') ||
            ' A suspicious session has been killed.'||
            ' [Username]'||username||
            ' [Osuser]'||osuser||' [Machine]'||machine||
            ' [Program]'||program) ;
EXCEPTION
WHEN no_data_found THEN
      DBMS_OUTPUT.PUT_LINE
    (TO_CHAR
            (SYSDATE,'YYYY/MM/DD HH24:MI:SS') ||
             ' A suspicious session is not found at this moment.');
END;
```

4. Login as `BAD_GUY` at an "abnormal" time (Here, that is anytime except between 3 and 4 AM)

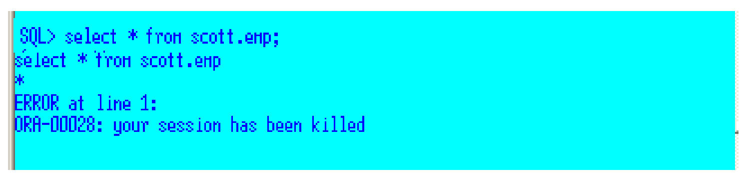


Chained-Rule Alerts: (UBM Session Policy and PUDR)

5 Get an alert when the (the Session Policy) Source rule is violated.

6 Get another alert when the chained PUDR executes and, in this case kills the session of `BAD_GUY`.

7 And, in the Alert Details dialog, display DB user name, OS user name, machine name, and source-program name as shown above.



Resulting Killed Session

8 Notice that our SQLPlus session has been killed

Alert Behavior

This topic describes various alert behavior users should be aware of.

Table Columns That Could Appear in Alerts

Be careful when specifying the SQL for your UDRs. Statements like "SELECT * FROM <table_name>", where <table_name> has a lot of columns, may produce alerts that are difficult to read due to the large number of columns. It is better to be more specific like "SELECT <column_name1>, ... , <column_nameN> from <table_name>".

For example using Oracle, `v$session` has over 40 columns, so instead of this statement:

```
SELECT * FROM v$session WHERE osuser = '$osusername'
```

you might want to use one with specific columns, like:

```
SELECT username, osuser, terminal FROM v$session WHERE osuser =
'$osusername'
```

Multiple Source-Rule-Violation Behavior

When using the Rule Chaining feature with PUDRs, you might expect a target-policy alert for each source-policy alert. However, unless there is a change in the passed parameter, there will be only one PUDR alert--despite multiple source-policy alerts.

For example, assume you have a session policy for your source rule, are passing the terminal name to the target PUDR, and that the session policy is violated twice. In this case, you will get two session-policy alerts because, due to different timestamps, the session policy alerts are not the same. However, you will get only one PUDR alert because the terminal name doesn't change.

DB Example

For example, when using a DB2 target database and passing `$objectowner`, only one PUDR (target rule) alert will show up, regardless of how many times the source rule gets violated. (A source-rule alert will appear for each violation.)

`$objectowner` is replaced by the `creator` parameter which represents the authorization ID of the user who pre-compiled the application[1]. This ID does not change when a user executes multiple SQL queries thereby triggering multiple source-rule alerts. Therefore, you can expect only one PUDR alert.

For example, assume:

a You set up a source-rule User Policy that monitors user X.

b You have a target-rule PUDR that expects `$objectowner` to be passed; like this:

```
SELECT '$objectowner' FROM SYSIBM.SYSDUMMY1 AS
SYSDUMMY1
```

c User X issues these two queries:

```
SELECT * from my.employee
SELECT * from x.table1
```

In this case, two source-rule alerts should show up but only one PUDR (target rule) alert.

PUDR Alert Behavior with Multiple SELECT-List Objects in the Violating SQL Statement

FortiDB MA can detect, and alert on, only the first item in a multiple-object SELECT list.

For example, assume you have created a user policy which gets violated by a user's executing:

```
SELECT * FROM vje.test, vje.test1
```

1. For more information, see http://publib.boulder.ibm.com/infocenter/db2luw/v8/index.jsp?topic=/com.ibm.db2.udb.doc/admin/r0007595.htm

In this case, the alert will be generated only for first object in the SELECT list; namely: `vje.test`.

Report Manager

In order to access the FortiDB MA Report Manager module, click on the **Report Manager** link on the left-side navigator on the main FortiDB MA screen.

The FortiDB MA Report Manager module offers:

- Alert Reports to summarize your alert data
- Custom Reports to enable you to design your own reports

Alert Report Manager

Due to the potential for a large number of alerts to accumulate in your system, the Alert Report Manager (ARM) enables you to create reports that organize the alert information. You filter and sort this information by:

- Severity Level[1] (critical, informational, etc.)
- Status (handled or not)
- Database connection
- Type of rule (PDR or UDR)
- Guarded Item Name or Description
- Alert-Generated Time or Day

ARM can retrieve historical reports and alerts, thus providing a basis for regulatory or legal compliance. And you can export reports in comma- or tab-delimited format for further enhancements.

Setting a Report Schedule

Schedules are either timer-or calendar-based. For a timer-based schedule, you set a time interval for monitoring. For a calendar-based schedule, you choose to have the monitoring run at a specific day and/or time. (You can also combine the two types and randomize the interval you specify.)

To set up a schedule, use the **Set Defaults-> Schedule Settings** menu.

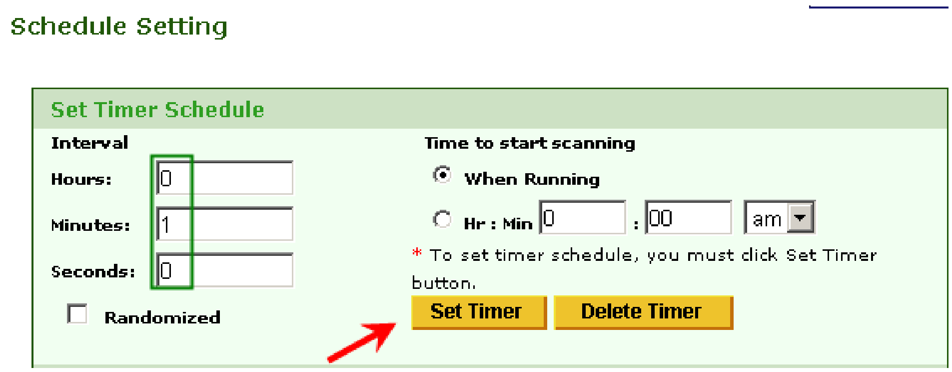
Setting a Timer-based Schedule

For a Timer-based Schedule:

1. Specify the monitoring **Interval** or the **Time to start scanning**
2. Click the Set Timer button[2] in order to save the settings.

---

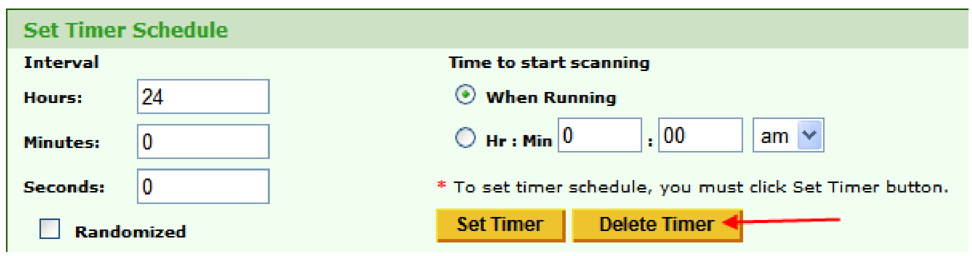
1. Severity levels are user-defined attributes. For example, you can define what 'Critical' means for your organization.
2. By default, reports will run every 24 hours. You must click on the **Set Timer** button to activate this, however.



Setting a Timer-Based Schedule

Deleting a Previously Set Timer Schedule

You can delete a previously set Timer schedule by clicking on the **Delete Timer** button.

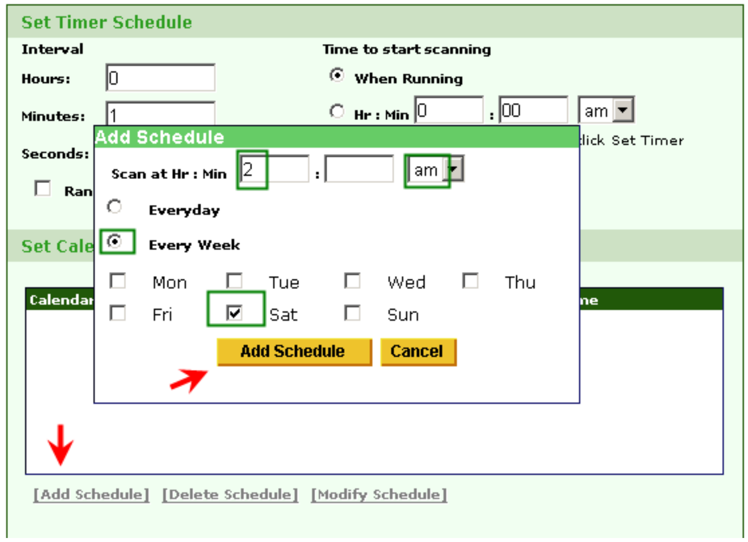


Deleting a Timer Schedule

Setting a Calendar-based Schedule

For a Calendar-based Schedule:

1. Click on the **[Add Schedule]** button at the bottom of the **Schedule Setting** screen.
2. Specify the days and/or times you want. In the example shown, we are setting up a schedule for monitoring to occur each week on Saturday at 2 am.
3. Click on the Add Schedule button at the bottom of the Add Schedule popup screen in order to save the settings.



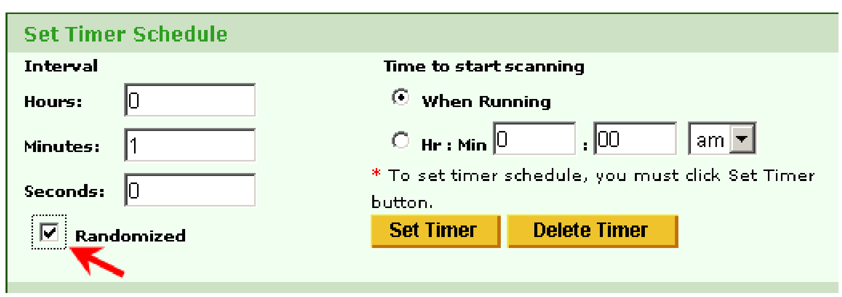
Setting a Calendar-Based Schedule

Setting a Combined Schedule

You can also specify a combined schedule which consists of both a timer- and a calendar-based schedule.

Setting a Randomized Interval

In order to make it difficult to predict your monitoring times, you may also set a reporting schedule that, while dependent on your chosen **Interval** value, won't run exactly that often.

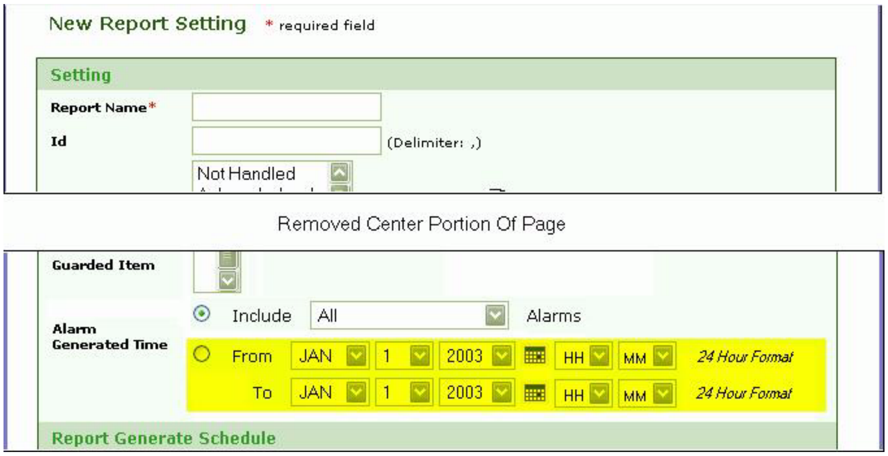


Setting a Randomized Interval

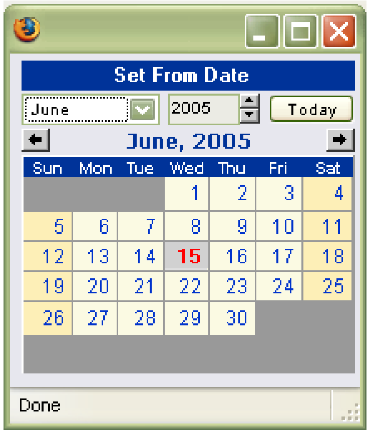
If you check the **Randomized** checkbox, a random number is used to modify your specified interval, in order to establish the time of the next monitoring. After each monitoring, the calculation is performed again--with another random number. This makes it extremely difficult to predict the time of your next monitoring. (However, the average of all of the random-number-calculated intervals will, over time and after a sufficient number of monitoring, be equal to your specified interval.)

Reporting by Time

The Alert Report Manager module generates reports based on alerts generated by the various other modules.



ARM: Reporting by Time



ARM: Reporting by Time: Calendar Pop-up

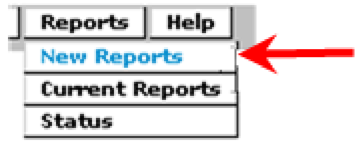
In order to reduce the number of alerts on your report to only those you are interested in, you may now filter alerts based on time.

Enabling Email Recipients

Please see the FortiDB MA *Administration Guide* for a discussion of this topic.

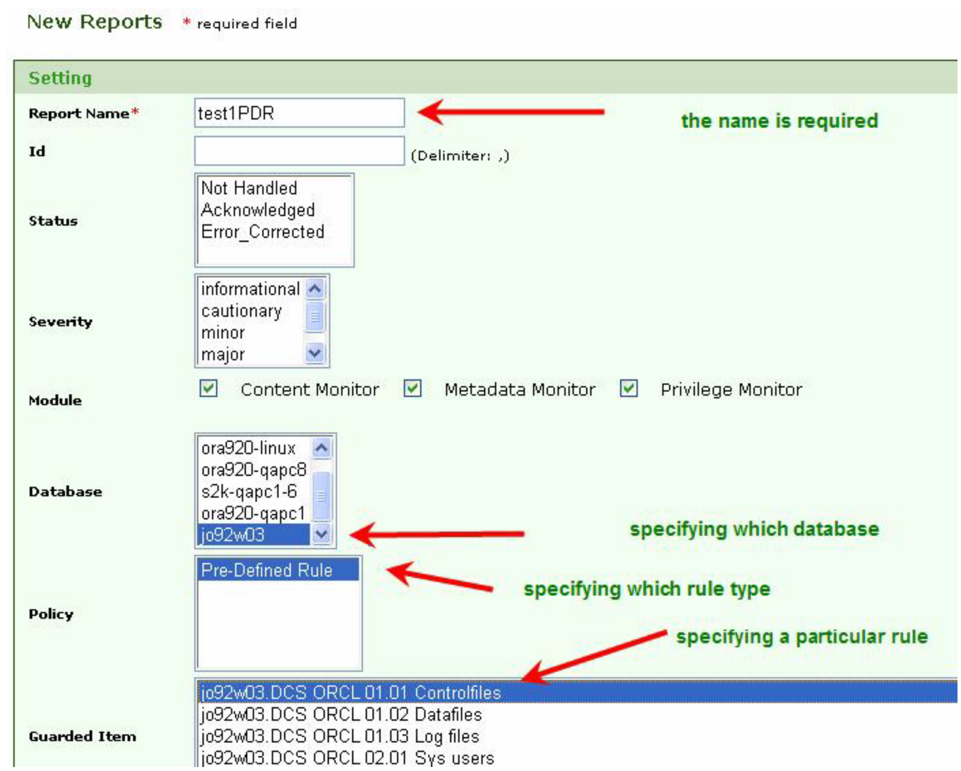
Specifying Report Parameters

You can begin designing reports via the **Reports -> New Reports** menu.

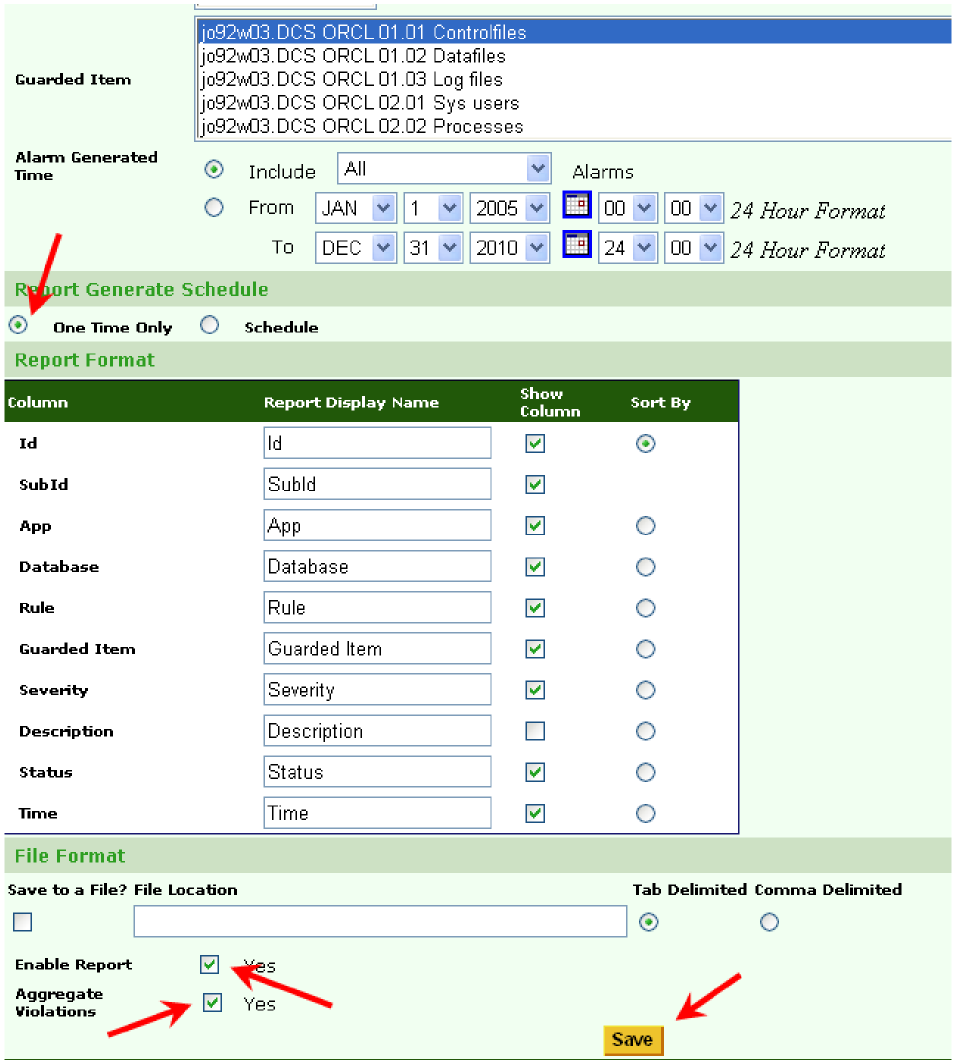


New Reports Menu

In the New Reports page, fill in the necessary data information that you want to show in the report.



New Report Setting Screen (top)



New Report Setting Screen (bottom)

You may specify these parameters for your new report:

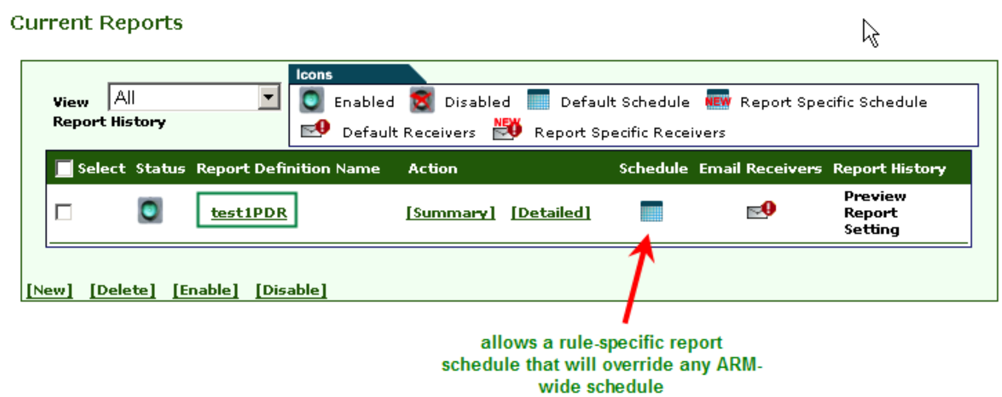
- Report Name (name you choose; this is required)
- ID (Alarm ID(s); each alarm[1] has a unique ID)
- Alert Status (handled, acknowledged, or not)
- Alert Severity (Critical, Informational, etc.)
- FortiDB MA module from which you want to see the alert report
- Database you are assessing
- Rule type you want to use to assess vulnerabilities)
- Guarded Items (the specific rules you want to use in order to assess vulnerabilities)

1. An *alarm* is an internal notification of a potential security violation; customers experience alarms indirectly through Alert Messages. An *alert* is an external notification of a potential security violation; alerts contain, and are triggered by, one or more alarms.

- Alert Generated Time (day or time interval that the alerts occurred)
- Report Generate Schedule:
- One Time Only (snapshot of current alerts typically used for archiving purposes)
- Schedule (run according to the schedule specified in **Set Defaults->Schedule Settings**)
- Report Format (Columns you want to appear and/or be used to sort your report):
- File Format
- Aggregate Violations checkbox (enables whether similar violations are put in a single Alert record; otherwise, each violation has its own record.)

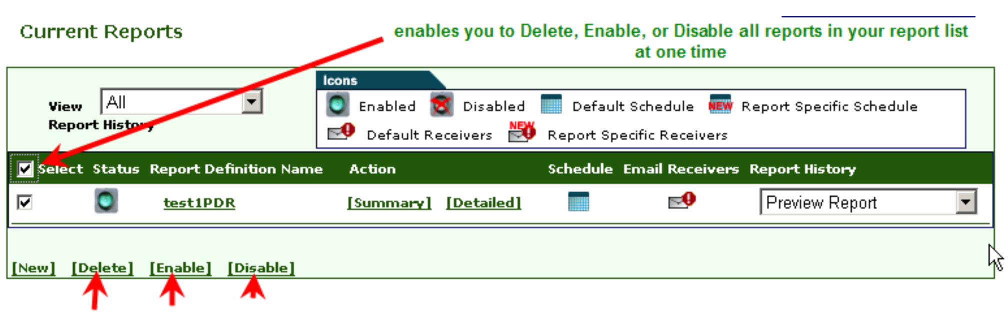
You must check the **Enable Report** checkbox for your report to run.

You must click the **Save** button to save your report settings.



Saved and Enabled Report

Once saved, your report will show up on the **Current Reports** page.



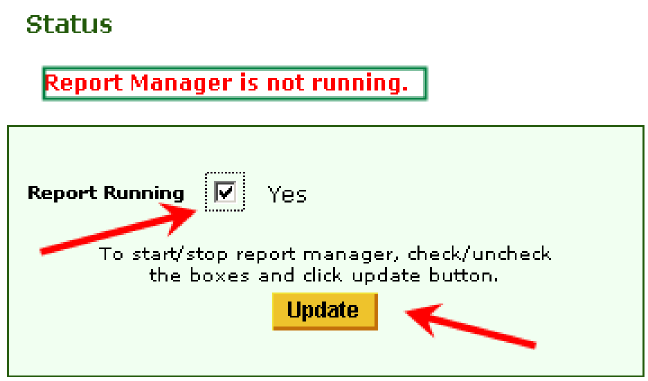
Using the Select Checkbox to Affect Multiple Reports

You can Delete, Enable, or Disable one or more reports from the **Current Reports** screen using the **[Delete]**, **[Enable]**, or **[Disable]** buttons, respectively. To perform these operations all of the reports in your list, check the **Select** checkbox in the column-header row first.

Activating ARM

In order to begin running scheduled reports, you should use the **Reports->Status** menu. Check the **Yes** checkbox and click the **Save** button.

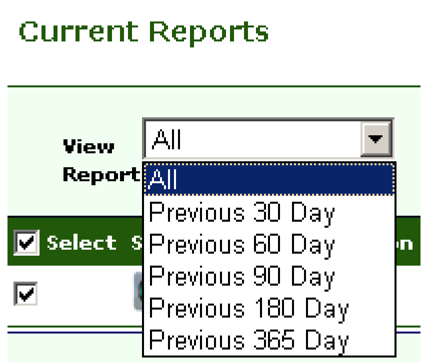
Status Menu



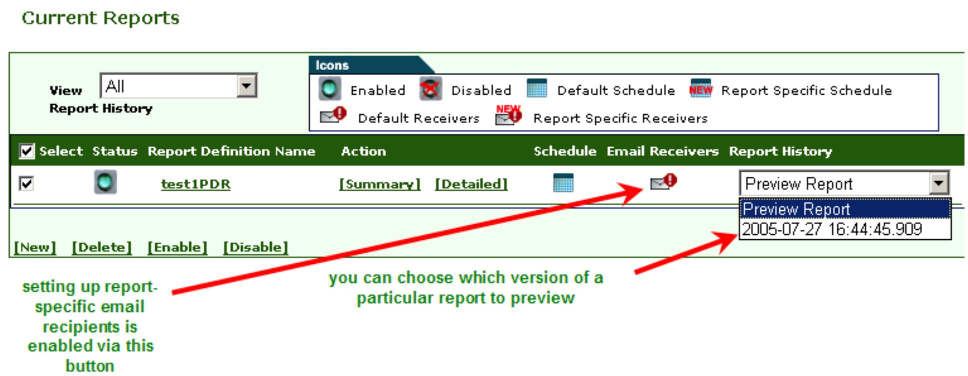
Status Dialog

Running and Analyzing Reports

You may elect to see all reports, or just those created since a specified number of days have occurred, by using the **View Reports** dropdown.



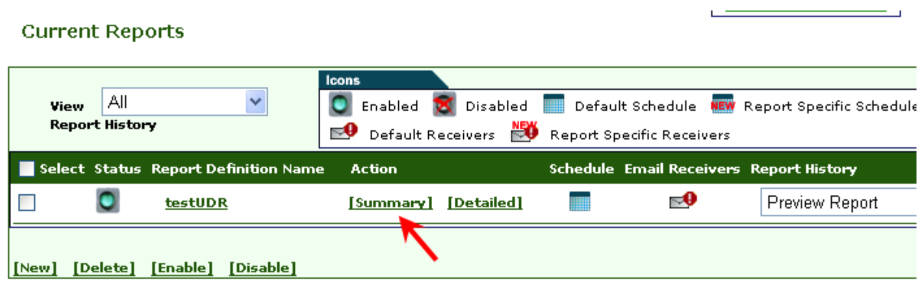
View Reports Dropdown List on Current Reports Screen



Current Report Configuration

In the row corresponding to your report of interest, you can choose which report version to preview via the **Report History** dropdown and you can specify report-specific email recipients by clicking on the **Email Receivers** icon.

Report Summary Action



Choosing Summary Report Action

By clicking the **[Summary] Action** button, you can get to a screen provides summary information for each alert.

The Summary Action gives high-level information about each alert.

By clicking on the **Id** number in the row of interest, you can get details on the alert related to that specific alarm ID.

You can update the **Status** of the alert and enter a **Reason for update** on the **Alert Details** screen. After making your changes, click the **Update Status** button.

Summary-Action Output Types

You can choose among the output types shown above. If you can't export your report to your local machine, you might need to change your Internet Options settings. Please see a note in Report Result section.

Report Detailed Action

By clicking the **[Detailed] Action]** button, you can get to a screen provides detailed information for each alert.

The Detailed Report gives specific information about each alert. The `Id` is a hyperlink that you can click on for more information.

As was the case for the Summary Report information screen, you can also click on the **Id** for the alarm of interest and be taken to the Alert Details screen.

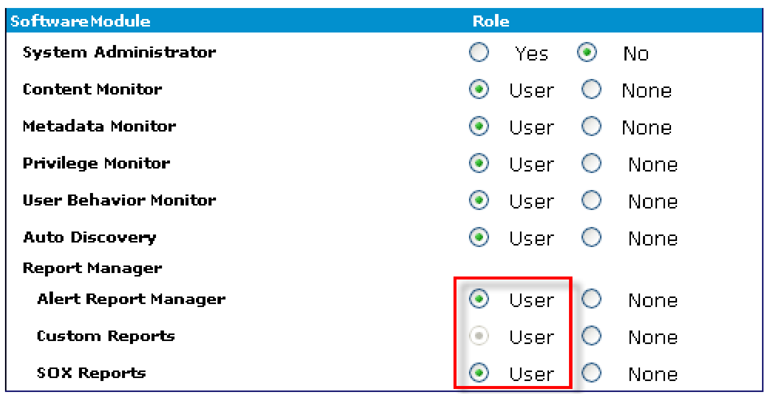
Limitation

Report Size

The reporting functionality has been tested up to a size of about 40,000 rows per report in PDF and HTML. Generating reports larger than this may produce out-of-memory errors.

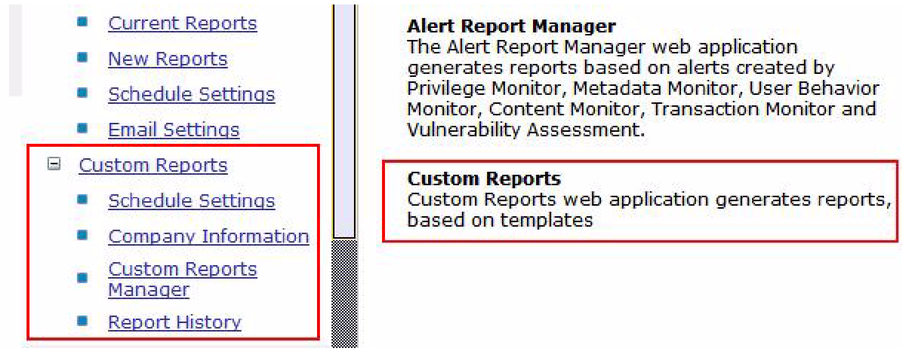
Archiving Reports

You will not be able to generate the same reports after you archive as you were able to prior to archiving, since reports are not archived.



Note: The FortiDB MA Administrative user must explicitly assign one or more of the above Report Manager roles in order for users to be able to run and view these reports.

Custom Reports



Custom Reports

Using the open-source JasperReports library[1], the Quartz scheduling librar[2]y, the chart generating Kavachart libra[3]ry, and the open-source iReport design too[4]l, you can produce your own custom reports to complement those offered by the FortiDB MA Report Manager.

As an example, FortiDB MA is shipping with an Alert Statistics Report and Template, produced by the above tools and libraries.

Reports can be generated in PDF, HTML, or Excel format.

Using This Feature

In general, the steps to use the Custom Reports feature are.

1. Set a schedule for all reports or for an individual report
2. Go to the Company Information page and provide the appropriate information
3. Generate the report
   a. Choose the report and template combination you want
   b. Filter the report by time or data categories
   c. Choose an output format type
4. (Optionally) view the Report History page to manage which reports you want to keep or discard.

Scheduling

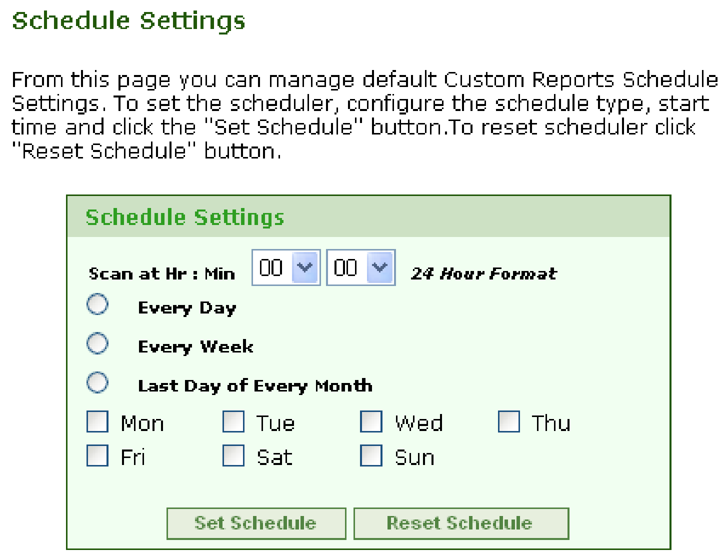
You can set a schedule for running all of your Custom Reports at once or set an individual report's schedule.

To set a schedule, click the Schedule Settings link from the left-side navigation menu or go to Set Defaults -> Schedule Settings from the top menu.

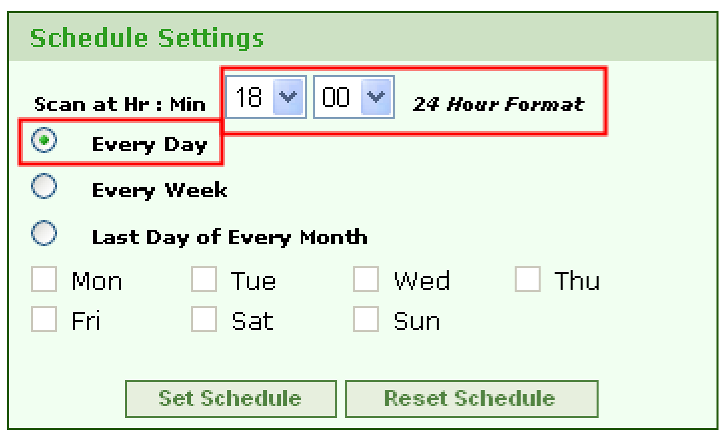
1. See http://jasperreports.sourceforge.net/
2. See http://www.opensymphony.com/quartz/
3. See http://www.ve.com
4. See http://ireport.sourceforge.net/

You can select:

- Time only schedule
- Daily schedule
- Weekly schedule
- Monthly schedule

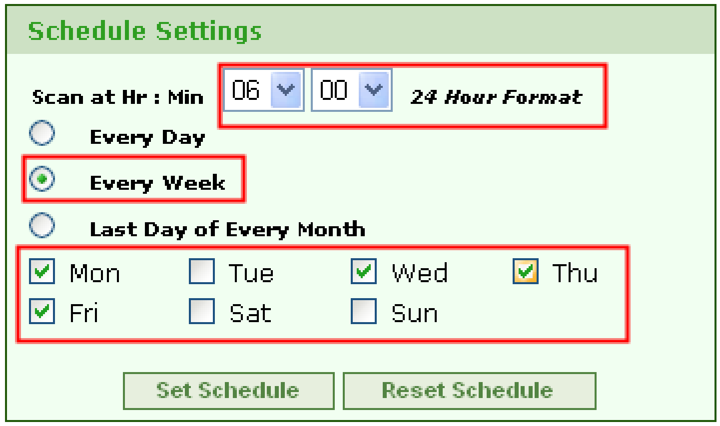


Time-only Schedule Settings



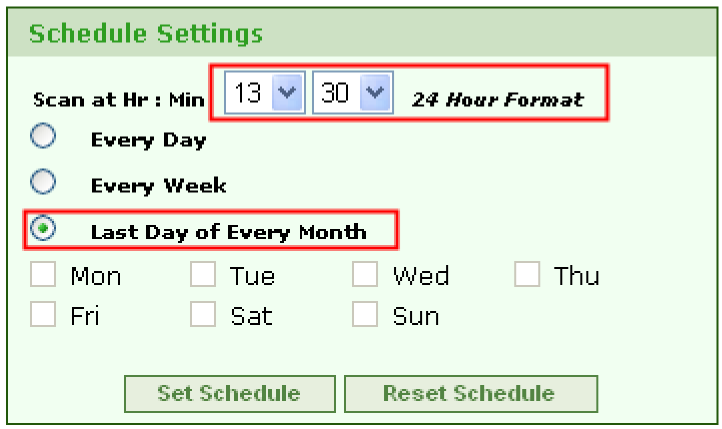
Daily Schedule Settings

You can have your reports run on a daily basis at a certain time.



Weekly Schedule Settings

You can have your reports run on a weekly basis on day(s).



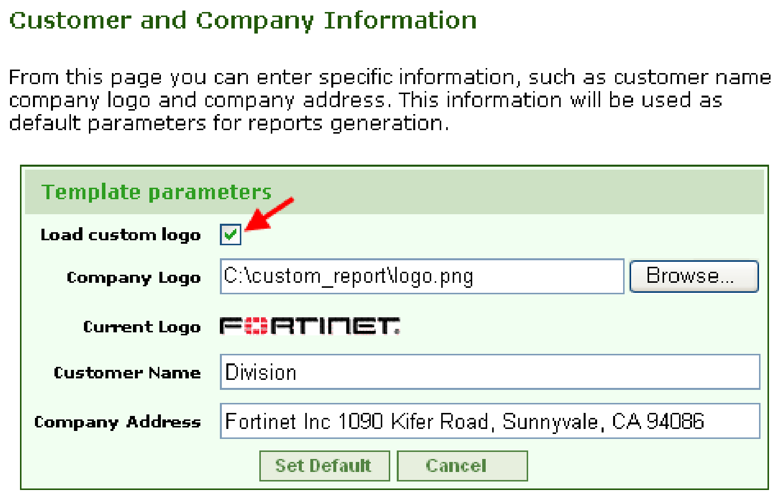
Monthly Schedule Settings

You can have your reports run on a monthly basis.

Customer and Company Information

You can have a custom logo and address (or other descriptive text) appear on each report.

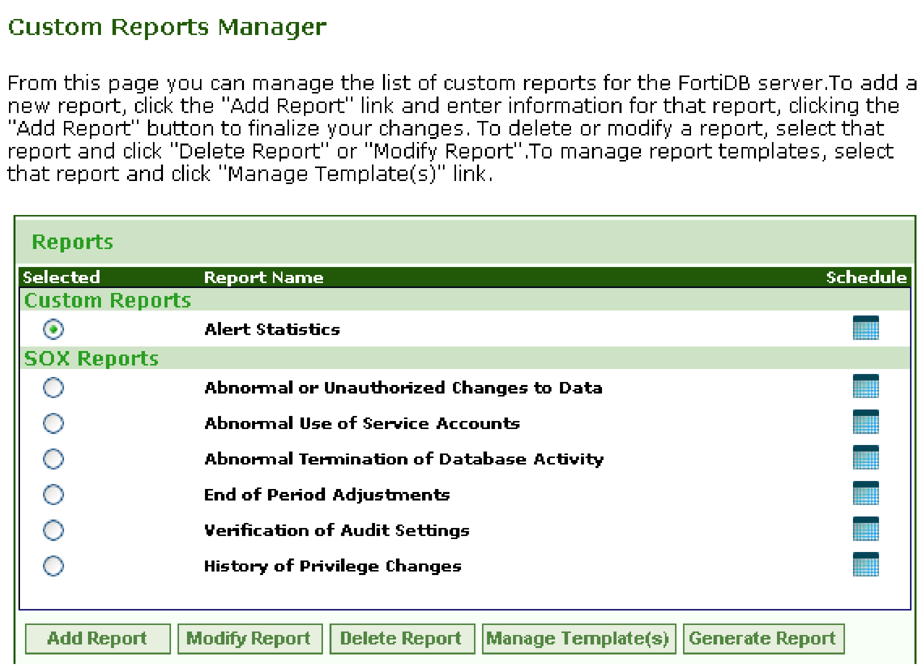
To set a customer and company information, click the Customer and Company Information link from the left-side navigation menu or go to **Set Defaults -> Customer and Company Information** from the top menu.



Company Information Dialog

Note: The name of the file containing the logo cannot contain spaces.

Report and Template Generation and Management



Custom Reports Main Page

From the Custom Reports main page, you can:

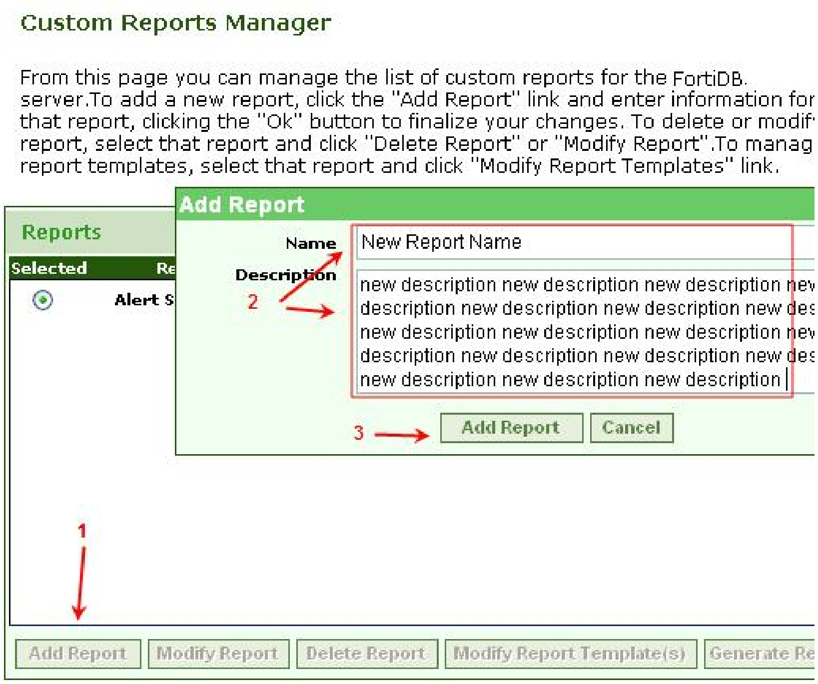
- Add a report
- Modify a report
- Delete a report
- Modify a report's template

- Generate a Report

Adding Reports

To add a new report, take the following steps:

1. Click on the **Custom Reports Manager** link on the left-side navigator or select from the top bar menu, **Reports** -> **Custom Reports Manager**.
2. Click the **Add Report** button. The Add Report dialog displays.
3. Enter your report name and description.
4. Click the **Add Report** button.

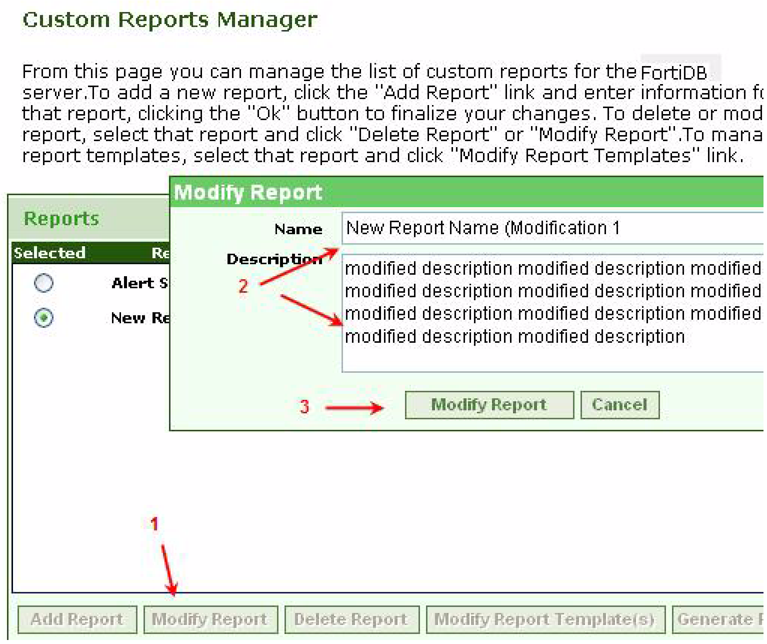


Adding a Report

Modifying Reports

To modify a report, take the following steps:

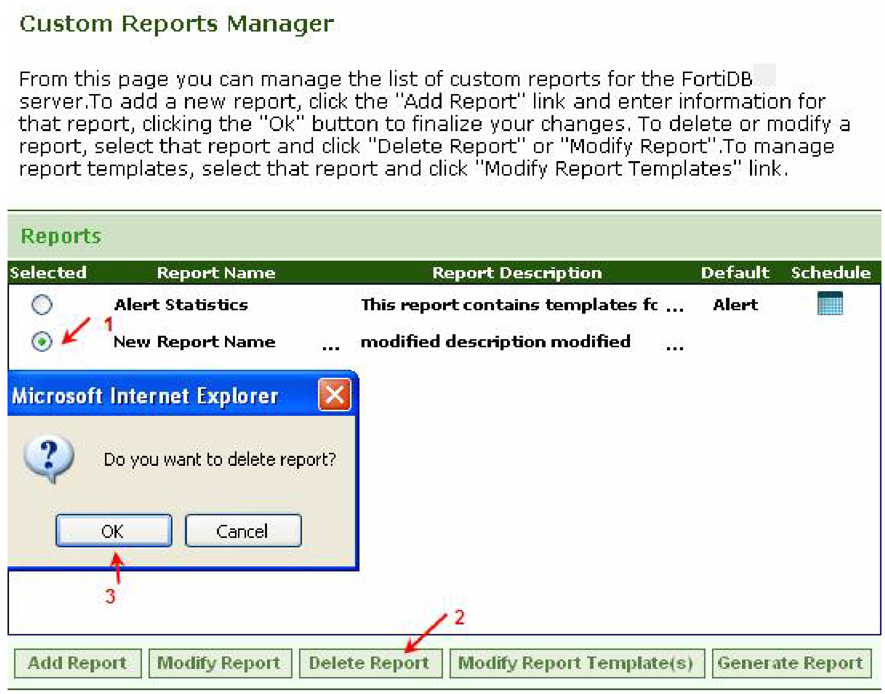
1. Click on the **Custom Reports Manager** link on the left-side navigator or select from the top bar menu, **Reports** -> **Custom Reports Manager**.
2. Select the report you want to modify.
3. Click the **Modify Report** button. The Modify Report dialog displays.
4. Modify your report name and/or description.
5. Click the Modify Report button.



Modifying a Report

Deleting Reports

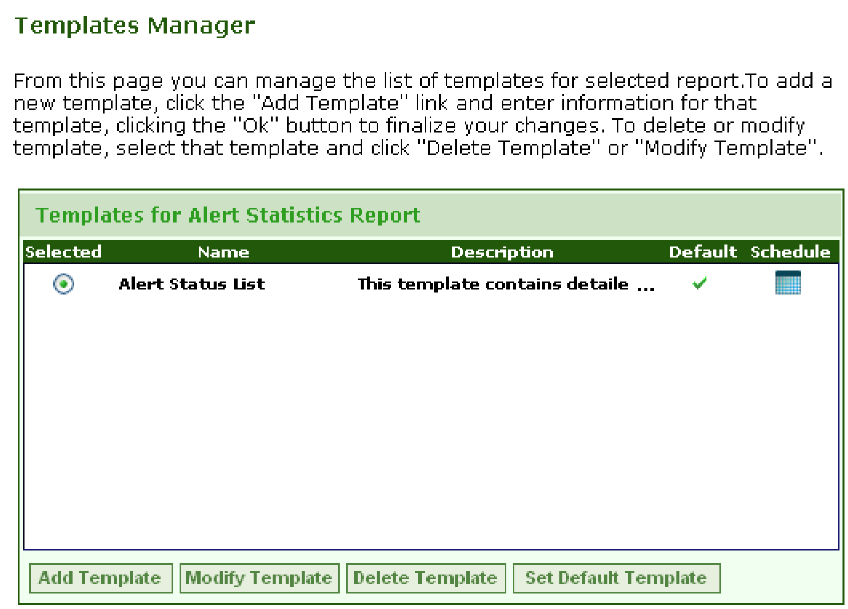
1. Select the report you want to delete.
2. Click the **Delete Report** button. The confirmation window displays.
3. Click the OK.



Deleting a Report

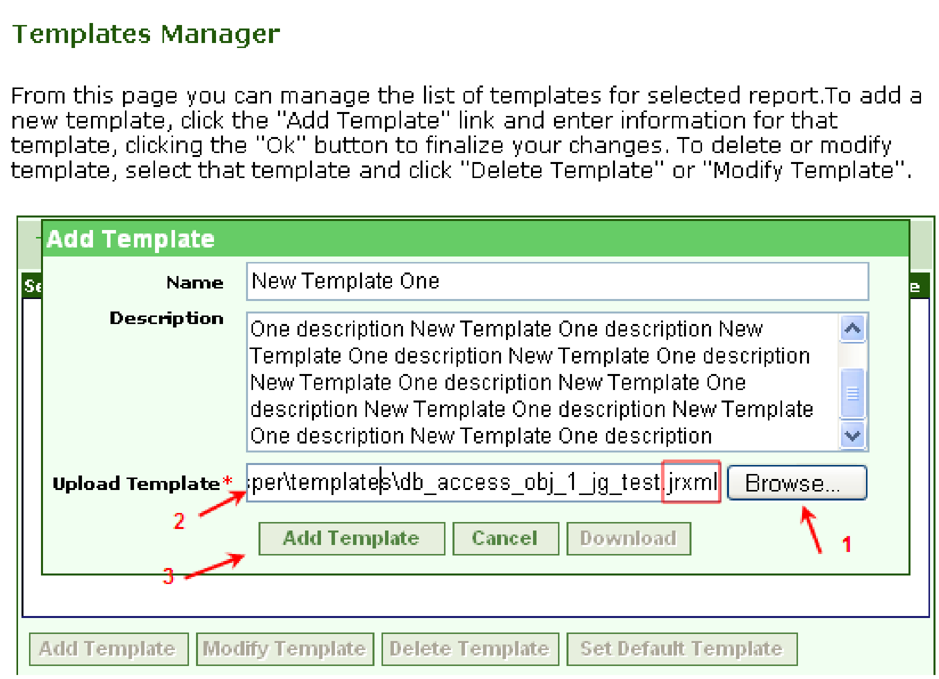
Modifying Report Templates

You can import your template (**.jrxml)* file and save it in the internal reports database. You can also export the template from the internal reports database and store it as a (**.jrxml)*) file on local file system.

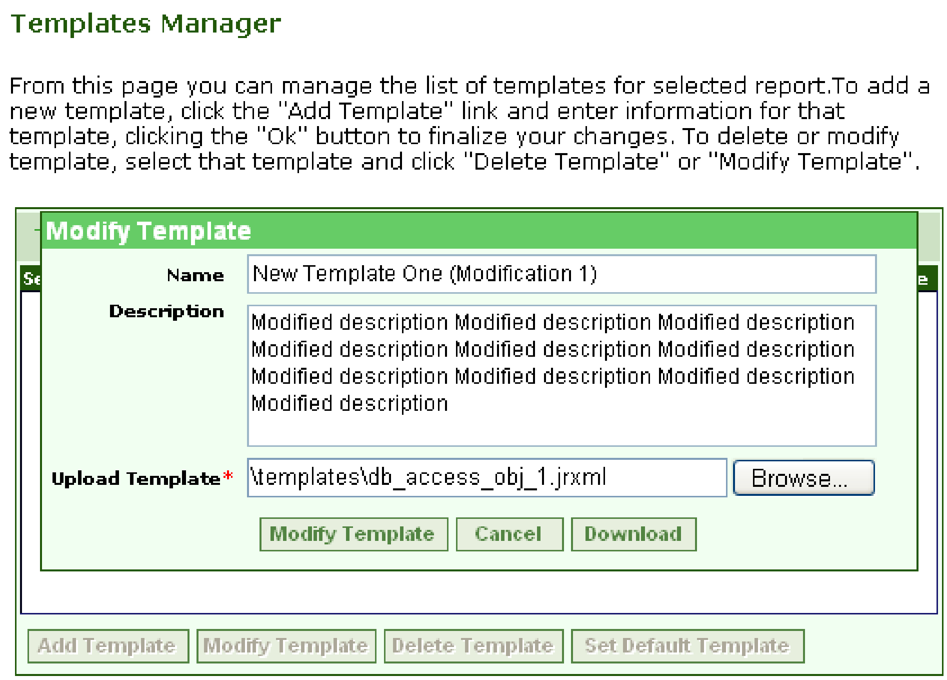


Templates Manager Page

Click on the **Manage Template(s)** button on the **Custom Reports Manager** page in order to bring up the **Templates Manager** page, where you can add, modify, delete templates as well as set your default template.



Templates Manager: Adding a Template Page



Templates Manager: Modifying a Template Page

Generating Reports

To generate a report, take the following steps:

1 From the Custom Reports Manager page, click the **Generate Report** button.

2 In the Template parameters page, select the template you want to use from the pull-down list.

3 To set parameter values to filter the report data, click the **Settings** button.

You may limit the rows returned by:

- Specifying a "like" or "not like" **Column Name** condition.
  - The **Filter Value** is case sensitive
  - You can use a % wild card with your search strings there. In the **Application** filter row, %B% will return records whose application is 'UBM', for example.
- Specifying a specific **Time Period**
- Using the **Limit Rows** text box to specify the number of data rows you want in your report.

Report Result

You can display your report in PDF, Excel, Tab delimited, or Comma delimited formats. You can also export your report and save in your local computer.

Fortinet Inc 1090 Kifer Road, Sunnyvale, CA 94086

ALERT STATUS LIST

Generated on: Fri Oct 24 14:37:08 PDT 2008

DB Connection Name: Tiff_UBM_MS2005

Guarded Item	Application	Policy	Severity	Alert Status	Description	Timestamp
tiffs2k5.dbo.Emplo yee	UBM	Object Policies	cautionary	Not Handled	Alarm ID: 115; Severity: cautionary; Violated Rule: Object Policies; Guarded Item: tiffs2k5.dbo.Employee; Alarm-Generated Time: 2008-10-23 17:41:54; Application: UBM;	2008-10-23 17:41:54.0

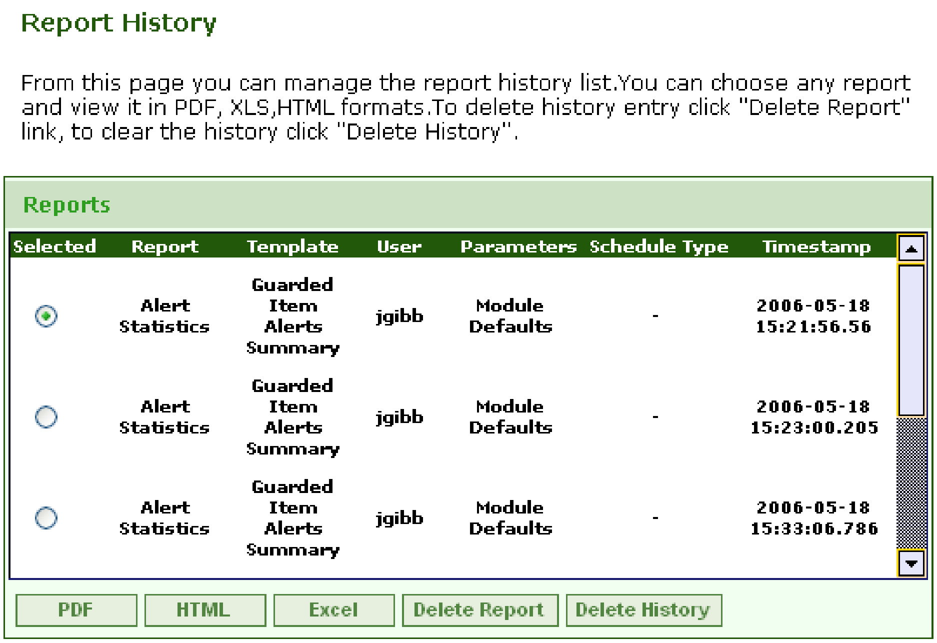
Total alerts for db connection: 1

Generated HTML Report Example

Note: In order to export and save your report files in a tightly secured machine, you might need to change the Internet Option settings of the machine. You can change your Internet Option settings as follows:

1. Open Control Panel, and open Internet Options.
2. In the Internet Properties window, click the Security tab.
3. Select Trusted sites.
4. Click the Sites button. The Trusted sites dialog displays.
5. Enter URL of FortiDB host server (for example, http://myserver.mydomain.com). If you enter a URL with http:// prefix, you need to uncheck Require server verification (https:) for all sites in this zone check box.
6. Click the Add button.
7. Click the Close button.
8. Set the Security Level for this zone to Low.
9. Click OK.

Report History

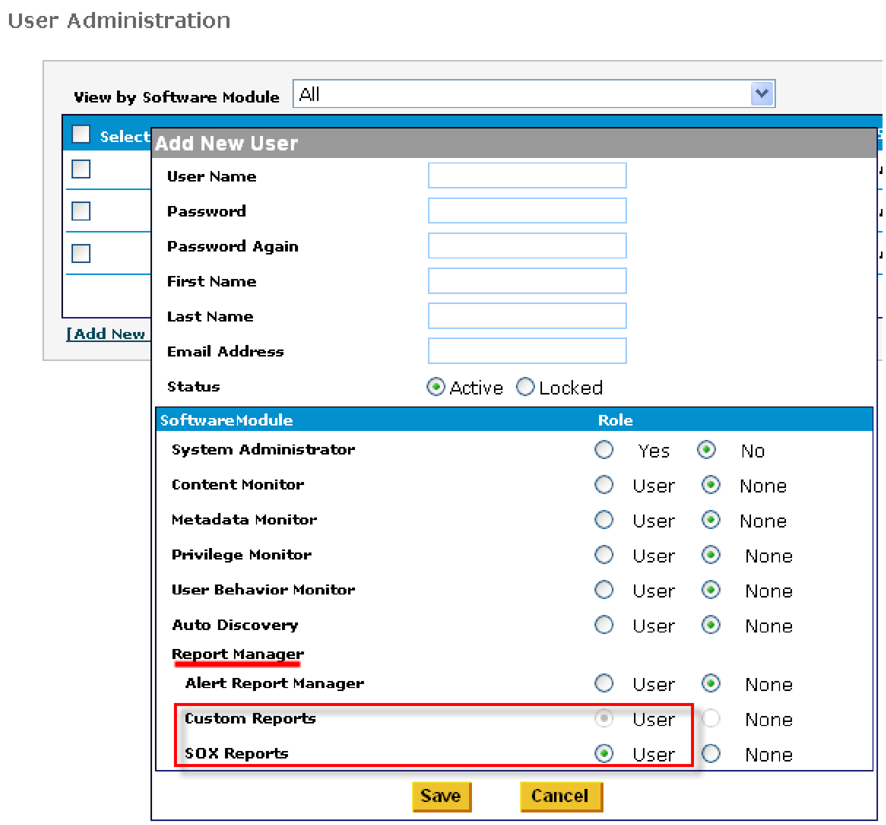


Report History

Report History allows you to:

- View a list of previously generated reports
- Regenerate a particular report
- Delete reports or your entire report history

Licensing and Administration



User Administration for Custom Reports and SOX Reports

In order to enable a user to utilize the Custom Reports feature, select the **Custom Reports** radio button on the **User Administration** screen.

Note: Selecting SOX Reports will automatically enable Custom Reports.

The FortiDB MA license file excerpt shown above includes a license to use the Custom Reports and SOX Reports features.

Custom Report Properties

The following Custom report-related properties are available in the *dssConfig.properties*:

Property	Purpose	Possible Values	Default[1]
cr.reportdbtype	Defines the RDBMS type of the FortiDB MA internal database	pg	pg

Property	Purpose	Possible Values	Default[1]
cr.reportDatabase	Defines the location of the FortiDB MA Custom Reports database	jdbc\:postgresql\://localhost/reportdb jdbc\:oracle\:thin\:@192.168.5.12\:1521\:ipref	
cr.user	Defines the user name for the FortiDB MA Custom Reports database		fortidbma
cr.password	Defines the encrypted password for the FortiDB MA Custom Reports database		

1. Initial value when FortiDB MA is installed.

Note: FortiDB MA has set up what it considers optimal Quartz-library schedule settings in *reportmanager.properties*. If you wish to set your own, see http://www.opensymphony.com/quartz/.

Limitations

The Custom Reports feature has this limitation:

- The maximum number of bar-chart columns for each report is 15. If the data being presented requires more than 15 columns, no bar chart is generated for that data.
- Your browser must allow Popup in order to successfully generate reports.
- Logos or other images will not show up in Excel reports, like they will for PDF and HTML reports.
- Logos with multi-byte characters in their filenames or paths cannot be imported.

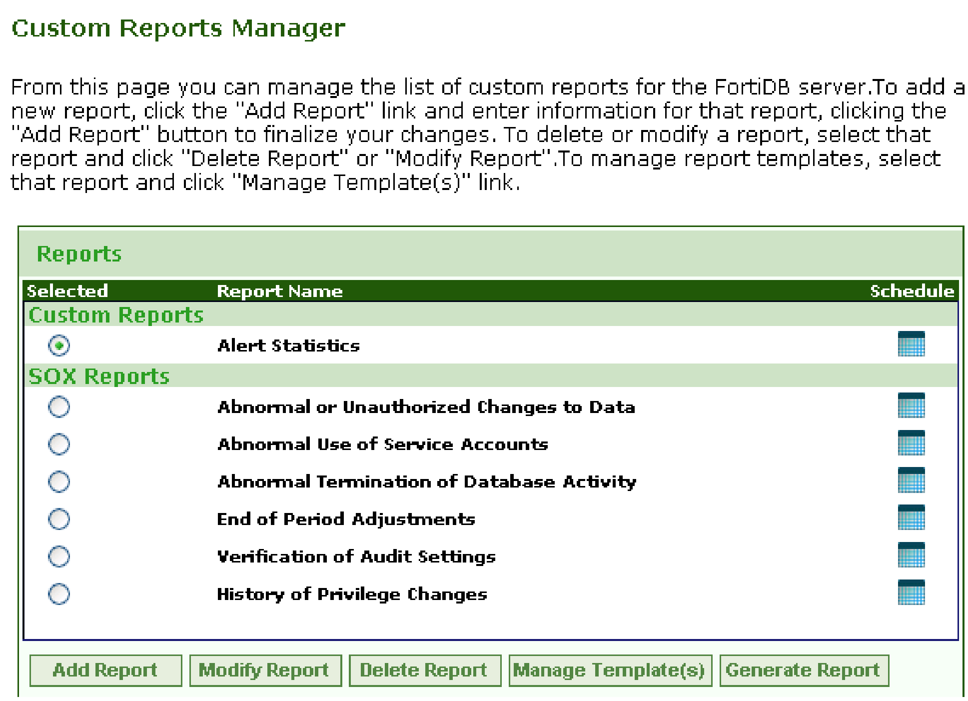
Note: You should schedule the running of long or complex reports for after normal business hours.

Note: Since Custom Reports use information that is currently in the internal reports database, a currently Open, or Open and Running, (target) Database Connection is not necessary.

Description of Shipped Sample Report

Alert Statstics Report	Contains detailed information about alerts: • Database Connection name • Guarded item name • Application name • Policy type • Alert Severity • Alert Status, • Alert Description • Alert Timestamp. Report data is grouped by Database Connection name. Report statistics include: total alerts for database, and total records at the end of report.

SOX Compliance Reports



SOX Reports within Custom Reports Manager Page

One type of Custom Reports is the Sarbanes-Oxley (SOX) Compliance reports.

Reports and Acronyms

This release includes these SOX reports:

Report Name	Acronym
History of Privilege Changes Report	HPC
Abnormal or Unauthorized Changes to Data Report	AUC
Abnormal Use of Service Accounts Report	AUS
Abnormal Termination of Database Activity Report	ATD
End of Period Adjustments Report	EPA
Verification of Audit Settings Report	VAS
Acronym representing all SOX Compliance reports	ALL

Common Report Header Fields

Here are the common report-header fields for the current SOX reports.

Field	Description
Customer Name	Indicates the title or name of the Customer producing the report.
Generated by:	Indicates that the report was generated utilizing FortiDB MA technology.
Date Created:	Indicates the date and time the report was created.
Period-end:	Indicates the last date covered by the report.
W/P Reference:	The “W/P Reference” or Work Paper Reference field represents a tracking mechanism used by customers to identify and place controls around reports.

General Setup Instructions

See the *FortiDB MA Administration Guide*

SOX Report Specifics

This section lists the COBIT objectives and descriptions, the FortiDB MA module-setup requirements, and individual-column detail for each report in this release.

History of Privilege Changes Report (HPC)

#	User ID	Grantee	Action	Target	Sys Privilege	Obj Privilege	Timestamp
1	MALICIOUS		DROP USER	MALICIOUS4			2007-02-23 10:39:16.0
2	MALICIOUS		CREATE USER	MALICIOUS4			2007-02-23 10:39:16.0

HPC Report Sample

COBIT Objectives and Setup Requirements

Objective Number(s)	Objective Description	FortiDB MA Module Setup Requirement
AI2.4, DS3.5, DS5.3, DS5.4	Changes to escalate or reduce database-user access privileges are tracked for review on a quarterly basis by the IT manager and the application business manager.	PM: using the **Audit** data retrieval method

Report Body Columns

The following columns are displayed in the report body:

Column	Description
User ID	The ID of the database user that initiated the privilege change.
Grantee	The name of the user for whom privileges were changed.
Action	The type of action successfully enacted by a non-application user account. Actions include UPDATE, INSERT, and GRANT.
Target	The object on which the privileges were changed.
Sys Privilege	The type of system privilege GRANTed to, or REVOKEd from, the grantee.
Obj Privilege	The type of object privilege GRANTed to, or REVOKEd from, the grantee.
Time Stamp	The exact time the flagged activity was conducted.

Abnormal or Unauthorized Changes to Data Report (AUC)

#	User ID	Object	Time Stamp	Terminal Name	Origin Application	Action Type
1	MALICIOUS	SCOTT.EMP	2007-02-23 10:36:00.0	JUNESONY		UPDATE
2	MALICIOUS	SCOTT.EMP	2007-02-23 10:36:00.0	JUNESONY		UPDATE
3	MALICIOUS	SCOTT.EMP	2007-02-23 10:36:00.0	JUNESONY		UPDATE
4	MALICIOUS	SCOTT.BONUS	2007-02-23 10:36:00.0	JUNESONY		INSERT

AUC Report Sample

COBIT Objectives and Setup Requirements

Objective Number(s)	Objective Description	FortiDB MA Module Setup Requirement
AI2.3	Unauthorized changes to data by non-application[1] accounts are tracked and reviewed by IT Management on a quarterly basis.	UBM: Object policies, since this will focus on data changes in specific tables containing financial information.

1. Non-application accounts have User IDs that belong to individual users. Application accounts have User IDs as well but they are not typically associated with individual users.

Report Body Columns

The following columns are displayed in the report body:

Column	Description
User ID	The ID of the database user that conducted the flagged activity.
Object	The name and owner of the database object that was directly manipulated by the flagged activity
Time Stamp	The exact time the flagged activity was conducted.
Terminal Name	The terminal IP address or name.
Origin Application	The name, or other identifier, for the originating application, if the activity originated from an external application or from an application server.
Action Type	The type of action successfully enacted by the **User ID**.

Note: By default, all actions are considered unauthorized. If you want, for example, to only mark UPDATEs as unauthorized actions, use an **Action Type** filter in the **Settings** dialog in order to filter out the other action types You can also distinguish (un)authorized users by defining a **User ID** filter in the **Settings** dialog.

Abnormal Use of Service Accounts Report (AUS)

#	User ID	Terminal Name	Origin Application	# of Actions	Timestamp
1	SOX_197	unknown		3	2007-02-23 10:30:28.0
2	SOX_197	unknown		3	2007-02-23 10:30:29.0
3	SOX_197	unknown		3	2007-02-23 10:31:31.0

AUS Report Sample

COBIT Objectives and Setup Requirements

Objective Number(s)	Objective Description	FortiDB MA Module Setup Requirement
DS5.3	Database transactions from unauthorized sources are tracked and reviewed by IT Management on a weekly basis.	PM: using the **Audit** data retrieval method MM: using the **Audit** data retrieval method UBM: Object or User policies

Report Body Columns

The following columns are displayed in the report body:

Column	Description
User ID	The ID of the database user that conducted the flagged activity.
Terminal Name	The terminal IP address or name.
Origin Application	The name, or other identifier, for the originating application, if the activity originated from an external application or from an application server.
# of Actions	The number of actions attempted by the account associated with the User ID.
Time Stamp	The exact time the flagged activity was conducted.

Note: If you are using an Oracle internal database and use the **Limit Rows** checkbox in the report's **Settings** dialog in order to limit the number of report rows, the limit that you specify applies to the number of actions and not to the the number of rows.

Abnormal Termination of Database Activity Report (ATD)

#	User ID	Object	Time Stamp	Terminal Name	Origin Application	Action Type	Error Code
1	MALICIOUS	DEVELOPER1	2007-02-23 10:39:17.0	JUNESONY		DROP USER	ORA-01918
2	MALICIOUS	DEVELOPER1	2007-02-23 10:39:17.0	JUNESONY		DROP USER	ORA-01918
3	MALICIOUS	DEVELOPER1	2007-02-23 10:39:17.0	JUNESONY		DROP USER	ORA-01918
4	MALICIOUS	developer1	2007-02-23 10:39:17.0	JUNESONY		CREATE USER	ORA-01920

ATD Report Sample

COBIT Objectives and Setup Requirements

Objective Number(s)	Objective Description	FortiDB MA Module Setup Requirement
DS10.1	Routine transactions and processes between the application and the database are reviewed on a daily basis for successful completion by IT Management.	PM: using the **Audit** data retrieval method MM: using the **Audit** data retrieval method UBM object policies or user policies, and the failed logins policy within the session policy(to capture failed logins)

Report Body Columns

The following columns are displayed in the report body:

Column	Description
User ID	The ID of the database user that conducted the flagged activity.
Object	The name and owner of the database object that was directly manipulated by the flagged activity
Time Stamp	The exact time the flagged activity was conducted.
Terminal Name	The terminal IP address or name.
Origin Application	The name, or other identifier, for the originating application, if the activity originated from an external application or from an application server.
Action Type	The action that was attempted, butt failed to fully process or transact. The action might be, for example, an INSERT, UPDATE, DELETE, logon, or logoff.

Column	Description
Error Code	The proprietary error code generated by the originating application.

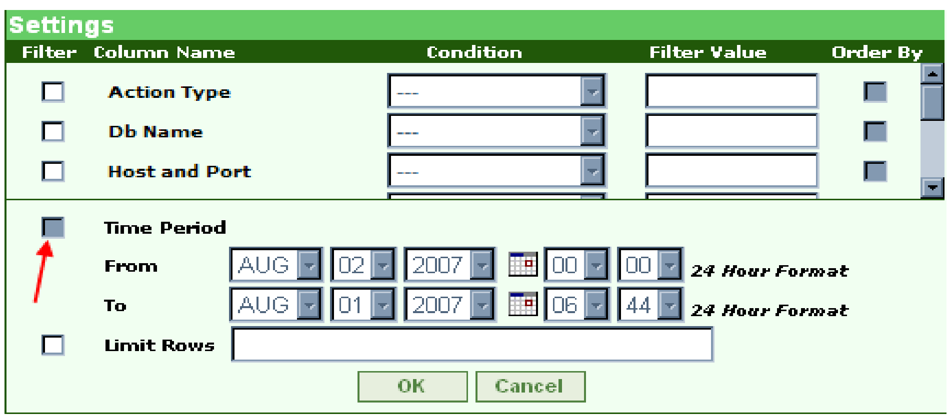
End of Period Adjustments Report (EPA)

#	User ID	Object	Time Stamp	Terminal Name	Origin App	Action
1	SYSTEM	QATEST50.QATABLE	2007-02-11 17:12:00.0	QACHEN		INSERT
2	QATESTUBM1	QATEST50.QATABLE	2007-02-11 17:29:00.0	QACHEN		INSERT

EPA Report Sample

COBIT Objectives and Setup Requirements

Objective Number(s)	Objective Description	FortiDB MA Module Setup Requirement
AI2.3	End of period adjustments to the general ledger are tracked and reviewed by Business Management on a monthly basis.	UBM object policies, focusing on tables containing financial data.



Settings Dialog for the EPA Report

Note: By design, you cannot change the **From** and **To** (**Time Period)** values in the **Settings** dialog.

Report Body Columns

The following columns are displayed in the report body:

Column	Description
User ID	The ID of the database user that conducted the flagged activity.

Column	Description
Object	The name and owner of the database object that was directly manipulated by the flagged activity
Time Stamp	The exact time the flagged activity was conducted.
Terminal Name	The terminal IP address or name.
Origin Application	The name, or other identifier, for the originating application, if the activity originated from an external application or from an application server.
Action	The type of action successfully completed by the User ID.

Determining Your Reporting Period

Reporting Period is the time frame surrounding a user-defined period-end day (PED). The reporting period extends a user-defined number of days before (UDDB) and a user-defined number of days after (UDDA) the PED.

Assumptions:

PED = the 1st day of each month

UDDB = 8

UDDA = 15

Case 1

Assumption:

You are running your End of Period Adjustments (EPA) report sometime before midnight on the first day of August

Assertions:

a) the most recent PED is the first day of July

b) the reporting period is (July 1)- 8 days until (July 1) + 15 days

Conclusion:

The resulting report period is June 23 until July 16, inclusive.

Case 2

Assumption:

You are running your End of Period Adjustments (EPA) report sometime before midnight on the second day of August

Assertions:

a) the most recent PED is the first day of August

b) the reporting period is (Aug 1)- 8 days until (Aug 1) + 15 days

Conclusion:

The resulting report period is July 24 until August 16, inclusive.

Note: Since the time frame from August 3rd and beyond is a future time frame, there will be no data for it in the report.

Verification of Audit Settings Report (VAS)

#	User ID	Object	Time Stamp	Terminal Name	Origin App	Action
1	SYSTEM	QATEST50.QATABLE	2007-02-11 18:47:42.0	unknown		AUDIT OBJECT
2	SYSTEM	CREATE SESSION	2007-02-11 18:48:01.0	unknown		SYSTEM AUDIT

VAS Report Sample

COBIT Objectives and Setup Requirements

Objective Number(s)	Objective Description	FortiDB MA Module Setup Requirement

DS3.5, DS5.5, DS13.3	Audit tracking is configured on all financial databases, changes to audit functionality is reviewed by IT Management on a quarterly basis.	There are two requirements:
		1. At least one of the following modules must be run in order to collect audit data:
		• UBM
		• PM: using the **Audit** data retrieval method
		• MM: using the **Audit** data retrieval method
		2. For tracking audit activity with the UBM module, run the following commands:
		`audit system audit;`
		`audit audit system;`
		`audit audit any;`
		and then Close and Open your database connection in UBM.

Report Body Columns

The following columns are displayed in the report body:

Column	Description
User ID	The ID of the database user that conducted the flagged activity.

Column	Description
Object	The name and owner of the database object that was directly manipulated by the flagged activity
Time Stamp	The exact time the flagged activity was conducted.
Terminal Name	The terminal IP address or name.
Origin Application	The name, or other identifier, for the originating application, if the activity originated from an external application or from an application server.
Action	The type of action successfully completed by the User ID.

Licensing and Administration

For SOX Reports licensing and administration information, please refer to the *FortiDB MA Administration Guide*

Limitations

Report Size

The reporting functionality has been tested up to a size of about 40,000 rows per report in PDF and HTML. Generating reports larger than this may produce out-of-memory errors.

Archiving Reports

You will not be able to generate the same reports after you archive as you were able to prior to archiving, since reports are not archived.

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