



FortiDB™

Version 4.4.1

User Guide

FORTINET®

FortiDB User Guide

Version 4.4.1

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Contents

FortiDB Quick Start.....	9
VA QuickStart.....	9
DAM QuickStart (TCP/IP Sniffer with Alert Data Policy).....	11
DAM QuickStart (Data policy).....	14
DAM QuickStart (Metadata policy).....	17
DAM QuickStart (Compliance policy).....	18
Installation (Standalone users only).....	21
Introduction.....	21
Prerequisites.....	22
FortiDB Repository.....	24
Configuring a PostgreSQL Repository.....	24
Configuring an Oracle Repository.....	25
Configuring an MS SQL Server Repository.....	26
UNIX/Linux Installations.....	27
Windows Installations.....	27
Post Installation Operations.....	27
Installations Troubleshooting.....	29
Upgrading FortiDB.....	30
Login.....	31
Login Steps.....	31
Changing Your Password.....	31
Password Rules.....	31
Appliance - Basic.....	33
Before Using Appliance.....	33
System Information and Settings.....	33
Setting the System Time.....	34
Changing the FortiDB Host Name.....	34
Update FortiDB Firmware.....	35
System Resources.....	35
Unit Operation.....	35
Network Configuration.....	35
Interface.....	36
DNS.....	37
Routing.....	37
Configuring Network Settings using the CLI.....	38
Managing Firmware.....	39
Backing up Your Data and Configuration.....	39
Upgrading FortiDB Firmware using the Web-based Manager.....	40
Upgrading FortiDB Firmware using the CLI.....	40
Installing FortiDB Firmware.....	41
Restoring your Configuration Settings using the CLI.....	42

Administration.....	43
Administrator Management.....	43
Adding (or Modifying) an Administrator.....	43
Deleting Administrators.....	47
Entitlement Report.....	47
Global Configuration.....	48
Changing the System Properties.....	48
Restoring the Default Values of System Properties.....	49
System Properties List.....	49
Archive and Retrieve.....	55
About Archiving.....	55
Archiving Manually.....	56
Scheduling an Archive.....	56
Remote Archive.....	57
Retrieving the Archived Data.....	57
Local Audit Trail.....	58
Target Management.....	61
Manage Target Database.....	61
Adding (or Modifying) a Target Connection.....	62
Deleting Target Database Connections.....	65
Exporting Target Database Data.....	66
Importing Target Database Data.....	66
Target Groups.....	67
Adding (or Modifying) a Target Group.....	67
Deleting Target Groups.....	68
Required Settings for Monitoring Target Databases.....	68
Configuring Monitoring with TCP/IP Sniffer.....	68
Configuring the Oracle Target Database.....	69
Configuring the MS SQL Server Target Database.....	74
Configuring the Sybase Target Database.....	75
Configuring the DB2 Target Database.....	79
Configuring the MySQL Target Database.....	83
Privileges of DB User for FortiDB.....	84
Privileges for Assessment.....	84
Privileges for Monitoring Data.....	89
Privileges for Monitoring Privilege.....	90
Privileges for Monitoring Metadata.....	91
Auto Discovery.....	92
Running Auto Discovery.....	92
Adding Targets from Auto Discovery.....	93
VA Policy Management.....	95
About VA Policies.....	95
VA Pre-Defined Policies (PDP).....	96
Exporting Pre-Defined Policies.....	97
Importing Pre-Defined Policies (for Appliance Users).....	97
Importing Pre-Defined Policies (for Standalone Users).....	98
OS-Level Pre-Defined Policies.....	98

VA User-Defined Policies (UDP).....	103
Adding User-Defined Policies (UDPs).....	104
Deleting User-Defined Policies (UDPs).....	106
Exporting User-Defined Policies.....	106
Importing User-Defined Policies.....	106
VA Policy Groups.....	106
Adding VA Policy Groups.....	107
Modifying the Existing VA Policy Groups.....	108
Deleting VA Policy Groups.....	108
About the Penetration Test.....	108
Data Discovery Policies and Policy Groups.....	111
DAM Policy Management.....	113
DAM Policy - Alert Policy and Audit Policy.....	113
Multiple Database Configuration from DAM Policy Management.....	113
Target based Configuration from Target Management.....	114
Configuring Policies.....	114
Data Policies.....	115
Configuring Table Policy.....	116
Configuring Table and Column Policy.....	120
Configuring Session Policy.....	121
Configuring User Policy.....	124
Configuring Database Policy for Auditing.....	128
Configuring DB Query Policy for Alert.....	128
Privilege Policies.....	129
Configuring Privilege Policy.....	129
Metadata Policies.....	133
Configuring Metadata Policy.....	133
Alert Compliance Policies.....	136
Configuring Compliance Policy.....	136
Setting or Modifying Audit Settings (Object Audit Options).....	137
Setting or Modifying Audit Settings (User Audit Options).....	137
DAM Alert/Audit Policy Groups.....	137
Adding a New Policy Group.....	138
Modifying the Existing Policy Groups.....	139
Deleting the Policy Group.....	139
Vulnerability Assessment.....	141
Adding (or Modifying) Assessments.....	141
Running Assessments.....	141
Assessment Notifications.....	142
Assessment Reports.....	145
Evaluating Assessment Results and Aborting Assessments.....	146
Deleting Assessments.....	147
VA Global Summary.....	147
Assessment History.....	147
VA Privilege Summary.....	148
DB-Type Distinctions.....	149
Sensitive Data Discovery.....	150
Local Assessment Log.....	151

Database Activity Monitoring.....	153
Target Monitoring Management.....	153
General tab.....	155
Alert Policies and Audit Policies.....	158
Associating Policy Groups to Target Monitoring.....	158
DB Query Policy Schedule.....	158
Alert Notification.....	159
Real Time Blocking.....	160
White List.....	161
Audit Management.....	163
Security Alerts.....	165
Filtering Alerts.....	167
Alert Details.....	167
Alert Group.....	168
Audit Group.....	169
Alerts Summary.....	170
Alerts Analysis.....	170
Activity Auditing.....	172
Configure Activity Auditing.....	173
Audit Details.....	173
Activity Profiling.....	173
Configure Activity Profiling.....	174
View/Export Activity Profiling Data.....	174
Compliance Audit.....	175
Local Monitoring Log.....	175
Report Management.....	177
About Reports.....	177
Pre-Defined VA Reports.....	178
Assessment Reports.....	179
User-Defined VA Reports.....	179
Scheduled VA Reports.....	180
Pre-Defined DAM Reports.....	180
User-Defined DAM Reports.....	181
Reports Management.....	182
Configuring Data Filtering.....	182
Configuring Data Display.....	183
Schedule and Notification.....	183
Compliance Reports.....	184
Report: Abnormal Termination of Database Activity.....	185
Report: Abnormal or Unauthorized Changes to Data.....	186
Report: Abnormal Use of Service Accounts.....	187
Report: End of Period Adjustments.....	187
Report: History of Privilege Changes.....	188
Report: Verification of Audit Settings.....	188
Appliance - Command Line Interface (CLI).....	191
Using the FortiDB CLI.....	191
Basic CLI Information.....	191

CLI Command Syntax.....	193
Administration Commands.....	194
config command.....	195
execute command.....	200
show commands.....	206
get and set commands.....	208
diagnose command.....	209
Contact Information.....	211
Getting Fortinet Contact Information.....	211

FortiDB Quick Start

VA QuickStart

This guide leads you through the process that results in the creation of a vulnerability-assessment report for one of your target databases.



Note: All GUI fields marked with an asterisk (*) must be filled in or specified.


The example below assumes you will be assessing an Oracle target database. Therefore you will need to make sure that the FortiDB user for your Oracle target database has the privileges shown below. If your target database is other than Oracle, refer to the Required Privileges for Assessment column of [Privileges for Assessment](#)

RDBMS Type	Required Privilege(s)
Oracle	<ul style="list-style-type: none">• CREATE SESSION• SELECT_CATALOG_ROLE• SELECT ON:<ul style="list-style-type: none">• SYS.AUDIT\$• SYS.REGISTRY\$HISTORY• SYS.USER\$• SYS.LINK\$• SYSTEM.SQLPLUS_PRODUCT_PROFILE

- 1 .Login to FortiDB as the FortiDB `admin` user using `fortidb1!$` for the password .
- 2 .Create a FortiDB user who can create a target database group, run an assessment, and review a report about that assessment.
 - a) Go to **Administration > User Management** in the left-side tree menu.
 - b) On the **User Management** page, select the **Add** button.
 - c) On the **Add New User** page, select the **General** tab.



Note: All GUI fields marked with an asterisk (*) must be filled in or specified.

- d) On the **General**-tab form, fill in the text boxes marked with an asterisk (*). (Assume a user name of `vauser` and a password of `fdb!23`.)
 - e) On the **Add New User** page, select the **Roles** tab.
 - f) On the **Roles**-tab, select these roles from the **Available Roles** list box:
 - **Target Manager**
 - **Operations Manager**
 - **Report Manager**
 - g) Select the  button in order to move those role names to the **Assigned Roles** text box.
 - h) Select the **Save** button.
 - i) Select the **Logout** link at the top-right of the screen in order to logout the `admin` user.
- 3 .As the newly created user, create a target-database connection.
 - a) Login to FortiDB as the FortiDB `vauser` user using `fdb!23` for the password.


You should notice the absence of an **Administration** section in the left-side navigation menu. (vauser cannot create, or even view, other users from within the FortiDB application.)

- b) Go to **Target Database Server > Targets** in the left-side tree menu.
- c) Select the **Add** button.
- d) On the **Target** page, select the **General** tab.
- e) Enter the information in the text boxes marked with an asterisk (*) with settings appropriate to your target database. Assume an Oracle target with these parameters:
 - **Name:** Enter a name (ex. vatarget)
 - **Type:** Select your database type (Oracle)
 - **DB Host Name/IP:** Enter IP address or machine name on your system that contains the Oracle target database (ex. test_machie or 172.30.12.112)
 - **Port:** Enter the port number or leave the default (1521)
 - **DB Name:** Enter the name of your target database. (ex. orcl)
 - **User Name:** Enter the name of the your target database
 - **Password:** Enter the password of your target database.
- f) Select the **Test Connection** button to verify that your target database is reachable and that your connection parameters are correct. You should see a 'Success' message.
- g) Select the **Save** button. vatarget should appear on the **Targets** page under the **Name** column header.


4 .Create a new group and add the newly created connection to your group.




Note: FortiDB runs assessments against target-database groups not individual database connections. And a group can consist of one or more target database.

- a) Go to **Target Database Server > Targets Groups** in the left-side tree menu.
- b) On the **Target Groups** page, select the **Add** button.
- c) On the **Targets** page, enter a name for your group in the **Group Name** text box. (Here assume the group name is mygroup.)
- d) Build a filter by filling in the following:
 - In the **Column** dropdown list, choose **Name**.
 - In the **Operator** dropdown list, choose **Contains**.
 - In the **Value** text box, enter all or part of the **Name** of the target you created above (For example, use targ, a substring of the name, vatarget, that you assigned above.)
- e) Select the **Search** button in order to see if this filter selects the target you created above.
- f) Select the **Save Group** icon  near the top of the page.
- g) Verify that the target group you just created is then listed on the **Target Groups** page.

5 .Assess the vulnerability of the target database in your group.

- a) Go to **Vulnerability Assessment > Assessments** in the left-side tree menu.
- b) On the **Assessments** page, select the **Add** button.
- c) Enter a name for your new assessment in the **Assessment Name** text box. (Here assume the assessment name is myscan.)
- d) Associate your newly created target-database group with your assessment. On the **Assessment** page, select the **Targets** tab.
- e) In the **Available Target Groups** list box in the **Target Groups**-tab, select mygroup, the target-database group you just created, and then select the  button in order to move mygroup to the **Assigned Target Groups** text box.

- f) Associate the appropriate group of FortiDB-shipped policies with your assessment. On the **Add Assessment** page, select the **Policies** tab.
- g) In the **Available Policy Groups** list box in the **Policy Groups**-tab, select `Oracle Policy Group` (assuming you are assessing an Oracle target database) and then select the  button in order to move that group name to the **Assigned Policy Groups** text box. If you select a Policy Group in the **Available Policy Groups** or **Assigned Policy Groups** list box, policies that belong to the Policy Group are displayed in the Active Policies list box.



Note: Although the active policies can be highlighted, you cannot choose an individual or group of active policies to execute.

- h) Select the **Save** button.
You should then see a ready-to-run assessment called `myscan` on the **Assessments** page.

6 .Run your newly created assessment.



Note: FortiDB offers assessment scheduling as well as email and SNMP-trap notifications of assessment results. Here, however, we will simply run the assessment created above which does not incorporate these features.

- a) Select the checkbox to the left of the `myscan` row.
- b) Select the **Run** button.
After a minute or so, you should see the **Last Run Time** column in the `myscan` row get populated with a stop date and time for the assessment you just ran.

7 .FortiDB ships with several pre-defined reports that will help you analyze your assessments. Here we will examine our assessment with the *Summary Failed Report* which summarizes failed-policy results.

- a) Go to **Report > Pre-Defined VA Reports** in the left-side tree menu.
- b) On the **Pre-Defined Reports** page, select **Summary Failed Report**.
- c) On the **Vulnerability Assessment Summary Failed Report** page, select:
 - `myscan` from the **Assessment Name** dropdown list
 - The start date and time associated with `myscan` from the **Assessment Time** dropdown list.
 - From the **Target** dropdown list, the target group (here `vatarget`) associated with `myscan`

On the **Target Information** tab of the **Vulnerability Assessment Summary Failed Report** page, you should see the fields get populated with the parameters of your assessment.

- d) Select the **Preview Report** tab of the **Vulnerability Assessment Summary Failed Report** page and, after it is compiled, a *Summary Failed Report* will appear in your browser.
- e) In order to view your report in another of the supported formats, scroll down to the **Export as** drop down list, select the file format you want, and select the **Export** button.



Note: The following file formats are supported:

- PDF
- Excel
- Tab-delimited
- Comma-separated values

DAM QuickStart (TCP/IP Sniffer with Alert Data Policy)

This guide leads you through the process that monitors your target database with TCP/IP sniffer, and results in generating alerts and exporting alerts to a report.



Note: DAM with TCP/IP Sniffer feature is only available with FortiDB appliance.



Note: All GUI fields marked with an asterisk (*) must be filled in or specified.

The example used in this guide assumes you will monitor an **Oracle target database** with the TCP/IP sniffer. You will apply a Alert Data-Table policy and generate alerts for the Security Violation rule and Suspicious Databases Users rule. Before starting a target connection, you need to make sure that your target database is configured properly to be monitored by FortiDB. For details about configuring Oracle target databases, see [Configuring the Oracle Target Database](#).




Note: To use the TCP/IP sniffer for DAM, following network environment and interconnections are required:

- Your target database server and clients use TCP/IP as protocol, and all database activities are going through LAN.
- The network switch, which your target database server connected, must support the port mirroring feature.
- Connect one ethernet port of FortiDB appliance to the mirror port (also known as SPAN port) of switch, which database server connects to.

- 1 .Login to FortiDB as the FortiDB admin user using `fortidb1!$` for the password (default administrator user and password).
- 2 .Create a target database connection.
 - a) Go to **Target Database Server > Targets**.
 - b) Select the **Add** button. The **Target** page will display. The **General** tab is selected.
 - c) Enter the information in the text boxes marked with an asterisk (*) with settings appropriate to your target database. Assume an Oracle target with these parameters:
 - **Name:** Enter your `target_name`
 - **Type:**Select your database type (Oracle)
 - **DB Host Name/IP:** Enter IP address or machine name on your system that contains the Oracle target database (ex. test_machie or 172.30.12.112)
 - **Port:** Enter the port number or leave the default (1521)
 - **DB Name:** Enter the name of your target database. (ex. orcl).
 - **User Name:** Enter the name of the your target database.
 - **Password:** Enter the password of your target database.
 - **DB Activity Monitoring:** Make sure the 'Allow' checkbox is selected.
 - d) Select the **Test Connection** button to verify that your target database is reachable and that your connection parameters are correct.
You should see a 'Success' message.
 - e) Select **Save**.
`target_name` and related information should appear on the **Targets** page.
- 3 .Configure Monitoring and Data-Table policy.
 - a) Go to **DB Activity Monitoring > Monitoring Management**. You will see your target database listed in the **Target Monitoring Management** page.
 - b) Click on the name of the target.
 - c) In the **General** tab, setup collection method and parameters for **Audit Configuration**.
 - In the **Collection Method** field, select 'TCP/IP Sniffer' (for this example).
 - Select **Version** for your target database (9i, 10g, or 11g for Oracle).
 - In the **Sniffer on Port**, select which FortiDB appliance port is connected to switch's mirror port.
 - Check the **Enable Activity Auditing** and **Log All**, to auditing all database activity.
 - Check the **Enable Activity Profiling**.
 - Check the **Save** button to save your **Audit Configuration**.
 - d) Go to the **Alert Policies** tab.

- e) Select **Table** from the **Data Policies** dropdown list at the bottom of the screen.
 - f) Click **Add**.
The **Target Monitor:<target name>** page will display.
 - g) Configure a Table policy.
 - Enter a policy name or use the default name.
 - Enter a description if necessary.
 - Select the **Enable** checkbox (checked by default). If checked, the policy will be enabled.
 - Select the **Create new policy group for policy** checkbox (checked by default). If checked, a policy group will be created.
 - Select a severity from the Severity dropdown or use the default.
 - h) Click the triangle icon of the **Audit Settings** section to expand.
 - i) In the **Select Objects to Audit** section, configure the following fields:
 - Select the **Browse Object by Target** checkbox. (checked by default). If this is checked, you can select the item from the dropdown list.
 - Select a schema from the **Schema** dropdown list (ex. SCOTT)
 - Select a table or multiple tables you want to monitor from the **Tables** box (ex. EMP or DEPT)
 - Select both **Read** and/or **Write** check boxes in the **Audit Actions** field.
 - Click the right arrow to move your selection to the **Selected Objects** table.
 - j) Click the triangle icon of the **Alert Rule** section to expand.
 - k) Configure the following fields:
 - Confirm that **"Issue alert if ANY of the enabled rules are triggered"**(default) is selected.
 - Select the **Security Violation** checkbox (checked by default).
 - Check the checkbox of **Suspicious Database Users**.
 - Click the triangle icon of **Suspicious Database Users** to expand the field.
 - Select user name(s) and click the right arrow to move the selection to the **Selected users** box.
 - Check the **Alert any successful access if the database user is in the list** checkbox.
 - l) Select **Save**. Make sure that the policy you created is listed with the green up-arrow (policy is enabled) in the Status column.
- 4 .Confirm the table policy group has been automatically created and associated to the target database.
 - a) Select the **Alert Policy Groups** tab.
 - b) Confirm the table policy group which is named as "<your policy name> Group" is created and listed in the right box.
 - 5 .Start monitoring your target.
 - a) Go to the **General** tab.
 - b) Click **Start Monitoring**.
Monitor status will show "Starting" and then "Running".
 - 6 .Execute SQL statements with your database client side application to generate alerts.

 **Note:** To generate alerts for the Data-Table policy that you configured, execute several SQL statements.
 - 7 .Check alerts.
 - a) Go to **DB Activity Monitoring > Security Alerts**.
You should see a single or multiple alerts in the Alerts table.
 - b) To display the alert details, click on each alert. To close the alert details, click the triangle icon of **Alert Details**.
 - 8 .Create a user-defined DAM report.
 - a) Go to **Report Management > User-Defined DAM Reports**.
 - b) Select **Add**.

- c) Enter a name in the **Name** field, and a description in the **Description** field (optional).
- d) Go to the **Columns** tab to specify the columns to include in the report.
- Select columns you want to include in the report, and click the right arrow to move the selections to the **Columns in Report** box.



Note: PDF report is limited to 5 columns if you select the **Portrait** radio button, 8 columns if you select the **Landscape** radio button.

- Click **Save**.
- e) Select the formats from the **Export as** dropdown list.



Note: The following file formats are supported:

- PDF
 - Excel
 - Tab-delimited
 - Comma-separated values
- f) Select **Export**.
The File Download dialog displays. You can open or save the report to a file.

9 .Check activity auditing.

- a) Go to **DB Activity Monitoring > Activity Auditing**.
You should see the audit logs for database activity.
- b) To display the audit details, click on each audit log and detail information will be displayed below audit log table.

10 Check the activity profiling.

- a) Go to **DB Activity Monitoring > Activity Profiling**.
The Profiling page will list the profiling status and summary information for target(s) currently monitored.
- b) Click the name of target, to open the profiling detail page to view the profiling detail information.

DAM QuickStart (Data policy)

This guide leads you through the process that monitors your target database and results in generating alerts and exporting alerts to a report.



Note: All GUI fields marked with an asterisk (*) must be filled in or specified.




The example used in this guide assumes you will monitor an **Oracle target database** with the `audit_trail` parameter set to `DB_EXTENDED`. You will apply a Data-Table policy and generate alerts for the Security Violation rule and Suspicious Databases Users rule. Before starting a target connection, you need to make sure that your target database is configured properly to be monitored by FortiDB. For details about configuring Oracle target databases, see [Configuring the Oracle Target Database](#)

Depending on the setting of the `audit_trail` parameter in your target database, you need to select a different FortiDB collection method as shown below:

Audit_trail setting in your Oracle target database	FortiDB Collection Method
XML, EXTENDED	XML File Agent: For this option, you need to run the FortiDB XML file agent. To run the FortiDB XML file agent, see Running the Oracle XML File Agent
DB, EXTENDED (used in this example)	DB, EXTENDED

Audit_trail setting in your Oracle target database	FortiDB Collection Method
DB	DB, EXTENDED: for Oracle 9i only.

- 1 .Login to FortiDB as the FortiDB admin user using fortidb1!\$ for the password .
- 2 .Create a target database connection.
 - a) Go to **Target Database Server > Targets**.
 - b) Select the **Add** button. The **Target** page will display. The **General** tab is selected.
 - c) Enter the information in the text boxes marked with an asterisk (*) with settings appropriate to your target database. Assume an Oracle target with these parameters:
 - **Name:** Enter your target_name
 - **Type:**Select your database type (Oracle)
 - **DB Host Name/IP:** Enter IP address or machine name on your system that contains the Oracle target database (ex. test_machie or 172.30.12.112)
 - **Port:** Enter the port number or leave the default (1521)
 - **DB Name:** Enter the name of your target database. (ex. orcl).
 - **User Name:** Enter the name of the your target database.
 - **Password:** Enter the password of your target database.
 - **DB Activity Monitoring:** Make sure the 'Allow' checkbox is selected.
 - d) Select the **Test Connection** button to verify that your target database is reachable and that your connection parameters are correct.
You should see a 'Success' message.
 - e) Select **Save**.
target_name and related information should appear on the **Targets** page.
- 3 .Configure a Data-Table policy.
 - a) Go to **DB Activity Monitoring > Monitoring Management**. You will see your target database listed in the **Target Monitors** page.
 - b) Click on the name of the target.
 - c) In the **General** tab, confirm the collection method and polling frequency.
 - In the **Collection Method** field, DB, EXTENDED is selected (for this example).
 - Set the polling frequency (60 seconds by default).
 - d) Click the **Test** button to test the collection method.
The "Success" message should be shown at the top of the page.
 - e) Go to the **Alert Policies** tab.
 - f) Select **Table** from the **Data Policies** dropdown list at the bottom of the screen.
 - g) Click **Add**.
The **Target Monitor:<target name>** page will display.
 - h) Configure a Table policy.
 - Enter a policy name or use the default name.
 - Enter a description if necessary.
 - Select the **Enable** checkbox (checked by default). If checked, the policy will be enabled.
 - Select the **Create new policy group for policy** checkbox (checked by default). If checked, a policy group will be created.
 - Select a severity from the Severity dropdown or use the default.
 - i) Click the triangle icon of the **Audit Settings** section to expand.
 - j) In the **Select Objects to Audit** section, configure the following fields:
 - Select the **Browse Object by Target** checkbox. (checked by default). If this is checked, you can select the item from the dropdown list.

- Select a schema from the **Schema** dropdown list (ex. SCOTT)
 - Select a table or multiple tables you want to monitor from the **Tables** box (ex. EMP or DEPT)
 - Select both **Read** and/or **Write** check boxes in the **Audit Actions** filed.
 - Click the right arrow to move your selection to the **Selected Objects** table.
- k) Click the triangle icon of the **Alert Rule** section to expand.
- l) Configure the following fields:
- Confirm that "**Issue alert if ANY of the enabled rules are triggered**"(default) is selected.
 - Select the **Security Violation** checkbox (checked by default).
 - Check the checkbox of **Suspicious Database Users**.
 - Click the triangle icon of **Suspicious Database Users** to expand the field.
 - Select user name(s) and click the right arrow to move the selection to the **Selected users** box.
 - Check the **Alert any successful access if the database user is in the list** checkbox.
- m) Select **Save**. Make sure that the policy you created is listed with the green up-arrow (policy is enabled) in the Status column.
- 4 .Confirm the table policy group has been automatically created and associated to the target database.
- a) Select the **Alert Policy Groups** tab.
 - b) Confirm the table policy group which is names as "<your policy name> Group" is created and listed in the right box.
- 5 .Start monitoring your target.
- a) Go to the **General** tab.
 - b) Click **Start Monitoring**.
Monitor status will show "Starting" and then "Running".
- 6 .Execute SQL statements in your target database to generate alerts.
-  **Note:** To generate alerts for the Data-Table policy that you configured, execute several SQL statements.
- 7 .Check alerts.
- a) Go to **DB Activity Monitoring > Security Alerts**.
You should see a single or multiple alerts in the Alerts table.
 - b) To display the alert details, click on each alert. To close the alert details, click the triangle icon of **Alert Details**.
- 8 .Create a user-defined DAM report.
- a) Go to **Report Management > User-Defined DAM Reports**.
 - b) Select **Add**.
 - c) Enter a name in the **Name** field, and a description in the **Description** field (optional).
 - d) Go to the **Columns** tab to specify the columns to include in the report.
 - Select columns you want to include in the report, and click the right arrow to move the selections to the **Columns in Report** box.
-  **Note:** PDF report is limited to 5 columns if you select the **Portrait** radio button, 8 columns if you select the **Landscape** radio button.
- Click **Save**.
- e) Select the formats from the **Export as** dropdown list.
-  **Note:** The following file formats are supported:
- PDF
 - Excel
 - Tab-delimited
 - Comma-separated values

- f) Select **Export**.
The File Download dialog displays. You can open or save the report to a file.

DAM QuickStart (Metadata policy)

This guide leads you through the process that monitors your target database and results in generating alerts for a Metadata policy and export an alert list from monitoring your target databases.




Note: All GUI fields marked with an asterisk (*) must be filled in or specified.

The example used in this guide assumes you will monitor an **Oracle** target database with the `audit_trail` parameter set to `DB_EXTENDED`. You will apply a Data-Table policy and generate alerts for the Security Violation rule and Suspicious Databases Users rule. Before starting a target connection, you need to make sure that your target database is configured properly to be monitored by FortiDB. For details about configuring Oracle target databases, see [Configuring the Oracle Target Database](#)

Depending on the setting of the `audit_trail` parameter in your target database, you need to select a different FortiDB collection method as shown below:

Audit_trail setting in your Oracle target database	FortiDB Collection Method
XML, EXTENDED	XML File Agent: For this option, you need to run the FortiDB XML file agent. To run the FortiDB XML file agent, see Running the Oracle XML File Agent
DB, EXTENDED (used in this example)	DB, EXTENDED
DB	DB, EXTENDED: for Oracle 9i only.


- 1 .Login to FortiDB as the FortiDB `admin` user using `fortidb1!$` for the password .
- 2 .Create a target database connection.
 - a) Go to **Target Database Server > Targets**.
 - b) Select the **Add** button. The **Target** page will display. The **General** tab is selected.
 - c) Enter the information in the text boxes marked with an asterisk (*) with settings appropriate to your target database. Assume an Oracle target with these parameters:
 - **Name:** Enter your `target_name`
 - **Type:**Select your database type (`Oracle`)
 - **DB Host Name/IP:** Enter IP address or machine name on your system that contains the Oracle target database (ex. `test_machie` or `172.30.12.112`)
 - **Port:** Enter the port number or leave the default (`1521`)
 - **DB Name:** Enter the name of your target database. (ex. `orcl`).
 - **User Name:** Enter the name of the your target database.
 - **Password:** Enter the password of your target database.
 - **DB Activity Monitoring:** Make sure the 'Allow' checkbox is selected.
 - d) Select the **Test Connection** button to verify that your target database is reachable and that your connection parameters are correct.
You should see a 'Success' message.
 - e) Select **Save**.
`target_name` and related information should appear on the **Targets** page.
- 3 .Configure a Metadata-Tables policy.
 - a) Go to **DB Activity Monitoring > Monitoring Management**. You will see your target database listed in the **Target Monitors** page.

- b) Click on the name of the target.
 - c) In the **General** tab, confirm the collection method and polling frequency.
 - In the **Collection Method** field, DB, EXTENDED is selected (for this example).
 - Set the polling frequency (60 seconds by default).
 - d) Click the **Test** button to test the collection method.
The "Success" message should be shown at the top of the page.
 - e) Go to the **Alert Policies** tab.
 - f) Select the checkbox of **Tables** of Privilege policy .
 - g) Click **Enable**.
The status icon of the Tables policy becomes a green arrow.
- 4 .Start monitoring your target.**
- a) Go to the **General** tab.
 - b) Select **Start Monitoring**.
Monitor status should show "Running". If you see "NEED_RECONFIGURE" message, go to the Policies tab and click the **Reconfigure*** button.
- 5 .Execute actions in your target database to generate alerts.**



Note: To generate alerts for the Metadata-Table policy you configured, execute several SQL statements for your target databases. For example, execute the following statements:

```
create table table1 (column1 int, column2 char);
drop table table1;
```

- 6 .Check alerts.**
- a) Go to **DB Activity Monitoring > Security Alerts**.
You should see several alerts in the All Alerts page.
 - b) To display the alert details, select each alert. To close the alert details, click the triangle icon of **Alert Details**.
 - c) To change the alert status from "Unacknowledged" to "Acknowledged", select the checkbox(es) of the alerts you want to change the status, and select "Acknowledged" in the **Status** dropdown list.
 - d) Click **Apply**. The color of the status icon will change.
- 7 .Create an alert report.**
- a) Select a view from the **View** dropdown list to display alerts you want to include in the report.
 - b) Select one of the formats from the **Export as** dropdown list.
-  **Note:** The following file formats are supported:
- PDF
 - Excel
 - Tab-delimited
 - Comma-separated values
- c) Select **Export**.
The File Download dialog displays. You can open or save the report to a file.

DAM QuickStart (Compliance policy)


This guide leads you through the process that monitors your target database and results in generating a compliance report.



Note: All GUI fields marked with an asterisk (*) must be filled in or specified.

The example used here assumes you will monitor an **MS SQL Server** target database. Before starting a target connection, you need to make sure that your target database is configured properly to be monitored by FortiDB. For details about configuring MS SQL Server target databases, see [Configuring the MS SQL Server Target Database](#)

- 1 .Login to FortiDB as the FortiDB admin user using `fortidb1!$` for the password .
- 2 .Create a target database connection.
 - a) Go to **Target Database Server > Targets**.
 - b) Select the **Add** button. The **Target** page will display. The **General** tab is selected.
 - c) Enter the information in the text boxes marked with an asterisk (*) with settings appropriate to your target database. Assume an MS SQL Server target with these parameters:
 - **Name:** Enter your `target_name`
 - **Type:** Select `Microsoft SQL Server`
 - **DB Host Name/IP:** Enter IP address or machine name on your system that contains the Oracle target database.
 - **Port:** 1433 (default)
 - **Connect At: Server Level** is selected (default)
 - **DB Name:** Enter the name of your MS SQL Server target database is shown and grayed out (ex. master)
 - **User Name:** Enter a name of an MS SQL Server database user.
 - **Password:** Enter the password of the user.
 - **DB Activity Monitoring:** Make sure the 'Allow' checkbox is selected.
 - d) Select the **Test Connection** button to verify that your target database is reachable and that your connection parameters are correct.
You should see a 'Success' message.
 - e) Select **Save**.
`target_name` and related information should appear on the **Targets** page.
- 3 .Configure a compliance policy.
 - a) Go to **Policy > DAM Alert Policies**.
 - b) Select **Compliance Policies** from the **View** dropdown list. The Compliance policy should be only listed in the table.
 - c) Click on **Compliance** in the **Policy Name** column.
The **Edit Policy: Compliance** page displays.
 - d) Configure a compliance policy in the **Edit Policy** page.
 - Enter a description if necessary.
 - Select the **Enable** checkbox. If checked, the policy will be enabled.
 - Select a severity from the Severity dropdown or use the default.
 - e) Click the triangle icon of the **Audit Settings** section to expand. In this example, you will generate "History Of Privilege Changes" compliance report. For generating "History Of Privilege Changes", you don't need to specify audit settings.
 - f) Select **Save**. Make sure that the policy you created is listed with the green up-arrow (policy is enabled) in the **Status** column.
- 4 .Associate the policy group to the MS SQL Server target database.
 - a) Go to **DB Activity Monitoring > Monitoring Management**.
 - b) Click on the name of your target database. The Target Monitor: <your target name> page displays.
The **General** tab is selected.
 - c) In the **General** tab, configure the following settings:
 - In the **Collection Method** field, SQL Trace is selected.
 - Enter a full path of the existing trace folder in the Trace Folder field. (Ex. C:\SQLTrace)

- Set the polling frequency (60 seconds by default).
 - d) Click the **Test** button to test the collection method.
The "Success" message should be shown at the top of the page.
 - e) Go to the **Alert Policy Groups** tab.
 - f) Select **Compliance Policies** and click the right arrow to move to the right box.
 - g) Click **Save**.
- 5** .Start monitoring your target.
- a) Go to the **General** tab.
 - b) Click **Start Monitoring**.
Monitor status should show "Running".
- 6** .Execute SQL statements in your target database to generate data.
-  **Note:** To generate data for History of Privilege Changes, execute SQL statements to change privileges.
- 7** .Create a compliance report.
- a) Go to **Report Management > Compliance Reports** in the left-side tree menu.
 - b) Select **History Of Privilege Changes** of the compliance reports (for this example).
 - c) Configure the Generate Audit Compliance report.
 - Select **PDF** from the **Export as** dropdown list (default).
 - Enter W/R Reference if necessary.
 - Set the **Date Range** you want to see data in the report.
 - Confirm you see your target database name in the left box. If there is no data, the target name does not appear in the box.
 - d) Select **Export**.
The File Download dialog displays. You can open or save the report to a file.

Installation (Standalone users only)

Introduction

The following table summarizes the general information of FortiDB installation.

Category	Descriptions	Notes
Installer Types	<ul style="list-style-type: none">• Windows Installation: GUI For Windows installation, you should use an Administrator account to install FortiDB. For details on Windows installation, refer to Windows Installation.• UNIX (Solaris, AIX, Linux) Installation: Command Line Interface For Solaris or AIX installation, and for Linux installations which use an Oracle repository database, you can use a non-root user account to install FortiDB. For details on UNIX installation, refer to UNIX Installation.	For both security and performance reasons, Fortinet recommends that the machine where FortiDB will be installed be dedicated to the FortiDB software and not run other memory- or processor-intensive applications. Furthermore, it is advisable to start with a fresh installation of the operating system, and have a minimum number of services running.
Application Types	<ul style="list-style-type: none">• Tomcat for Windows and UNIX	FortiDB runs as Web Application, and uses Tomcat as Application Server.
FortiDB Repository for Internal Data	<ul style="list-style-type: none">• Derby: shipped with FortiDB No manual setup is required.• PostgreSQL For setting up PostgreSQL repository, refer to Configuring a PostgreSQL Repository• Oracle For setting up Oracle repository, refer to Configuring an Oracle Repository.• MS SQL Server For setting up MS SQL Server repository, refer to Configuring an MS SQL Server Repository.	<p>You should not use the FortiDB application to assess its own repository database.</p> <p>For all repository types except Derby, make sure that your character-encoding setting is UTF-8.</p> <p>Note: For performance reasons, Fortinet recommends that you put your repository database on a different machine than that used for the FortiDB application. If you are using the Derby repository that ships with the FortiDB application, this will not be possible.</p>
System Requirements	See the Supported Hardware section of the Release Notes accompanying this version for a list of currently supported hardware and software.	

Category	Descriptions	Notes
FortiDB Location	You can install FortiDB in any directory. Once installed, <FortiDB-install directory> represents the installed location.	
Installation Confirmation	<p>Following the installation process, you can test the success of a New or Upgrade installation by opening a browser and entering a URL like this:</p> <pre>http://<fortidb_host>:<port>/fortidb</pre> <p>'fortidb_host' is FortiDB machine or IP address, 'port' is the application server port.</p> <p>If your installation is successful, you will see Login page with which your FortiDB administrator can login to, and perform administrative tasks with, FortiDB.</p> <p>For the FortiDB administrator, the initial, default username is admin and the initial, default password is fortidb1!\$</p>	<p>For using DAM (Database Activity Monitoring), the FortiDB user should be "admin" user.</p> <p>For using VA (Vulnerability Assessment), "admin" user should be used only for performing administrative tasks such as adding new users and performing backups. In order to maintain separation of duties, you should create other users, and assign them the appropriate roles for using FortiDB VA.</p>
Initial FortiDB Administrator name and password	For the FortiDB administrator, the default username is admin and the initial, default password is fortidb1!\$	After login, "admin" user should change the password from User Management page.

Prerequisites

This is a prerequisites list you need to prepare and consider prior to installing FortiDB.

System Prerequisites

This is a prerequisites list for your computer system.

Prerequisite or Requirement	Detail	Comments
Disk space	300 MB of free disk space. Additional space will be required for internal data repository, log files, reports and archives.	This is a minimum requirement. In order to optimally use FortiDB, consult with a FortiDB representative for recommendations more suited to your individual situation.
Memory	A minimum of 2048 MB of system memory, 1024 MB of which are dedicated to the FortiDB application	This is a minimum requirement. In order to optimally use FortiDB, consult with a FortiDB representative for recommendations more suited to your individual situation.

Prerequisite or Requirement	Detail	Comments
Processor	<p>The processor requirements for both Windows and Linux are: Intel-based platforms configured with one or more P4 (or higher) processors.</p> <p>The processor requirement for Solaris is SPARC-based platform configured with one or more processors</p>	

Prerequisites for Installation

This is a prerequisites list you need to prepare prior to installing FortiDB.

Prerequisite or Requirement	Detail	Comments
User account for FortiDB installation	<p>Create a user account that you will use in order to install FortiDB.</p> <p>For Windows, it should be an Administrator-level account.</p> <p>For Linux or Solaris, it should be a non-root account.</p>	
Location for FortiDB	Choose a directory in which you want to install FortiDB.	<p>If you choose a location where a previous version of FortiDB exists, an Upgrade installation will be performed.</p> <p>Note: Choose a path whose name does NOT contain a space. For example, this would not work: C:\Program Files\FortiDB due to the space between 'Program' and 'Files'.</p>
DB type for your repository database	Choose from Derby, MS SQL Server, Oracle, and PostgreSQL	<p>Derby ships with FortiDB at no charge and gets set up during the FortiDB installation.</p> <p>For MS SQL Server, Oracle, and PostgreSQL, you should set up your repository database before installing FortiDB. See the FortiDB Repository section.</p>
Name of host machine for repository database	You will need to specify the hostname or IP address for the machine containing your MS-	

Prerequisite or Requirement	Detail	Comments
	SQL, Oracle, PostgreSQL, or DB2 repository database.	
Port number for repository database	Choose an available port number above 1024	
Database name/SID for repository database	Specify the name (or SID) of the database you will use for the FortiDB repository database.	
Username for repository-database user	You should set up a database user account before installing FortiDB and know the account name before installing FortiDB.	
Password for repository-database user account	You should know the database user's password before installing FortiDB.	
Application Server HTTP Port Number	Choose an available port number above 1024	
Application Server HTTPS Port Number	Choose an available port number above 1024	
Application Server Shutdown Port Number	Choose an available port number above 1024	

FortiDB Repository

FortiDB supports the following databases as FortiDB internal repository. For all repository types except Derby, the specific settings are required.

- **Derby** (shipped with FortiDB)
- **PostgreSQL**: For setting PostgreSQL repository, see [Configuring a PostgreSQL Repository](#)
- **Oracle**: For setting Oracle repository, see [Configuring an Oracle Repository](#)
- **MS SQL Server**: For setting MS SQL Server repository, see [Configuring a MS SQL Server Repository](#)



Note: For all repository types except Derby, make sure that your character-encoding setting is UTF-8.

Configuring a PostgreSQL Repository

This topic describes configuring a PostgreSQL database to use as the FortiDB repository. If you use PostgreSQL 8.x as your local repository, you need to create the language pack in order to use the FortiDB archive feature properly.

- 1 .Create a database to use for FortiDB local repository (for example, "fortidb") with UTF8 encoding. For FortiDB installation, the following information is necessary.
 - Database name for FortiDB local repository
 - User name of FortiDB local repository
 - Password of FortiDB local repository user

2. Create the language pack. To create the language pack, plpgsql by executing the following command:

```
createlang -h 127.0.0.1 -d <database_name> -U <database_user> plpgsql
```

- <database_name> is the database name
- <database_user> is the database user name

3. Make sure the language pack is installed properly by executing the following command:

```
psql -U <database_user> -c "select * from pg_language"
```

- <database_user> is the database user name

As a result of this command, you will see the row of "plpgsql" in the pg_language table.

Configuring an Oracle Repository

This topic describes configuring an Oracle database to use as the FortiDB repository.

1. Create a tablespace for FortiDB that has the following values or minimum parameter settings:

- Block Size (B): at least 16K
- Total SGA size: at least 500MB
- Total PGA size: at least 100MB
- Segment Space Management: Automatic
- Extent Management: Local

2. Create a user for FortiDB which have the following privileges:

- CREATE SESSION
- CREATE TABLE
- CREATE SEQUENCE
- UNLIMITED QUOTA for a FortiDB-dedicated tablespace.

3. Consider I/O contention. For example, put your database and log files on separate disks.

4. Create a datafile for the FORTIDB tablespace. For example:

- File Name: FORTIDB.DBF
- File Directory: C:\oracle\product\10.2.0\oradata\orcl\
- Tablespace: FORTIDB
- File size: 500M
- Automatically extend datafile when full (AUTOEXTEND)

5. Here is an example of the parameters in init.ora (for Oracle 10g):

```
*.db_name='fortidb'
*.db_block_size=8192
*.sga_target=584M
*.pga_aggregate_target=194M
*.db_create_file_dest='/home/oracle/product/10.2.0/db_1/oradata/fdb'
*.db_recovery_file_dest='/home/oracle/product/10.2.0/db_1/flash_recovery_area'
*.db_recovery_file_dest_size=2G
*.undo_management='AUTO'
*.undo_tablespace='UNDOTBS1'
*.audit_file_dest='/home/oracle/product/10.2.0/db_1/admin/fdb/adump'
*.user_dump_dest='/home/oracle/product/10.2.0/db_1/admin/fdb/udump'
*.core_dump_dest='/home/oracle/product/10.2.0/db_1/admin/fdb/cdump'
*.background_dump_dest='/home/oracle/product/10.2.0/db_1/admin/fdb/bdump'
*.compatible='10.2.0.3.0'
*.control_files='/home/oracle/product/10.2.0/db_1/oradata/fdb/control01.ctl'
*.db_file_multiblock_read_count=16
```

```
*.job_queue_processes=10
*.open_cursors=300
*.processes=150
```

Configuring an MS SQL Server Repository

This topic describes configuring an MS SQL Server database to use as the FortiDB repository. The instruction of this topic uses MS SQL Server 2008 Management Studio as an example. **WARNING: The user ID and schema name must be same for the FortiDB repository.**

1 .Create the database “fortidb”

- a) Log in as “sa”
- b) Right-click on Databases.
- c) Click New Database.
- d) Enter “fortidb” as the database name.
- e) Configure the database meets the following requirement:
 - Has an initial data-file size of at least 300 MB
 - Has an initial log-file size of at least 20 MB
 - Has a collation value that allows for case-sensitivity.



Note: A case-sensitive collation value will have the characters “CS” appended to the Collation Designator. For example, the collation value SQL_Latin1_General_CP1_CS_AS is for U.S. English systems.

- f) Click OK.

2 .Create the system login “fortidb”

- a) Go to Security
- b) Right-click on Logins.
- c) Select New Login
- d) Enter “fortidb” as the login name
- e) Use SQL authentication and enter your own password
- f) Uncheck the enforce password expiration checkbox
- g) Select “fortidb” in the Default database field
- h) To set the user mappings, go to the User Mapping page
- i) Check “fortidb”. The user column on that row should now show “fortidb”
- j) With that row selected, select the db_owner permission (in the lower box, which should say Database role membership for: fortidb”
- k) Click OK

3 .Create the fortidb schema.



Note: The schema name has to be the same as the login name that you created in the previous step.

- a) Log in as “fortidb” with the password you created in step 2.
- b) Go to Databases > fortidb > Security.
- c) Right click on Schemas and select New Schema
- d) Enter “fortidb” in the Schema name field and Schema owner field
- e) Click “OK”
- f) Go to Databases > fortidb > Security > Users.
- g) Right-click “fortidb” user, and select Properties.
- h) Enter “fortidb” in the Default schema field
- i) Click OK

- 4 .Verify that the login “fortidb” is mapped to the proper schema “fortidb” and user “fortidb”
 - a) In your sa login, go to > Security > Logins
 - b) Right-click on fortidb, and select Properties.
 - c) In the User Mapping page, verify that the row for “fortidb” shows “fortidb” for both user and default schema

UNIX/Linux Installations

This topic describes how to install FortiDB on UNIX/Linux.

FortiDB installation for Unix/Linux is interactive, console-based installation.

In order to install FortiDB on UNIX/Linux, make sure you have supported hardware/OS:

- Solaris with SPARC-based platform
- 64bit Linux system with Intel-based platform, and 2.6 kernel



Note: Refer the release notes for detail platforms support.

Get the correct FortiDB installer file for your system:

- **fdb-install-{version}-solaris-sparc.bin** for Solaris
- **fdb-install-{version}-linux-x64.bin** for Linux
- **fdb-install-{version}-unix.bin** for other Unix

Execute the installer file supplied using this syntax: `sh <installer_file>`

For Linux RPM Installations:

- Get the correct FortiDB installer file for your system:**fdb-install-{version}-linux-x64.rpm**
- Execute the installer file supplied using this syntax: **rpm -ivh <installer_file>**



Note: To install FortiDB on other UNIX system like AIX, you need instal the Java Runtime Environment version 1.6 or above first. And update FortiDB startup script after installation. Please refer release note or contact Fortinet for detail.

Windows Installations

This topic describes how to install FortiDB on Microsoft Windows.

A GUI-based installer is available for FortiDB installation for Microsoft Windows.



Note: Refer the release notes for detail Windows versions support.

Get the correct FortiDB installer file for your system:

- **fdb-install-{version}-windows-x64.exe** for 64bit Windows
- **fdb-install-{version}-windows-x86.exe** for 32bit Windows

Execute the installer file with administrator privilege, follow the instructions presented by the GUI installer to finish install.

To uninstall FortiDB, go to your system **Add/Remove Programs** panel, select **FortiDB** to uninstall.

Post Installation Operations

These are operations you might need to perform after installing FortiDB with a Tomcat application server.

Operation or Item	Descriptions
<p>Starting and Stopping FortiDB</p>	<p>You might find it necessary to start and or stop FortiDB manually. For example, when updating or replacing your FortiDB license file. Or, after rebooting on UNIX , you might need to manually start FortiDB.</p> <p>When FortiDB is stopped, it saves state information within the internal database. When you log back in; this information is retrieved and the databases that were open prior to shutdown are reopened once again. Since state information is periodically saved during your session, most of the state can be restored- even if FortiDB goes down due to a power failure or other similar problems occur.</p> <ul style="list-style-type: none"> • In order to manually start FortiDB: <ul style="list-style-type: none"> • On Windows, you can use either the <i><FortiDB-install directory>\bin\start.bat</i> batch file or the Start->Programs->FortiDB ->Start FortiDB menu choice. • On UNIX, use the <i><FortiDB-install directory>/bin/start</i> script. • In order to manually stop FortiDB: <ul style="list-style-type: none"> • On Windows, you can use either the <i><FortiDB-install directory>\bin\stop.bat</i> batch file or the Start->Programs->FortiDB ->Stop FortiDB menu choice. • On UNIX, use the <i><FortiDB-install directory>/bin/stop</i> script.
<p>Changing the FortiDB Administrator Password</p>	<p>For security reasons, it is highly recommended that you change the password for the FortiDB administrator user account (admin) after installation.</p>
<p>Installing a New License</p>	<p>FortiDB requires a license key in order to operate and ships with a temporary one. About two weeks before your license expires, you may see a notice warning you that your license is about to expire. You should then contact your FortiDB sales representative for an extended license. To install the new license:</p> <ol style="list-style-type: none"> 1 .Stop FortiDB. 2 .Replace <i>license.properties</i> with the new license file in <i><FortiDB-install directory>/conf</i> 3 .Restart FortiDB.
<p>Troubleshooting</p>	<p>FortiDB produces log files that can assist troubleshooting. These are files that Fortinet Support may need to assist you:</p> <ul style="list-style-type: none"> • <i><FortiDB-install directory>/logs/*.log</i> • <i><FortiDB-install directory>/tomcat/logs/*.log</i>
<p>Managing Disk Space</p>	<p>FortiDB log, archive, and report files all consume disk space which you must manage in order to conserve disk space.</p> <p>So you might want to backup these files, delete them and then restore them if needed.</p>

Operation or Item	Descriptions
Important Directories	<p>You may occasionally need to know about these directories</p> <ul style="list-style-type: none"> • <i><FortiDB-install directory>/bin</i> contains utility files including those that allow manual starting and stopping of FortiDB • <i><FortiDB-install directory>/conf</i> contains your license file, encryption-key files, installation-properties file, and your report logo files. • <i><FortiDB-install directory>/data/archives/VA</i> contains assessment-archive files • <i><FortiDB-install directory>/data/reports</i> contains report files • <i><FortiDB-install directory>/doc</i> contains the Administration, Quick Start, and Installation Guides • <i><FortiDB-install directory>/etc/conf/pentest</i> contains Pen Test-related files • <i><FortiDB-install directory>/etc/snmp</i> contains the SNMP-trap dictionary file for FortiDB • <i><FortiDB-install directory>/logs</i> contains error and other log files • <i><FortiDB-install directory>/tomcat/logs</i> contains log files for the Tomcat application server • <i><FortiDB-install directory>/uninstall</i> contains the uninstall executable
Important FortiDB Files and Folders (in <i><FortiDB-install directory>/conf</i>)	<ul style="list-style-type: none"> • <i>license.properties</i> (specifies the length of, and number of target-databases allowed during, the FortiDB license period.) • <i>.keyFile</i> (needed for the encryption of passwords and assessment archives) • <i>.keystore</i> (needed for target-database connections involving SSH) • <i>reportlogos</i> directory (contains images for report logos) • The <i><FortiDB-install directory>/etc</i> directory contains: <ul style="list-style-type: none"> • Pen Testing dictionary and db-type-specific files • XML files with samples of importable target-database information • FortiDB-specific MIB file for SNMP notifications • a <i>templates</i> directory containing <i>server.xml</i> (this file is for internal FortiDB use only).

Installations Troubleshooting

This topic contains information about troubleshooting a FortiDB installation involving a Tomcat application server.

Tomcat Logs

You can troubleshoot installation problems by reviewing information in Tomcat's log files. The log files are located in these directories:

- *<FortiDB-install directory>/logs*

- <FortiDB-install directory>/tomcat/logs
- <FortiDB-install directory>/tomcat/webapps/fortidb/WEB-INF/logs

Upgrading FortiDB

This topic describes instructions to upgrade from an earlier version of FortiDB



Note: Refer the release notes for supported upgrade versions.

Following these steps to perform an Upgrade Installation from earlier version of FortiDB:

- 1 .Backup your repository database (optionally, but recommended).
- 2 .Shutdown your existing FortiDB process or service. Depending on your platform type, use the following instructions to shutdown FortiDB:
 - If your FortiDB application resides on a UNIX platform, execute *<FortiDB-install directory>/bin/stop*
 - If your FortiDB application resides on a Windows platform, either execute *<FortiDB-install directory>/bin\stop.bat* or stop the FortiDB Application Server service.
- 3 .Execute the FortiDB installer file.
- 4 .Point to the directory that contains your existing FortiDB installation.
- 5 .Follow the subsequent instructions to finish upgrade installation.

Login

Login Steps

You must have a valid FortiDB license in order to login.

Open the FortiDB application in your browser. Depending upon its location with respect to your browser location and depending upon your chosen port number, that will require a specific URL.

In the FortiDB Login page, take the following steps:

- 1 .Enter your assigned username.
- 2 .Enter your assigned password.
- 3 .Select the **Login** button.
- 4 .Using the navigation panel on the left side of the page, go to the FortiDB component of interest.

Changing Your Password

This topic describes how your FortiDB users can change their passwords.

- 1 .Login.
- 2 .Select the **Change Password** link on the top of any page in the FortiDB application.
- 3 .Enter you existing password in the **Old Password** text box.
- 4 .Enter your proposed new password in the **New Password** text box.



Note: Your password must meet the criteria for acceptable passwords.

- 5 .Enter your proposed new password again in the **Reenter New Password** text box.
- 6 .Select the **OK** button.

Password Rules

The following table indicates the rules for creating your password.

Rule Category	Descriptions
Mandatory Length	By default, no mandatory length is set. You can set the length limitation in System Configuration. Please see the Minimum Password Length properties in System Properties List
Mandatory contents	<ul style="list-style-type: none">• At least one number• At least one special character from this set: !@#\$%^&*()_+ ~-=\` {} []:":';<>?,./
Prohibited Contents	<ul style="list-style-type: none">• Any spaces• User name• User name reversed

Appliance - Basic

Before Using Appliance

Default Settings

- The default IP address/subnet of port1 is 192.168.1.99/255.255.255.0
- The default administrator user/password is admin/fortidb1!\$
- Web administration is available with access of https://ip_address/
- Connect your terminal to appliance's console port with 9600/8N1 (or check hardware specification for particular model)

Setup Appliance Before Using

- Connect to appliance with terminal console or network cable, login with CLI or Web Administration, to change IP Address and Netmask.
- Change time setting and specify correct Time Zone, Save and Reboot the appliance.
- Change default password of user 'admin'.
- Connect FortiDB appliance to your network, make sure it can reach your database server. Setup static route in FortiDB if need.

Database Activity Monitoring with TCP/IP Sniffer

- DAM with TCP/IP Sniffer is appliance based feature, provides functions like policy based activity auditing, activity profiling, and security alert.
- To use DAM with TCP/IP sniffer, connect FortiDB appliance's one or more ports to your network switch's SPAN port. The switch must have TCP/IP traffic of your database activity.

System Information and Settings

The System Information page displays basic information about the FortiDB unit. FortiDB administrators, whose access profiles permit maintenance read and write access, can change the FortiDB firmware.

Host Name	The name of the host name of FortiDB unit. For details on changing the name, see <i>Changing the FortiDB Host name</i> .
Firmware Version	The version of the firmware installed on the FortiDB unit. Select Update to upload a new version of the firmware. For details on updating the firmware, see <i>Changing the Firmware Version</i> .
Serial Number	The serial number of the FortiDB unit. The serial number is specific to the FortiDB unit and does not change with firmware upgrades. Use this number when registering your FortiDB unit with Fortinet.
System Time	The current time according to the FortiDB internal clock. Select the Change link to change the time. For details, see <i>Setting the System Time</i> .
Uptime	The time in days, hours, and minutes since the FortiDB was started or last rebooted.
Hard Disk RAID	The RAID information.


**Note:**

- Check your hardware specification for RAID support
- Refer the CLI **config system raid** and related commands, for raid creation and information.

Setting the System Time

This topic describes how to set the system time to ensure correct report time ranges and scheduling and accurate logging.

- 1 .Go to Appliance > **System Information** on the left-side tree menu.
- 2 .Select the **Change** link to change the system Time.
The **Time Settings** page displays.
- 3 .You have options to set the time as follows.

System Time	The current FortiDB system date and time. Select the Refresh button to update the display of the current FortiDB system date and time.
Time Zone	Select the FortiDB unit's time zone from the Time Zone dropdown list. The Automatically adjust clock for daylight saving changes checkbox switches the clock setting between daylight saving time and non-daylight saving time.  Note: Changing Time Zone requires rebooting the system to take the change into effect.
Set Time	Select to set the FortiDB system date and time to the values you set in the Year, Month, Day, Hour, Minute and Second fields.
Synchronize with NTP Server	Select to use an NTP server to automatically set the system date and time. You must specify the server and synchronization interval. Alternatively, select Set Time. <ul style="list-style-type: none"> • Server: Enter the IP address or domain name of an NTP server. To find an NTP server that you can use, see http://www.ntp.org. • Sync Interval: Specify how often the FortiDB unit should synchronize its time with the NTP server. For example, a setting of 1440 minutes causes the FortiDB unit to synchronize its time once a day.

- 4 .Select **OK**.

Changing the FortiDB Host Name

This topic describes how to change the FortiDB unit host name.

- 1 .Go to **System Information** under **Appliance**.
- 2 .In the **Host Name** field of the System Information section, select the **Change** link.
The **Edit Host Name** dialog displays.
- 3 .In the **Host Name** field, type a new host name.
- 4 .Select **OK**.
The new host name is displayed in the **Host Name** field.

Update FortiDB Firmware

When updating the firmware image, the FortiDB unit will either keep or reset its configuration. Fortinet recommends backing up all configuration settings from your FortiDB unit before upgrading. See **Managing Firmware** for detail.

- 1 .Download the firmware image file to your management computer.
For FortiDB units with a valid technical support contract, firmware images can be downloaded from the Fortinet Technical Support web site, <https://support.fortinet.com>.
- 2 .Log on to FortiDB as the administrative user.
- 3 .Go to **System > System Information**.
- 4 .In the **Firmware Version** field, select the **Update** link.
- 5 .Type the path and file name of the firmware image file, or select the **Browse** button and locate the firmware image file.
- 6 .Select **OK**.
- 7 .Select **Update**. The FortiDB unit uploads the firmware image file, upgrades to the new firmware version, restarts. This process takes a few minutes.



Note: All data created in the previous version stays intact after updating the firmware version. If you want to reset all device settings and configuration, and delete log data on the hard drive, you can use `execute format disk` command using CLI. For details, see Command Line Interface section.

System Resources

The System Resources section displays usage of the FortiDB unit's resources, including CPU, memory (RAM) and hard disk.

CPU Usage	The current status of CPU usage. This field displays CPU usage for core processes only. CPU usage for management processes (for example, for HTTPS connections to the web-based manager) is excluded.
Memory Usage	The current status of memory usage. This field displays memory usage for core processes only. Memory usage for management processes (for example, for HTTPS connections to the web-based manager) is excluded.
Hard Disk Usage	The current status of hard disk usage. This field displays the amount of hard disk space used.

Unit Operation

The Unit Operation section allows administrator to reboot, reset data, or format hard disk to appliance.

Device Information	Display the device model, and connection status of Ethernet Ports.
Operation	Reboot, Reset Data, Format Hard Disk.

Network Configuration

You can configure the FortiDB unit to operate in your network in the **Network Setting** page or using the CLI. Basic network settings include those for interfaces, DNS settings and static routes.





Note: You can specify IP address/network-mask pairs with either:

- Dotted-decimal format; e.g., 192.168.1.1/255.255.255.0
- Bit representation; e.g., 192.168.1.1/24

Interface

You can configure the interfaces on the FortiDB unit, including interface names, device IP, and Access.

Interface List

Interface	The name of the network interface on the FortiDB unit.
Device IP/Netmask	The IP address and network mask configured for the interface.
Access	A list of the administrative access methods available on the interface.
Status	<p>The status of the network interface.</p> <ul style="list-style-type: none"> • A green arrow  indicates the interface is up. Select Modify icon to disable the port. • A red arrow  indicates the interface is down. Select Modify icon to enable the port.
Modify	Select Modify to change the interface settings.

Configure Interface

In the row corresponding to the interface you want to change, select **Edit** icon in **Modify** column, to go to interface edit page.

Configure interface the following options:

Enable checkbox	You can change the interface status by using this checkbox. To disable the port, uncheck the checkbox. To enable the port, check the checkbox.
Interface Name	The interface name cannot be changed.
Device IP/Netmask	Enter an IP address and network mask. For example, 192.168.10.3 / 255.255.255.0
Access	<p>Select which methods of administrative access should be available on this interface.</p> <ul style="list-style-type: none"> • HTTP allows HTTP connections to the FortiDB. HTTP connections are not secure and can be intercepted by a third party. • HTTPS allows secure HTTPS connections to the FortiDB. • PING allows response to ICMP pings, which are useful for testing connectivity. • SSH allows SSH connections to the FortiDB CLI. • TELNET allows Telnet connections to the FortiDB CLI. Telnet connections are not secure, and can be intercepted by a third party.

Select the **Save** button to save the interface setting.

DNS

You can configure primary and secondary DNS servers to provide the name resolution required by FortiDB features.

Go to **System > Network Setting**, and select **DNS** tab to configure DNS.

Enter an IP address for a primary and secondary DNS server.



Click the **Apply** button to save and apply the DNS setting.

Routing

You can configure static routes by defining the destination IP address and netmask of packets that you intend to intercept, and by specifying a (gateway) IP address for those packets. The gateway address specifies the next-hop router to which traffic will be routed.

Go to **System > Router** to configure Static Route.

Static Routes List

Destination IP/ Netmask	The destination IP address and netmask for packets that FortiDB sends to.
Gateway	The IP address of the router where FortiDB forwards packets.
Interface	The names of the FortiDB interfaces through which intercepted packets are received and sent.
Modify	Select to change the route configuration settings or delete them. <ul style="list-style-type: none">  edit icon, for changing route setting  delete icon, for deleting route setting

Add/Change/Delete Route Setting

Click **Add** button to create a new route setting.

To change route setting, click the **Edit** icon in **Modify** column, in the row corresponding to the route you want to change.

Click the **Delete** icon in **Modify** column to delete the corresponding route.

When add/change the route setting, configure it with following options:

Destination IP/ Netmask	Enter the destination IP address and netmask for the routing. Enter the IP/ netmask "0.0.0.0/0.0.0.0" for any/all destinations.
Gateway	Enter the gateway(router) IP address.
Interface	Select the FortiDB interface through which packets will be received and sent.

Default Route and Default Gateway

To forward the packet beyond the FortiDB unit to the default gateway, through specified interface, you need add a default static route entry.

For example, to allow FortiDB to access Internet in your private subnet.

Add a static route entry, associated with a destination address of 0.0.0.0/0.0.0.0, and specify the gateway address to forward the packet to.

Configuring Network Settings using the CLI

This topic describes the steps to configure your network settings using the CLI. For details about each command, refer to the Command Line Interface section.

1 .Set the IP address and netmask of the LAN interface:

```
config system interface
  edit <port>
    set ip <ip_address> <netmask>
    set allowaccess (http https ping ssh telnet)
  end
```

where:

- <port> can be one of port1- port4.
- <ip_address> is the interface IP address.
- <netmask> is the interface netmask.

Sample Command:

```
config system interface
  edit port1
    set ip 192.168.100.159 255.255.255.0
    set allowaccess ping https ssh
  end
```

2 .Set the primary and optionally the secondary DNS server:

```
config system dns
  set primary <dns-server_ip>
  set secondary <dns-server_ip>
end
```

where:

- <dns-server_ip> is the primary or secondary DNS IP server address

Sample Command:

```
config system dns
  set primary 65.39.139.52
  set secondary 65.39.139.62
end
```

3 .Set the default gateway:

```
config system route
  edit <seq_num>
    set device <port>
    set gateway <gateway_ip>
  end
```

where:

- <seq_num> is an unused routing sequence number starting from 1 to create a new route.
- <port> is the port used for this route.
- <gateway_ip> is the default gateway IP address for this network.

Sample Command:

```
config system route
edit 1
set device port1
set gateway 172.30.62.254
end
```

4 .Set a network protocol (NTP) server:

```
config system ntp
set server <server_ip>
set status (enable | disable)
end
```

where:

- <server_ip> is the IP address or fully qualified domain name of the NTP server.

Sample Command:

```
config system ntp
set server 172.30.62.81
set status enable
end
```

Managing Firmware

Fortinet periodically updates the FortiDB firmware to include enhancements and address issues. After you have registered your FortiDB system, FortiDB firmware is available for download at <http://support.fortinet.com>. Only the FortiDB administrators, whose access profiles contain system configuration read and write privileges, and the FortiDB admin user can change the FortiDB firmware.

Backing up Your Data and Configuration

Fortinet recommends backing up all data and configuration settings from your FortiDB unit before upgrading. This ensures all data and configuration settings are not lost if you require upgrading or resetting FortiDB unit and want to restore data and configuration settings.



Note: Always backup your configuration before installing a patch release, upgrading, or when resetting to factory defaults.

Backing Up your Configuration using the CLI

This topic describes how to backup up your data and current configuration using the CLI. You will need an FTP server to back up the current configuration from the CLI.

- 1 .Log into the CLI.
- 2 .Enter the following command to back up your local database, system-configuration settings, archives and reports:

```
execute backup all-settings <ftp server> <filepath> <username> <password>
[cryptpasswd]
```

For details about backup and restore using the CLI, see the All-Settings Backup and All-Settings Restore sections in *Appliance - Command Line Interface*.

- 3 .After successfully backing up your configuration files from the CLI, proceed with upgrading FortiDB firmware.

Upgrading FortiDB Firmware using the Web-based Manager

This topic describes how to upgrade the FortiDB firmware. When changing the firmware image, the FortiDB unit will keep its data and configuration.

- 1 .Download the firmware image file to your management computer.
For FortiDB units with a valid technical support contract, firmware images can be downloaded from the Fortinet Technical Support web site, <https://support.fortinet.com>.
- 2 .Log on to FortiDB as the administrative user.
- 3 .Go to **System > System Information**.
- 4 .In the **Firmware Version** field, select the **Update** link.
- 5 .Type the path and file name of the firmware image file, or select the **Browse** button and locate the firmware image file.
- 6 .Select **OK**.
- 7 .Select **Update**. The FortiDB unit uploads the firmware image file, upgrades to the new firmware version, restarts. This process takes a few minutes.



Note: All data created in the previous version stays intact after updating the firmware version. If you want to reset all device settings and configuration, and delete log data on the hard drive, you can use `execute format disk` command using CLI. For details, see Command Line Interface section.

Upgrading FortiDB Firmware using the CLI

To use the following procedure, you must have a TFTP or FTP server the FortiDB unit can connect to. You must also log in using the admin administrator account.

- 1 .Make sure the FTP or TFTP server is running.
- 2 .Copy the new firmware image file to the FTP or TFTP server.
- 3 .Log into the CLI.
- 4 .Make sure the FortiDB unit can connect to the FTP or TFTP server.
You can use the following command to ping the computer running the FTP or TFTP server. For example, if the IP address of the TFTP server is 192.168.1.168:

```
execute ping 192.168.1.168
```

- 5 .Enter the following command to copy the firmware image from the TFTP server to the FortiDB unit:

```
execute restore image ftp <filename> <ftp_ip>  
execute restore image tftp <filename> <tftp_ip>
```

Where <filename> is the name and location of the firmware image file and <ftp_ip> or <tftp_ip> is the IP address of the FTP or TFTP server. For example, if the firmware image file name is image.out and the IP address of the FTP or TFTP server is 192.168.1.168, enter:

```
execute restore image tftp image.out 192.168.1.168
```

The FortiDB system responds with the message:

```
This operation will replace the current firmware version!  
Do you want to continue? (y/n)
```

- 6 .Type `y`.
The FortiDB system uploads the firmware image file, upgrades to the new firmware version, and restarts. This process takes a few minutes.
- 7 .Reconnect to the CLI.

8 .To confirm the new firmware image is successfully installed, enter:

```
get system status
```

Installing FortiDB Firmware

This procedure installs a specified firmware image and resets the FortiDB system to default settings. You can use this procedure to upgrade to a new firmware version, revert to an older firmware version, or re-install the current firmware version.

To use this procedure, you must connect to the CLI using the FortiDB console port and a RJ-45 to DB-9 or null-modem cable. This procedure reverts the FortiDB system to its factory default configuration.

For this procedure you:

- Access the CLI by connecting to the FortiDB console port.
- Install a TFTP server that you can connect from the FortiDB interface. The TFTP server should be on the same subnet as the internal interface.

Installing Firmware using Boot Loader Menu

This procedure installs a specified firmware image and resets the FortiDB system to default settings. You can use this procedure to upgrade to a new firmware version, revert to an older firmware version, or re-install the current firmware version.

- 1 .Connect to the FortiDB CLI through your console port.
- 2 .Get and copy your current network settings as your reference, by executing the following command:

```
show
```



Note: After installing a new image, your network settings are reset to the factory defaults. You need to re-configure network settings in order to access to the web-based manager.

- 3 .Make sure the TFTP server is running.
- 4 .Copy the new firmware image file to the TFTP server.
- 5 .Make sure the internal interface is connected to the same network as the TFTP server. To test the connection, enter:

```
execute ping <tftp_ip_address>
```

- 6 .Enter the following command to restart the FortiDB.

```
execute reboot
```

The FortiDB system responds with the following message:

```
This operation will reboot the system !
Do you want to continue? (y/n)
```

- 7 .Type `y` to display the boot loader menu.

As the FortiDB system starts, a series of system startup messages is displayed. When one of the following messages appears:

```
Press any key to display configuration menu.....
```

Immediately press any key to interrupt the system startup.



Note: You have only 3 seconds to press any key. If you do not press a key soon enough, the FortiDB system reboots and you must log in and repeat the execute reboot command.

If you successfully interrupt the startup process, one of the following messages appears:

```
[G]: Get firmware image from TFTP server.
[F]: Format boot device.
```

```
[B]: Boot with backup firmware and set as default
[C]: Configuration and information
[Q]: Quit menu and continue to boot with default firmware.
[H]: Display this list of options.
```

Enter G,F,B,C,Q, or H:

8. Type G to get the new firmware image from the TFTP server.

The following message appears:

```
Enter TFTP server address [192.168.1.168]:
```

9. Type the address of the TFTP server and press Enter.

The following message appears:

```
Enter Local Address [192.168.1.188]:
```

10. Type an IP address that can be used by the FortiDB unit to connect to the TFTP server.

The IP address can be any IP address that is valid for the network the interface is connected to. Make sure you do not enter the IP address of another device on this network.

The following message appears:

```
Enter firmware image file name [image.out]:
```

11. Enter the firmware image file name (and location) and press Enter.

The TFTP server uploads the firmware image file to the FortiDB unit. Some unit models may display the following message:

```
Save as Default firmware/Backup firmware/Run image without saving:[D/B/R]
```

12. Type D.

The FortiDB unit installs the new firmware image and restarts. The installation might take a few minutes to complete. If the installation is successfully done, you will get the FortiDB CLI prompt.

13. Configure your network settings. To configure your network settings, please refer to [Configuring Network using the CLI](#).

Restoring your Configuration Settings using the CLI

The following steps restore your FortiDB configuration settings using the CLI.

1. Log into the CLI.
2. Enter the following command to copy the backup configuration settings to restore the file on the FortiDB unit:

```
execute restore all-settings <ftp server> <filepath> <username> <password>
[crptpasswd]
```






Note: This operation will replace your current settings and necessitate a reboot. For details about backup and restore using the CLI, see the All-Settings Backup and All-Settings Restore sections in [FortiDB-Specific Commands](#).

3. Use the show shell command to verify your settings are restored, or log into the web-based manager.

Administration

Administrator Management

The Administrators page allows you to add, delete administration users, and enable and disable users. You can display users by roles using the **View By Role** dropdown list.



Columns	Descriptions
Selection	Check or uncheck the checkbox to delete the users, or enable/disable the users.
User Status	<ul style="list-style-type: none"> indicates an enabled user. An account can be enabled at any time by a user who has the Security Administrator role. indicates a disabled user. An account can be disabled at any time by a user who has the Security Administrator role. indicates a locked user account. An account can be locked after unsuccessful login attempts
User Type	<ul style="list-style-type: none">Normal - FortiDB local user, with specified password.LDAP - LDAP user with username only. When LDAP user login, FortiDB will connect LDAP server to authenticate. <p>Define the LDAP server properties in Global Configuration first if want to define LDAP user.</p>
User Name	User defined user name
First Name	The user's first name
Last Name	The user's last name
Email Address	The user's email address
Phone Number	The user's phone number
Other	Other information of the user

Adding (or Modifying) an Administrator

This topic describes the task of adding (or modifying) FortiDB administrators and assigning them certain roles. Each of the built-in FortiDB roles allow your administrators to perform certain FortiDB operations.

- 1 .Go to the **Administrators** page.



Note: Currently enabled administrators are marked with a  icon to the left of their User Name. Currently disabled users are marked with a  icon to the left of their User Name.

- 2 .Select the **Add** button. (or, to modify a administrator's settings, select the **User Name** of the user whose settings you want to change.)

- 3 .On the **General** tab of the **Add New Administrator** page (or **Administrator Details** page, if you are modifying an existing administrator), enter all mandatory items.



Note: Items marked with an asterisk (*) are mandatory.

- 4 .Select **User Authentication Type** - Normal or LDAP. For Normal user, you need input user's Password. For LDAP user, you need configure the LDAP server in **Global Configuration** first. When choosing a password, use one that follows these rules:

Rule Category	Description
Mandatory Length	By default, no mandatory length is set. You can set the length limitation in System Configuration. Please see the Minimum Password Length properties in System Properties List .
Mandatory Contents	<ul style="list-style-type: none"> At least one number At least one special character from this set: !@#%&^&*()_+ ~-=\`{} []:"';<>?.,/
Prohibited Contents	<ul style="list-style-type: none"> Any spaces User name User name reversed

Example: wru2rxy? is a valid password.

- 5 .On the **Roles** tab on the **Administrator Details** tab, select one or more of the entries in the **Available Roles** list box and add them to the **Assigned Roles** list on the right by selecting on the right-arrow button.



Note: In order to remove role(s) from your Administrator, select them in the **Assigned Roles** list box and select the left-arrow button.

- 6 .On the **Targets** tab on the **Administrator Details** page, if you want the user to manage specific targets only, choose 'Manage Limited Targets' radio button, select one or more of the entries in the **Available Targets** list box and add them to the **Assigned Targets** list on the right by selecting on the right-arrow button.



Note: In order to remove targets(s) from your user, select them in the **Assigned Targets** list box and select the left-arrow button.

- 7 .If you want a new Administrator to be initially disabled (and, therefore, unable to login), select the **Set user status as "disabled" immediately** checkbox. (In order to disable an existing user, go to the **User Management** page, select the checkbox to the left of the user(s) of interest, and select the **Disable** button.)

Role-Dependent Privileges

This topic maps the built-in FortiDB roles with their privileges.

Privileges by Role

Once a given role has been assigned to a user, that user can only perform certain FortiDB operations.

The following tables show which privileges are mapped to the roles associated with users.

Role	Privileges
Operations Manager	<ul style="list-style-type: none"> Review target-database connection information.

Role	Privileges
	<ul style="list-style-type: none"> • Review target group connection information • View Pre-Defined Policies (PDPs) and User-Defined Policies (UDPs) • View DAM Policies (Data, Metadata, Privilege, and Compliance Policies) • Create, modify, delete, and run assessments • Start/Stop monitoring • View DAM Alerts • Read results of FortiDB-shipped reports • Read results of Custom reports • Perform Penetration Tests • View the Privilege Summary
Policy Manager	<ul style="list-style-type: none"> • Import/export and enable/disable Pre-Defined Policies (PDPs) for VA • Import/export and enable/disable Metadata, Privilege, and Compliance Policies for DAM • Import/export and enable/disable User-Defined Policies (UDPs) for VA and Data Policies for DAM • Add Policy Groups for VA and DAM • Create, modify and delete User-Defined Policies (UDPs) for VA and Data Policies for DAM
Report Manager	<ul style="list-style-type: none"> • Review target-database connection information. • Review target group connection information • Review Assessment settings • Read results of FortiDB-shipped reports • Generate DAM compliance reports • Read results of Custom reports • View the Privilege Summary
Security Administrator	<ul style="list-style-type: none"> • Create, modify, delete, and enable/disable FortiDB users • Configure and modify user-role assignments • View the Entitlement report
System Administrator	<ul style="list-style-type: none"> • Import/export and enable/disable Pre-Defined Policies (PDPs) • Import/export and enable/disable User-Defined Policies (UDPs) • Archive and restore assessment results • Change system properties • Enable/View Audit trail
Target Manager	<ul style="list-style-type: none"> • Create, modify, and delete and import/export connections to target databases • Create, modify , and delete target groups • Perform Auto Discovery of target databases • Review Assessment settings • Review the Privilege Summary




Privileges by License Type

Privileges are enabled based on what type of license is being used. The following tables show which privileges are enabled for the different type of licenses.

License Type	Privileges
VA Only	<ul style="list-style-type: none"> • Policy Manager: View/Modify VA policies • Operations Manager: Create, modify, delete, and run assessments • Report Manager: Generate VA reports • Target Manager: All privileges for this role enabled • System Administrator: All privileges for this role enabled • Security Administrator: All privileges for this role enabled
DAM Only	<ul style="list-style-type: none"> • Policy Manager: View/Modify DAM policies • Operations Manager: start/stop monitoring, view DAM Alerts, view/edit DAM Alert Groups • Report Manager: Generate DAM reports • Target Manager: All privileges for this role enabled • System Administrator: All privileges for this role enabled • Security Administrator: All privileges for this role enabled
VA and DAM	<ul style="list-style-type: none"> • All privileges for the different roles enabled

User Management Icon Descriptions

Here are the User Management icon descriptions:

Icon	Description	Comments
	An Enabled user account	An account can be enabled at any time by a user who has the Security Administrator role.
	A Disabled user account	An account can be disabled at any time by a user who has the Security Administrator role.
	A Locked user account	An account can be locked after unsuccessful login attempts

Limited Targets Management

FortiDB user can be defined to manage all targets, or manage assigned target(s) only.

In the **Targets** tab of user add/edit page, you can choose "Manage all targets" or "Manage limited targets".

Once choose "Manage limited targets", you can select available targets to assign to user.

The user with limited targets access, will only be able to manage VA/DAM/Reports of assigned targets.

This target management definition also depends on **Role Privileges**. For example, you need have "Target Manager" role privilege first, to edit any target.













Deleting Administrators










This topic describes how to delete FortiDB Administrators.

- 1 .Go to the **Administrators** page.
- 2 .Select the checkbox(es) corresponding to the administrator(s) you want to delete.
- 3 .Select the **Delete** button.

Entitlement Report

The Entitlement Report shows you all of your FortiDB administrators, their account status, and their granted roles.

Columns	Meaning	Description
Status	User status	<ul style="list-style-type: none"> •  indicates an enabled user account •  indicates a disabled user account •  indicates a locked user account
Username	User defined user name	The user entry in the User Management page is displayed.
First Name	First name of the user	The user entry in the User Management page is displayed.
Last Name	Last name of the user	The user entry in the User Management page is displayed.
Other	Other information about the user	The user entry in the User Management page is displayed.
	System Administrator role	<ul style="list-style-type: none"> •  indicates the user has the System Administrator role. •  indicates the user does not have the System Administrator role.
	Security Administrator role	<ul style="list-style-type: none"> •  indicates the user has the Security Administrator role. •  indicates the user does not have the Security Administrator role.
	Target Manager role	<ul style="list-style-type: none"> •  indicates the user has the Target Manager role. •  indicates the user does not have the Target Manager role.

Columns	Meaning	Description
	Policy Manager role	<ul style="list-style-type: none">  indicates the user has the Policy Manager role.  indicates the user does not have the Policy Manager role.
	Operations Manager role	<ul style="list-style-type: none">  indicates the user has the Operations Manager role.  indicates the user does not have the Operations Manager role.
	Report Manager role	<ul style="list-style-type: none">  indicates the user has the Report Manager role.  indicates the user does not have the Report Manager role.

Sort: You can sort the Entitlement Report by clicking on any of the column headers. That header is used as your sort key.



Note: The sorted result will be retained when you export the report.

For example, you can sort by **Status**

Export: You can export the Entitlement Report as a PDF, Excel, comma-delimited, or tab-delimited file. Just choose the desired format in the **Export as** dropdown and Select the **Export** button.

Global Configuration

The Global Configuration page allows you to change FortiDB system property values in the following tabs:

Tabs	Description
All	Properties in a read-only manner. You must select one of the other tabs in order to add or change property values
Assessment	Properties related to assessment
Notification	Properties related to Email, SNMP and Syslog
Reporting	Properties related reports generation
User profile/Security	Properties related to user profile and security
Target	Properties for additional JDBC settings for each database type
LDAP Server	Properties related LDAP server for user authentication

Changing the System Properties

- 1 .Log in as System Administrator.

- 2 .Go to **Administration > System Configuration** of the left-side tree menu.
- 3 .Click one among the following tabs.
 - Assessment
 - Notification
 - Reporting
 - User profile/Security
 - Target
- 4 .Set the value of the property you want to change.
- 5 .Select **Save**.

Restoring the Default Values of System Properties

- 1 .Log in as System Administrator.
- 2 .Go to **Administration > System Configuration** of the left-side tree menu.
- 3 .Click one among the following tabs.
 - Assessment
 - Notification
 - Reporting
 - User profile/Security
 - Target
- 4 .Check the checkbox(es) of the properties you want to restore the default values.
- 5 .Click the **Restore Defaults(s)** button.
- 6 .Select **Save**.

System Properties List

This topic presents a list of all the properties that you can configure.

View/Edit System Properties

View all properties in **All** tab. And, go to following tabs to edit properties.

Assessment	Settings for Vulnerability Assessment.
Notification	Email,SNMP, Syslog and others setting for notification.
Reporting	Report title and encoding.
User Profile/ Security	Settings for user account and security.
Target	Additional JDBC settings for connection of target server.
LDAP Server	LDAP server settings for authentication of LDAP type of user.
Monitor	Settings for Database Activity Monitoring.

Assessment

Property	Purpose	Possible Values and Default Values
Enable Localhost Auto Discovery	Enables Auto Discovery to be performed on the machine containing the FortiDB application.	true or false. The default value is false.
Number of Concurrent Assessments	Total number of assessments which can run simultaneously. The optimum value of this parameter depends on your environment but tuning this parameter will affect assessment performance and CPU usage by FortiDB. Note: Assuming at least one target database per assessment, the <code>numberOfConcurrentScans</code> can never exceed <code>numberOfConcurrentTargetScans</code> .	The default value is 5.
Number of Concurrent Target Assessments	Total number of target-databases that can be assessed simultaneously during the <code>numberOfConcurrentScans</code> assessments. The optimum value of <code>numberOfConcurrentTargetScans</code> depends on your environment but tuning this parameter will affect assessment performance and CPU usage by FortiDB. Note: Assuming at least one target database per assessment, the <code>numberOfConcurrentScans</code> can never exceed <code>numberOfConcurrentTargetScans</code> .	The default value is 20.
SSH Key File (Appliance only)	The file that contains the private key used for all SSH connections. Oracle OSVA and DB2 only. The Browse button allows you to locate and set your SSH key file. After setting your key file, select the Save button. Caution: If you select Restore Default(s) and then Save button, your key file that you set will be deleted. Please keep your own copy of the file in a safe place.	There is no default key set in the appliance. The private key file type, RSA or DSA, can be uploaded. Any uploaded key files will be renamed as <code>id_rsa</code> or <code>id_dsa</code> , depending on the type of key that was uploaded. If you uploads a key file and a key file already exists in the appliance, the old key will be replaced with the new key.
MSSQL Server Level Exclusions	A comma separated list of the databases that will be skipped when a "Server Level" scan of a MS SQL target is done.	model,tempdb,pubs, msdb,Northwind
Sybase Server Level Exclusions	A comma separated list of the databases that will be skipped when a "Server Level" scan of a Sybase target is done.	model,tempdb,pubs2, pubs3,jpubs,sybsyntax,

Property	Purpose	Possible Values and Default Values
		sybsecurity,sybsystemdb, sybsystemprocs
Enable Pen Test	When set to <code>true</code> , the Pen Test capability is enabled. When set to <code>false</code> , which is the default, the Pen Test capability is disabled.	<code>true</code> or <code>false</code> . The default value is <code>false</code> .
Enable Pen Test For All Users in Database (Standalone only)	When set to <code>false</code> , FortiDB uses the user names in <code><dbtype>user.txt</code> , where <code>dbtype</code> represents the target-database type and is one of these strings: <ul style="list-style-type: none"> • ora for Oracle • sql for MS-SQL • db2 for DB2 UDB • syb for Sybase • mysql for MySQL When set to <code>true</code> , FortiDB ignores the user names in <code><dbtype>user.txt</code> .	<code>true</code> or <code>false</code> . The default value is <code>true</code> .
Pen Test Method	The Login method actually logins in to your target databases. Caution: Be careful when using this method. Since its login attempts may be unsuccessful, it can result in preventing any, even approved, users from logging in to your target database. The Hash-based method is a safer, offline approach, but is available for only Oracle and MS SQL target databases. (A 'hash' is the value obtained after encrypting a clear-text string.) With the Hybrid method, FortiDB attempts the best available method. If the hash-based method is available, as will be the case with Oracle and MS-SQL targets, FortiDB uses it.	<ul style="list-style-type: none"> • 1=Login method • 2=Hash-based method • 3=Hybrid The default value is <code>Hybrid</code> . (If you select the Hash-based method for Sybase or DB2 targets, none of the Pen Test rules will be applied, your assessment result will be essentially empty, and no error will be signaled.)
Pen Test Password Dictionary	A file containing the passwords to be checked when executing the Dictionary Penetration test. The Browse button allows you to select your dictionary file. You need to select the Save button to complete your selection.	“Built-in Dictionary” indicates that the default dictionary is being used. “User Dictionary” indicates that you have uploaded your own dictionary file. The filename of the dictionary you upload will not appear here. Note: When you restore the default dictionary by

Property	Purpose	Possible Values and Default Values
		checking the checkbox, and selecting Restore Default(s) and then Save , your dictionary file will be deleted from the system.

Notification

Property	Purpose	Possible Values and Default Values
Email Server Host Name	The SMTP email server hostname or IP address. Email notifications cannot be sent when the (empty) default value for this property is used.	
Email Server Port	The server port number associated with emailServerHostName.	The default value is 25.
Email Server User Name	The user name associated with emailServerHostName. Need input the user and password, if the email server need authentication to send email, and leave empty if doesn't.	
Email Server Password	The password associated with emailServerHostName.	
From Address	The email address used to fill the 'From' field in email notification.	
SNMP Community String	The SNMP community name.	The default value is public.
SNMP Receiver Host	The SNMP receiver host. SNMP-trap notifications cannot be sent when this field is empty.	
SNMP Receiver Port	The SNMP receiver port number.	The default value is 162.
Syslog Receiver Host	The Syslog receiver host. Syslog notifications cannot be sent when this field is empty.	
Syslog Receiver Port	The Syslog receiver port number.	The default value is 514.

Reporting

Property	Purpose	Possible Values and Default Values
Company Logo	Location and name of file containing your company's logo. When you locate and	

Property	Purpose	Possible Values and Default Values
	specify a new image via the Browse button and then save it via the Save button, it will be placed in <code><FortiDB-install directory>/conf/reportlogos</code> for subsequent use in your reports.	
Company Name	The company name to be displayed on VA reports.	Fortinet
DAM Report Encoding	The character encoding used for DAM report generating.	UTF-8

User Profile/Security

Property	Purpose	Possible Values and Default Values
Idle Account Expiration	The number of days a user can be inactive after which the account expires. (This does not apply to the FortiDB superuser, admin.) An expired account is "locked" and can be unlocked by a user with Security Administrator privileges.	The default value is -1.
Max Number of Failed Login Attempts	The number of login attempts allowed before user account is locked. (This does not apply to the FortiDB superuser, admin.)	The default value is -1.
Days Until Password Expiration	The number of days after which an unchanged password expires.	The default value is -1.
Minimum Password Length	The minimum length of a user password.	The default value is -1.
Enable Local Audit Trail	Enables or disables FortiDB local Audit Trail. When set to true, Audit Trail is enabled. When set to false, Audit Trail is disabled.	The default value is <code>false</code> .

Target

Property	Purpose	Possible Values and Default Values
Additional Oracle JDBC Settings	List of additional key=value pair(s), separate by semicolon, for all database connections of the same type.	
Additional SQL Server JDBC Settings	List of additional key=value pair(s), separate by semicolon, for all database connections of the same type.	If you use NTLM v2 authentication, enter <code>useNTLMv2=true</code>

Property	Purpose	Possible Values and Default Values
		If need force to use SSL encryption, enter SSL=require
Additional Sybase JDBC Settings	List of additional key=value pair(s), separate by semicolon, for all database connections of the same type.	See below note for using Encrypted Password connection
Additional DB2 JDBC Settings	List of additional key=value pair(s), separate by semicolon, for all database connections of the same type.	
Additional MySQL JDBC Settings	List of additional key=value pair(s), separate by semicolon, for all database connections of the same type.	

Note: If use Sybase Encrypted Password connection (set the 'net password encryption reqd' to 1 or 2 in Sybase server), enter:

```
ENCRYPT_PASSWORD=true;
RETRY_WITH_NO_ENCRYPTION=true;
JCE_PROVIDER_CLASS=org.bouncycastle.jce.provider.BouncyCastleProvider
```

LDAP Server

Property	Purpose	Possible Values and Default Values
Server Name/IP	LDAP server name or IP address.	
Port	LDAP server port.	389
Common Name Identifier	Name of user identifier in LDAP user path.	If the user path is like "cn=username,ou=dept,dc=com", this value should be "cn". If the user path is like "un=username,ou=dept,dc=com", this value should be "un".
Distinguished Name	Distinguished name of LDAP user.	For the user with path "cn=username,ou=dept,dc=com", this value should be "ou=dept,dc=com".
Bind Type	LDAP authentication type.	none or Simple, default is Simple.
Use Secure Connection(SSL)	Use SSL for secure connection.	True or False.

Click **Test Connection** to test the LDAP server configuration.

Monitor

Property	Purpose	Possible Values and Default Values
Records contained by single Compliance Audit File	The number of the records that each Compliance Audit File contains. The value should be	100000 - 400000

Property	Purpose	Possible Values and Default Values
	100,000~400,000.The default value is 400,000.	

Archive and Retrieve

This topic describes the FortiDB archiving and retrieving process and gives some guidelines for its use.

All data for assessment and monitoring/auditing in the FortiDB repository can be moved to archive files in order to conserve repository space and improve performance. It's recommended that archive data periodically, if you enable the DAM Activity Auditing, or Compliance Audit with Alert Compliance Policy, or will get large amount of security alerts.

There are three types of dataset archived and restore.

- Assessment data
- Alert data
- Auditing data - including sniffer activity auditing data, and compliance audit data generated by alert compliance policy.

When data is archived, the information is exported to a file. When data is retrieved, the information is imported in FortiDB repository.

FortiDB archives are stored within encrypted files. Depending upon your assessment or monitoring frequency and upon the number and type of policies and target databases involved, the files can consume a large amount of space. So, you could move the files to a separate location and then move them back when needed.



Note:

If you want to report on an archived data, you need to retrieve the archive containing that data.

If you delete a completed assessment's configuration settings after archiving, that information cannot be retrieved. For example, if you delete a target-database connection after archiving its assessment information, that information cannot be restored.

The entry in the **Timestamp** column on **Retrieve** tab represents the day and time that the archive was performed.

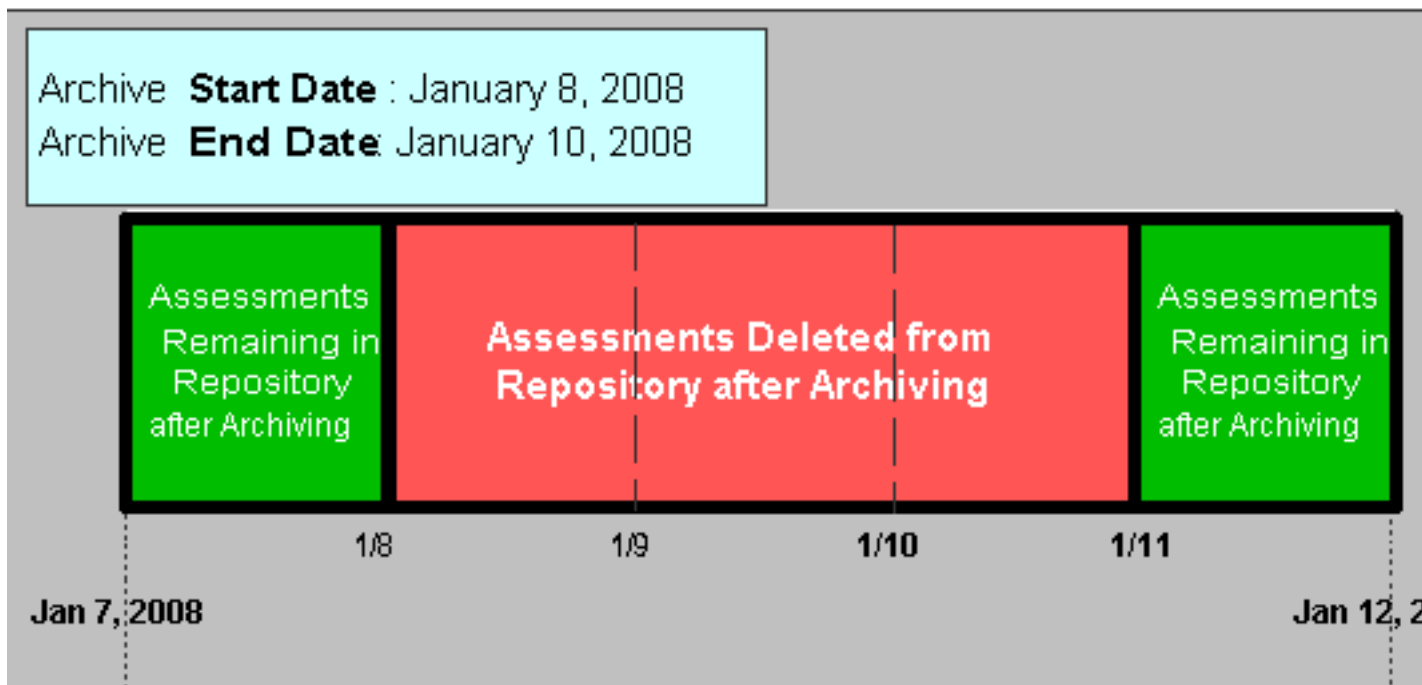
Once retrieved and in order to prevent duplicate records in the FortiDB repository, any records already in the FortiDB repository will not be retrieved again during the restore process.

About Archiving

This topic illustrates the effect of archiving on the contents of your repository and describes a possible archiving strategy.

Effect of Archiving

The following figure illustrates the effect of an archive whose start date is January 8, 2008 and whose end data is January 10, 2008.



An Archiving Strategy

Depending upon your data volume, you should decide on an archive strategy and frequency. You should also decide if you want your archive to commence immediately or not.

For example, assume you decide to keep no more than four months worth of data in your FortiDB repository at any given moment. In this case, you might wait four months after installing FortiDB before you first archive. Then specify (in the **Archive Period** field of the **Archive** tab) "3 Month(s) and older".

Three months worth of data would then remain in your repository.

You could either run a "3 Month(s) and older" archive manually every month or automate the process by scheduling it to occur at a prescribed interval or on a certain day of the week or month.

Archiving Manually

This topic describes how to archive data manually. To archive manually, take the following steps:

- 1 .Go to **Administration > Archive/Retrieve** of the left-side tree.
- 2 .Select the **Archive** tab.
- 3 .Specify a start and end date for your archive. The date ranges 0:00 am to 0:00 am of the next date.



Note: The archive includes data which starts from 0:00 am of the start date, and ends 0:00 am of the end date you specify. It does not include the data generated in end date.

- 4 .Click **Archive Now** button.

You should then see "Archiving Completed" message in the **Status** area in the upper-right corner of the page.

Scheduling an Archive

This topic describes how to archive data via a schedule. To schedule archiving, take the following steps:

- 1 .Go to **Administration > Archive/Retrieve** of the left-side tree menu.

- 2 .Select the **Archive** tab.
- 3 .Enable the **Enable Auto Archive** option
- 4 .In the **Archive period** section, specify the archive period for which you want to archive data. Here you can specify the number of days, weeks, or months, prior to the current date, that you want as the last date for data in the archive.
For example: "3 Month(s) and older" would result in an archive that contained results for all assessments, and monitoring/auditing except those run in the last 3 months
- 5 .In the **Run time** section, specify a **Start at** time or, in the **Recurrence pattern** section, specify either the **Hourly**, the **Daily**, **Weekly**, or **Monthly** radio button.
 - If you choose the **Hourly** radio button, you can then specify the hourly interval in the **Every ___ hours** field.
 - If you choose the **Daily** radio button, you can then specify the daily interval in the **Every ___ days** field.
 - If you choose the **Weekly** radio button, you can then specify the weekly interval in the **Every ___ week(s) on** field. You should then specify on which day(s) of the week you want to run your archive by selecting one or more of the appropriate day checkbox(es).
 - If you choose the **Monthly** radio button, you can then specify which day during the month and which months during the year you want your archive to run. There are checkboxes for you to specify in which months you want to run your assessments. The **Day** radio button and adjacent dropdown list allows you to specify the numeric day for your archive to run in each specified month. Alternatively, you may specify the day in each month, such as the 'first Monday', using the two dropdown lists.
- 6 .If you want FortiDB to send the archive file to remote server, select the **Enable remote archive** checkbox. And if you don't want save the archive file copy in FortiDB, select the option **Delete archive file after sending to remove server**.
See the [Remote Archive](#) for detail.
- 7 .Click the **Save Schedule** button.

Remote Archive

This topic describes how to archive data to remote server. To enable remote archive, take the following steps:

- 1 .Go to **Administration > Archive/Retrieve** of the left-side tree menu.
- 2 .Select the **Remote Archive Configuration** tab to configure remote server. The remote server must be a FTP server.
- 3 .Input the IP Address, port, username, password and remote path for remote FTP server.
- 4 .Click the **Save** button to save the remote server configuration.
- 5 .In the **Archive** tab, when you schedule an archive, enable remote archive option.
- 6 .In the **Retrieve** tab, you can select an archive file, click **Send to remote server** button, to send the archive file to remote server manually.
- 7 .In the **Retrieve** tab, you can input archive file path in remote server, click **Get from remote server** button, to get the archive file from remote server into FortiDB.

Retrieving the Archived Data

This topic describes how to retrieve and manage the archived data.

- 1 .Go to **Administration > Archive/Retrieve** of the left-side tree menu.
- 2 .Select the **Retrieve** tab.
- 3 .Select the radio button next to the archive file of interest.

- 4 .Click the **Retrieve** button.
You should then see "Restoring Completed" message in the **Status** area in the upper-right corner of the page.
- 5 .Select the archive file and click **Delete** button to remove the archive file.
- 6 .Select the archive file and click **Send to remote server** to send the archive file to remote server.
- 7 .To get archive file from remote server back to FortiDB, input the archive file path in remote server, and click **Get from remote server** button to get the archive file.



Local Audit Trail

This topic describes FortiDB's Audit Trail feature. This feature allows you to capture the following information:

- All users activities: add/delete/update users, add/delete/update policies or policy groups, add/delete/update targets or target groups, add/delete/run assessments, archive, restore, log on, and updates in system configuration.
- System activities: start and stop.

You can filter audit trail records for display by dates in the audit trail page. You can also export the list to a tab-delimited text which you can open from any spreadsheets application.

Notes: To display the audit trail, the user must have a Administrator role.

Columns	Description
Timestamp	The date and time of the action that was taken place.
Action	The action that was taken place.
By	The user who took the action. For example, admin, any specific users, or internal.  Note: When the actions are invoked by FortiDB such as scheduled scan, scheduled archive, start FortiDB, or stop FortiDB, this column shows "internal".
Location	The location where the action was taken place. For example, locally or from any specific location, shown as IP address or host name of the login user.  Note: When the actions are invoked by FortiDB such as scheduled scan, scheduled archive, start FortiDB, or stop FortiDB, this column shows "internal".
Object Name	The object which the action was taken place against.

Enable Local Audit Trail

- 1 .Go to **Administration > Global Configuration** of the left-side tree menu.
- 2 .Select the **User Profile/Security** tab.
- 3 .Set the value of **Enable Local Audit Trail** to `true`.
- 4 .Select **Save**.

View/Delete/Export Local Audit Trail

To filter the local audit logs, enter a start date in the **Start Date** field and an end date in the **End Date** field or click the calendar icon and select dates.

Select **Apply** button to view the audit trail in the selected date range.

Optionally, you can sort the list by clicking on any of the column headers. The header is used as your sort key.

Select **Delete** button to delete the audit trail in the selected date range.



Note: If the Local Audit Trail is enabled, the delete operation will generate a trail log.

Select **Export** button to export the audit trail in the selected date range.



Audit Trail Examples

```
Timestamp:2009-02-26 16:06:47
Action: Update
By: admin
Location: 172.30.63.50
Object Name: VA Policy: DVA IBM DB2 UDB 02.11 Latest Fixpak not installed
-----
Timestamp:2009-02-26 15:36:31
Action: Scan
By: jsmith
Location: 172.30.63.40
Object Name: VA Scan: Latest Patch Policies
-----
Timestamp:2009-09-09 15:02:25
Action: Add
By: admin
Location: 172.30.63.50
Object Name: DAM Policy Group: tablePolicy1_2 Group
-----
```


Target Management

Manage Target Database

For assessment or monitoring of your target databases, you first need to create target-database connections. From the Targets page, you can organize all target databases you want to perform assessment or monitoring. The following table describes columns, buttons, and icons used in the Targets page.


Columns	Descriptions
Status (Connection status)	<ul style="list-style-type: none">  indicates a target database for which the information is incomplete  indicates a target database for which the information is complete
Name	User defined target connection name. When clicked, the target connection page (General tab) displays.
DB Name	Database name of your target database
DB Host Name/IP	Database host name or IP address of your target database machine
Port	Port number to use for the target connection
DB Type	Database type of your target. ORACLE, MSSQL, DB2, SYBASE, or MYSQL
Action	Click the Edit icon to modify the target, same as click the DB Name .

Buttons and Fields


Buttons and Fields	Descriptions
View dropdown	Filters a display of the target list
Search / New Group	Search the target by column's filtering, or create a new group with search criteria
Add	Add a new target
Delete	Delete the selected target
Import	Import a target list file from exported XML file
Export selected to XML	Export selected targets to XML file
Export all to XML	Export all targets to XML file
Export all to PDF	Export a target list to PDF file

Adding (or Modifying) a Target Connection

This topic describes the task of creating or modifying target-database connections.

- 1 .Go to **Target Management > Targets**
- 2 .Select the **Add** button. (or, to modify a target, click on the name of the target database you would like to change.)
- 3 .In the **General** tab of the **Target** page, enter the requested information, taking the following items into consideration.
 - In the **Name*** field, do not use spaces for the name.
 - In the **Type*** field, if you choose Oracle or DB2, you may then need to fill out information on the **SSH** tab.)
 - In the **DB Host Name/IP*** field, enter the DB host name or IP address of the machine containing your target database.
 - In the **Port*** field, enter the port number or keep the default for your target database.
 - For MS SQL or Sybase only, check the appropriate **Database Level** or **Server Level** radio button in the **Connect At** field. If you select **Server Level** scan, you can exclude databases you specified using MSSQL Server Level Exclusions property and Sybase Server Level Exclusions property values. For details, see [System Properties List](#)
 - In the **Additional JDBC Settings** field, enter JDBC settings for this target. The JDBC settings should be listed as key=value pair(s) and separate by semicolon. The Value in [Additional JDBC Settings](#) will be overwrite if the JDBC settings of target is set.
 -  **Note:**
FortiDB supports SSL encrypted connection to MS SQL Server.

FortiDB will connect SQL Server with encrypted connection if set "ForceEncryption=Yes" in SQL Server, and connect with no encrypted connection if "ForceEncryption=No".

Input value "SSL=require" in [Additional JDBC Settings](#) if want force FortiDB to use encrypted connection.
 -  **Note:**
FortiDB supports SSL encrypted connection to Sybase Server.

FortiDB will connect this Sybase Server with SSL encrypted connection if set "SYB SOCKET_FACTORY=com.fortinet.fortidb.target.internal.connection.SybaseSSL" to the Target as JDBC setting.
 - In the option **DB Activity Monitoring**, enable the checkbox "Allow" if you want monitor the target.
 - If you are connecting to a DB2 target, must specify the **Retrieval Method** in the DB2 Options tab.

DB2 Retrieval Method	Comments
SSH	See SSH Connections for Oracle and DB2
db2level command	This method requires that you specify: <ul style="list-style-type: none"> • The output of the <i>db2level</i> command or the name of a text file containing that output. • The output of the <i>get dbm cfg</i> command.
User SQL query for connection	This method requires DB user has privilege of executing stored procedure. Use this method, FortiDB will get necessary information for target definition from DB2 server through SQL query.

4 .(Optionally) you may select the **Classification** and **Contact Info** tabs of the **Database Form** and enter the information there.



Note: Entries made here may be useful as filtering criteria for subsequent grouping of your targets.

5 .(Optionally) in order to test your connection, select the **Test Connection** button after you have specified all the required information.

6 .Once you have specified your target information, you can save it by selecting the **Save** button.

SSH Connections for Oracle and DB2

FortiDB allows you to connect to Oracle and DB2 target databases using SSH.

FortiDB offers these SSH access methods:

- **Password** method which utilizes just a user name and password.
- **Implicit Key Pair** method which uses SSH key file entered through the SSH Key File property value. For details about SSH key file property and how to set your SSH key file, see [Using SSH Target-Database Connections](#).
- **Explicit Key Pair** (Standalone only) which assumes:
 - That your private key resides in the directory named `.ssh` under the directory in the Key Path field
 - That you will enter a pass phrase that is a part of your private key


Using SSH Target-Database Connections

This topic describes the task for using SSH in order to connect to target databases.

- 1 .Select the **SSH** tab.
- 2 .Specify a port number or use the default of 22.
- 3 .Specify an access method among the choices.



Note: The Explicit Key Pair option is for standalone users only.

Access Method	Associated Information
Password	Enter appropriate values into the User Name and Password fields.
Implicit Key Pair	<p>Enter just a User Name. FortiDB will use the SSH key file entered through the SSH Key File property value. To set your SSH key file:</p> <ol style="list-style-type: none"> 1 .Select System Configuration in the left-side navigation menu. 2 .Select the Assessment tab. 3 .Select Browse button in the SSH Key File property and locate your SSH private key file. 4 .Select the Save button. <p> Note: When User Name is empty, FortiDB will use the name of the user that started FortiDB.</p>
Explicit Key Pair (Standalone Only)	<p>Enter:</p> <ul style="list-style-type: none"> • A User Name for the FortiDB SSH user • A Key Path which represents the location, on your SSH client machine, of your private key. You need to create <code>.ssh</code> directory under the directory shown in this field and copy the private key in <code>.ssh</code> directory you created. • (Optionally) a Pass Phrase

Access Method	Associated Information
	FortiDB will attempt to use the private key (and, if specified, pass phrase) located in Key Path location at run time.

- 4 .Select the Test SSH Connection button to check if the connection has been established.

SSH Environment (for standalone users)

You must have a working SSH environment by which you can remotely login to different target-database machines. (See your System Administrator if you need help setting up a working SSH environment.) Here are some items to consider:

Item	Description
Public Key handling	For either the Explicit or Implicit Key Pair methods, you must secure-copy the public key, which you generate on the SSH client. Secure-copy it to your SSH server and then append it to the <i>authorized_keys</i> file located in the <i>.ssh</i> directory within the home directory of the FortiDB SSH user.
Private Key handling	For either the Explicit or Implicit Key Pair methods, you should generate <i>id_dsa</i> or <i>id_rsa</i> private keys and copy them to the <i>.ssh</i> directory under user's home directory on the SSH client machine. In a Windows environment, depending on Operating systems, the private key should resides in <i>.ssh</i> directory under user's home directories, such as C:\Documents and Settings\All Users. In order to place the private key, take the following steps: <ol style="list-style-type: none"> 1 .Select the SSH tab from the Target page. 2 .Select Explicit Key Pair in the Access Method field. The user's home directory is shown in the Key Path field. 3 .Create <i>.ssh</i> directory under the directory shown in the Key Path field. 4 .Copy the private key to <i>.ssh</i> directory you created.
SSH Client Location	The SSH client should be on your FortiDB machine.
SSH Server Location	The SSH server should be on your target-database machine.
User account for SSH User	You must create a user account on your target-database machine for the FortiDB SSH user.
DB2 Target Specific Instructions	For DB2 targets, you may need to execute, for the OS user that you created for FortiDB on your target-database machine, the following. For example, if you are the <i>db2inst3</i> user and you use the <i>bash</i> shell, add this to your <i>.bashrc</i> : <pre>if [-f /home/db2inst3/sqllib/db2profile]; then . /home/db2inst3/sqllib/db2profile fi</pre>
Using the OSVA Feature with Oracle Targets	If you are using the FortiDB OSVA feature for Oracle target databases on Solaris platforms, you will need to specify the Home Directory , Owner , and owner's Group of your target database.

Enabling OS-Level PDP (Solaris, AIX)

This topic describes how to enable OSVA Pre-Defined Policies for Oracle target database on Solaris or AIX machine. In order to be able to run OS-Level PDPs against Solaris or AIX target machine, make sure that your SSH connections have been established. The steps to enable OS-Level PDP are:

- 1 .Select the **Enable OSVA** check box.
- 2 .Select **Solaris** or **AIX** for the operating system from the pull-down list.
In your target machine, make sure the environment variable includes "opatch" command path.
- 3 .Enter Oracle home directory. The \$ORACLE_HOME environment. Ask your Oracle DBA for this information.
- 4 .Enter Oracle Owner name. Ask your Oracle DBA for this information.
- 5 .Enter Oracle User Group name (Typically dba or oinstall). Ask your Oracle DBA for this information.
- 6 .Select the Save button.

Additional JDBC Settings

FortiDB uses JDBC to connect target database, you can specify additional JDBC settings for particular connection need.

Specify Additional JDBC Settings

Goto **Administration > Global Configuration > Target**, input the Value for specific type of database.

Please note that the setting will apply to all targets belong to same type.

Specify JDBC Setting for MS SQL Server to force using SSL encryption

When SQL Server sets the "ForceEncryption=No" and want to FortiDB connect SQL Server with SSL encryption, input following value for SQL Server JDBC Settings:

```
SSL=require
```

Specify JDBC Setting for Sybase connection with "Encrypted Password" option

For Sybase "Encrypted Password" option (set the 'net password encryption reqd' to 1 or 2 in Sybase server), need input following value for Sybase JDBC Settings:

```
ENCRYPT_PASSWORD=true;RETRY_WITH_NO_ENCRYPTION=true;
JCE_PROVIDER_CLASS=org.bouncycastle.jce.provider.BouncyCastleProvider
```

Specify JDBC Setting for Sybase to force using SSL encryption

When Sybase server access is protected using SSL and want to FortiDB connect to it with SSL encryption, input following value for Global or Target Sybase JDBC Settings:

```
SYB SOCKET_FACTORY=com.fortinet.fortidb.target.internal.connection.SybaseSSL
```



Note: Working with the Sybase server using SSL, the VA and Native DAM can work, but for TCP/IP Sniffer feature, it can not be supported.

Deleting Target Database Connections

This topic describes how to delete target-database connections.

- 1 .Go to **Target Management > Targets**.
- 2 .Select the checkbox(es) corresponding to the **Name(s)** of the target-database connection(s) you want to delete.

- 3 .Select the **Delete** button.


Exporting Target Database Data

This topic describes how to export target-database information.

- Click **Export All** button to export all targets information to a XML file.
- To export select target(s):
 - Change target group with **View** dropdown list, or use **Search/New Group** button to search target(s)
 - Select target(s) with checkboxes, click **Export** button to export.
- Click **Export All to PDF** button to export targets list to a PDF file. Please note that the exported PDF contains parts of target information only, cannot used for importing.
- After click export button, a dialog box will help you to choose a directory in which you can save the file to your disk.

Importing Target Database Data

This topic describes how to import target-database information.

- 1 .Prepare an XML file containing target-database information you want to import. In order to help insure that your file will import successfully, consider:
 - Export your target-database information from an existing FortiDB machine in order to provide you an example of a file that should import properly. For standalone users, you can use one of the example files in `<FortiDB-install directory>/etc/import-target` as an example of a file that should successfully import.
 - For element values, consider that:
 - Your new target names should be unique. If you import a target with the same name of the existing target, the existing target-database information will be updated by that in the imported file.
 - You need to populate all required elements. If your imported XML file does not have values for all required elements, an Incomplete status will be indicated in the  (target-status) column.
 - Do not change any encrypted values. For passwords, use clear text which, in turn, will be encrypted during Import.
 - Do not change the Database Type element value.
- 2 .Go to **Target Management > Targets** of the left-side tree menu.
- 3 .Select the **Import** button.
The **Target Import** page should display.



Note: Target database data is imported based on the **Name**. If the same **Name** already exists in the target list, the existing target-database data in the target list will be overwritten by the imported data.

- 4 .Enter the path to the XML file you want to import, or select the **Browse** button and select the XML file you want to import.
- 5 .Select the **Import** button. Here are the column descriptions:

Column	Description
Name	Contains the value of the <name> element is shown.
Results	Indicates whether the imported targets are New, Updated, or Failed.
Complete	Contains Complete or Incomplete. Incomplete means that one or more required elements have a missing value.

Column	Description
Message	Indicates the reason that the Results column shows Failed.

6 .Select the **Continue** button to complete the import.

Target Groups

The Target Groups page shows all pre-defined target groups.

There are the following pre-defined target groups.

- DB2 Database Group
- MySQL Database Group
- Oracle Database Group
- MS SQL Server Database Group
- Sybase Database Group

In this page you can:

- Add a new target group by selecting **Add**. See [Adding a Target Group](#)
- Modify the target group by selecting the group name.
- Delete the user-defined target groups by selecting the group and click **Delete**.

Adding (or Modifying) a Target Group

This topic describes the task of creating target-database groups by using filtering criteria.

- 1 .Go to **Target Management > Targets** in the left-side tree menu.
- 2 .Click the **Add** button to add a new target group. (or, to modify a target group, click the name of the target-database group you would like to change.)
- 3 .On the subsequent **Targets** page, fill in the text boxes
 - a) Use the **Group Name** text box for entering (or modifying) a name that will show up in the saved target-group list. Use the optional **Description** text box to describe your filtering/grouping criteria.
 - b) In order to create a filtering condition, select a **Column** on which you would like to filter, an **Operator** that associates the **Column** with a **Value**, and a **Value** that the **Column** must match.



Note: The value you enter in the Value box is case-sensitive.

- c) In order to cancel a target-database grouping operation, click the **Cancel** button.
- d) You can add or subtract filtering-criteria rows by selecting the **+** (**plus**) or **-** (**minus**) buttons, respectively.

You may add additional criteria by adding rows to the **Column/Operator/Value** table. Multiple rows represent additional criteria.



Note: You cannot use the same **Column** in multiple rows. For example, you cannot establish a criteria that includes a row for Location = 'London' and a row for Location = 'New York'.

Here are some examples of filtering criteria:

Attribute	Operator	Value	Return Possibilities
Location	Contains	nd	all databases in London
Database Type	Equals	DB2	all DB2 databases

- 4 .Select **Search** button to test your filtering criteria.
- 5 .Select the **Save Group** button to save your new group.

Your new group will be displayed in the **Target Groups** page.

Deleting Target Groups

This topic describes how to delete target-database groups.

- 1 .Go to **Target Management > Target Groups**.
- 2 .Select the checkbox(es) corresponding to the **Name(s)** of the target-database group(s) you want to delete.
- 3 .Select the **Delete** button.

Required Settings for Monitoring Target Databases

In order to properly monitor your target databases and generate alerts, you need to configure your target databases before starting monitoring. Depending upon your target databases, different settings are necessary. For details about required settings of each target database type, see the following sections.

- [Configuring Monitoring with TCP/IP Sniffer](#)
- [Configuring the Oracle Target Database](#)
- [Configuring the MS SQL Server Target Database](#)
- [Configuring the Sybase Target Database](#)
- [Configuring the DB2 Target Database](#)
- [Configuring the MySQL Target Database](#)

Configuring Monitoring with TCP/IP Sniffer

FortiDB appliance supports monitor data activity through TCP/IP sniffer, with Oracle, MS SQL Server, DB2 and Sybase.

The feature **Activity Auditing** and **Activity Profiling** depend on TCP/IP sniffer.

Environment Required for TCP/IP Sniffer

- Your target database server and clients use TCP/IP as protocol, and all database activities are going through LAN.
- The network switch, which your target database server is connected, must support the port mirroring feature.
- Connect one Ethernet port of FortiDB appliance to the mirror port (also known as SPAN port) of switch, which database server is connecting to.
- A typical network connection for monitoring with TCP/IP Sniffer:
 - One port of FortiDB unit, such as Port1, connects to your LAN, as management port. And, make sure FortiDB can manager your target database server through the connection.
 - Another port of FortiDB, such as Port2, connects to your switch's mirror port, to collect network traffic of your database server.

Configure FortiDB for TCP/IP Sniffer

- Define the target database first, and make sure the **Allow** option for **DB Activity Monitoring** is checked.
- Configure the Target Monitor, select **TCP/IP Sniffer** for Collection Method, in General tab.
- Select your target database version. Following is the supported database versions.
 - Oracle: 9i, 10g, 11g

- MS SQL Server: 2000, 2005, 2008, 2008_R2, 2012
- DB2: UDB 9.1, 9.5, 9.7
- Sybase: ASE 12.5, 15.0, 15.5, 15.7
- For MS SQL Server, if server enabled SSL encryption connection, need specify the **SSL Certificate Private Key** and **Key Password**(if have) for FortiDB. The SSL Certificate is configured in server side for SSL encryption
- Specify which FortiDB's Ethernet port is connecting to network switch for sniffer.
- Select **Enable Activity Auditing** to enable activity auditing. Select **Log All** to audit all activity. Otherwise, audit activity by associated **Audit Policies**.
- Select **Enable Activity Profiling** to enable activity profiling.

Policy based Activity Auditing

When using TCP/IP sniffer, you can enable/customize **DAM Audit Policy** to filter out activity auditing.

- Goto **Policy > DAM Audit Policies** and **DAM Audit Policy Groups** for Audit Policy configuration.
- After select TCP/IP Sniffer as collection method when configuring monitoring, **Audit Policies** and **Audit Policy Groups** tabs will be available.
- Make sure the **Enable Activity Auditing** option is checked, but **Log All** is not.
- Goto **Audit Policy Groups** tab, to select policy group(s) to associate to the monitoring, and **Save**.



Note: No Audit Policy/Policy Group associated to monitoring by default.

- Goto **Audit Policies** tab to enable/configure Audit Policy if need.

Configuring the Oracle Target Database

This topic describes required settings of Oracle databases. To monitor the Oracle target database, FortiDB provides several methods that users can choose depending on their circumstances.

Collection Methods

FortiDB collects Oracle audit information using the following methods:



Note: When you change a collection method from one option to the other, you need to stop monitoring first, and after changing the collection method, start monitoring.

Collection Methods	Values of the Oracle audit_trail parameters	Required Agent?
TCP/IP Sniffer	None	No See Configuring Monitoring with TCP/IP Sniffer for detail
DB, EXTENDED	DB, EXTENDED	No
DB, EXTENDED	DB	No For Oracle 9i only. Please see the notes below for limitation of this method.
XML File Agent	XML, EXTENDED	Yes FortiDB's XML file agent provides high performance for auditing the Oracle target database. To use the XML file agent option, you need to run the FortiDB XML file agent in

Collection Methods	Values of the Oracle audit_trail parameters	Required Agent?
		your target database. For details about how to run the Oracle XML file agent, go to Running the Oracle XML File Agent
SGA Agent	None	<p>Yes</p> <p>FortiDB SGA agent utilizes the Oracle System Global Area (SGA), a group of shared memory areas, dedicated to an Oracle instance. FortiDB allows users to collect data via the SGA agent from your target database. The FortiDB SGA agent requires less performance overhead, and the database-side configuration is not necessary. For your Oracle target database, EZCONNECT parameter allows the FortiDB agent to connect to the Oracle database by specifying the connection strings: hostname[or IP]:portnumber/SID.</p> <p>To add EZCONNECT parameter, take the following steps:</p> <ol style="list-style-type: none"> 1 .Go to \$ORACLE_HOME/network/admin/sqlnet.ora 2 .Open sqlnet.ora with your editor. 3 .Add EZCONNECT parameter as follows: <pre>NAMES.DIRECTORY_PATH= (TNSNAMES , EZCONNECT)</pre> <p>For the SGA agent option, you must run the FortiDB SGA agent in your target database. For details about how to run the SGA agent, go to Running the Oracle SGA Agent</p>
Net Agent	None	<p>Yes</p> <p>FortiDB's Net agent collects data activities to Oracle target database through TCP/IP. To use the Net agent option, you need to run the FortiDB Net agent in your target database. For details about how to run the Oracle Net agent, please refer the document released with FortiDB Net Agent.</p>

Note: Limitation of using method 'DB' for Oracle 9i

- 1 .Table and Table Column Policy - Cannot retrieve the SQL statement text
- 2 .Table/User/Session Policy - No effect with Suspicious Location rule
- 3 .Session Policy - No effect with Extremely Long Session rule and High Read Ratio rule

Target Preparation for the Compliance Policy

FortiDB Compliance Policy allows you to capture all types of activities and stores the data in the internal repository. To generate Compliance reports properly, you need to execute "create trigger" commands.

Take the following steps in your Oracle target database:

- 1 .Copy the following scripts in a file.

```
CREATE OR REPLACE TRIGGER FORTIDB_get_application AFTER LOGON ON DATABASE
WHEN (user != 'SYS')
```

```

DECLARE l_program VARCHAR2(50);
l_machine VARCHAR2(50);
BEGIN
SELECT substr(program, 1, 43), substr(machine, 1, 20) INTO l_program,
l_machine FROM v$session
WHERE audsid = sys_context('USERENV', 'SESSIONID');
dbms_session.set_identifier(l_program || ':' || l_machine);
EXCEPTION WHEN OTHERS THEN ROLLBACK;
END;
/

```

- 2 .Login as sys as sysdba to your Oracle instance.
- 3 .Execute the file.

User Privileges for Monitoring/Auditing

In order to monitor/audit the Oracle target databases, the database users must have the following privileges:

Data Policies	Privilege Policies	Metadata Policies
<p>For Collection Method 'DB, EXTENDED' and 'XML File Agent'</p> <ul style="list-style-type: none"> • CREATE SESSION • SELECT_CATALOG_ROLE • DELETE_CATALOG_ROLE • AUDIT ANY • AUDIT SYSTEM • SELECT SYS.AUD\$ • SELECT on the monitored tables or SELECT ANY TABLE 	<ul style="list-style-type: none"> • CREATE SESSION • SELECT_CATALOG_ROLE • DELETE_CATALOG_ROLE • AUDIT SYSTEM 	<ul style="list-style-type: none"> • CREATE SESSION • SELECT_CATALOG_ROLE <p>for use with auditing:</p> <ul style="list-style-type: none"> • CREATE SESSION • AUDIT SYSTEM • SELECT_CATALOG_ROLE
<p>For Collection Method 'TCP/IP Sniffer', 'SGA Agent', 'Net Agent' (Privileges need for browsing database to define data policy)</p> <ul style="list-style-type: none"> • CREATE SESSION • SELECT_CATALOG_ROLE • SELECT on the monitored tables or SELECT ANY TABLE 		

To grant privileges to a user, use the GRANT statement. Some examples are:

```

GRANT SELECT_CATALOG_ROLE TO username
GRANT DELETE_CATALOG_ROLE TO username

```

Enabling FortiDB to Delete Audit Records

To enable FortiDB to delete audit records from the SYS.AUD\$ table you must give the FortiDB user delete privileges on the SYS.AUD\$ table. This privilege should only be granted to the FortiDB user if

you understand the implications. The SYS.AUD\$ contains all audit records not only the audit records generated for FortiDB monitoring. When FortiDB delete audit records it deletes all audit records. See Audit Management for more information regarding the delete audit records feature. Use this grant statement:

```
grant delete on SYS.AUD$ to username
```

Running the Oracle XML File Agent (UNIX, Windows)

This section contains instructions on how to configure and run FortiDB's Oracle XML file agent to monitor multiple Oracle databases(SIDs). The agent, when active, periodically pushes Oracle's audit log data to FortiDB server for further processing.

Prior to configuring and starting FortiDB agent:

- 1 .Have a login credential with read and write access to each of Oracle database audit log directory under monitor. Use this login to configure and run FortiDB agent. Run *show parameters audit_file_dest;* using Oracle SQLPlus utility to obtain your Oracle database audit directory. On Windows platform, in order to install the agent as a Windows service, the login credential must be in administrator group. The group can be removed from the login credential once the installation completes.
- 2 .Have a Java Virtual Machine (JVM) 1.6+ installed with *JAVA_HOME* environment variable correctly configured, and its *bin* directory is first on execution path. On 64 bit x86_64 Windows systems, do not use the native x86_64 JVM, but use the x86 JVM instead in order to get FortiDB agent to run under Windows system services. There is no performance issue about this limitation.

To configure and run the Oracle XML file agent, take the following steps.

- 1 .Prepare your Oracle target database. See [Configuring the Oracle Target Database](#)
- 2 .In FortiDB Target Management, create a connection to an Oracle target database (this step is required to make a connection to the agent).
- 3 .Unpack a copy of FortiDB agent installer to a directory using login credential mentioned in the prerequisite step.
- 4 .Copy *agent.properties.sample file* from agent's *doc* directory to agent's *conf* directory, and change the file name to *agent.properties*.
- 5 .Edit the *agent.property* file.
 - a) Open the *agent.property* file using a text editor.
 - b) Enter the values for the following properties.

Parameters	Descriptions	Required or Optional
agentType	Enter ORA_XML	Required
brokerAddress	Enter IP address or resolvable host name of the FortiDB server.	Required
brokerPort	FortiDB Communication Server Listening port.	Optional. The default value is 9116.
agentDBAddress	Enter your target database IP Address. This value must match FortiDB's target configuration.	Required
agentDBPort	Enter your target database listening port. This value must match FortiDB's target configuration.	Required
pollingInterval	Enter the positive integer in milliseconds for the polling interval.	Optional. The default value is 60000 (60 seconds) for Oracle XML.

Parameters	Descriptions	Required or Optional
removeAuditFile	Remove DB2 audit file outputs after sending to FortiDB	Not required. This parameter is only for DB2 target databases.

6 .Install the agent service (Windows only).

- a) Go to agent's bin directory
- b) Execute the following command:

```
fdbagent install
```

- c) Open Windows Services Control Panel, and configure *FortiDB Database Monitoring Agent* to run with the same log on id that is used to unpack the FortiDB agent bundle.

7 .Start the FortiDB agent.

- For Windows, Linux or Solaris:

- 1 .Go to agent's bin directory.
- 2 .Execute the following command:

```
$ fdbagent start
```

To stop the agent, execute:

```
$ fdbagent stop
```

- For other platforms:

- 1 .Go to agent's bin directory.
- 2 .Execute the following command:

```
$ nohup ./fdbagentapp &
```

8 .To test the collection method with the agent, go to **Data Activity Monitoring > Monitors**. For details about collection methods, see [Choosing a Collection Method](#)

Running the Oracle SGA Agent (Solaris)

You can monitor only **Oracle 10gR2 on Solaris**, using the Oracle SGA agent. To run the Oracle SGA agent, take the following steps.

- 1 .Prepare your Oracle target database. See [Configuring the Oracle Target Database](#)
- 2 .In FortiDB Target Management, create a connection to an Oracle target database (this step is required to make a connection to the agent).
- 3 .Download the Oracle XML agent to your target database machine. For details about downloading the Oracle XML agent, please ask FortiDB technical support.
- 4 .Create a directory and unzip the Oracle agent in the directory.
- 5 .Copy agent.properties.sample file from /fdbagents/doc directory to fdbagent/conf directory, and change the file name to "agent.properties".
- 6 .Edit the agent property file.
 - a) Open the agent.property file using a text editor.
 - b) Enter the values for the following properties.

Parameters	Descriptions	Required or Optional
agentType	Enter ORA_SGA	Required
brokerAddress	Enter IP address or resolvable host name of the FortiDB server.	Required
brokerPort	FortiDB Communication Server Listening port.	Optional. The default value is 61616.

Parameters	Descriptions	Required or Optional
agentDBAddress	Enter your target database IP Address. This value must match FortiDB's target configuration.	Optional. This value is normally discovered at startup, but if ping `hostname` shows 127.0.0.1 as its address, then you need to replace it with the actual IP address.
agentDBPort	Enter your target database listening port. This value must match FortiDB's target configuration.	Required
pollingInterval	Enter the positive integer in milliseconds for the polling interval.	Optional. The default value is 60000 (60 seconds) for Oracle SGA.
removeAuditFile	Remove DB2 audit file outputs after sending to FortiDB	Not required. This parameter is only for DB2 target databases.

7 .Start the FortiDB agent.



Note: To run the agent, Java SE 6 (JDK 6) is required.

- 1 .Go to /fdbagent/bin directory.
- 2 .Execute the following command:

```
$ ./fdbagent start
```

To stop the agent, execute:

```
$ ./fdbagent stop
```

- 8 .To test the collection method with the agent, go to **Data Activity Monitoring > Monitors**. For details about collection methods, see [Choosing a Collection Method](#)

Configuring the MS SQL Server Target Database

This topic describes required settings of MS SQL Server databases. To monitor the MS SQL Server target database, FortiDB provides several methods that users can choose depending on their circumstances.

Collection Methods

FortiDB collects MS SQL Server data using the following method:

Collection Methods	Prerequisite	Required Agent?
TCP/IP Sniffer	See Configuring Monitoring with TCP/IP Sniffer for detail	No
SQL Trace	Make sure the SQL Server has audit trace folder (ex. C:\SQLTrace), and must enter the full path of folder in FortiDB's monitoring definition.	No
Net Agent	You must install the Net Agent in host of SQL Server first. For details about how to run the MSSQL Net Agent, please refer the document released with FortiDB Net Agent.	Yes

User Privileges for Monitoring with TCP/IP Sniffer or Net Agent

The user specified in target database, must be member of **sysadmin**.

User Privileges for Monitoring with SQL Trace

In order to connect to the MS SQL target databases from FortiDB, the database user must have the following privileges:

Data Policies	Privilege Policies	Metadata Policies
Member of sysadmin	<p>For Collection Method 'SQL Trace'</p> <p>SELECT on:</p> <ul style="list-style-type: none"> sys.columns sys.database_role_members sys.database_permissions sysobjects sys.database_principals sys.sql_logins <p>EXECUTE on:</p> <ul style="list-style-type: none"> sp_helpsrvrolemember <p>For Collection Method 'TCP/IP Sniffer' and 'Net Agent'</p> <ul style="list-style-type: none"> No privilege is required 	<p>For Collection Method 'SQL Trace'</p> <p>SELECT on:</p> <ul style="list-style-type: none"> information_schema.columns sysindexes sysobjects information_schema.routines sys.objects obj sys.sql_modules information_schema.views <p>For Collection Method 'TCP/IP Sniffer' and 'Net Agent'</p> <ul style="list-style-type: none"> No privilege is required

For MS SQL Server, use the following command to add a login as a member of sysadmin;

```
sp_addsrvrolemember 'username', 'sysadmin'
```

Configuring the Sybase Target Database

This topic describes required settings of Sybase databases for monitoring.

Collection Methods

FortiDB collects Sybase data using the following method:

Collection Methods	Prerequisite	Required Agent?
TCP/IP Sniffer	See Configuring Monitoring with TCP/IP Sniffer for detail	No
MDA(Monitoring and Data Access)	<p>Before monitoring your Sybase target database, you need to perform the following procedures:</p> <ul style="list-style-type: none"> Create the sybsecurity database Install installsecurity Configure MDA (Monitoring and Data Access) tables 	No

Collection Methods	Prerequisite	Required Agent?
	And see Preparing Sybase Using MDA for preparation.	

Procedures for Using MDA

Create the sybsecurity Database

To create the sybsecurity database, execute the following commands (you need to change the value of physname to your actual sybase path):

```
disk init name = "auditdev", physname = "C:\sybase\data\sybaud.dat", size =
5120
go
disk init name = "auditlog", physname = "C:\sybase\data\sybaudlog.dat", size =
1024
go
create database sybsecurity on auditdev log on auditlog
go
```

Install installsecurity

The SQL script installsecurity contains all required stored procedures and audit tables. To install installsecurity, take the following steps. For example, the script is located under \$SYBASE/ASE-15_0//scripts.

- 1 .Go to the scripts directory. For example, \$SYBASE/ASE-15_0/scripts.
- 2 .Execute the following command:

```
isql -Usa -P<password> < instsecu
```

- 3 .Restart the database.

Configure MDA Tables

FortiDB uses Sybase MDA tables for collecting audit information. You must configure your server to enable MDA. For configuring Sybase MDA tables, perform the following procedures.

- 1 .Grant mon_role to the database user to connect to FortiDB. To grant mon_role to the user, execute the following script:

```
grant role mon_role to <user name>
```



Note: You may need to disconnect/reconnect to activate 'mon_role' when you just granted this role to the login you're currently using.

- 2 .Prepare Sybase with MDA tables. See [Preparing Sybase with MDA tables](#)
- 3 .Connect to Sybase. For details about connecting to the target database, see [Managing Target Databases](#)
- 4 .Clear MDA buffer. This step should be taken only after the first connection. To clear MDA buffer, execute the following commands:

```
select top 1 * from dbo.monSysSQLText
go

select top 1 * from dbo.monSysStatement
go
```

Preparing Sybase using MDA (Monitoring and Data Accesses)

This topic describes preparing the Sybase target database to monitor, using Sybase MDA tables. The following steps are required to monitor Sybase target databases.

Setting "tempdb" database for MDA

In order to monitor Sybase target database with FortiDB, it is recommended to have more than 100MB free area for "tempdb" database. To set the size of "tempdb", take the following steps:

- 1 .Connect to master database as "sa" user.
- 2 .Check the size of "tempdb". For example, execute as follows:

```
sp_helpdb
go
```

name	db_size	owner	dbid	created	status
master	13.0 MB	sa		1 Dec 07, 2007	
model	4.0 MB	sa		3 Dec 07, 2007	
sybmgmt	75.0 MB	sa		4 Dec 07, 2007	
sybsystemdb	3.0 MB	sa	31513	Dec 07, 2007	
sybsystemprocs	120.0 MB	sa	31514	Dec 07, 2007	
tempdb	4.0 MB	sa		2 Nov 11, 2008	
text_db	5.5 MB	sa		5 Dec 07, 2007	

- 3 .Allocate disk space to "tempdb". For example, to allocate 500 MB, which is 256000 pages, execute as follows:

```
disk init name = "tempdb_data01",
physname = "/export/home/sybase/data/tempdb_data01.dat",
size = 256000
go
```

- 4 .Allocate disk space on the new device to "tempdb" . For example, execute as follows:

```
alter database tempdb on tempdb_data01 = 500
go
```

Extending database by 256000 pages (500.0 megabytes) on disk tempdb_data01

Setting Logon Trigger for Session Policies

In order to get session information, creating a table to store session information, and set logon trigger are required. To set logon trigger to get session information, take the following steps:

- 1 .Drop the previous created "FortiDB_audit" table if there is any. For example, to drop the table "FortiDB_audit", execute as follows:

```
drop table master.dbo.FortiDB_audit
go
```

- 2 .Create a table to store logon information. For example, to create the table "FortiDB_audit" in the master database, execute as follows:

```
create table master.dbo.FortiDB_audit
(
```

```
spid smallint,  
kpid int,  
suid int,  
loginname varchar(30),  
dbusername varchar(30),  
dbid smallint,  
dbname varchar(30),  
program_name varchar(30) null,  
hostprocess varchar(30) null,  
ipaddr varchar(64) null ,  
loggedindatetime datetime  
)  
go
```

- 3.** Create a procedure for logon trigger. For example, to create the procedure "login_proc", execute as follows:

```
use master  
go  
  
drop procedure login_proc  
go  
  
create procedure login_proc  
as  
begin  
insert into master.dbo.FortiDB_audit  
select  
S.spid,  
S.kpid,  
S.suid,  
suser_name(),  
user_name(),  
S.dbid,  
db_name(),  
S.program_name,  
S.hostprocess,  
S.ipaddr,  
S.loggedindatetime  
from master.dbo.sysprocesses S  
where S.spid = @@spid  
end  
go
```

- 4.** Create logon trigger. To create logon trigger, execute as follows:

```
sp_logintrigger 'master.dbo.login_proc'  
go
```

Global login trigger updated.

If sp_logintrigger is not installed, recreate master database procedures. For example, execute the following script.

For UNIX:

```
isql -Usa -P<password> -i$SYBASE/ASE-15_0/scripts/installmaster
```

For Windows:

```
isql -Usa -P<password> -i$SYBASE/ASE-15_0/scripts/installmstr
```

If you need to drop the global trigger, execute:

```
sp_logintrigger 'drop'  
go
```

5 .Grant execute logon trigger for all users as follows:

```
grant execute on dbo.login_proc to public
go
```

Setting MDA parameters

To set MDA parameters, take the following steps:

1 .Configure MDA parameters. Set the following parameters: (the following commands are examples for Linux. For Windows, you need to enter "go" for each execution.)

```
sp_configure "enable cis", 1
sp_addserver loopback, null, @@servername (not required for 15.0.2 or later)
set cis_rpc_handling on (not required for 15.0.2 or later)
exec loopback...sp_who (note: 3 dots)
sp_configure "errorlog pipe active", 1
sp_configure "deadlock pipe active", 1
sp_configure "wait event timing", 1
sp_configure "process wait events", 1
sp_configure "object lockwait timing", 1
go
```

(For monSysStatement table)

```
sp_configure "statement statistics active",1
sp_configure "statement pipe max messages",30000
sp_configure "per object statistics active",1
sp_configure "statement pipe active" ,1
go
```

(for monSysSQLText table)

```
sp_configure "max SQL text monitored" , 8192
sp_configure "SQL batch capture", 1
sp_configure "sql text pipe max messages", 30000
sp_configure "sql text pipe active", 1
go
```

The following parameter values are recommended:

```
sp_configure "max memory" , 256000
sp_configure "event buffers per engine", 2000
sp_configure "plan text pipe max messages", 100
sp_configure "errorlog pipe max messages", 30000
sp_configure "deadlock pipe max messages", 100
go
```

2 .Restart Sybase database.**3 .Enable MDA. To enable MDA, set the following parameter:**

```
sp_configure "enable monitoring" , 1
go
```

4 .Go to Step 3 of "Configure MDA Tables".

Configuring the DB2 Target Database

This topic describes required settings of the DB2 databases. In DB2 target databases, there are the following users involved in monitoring.

Collection Methods

FortiDB collects DB2 data using the following method:

Collection Methods	Prerequisite	Required Agent?
TCP/IP Sniffer	See Configuring Monitoring with TCP/IP Sniffer for detail	No
DB2 Agent	See below sections for detail.	Yes

Use and Privileges need for Using DB2 Agent

Required DB2 users	Roles	Required privileges
DB2 user to connect to FortiDB	Connects FortiDB to the DB2 target database	SECADM (auditing privilege). See Step5 of Setting the DB2 Target Database
DB2 Instance owner	DB2 instance owner	Privileges as the DB2 instance owner
DB2 user for running the agent	Run the DB2 agent. This user should be the same user of the DB2 instance owner	For Windows, this user should belong to the DB2ADMNS group. For details about how to run the agent, see Running the DB2 Agent .

Configure DB2 Target and DB2 Agent

In order to start monitoring DB2 target databases, you need to perform the following tasks in your target database.

- [Setting the DB2 Target Database for DB2 Agent](#)
- [Running the DB2 Agent on Windows](#)

Setting DB2 Target Database for DB2 Agent

In order to connect FortiDB to a DB2 target database, and monitor it with DB2 Agent, you need to set your target database properly. To set your DB2 target database, take the following steps:

- 1 .Reset the instance level audit if you had previously configured auditing. To reset the instance level audit, execute the following command:

```
db2audit configure reset
```

- 2 .Start db2audit. To start db2audit, execute the following command:

```
db2audit start
```

- 3 .Set the instance level audit for monitoring login failure. To set the instance level audit, execute the following command:

```
db2audit configure scope context status failure
```

- 4 .Set Audit buffer. To set Audit buffer (AUDIT_BUF_SZ) for an instance, run the following commands:

```
db2 update dbm cfg using AUDIT_BUF_SZ 10000
```



Note: The default audit buffer is 0 (no setting).

- 5 .Grant SECADM privilege to the FortiDB connection user to execute audit. To grant the privilege, execute the following command:

```
db2=> GRANT SECADM ON DATABASE TO USER <user_name>
```

where `<user_name>` is the FortiDB connection user name.



Note: For Windows, the FortiDB connection user must belong to the DB2ADMINS or DB2USERS group. For UNIX, AIX, or Linux, the FortiDB connection user can be a non-instance owner. By default, the DB2admin user does not have the "SECADM" privilege.

- 6 .Connect to FortiDB for monitoring. For details about connecting to FortiDB, go to "Managing Target Databases".
- 7 .Run the DB2 agent for monitoring DB2 target databases. For details about running the DB2 agent, go to "Running the DB2 Agent".

Configuring and Running the DB2 Agent

This section contains instructions to how to configure and run FortiDB's DB2 agent to monitor multiple DB2 databases.

The following consists of list of prerequisites prior to configuring and running FortiDB DB2 agent.

- 1 .FortiDB DB2 agent is responsible to periodically request DB2 database to dump its audit data to file system location belonging to FortiDB DB2 agent temporary directory. The agent then pushes the audit files to FortiDB server and finally removes them. This means, FortiDB DB2 agent must have read and write access to the audit data files. To do that, FortiDB DB2 agent must run under the same credential that runs the DB2 server (ie the instance owner of the DB2 instance under monitor). On Windows platform, in order to install the agent as a Windows service, the login credential must be in administrator group. The group can be removed from this login credential once the installation completes.
- 2 .Have a Java Virtual Machine (JVM) 1.6+ installed with `JAVA_HOME` environment variable correctly configured, and its `bin` directory is first on execution path. On 64 bit x86_64 Windows systems, do not use the native x86_64 JVM, but use the x86 32 bit JVM instead in order to get FortiDB agent to run under Windows system services. There is no performance issue about this limitation.
- 3 .Have a copy of FortiDB Agent installer.

To configure and run FortiDB DB2 agent, take the following steps.

- 1 .Prepare your DB2 target database. See [Configuring the DB2 Target Database](#)
- 2 .Unpack a copy of FortiDB agent installer to a directory using login credential mentioned in the prerequisite step.
- 3 .Copy and edit the agent property file.
 - a) Copy the file named `agent.properties.sample` from agent's doc directory to agent's conf directory and change the file name to `agent.properties`
 - b) Open the agent.property file using a text editor.
 - c) Enter the values for the following properties.

Parameters	Descriptions	Required or Optional
agentType	Enter DB2.	Required
brokerAddress	Enter IP address or resolvable host name of the FortiDB server.	Required
brokerPort	FortiDB Communication Server Listening port.	Optional. The default value is 9116.
agentDBAddress	Enter your target database IP Address. This value must match FortiDB's target configuration.	Required.
agentDBPort	Enter your target database listening port. This value must match FortiDB's target configuration.	Required

Parameters	Descriptions	Required or Optional
pollingInterval	Enter the positive integer in milliseconds for the polling interval.	Optional. The default value is 60000 (60 seconds) for DB2.
removeAuditFile	true or false. To remove DB2 audit file outputs after sending to FortiDB, enter true.	Optional. The default is true.

4 .Execute DB2 Agent Setup.

- a) Go to agent's bin directory.
- b) Execute:

```
DB2AgentSetup
```

to configure your DB2 to write audit contents to FortiDB DB2 agent temporary directory.

5 .Install the agent service (Windows only).

- a) Go to agent's bin directory
- b) Execute:

```
fdbagent install
```

- c) Open Windows Services Control Panel, and configure *FortiDB Database Monitoring Agent* to run with the same log on id that is used to unpack the FortiDB agent bundle.

6 .Start the FortiDB agent.

- For Windows, Linux or Solaris:

- 1 .Go to agent's bin directory.
- 2 .Execute the following command:

```
$ fdbagent start
```

To stop the agent, execute:

```
$ fdbagent stop
```

- For other platforms:

- 1 .Go to agent's bin directory.
- 2 .Execute the following command:

```
$ nohup ./fdbagentapp &
```

7 .Confirm db2audit settings. To confirm that the audit data path and audit archive path are filled in correctly, execute the following command:

```
> db2audit describe
```

For example, the following audit settings display.

```
DB2 AUDIT SETTINGS:
```

```
Audit active: "TRUE"
Log audit events: "FAILURE"
Log checking events: "FAILURE"
Log object maintenance events: "FAILURE"
Log security maintenance events: "FAILURE"
Log system administrator events: "FAILURE"
Log validate events: "FAILURE"
Log context events: "FAILURE"
Return SQLCA on audit error: "FALSE "
Audit Data Path: "C:\DB2\fdbagent\bin\..\tmp\db2audit\flush\"
Audit Archive Path: "C:\DB2\fdbagent\bin\..\tmp\db2audit\archive\"
```

```
AUD0000I Operation succeeded.
```

- To test the collection method with the agent, go to **Data Activity Monitoring > Monitors**. For details about collection methods, see [Choosing a Collection Method](#)

Configuring the MySQL Target Database

This topic describes configuring the MySQL target database. To monitor MySQL databases, you need to configure the MySQL general log.

This topic explains:

- [Setting MySQL General Log](#)

Setting MySQL General Log

This topic describes setting MySQL general log table.

- Add parameters to my.cnf file (For Windows, my.ini).
 - Go to %MYSQL_HOME directory.
 - Open my.cnf (for UNIX) or my.ini (for Windows) with your text editor.
 - Add the following parameters in [mysqld] section.
- Restart MySQL databases.
- Change the definition of "mysql.general_log" table.
 - Switch the engine from CSV to MyISAM. To switch the engine from CSV to MyISAM, execute the following commands (the default is ENGINE=CSV).

```
general_log=1
log_output=TABLE
```

- Restart MySQL databases.

- Switch the engine from CSV to MyISAM. To switch the engine from CSV to MyISAM, execute the following commands (the default is ENGINE=CSV).

```
mysql> SET GLOBAL general_log = 'OFF';
mysql> ALTER TABLE mysql.general_log ENGINE = MyISAM;
mysql> SET GLOBAL general_log = 'ON';
```

- Check the definition of "mysql.general_log" table. Execute the following SQL command:

```
mysql> show create table mysql.general_log;

+-----+
+-----+
+-----+
| Table          | Create Table
+-----+
| general_log    | CREATE TABLE `general_log` (
  `event_time` timestamp NOT NULL DEFAULT CURRENT_TIMESTAMP ON UPDATE
  CURRENT_TI
MESTAMP,
  `user_host` mediumtext NOT NULL,
  `thread_id` int(11) NOT NULL,
  `server_id` int(11) NOT NULL,
  `command_type` varchar(64) NOT NULL,
  `argument` mediumtext NOT NULL
) ENGINE=MyISAM DEFAULT CHARSET=utf8 COMMENT='General log' |
+-----+
+-----+
```

- Check if logging started. Execute the following command:

```
mysql> select * from mysql.general_log;
```

```
+-----+
+-----+
```

```

+-----+-----+-----+
| event_time      | user_host                                     | thread_id |
server_
id | command_type | argument                                     |
+-----+-----+-----+
+-----+
| 2009-07-29 16:44:23 | root[root] @ localhost [127.0.0.1] | 1 |
0 | Connect      | root@localhost on mysql             |
| 2009-07-29 16:44:23 | root[root] @ localhost [127.0.0.1] | 1 |
0 | Query       | select @@version_comment limit 1    |
| 2009-07-29 16:44:37 | root[root] @ localhost [127.0.0.1] | 1 |
0 | Query       | show create table general_log      |
| 2009-07-29 16:45:19 | root[root] @ localhost [127.0.0.1] | 1 |
0 | Query       | set global general_log='OFF'       |
| 2009-07-29 16:46:18 | root[root] @ localhost [127.0.0.1] | 1 |
0 | Query       | select * from mysql.general_log    |
+-----+-----+-----+
+-----+
5 rows in set (0.00 sec)

```

Privileges of DB User for FortiDB

This section indicate the privileges necessary for a target database user who connects FortiDB to the target database. This user name is used in the FortiDB Target connection page, in order to connect to the target database for Assessment, and DB Activity Monitoring.

To grant privileges to the FortiDB user, use the GRANT statement. Some examples are:

```

GRANT SELECT_CATALOG_ROLE TO <username>
GRANT SELECT ON dbo.syscolumns TO <username>
GRANT SELECT ON SYSIBM.SYSCOLAUTH TO <username>
GRANT ROLE SSO_ROLE TO <username>

```

For MS SQL Server, use the following command to add a login as a member of sysadmin;

```
sp_addsrvrolemember 'username', 'sysadmin'
```

Privileges for Assessment

To run assessment, the FortiDB users for your target databases need the following privileges:

DB2 UDB

Required Privileges for	Required Privileges
Assessment	<ul style="list-style-type: none"> • CREATE TABLE • SELECT on the following SYSIBM tables: <ul style="list-style-type: none"> • SYSCOLAUTH • SYSDBAUTH • SYSINDEXAUTH • SYSPLANAUTH • SYSSCHEMAAUTH • SYSTABAUTH • SYSTBSPACEAUTH

Required Privileges for	Required Privileges
Privileges Summary Use	<ul style="list-style-type: none"> • SELECT on the following SYSCAT tables: <ul style="list-style-type: none"> • COLAUTH • DBAUTH • INDEXAUTH • PACKAGEAUTH • SCHEMAAUTH • TABAUTH • TBSPACEAUTH • SELECT on the following SYSIBM tables: <ul style="list-style-type: none"> • SYSCOLAUTH • SYSDBAUTH • SYSINDEXAUTH • SYSPLANAUTH • SYSSCHEMAAUTH • SYSTABAUTH • SYSSYSTABLESPACES • SYSTBSPACEAUTH • SYSUSERAUTH
Pen Test Use	<ul style="list-style-type: none"> • SELECT on the following SYSCAT tables: <ul style="list-style-type: none"> • COLAUTH • DBAUTH • INDEXAUTH • PACKAGEAUTH • SCHEMAAUTH • TABAUTH • TBSPACEAUTH • SELECT on the following SYSIBM tables: <ul style="list-style-type: none"> • SYSCOLAUTH • SYSDBAUTH • SYSINDEXAUTH • SYSPLANAUTH • SYSSCHEMAAUTH • SYSTABAUTH • SYSTBSPACEAUTH • SYSUSERAUTH

MSSQL 2000

Required Privileges for	Required Privileges
Assessment	<ul style="list-style-type: none"> • SELECT on: <ul style="list-style-type: none"> • MASTER.DBO.SPT_VALUES • MASTER.DBO.SYSALTFILES • MASTER.DBO.SYSDATABASES

Required Privileges for	Required Privileges
	<ul style="list-style-type: none"> • MASTER.DBO.SYSLOGINS • MASTER.DBO.SYSXLOGINS • SYSCOLUMNS • SYSMEMBERS • SYSOBJECTS • SYSPROTECTS • SYSUSERS • EXECUTE on: <ul style="list-style-type: none"> • MASTER.DBO.XP_CMDSHELL • MASTER.DBO.XP_INSTANCE_REGENUMVALUES • MASTER.DBO.XP_INSTANCE_REGREAD • MASTER.DBO.XP_LOGINCONFIG • MASTER.DBO.XP_LOGININFO • MASTER.DBO.XP_REGENUMVALUES • MASTER.DBO.XP_REGREAD <p>Note:The MS-SQL <i>sysadmin</i> role is an additional requirement if you want to use these policies during your assessment:</p> <ul style="list-style-type: none"> • DVA MSSQL 01.01 password field empty • DVA MSSQL 01.02 password is the same as login name
Privileges Summary Use	<ul style="list-style-type: none"> • For each individual MS-SQL 2000 database you want to connect to, SELECT on: <ul style="list-style-type: none"> • MASTER.DBO.SYSDATABASES (for MS-SQL 2000 server-level connections) • SYSMEMBERS • SYSOBJECTS • SYSPROTECTS • SYSUSERS
Pen Test Use	<ul style="list-style-type: none"> • SELECT on: <ul style="list-style-type: none"> • MASTER.DBO.SYSDATABASES (for MS-SQL 2000 server-level connections) • MASTER.DBO.SYSXLOGINS • SYS.DATABASE_ROLE_MEMBERS • SYSMEMBERS • SYSOBJECTS • SYSPROTECTS • SYSUSERS (for each individual MS-SQL 2000 database you want to connect to)

MSSQL 2005/2008

Required Privileges for	Required Privileges
Assessment	<ul style="list-style-type: none"> • SELECT on: <ul style="list-style-type: none"> • MASTER.DBO.SPT_VALUES

Required Privileges for	Required Privileges
	<ul style="list-style-type: none"> • MASTER.DBO.SYSALTFILES • MASTER.DBO.SYSDATABASES • MASTER.DBO.SYSLOGINS • MASTER.DBO.SYSXLOGINS • SYS.COLUMNS • SYS.MEMBERS • SYS.OBJECTS • SYS.PROTECTS • SYS.USERS • EXECUTE on: <ul style="list-style-type: none"> • MASTER.DBO.XP_CMDSHELL • MASTER.DBO.XP_INSTANCE_REGENUMVALUES • MASTER.DBO.XP_INSTANCE_REGREAD • MASTER.DBO.XP_LOGINCONFIG • MASTER.DBO.XP_LOGININFO • MASTER.DBO.XP_REGENUMVALUES • MASTER.DBO.XP_REGREAD <p>Note:The MS-SQL <code>sysadmin</code> role is an additional requirement if you want to use these policies during your assessment:</p> <ul style="list-style-type: none"> • DVA MSSQL 01.01 password field empty • DVA MSSQL 01.02 password is the same as login name • DVA MSSQL 05.36 List database logins that are part of the local Administrators group • DVA MSSQL 05.37 Verify SQL Server not run as local System Administrator • DVA MSSQL 05.42 Default MS SQL Listener Port Report
Privileges Summary Use	<ul style="list-style-type: none"> • SELECT on: <ul style="list-style-type: none"> • MASTER.SYS.DATABASES (for MS-SQL 2005 server-level connections) • For each individual MS-SQL 2005 database you want to connect to, SELECT on: <ul style="list-style-type: none"> • SYS.DATABASE_PERMISSIONS • SYS.DATABASE_PRINCIPALS (for each individual MS-SQL 2005 database you want to connect to) • SYS.DATABASE_ROLE_MEMBERS • SYS.OBJECTS
Pen Test Use	<ul style="list-style-type: none"> • SELECT on: <ul style="list-style-type: none"> • MASTER.SYS.DATABASES (for MS-SQL 2005 server-level connections) • SYS.DATABASE_PERMISSIONS • SYS.DATABASE_PRINCIPALS (for each individual MS-SQL 2005 database you want to connect to) • SYS.DATABASE_ROLE_MEMBERS

Required Privileges for	Required Privileges
	<ul style="list-style-type: none"> • SYS.OBJECTS • SYS.SQL_LOGINS

Oracle

Required Privileges for	Required Privileges
Assessment	<ul style="list-style-type: none"> • CREATE SESSION • SELECT_CATALOG_ROLE • SELECT on: <ul style="list-style-type: none"> • SYS.AUDIT\$ • SYS.LINK\$ • SYS.REGISTRY\$HISTORY (Oracle 10g only) • SYS.USER\$ • SYSTEM.SQLPLUS_PRODUCT_PROFILE
Privilege Summary Use	<ul style="list-style-type: none"> • SELECT on: <ul style="list-style-type: none"> • ALL_USERS • DBA_COL_PRIVS • DBA_ROLE_PRIVS • DBA_ROLES • DBA_SYS_PRIVS • DBA_TAB_PRIVS
Pen Test Use	<ul style="list-style-type: none"> • SELECT on: <ul style="list-style-type: none"> • ALL_USERS • DBA_COL_PRIVS • DBA_ROLE_PRIVS • DBA_ROLES • DBA_SYS_PRIVS • DBA_TAB_PRIVS • SYS.USER\$

Sybase

Required Privileges for	Required Privileges
Assessment	<ul style="list-style-type: none"> • The SSO_ROLE and: <ul style="list-style-type: none"> • If the Sybase Server is using SybSecurity, you need: <ul style="list-style-type: none"> • On the MASTER database, you need to add the FortiDB user to the database, and you need SELECT on: <ul style="list-style-type: none"> • SYSSRVROLES • SYSLOGINROLES • SYSSECMECHS • SYSDATABASES (AUDFLAGS column) • SYSLOGINS (AUDFLAGS column)

Required Privileges for	Required Privileges
	<ul style="list-style-type: none"> On any user-defined databases, you need to add the FortiDB user to the database, and you need SELECT on: <ul style="list-style-type: none"> SYSUSERS If the Sybase Server is not using SybSecurity, you need SELECT on: <ul style="list-style-type: none"> SYSSRVROLES SYSLOGINROLES SYSSECMECHS SYSDATABASES (AUDFLAGS column)
Privilege Summary Use	<ul style="list-style-type: none"> For each individual database you want to connect to, SELECT on: <ul style="list-style-type: none"> MASTER.DBO.SYSDATABASES (for server-level connections) SYSOBJECTS SYSPROTECTS SYSUSERS
Pen Test Use	<ul style="list-style-type: none"> SELECT on: <ul style="list-style-type: none"> MASTER.DBO.SYSDATABASES (for server-level connections) SYSOBJECTS SYSPROTECTS SYSUSERS (for each individual database you want to connect to)

MySQL

Required Privileges for	Required Privileges
Assessment	<ul style="list-style-type: none"> SELECT on: <ul style="list-style-type: none"> mysql.user mysql.db mysql.columns_priv mysql.tables_priv
Privilege Summary Use	<ul style="list-style-type: none"> SELECT on: <ul style="list-style-type: none"> `INFORMATION_SCHEMA`.* mysql.user Granted User privilege: <ul style="list-style-type: none"> SHOW DATABASES
Pen Test Use	<ul style="list-style-type: none"> SELECT on: <ul style="list-style-type: none"> mysql.user

Privileges for Monitoring Data

To monitor data, the FortiDB user for your target database need the following privileges:

RDBMS Type	Required Privilege(s)
Oracle	<p>For Collection Method 'DB, EXTENDED' and 'XML File Agent'</p> <ul style="list-style-type: none"> • CREATE SESSION • SELECT_CATALOG_ROLE • DELETE_CATALOG_ROLE • AUDIT ANY • AUDIT SYSTEM • SELECT SYS.AUD\$ • SELECT on the monitored tables or SELECT ANY TABLE <p>For Collection Method 'TCP/IP Sniffer', 'SGA Agent', 'Net Agent' (Privileges need for browsing database to define data policy)</p> <ul style="list-style-type: none"> • CREATE SESSION • SELECT_CATALOG_ROLE • SELECT on the monitored tables or SELECT ANY TABLE
MSSQL	Member of sysadmin
Sybase	<p>For MDA</p> <ul style="list-style-type: none"> • No privilege is required for the MDA table <p>For Collection Method 'TCP/IP Sniffer' (Privileges need for browsing database to define data policy)</p> <ul style="list-style-type: none"> • User who can browse database object
DB2 UDB	<p>For DB2 Agent</p> <ul style="list-style-type: none"> • SECADM privilege <p>For Collection Method 'TCP/IP Sniffer' (Privileges need for browsing database to define data policy)</p> <ul style="list-style-type: none"> • User who can browse database object

Privileges for Monitoring Privilege

To monitor privileges, the FortiDB user for your target database need the following privileges:

RDBMS Type	Required Privilege(s)
Oracle	<ul style="list-style-type: none"> • CREATE SESSION • SELECT_CATALOG_ROLE • DELETE_CATALOG_ROLE • AUDIT SYSTEM
MSSQL	<p>For Collection Method 'SQL Trace'</p> <p>SELECT on:</p> <ul style="list-style-type: none"> • sys.columns • sys.database_role_members

RDBMS Type	Required Privilege(s)
	<ul style="list-style-type: none"> sys.database_permissions sysobjects sys.database_principals sys.sql_logins EXECUTE on: <ul style="list-style-type: none"> sp_helpsrvolemember <p>For Collection Method 'TCP/IP Sniffer' and 'Net Agent'</p> <ul style="list-style-type: none"> No privilege is required
Sybase	No privilege is required for the MDA table, or TCP/IP Sniffer
DB2 UDB	SECADM privilege for DB2 Agent No privilege is required for TCP/IP Sniffer

Privileges for Monitoring Metadata

To monitor metadata, FortiDB target database users need the following privileges:

RDBMS Type	Required Privilege(s)
Oracle	<ul style="list-style-type: none"> CREATE SESSION SELECT_CATALOG_ROLE for use with auditing: <ul style="list-style-type: none"> CREATE SESSION AUDIT SYSTEM SELECT_CATALOG_ROLE
MSSQL	<p>For Collection Method 'SQL Trace'</p> SELECT on: <ul style="list-style-type: none"> information_schema.columns sysindexes sysobjects information_schema.routines sys.objects obj sys.sql_modules information_schema.views <p>For Collection Method 'TCP/IP Sniffer' and 'Net Agent'</p> <ul style="list-style-type: none"> No privilege is required
Sybase	No privilege is required for the MDA table, or TCP/IP Sniffer
DB2 UDB	SECADM privilege for DB2 Agent

RDBMS Type	Required Privilege(s)
	No privilege is required for TCP/IP Sniffer

Auto Discovery

Auto Discovery facilitates the creation of target-database connections by searching your network for potential target databases.

Auto Discovery scans your specified IP-address range, database-type specification, and port numbers for potential target databases.

Considerations for Successful Discovery of DB2

Consider the following when attempting to discover DB2 target databases:

- DB2 targets will not be discovered if TCP port 523 is in the CLOSED state for whatever reason. Causes for this could include dedicated firewall devices, router rules, or host-based firewall software.
- For successful discovery, the DB2 Administration Server (DAS) should be running.

Considerations for Successful Discovery of MS SQL Server

Consider the following when attempting to discover MS SQL Server target databases:

In order to display the correct version of MS SQL Server target databases, make sure that:

- Your MS SQL Server instance is up and running
- Your MS SQL Server Browser service is up and running

Running Auto Discovery

This topic describes how to perform Auto Discovery.



Note: To run Auto discovery, the FortiDB Administrator (the `admin` user that ships with FortiDB) or a user with the Target Manager role is required.

1. Go to **Target Management > Auto Discovery** of the left-side tree menu.
2. In order to discover a single database, enter the IP address in the **From** field and leave the **To** field blank. If you want to discover multiple databases, enter a range of IP addresses by using both the **From** field and **To** field.
3. Select the **Add** button. The discovered IP address(es) should be added to the list of IP addresses.



Note: In order to delete an IP address (or address range) already on the list, select the checkbox on the left of the IP address or range and select the **Remove** button

4. Specify database types to attempt discovery for and their respective port ranges to discover from the list.
 - a) Select or clear the checkbox(es) on the left of the list.
 - b) Add or edit the port ranges in the **To** and **From** fields.
5. Select one or more IP address rows and then select the **Begin Discovery** button. One of the following status messages will be displayed at the top of the screen.



Status	Meaning
Running...	This status appears on the right side of the view header next to the "Status". The "processing" icon appears next to the page title. The Discovery Result page will display.

Status	Meaning
No databases found	There was no database of the specified IP address found.
Idle	Has one of these meanings: <ul style="list-style-type: none"> • User cancelled the Auto Discovery process before completion. • This is the status after <code>Running...</code> • This is the status after <code>No databases found</code>



Note: If you need to stop running Auto Discovery, select the **Abort** button to abort.

6 .The Auto Discovery Results page displays.

-  indicates that this database was discovered.
-  indicates that this database was added to the targets list.

Adding Targets from Auto Discovery

This topic describes how to add target-database configuration to the **Targets** page from the **Auto Discovery Results**.

- 1 .Run Auto Discovery.
- 2 .Select the checkbox(es) next to the targets you want to add to your list of target databases.
- 3 .Select the **Add to Targets** button at the bottom.
- 4 .Go to the **Targets** page where you should see that the auto-discovered targets databases have been added to the **Targets** list.

VA Policy Management

About VA Policies

VA policies are best-practice business rules that are applied during assessments. FortiDB is pre-populated with hundreds of policies for security and compliance to address security standards.

Policy Types

There are two types of policies you can use for database-vulnerability assessments.

- Pre-Defined Policies --- Fortinet adaptation of a Best Practice policy in database security. In addition to numerous database-vulnerability policies, Fortinet also provides policies that help you perform operating-system (OS) level assessments such as making sure that your OS version is appropriate for the version of your target database.
- User-Defined Policies --- Customer-, or third-party-, adaptation of an industry-, or company-, specific security policy. UDPs are constructed with conventional or procedural SQL.

You can use the policy groups that ship with FortiDB or create your own.

Policy Updates

Fortinet updates its policies several times a year with an XML file containing new or enhanced policies. Fortinet recommends that you import this list in order to stay current. You can get the latest policies from FortiGuard Center. For details, please refer to Managing Pre-Defined Policies(PDPs).

Exporting and Importing Policies

If you want to move the FortiDB policies to another machine, you can export them, as XML files, from the FortiDB source application's repository and then import them to a FortiDB target application's repository.



Note: Database Type, Severity and Classification are not validated when importing. So, before importing policies, make sure that the element contents in your XML file are accurate. You can export one or more policies in order to see a sample of what that content should be.

Policy Version

Each policy has a policy version. With the policy version, you can keep a track of:

- Pre-defined policies you imported, and ran assessments.

The policy version number will be incremented when you import the PDP Updates.

- User-defined policies you updated.

When you update your User-Defined Policy (UDP) in the Modify User Defined Policy page, the policy version number stays same. If you want to update the policy version number, you need to export your UDP, and change the policy version number before importing the policy. When you import your UDP with an equal or lower policy number than the original policy number, the policy will not be imported.



Note: The restored data from an old archive (prior to v3.2.1) will have the latest version of policies at the time you restored.

Policy Groups

Assessments use policy groups. A policy group must contain at least one policy.







These are the policy groups shipped with FortiDB.

- DB2 Policy Group

- MySQL Policy Group
- Oracle Policy Group
- Pen Test Policy Group
- SQL Server Policy Group
- Sybase Policy Group

Policy States

At any given moment, FortiDB policies will be in one of several states:

State(applicable icon)	Indication
Enabled ()	Subsequent assessments will use this policy.
Disabled ()	Subsequent assessments will not use this policy.
Modified and Enabled ()	A previously existing policy has been modified by an import and subsequent assessments will use this policy.
Modified and Disabled ()	A previously existing policy has been modified by an import and subsequent assessments will not use this policy.
New and Enabled ()	A new policy has been added by an import and subsequent assessments will use this policy.
New and Disabled ()	A new policy has been added by an import and subsequent assessments will not use this policy.

Keywords and User Keywords






Keywords are predefined keywords of policy, are read only.


User Keywords are allowed input by user, and can be used as criteria for grouping.


VA Pre-Defined Policies (PDP)

On the **Policies** page, you can manage Pre-Defined Policies in the Pre-Defined Policies tab. To view only certain policies, you can use the **View** dropdown list at the top of the page. You can also import additional policies or updates to existing policies.

The following table indicates columns and meanings in the pre-defined policies list.

Columns	Descriptions
Status	<ul style="list-style-type: none"> • Enabled () • Disabled () • New and Enabled () • New and Disabled () • Modified and Enabled ()

Columns	Descriptions
	<ul style="list-style-type: none"> Modified and Disabled ()
Name	Pre-defined policy name
DB Type	Oracle, Sybase, DB2, MS SQL Server, or MySQL
Severity	User defined severity level. There are 5 levels of severity: <ul style="list-style-type: none"> Informational (default) Cautionary Minor Major Critical
Classification	Unclassified, Configuration, Password, Privilege, Database server, Host System.

- The **View** dropdown enables you to limit the policies that you view to only those within a certain policy group.
- The  button enables you to create a new policy group.
- The **Enable** button enables you to activate the policies for which a checkbox has been checked.
- The **Disable** button enables you to deactivate the policies for which a checkbox has been checked.
- The **Import** button enables you to import new or updated policies into the FortiDB repository.
- The **Export** button enables you to export the all policies on the screen as an XML file.

Exporting Pre-Defined Policies

This topic describes how to export Pre-Defined Policies (PDPs).

- 1 .Go to **Policy > VA Policies** of the left-side tree menu.
- 2 .Select the **Pre-Defined Policies** tab (default).
- 3 .In the **View** dropdown list, select All or a policy group you want to export.



Note: The checkboxes next to the individual policies have no effect when exporting. No matter how many checkboxes you check, all items on the screen will be exported

- 4 .Select the **Export** button.
- 5 .Save the XML file.

Importing Pre-Defined Policies (for Appliance Users)

This topic describes how FortiDB appliance users can import Pre-Defined Policies (PDPs) using the Fortinet Distribution Network (FDN).

This task includes importing those new and updated policies that FortiDB periodically offers its customers in order to keep their policy sets current and effective.

- 1 .Go to **Policy > VA Policies** of the left-side tree menu/



Note: If you choose the **Policies Groups** link, you will then have to select an existing policy **Name** to be taken to the **Policies** page.

- 2 .Select the **Import** button.
The **Pre-Defined Policy Update** page displays.
- 3 .Select or clear the **Disable new and modified rules after import** checkbox.

- If checked, new and modified rules are disabled after import.
 - If unchecked, new and modified rules are enabled after import.
- 4 .Select or clear the **Identify new and modified rules with icons** checkbox.
 - If checked, new and modified rules will be distinguished with an appropriate icon.
 - If unchecked, new and modified rules will not be distinguished from any other policy.



Note: Fortinet recommends that you select this checkbox.

- 5 .Select the **Import Updates from FortiGuard Center** button.

This button attempts a connection with, and then an automatic download from, the FortiGuard Center.

If this is a successful operation, you will get a message like: “Updated 12 policies of 544 found in file.” The downloaded update file contains all policies. However, only the policies that have modifications are actually updated in your system. In this example, the downloaded update file contained a total of 544 policies only 12 of which needed to be updated in your system. The other 532 policies in the update file were identical to those already in your system.



Note: Appliance users can also import policy updates by using the **Select XML file to be uploaded** field. After clicking the Browse button and selecting the xml file to upload, and select the Import button.

Importing Pre-Defined Policies (for Standalone Users)

This topic describes how FortiDB users can import Pre-Defined Policies (PDPs) by uploading XML files containing these policies.

Before performing this task, you may need to download one or more XML files from a designated FortiDB web or FTP site.

This task includes importing those new and updated policies that FortiDB periodically offers its customers in order to keep their policy sets current and effective.

- 1 .Go to **Policy > VA Policies** of the left-side tree menu.



Note: If you choose the **Policies Groups** link, you will then have to Select an existing Name to be taken to the **Policies** page.

- 2 .Select the **Import** button.

The **Pre-Defined Policy Update** page displays.
- 3 .Enter the path to the XML file you downloaded, or select the **Browse** button and select the XML file.
- 4 .Check or uncheck the **Disable new and modified rules after import** checkbox.
 - If you check this, the new and modified rules after import are deactivated.
 - If you uncheck this, the new and modified rules after import are activated.
- 5 .Select or clear the **Identify new and modified rules with icons** checkbox.
 - If you select this, you can identify new and modified rules with icons.
 - If you clear this, you cannot identify new and modified rules with icons.
- 6 .Select the **Import** button.

Policies will be imported to the list on the **Policies** page.

OS-Level Pre-Defined Policies

FortiDB OS-Level PDP is the Pre-Defined Policy that uses SSH and a client-side script, containing OS commands, in order to gather and evaluate information about the target's operating system.

To run assessments against Oracle target machine using OS-Level PDPs, see [Enabling OS-Level PDP](#).

OS-Level PDP and Permission Requirements

This topic describes specific OS-Level PDP and their permission requirements.

Guarded Item Description (proposed change)	Purpose	Required Permissions
OSVA ORCL 01.01 Oracle Critical Patches (opatch)	Returns: <ul style="list-style-type: none"> • opatch version • applied critical patch numbers 	Oracle 9i, 10g or 11g: <ul style="list-style-type: none"> • The SSH user needs execute permission on opatch • The SSH user's PATH variable should include the location of opatch Oracle 10g and 11g: <ul style="list-style-type: none"> • The SSH user needs read, write, and execute permissions on opatch • The SSH user needs read, write, and execute permissions on \$ORACLE_HOME/cfgtoollogs/opatch/lsinv
SVA ORCL 01.02 Oracle Owner-Login Check	Alerts if Oracle owner, which is specified on the FortiDB Database Connection GUI, is not in /etc/passwd.	The SSH user needs read permission on /etc/passwd with cat and grep commands
OSVA ORCL 01.03 Oracle DBA-Group Check	Alerts if dba is not in /etc/group file	The SSH user needs read permission on /etc/group with cat and grep command
OSVA ORCL 01.04 Oracle DBA-Group-Member List	Returns a list of members of the dba group from /etc/passwd and /etc/group	The SSH user needs read permission on /etc/passwd and /etc/group with cat and grep command
OSVA ORCL 01.05 Oracle Process-Owner Check	Alerts if Oracle process is being run by a non-Oracle user such as root, or bin.	The SSH user needs execute permission ps and grep command
OSVA ORCL 01.06 Oracle Excessive Directory & File Permissions Check	Alerts if other permissions, on the Oracle Home directory (and its contents) specified on the Create/Modify Database Connection screen, include both read and write (and not execute)	The SSH user needs other read and execute permissions on the \$ORACLE_HOME directory. For example setup instructions, see Using Minimally-Privileged User with an ACL.
OSVA ORCL 01.07 Oracle Correct Directory/File Owner & Group Check	Alerts if files and directories under the Oracle Home directory specified on the Create/Modify Database Connection screen,	The SSH user needs other read and execute permissions on the \$ORACLE_HOME directory. For example setup instructions, see

	<p>do not have correct owner and group permissions. Exempt from this check are:</p> <ul style="list-style-type: none"> • \$ORACLE_HOME/bin/oracle • \$ORACLE_HOME/bin/oradism • \$ORACLE_HOME/bin/dbsnmp 	<p>Using Minimally-Privileged User with an ACL.</p>
<p>OSVA ORCL 01.08 Oracle setuid/setgid File Check</p>	<p>Alerts if setuid or setgid permissions are assigned to files and directories under the Oracle Home directory specified on the Create/Modify Database Connection screen. Exempt from this check are:</p> <ul style="list-style-type: none"> • \$ORACLE_HOME/bin/oracle • \$ORACLE_HOME/bin/oradism • \$ORACLE_HOME/bin/dbsnmp 	<p>The SSH user needs other read and execute permissions on the \$ORACLE_HOME directory. For example setup instructions, see Using Minimally-Privileged User with an ACL.</p>
<p>OSVA ORCL 01.09 Oracle Database-Configuration-Change Check</p>	<p>This policy checks if these database configuration files change between the previous and current assessments:</p> <ul style="list-style-type: none"> • init.ora • spfile.ora 	<ul style="list-style-type: none"> • The SSH user needs execute permission on ls for the \$ORACLE_HOME/dbs/ directory • The SSH user needs read permission on the \$ORACLE_HOME/dbs/ directory
<p>OSVA ORCL 01.10 Oracle Network-Configuration-Change Check</p>	<p>This policy check if network configuration files changed between between the previous and current assessments</p> <ul style="list-style-type: none"> • listener.ora • tnsnames.ora • sqlnet.ora 	<ul style="list-style-type: none"> • The SSH user needs execute permission for ls on the \$ORACLE_HOME/network/admin/ directory • The SSH user needs read permission on the \$ORACLE_HOME/network/admin/ directory
<p>OSVA ORCL 01.11 Oracle Installed-Operating-System Info</p>	<p>Returns OS name and version</p>	<ul style="list-style-type: none"> • The SSH user needs execute permission for cat on the /etc/release file • The SSH user needs read permission on the /etc/release file
<p>OSVA ORCL 01.12 Oracle External-Procedure Processes Running Check</p>	<p>Alert if external-procedure process is running on target server.</p>	<p>The SSH user needs execute permission for ps and grep</p>

OSVA ORCL 01.13 Oracle EXTPROC	<p>Alerts if any EXTPROC settings are listed in listener.ora.</p> <p>For example:</p> <pre>(SID_NAME = PLSExtProc)</pre>	<ul style="list-style-type: none"> • The SSH user needs execute permission for cat on the listener.ora file • The SSH user needs read permission on the listener.ora file
OSVA ORCL 01.14 Oracle Missing-Listener-Password Check	<p>Alerts if a PASSWORD setting is missing in listener.ora.</p>	<ul style="list-style-type: none"> • The SSH user needs execute permission for cat on the listener.ora file • The SSH user needs read permission on the listener.ora file
OSVA ORCL 01.15 Oracle Missing-Listener-ADMIN_RESTRICTIONS Check	<p>Alerts if a ADMIN_RESTRICTIONS setting is missing in listener.ora.</p>	<ul style="list-style-type: none"> • The SSH user needs execute permission for cat on the listener.ora file • The SSH user needs read permission on the listener.ora file
OSVA ORCL 01.16 Oracle Default-Listener Check	<p>Alerts if default LISTENER is set in listener.ora.</p>	<ul style="list-style-type: none"> • The SSH user needs execute permission for cat on the listener.ora file • The SSH user needs read permission on the listener.ora file
OSVA ORCL 01.17 Oracle Default-Port (1521) Check	<p>Alerts if default PORT is set in listener.ora.</p>	<ul style="list-style-type: none"> • The SSH user needs execute permission for cat on the listener.ora file • The SSH user needs read permission on the listener.ora file
OSVA ORCL 01.18 Oracle Advanced-Listener-Security Settings Check	<p>Alerts if any Oracle Advanced Security settings are missing in sqlnet.ora.</p> <p>For example, the presence of the following would not cause an alert:</p> <pre>SQLNET.ENCRYPTION_SERVER = Requested</pre>	<ul style="list-style-type: none"> • The SSH user needs execute permission for grep the sqlnet.ora file • The SSH user needs read permission on the sqlnet.ora file
OSVA ORCL 01.19 Oracle Configured Listener List	<p>Display all listener names</p>	<ul style="list-style-type: none"> • The SSH user needs execute permission for cat on the listener.ora file • The SSH user needs read permission on the listener.ora file

OSVA ORCL 01.20 Oracle Unencrypted Listener Password Check

Alerts if password in listener.ora is unencrypted. Encrypted passwords should be 16 characters long and consist only of upper-case letters from A to F or numbers.

For example, the following is an acceptably encrypted password and would not generate an alert:

```
PASSWORDS_LISTENER =
F56401ADBA6810DS
```

- The SSH user needs execute permission for cat on the listener.ora file
- The SSH user needs read permission on the listener.ora file



Note: You can use your known_hosts file in order to give access to only certain hosts.

Setting Access Control List (ACL) for Minimally-Privileged Users

The Access Control List (ACL) helps provide more secure target-database access. For example, an ACL enables a minimum-permission user to perform, via SSH, the OS-Level operations used by the FortiDB OS-level PDPs.

In general, you create a user, belonging to the nobody group, on your target-database machine. Then, using ACL, you give that user only the specific permissions necessary to execute the OS-level PDPs in which you are interested. Here are some examples you could use in order to grant, to the SSH user, the other users' read and execute permissions on the \$ORACLE_HOME directory, required by some OSVA PDPs.

Example One: How to set ACL on an Oracle 10g or 11g target server for OSVA ORCL 01.01

This example describes how to set ACL on an Oracle 10g target server for OSVA ORCL 01.01.

- 1 .Assume the SSH user is fortidb.

```
$setfacl -m user:fortidb:rw,mask:rwx $ORACLE_HOME/cfgtoollogs/opatch/lsinv
```

- 2 .In order to confirm permissions:

```
$getfacl $ORACLE_HOME/cfgtoollogs/opatch/lsinv
```

That will return something like:

```
# file: /export/home/ora1020/product/10.2.0/Db_1/cfgtoollogs/opatch/lsinv
# owner: ora1020
# group: oinstall
user::rw
user:fortidb:rw      #effective:rw  <--- Please check it
group::r-x          #effective:r-x
mask:rw
other:r-x
```

Example Two: How to set ACL on an Oracle 9, 10g, or 11g target server for OSVA ORCL 01.06, 01.07, and 01.08

This example describes how to set ACL on an Oracle 10g target server for OSVA ORCL 01.01.

- 1 .In order to find the directories within \$ORACLE_HOME for which the required permissions do not exist, execute the following, as the Oracle owner (see o_owner), on your target-database machine:

```
$ find $ORACLE_HOME \( -type d \) -a \( ! -perm -o+rx \)
  -ls|awk '{print $3,$11}'
```

which might return something like:

```
drwx----- /oracle/db1/Apache/Apache/conf/ssl.key
drwxr-x--- /oracle/db1/.patch_storage
```

2. Using the File Access Control List program, grant the appropriate permissions to sshuser:

```
$ setfacl -m user:sshuser:r-x,mask:r-x /oracle/db1/Apache/Apache/conf/ssl.key
$ setfacl -m user:sshuser:r-x,mask:r-x /oracle/db1/.patch_storage
```

3. (Optionally) confirm that correct permissions were granted with:

```
$ getfacl /oracle/db1/Apache/Apache/conf/ssl.key
$ getfacl /oracle/db1/.patch_storage
```

which would return something like:

```
# file: /export/home/ora1020/product/10.2.0/Db_1/.patch_storage
# owner: ora1020
# group: oinstall
user::rwx
user:mitagaki:rwx          #effective:r--
group::r--                #effective:r--
mask:r--
other:---
```

4. (Optionally) you can revoke permissions with:







```
$ setfacl -d user:sshuser:r-x,mask:r-x oracle/db1/Apache/conf/ssl.key
$ setfacl -d user:sshuser:r-x,mask:r-x /oracle/db1/.patch_storage
```




Note: If you can not give read(r)/exec(x) permission to the directory, FortiDB VA will produce a "Permission denied" error on the report which you can ignore.

VA User-Defined Policies (UDP)

On the **Policies** page, you can manage User-Defined Policies in the **User-Defined Policies** tab. To view only certain policies, you can use the **View** dropdown list at the top of the page. You can also import additional policies or updates to existing policies.

Columns	Descriptions
Status	<ul style="list-style-type: none"> Enabled () Disabled () New and Enabled () New and Disabled () Modified and Enabled () Modified and Disabled ()
Name	User-defined policy name
DB Type	Oracle, Sybase, DB2, MS SQL Server, or MySQL
Severity	<p>User defined severity level. There are 5 levels of severity:</p> <ul style="list-style-type: none"> Informational (default)


Columns	Descriptions
	<ul style="list-style-type: none"> • Cautionary • Minor • Major • Critical
Classification	Unclassified, Configuration, Password, Privilege, Database server, Host System.


- The **View** dropdown enables you to limit the policies that you view to only those within a certain policy group
- The  button enables you to create a new policy group.
- The **Add** button enables you to create your own User-Defined policy.
- The **Delete** button enables you to delete the policies for which a checkbox has been checked.
- The **Enable** button enables you to activate the policies for which a checkbox has been checked.
- The **Disable** button enables you to deactivate the policies for which a checkbox has been checked.
- The **Import** button enables you to import new or updated policies into the FortiDB repository.
- The **Export** button enables you to export all policies on the screen as an XML file.

Adding User-Defined Policies (UDPs)

This topic describes the task of adding User-Defined Policies.

- 1 .Go to **Policy> VA Policies** of the left-side tree menu.
- 2 .Select the **User-Defined Policies** tab.
- 3 .Select the **Add** button.
- 4 .Fill in the appropriate fields. Some of the fields to note are:

Field Name	Descriptions
ID	Enter a unique designator that can include any character, including alphanumeric, special characters, and white spaces.
SQL query	Enter the query that will be used when this User-Defined Policy is applied during an assessment.
Result Column Name(s)	<p>Entries in this field are the column names referred to in the SQL query field. Multiple entries are delimited by semicolons.</p> <p>The names can either be actual column names in your query, like empno in 'SELECT empno FROM scott.emp' or aliases like enumber in 'SELECT empno AS " enumber"FROM scott.emp'</p> <p>You can use the '*' column wild card in your queries; however, you must separately specify the name of each column for which you want report results. If, for example, you use 'SELECT * FROM scott.emp' against an Oracle target database, you must enter "empno;ename;job;mgr;hiredate;sal;comm;deptno" in this field in order to get a report on all columns in scott.emp</p> <p> Note: Do not put spaces before or after the semicolons unless your aliased column names also have leading or trailing spaces, respectively.</p>
Result Column Label(s)	Entries in this field are the column names that you would like to see in your reports. Multiple entries are delimited by semicolons.

Field Name	Descriptions
	 Note: If you don't populate this field, your report's column headers will be the entries used for the Result Column Name(s) field.
Keywords	Entries in this field can be used when using a filter to create policy groups.

5 .Select the **Save** button.

Here is an Oracle example, which assumes you have access to the SCOTT schema:²

1 .Create a new UDP with these entries:

- **ID:** unique designator
- **Name:** myOracleUDP1
- **Database type:** Oracle
- **SQL query:** SELECT empno, ename from scott.emp
- **Result Column Name(s):** empno;ename
- **Result Column Label(s):** Employee Number;Employee Name
- **Severity:** Informational
- **Classification:** Unclassified

2 .Select **Save** in order to save myOracleUDP1.

3 .Create a policy group, myUDPGroup, containing the new UDP

4 .Create an assessment that runs against an Oracle target-database group and which uses myUDPGroup.

5 .Run a Detailed (Pre-Defined) Report against your assessment and you should see several rows of **Scan Results** like this in the **Informational Vulnerabilities** section:

- **Employee Number 7369 Employee Name:** SMITH

Here is another, slightly different, Oracle example, which uses column-name aliasing and, again, assumes you have access to the SCOTT schema:

1 .Create a new UDP with these entries:

- **ID:** can be any value
- **Name:** myOracleUDP2
- **Database type:** Oracle
- **SQL query:** SELECT empno as "EmpID", ename as "Worker" from scott.emp
- **Result Column Name(s):** EmpID;Worker
- **Result Column Label(s):** Employee Number;Employee Name
- **Severity:** Informational
- **Classification:** Unclassified

2 .Select **Save** in order to save myOracleUDP1.

3 .Create a policy group, myUDPGroup, containing the new UDP

4 .Create an assessment that runs against an Oracle target-database group and which uses myUDPGroup.

5 .Run a Detailed (Pre-Defined) Report against your assessment and you should see several rows of **Scan Results** like this in the **Informational Vulnerabilities** section:

- **Employee Number 7369 Employee Name:** SMITH

Deleting User-Defined Policies (UDPs)

This topic describes how to delete User-Defined Policies.

- 1 .Go to **Policy > VA Policies** of the left-side tree menu.
- 2 .Select the **User-Defined Policies** tab.
- 3 .Select the checkbox(es) corresponding to the user-defined policy you want to delete.
- 4 .Select the **Delete** button.

Exporting User-Defined Policies

This topic describes how to export User-Defined Policies.

- 1 .Go to **Policy > VA Policies** of the left-side tree menu.
- 2 .Select the **User-Defined Policies** tab.
- 3 .In the View dropdown list, select All or a policy group you want to export.



Note: The checkboxes next to the individual policies have no effect when exporting. No matter how many checkboxes you select, all policies on the screen will be exported

- 4 .Select the **Export** button.
- 5 .Save the XML file.

Importing User-Defined Policies

This topic describes how to import User-Defined Policies.

- 1 .Go to **Policy > VA Policies** of the left-side tree menu.
- 2 .Select the **User-Defined Policies** tab.
- 3 .Select the **Import** button.
- 4 .Enter the path to the XML file you want to import, or select the **Browse** button and select the XML file you want to import.
To successfully import your policies, you need to increase the value of the version attribute (for example, you need to change from version="3" to version="4") which can be found in <VaPolicy> element.
- 5 .Select or clear the **Deactivate new and modified rules after import** checkbox.
 - If you select this, the new and modified rules after import are deactivated.
 - If you clear this, the new and modified rules after import are activated.
- 6 .Select or clear the **Identify new and modified rules with icons** checkbox.
 - If you select this, you can identify new and modified rules with icons.
 - If you clear this, you cannot identify new and modified rules with icons.
- 7 .Select the **Import** button.

VA Policy Groups

The Policy Groups page displays all policy groups with groups names and descriptions.

In the VA Policy Groups page, you can:

- Add a new policy group by selecting **Add**. See [Adding a New Policy Group](#)
- Modify the policy group by selecting the group name. See [Modifying the Existing Policy Groups](#)

- Delete policy groups by selecting the group checkbox, and click **Delete**.

The following pre-defined policy groups are available:

Groups/Policies	Policies included
DB2 Policy Group	DB2 policies
MySQL Policy Group	MySQL policies
Oracle Policy Group	Oracle policies
SQL Server Policy Group	SQL Server policies
Sybase Policy Group	Sybase policies
Pen Test Policy Group	<i>Pen test policies</i>
CIS Policy Group	CIS benchmark policies

Adding VA Policy Groups


This topic describes the task of creating groups for Pre-, or User-, Defined) Policies by using filtering criteria.

- 1 .Go to **Policy > VA Policy Groups** of the left-side tree menu.
- 2 .Select the **Add** button.
- 3 .On the subsequent **Policies** page, choose either the **Pre-Defined Policies** tab or the User-Defined Policies tab and then fill in the text boxes
 - a) Use the **Policy Type** dropdown in order to create a group consisting of just Pre-Defined Policies, User-Defined Policies, or both (All).
 - b) Use the **Group Name** text box to enter a name that will show up in the saved policy-group list. Use the optional **Description** text box to describe your filtering/grouping criteria.
 - c) To create a filtering condition, enter an **Column** on which you would like to filter, an **Operator** that associates the **Column** with a **Value**, and a **Value** that the **Column** must match .
 - d) You can add or subtract, respectively, filtering criteria rows by selecting the **+** (**plus**) or **-** (**minus**) buttons.




Note: You cannot use the same **Column** in multiple rows. For example, you cannot establish a criteria that includes all the policies with a Severity of Minor and all the policies with a Severity of Major.



Note: In order to cancel creating a new policy-group filter and go back to the main **Policies** page, select the  icon.

Here are some examples of filtering criteria:

Attribute	Operator	Value	Return Possibilities
Severity	Equals	Minor	all policies with a Severity of Minor
Database Type	Equals	DB2	all policies associated with DB2 databases

- 4 .To test your filtering criteria, select the **Apply** button.
- 5 . To save the group you created, select the  icon.



Note: In order to modify an existing group, select the **Name** of the group on the **Policy Groups** page.

Modifying the Existing VA Policy Groups


This topics describe modifying the existing policy group.


- 1 .Go to **Policy > VA Policy Groups** from the left-side tree menu.
- 2 .In the Policy Groups page, click the name of a policy group that you want to modify.
- 3 .Modify the policy name or description if necessary.
- 4 .Select the **Policy Type** from the dropdown list (All, Pre-efined, or User)
- 5 .To create a filtering condition, enter an **Column** on which you would like to filter, an **Operator** that associates the **Column** with a **Value**, and a **Value** that the **Column** must match .
- 6 .You can add or subtract, respectively, filtering criteria rows by selecting the **+ (plus)** or **- (minus)** buttons.



Note: You cannot use the same **Column** in multiple rows. For example, you cannot establish a criteria that includes all the policies with a Severity of Minor and all the policies with a Severity of Major.



Note: In order to cancel modifying the policy-group filter and go back to the main **Policies** page, select the  icon.

- 7 .To test your filtering criteria, select the **Apply** button.
- 8 . Click  to save.

Deleting VA Policy Groups

This topic describes how to delete a policy group.

- 1 .Go to **Policy > VA Policy Groups** of the left-side tree menu.
- 2 .Check the checkbox(es) corresponding to the policy group(s) you want to delete.
- 3 .Click the **Delete** button.

About the Penetration Test

Penetration Tests (Pen Tests) allow you to run weak-password evaluations of your target databases.

For some database types, you can define whether they want to utilize hash-based method which is less destructive or login method which is more aggressive.

You can schedule Pen tests or run them immediately.

Managing Pen Tests

This topic describes how to configure and run Penetration Testing against target databases you specify.

- 1 .You can set the following properties in the **System Configuration** component of the FortiDB application.

Pen Test-related System Properties:

Property	Purpose	Possible Values and Default Values
Enable Pen Test	When set to <code>true</code> , the Pen Test capability is enabled.	<code>true</code> or <code>false</code> . The default value is <code>false</code> .

Property	Purpose	Possible Values and Default Values
	When set to <code>false</code> , which is the default, the Pen Test capability is disabled.	
Enable Pen Test For All Users in Database (Standalone only)	<p>When set to <code>false</code>, FortiDB uses the user names in <code><dbtype>user.txt</code>, where <code>dbtype</code> represents the target-database type and is one of these strings:</p> <ul style="list-style-type: none"> • <code>ora</code> for Oracle • <code>sql</code> for MS-SQL • <code>db2</code> for DB2 UDB • <code>syb</code> for Sybase • <code>mysql</code> for MySQL <p>When set to <code>true</code>, FortiDB ignores the user names in <code><dbtype>user.txt</code>.</p>	<code>true</code> or <code>false</code> . The default value is <code>true</code> .
Pen Test Method	<p>The Login method actually logs in to your target databases.</p> <p>Caution: Be careful when using this method. Since its login attempts may be unsuccessful, it can result in preventing any, even approved, users from logging in to your target database.</p> <p>The Hash-based method is a safer, offline approach, but is available for only Oracle and MS SQL target databases. (A 'hash' is the value obtained after encrypting a clear-text string.)</p> <p>With the Hybrid method, FortiDB attempts the best available method. If the hash-based method is available, as will be the case with Oracle and MS-SQL targets, FortiDB uses it.</p>	<ul style="list-style-type: none"> • 1=Login method • 2=Hash-based method • 3=Hybrid <p>The default value is <code>Hybrid</code>. (If you select the Hash-based method for Sybase or DB2 targets, none of the Pen Test rules will be applied, your assessment result will be essentially empty, and no error will be signaled.)</p>
Pen Test Password Dictionary	A file containing the passwords to be checked when executing the Dictionary Penetration test. The Browse button allows you to select your dictionary file. You need to select the Save button to complete your selection.	<p>"Built-in Dictionary" indicates that the default dictionary is being used. "User Dictionary" indicates that you have uploaded your own dictionary file. The filename of the dictionary you upload will not appear here.</p> <p>Note: When you restore the default dictionary by checking the checkbox, and selecting Restore Default(s) and then Save,</p>

Property	Purpose	Possible Values and Default Values
		your dictionary file will be deleted from the system.



Note: After changing Pen Test properties, you must restart FortiDB to take your change into effect.

2. Decide which of the following policies are suitable for your organization.


This table explains which files each Pen Test Policy uses:

Policy Name	File Used	Evaluate Content
Default Password	<dbtype>default.txt	All the username/password pairs in the file.
Username Reversed	<dbtype>user.txt	The pairing of usernames in the file with those same user names reversed as passwords.
Same as Username	<dbtype>user.txt	The pairing of usernames in the file with those same usernames as passwords.
Username Following Number	<dbtype>user.txt	The pairing of usernames in the file with those same usernames followed by one or more numbers as passwords.
Number Following Username	<dbtype>user.txt	The pairing of usernames with those same usernames preceding one or more numbers as the passwords.
Dictionary	<dbtype>user.txt, dictionary.txt	The pairing of username in the <dbtype>user.txt file with every password in dictionary.txt file.

3. (For standalone users) If you set `Enable Pen Test For All Users in Database` to false, you need to copy all of the files in the table below from <FortiDB-install directory>/etc/conf/pentest to <FortiDB-install directory>/conf/pentest and edit them.

The user name and password both have to be uppercase in the Oracle-related oradefault.txt and orauser.txt files.

Filename	Content
<dbtype>default.txt	A list of user name and password pairs that will be used for Default Password policy.
<dbtype>user.txt	A list of system or user accounts. The user names in this file will be used for all policies except for Default Password policy.
dictionary.txt	A list of passwords to use for Pen Test Dictionary policy. You can use your dictionary file by setting the Pen Test Password Dictionary property in the Assessment tab of the System Configuration page.

 **Note:** When FortiDB executes the Pen Test Dictionary policy, the domain name automatically added in the password list.



Note: The Enable Pen Test for All Users in Database property is not available for Appliance users.

- 4 .If you use Dictionary Policy, you can set your own dictionary file using Pen Test Password Dictionary property in the **Assessment** tab of the **System Configuration** page.
- 5 .You might also have to set proper privileges on your target database. For more information see [Target Privilege Matrix](#).
- 6 .Select the **Policy Groups** link in the **Policy Management** section of the left-side tree-navigation menu.
- 7 .Select **Pen Test Policy Group**.
- 8 .Activate (or deactivate) Pen Test policies you want to run by checking the checkbox(es) next to each policy of interest and then clicking the **Enable** or **(Disable)** button.
- 9 .Optionally you can edit each policy by clicking on it and then modifying one or more of the following items. After you modify a policy, select the **Save** button on the Policy details page.
 - Severity
 - Classification
 - Keywords
 - Status
- 10 Go to the **Assessments** link in the **Assessment Management** section of the left-side tree-navigation menu and create an assessment:
 - a) In the **Policies** tab of the **Assessment** page, select the **Pen Test Policy Group** within the **Available Policy Groups** list and then select the right arrow.
 - b) Save your Pen Test Assessment.
 - c) Run the Pen Test assessment.
 - d) Evaluate the results of your assessment.



Note: "Failed" means your passwords are weak and may not protect you from malicious login attempts.



Data Discovery Policies and Policy Groups

Data Discovery Policy is used by Sensitive Data Discovery and allows searching database for sensitive information located in tables/columns.

Manage Data Discovery Policies

Go to **Policy > Data Discovery Policies** to add/enable/disable/delete/import/export Data Discovery Policies.

The following table indicates columns and meanings in the Data Discovery Policies list.

Columns	Descriptions
Status	<ul style="list-style-type: none"> • Enabled () • Disabled ()
Policy Name	policy name
Policy Type	Built-in or User defined. The built-in policies cannot be deleted.
Match Rule	Match rule for searching data

Columns	Descriptions
Column Name Pattern	Pattern for matching table column's name. <ul style="list-style-type: none">• Allow regular expression• Left blank for skipping column name match check• Data Discovery will check column name match first, and:<ul style="list-style-type: none">• if matched, continue to check sample data match• if not matched, abort sample data match checking
Data Pattern	Pattern for matching sample data content. <ul style="list-style-type: none">• Allow regular expression• Left blank(or regular expression ".+") for skipping sample data match check• If sample data matched with data pattern, will continue to check with Match Rule

Data Discovery Policy Groups

Data Discovery Policy Group will be assign to **Sensitive Data Discovery**, to search database for data discovery.

Go to **Policy > Data Discovery Policy Groups** to manage groups of Data Discovery Policy.

Click 'Group Name' to edit group, click 'Add' button to add new group, select group checkbox, and click 'Delete' button to delete group.

DAM Policy Management

DAM Policy - Alert Policy and Audit Policy

There are two types of DAM Policy - **Alert Policy** and **Audit Policy**.


Alert Policy is for security alerts - generate alert when DB activity is against to the alert rule defined in policy.

Audit Policy is for activity auditing, and only for monitoring target with TCP/IP sniffer - generate audit log when the activity is matched with audit setting.

Both Alert Policy and Audit Policy have following sub-type policies:

- **Metadata Policies** - Pre-defined policies, to alert/audit metadata activity
- **Privilege Policies** - Pre-defined policies, to alert/audit privilege activity
- **Sys Operations Policy** - Pre-defined policy, to alert/audit SYS user operations
- **Data Policy** - User-defined policy, to alert/audit data manipulation activity

Following table describes differences of two types of DAM policy.

	Alert Policy	Audit Policy
Used For	Alert if there's policy rule violation in activity	Log if the activity is want to log
Available With	All Collection Methods for DAM	Only TCP/IP Sniffer Collection Method
Types of Data Policies	<ul style="list-style-type: none"> • Table • Table and Column • Session • User • Database Query Policy 	<ul style="list-style-type: none"> • Database • Table • Table and Column • Session • User
Configuration of Data Policies	<ul style="list-style-type: none"> • "Read and Write" Audit Actions for Table, Table and Column • "Alert Rule" for violations <p> Note: Not for "Database Query Policy"</p>	<ul style="list-style-type: none"> • "Select/Insert/Update/Delete/Truncate" Audit Actions for Table • "Select/Insert/Update/Delete" Audit Actions for Database, Table and Column • No "Alert Rule" settings
Compliance Policy	Yes	No
Severity Attribute	Yes	No

Multiple Database Configuration from DAM Policy Management

DAM Policy Management enables you to configure policies for multiple databases. From the Monitoring Policy Management page, you can configure Metadata policies, Privilege Policies, and Compliance

Policies. If you use the Policy Groups which consist of several policies, you can apply the policy group for the multiple target databases. You don't need to configure the same policy for each database.

To navigate to the Policies page, go to **Policy> DAM Alert Policies** for security alert policies, and go to **Policy> DAM Audit Policies** for activity auditing policies.

Target based Configuration from Target Management

The target based configuration is useful when you configure a policy for a single target database. You can create or configure Data, Metadata, and Privilege policies from the Target Monitors page and Policies tab.

- FortiDB automatically creates a new data policy group, and
- FortiDB automatically associates the policy group to the target database

To configure a data policy for the alert or auditing individual target database, go to **DB Activity Monitoring >** Click on the target name, then select **Alert Policies** or **Audit Policies** tab.

For Activity Auditing, the Audit Policies are not enabled for target database. Go to **Audit Policy Groups** to associate the audit policy group to the target.





Configuring Policies








The DAM Alert/Audit Policy Management page displays all policies with Status, Policy Name, Supported Databases information.

The Alert/Audit Policy page allows you to:

- Configure Data policies: [Table Policy](#), [Table and Column Policy](#), [Session Policy](#), [User Policy](#), [Database Policy for Auditing](#), and [Database Query Policy for Alert](#), by selecting the Data Policies dropdown list at the bottom of the page.
- Modify the pre-defined policies: [Privilege Policy](#), [Metadata Policy](#), SYS Operations Policy, and [Compliance Policy\(for Alert\)](#), by clicking the policy name.
- Delete the user-defined policies (Data policies), by selecting the checkbox of the policy, and click Delete
- Filter the view by selecting a view from the View dropdown list.
- Navigate to the modifying the group page by clicking **Edit** button.
- Navigate to the searching and creating the group page by clicking **Search / New Group** button.

The following table indicates icons and meanings in the policy table list.

Columns	Descriptions
Type	<p>Data Policy:</p> <ul style="list-style-type: none"> •  Table Policy monitors/audits suspicious reads and writes on specific tables •  Table and Column Policy monitors/audits suspicious reads and writes on specific table columns •  Session Policy monitors/audits suspicious session behavior •  User Policy monitors/audits suspicious reads and writes by specific users •  Database Policy(for Auditing) audits activities reads and writes on specific databases

Columns	Descriptions
	<ul style="list-style-type: none">  Database Query Policy(for Alert) queries database data value periodically <p>Privilege policy is indicated as this icon </p> <p>Metadata policy is indicated as this icon </p> <p>Compliance policy is indicated as this icon </p>
Status	<ul style="list-style-type: none">  indicates the policy has a problem.  indicates the policy is disabled.  indicates the policy is enabled.
Policy Name	User defined policy name, or pre-defined name
Severity	<p>User configurable severity level (Not available for Audit Policy). There are 5 levels of severity:</p> <ul style="list-style-type: none"> Informational (default) Cautionary Minor Major Critical
Supported Databases	All, or specify database type, or have fixed setting for each database

When add/edit a policy, set following base attributes in **Policy Info** field:

- Policy Name - enter unique name for policy, duplicate with exist policy name is not allowed.
- Description - enter a description if necessary.
- Enable - select **Enable** checkbox to enable policy
- Create new policy group for policy - For target-based configuration, Select the **Create new policy group for policy** checkbox (checked by default). If checked, the policy group will be automatically created and associated to the target database (This option is available for the target-based configuration: Data Access Monitoring > Monitors > click on the target name > Alert/Audit Policies tab > Data Policies dropdown).
- Severity - Select the severity for Alert Policy
- Supported Database - For Data Policy, select supported database for the policy. Compliance Policy will be applied to All database. For Privilege and Metadata Policy, will have fixed settings for each database.

Data Policies

Data Policies monitor/audit reads and writes on specific objects. They also monitor access to the database that takes place via your application server, location, or OS user.

To configure a data policy:

1. Go to **DB Activity Monitoring > Monitoring Management** > click on the target name > **Alert/Audit Policies** tab

- 2 .Click on the target name for which you want to configure a policy.
- 3 .Select a policy from the **Data Policies** dropdown.
- 4 .Click **Add**, and set the policy base attributes, Audit Settings, and Alert Rule.
- 5 .Click **Save** to save policy.



Note: You can set **Supported Database** for Data Policy, with All or specified database. And if changed the **Supported Database** for a policy applied for a running monitoring target, you must **Stop Monitoring** and **Start Monitoring** to apply change.

Configuring Table Policy

- 1 .In the **Data Policies** field, select **Table** from the Data Policies dropdown list.
- 2 .Select **Add**. The **Edit Policy** page displays.
- 3 .In the **Policy Info** field, set base attributes with Policy Name, Description, Enable, Severity(for Alert Policy), Supported Databases.
- 4 .To set Audit Settings, refer to [Configuring Audit Settings for Table Policy](#)
- 5 .To set Alert Rule (for Alert Policy), refer to:
 - [Configuring Audit Rules for Table Policy](#)
 - And [Table Policy Alert Rules for Different DB System](#)
- 6 .Select **Save**. The policy you created displays in the Data policy list.

Audit Settings for Table Policy

- 1 .Click the triangle icon of the **Audit Settings** section to expand.
- 2 .Select one of the following check boxes.
 - **Manually Select Object:** You enter the specific object name.
 - **Browse Object by Target:** You can select one from the dropdown list (default).
- 3 .Select a target from the **Target** dropdown list when you access from **Policy > DAM Alert/Audit Policies > Data Policies** dropdown list.
- 4 .For Oracle and DB2, in the **Schema** field, select one from the dropdown list. For MS SQL Server and Sybase, select a database from the **Database** dropdown list, and then select a schema from the **Schema** dropdown list.
- 5 .From the **Tables** selection box, select one or more tables.
- 6 .For Alert Policy, select the **Read** (Select) or **Write** (Insert/Update/Delete) checkbox or both in the **Audit Actions** field.
- 7 .For Audit Policy, select the **Select, Insert, Update, Delete, Truncate** checkboxes in the **Audit Actions** field.
- 8 .Click the right arrow to move the selection to the **Selected Objects** table.



Note: If you want to remove the objects from the Selected Objects list, select the object you want to remove and click the left arrow.

- 9 .Configure Alerts Rules for each target database.


Alert Rules for Table Policy


- 1 .Click the triangle icon of the **Alert Rules** section to expand.
- 2 .In the **Combination Rule** field, select one from the dropdown list:

Options	Descriptions
Issue alert if ANY of the enabled rules are triggered	if you select this, each rule generates alerts individually.

Options	Descriptions
Issue alert if ALL of the enabled rules are triggered	If you select this, the combination of selected policies generates alerts.

3 .Select the checkbox of your interests from the following rules:

Options	Descriptions
Security Violation	Alert any failed attempt to access selected object without proper permission.
Suspicious OS User	<p>Alert any successful access to selected object by certain OS users. You can specify one or more OS user names by typing the specific name or using a regular expression.</p> <ol style="list-style-type: none"> 1 .Click Add 2 .Select an operator from the dropdown list. 3 .Enter OS user name depending on the operator you selected. <ul style="list-style-type: none"> • To generate alerts for the OS user(s) you specified in the list, check "Alert any successful access if the OS user is specified in the list " check box. • To generate alerts for the OS user(s) you didn't specified in the list, check " Alert any successful access if the OS user is not specified in the list " check box.
Suspicious Location	<p>Alert any successful access to selected object from certain locations. You can specify one or more locations by typing the specific location or using a regular expression.</p> <ol style="list-style-type: none"> 1 .Click Add. 2 .Select an operator from the dropdown list. 3 .Enter a location name depending on the operator you selected. 4 .Repeat 1 to 3 if necessary. <ul style="list-style-type: none"> • To generate alerts for any successful access from locations you specified in the list, check "Alert any successful access from locations in the list " check box. • To generate alerts for any successful access from locations not in the list, check " Alert any successful access from locations in the list Alert any successful access from locations not in the list " check box.
Suspicious Database Users	<p>Alert any successful access to selected object by certain database users.</p> <p>You can specify one or more users as follows:</p> <ol style="list-style-type: none"> 1 .Select one or more users from the Users list. 2 .Click the right arrow to move the selections the Selected Users list. <p> Note: If you want to remove the users from the selected users list, select the users you want to remove and click the left arrow.</p>

Options	Descriptions
	<ul style="list-style-type: none"> To generate alerts for the database user(s) you specified in the list, check "Alert any successful access if the database user is in the list" check box. To generate alerts for the database user(s) you didn't specified in the list, check " Alert any successful access if the database user is not in the list " check box.
Suspicious Login Names	<p>Alert any successful access to selected object by certain login users.</p> <p>You can specify one or more users as follows:</p> <ol style="list-style-type: none"> Select one or more users from the Users list. Click the right arrow to move the selections the Selected Users list. <p> Note: If you want to remove the users from the selected users list, select the users you want to remove and click the left arrow.</p> <ul style="list-style-type: none"> To generate alerts for login user(s) you specified in the list, check "Alert any successful access if the login user is in the list " check box. To generate alerts for login user(s) you didn't specified in the list, check " Alert any successful access if the login user is not in the list " check box.
Suspicious Client Application (Client Id)	<p>Alert any successful access to selected object by certain client applications.</p> <p>You can specify one or more client applications by typing the specific client application or using a regular expression.</p> <ol style="list-style-type: none"> Click Add. Select an operator from the dropdown list. Enter a client application depending on the operator you selected. Repeat 1 to 3 if necessary. <ul style="list-style-type: none"> To generate alerts for the client application you specified in the list, check "Alert any successful access if the client application is in the list " check box. To generate alerts for the client application you didn't specified in the list, check " Alert any successful access if the client application is not in the list " check box.
Excessive Access Violation	<p>Alert excessive access to selected object within the specified time slot.</p> <p>You can specify the maximum accesses allowed within a certain time period.</p> <ol style="list-style-type: none"> Enter the number of accesses allowed. Enter the number of hours, days, minutes, or seconds after selecting one from the dropdown list. <p>Tracking Strategy - Tracking rule selection for time violation.</p>

Options	Descriptions
	The threshold you set for time violation can be incremented by OS User, Location, Client Application, or Database User separately, depending on your selection. If you don't select any rule, any access to the selected audit settings will be counted.
Time Range Violation	<p>Alert any access to selected object by certain time range.</p> <p>You can specify one or more time range.</p> <ol style="list-style-type: none"> 1 .Click Add. 2 .Enter hour and minute values in "Received from" and "To" for time range, with 24 hours format. 3 .Repeat above if necessary. <ul style="list-style-type: none"> • To generate alerts for the access within the time range, select the "Alert any access if the timestamp is between time range". • To generate alerts for the access out of the time range, select the "Alert any access if the timestamp is not between time range".
Suspicious Client IP (only for Collection Method "TCP/IP Sniffer")	<p>Alert any successful access to selected object by certain client IPs. This rule only has effect for monitoring with Collection Method "TCP/IP Sniffer".</p> <p>You can specify one or more IP address, IP address Range or subnet.</p> <ol style="list-style-type: none"> 1 .Click Add. 2 .Enter Start/End IP address, or IP/Netmask. For example, "192.168.1.1" - "192.168.1.254" for IP range, "192.168.2.0/255.255.255.0" for subnet. 3 .Repeat above if necessary. <ul style="list-style-type: none"> • To generate alerts for the client which's IP is in the specified IP range or subnet, select the "Alert any successful access if the client's IP is in the list". • To generate alerts for the client which's IP is not in the specified IP range or subnet, select the "Alert any successful access if the client's IP is not in the list".

4 .Select Save or Cancel.

Table Policy Alert Rules for Different DB Systems

For Table Policy, there are different **Alert Rules** available for different DB systems:

DB	Available Alert Rules
Oracle	<ul style="list-style-type: none"> • Security Violation • Suspicious OS User • Suspicious Location • Suspicious Database Users (Login Name) • Suspicious Client Application (Client Id) • Excessive Access Violation • Time Range Violation

DB	Available Alert Rules
	<ul style="list-style-type: none"> Suspicious Client IP (only for "TCP/IP Sniffer")
MSSQL	<ul style="list-style-type: none"> Security Violation Suspicious OS User Suspicious Location Suspicious Database Users Suspicious Login Names Suspicious Client Application Excessive Access Violation Time Range Violation Suspicious Client IP (only for "TCP/IP Sniffer")
DB2	<ul style="list-style-type: none"> Security Violation Suspicious OS User Suspicious Location Suspicious Database Users Excessive Access Violation Time Range Violation Suspicious Client IP (only for "TCP/IP Sniffer")
Sybase	<ul style="list-style-type: none"> Security Violation Suspicious OS User Suspicious Location Suspicious Login Names Excessive Access Violation Time Range Violation Suspicious Client IP (only for "TCP/IP Sniffer")
MySQL	<ul style="list-style-type: none"> Security Violation Suspicious Location Suspicious Login Names Excessive Access Violation Time Range Violation

Configuring Table and Column Policy

1. In the **Data Policies** field, select **Table and Column** from the Data Policies dropdown list.
2. Select **Add**. The **Edit Policy** page displays.
3. In the **Policy Info** field, set base attributes with Policy Name, Description, Enable, Severity(for Alert Policy), Supported Databases.
4. Expand "Audit Settings" section to set Audit Settings:
 - a) For Oracle and DB2, in the Schema field, select one from the pulldown list. For MS SQL Server and Sybase, select one from the pulldown list in the Database field, and then select one in the Owner field.
 - b) From the Tables selection box, select one table.
 - c) From the Column selection box, select one or more columns for the table you selected.

- d) For Alert Policy, select the **Read** (Select) or **Write** (Insert/Update/Delete) checkbox or both in the **Audit Actions** field.
- e) For Audit Policy, select the **Select, Insert, Update, Delete** checkboxes in the **Audit Actions** field.
- f) Click the right arrow to move the selection to the Selected Objects table.



Note: If you want to remove the objects from the selected objects list, select the object you want to remove and click the left arrow.

- 5 .To set Alert Rule (for Alert Policy), refer to:
 - [Configuring Audit Rules for Table Policy](#)
 - And [Table Policy Alert Rules for Different DB System](#)
- 6 .Select **Save**. The policy you created displays in the Data policy list.

Configuring Session Policy

- 1 .In the **Data Policies** field, select **Session** from the Data Policies dropdown list.
- 2 .Select **Add**. The **Edit Policy** page displays.
- 3 .In the **Policy Info** field, set base attributes with Policy Name, Description, Enable, Severity, Supported Databases.
- 4 .To set Audit Settings, refer to [Configuring Audit Settings for Session Policy](#)
- 5 .To set Alert Rule (for Alert Policy), refer to [Configuring Alert Rules for Session Policy](#)
- 6 .Select **Save**. The policy you created displays in the Data policy list.

Audit Settings for Session Policy

- 1 .Click the triangle icon at Audit Settings to expand.
- 2 .Select **Any User** or **Specify Users** radio button
- 3 .For **Specify Users**, input username in **Enter user** input box. Or click **Browse by target** dropdown list, select one or more users from the Users selection box, and click the right arrow to move the selection to the Selected Users table.




Note: If you want to remove the user from the selected users list, select the user you want to remove and click the left arrow.

- 4 .Configure Alert Rule for Alert Policy.

Alert Rules for Session Policy

- 1 .Click the triangle icon at Alert Rules to expand.
- 2 .In the Combination Rule field, select one from the pulldown list:
 - Issue alert if ANY of the enabled rules are triggered
 - Issue alert if ALL of the enabled rules are triggered
- 3 .Select the checkbox of your interests from the following rules:

Options	Descriptions
Login/Logout Activity	Generate alerts for login/logout activity. Select option "Alert Login Failure" to alert for failure login only, or select option "Alert All Login/logout Activity".
Suspicious Login Time	Time of login is beyond specified normal hours. You can specify the time, entering numbers: 1 .In the From and To field, enter the starting and ending times you want to specify as suspicious login time.

Options	Descriptions
	<p>2 .If necessary, click + sign to add more time range, or - sign to remove the time range.</p> <ul style="list-style-type: none"> To generate alerts for the login time you specified in the list, check "Alert if login time is within one of the time ranges in the list " check box. To generate alerts for the login time you didn't specified in the list, check " Alert if login time is NOT within one of the time ranges in the list" check box.
Extremely Long Session	<p>Generate alerts when duration of session is abnormally long.</p> <p>You can specify the threshold by entering how many hours allowed for a session.</p>
Excessive Read Activities	<p>Generate alerts when number of logical page reads is abnormally high.</p> <p>You can specify the threshold by entering how many page reads are allowed for a session.</p>
High Read Ratio	<p>Generate alerts when number of logical reads/minute is abnormally high.</p> <p>You can specify the threshold by entering how many page reads are allowed for a session.</p>
Suspicious Os User	<p>Alert any successful access to selected object by certain OS users.</p> <p> Note: For MS SQL Server, this rule is applicable for only Windows authentication.</p> <p>You can specify one or more OS user names by typing the specific name or using a regular expression.</p> <ol style="list-style-type: none"> Click Add Select an operator from the pulldown list. Enter OS user name depending on the operator you selected. Repeat 1 to 3 if necessary. <ul style="list-style-type: none"> To generate alerts for the OS user(s) you specified in the list, check "Alert any successful access if the OS user is specified in the list " check box. To generate alerts for the OS user(s) you didn't specified in the list, check "Alert any successful access if the OS user is not specified in the list" check box.
Suspicious Location	<p>Alert any successful access to selected object from certain locations.</p> <p>You can specify one or more locations by typing the specific location or using a regular expression.</p> <ol style="list-style-type: none"> Click Add Select an operator from the pulldown list. Enter a location name depending on the operator you selected. Repeat 1 to 3 if necessary.

Options	Descriptions
	<ul style="list-style-type: none"> To generate alerts for location(s) you specified in the list, check "Alert any successful access from locations in the list" check box. To generate alerts for location(s) you didn't specified in the list, check "Alert any successful access from locations not in the list" check box.
Suspicious Client Application	<p>Alert any successful access to selected object by certain client applications.</p> <p>You can specify one or more client applications by typing the specific client application or using a regular expression.</p> <ol style="list-style-type: none"> Click Add. Select an operator from the dropdown list. Enter a client application depending on the operator you selected. Repeat 1 to 3 if necessary. <ul style="list-style-type: none"> To generate alerts for the client application you specified in the list, check "Alert any successful access if the client application is in the list " check box. To generate alerts for the client application you didn't specified in the list, check " Alert any successful access if the client application is not in the list " check box.
Excessive Access Violation	<p>Alert excessive access to selected object within the specified time slot.</p> <p>You can specify the maximum accesses allowed within a certain time period.</p> <ol style="list-style-type: none"> Enter the number of accesses allowed. Enter the number of hours, days, minutes, or seconds after selecting one from the dropdown list. <p>Tracking Strategy - Tracking rule selection for time violation.</p> <p>The threshold you set for time violation can be incremented by OS User, Location, Client Application, or Database User separately, depending on your selection. If you don't select any rule, any access to the selected audit settings will be counted.</p>
Suspicious Client IP (only for Collection Method "TCP/IP Sniffer")	<p>Alert any successful access to selected object by certain client IPs. This rule only has effect for monitoring with Collection Method "TCP/IP Sniffer".</p> <p>You can specify one or more IP address, IP address Range or subnet.</p> <ol style="list-style-type: none"> Click Add. Enter Start/End IP address, or IP/Netmask. For example, "192.168.1.1" - "192.168.1.254" for IP range, "192.168.2.0/255.255.255.0" for subnet. Repeat above if necessary.

Options	Descriptions
	<ul style="list-style-type: none"> To generate alerts for the client which's IP is in the specified IP range or subnet, select the "Alert any successful access if the client's IP is in the list". To generate alerts for the client which's IP is not in the specified IP range or subnet, select the "Alert any successful access if the client's IP is not in the list".


4 .Select Save or Cancel.

Configuring User Policy

- 1 .In the **Data Policies** field, select **User** from the Data Policies dropdown list.
- 2 .Select **Add**. The **Edit Policy** page displays.
- 3 .In the **Policy Info** field, set base attributes with Policy Name, Description, Enable, Severity, Supported Databases.
- 4 .To set Audit Settings, refer to [Configuring Audit Settings for User Policy](#)
- 5 .To set Alert Rule (for Alert Policy), refer to:
 - [Configuring Audit Rules for User Policy](#)
 - And [User Policy Alert Rules for Different DB System](#)
- 6 .Select **Save**. The policy you created displays in the Data policy list.

Audit Settings for User Policy

- 1 .Click the triangle icon of the **Audit Settings** section to expand.
- 2 .Select **Any User** or **Specify Users** radio button
- 3 .For **Specify Users**, input username in **Enter user** input box. Or click **Browse by target** dropdown list to browse available users from target.
- 4 .For Alert Policy, select the **Read** (Select) or **Write** (Insert/Update/Delete) checkbox or both in the **Audit Actions** field.
- 5 .For Audit Policy, select the **Select, Insert, Update, Delete, Truncate** checkboxes in the **Audit Actions** field.
- 6 .Click the right arrow to move the selection to the **Selected Users** table.




Note: If you want to remove the objects from the Selected Users list, select the user you want to remove and click the left arrow.
- 7 .Configure Alert Rule (for Alert Policy).

Alert Rules for User Policy

- 1 .Click the triangle icon of the **Alert Rules** section to expand.
- 2 .In the **Combination Rule** field, select one from the dropdown list:

Options	Descriptions
Issue alert if ANY of the enabled rules are triggered	if you select this, each rule generates alerts individually.
Issue alert if ALL of the enabled rules are triggered	If you select this, the combination of selected policies generates alerts.

- 3 .Select the checkbox of your interests from the following rules:

Options	Descriptions
Security Violation	Alert any failed attempt to access selected object without proper permission.
Suspicious OS User	<p>Alert any successful access to selected object by certain OS users. You can specify one or more OS user names by typing the specific name or using a regular expression.</p> <ol style="list-style-type: none"> 1 .Click Add 2 .Select an operator from the dropdown list. 3 .Enter OS user name depending on the operator you selected. <ul style="list-style-type: none"> • To generate alerts for the OS user(s) you specified in the list, check "Alert any successful access if the OS user is specified in the list " check box. • To generate alerts for the OS user(s) you didn't specified in the list, check " Alert any successful access if the OS user is not specified in the list " check box.
Suspicious Object Access	<p>Alert any successful access to selected object(s). There are the following options to select objects:</p> <ul style="list-style-type: none"> • Manually Select Object • Browse Object by Target (default) <p>You can specify one or more objects as follows:</p> <ol style="list-style-type: none"> 1 .Select a target from the Target dropdown list. 2 .Select a schema from the dropdown list. 3 .Select one or more tables from the Tables list. 4 .Select the Read (Select)or Write (Insert/Update/Delete) checkbox or both in the Audit Actions field. 5 .Click the right arrow to move the selections the Selected Objects list. <p> Note: If you want to remove the users from the selected objects list, select the objects you want to remove and click the left arrow.</p> <ul style="list-style-type: none"> • To generate alerts for the object(s) you specified in the list, check "Issue alert if the accessed object is specified in the list " check box. • To generate alerts for the object(s) you didn't specified in the list, check " Issue alert if the accessed object is not specified in the list " check box.
Suspicious Location	<p>Alert any successful access to selected object from certain locations. You can specify one or more locations by typing the specific location or using a regular expression.</p> <ol style="list-style-type: none"> 1 .Click Add 2 .Select an operator from the dropdown list. 3 .Enter a location name depending on the operator you selected. 4 .Repeat 1 to 3 if necessary.

Options	Descriptions
	<ul style="list-style-type: none"> To generate alerts for the location(s) you specified in the list, check "Alert any successful access from locations in the list " check box. To generate alerts for the location(s) you didn't specified in the list, check " Issue alert if the accessed object is not specified in the list " check box.
Suspicious Client Application (Client Id)	<p>Alert any successful access to selected object by certain client applications.</p> <p>You can specify one or more client applications by typing the specific client application or using a regular expression.</p> <ol style="list-style-type: none"> Click Add Select an operator from the dropdown list. Enter a client ID depending on the operator you selected. Repeat 1 to 3 if necessary. <ul style="list-style-type: none"> To generate alerts for the client application you specified in the list, check "Alert any successful access if the client application is in the list " check box. To generate alerts for the client application you didn't specified in the list, check "Alert any successful access if the client application is not in the list " check box.
Excessive Access Violation	<p>Alert excessive access to selected object within the specified time slot.</p> <p>You can specify the maximum accesses allowed within a certain time period.</p> <ol style="list-style-type: none"> Enter the number of accesses allowed. Enter the number of hours, days, minutes, or seconds after selecting one from the dropdown list. <p>Tracking Strategy - Tracking rule selection for time violation.</p> <p>The threshold you set for time violation can be incremented by OS User, Location, Client Application, or Database User separately, depending on your selection. If you don't select any rule, any access to the selected audit settings will be counted.</p>
Time Range Violation	<p>Alert any access to selected object by certain time range.</p> <p>You can specify one or more time range.</p> <ol style="list-style-type: none"> Click Add. Enter hour and minute values in "Received from" and "To" for time range, with 24 hours format. Repeat above if necessary. <ul style="list-style-type: none"> To generate alerts for the access within the time range, select the "Alert any access if the timestamp is between time range".

Options	Descriptions
	<ul style="list-style-type: none"> To generate alerts for the access out of the time range, select the "Alert any access if the timestamp is not between time range".
Suspicious Client IP (only for Collection Method "TCP/IP Sniffer")	<p>Alert any successful access to selected object by certain client IPs. This rule only has effect for monitoring with Collection Method "TCP/IP Sniffer".</p> <p>You can specify one or more IP address, IP address Range or subnet.</p> <ol style="list-style-type: none"> Click Add. Enter Start/End IP address, or IP/Netmask. For example, "192.168.1.1" - "192.168.1.254" for IP range, "192.168.2.0/255.255.255.0" for subnet. Repeat above if necessary. <ul style="list-style-type: none"> To generate alerts for the client which's IP is in the specified IP range or subnet, select the "Alert any successful access if the client's IP is in the list". To generate alerts for the client which's IP is not in the specified IP range or subnet, select the "Alert any successful access if the client's IP is not in the list".

4 .Select Save or Cancel.

User Policy Alert Rules for Different DB Systems

For User Policy, there are different **Alert Rules** available for different DB systems:


DB	Available Alert Rules
Oracle	<ul style="list-style-type: none"> Security Violation Suspicious OS User Suspicious Object Access Suspicious Location Suspicious Client Application (Client Id) Excessive Access Violation Time Range Violation Suspicious Client IP (only for "TCP/IP Sniffer")
MSSQL	<ul style="list-style-type: none"> Security Violation Suspicious OS User Suspicious Object Access Suspicious Location Suspicious Client Application Excessive Access Violation Time Range Violation Suspicious Client IP (only for "TCP/IP Sniffer")
DB2	<ul style="list-style-type: none"> Security Violation Suspicious OS User

DB	Available Alert Rules
	<ul style="list-style-type: none"> • Suspicious Object Access • Suspicious Location • Excessive Access Violation • Time Range Violation • Suspicious Client IP (only for "TCP/IP Sniffer")
Sybase	<ul style="list-style-type: none"> • Security Violation • Suspicious OS User • Suspicious Object Access • Suspicious Location • Excessive Access Violation • Time Range Violation • Suspicious Client IP (only for "TCP/IP Sniffer")
MySQL	<ul style="list-style-type: none"> • Security Violation • Suspicious Object Access • Suspicious Location • Excessive Access Violation

Configuring Database Policy for Auditing

Database Data Policy is for Activity Auditing only. Configure this policy to log activities to specified database or schema.

1. Goto DAM Audit Policy page. In the **Data Policies** field, select **Database** from the Data Policies dropdown list.
2. Select **Add**. The **Edit Policy** page displays.
3. In the **Policy Info** field, set base attributes with Policy Name, Description, Enable, Severity (for Alert Policy), Supported Databases.
4. Click the triangle icon of the **Audit Settings** section to expand.
5. Select one of the following check boxes.
 - **Manually Select Object:** You enter the specific database or schema name.
 - **Browse Object by Target:** You can select one from the dropdown list (default).
6. Select a target from the **Target** dropdown list.
7. Select one or more database/schema from **Database or Schema** listbox. Type text in **Search** input box to filter database/schema list.
8. Select the **Select, Insert, Update, Delete** checkboxes in the **Audit Actions** field.
9. Click the right arrow to move the selection to the **Selected Objects** table.

 **Note:** If you want to remove the objects from the Selected Objects list, select the object you want to remove and click the left arrow.
10. Select **Save**. The policy you created displays in the Data policy list.

Configuring DB Query Policy for Alert

Database Query Policy is Alert only. Configure this policy to query target database with specified SQL, and save the query result as alert.

1. Goto DAM Alert Policy page. In the **Data Policies** field, select **Database Query Policy** from the Data Policies dropdown list.

- 2 .Select **Add**. The **Edit Policy** page displays.
- 3 .In the **Policy Info** field, set base attributes with Policy Name, Description, Category, Enable, Severity, Supported Databases.
- 4 .Input the SQL query text for **SQL query**.
- 5 .Input the number for **Return Records Count Limit**.
- 6 .Click **Test** button to verify the SQL query. It will display "Success" for successful test.
- 7 .Select **Save**. The policy you created displays in the Data policy list.

Privilege Policies

Privilege Policies monitor changes of privilege settings in selected databases. If you select Privilege from the View dropdown list, you can see predefined privilege policies.


To configure a privilege policy:

- From DAM Policy Management: **Policy > DAM Alert Policies** or **DAM Audit Policies**
- From DB Activity Monitoring: **DB Activity Monitoring > Monitoring Management > Click on the target name > Alert Policies** or **Audit Policies** tab

Configuring Privilege Policy

You can choose global configuration or target based configuration for privilege policies. After creating a target database connection, take the following steps:

- 1 .For global configuration, go to **Policy > DAM Alert Policies** or **DAM Audit Policies**. For target based configuration, go to **Data Activity Monitoring > Monitors > click a target name > Alert Policies** or **Audit Policies**.
- 2 .(For global configuration) Select **Privilege Policies** from the View dropdown list.



Note: The default Privilege Policies groups include privilege policies of all database types. If you want to view privilege policies of a certain database type, you can modify the filter of the Privilege policies group or create a new policy group. For details about modifying a policy group, see [DAM Policy Groups](#) .
- 3 .Click on the policy name you want to configure. The Edit Policy:<policy name> page displays.
- 4 .In the **Policy Info** field:
 - a) Enter a description if necessary.
 - b) Select the **Enable** checkbox. If checked, the policy will be enabled.
- 5 .For Alert Policy, you can select one of the following severity options from the dropdown list.
 - Informational (default, lowest severity level)
 - Cautionary
 - Minor
 - Major
 - Critical (highest severity level)
- 6 .Select **Save**.

Oracle Privilege Policies

This topic describes Oracle Privilege policies.

Privilege policies consist of the following policies:

Policy Names	Contents	Description
Column Privileges	Column-level privilege granting	<p>This policy generates alerts when the column privileges are modified.</p> <p>For example, user SCOTT can grant SELECT privileges on a column of a table to a user, without letting that user SELECT on other columns in the same table.</p>
Profiles	Resources (I/O, etc.) assigned to users	<p>This policy generates alerts when the profiles are modified.</p> <p>Changes to any profile setting could have wide-reaching effects.</p>
Role Privileges	Roles granted to users and other roles	<p>This policy generates alerts when the role privileges are modified.</p> <p>It also contains information about which role has been assigned to other roles. Change of user's role means changes in user's access privileges. Role changes should be closely monitored in order to ensure data security.</p>
Roles	Database roles	<p>This policy generates alerts when the roles are modified.</p> <p>Contains information about all existing roles in the database.</p>
System Privileges	All granted system privileges	<p>This policy generates alerts when the system privileges are created, deleted, or modified.</p> <p>Contains all granted system privileges to all users or roles. System privileges are powerful privileges and should be granted with great cautions. Monitoring system-privilege changes should be mandatory.</p>
Table Privileges	All granted schema-object privileges	<p>This policy generates alerts when the table privileges are modified.</p> <p>Lists all granted privileges on schema objects. These include privileges on tables, views, sequences, procedures, functions and packages.</p>
User Privileges	Database users	<p>This policy generates alerts when the users privileges are modified.</p> <p>Contains information about users in the database. Although this view has no privilege information, it contains the users to whom privileges may be assigned or changed.</p>

MS SQL Server Privilege Policies

This topic describes MS SQL Server Privilege policies.

Privilege policies consist of the following policies:

Policy Names	Privileges involved	Description
Column Privileges	Column-level privilege	This policy generates alerts when the column privileges are modified.
Member Privileges	Role- and group-membership assignments	This policy generates alerts when the members are modified.
Object Privileges	Column- and table- and other object-level privileges	This policy generates alerts when the object privileges are modified.
Roles	All objects that are accessible by the current user	This policy generates alerts when the roles are modified. Contains information about all existing roles in the database.
Server Roles	Default server roles assigned to users.	This policy generates alerts when the server roles are modified.
User Privileges	Lists valid database users and the groups to which they belong	This policy generates alerts when the user privileges are modified.

Sybase Privilege Policies

This topic describes Sybase Privilege policies.

Privilege policies consist of the following policies:

Policy Names	Privileges involved	Description
Column Privileges	Column-level privilege	This policy generates alerts when the column privileges are modified.
Member Privileges	Role- and group-membership assignments	This policy generates alerts when the members privileges are modified.
Object Privileges	Column- and table- and other object-level privileges	This policy generates alerts when the object privileges are modified.
Procedures	Procedure privilege	This policy generates alerts when the procedures are modified.
Roles	All role groups as the server level.	This policy generates alerts when the role groups are modified.

Policy Names	Privileges involved	Description
Roles and Groups	All roles and groups. A group is a user group as the database level.	This policy generates alerts when the roles and groups are modified.
System Privileges	All granted system privileges	This policy generates alerts when the system privileges are modified.
User Privileges	Lists valid database users and the groups to which they belong	This policy generates alerts when the user privileges are modified.

DB2 Privilege Policies

This topic describes DB2 Privilege policies.

Privilege policies consist of the following policies:

Policy Names	Contents	Description
Column Privileges	column privileges	
Database Privileges	database system privileges	
Index Privileges	Index privileges	This view contains the right to DROP the index. The creator of an index automatically has this CONTROL privilege.
Package Privileges	A package is a database object grouping related procedures, functions, associated cursors, and variables together.	CONTROL: Provides the ability to rebind, drop, execute, and extend these package privileges to others. Only SYSADM and DBADM authorities can grant CONTROL privilege. BIND: Provides the privilege to rebind an existing package. EXECUTE: Provides the privilege to execute a package.
Schema Privileges	Objects within a schema : tables, views, indexes, packages, data types, functions, triggers, procedures, and aliases	CREATEIN: Provides the privilege to create objects within the schema. ALTERIN: Provides the privilege to alter objects within the schema. DROPIN: Provides the privilege to drop objects within the schema
Table and View Privileges	Tables and view privileges	CONTROL: Provides the privilege to DROP the table or view and GRANT table or view privileges to somebody else. ALTER: Provides the privilege to add columns, comments, primary key or unique constraint, in order to create triggers, and create or drop check constraints DELETE: Provides the privilege to delete rows

Policy Names	Contents	Description
		INDEX: Provides the privilege to CREATE INDEX INSERT: Provides the privilege to INSERT rows. REFERENCES: Provides the privilege to CREATE or DROP a foreign key. SELECT: Provides the privilege to retrieve data. UPDATE: Provides the privilege to change existing entries.
Tablespace Privileges	tablespace privileges	A SYSADM or SYSCTRL authority can create Tablespace and grant USE privilege to others

MySQL Privilege Policies

This topic describes MySQL Privilege policies.

Privilege policies consist of the following policies:

Policy Names	Privileges involved	Description
Column Privileges	Column-level privilege	This policy generates alerts when the column privileges are modified.
Object Privileges	Column- and table- and other object-level privileges	This policy generates alerts when the object privileges are modified.
Procedures	Procedure privilege	This policy generates alerts when the procedures are modified.

Metadata Policies

Metadata Policies monitor changes of metadata in selected databases. If you select Metadata from the View dropdown list, you can see predefined metadata policies.

To configure a metadata policy:

- From DAM Policy Management: **Policy > DAM Alert Policies** or **DAM Audit Policies**
- From DB Activity Monitoring: **DB Activity Monitoring > Monitoring Management > Click on the target name > Alert Policies** or **Audit Policies** tab

Configuring Metadata Policy

You can choose global configuration or target based configuration for metadata policies. After creating a target database connection, take the following steps:

- 1 .For global configuration, go to **Policy > DAM Alert Policies** or **DAM Audit Policies**. For target based configuration, go to **Data Activity Monitoring > Monitors > click a target name > Alert Policies** or **Audit Policies**.
- 2 .(For global configuration) Select **Metadata Policies** from the View dropdown list.



Note: The default Metadata Policies groups include metadata policies of all database types. If you want to view metadata policies of a certain database type, you can modify the filter of the Metadata policies group or create a new policy group. For details about modifying a policy group, see [DAM Policy Groups](#) .

- 3 .Click on the policy name you want to configure. The Edit Policy:<policy name> page displays.

4 .In the **Policy Info field:**

- a) Enter a description if necessary.
- b) Select the **Enable** checkbox. If checked, the policy will be enabled.

5 .Select one of the following severity options from the dropdown list.

- Informational (default, lowest severity level)
- Cautionary
- Minor
- Major
- Critical (highest severity level)

6 .Select **Save.****Oracle Metadata Policies**

This topic describes Oracle Metadata policies.

Metadata policies consist of the following policies:

Policy Names	Contents	Description
Packages	packages	This policy generates alerts when database packages are modified.
Synonyms	synonyms	This policy generates alerts when database synonyms are modified.
Tables	tables, columns and indexes	This policy generates alerts when tables, columns, or indexes are modified.
Tablespaces	tablespaces	This policy generates alerts when table spaces are modified.
Triggers	triggers	This policy generates alerts when triggers are modified.
Views	views	This policy generates alerts when views are modified.

MS SQL Server Metadata Policies

This topic describes MS SQL Server Metadata policies.

Metadata policies consist of the following policies:

Policy Names	Contents	Description
Routines	routines	This policy generates alerts when database packages are modified.
Tables	tables, columns and indexes	This policy generates alerts when tables, columns, or indexes are modified.
Triggers	triggers	This policy generates alerts when triggers are modified.
Views	views	This policy generates alerts when views are modified.

Sybase Metadata Policies

This topic describes Sybase Metadata policies.

Metadata policies consist of the following policies:

Policy Names	Contents	Description
Indexes	indexes	This policy generates alerts when indexes are modified.
Stored Procedures	stored procedures	This policy generates alerts when stored procedures are modified.
Tables	tables, columns and indexes	This policy generates alerts when tables, columns, or indexes are modified.
Triggers	triggers	This policy generates alerts when triggers are modified.
Views	views	This policy generates alerts when views are modified.

DB2 Metadata Policies

This topic describes Oracle Metadata policies.

Metadata policies consist of the following policies:

Policy Names	Contents	Description
Aliases	aliases	This policy generates alerts when aliases are modified
Indexes	indexes	This policy generates alerts when indexes are modified
Packages	packages	This policy generates alerts when database packages are modified.
Tables	tables	This policy generates alerts when tables and columns are modified.
Tablespaces	tablespaces	This policy generates alerts when table spaces are modified.
Triggers	triggers	This policy generates alerts when triggers are modified.
Views	views	This policy generates alerts when views are modified.

MySQL Metadata Policies

This topic describes MySQL Metadata policies.

Metadata policies consist of the following policies:

Policy Names	Contents	Description
Events	events	This policy generates alerts when events are modified.
Indexes	indexes	This policy generates alerts when indexes are modified.
Stored Procedures	stored procedures	This policy generates alerts when stored procedures are modified.
Tables	tables	This policy generates alerts when tables and columns are modified.
Triggers	triggers	This policy generates alerts when triggers are modified.
Views	views	This policy generates alerts when views are modified.

Alert Compliance Policies

Compliance Policies capture all types of database activities and store the data in the internal repository. This policy can be used for generating the SOX compliance reports. For details about compliance reports, see [Compliance Reports](#)

To configure a compliance policy:

- 1 .Go to **Policy > DAM Alert Policies**
- 2 .Select **Compliance Policies** from the **View** dropdown.
- 3 .Click on **Compliance** in the Policy Name column.

Configuring Compliance Policy

In order to generate Compliance reports (except History of Privilege Changes), you need to set either Object audit options or User audit option. "History of Privilege Changes" report doesn't require objects or users settings. To configure the compliance policy, take the following steps:

- 1 .Go to **Policy > DAM Alert Policies**.
- 2 .In the **View** field, select **Compliance Policies** from the View dropdown list.
- 3 .Click on the policy name ("Compliance" by default).
The **Edit Policy: Compliance** page will display.
- 4 .Enter the following information if necessary.
 - a) Enter a description.
 - b) Select the **Enable** checkbox. If checked, the policy will be enabled.
- 5 .Select one of the following severity options from the dropdown list.
 - Informational (default, lowest severity level)
 - Cautionary
 - Minor
 - Major
 - Critical (highest severity level)
- 6 .For generating reports (except for History of Privilege Changes), set Object Audit Options or User Audit Options. For details about setting Object Audit Options and User Audit Options, see [Setting or Modifying Audit Settings \(Object Audit Options\)](#) and [Setting or Modifying Audit Settings \(User Audit Options\)](#)

The Compliance report "History of Privilege Changes" does not require to set Audit Settings section.
7 .Select **Save**. The Target Monitor page displays.

Setting or Modifying Audit Settings (Object Audit Options)

This action is required for generating the following SOX reports: Abnormal or Unauthorized Changes to Data, Abnormal Use of Service Accounts, Abnormal Termination of Database Activity, and End of Period Adjustments.

- 1 .Click the triangle icon of the **Audit Settings** section to expand.
- 2 .In the **Select Objects to Audit** section, Select one of the check boxes. The following steps are based on the default setting of this field.
 - **Manually Select Object:** You enter the specific object name.
 - **Browse Object by Target:** You can select one from the dropdown list (default).
- 3 .In the **Target** field, select a target from the dropdown list.
- 4 .For Oracle and DB2, in the **Schema** field, select one from the dropdown list. For MS SQL Server and Sybase, select one from the dropdown list in the **Database** field, and then select one in the **Schema** field.
- 5 .From the **Tables** selection box, select one or more tables.
- 6 .Select the **Read** (Select) or **Write** (Insert/Update/Delete) checkbox or both in the **Audit Actions** field.
- 7 .Click the right arrow to move the selection to the Selected Objects table.



Note: If you want to remove the objects from the Selected Objects list, select the object you want to remove and click the left arrow.

- 8 .Click **Save**.
- 9 .Configure the User Audit Options for SOX reports "Abnormal Use of Service Accounts" and "Abnormal Termination of Database Activity". For details about setting the User Audit Options, go to "Setting or Modifying User Audit Options".

Setting or Modifying Audit Settings (User Audit Options)

This action is required for generating the following SOX reports: Abnormal Use of Service Accounts and Abnormal Termination of Database Activity.

- 1 .Click the triangle icon of the **Audit Settings** section to expand.
- 2 .In the **User Audit Options** section, select a target from the **Browse by target** dropdown list. You can enter a user name in the **Enter user** field.
- 3 .Click the right arrow to move the selection to the Selected Objects table.



Note: If you want to remove the objects from the Selected Objects list, select the object you want to remove and click the left arrow.

- 4 .Click **Save**.

DAM Alert/Audit Policy Groups

Both DAM Alert and Audit policies can use Policy Group to manage a group of policies

The Policy Groups page displays all policy groups with groups names and descriptions.

In the policy group page, you can:

- Add a new policy group by selecting **Add**. See [Adding a New Policy Group](#)
- Modify the policy group by selecting the group name. See [Modifying the Existing Policy Groups](#)

- Delete the user-defined policy groups by selecting the group and click **Delete**.

This table shows which policies are included in the DAM per-defined policy groups.

Policies\Groups	Compliance Policies	Data Policies	Metadata Policies	Privilege Policies
Compliance	X			
Database(Audit)		X		
Table		X		
Table Column		X		
Session		X		
User		X		
Database Query(Alert)		X		
Metadata			X	
Privilege				X

Adding a New Policy Group

This topics describe adding a new policy group.

- 1 .Go to **Policy > DAM Alert/Audit Policy Groups**
- 2 .In the Policy Groups page, click **Add**.
- 3 .Enter a policy group name in the Group Name field (required).
- 4 .(optional) Enter descriptions in the Description field to describe your filtering/grouping criteria.
- 5 .Create a filtering condition by taking the following steps:
 - a) Select a column on the **Column** dropdown on which you would like to filter.
 - b) Select an operator from the **Operator** dropdown that associates the column you selected.
 - c) Select a value from the **Value** dropdown that the **Column** must match, and click the right arrow to move the selection to the right box.
 - d) You can add or subtract, respectively, filtering criteria rows by selecting the **+ (plus)** or **- (minus)** buttons.



Note: In order to cancel creating a new policy-group filter and go back to the main **Policies** page, select the **Cancel** button.

Here are some examples of filtering criteria:

Column	Operator	Value	Return Possibilities
Database Type	Equals	DB2	All policies associated with DB2 databases
Policy Type	Equals	Metadata Policies	Metadata policies associated with DB2 databases

- 6 .To test your filtering criteria, select the **Search** button.
- 7 .To save the group you created, select the **Save Group** button.



Note: In order to modify an existing group, select the **Name** of the group on the **Alert/Audit Policy Groups** page.

- 8 .Associate the policy group to a target database.
 - a) Select the Targets tab.
 - b) Select the targets to be associated with the policy group, and click the right arrow to move the selection to the right box.
- 9 .Click **Save**.

Modifying the Existing Policy Groups

This topics describe modifying the existing policy group.

- 1 .Go to **Policy > DAM Alert/Audit Policy Groups**
- 2 .In the Policy Groups page, click on the name of the policy group you want to modify.
- 3 .Modify the filtering condition by taking the following steps:
 - a) Select a column on the **Column** dropdown on which you would like to filter.
 - b) Select an operator from the **Operator** dropdown that associates the column you selected.
 - c) Select a value from the **Value** dropdown that the condition must match, and click the right arrow to move the selection to the right box.
 - d) You can add or subtract, respectively, filtering criteria rows by selecting the **+** (**plus**) or **-** (**minus**) buttons.



Note: In order to cancel creating policy-group filter and go back to the main **Policies** page, select the **Cancel** button.

- 4 .To test your filtering criteria, select the **Search** button.
- 5 .To save the group you created, select the **Save Group** button.
- 6 .Modify the target databases associated to the policy group.
 - a) Select the **Targets** tab.
 - b) Modify the selected target databases by selecting the target name first and either the right arrow or the left arrow to move the selection.
- 7 .Click **Save**.

Deleting the Policy Group

This topics describe deleting the existing user-defined policy groups. Pre-defined policy groups cannot be deleted.

- 1 .Go to **Policy > DAM Alert/Audit Policy Groups**
- 2 .In the Policy Groups page, select the checkbox(es) of user-defined policies.



Note: The pre-defined policy groups will not be deleted.

- 3 .Click **Delete**.
The policy will be deleted from the list.

Vulnerability Assessment

Adding (or Modifying) Assessments



This topic describes the task of adding (or modifying) FortiDB assessments. For a successful assessment, you must:

- Create, or use an existing, target-base group which contains at least one valid target database
- Create, or use an existing, policy group which contains at least one working policy



Note:

- FortiDB does not perform an automatic session timeout after a certain period of time has elapsed. For example, if you leave assessment results on your screen while at lunch, unauthorized individuals could see this information. Therefore, you should logout or close your browser if you expect to leave your machine unattended.
- Items marked with an asterisk (*) on data-entry forms are mandatory.

- 1 .Go to the **Assessments** page by selecting the **Assessments** link in the **Assessment Management** section on the left-side tree-navigation menu.
- 2 .Select the **Add** button. (or, to modify a user, select the **Name** of the assessment you would like to change.)
- 3 .On the subsequent **Assessment** page (**General** tab) , enter the requested items: an **Assessment Name** so that you can reuse it later and (optionally) a **Description** of your assessment. Then configure your assessment using the tabs on the web page.
- 4 .In the **Targets** tab, specify which target-database groups you want to assess.
 - a) Select one or more target-database groups from the **Available Target Groups** list on the left and add them to the **Assigned Target Groups** list by selecting the  button. In order to remove a target-database group from **Assigned Target Groups** list on the right, select the  button.
- 5 .In the **Policies** tab, specify which target-database groups you want to assess.
 - a) Select one or more target-database groups from the **Available Policy Groups** list on the left and add them to the **Assigned Policy Groups** list by selecting the right-arrow button. (In order to remove a policy group from the **Assigned Policy Groups** list , select the left-arrow button.)
 - b) In order to see the policies associated with a policy group, select the group of interest in either the **Available Policy Groups** list or the **Assigned Policy Groups** list. The list of policies should then show up in the **Active Policies** list on the right.

Running Assessments

This topic explains how to run an assessment immediately and via a schedule.

On the **Scheduling** tab of the **Assessment** page, select either the **Run once** radio button, which enables you to specify the time and date for a single assessment run, or the **Recurring** radio button, which enables you to schedule a series of assessments.

Running an Assessment Immediately

- 1 .Go to the **Assessments** page.
- 2 .Select the assessment of interest.

- 3 .Select the **Run** button.

Running an Assessment At a Specified Date and Time

- 1 .After you select the **Run once** radio button:
 - a) In the **Starts at** field group, specify a starting date directly, use the default, or alternatively, select the calendar icon, and then select a date.
- 2 .Select the **Enable Schedule** checkbox if you want to activate your schedule. (By default, your assessment schedule is disabled so that you can configure it without activating it.)
- 3 .Select the **Save** button to save your schedule.

Running Scheduled Assessments

- 1 .After you select the **Recurring** radio button:
 - a) In the **Starts at** field group, specify a starting date directly, use the default, or alternatively, select the calendar icon, and then select a date.
- 2 .Select one of the radio buttons in the **Recurrence pattern** field group.
 - If you choose the **Hourly** radio button, you can then specify the hourly interval in the **Every ___ hours** field.
 - If you choose the **Daily** radio button, you can then specify the daily interval in the **Every ___ days** field.
 - If you choose the **Weekly** radio button, you can then specify the day(s) of the week on which you want your weekly assessments to run.
 - If you choose the **Monthly** radio button, you can then specify which day(s) during which month(s) you want your assessment to run. The **Day** radio button and adjacent dropdown list allows you to specify the numeric day for your assessment to run in each specified month. Alternatively, you may specify the day in each month, such as the 'first Monday', using the two provided dropdown lists.
 - a) In the **Starts at** field group, specify a starting time or use the default.
 - b) In the **Recurrence pattern** field group, select the **Hourly** , **Daily** , **Weekly** , or **Monthly** radio button.
 - c) In the **Ends by** field group, you can leave the default **No end date** radio button selected or select the **End by** radio button and then specify a particular date at which you want your schedule to end by selecting on the calendar icon.
- 3 .Select the **Enable Schedule** checkbox if you want to activate your schedule. (By default, your assessment schedule is disabled so that you can configure it without activating it.)
- 4 .In the Administrative Domains section, you can select which users this scheduled task will be applicable for. Remember that users may only manage specific targets, so this section provides a way to perform assessments on particular targets. If one or more of the selected users manages all targets, then assessments will be performed on all applicable targets for this VA scan.
- 5 .Select the **Save** button to save your schedule.

Assessment Notifications

This topic describes the task of configuring how and to whom assessment notifications will be sent. You can choose email and/or SNMP-trap notifications of these issues.

- 1 .In the **Desired Notification format(s)** section of the **Notifications** tab, select the **Target Level** (default) and/or the **Rule Level** checkbox(es).
 - Target-level notifications contain a target-database-level summary of issues discovered during the assessment.
 - Rule-level notifications contain detail for every discovered issue.

2 .Select the **Enable Email** and/or the **Enable SNMP Trap** checkbox(es) in order to enable email and/or SNMP notifications, respectively, of assessment-discovered issues.

- a) For email notifications, you must designate one or more email receivers. Select one or more of the entries in the **Available Receivers** list box and add them to the **Selected Receivers** list on the right by selecting on the right-arrow button.



Note:

- When the email receiver cannot be reached, it is your email server's responsibility to retry sending the email.
- In order to remove receiver(s), select them in the **Selected Receivers** list and select the left-arrow button.
- In order to see the details associated with any receiver, select the name of a receiver in either the **Available Receivers** or **Selected Receivers** lists and those details will appear in **Receiver Details** list on the right.

- b) For SNMP notifications, you should set the **Notification** properties in the **System Configuration** component of the FortiDB application.



Note: The non-appliance version of FortiDB ships with MIB files in the `$FortiDB_HOME/etc/snmp` directory.

3 .(Optional) If you want to attach reports to the e-mail notification, go to the **Reports** tab and select the **Attach reports to selected e-mail receivers** checkbox, and make sure to select one or more report(s) and format(s). Note that the **Enable Report Generation to Disk** option is not required to be selected to use this capability.

Notification OIDs for Target-Level Assessments

Here are OIDs, and their descriptions, for target-level assessment notifications.

An example of a trap for a target-database-level SNMP notification:

```
DISMAN-EVENT-MIB::sysUpTimeInstance = Timeticks: (3) 0:00:00.03
SNMPv2-MIB::snmpTrapOID.0 = OID: SNMPv2-SMI::enterprises.12356.104.0.6
SNMPv2-SMI::enterprises.12356.104.0.105 = STRING: "Tue Dec 04
17:38:15 PST 2007"
SNMPv2-SMI::enterprises.12356.104.0.107 = STRING: "Test Target"
SNMPv2-SMI::enterprises.12356.104.0.123 = STRING: "Test
Assessment"
SNMPv2-SMI::enterprises.12356.104.0.124 = STRING: "jdoe.fdb.com"
SNMPv2-SMI::enterprises.12356.104.0.125 = STRING: "158"
SNMPv2-SMI::enterprises.12356.104.0.126 = STRING: "36"
SNMPv2-SMI::enterprises.12356.104.0.127 = STRING: "10"
SNMPv2-SMI::enterprises.12356.104.0.128 = STRING: "0"
SNMPv2-SMI::enterprises.12356.104.0.129 = STRING: "2"
SNMPv2-SMI::enterprises.12356.104.0.130 = STRING: "4"
SNMPv2-SMI::enterprises.12356.104.0.131 = STRING: "20"
```

The OID descriptions:

OID	Meaning
SNMPv2-SMI::enterprises.12356	Fortinet enterprise ID
SNMPv2-SMI::enterprises.12356.104	FortiDB product ID
SNMPv2-SMI::enterprises.12356.104.0.6	VA Alert Trap/Notification

OID	Meaning
SNMPv2-SMI::enterprises.12356.104.0.105	assessment Time
SNMPv2-SMI::enterprises.12356.104.0.107	Target Name
SNMPv2-SMI::enterprises.12356.104.0.123	Assessment Name
SNMPv2-SMI::enterprises.12356.104.0.124	FortiDB host name
SNMPv2-SMI::enterprises.12356.104.0.125	Policy count
SNMPv2-SMI::enterprises.12356.104.0.126	Total Failed Count
SNMPv2-SMI::enterprises.12356.104.0.127	Critical failure count
SNMPv2-SMI::enterprises.12356.104.0.128	Major failure count
SNMPv2-SMI::enterprises.12356.104.0.129	Minor failure count
SNMPv2-SMI::enterprises.12356.104.0.130	Caution failure count
SNMPv2-SMI::enterprises.12356.104.0.131	Informational count

Notification OIDs for Rule-Level Assessments

Here are OIDs, and their descriptions, for rule-level assessment notifications.

An example of formatted traps for a rule-level SNMP notification.

```
DISMAN-EVENT-MIB::sysUpTimeInstance = Timeticks: (73) 0:00:00.73
SNMPv2-MIB::snmpTrapOID.0 = OID: SNMPv2-
SMI::enterprises.12356.104.0.8
SNMPv2-SMI::enterprises.12356.104.0.123 = STRING: "Test
  Assessment "
SNMPv2-SMI::enterprises.12356.104.0.107 = STRING: "Test Target "
SNMPv2-SMI::enterprises.12356.104.0.124 = STRING: "jdoe.fdb.com"
SNMPv2-SMI::enterprises.12356.104.0.105 = STRING: "Thu Dec 06
  16:26:26 PST 2007"
SNMPv2-SMI::enterprises.12356.104.0.125 = STRING: "158"
SNMPv2-SMI::enterprises.12356.104.0.126 = STRING: "36"
SNMPv2-SMI::enterprises.12356.104.0.127 = STRING: "10"
SNMPv2-SMI::enterprises.12356.104.0.128 = STRING: "0"
SNMPv2-SMI::enterprises.12356.104.0.129 = STRING: "2"
SNMPv2-SMI::enterprises.12356.104.0.130 = STRING: "4"
SNMPv2-SMI::enterprises.12356.104.0.131 = STRING: "20"
```

An example of the trap with the rule information:

```
DISMAN-EVENT-MIB::sysUpTimeInstance = Timeticks: (84) 0:00:00.84
SNMPv2-MIB::snmpTrapOID.0 = OID: SNMPv2-
SMI::enterprises.12356.104.0.6
SNMPv2-SMI::enterprises.12356.104.0.132 = STRING: "6501"
SNMPv2-SMI::enterprises.12356.104.0.102 = STRING: "MINOR"
SNMPv2-SMI::enterprises.12356.104.0.103 = STRING: "DVA ORCL 01.01
  Lock and Expire
  Unused Default Accounts"
SNMPv2-SMI::enterprises.12356.104.0.106 = STRING:
  "VA@jdoe.fdb.com"
SNMPv2-SMI::enterprises.12356.104.0.107 = STRING: "Test Target "
```

```
SNMPv2-SMI::enterprises.12356.104.0.123 = STRING: "Test
Assessment"
SNMPv2-SMI::enterprises.12356.104.0.105 = STRING: "Thu Dec 06
16:26:26 PST 2007"
```

The OID descriptions:

OID	Meaning
SNMPv2-SMI::enterprises.12356	Fortinet enterprise ID
SNMPv2-SMI::enterprises.12356.104	FortiDB product ID
SNMPv2-SMI::enterprises.12356.104.0.6	VA Alert Trap/Notification
SNMPv2-SMI::enterprises.12356.104.0.8	VA Target Level Alert Trap/Notification
SNMPv2-SMI::enterprises.12356.104.0.102	Severity
SNMPv2-SMI::enterprises.12356.104.0.103	Policy Name
SNMPv2-SMI::enterprises.12356.104.0.105	Assessment Time
SNMPv2-SMI::enterprises.12356.104.0.106	Application name@ server name
SNMPv2-SMI::enterprises.12356.104.0.107	Target Name
SNMPv2-SMI::enterprises.12356.104.0.123	Assessment Name
SNMPv2-SMI::enterprises.12356.104.0.107	Target Name
SNMPv2-SMI::enterprises.12356.104.0.124	FortiDB host name
SNMPv2-SMI::enterprises.12356.104.0.125	Policy count
SNMPv2-SMI::enterprises.12356.104.0.126	Total Failed Count
SNMPv2-SMI::enterprises.12356.104.0.127	Critical failure count
SNMPv2-SMI::enterprises.12356.104.0.128	Major failure count
SNMPv2-SMI::enterprises.12356.104.0.129	Minor failure count
SNMPv2-SMI::enterprises.12356.104.0.130	Caution failure count
SNMPv2-SMI::enterprises.12356.104.0.131	Informational count
SNMPv2-SMI::enterprises.12356.104.0.132	Policy ID

Assessment Reports

This topic describes the task by which you choose which reports you want for your assessment. For example, you might want just a Summary Report, just a Detailed Report, or both.

- 1 .Go to **Assessment Management > Assessment**
- 2 .Select one of the Assessment name.
- 3 .Click the **Reports** tab.
- 4 .Specify which report you want for your assessment.
 - a) Select one or more report groups from the **Available Reports**: list on the left and add them to the **Selected Reports** list box by clicking on the right-arrow button. (In order to remove a report from the **Selected Reports** list, select the left-arrow button.)



Note: In order to see a report description, select the report of interest in the **Selected Reports** list box and then the description should show up in the **Report Description** list box on the right.

b) Check the **Enable Report** checkbox.

5 .In the **Report formats** field group:

a) Enable one or more of the following checkboxes: **PDF (.pdf)** (the default), **Excel (.xls)**, **Comma Delimited (.csv)**, and/or **Tab Delimited (.txt)**.

6 .Select the **Save** button

Evaluating Assessment Results and Aborting Assessments

The **Results** tab of the **Assessment** page allows you to review assessment results and to abort assessments.

1 .Select an assessment's **Start Time** (in the top table) in order to view the target databases involved.

2 .To see target-specific results, select a name in the **Target** column in the bottom table.

3 .You can abort an entire assessment or the assessment of a particular target on this tab.

- In order to abort an entire assessment, check the row of interest in the top table and then select the **Abort** button below that table.
- In order to abort the assessment of a particular target database within an assessment, after clicking on an assessment's **Start Time** in the top table, check the row of interest in the bottom table and then select the **Abort** button below the bottom table.

Assessment Results

The **Results** tab shows you the status and other information about your assessments, completed or not.







Column Descriptions

The Results tab shows the following columns:

Column Name	Description
Status	The current status of the assessment
DB Type	The type of your target database
Failed (Cri,Maj,Min,Cau)	The number of failed policies by Severity type where: <ul style="list-style-type: none"> • Cri is Critical • Maj is Major • Min is Minor • Cau is Cautionary
Passed	The number of passed policies
Informational	The number of Informational policies
Errors	The number of policies for which errors were returned
Total	The total number of policies incorporated by the assessment

Status Icons

Assessments can be in any one of the following states:

Status-Column Icon	Description
	Running
	Idle
	Queued
	Completed
	Error
	Aborted

Deleting Assessments

This topic describes how to delete previously run assessments.

- 1 .Go to the **Assessments** page.
- 2 .Select the checkbox(es) corresponding to the assessment(s) you want to delete.
- 3 .Select the **Delete** button.

VA Global Summary

The Global Summary page displays the summary information for all targets.

The summary information includes statistics of assessments, and vulnerabilities found by assessment.

If you run more than once assessments to same target, this global summary only summarizes the latest one assessment.

For found vulnerabilities (failed checking items in assessment scan), this page also displays category statistics, includes by severity, classification, and by database type.

Assessment History

The Assessment History page displays the run assessments and scheduled reports in disk.

Assessment History

Display all run assessment in this list page.

Click the link of **Target** to view the Detailed Report of this assessment.

Select the assessment record(s), click the **Delete** button to delete.

Scheduled Reports

When enable the option "**Save Scheduled Assessment Report to Disk File**" in **Assessment -> Report** tab, the selected report files will be saved in disk after running the scheduled assessment.

Go to **Scheduled Reports** tab page, to download report files, or delete.

Import/Export Assessment History

FortiDB allows you to export the assessment result as a XML file, and allow to import assessment result from the XML file, which exported from this FortiDB, even another instance of FortiDB.

To export assessment result to XML file:

- 1 .Input the date range: assessments run between this date range, from the 1st date 0:00 to 2nd date 0:00(not include result in 2nd date).
- 2 .Input the **Prefix** as XML filename prefix, optionally.
- 3 .Click **Export** button to export, and save the download XML file.

To import assessment result from XML file:

- 1 .Click the **Import** button to goto **Import Assessments History** page.
- 2 .Choose your exported XML file.
- 3 .Click **Import** button to import.
- 4 .Click **Back** button to back to **Assessments History** page.



Note: If you import the XML export from another FortiDB, it might contain its own Target Databases information, which not managed by current FortiDB. The Assessment History Import will import these Target Databases as **Imported Shadow Targets**, which can be used for assessment reporting, but will not be added into Target list, and cannot managed by current FortiDB.

VA Privilege Summary

This topic describes how to display and export the Privilege Summary.

In order to view the Privilege Summary, you must have the Operations Manager role.

The Privilege Summary shows who has access to what in your target databases. As such, it can:

- Help you establish a baseline for your security system
- Show you if any users have more privileges than they need in order to do their jobs
- Show you if any roles (or, for DB2, groups) include more privileges than necessary
- Provide a common place to review privilege assignments for all FortiDB-supported target DB types
- Eliminate the need to execute the SQL statements to get privilege-assignment information

- 1 .In order to display the **Privilege Summary** page, select the **Privilege Summary** link in the **Assessment Management** section of the left-side tree-navigation menu.
- 2 .From the **Target Group** dropdown list, select the target-database group containing the target database for which you want to see a Privilege Summary.
- 3 .From the **Target** dropdown list , select the target database for which you want to see a Privilege Summary.



Note: MS SQL Server and Sybase targets may be accessed individually via database-level connections or, as a group, via server-level connections

- 4 .From the **Database Name** dropdown list , select the name of the database for which you want to see a Privilege Summary.
- 5 .Select the **Users** tab in order to see a list of users, or the **Roles** tab in order to see a list of roles, for the database whose name you selected .



Note:

- MySQL does not support roles or groups of privileges. There is no role tab for MySQL target databases.

- In MySQL a user is identified by a combination of a user name and host name, such as `root@localhost`, or `navicat@172.21.12.3`. Therefore two users with the same name but at different hosts, can have different privileges.
- a) Once you have selected a user or role, you can then use the **Privilege Type** or **Classification** dropdown lists in order to filter the displayed information.
The subsequently available privilege information depends on:
 - FortiDB-user access having already been given to certain target-database system tables, catalogs, and/or views. (See the **Target Privilege Matrix** for a list of the appropriate tables.)
 - The particular combination of Privilege Type and Classification choices you make. (See the **DB-Type Distinctions** link below for more information on these choices.)
 - b) Optionally, you may export most of the information displayed when viewing a Privilege Summary. You may choose among these file formats:
 - PDF (**Portrait** (the default) or **Landscape** orientation)
 - Tab-delimited (.txt)
 - Comma-separated-values (.csv)

DB-Type Distinctions

The Privilege Summary varies slightly by the DB type of the target database.


General Differences

There are differences by RDBMS type:

- The **Users** tabs are used for all RDBMS types.
- The **Roles** tab are used for all RDBMS types, except for MySQL which does not support roles. For DB2 target database, **Roles** means Groups.

Filtering Differences

After selecting a specific user name on the **Users** tab, or a specific role on the **Roles** tab, you can filter the displayed privilege information via:

- For Oracle, DB2, MS SQL Server, and Sybase, the **Privilege Type** dropdown offers these choices:
 - **Direct** which refers to privileges that have been directly assigned (i.e., not via roles) to the selected user name
 - **Indirect** which refers to privileges that have been assigned via roles to the selected user name
-  **Note:** MySQL applies the **Direct** type only.
- For Oracle, the **Classification** dropdown offers these choices:
 - **Object Privileges** which refers to privileges that pertain to a specific schema or object
 - **System Privileges** which refers to privileges that do not pertain to a specific schema or object
- For DB2, the **Classification** dropdown offers these choices:
 - **Column Auth** which refers to privilege information on certain columns
 - **DB Auth** which refers to privilege information on certain databases
 - **Index Auth** which refers to privilege information on certain indexes
 - **Package Auth** which refers to privilege information on certain packages
 - **Schema Auth** which refers to privilege information on certain schemas
 - **Table Auth** which refers to privilege information on certain tables
 - **Tablespace Auth** which refers to privilege information on certain tablespaces

- For MySQL, the **Classification** dropdown offers these choices:
 - **Column Level** which refers to privilege information on certain columns. Granting/Revoking grant option is applied for all privileges within the same table only.
 - **Schema Level** which refers to privilege information on certain databases. Granting/Revoking grant option is applied for all privileges.
 - **Table Level** which refers to privilege information on certain tables. Granting/Revoking grant option is applied for all privileges within the same table only.
 - **User Level** which refers to privilege information applied to all databases on the database server. Granting/Revoking grant option is applied for all privileges.

Column and Column-Value Differences

The column names and values used by the Privilege Summary vary by the DB type of your target database. For more information, see the documentation provided by your database vendor for system tables, views, and/or catalogs.

Sensitive Data Discovery

This topic describes the sensitive data discovery.



Note: This feature is only working with Oracle and MSSQL target database. And you need define target database before using this feature.

Manage Sensitive Data Discovery

Before starting define/run sensitive data discovery, you must define and enable **Data Discovery Policy** first, and add policies to group(s).

See [Data Discovery Policies and Policy Groups](#) for data discovery policy management.

Go to **Vulnerability Assessment > Sensitive Data Discovery** to manage data discovery.

In the list page:

- Status: indicates discovery is running (active) or not(inactive).
- Data Discovery Policy Group: which policy groups are assigned to this discovery.
- Last Discovery: Last discovery time and found result, click to view detail report.

Click 'Target Name' in list to add/modify data discovery:

- Target tab: select database metadata as discovery object(s).
- Policy Group tab: select discovery policy group to assign to this discovery.
- Result tab: after run discovery, check this tab for result summary.

And click 'Save' button to save discovery definition.

Run Sensitive Data Discovery

In discovery add/modify page, click 'Save & Start Scan' button to save and start discovery.

In discovery list page, select one or more discovery with checkbox(es), click 'Start Scan' button to start discovery, click 'Stop Scan' button to stop.

Sensitive Data Discovery Report

There are two pre-defined data discovery reports - detailed and summary report.

In discovery list page, click result link in 'Last Discovery' column, to view detailed report.

Go to **Report > Pre-Defined VA Reports**, click 'Sensitive Data Discovery Detailed Report', or 'Sensitive Data Discovery Summary Report', to view or export report.

Local Assessment Log

The Local Assessment Log page lists events log of Vulnerability Assessment(VA) and Sensitive Data Discovery(SDD).

The Assessment logs include information of Date, Module (VA or SDD), Assessment, Target, Severity, Action, Result/Description.

In the Local Assessment Logs page, you can:

- Display logs filtered by module (VA or SDD) that you select from the **Module** dropdown list.
- Display logs filtered by Assessment name(for VA only) that you select from the **Assessment** dropdown list.
- Display logs filtered by Target that you select from the **Target** dropdown list.
- Display logs filtered by Severity that you select from the **Severity** dropdown list.
- Display logs filtered by Action that you select from the **Action** dropdown list.
- Display logs filtered by the date range you select from the **From** and **To** fields.
- Display Date, Policy name, Target, Type, Severity, and description for each error.
- Export the logs view you selected, by selecting **Export**
- Delete all logs by selecting **Delete All**
- Configure the History Prune - specify the number of days after which to delete the log entries. The default number is 30 (days).











Database Activity Monitoring


Target Monitoring Management

The Monitoring Management page provides a centralized management for monitoring target databases. You can view monitoring status, policies you configured, start and stop monitoring. You can also associate policy groups to your target databases and view generated alerts.

Monitoring List Page

The following table describes columns, buttons, and icons used in the Monitoring Management page.

Columns	Descriptions
Status	<ul style="list-style-type: none">  indicates the target has not been initialized for monitoring. Goto monitoring configuration page to setup monitoring.  indicates the target is not monitored.  that monitoring is starting  indicates that monitoring is stopping.  indicates the target is being monitored but some of the policies could not be applied.  indicates that monitoring is active.  indicates that monitoring is not running. An attempt to start the monitor failed.  indicates that the FortiDB is has disconnected from the target. The target database maybe not available, or disconnected from FortiDB agent (if using agent as collection method).
Name	Target name. Click to configure monitoring.
DB Host Name/IP	Database host name or IP address of your target database machine
DB Type	Database type of your target. ORACLE, MSSQL, DB2, SYBASE, or MYSQL
Collection Method	Collection method used for monitoring
Alert Policy Groups	Alert Policy Groups Associated for alerting
Action	<ul style="list-style-type: none">  configure monitoring, same as click Name.  show the Alerts of this target.



Columns	Descriptions
	<ul style="list-style-type: none">  show the Local Monitoring Logs of this target



Buttons and Fields

Buttons and Fields	Descriptions
View dropdown	Filters a display of the target list
Start Monitoring	This button starts monitoring for the target database. You must select the target first.
Stop Monitoring	This button stops monitoring. You must select the target first.
Restart	This button stops then starts monitoring.

Monitoring Configuration

Click on each target name to enter the monitoring configuration page, to configure the monitoring. The following tabs and functionalities are available for monitoring configuration:

Tabs	Purposes
General	Settings of audit configuration for each target database. You can start and stop monitoring and auditing in this page. It also shows monitoring and auditing status.
Alert Policies	Shows the available alert policies with information, such as policy type, status, name, and severity. You can create Data policies from this page, and enable/disable policies for the target.
Alert Policy Groups	Associate the alert policy group to your target database.
Audit Policies	Shows the available audit policies with information. You can create Data policies, or enable/disable policies from this page.  Note: This tab will be only available for collection method "TCP/IP Sniffer" for Oracle, MSSQL, Sybase and DB2.
Audit Policy Groups	Associate the audit policy group to your target database.  Note: This tab will be only available for collection method "TCP/IP Sniffer" for Oracle, MSSQL, Sybase and DB2.
Query Schedule	Enable/Disable schedule for Database Query Policy, which is a type of Data Policy of Alert Policies. And configure the schedule detail.
Alert Notification	Configure Alert Notification for monitoring.
Real Time Blocking	Enable/Disable Real Time Blocking for monitoring with TCP/IP Sniffer, and configure blocking settings.
Audit Management	For Oracle, this page shows the issued audit command and all audit commands for each object. For MS SQL Server, this page shows audited events and audited filters used by FortiDB. This page is not applicable for Sybase.

Tabs	Purposes
	 Note: This tab will be only available for collection method "DB, EXTENDED" or "XML File Agent" for Oracle, "SQL Trace" for MSSQL, or "DB2 Agent" for DB2.
White List	<p>In the White List tab, you can configure data policies, which will be automatically excluded from the Alert Policy settings for Oracle or MSSQL Server.</p>  Note: This tab will be only available for collection method "DB, EXTENDED" for Oracle, "SQL Trace" for MSSQL. After Monitor started, the SQL action matching with the white list settings, fortidb will not generate alerts for it. The SQL action matching the white list settings should be known secure action.

General tab

The General tab shows Audit configuration information and monitoring status for each target database.

Audit Configuration

Set the audit configuration, see [Choosing a Collection Method](#) for detail.

The **Test** button is available for some collection method, click to verify the connection.

Click **Save** button to save after setting audit configuration.

Start/Stop Monitoring

This field allows you to start or stop monitoring. The following buttons and information are available:

Fields	Description
Start Monitoring or Stop Monitoring	If you click this button, monitoring starts or stops.
Start monitoring when FortiDB starts	If you select this checkbox, monitoring automatically starts when FortiDB starts.
Monitoring Status	Indicates the following monitoring status: <ul style="list-style-type: none"> • Running • Need Restart: need restart monitoring to apply policy change • Idle • Terminating • Terminated • INIT (Initializing)
Status Message	Indicates information related to the status of monitoring or auditing


Choosing a Collection Method

This topic describes monitoring and auditing options to choose a collection method for your target database.

- See [Required Settings for Monitoring Target Databases](#) for required settings.
- To use **TCP/IP Sniffer** for monitoring and activity auditing/profiling, see [Configuring Monitoring with TCP/IP Sniffer](#)


Oracle Audit Configuration

FortiDB can collect audit information using several methods. Select the type of agent you have configured your target with. The **Test** button will confirm that FortiDB can monitor your system with the type you select. For details, see [Configuring the Oracle Target Database](#)

Fields	Descriptions
Collection Method	<p>You can select one of the following options:</p> <ul style="list-style-type: none"> • DB,EXTENDED • XML File Agent • SGA Agent (for Oracle 10gR2 on Solaris only) • Net Agent • TCP/IP Sniffer(available with FortiDB appliance only) <p>Click the Test button to confirm the connection with the method you selected (not for 'TCP/IP Sniffer').</p>
Polling Frequency (ms)	<p>Polling frequency for audit collection. This field applies only DB,EXTENDED collection methods.</p> <p> Note: When you change the value of Polling frequency, you must stop and start monitoring.</p>
TCP/IP Sniffer Settings	<p>Specify:</p> <ul style="list-style-type: none"> • Target database version • FortiDB port connecting to network switch's SPAN port • Enable/Disable Activity Auditing and Activity Profiling options. <p>See Configuring Monitoring with TCP/IP Sniffer for detail</p>

MS SQL Server Audit Configuration

FortiDB uses SQL Trace for collecting audit information. Select SQL Trace as the Collection Method. You must specify the folder where your server writes the trace information. For details, see [Configuring the MS SQL Server Target Database](#)

Fields	Descriptions
Collection Method	<ul style="list-style-type: none"> • SQL Trace - Click the Test button to confirm the connection with the method you selected. • Net Agent • TCP/IP Sniffer(available with FortiDB appliance only)
Trace Folder	<p>Enter the full path of the audit trace folder here.</p>
Polling Frequency (ms)	<p>Polling frequency for audit collection. This field applies only SQL Trace collection methods.</p> <p> Note: When you change the value of Polling frequency, you must stop and start monitoring.</p>

Fields	Descriptions
TCP/IP Sniffer Settings	Specify: <ul style="list-style-type: none"> Target database version SSL Certification Private Key file and Key Password, for encrypted connection FortiDB port connecting to network switch's SPAN port Enable/Disable Activity Auditing and Activity Profiling options. See Configuring Monitoring with TCP/IP Sniffer for detail


DB2 Audit Configuration

FortiDB uses the DB2 agent for collecting audit information. You must configure your DB2 system for auditing. In addition you must install and start the FortiDB DB2 audit agent. For details, see [Configuring the DB2 Target Database](#)

Fields	Descriptions
Collection Method	<ul style="list-style-type: none"> DB2 Agent Click the Test button to confirm the connection with the method you selected. <ul style="list-style-type: none"> TCP/IP Sniffer(available with FortiDB appliance only)
TCP/IP Sniffer Settings	Specify: <ul style="list-style-type: none"> Target database version FortiDB port connecting to network switch's SPAN port Enable/Disable Activity Auditing and Activity Profiling options. See Configuring Monitoring with TCP/IP Sniffer for detail

Sybase Audit Configuration

FortiDB uses the Sybase Monitoring and Data Access (MDA) tables for collecting audit information. You must configure your server to enable MDA. For details, see [Configuring the Sybase Target Database](#)

Fields	Descriptions
Collection Method	<ul style="list-style-type: none"> MDA Click the Test button to confirm the connection with the method you selected. <ul style="list-style-type: none"> TCP/IP Sniffer(available with FortiDB appliance only)
Polling Frequency (ms)	Polling frequency for MDA audit collection method.  Note: When you change the value of Polling frequency, you must stop and start monitoring.
TCP/IP Sniffer Settings	Specify: <ul style="list-style-type: none"> Target database version FortiDB port connecting to network switch's SPAN port Enable/Disable Activity Auditing and Activity Profiling options.

Fields	Descriptions
	See Configuring Monitoring with TCP/IP Sniffer for detail

MySQL Audit Configuration

FortiDB uses the MySQL general log for collecting audit information. You must configure your server to enable MySQL general log. For details, see [Setting MySQL General Log](#)

Fields	Descriptions
Collection Method	General Log Click the Test button to confirm the connection with the method you selected.

Alert Policies and Audit Policies

In the Alert/Audit Policies tab, you can configure data policies, which will be automatically belong to a new policy group and associated to the target you selected.



Note: Audit Policies is available only for TCP/IP Sniffer.

The page lists policies available for this target's monitoring.

- Select one or more policies, click **Enable** or **Disable** button to enable/disable them.
- Select user defined policies, click **Delete** button to delete.
- Select policy type in **Data Policies** dropdown list, click **Add** button to create new data policy.
- Click policy name of one policy to edit.
- Click **Restart** button to restart monitoring after policy change.

See [DAM Policy Management](#) for detail DAM Alert and Audit Policy.

Associating Policy Groups to Target Monitoring

For Alert Policy Groups, Data, Metadata, and Privilege policies are automatically associated to your target databases monitoring. When you configure policies, you do not need to manually associate. However, Compliance policies are not automatically associated to your targets. For Audit Policy, no group is associated to target by default. You need select group to associate to group before using the Policy based Activity Auditing. Take the following steps to associate the policy group to target databases monitoring.

- 1 .Make sure you have target connection, with allowing monitoring setting.
- 2 .Go to **DB Activity Monitoring > Monitoring Management**.
- 3 .Click on the target name. The Target Monitor:<target name> page will display.
- 4 .Select the **Alert/Audit Policy Groups** tab.
- 5 .Select the policy groups you want to associate to the target from the **Available Policy Groups** box..
- 6 .Click the right arrow to move the selection to the **Selected Policy Groups** box.
If you select each group name, the policies contained in selected policy group are shown in the right box.
- 7 .Select **Save**.

DB Query Policy Schedule

The Query Schedule tab allow setup schedule for Database Query Policy.

Database Query Policy is one type of user-defined DAM Alert Data Policy. See the [Configuring DB Query Policy for Alert](#) for detail.

Enable Schedule for Database Query Policy

Enable this option to run the Database Query Policy after starting monitoring.

Schedule Type, Start/End time and Recurrence Pattern

Select schedule type - Run Once, or Recurring

Input the date and time for starting.

For Recurring type of schedule, select Recurrence pattern

And select End by - No end date or input end date.

Alert Notification

The Alert Notification tab allow setup notification configurations for new alert.

The notification will be sent once FortiDB receives the monitoring alert.

If you want to filter the alerts in batch and send the report with notification email, go to the **DAM Report**, customize the Schedule and Notification for your report.

Email Notification

Enable this option to send notification email for alert.

For email notifications, you must designate one or more email receivers. Select one or more of the entries in the Available Receivers list box and add them to the Selected Receivers list on the right by selecting on the right-arrow button.

You need to set the following properties in the System Configuration.

- Email Server Host Name: enter your email server host name in the Value text box.
- Email Server Port: enter the email server port associated with the email server host property. The default is 25.

For details about the System Configuration, go to the System Configuration section.

SNMP Trap

Enable this option to send SNMP notification.

For SNMP notifications, you should set the following properties in the System Configuration.

- SNMP Receiver Host: enter the SNMP receiver host.
- SNMP Receiver Port : enter the SNMP receiver port number: the default is 162.

Syslog

Enable this option to send syslog packet to syslog server.

For Syslog notifications, you should set the following properties in the Global Configuration.

- Syslog Receiver Host: enter the Syslog receiver host.
- Syslog Receiver Port : enter the Syslog receiver port number: the default is 514.

ArcSight Syslog

Enable this option to send ArcSight CEF syslog packet to ArcSight server.

For ArcSight notifications, you should set the following properties in the Global Configuration.

- ArcSight Syslog Receiver Host: enter the ArcSight Syslog receiver hostname or IP address.

- ArcSight Syslog Receiver Port : enter the ArcSight Syslog receiver port number: the default is 514.

Following table lists the mappings from FortiDB event definitions to ArcSight data fields.

FortiDB Event Definition	ArcSight Event Data Field
Hostname	dhost
Source Hostname	shost
Alert Timestamp	rt
FortDB Hostname	dvchost
Severity	cat
Action	act
Return Code	cn1
Display ID	externalId
DB Type	cs1
System User	suser
DB User	duser
Login Name	cs3
DB Object	fname
Description	cs4
Target Database Name	cs5
Policy Name	cs6
Source Application	requestClientApplication
SQL Statement	msg

Real Time Blocking

The Real Time Blocking tab allow setup real time blocking for monitoring.

About Real Time Blocking

The Real Time Blocking feature is based on TCP/IP Sniffer. This tab will be only available when you select collection method "TCP/IP Sniffer".

FortiDB uses TCP/IP Reset(RST) mechanism to block the invalid access from database client to server. The invalid access is dynamically determined by checking the connection data, according to assigned Alert Policies.

Once blocking triggered, a critical Security Alert will be reported in same time.



Note: Please note that there is risk that using real time blocking - it might make your database client application, or application server, become unusable once blocking be fired. You must fully understand this feature and it's mechanism before starting to use it.

Settings

Settings are only configurable when the monitoring is stopped, and will take effect when monitoring starts up.

Check the **Enable Real Time Blocking** to enable real time blocking.

Enable the **Block Client for [x] minutes** option if you want to keep block the client for a duration (default value is 5 minutes): Once FortiDB detects the invalid access, FortiDB will keep reset the connection from this client without checking policy again, during this time period.

Select FortiDB network port for **TCP RST Blocking Port**. FortiDB must can reach the connection between database client and server through this port. If the client is behind firewall/router with NAT, the Reset packet will be send to the IP from firewall/router.

Assign Alert Policies for Real Time Blocking: Select one or more policies from **Available Policies** list, click " >> " to add into **Selected Policies** list, and use " << " to remove.

Click **Save** button to save your settings.


White List





In the White List tab, you can configure data policies, which will be automatically excluded from the Alert Policy settings for Oracle or MSSQL Server.




Note: This tab will be only available for collection method "DB, EXTENDED" for Oracle,"SQL Trace" for MSSQL.After Monitor started, the SQL action matching with the white list settings, fortidb will not generante alerts for it. The SQL action matching the white list settings should be known secure action.

Select the "Enable White List" checkbox to enable white list.

Options	Descriptions
Object Settings	<p>Exclude to alert any successful access to selected object(s). There are the following options to select objects:</p> <ul style="list-style-type: none"> Manually Select Object Browse Object by Target(default) <p>You can specify one or more objects as follows:</p> <ol style="list-style-type: none"> Select a target from the Target dropdown list. Select a schema from the dropdown list. Select one or more tables from the Tables list. Click the right arrow to move the selections to the Selected Objects list. <p> Note: If you want to remove the users from the selected objects list, select the objects you want to remove and click the left arrow.</p>
Login Name Settings	<p>Exclude to alert any successful access to selected object by certain login names.</p> <p>You can specify one or more login names as follows:</p> <ol style="list-style-type: none"> Select one or more login names from the login names list.

Options	Descriptions
	<p>2 .Click the right arrow to move the selections to the Selected login names list.</p> <p> Note: If you want to remove the login names from the selected login names list, select the login names you want to remove and click the left arrow.</p>
DB User Settings	<p>Exclude to alert any successful access to selected object by certain database users.</p> <p>You can specify one or more database users as follows:</p> <ol style="list-style-type: none"> 1 .Select one or more database users from the login names list. 2 .Click the right arrow to move the selections to the Selected database users list. <p> Note: If you want to remove the database users from the selected database users list, select the database users you want to remove and click the left arrow.</p>
OS User Settings	<p>Exclude to alert any successful access to selected object by certain OS users.</p> <p>You can specify one or more OS user names by typing the specific name or using a regular expression.</p> <ol style="list-style-type: none"> 1 .Input one OS user into the textbox. 2 .Click the right arrow to move the selections to the Selected users List. <p> Note: If you want to remove the OS users from the selected OS users list, select the OS users you want to remove and click the left arrow.</p>
Source Location Settings	<p>Exclude to alert any successful access to selected object from certain locations.</p> <p>You can specify one or more locations by typing the specific location or using a regular expression.</p> <ol style="list-style-type: none"> 1 .Input one Hostname or ip address into the textbox. 2 .Click the right arrow to move the selections to the Selected source locations list. <p> Note: If you want to remove the users from the selected users list, select the users you want to remove and click the left arrow.</p>
Application Settings	<p>Exclude to alert any successful access to selected object by certain client applications.</p> <p>You can specify one or more client applications by typing the specific client application or using a regular expression.</p> <ol style="list-style-type: none"> 1 .Input one application name or client ID into the textbox. 2 .Click the right arrow to move the selections to the Selected applications list.

Options	Descriptions
	 Note: If you want to remove the users from the selected users list, select the users you want to remove and click the left arrow.

Audit Management

The Audit Management tab displays the issued audit command history. Each target databases has a different style of Audit management.



Note: This tab will be only available for collection method "DB, EXTENDED" or "XML File Agent" for Oracle, "SQL Trace" for MSSQL, or "DB2 Agent" for DB2.

- [Oracle Audit Management](#)
- [MS SQL Server Audit Management](#)
- [DB2 Audit Management](#)
- Sybase MDA is not applicable for audit management

Oracle Audit Management

The Audit Management page for Oracle target databases displays the issued audit command history.

Statement Options

The Statement options section displays:

- Database User
- Audit Option
- Success
- Failure

Object Options

The Object options section displays all the audit commands, success or failure, for each object with:

- Object owner
- Object name
- Object type
- Access or Session on SELECT/INSERT/UPDATE/DELETE/EXECUTE/ALTER

The Refresh button is available to update the list.

Clear Audit Settings

FortiDB modifies the Oracle auditing system for monitoring the policies defined by the FortiDB user. These audit settings affect what is audited and affect how fast the SYS.AUD\$ table will fill. Under normal operating conditions FortiDB removes its settings when monitoring is stopped.

However is not uncommon for the AUDIT system to get cluttered with settings from other users that were not properly removed and are no longer needed - thus needlessly filling the SYS.AUD\$ table. FortiDB's clear audit setting feature removes all the audit settings. These are the settings are described above.

If FortiDB is the only client of the audit system then it is safe to use this feature to clear all audit settings. If other users need the audit settings you should not use the clear audit settings feature. To clear audit settings monitoring must be stopped. After clearing the settings the audit statement and audit options tables described above will be empty. If you then start FortiDB monitoring you will see only FortiDB's audit settings necessary for the enabled policies.

Audit Management

When using the Audit-based collection methods for Oracle, users may want to clear the audit settings that were set from previous operations if FortiDB is used as the exclusive auditing mechanism for that target database. Also, for the DB,EXTENDED collection method, users may want to delete all previous log entries in the Oracle target database. Both of these options are available in the **Audit Settings Management** section of the Audit Management tab. Furthermore, these options are selected by default, so users must make sure to un-select these options if FortiDB is not the only service that is using Oracle's auditing mechanism.

In addition, for the DB,EXTENDED collection mechanism, the audit log table may periodically grow larger than the file system capacity for that table. There is a scheduled deletion option in the **Scheduled Maintenance** section, where users can setup FortiDB to periodically delete audit log entries.

WARNING: Using FortiDB to manage the contents of the SYS.AUD\$ should be compliant with the best practices of your organization.

MS SQL Server Audit Management

The Audit Management page for MS SQL Server target databases displays a list of MS SQL Server event, and filters used by FortiDB for auditing purposes.

You select Monitoring or Auditing from the Trace Type dropdown list and click the Refresh button, the general information will be displayed.

Audited Events

The MS SQL Server Audited Events section displays a list of MS SQL Server events used by FortiDB for auditing purposes with the following information:

- Column
- Event

Audited Filters

The MS SQL Server Audited Filters section displays a list of MS SQL Server filters used by FortiDB for auditing purposes with the following information:

- Column
- Comparison Operator
- Logical Operator
- Value

The Refresh button is available to update the list.

DB2 Audit Management

The Audit Management page for Oracle target databases displays the issued audit command history.

DB2 Audit Settings with syscat.auditpolicies

The DB2 Audit Settings section displays DB2 syscat.auditpolicies view contents with the following information:

- Policy Name
- Policy ID
- Create Time
- Alter Time

- Audit Status
- Context Status
- Validate Status
- Checking Status
- SecMaint Status
- ObjMaint Status
- SysAdmin Status
- Execute Status
- Execute with Data
- Error Type

DB2 Audit Settings with syscat.audituse

The DB2 Audit Settings section also displays DB2 syscat.audituse view contents with the following information:

- Policy Name
- Policy ID
- Schema
- Object Name
- Object Type
- Sub Object Type

The Refresh button is available to update the list.








Security Alerts





The Security Alerts page is a comprehensive alerts list with alert details. All alerts generated from all databases are displayed in this page. You can filter the alerts based on groups, pre-defined alert groups or alert groups you created.

Alert List

The alert list displayed in this page can be exported to several different formats as a report.

The Alerts list is displayed in the following columns:

Columns	Descriptions
ID	Alert ID. This number is set sequentially
Type	<ul style="list-style-type: none"> •  indicates that the alert is generated by Table Policy •  indicates that the alert is generated by Table and Column Policy •  indicates that the alert is generated by Session Policy •  indicates that the alert is generated by User Policy •  indicates that the alert is generated by Database Query Policy •  indicates that the alert is generated by Privilege Policy •  indicates that the alert is generated by Metadata Policy

Columns	Descriptions
Status	<p>Three types of alert status: Unacknowledged, Acknowledged, or Error_corrected. You can change the alert status from the Alert Summary page.</p> <ul style="list-style-type: none">  indicates that the alert is not acknowledged  indicates that the alert has been acknowledged  indicates that the error has been corrected  indicates that the alert has user-input annotation
Severity	Severity of the policy which the alert was generated from. There are Informational, Cautionary, Minor, Major, and Critical.
Received Time	The date and time when the alert was received by FortiDB
Target	Target database name.
Source Location	Hostname of source client.
Policy Violation & Action	The name of the policy which the alert was generated from, and action of rule violation

Click one of alert record to view the detail in bottom of list table.

See the [Alert Detail](#) for detail.

Filter and Search

Alert display can be filtered by the following criteria:

- **View:** Filter alerts based on the alert group, per-defined or user-defined, by select group from **View** dropdown list.
- **Search:** Click **Search / New Group** button to define search criteria, or click **Edit** button to modify search criteria of user-defined group. When you finish search criteria configuration, click **Search** button to search alerts. Also you can use **Save Group** button to save the search criteria to an alert group quickly.
 - See the [Alert Group](#) for more information of group.
 - See the [Filtering Alerts](#) for search criteria configuration.
- **Date Range and Entry Limit:** Filters alerts based on the specified date range, and input number for **Limit To**, then click **Refresh** button to refresh alerts.

Change Status and Annotate

Select one or more alerts with checkboxes, click one of three Status Icon button, to change status to Unacknowledged, Acknowledged, or Error Corrected.

Select one or more alerts with checkboxes, click **Annotate** icon button, to add or edit exist alert's annotation. Click **Save** button to save annotation.

Export Report

The alert list displayed in this page can be exported as several different formats as reports.

- PDF (.pdf)
- Excel (.xls)
- Tab (.txt)

- CSV (.csv)

To export alerts, select a format of the file you want to export a report from the **Export as** dropdown, and click **Export** button to export file.



Note:

If you want to generate alerts report with more detail information, use the Pre-Defined or User-Defined DAM Alert feature.

Go to the [Reports](#) for detail.

Filtering Alerts

For alerts search or group filters setting, to filter alerts by columns condition, you can define filtering criteria with one or more data filtering entries.

Exclude Option

Check **Exclude following filters** option, if you want alerts in opposite (don't match the criteria).

Configure Criteria Row

One filtering criteria entry is defined in a row. Select **Operator** ("And" or "Or", not available for first row), **Column**, **Operator** from dropdown list, and input **Value** or select from available value list to add.

Multiple Criteria Rows

Add or subtract, respectively, filtering criteria rows by selecting the **+** (**plus**) or **-** (**minus**) buttons.

If there are multiple filtering entries, combined both with "And" and "Or" operations, use the brackets "(" and ")" for the operations priority.

Filters sample for group "Table change by non-system user":

```

Action      Equals      Delete Insert Truncate Update
and ( DB User      Not Equal   SYSTEM
or  Login Name     Not Equal   SYSTEM )

```

Alert Details

The Alert Details section shows following details information about the alerts:

Field Name	Description
ID	Alert ID. This number is set sequentially
Timestamp	The date and time when the alert was received by FortiDB
Target Name	Target database name.
Policy Name	Policy name that generated the alert. For example, Tables, Column Privileges, tablePolicy1, etc.
Action	Action that was taken and caused the alert
Rule Violations	Alert rules that generated the alert. For example, Suspicious location, Suspicious Login Name, etc.

Field Name	Description
Severity	Short name of Severity level to which the policy is configured: <ul style="list-style-type: none"> • INF - Information • CAU - Cautionary • MAJ - Major • MIN - Minor • CRI - Critical
OS User or Auth Id	OS user (for Oracle, MS SQL Server), Auth Id (for DB2) that accessed to the target database
DB User	DB user who took an action
Login Name	Login name that logged into the target database
Object	Object that was accessed and caused the alert
SQL Statement	SQL Statements that were executed and caused the alert
Return Code	Return code from the target database
Source Location	Hostname of source location that originated the action
Application	Source application that originated the actions and caused alerts
Annotation	Annotation text added by administrator for this alert



Note: For Sybase target databases, the OS User field shows as "not available". For MS SQL Server, the OS User is available only when you use the Windows authentication. For Sybase, and MS SQL Server, the Object field may not be available for Privilege Policies: Roles and System Privileges.

Alert Group

The Alert Group page allows you to categorize the alerts into the specific groups.

In the **Security Alerts** page, you can filter alerts by selecting the Alert Group. And, Alert Group can be used as data filtering criteria for DAM Reports

Add/Edit/Delete Group

- Click **Add** button to create new group.
- Click on the name of the group, or the **Edit** icon in action column, to modify group settings.
- Select the checkbox(es) of user-defined alert group(s), click **Delete** button to delete.

Pre-defined alert groups

FortiDB provides the following pre-defined alert groups. Based on these pre-defined alert groups, you can add and modify filtering criteria.

Pre-defined alert groups	Descriptions
Major and Critical Alerts	Alerts that have major and critical severities
Metadata Changes	Alerts generated by triggering metadata policies.
Privilege Changes	Alerts generated by triggering privilege policies

Pre-defined alert groups	Descriptions
Security Violations	Alerts that are triggered by security violations
Table changes	Alerts that are triggered by inserts, updates, or deletes on tables
Unacknowledged Alerts	Alerts that have a status of 'Unacknowledged'

Data Filter for Group

Goto **Filters** tab to define data filtering criteria for group, when Add or Edit a group.

You can define one or more data filtering entries, as match criteria, to filter out DAM security alerts for the group.

Check **Exclude following filters** option, if you want alerts in opposite (don't match the criteria).

One filtering entry is defined in a row. Select **Operator** ("And" or "Or", not available for first row), **Column**, **Operator** from dropdown list, and input **Value** or select from available value list to add.

Add or subtract, respectively, filtering criteria rows by selecting the **+** (**plus**) or **-** (**minus**) buttons.

If there are multiple filtering entries, combined both with "And" and "Or" operations, use the brackets "(" and ")" for the operations priority.

Filters sample for group "Table change by non-system user":

```

Action      Equals      Delete Insert Truncate Update
and ( DB User      Not Equal    SYSTEM
or   Login Name    Not Equal    SYSTEM )

```

Audit Group

The Audit Group page allows you to categorize the audits into the specific groups.

In the **Activity Auditing** page, you can filter audits by selecting the Audit Group. And, Audit Group can be used as data filtering criteria for DAM Reports

Add/Edit/Delete Group

- Click **Add** button to create new group.
- Click on the name of the group, or the **Edit** icon in action column, to modify group settings.
- Select the checkbox(es) of user-defined audit group(s), click **Delete** button to delete.

Pre-defined audit groups

FortiDB provides the following pre-defined audit groups. Based on these pre-defined audit groups, you can add and modify filtering criteria.

Pre-defined audit groups	Descriptions
All	All available policies
All DB2 Policies	All policies that are supported for DB2 databases
All MySQL Policies	All policies that are supported for MySQL databases
All Oracle Policies	All policies that are supported for Oracle databases

Pre-defined audit groups	Descriptions
All SQL Server Policies	All policies that are supported for Microsoft SQL Server databases
All Sybase Policies	All policies that are supported for Sybase databases
Data Policies	All policies that trigger on table, table-column, user, or session changes to the target database
Metadata Policies	All policies that trigger on metadata changes to the target database
Privilege Policies	All policies that trigger on privilege changes to the target database
SYS Operations	Policies that monitor SYS operations

Data Filter for Group

Goto **Filters** tab to define data filtering criteria for group, when Add or Edit a group.

You can define one or more data filtering entries, as match criteria, to filter out DAM security audits for the group.

Check **Exclude following filters** option, if you want audits in opposite (don't match the criteria).

One filtering entry is defined in a row. Select **Operator** ("And" or "Or", not available for first row), **Column**, **Operator** from dropdown list, and input **Value** or select from available value list to add.

Add or subtract, respectively, filtering criteria rows by selecting the **+** (**plus**) or **-** (**minus**) buttons.

If there are multiple filtering entries, combined both with "And" and "Or" operations, use the brackets "(" and ")" for the operations priority.

Filters sample for group "Table change by non-system user":

```

Action      Equals      Delete Insert Truncate Update
and ( DB User      Not Equal   SYSTEM
or  Login Name     Not Equal   SYSTEM )

```

Alerts Summary

Alerts Summary page summarizes the alerts statistics and recent trends.

The Activity Monitoring table shows the alerts statistics for total, today and recent year. It also displays the monitoring and group count.

The alert trend charts show the alerts change by time, include alerts trends of last 7 days, last 30 days, last 90 days, and last 12 months.

Alerts Analysis

The Alerts Analysis page allows to do analysis of alerts received within specified date range.

Create and Run Analysis

To Create, Run analysis and View analysis result:

- Click **Add** button to add a new analysis. Click the analysis name, or click the **Edit** icon in Action column, to edit the analysis.
- In the analysis add/edit page, input name, select target - All or one of target, specify alerts receive date range, and Save.









Note: Include alerts received in "Received To" day. E.g. From "March 1" to "March 31" for alerts received in March.

- Select analysis with checkbox, click **Run** button to run analysis.
- Click the **View** icon button in Action column, or click analyze time for finished run analysis, to view the analysis result.
- Select analysis with checkbox, click **Delete** button to delete.

Analysis List

The Alerts Analysis list is displayed in the following columns:

Columns	Descriptions
Status	<ul style="list-style-type: none"> •  indicates that the alert analysis is new created or edit •  indicates that the alert analysis is in queue to run •  indicates that the alert analysis is running •  indicates that the alert analysis is done running analyze
Target	Target to analysis, All or specified target
Alert Received From	Start date of alerts
Alert Received To	End date of alerts
Analyze Time	Analyze time
Action	<ul style="list-style-type: none"> •  Edit icon button, click to edit analysis •  View icon button, click to view analysis result

View Analysis Result

Click the **View** icon button in Action column, or click analyze time to view analysis result.

In analysis result page:

- **Analysis Summary:** Target, Alerts date range, and Total alerts count in this range.
- **Statistics Chart:** Alerts statistics date-series chart.
- **More alerts statistics by different category:**
 - By Target(for 'All' target analysis)
 - By Severity
 - By Policy
 - By Action
 - By DB Login
 - By DB User
 - By Client Location (Top 10)
 - By Client Application (Top 10)









Activity Auditing

The Activity Auditing Alerts page is a comprehensive audit list with audit details.

The Activity Auditing is for monitoring with TCP/IP Sniffer. To use this function, see the [Configure Activity Auditing](#).

Audit List

The Audit list is displayed in the following columns:

Columns	Descriptions
ID	Audit ID. This number is set sequentially
Type	<ul style="list-style-type: none">  indicates that the audit is generated by Log All option enabled for target monitoring  indicates that the audit is generated by Table Policy  indicates that the audit is generated by Table and Column Policy  indicates that the audit is generated by Session Policy  indicates that the audit is generated by User Policy  indicates that the audit is generated by Database Policy  indicates that the audit is generated by Privilege Policy  indicates that the audit is generated by Metadata Policy
Timestamp	Audit timestamp
Target	Target database name.
Source Hostname/IP	Hostname and IP address of source client.
Action	Action of database activity
DB User	Database user of action.
SQL Text	SQL Text.

Filter and Search

Select the **View** dropdown list to filter the audits by Audit Policy category.

Click **Search/New Group** button to search the audits. Configure the search criteria, then click the **Search** button to search the audits. And you can save the search criteria as a group.

To edit your saved group, select the group from **View** dropdown list, click **Edit** button to modify the search criteria, then click **Save Group** button to save. Or, click **Delete** button to delete group.

Specify the **Received from** and **To** time, input the **Limit to** number, and click **Refresh** button to filter the audits by time range.

Audit Detail

Click one of audit record to view the detail in bottom of list table.

See the [Audit Detail](#) for detail.

Configure Activity Auditing

The Activity Auditing logs database activity by specified option or associated Audit Policies. It needs the FortiDB appliance monitoring the target database with TCP/IP sniffer.

See the following sections for Activity Auditing related configuration:

- [Configuring Monitoring with TCP/IP Sniffer](#)
- [DAM Policy - Alert Policy and Audit Policy](#)
- [Monitoring Management - Choosing a Collection Method](#)
- [Monitoring Management - Associating Policy Groups to Target Monitoring](#)

Audit Details

The Activity Event Details section shows following details information about the audit:








Field Name	Description
ID	Audit ID. This number is set sequentially.
Timestamp	The date and time activity audited.
Target/IP	Target database name and database server's IP address.
Target Service Port	Target database server's service port.
Policy Type	Type of audit policy that generate the audit. Shows "All" if enable Log All option.
Policy Name	Name of audit policy that generated the alert. For example, Tables, Column Privileges, tablePolicy1, etc.
Action	Activity action.
Source Hostname/IP	Hostname and IP address of source client.
Source MAC	MAC address of source client.
DB User	DB user who took an action.
SQL Text	SQL Statements text of activity.

Activity Profiling

The Activity Profiling page shows the target profiling status and summary information.

The Activity Profiling is supported with TCP/IP Sniffer only. To use this function, see the [Configure Activity Profiling](#).

The following table describes columns/icons used in the Activity Profiling page.

Columns	Descriptions
Status	<ul style="list-style-type: none">  indicates the target is not monitored.  indicates that monitoring and profiling are active.  indicates that monitoring is active and profiling is not enabled.
Name	Target name. Click to view profiling detail .
DB Host Name/IP	Database host name or IP address of your target database machine
DB Type	Database type of your target. ORACLE, MSSQL, DB2, SYBASE
Profiling Statistics	Activity total count from profiling start time
Profiling Start Time	Profiling start time. It will be monitoring start time, or user reset statistics time.
Action	<ul style="list-style-type: none">  view profiling detail, same as click Name.  reset profiling statistics. <p> Note: Reset action will clear all exist profiling result.</p> <p> Note: If monitoring with profiling is active, the Reset action will set the Profiling Start Time to the current time. Otherwise, the Profiling Start Time will be set in future when monitoring starts.</p>

Select **View** dropdown listbox, to filter targets display by Target Group.

Configure Activity Profiling

The Activity Profiling profiles user behavior for monitored targets. It is supported in FortiDB appliance only and requires TCP/IP sniffer method for monitoring target database.

To enable profiling, check the **Enable Activity Profiling** option when configure the monitoring with TCP/IP Sniffer as Collection Method.

See the following sections for Activity Profiling related configuration:

- [Configuring Monitoring with TCP/IP Sniffer](#)
- [Monitoring Management - Choosing a Collection Method](#)

View/Export Activity Profiling Data

The Activity Profiling result displays detailed profile information.

The Profiling result information is classified by DB Login or DB User. For each DB Login/User, there is profiling statistics for Source Clients and Database Tables Access.

Choose login/user from **DB Login/User** dropdown listbox to view the profiling detail.

Source Clients Access

The Source Clients Access list is displayed in the following columns:

Columns	Descriptions
Source IP	IP address of database source client.
OS Hostname	Hostname of source client.
Source Application	Application name of source client
OS User	OS User name.
Session Count	Database access session count from this source client.

Database Tables Access

The Database Tables Access lists all database tables accessed by selected login/user, and access action statistics to the database tables.

The Tables Name column displays the accessed database table name.

The other columns, display the count number for actions, include:

- Select
- Update
- Insert
- Delete
- Create
- Alter
- Drop
- Trunc
- Grant
- Revoke

Export Profiling Report

To export profiling detail information as report, select report file format, then click **Export** button to export.

The report file can be:

- PDF (.pdf)
- Excel (.xls)
- Tab (.txt)
- CSV (.csv)

Compliance Audit

When monitor the target database with **Compliance Policy** of Alert Policy, FortiDB will save the compliance audit logs accordingly.

This page displays the compliance audit logs.

Select the **Target Database** in the dropdown listbox, enter the from/to date, click the **Refresh** button to filter the audit logs.

Local Monitoring Log

The Local Monitoring Log page lists monitoring events logs.

The monitoring logs include information: Date, Target, Policy name, Severity, and Description.

In the Local Monitoring Logs page, you can:

- Display logs filtered by the severity level that you select from the **Severity** dropdown list.
- Display logs filtered by the target database that you select from the **Target** dropdown list.
- Display logs filtered by the date range you select from the **From** and **To** fields.
- Export the logs view you selected, by selecting **Export**
- Delete all logs by selecting **Delete All**
- Schedule error checks. You can select check schedules as:
 - **Run Once**: Error checks will occur once at the specific time you set in the Start at field.
 - **Recurring**: Error checks will occur starting from the time set in the Start at field, and continue until the End by.

Report Management

About Reports

FortiDB provides various reports, includes Pre-defined/User-defined VA and DAM reports, and other exportable reports.

For VA and DAM reports, goto specific item in **Report** menu, to manage and generate reports. For other exportable reports, goto the corresponding context page, use **Export** function to export the report file.

Reports can be exported as PDF file, and some reports can be exported to Excel, Tab Text or CSV file.



Note: In order to generate VA and DAM reports, users are required to have the Report manager role.

VA Reports

VA Reports include Pre-defined or User-Defined Assessment Reports, Pre-defined VA Policy Reports and Pre-defined Sensitive Data Discovery Reports.

You can view and export VA Report manually. Goto Pre-defined or User-defined VA reports, select report to preview content, and **Export** report with PDF or other format of file.

Also you can generate Assessment Report files automatically with scheduled Assessment. When you schedule an assessment and configured with generating report file, the report file(s) will be generated and saved in FortiDB when the assessment run complete successfully.

DAM Reports

DAM Reports include Pre-defined/User-defined Security Alert Reports and Activity Audit Reports, and Compliance Reports.



Note: Activity Audit Reports come from DAM Activity Auditing, which is based monitoring with collection method **TCP/IP Sniffer** from FortiDB appliance.

The Security Alert Reports and Activity Audit Reports allow you configure the report criteria, including data filtering, schedule running and notification. User-defined reports even allow to customize display of data table view and analysis chart view.

For the Security Alert Reports and Activity Audit Reports, all format of report files will be generated and saved in FortiDB, when you run the report manually, or run by schedule.

Report Files in Disk

The generated report files (such as PDF or XSL) will be saved in disk, with following circumstances:

- For all DAM Reports, report files will generate when every report run completes.
- Enable **Schedule** and **Save Scheduled Assessment Report to Disk File** option for Vulnerability Assessment.

Please notice that report files will use the disk space. You can remove report files after downloading them.

Other Exportable Reports

You can export report file(PDF) for following content:

- Administrators Entitlement Report: **Administration > Administrators**

- Target Database Report: **Target Database Server > Targets**
- Database Discovery Report: **Target Database Server > Auto Discovery**
- VA Privilege Summary Report: **Vulnerability Assessment > Privilege Summary**
- VA Local Log Report: **Vulnerability Assessment > Local Assessment Log**
- DAM Security Alerts Summary Report for search result: **DB Activity Monitoring > Security Alerts**
- Activity Profiling Report: **DB Activity Monitoring > Activity Profiling > Profiling Detail**
- DAM Local Log Report: **DB Activity Monitoring > Local Monitoring Log**

Pre-Defined VA Reports

Goto **Report > Pre-Defined VA Reports** for available reports list page, select one of report template to view and export report file.

Assessment Reports

Assessment Reports give the assessment result to target database, including assessment statistics, vulnerabilities detail, and run result of policies.

To view and export Assessment Reports, select report parameters include Assessment, run time and target database. Goto **Preview Report** tab to view the report content, and **Export** as file with format you selected.

Pre-defined Assessment Reports:

- Global Detailed Report: this report gives the number and types of passed and failed policies and their details for all targets in the assessment
- Target Detailed Report: this report gives the number and types of passed and failed policies and their details
- Target Detailed Failed Report: this report gives the number and types of failed policies and their details
- Target Summary Report: this report summarizes the number and types of passed and failed policies
- Target Summary Failed Report: this report summarizes the number and types of failed policies
- Target Score Report: this report displays the scan results in graphical form
- Target Trend Report: this report displays the database policy progress over time

Policy Reports

Policy Reports give the report of Pre-defined and User-defined VA policies in FortiDB. You can select all VA policies, or filter by Database Type, Classification, Severity, or Policy Type, to generate report.

Policy Reports:

- Policy Summary Report: this report gives the detailed information about the current vulnerability assessment policies in the system
- Policy Detailed Report: this report summarizes the most current vulnerability assessment policies in the system

Sensitive Data Discovery Reports

Sensitive Data Discovery Reports give you result information of sensitive data discovery. Select target database and discovery time to view and export discovery report.

Sensitive Data Discovery Reports:

- Sensitive Data Discovery Detailed Report: this report gives the detailed information about the sensitive data discovery.
- Sensitive Data Discovery Summary Report: this report gives the summary information about the sensitive data discovery.

Assessment Reports

Statistic Tables

All report templates (except for Trend report) contain the following two statistic tables:

- Severity: Summary of numbers of each state by policy-severity type.
- Classification: Summary of numbers of each state by policy-classification type

Vulnerabilities

All report templates (except for Score report and Trend report) contains the summary or detail information for vulnerabilities. And divided by following vulnerability severity:

- Critical Vulnerabilities
- Major Vulnerabilities
- Minor Vulnerabilities
- Cautionary Vulnerabilities
- Informational Vulnerabilities

Score Report and Trend Report

The pre-defined Score Report template provides you a way to see vulnerability results in graphical form for all target databases used in an assessment. It also shows results by the RDBMS type of the assessed targets.

The pre-defined Trend Report template provides you a way to see assessment results over time to assist your vulnerability planning and remediation efforts.

User-Defined VA Reports

You can customize your report template with selected columns and data from the User-Defined VA and DAM Reports page.

User-Defined VA Reports page lists the report(s) you created, and allows you add/modify/delete report(s).

Columns and Buttons	Description
Name	User defined name for report. Click name link to modify and export report.
Description	User defined description
Last Modified	Date and time of the report you modified last
Created By	User who created the report
Add	This button adds a report
Delete	This button deletes the report you checked in the checkbox

Manage User-Defined Report

Click **Add** button, or click the name of exist report, to goto report edit page

Here are the User-Defined report operations with following Tabs and page footer:

General Tab

Naming and describing your reports.

Columns Tab

Specifying which columns you want to include in your reports.

Select columns from **Available Columns** list, add into **Columns in Report** list.

Your report must contain at least one display column.

Grouping Tab

Specifying grouping criteria:

In the **Group Data By** dropdown list, select the column name(s) by which you want to group data results. Optionally, specify a sort order in the **Order** dropdown (Ascending or Descending). And specify a Day, Week, Month, Quarter, or Year value by which to group date-related report results in the **Group date values by** dropdown.

For VA reports, you cannot group by **Policy Description**. You can specify two additional grouping levels, in the same way, by using the **and then by** and the **and lastly by** dropdown lists.

Filtering Tab

Specifying filtering criteria:

- Define a column filtering entry in a row, by selecting **Column**, **Operator** and inputting the **Value**.
- Add or subtract filtering criteria rows respectively by selecting the **+** (**plus**) or **-** (**minus**) buttons.

In order to limit the number of rows to display, check the **Enter number** radio button and then specify, as your row limit, any positive number less than 1000.

Page Footer

Export/Save report or Cancel editing.

Exporting your report in a certain output format, PDF or tab-delimited text file.

Click **Save** button to save report, click **Cancel** button to cancel.

Scheduled VA Reports

Scheduled VA Reports page allows you manage report files generated from scheduled Vulnerability Assessment.

The scheduled VA report file will be generated and saved in disk, with following VA configurations:

- Enable schedule for Vulnerability Assessment
- Enable the report option **Save Scheduled Assessment Report to Disk File**

Refer the [Adding/Modifying Vulnerability Assessment](#) for Assessment configurations.

Target database name and report filename will be list in **Scheduled VA Reports** page.

Click the report filename to download/open the report file.

Select one or more reports with checkboxes, click **Download** button to download the packed single zip file. And click **Delete** button to delete the selected report file(s).

Pre-Defined DAM Reports

Pre-defined DAM reports display security alerts data or activity audit events, which you can filter to exclude from the report data.

Goto **Report > Pre-Defined DAM Reports**, select **Security Alert Reports** or **Activity Audit Reports** tab, to configure/run reports with pre-defined template, and browse generated report content and download report file(s).

**Note:**

Activity Audit Report is available only for FortiDB appliance, and monitoring target database with collection method of **TCP/IP sniffer**.

See the [Activity Auditing](#) for detail.

The following pre-defined report templates are available for Pre-defined DAM reports.

Pre-defined Security Alert Reports:

- Security Alert Detailed report: this report shows the details for all alerts generated within the report filter criteria.
- Security Alert Summary report: this report summarizes the alerts generated within the report filter criteria.
- Security Alert Statistical report: this report summarizes statistical information about alerts generated based on rules-violations, policies, and severities.

Pre-defined Security Audit Reports:

- Activity Audit Detailed report: this report shows the details for all activity audit events generated within the report filter criteria.
- Activity Audit Summary report: this report summarizes the activity audit events generated within the report filter criteria.

Manage/Configure Pre-Defined DAM Reports

DAM Reports page displays the reports list and recent running result, see following topic for report management:

- [DAM Reports Management](#)

You can configure the data filtering for DAM Reports:

- [Configure Data Filtering](#)

And, configure the schedule and notification:

- [Configure Schedule and Email Notification](#)

User-Defined DAM Reports

The User-Defined DAM Reports allow you configure the report data filtering, schedule report running and notification, and customize report display.

Goto **Report > User-Defined DAM Reports**, select **Security Alert Reports** or **Activity Audit Reports** tab for your report type, and define report.

DAM Reports page displays the reports list and recent running result, see following topic for report management:

- [DAM Reports Management](#)








See following topics for report customization:

- [Configure Data Filtering](#)

- [Configure Data Display](#)
- [Configure Schedule and Email Notification](#)

Reports Management

The DAM Reports page contains list table with following columns:

Columns	Description
 	Expand/collapse displaying report's last 10 running result. When expand: <ul style="list-style-type: none"> • click report name entry (contains generating time) to view report content in html • click the one of icons in right (pdf/txt/xls/csv) to download the report file
Status	<ul style="list-style-type: none"> •  indicates a report is idle •  indicates a report is running •  indicates a report is scheduled
Name	Report name, click to configure report
Description	Report description
Last Modified	Date and time of the report you modified last
Created By	User who created the report
Results	Count of report's running result
Action	<ul style="list-style-type: none"> •  click to configure report •  click to browse all running result entries

For Pre-Defined DAM Report, select report(s) with checkbox, click **Run** button to run report.

For User-Defined DAM Report, click **Add** button to create a new report. Select report(s) with checkbox, click **Delete** button to delete, click **Run** button to run.

Configuring Data Filtering

Goto **Data Filter** tab to configure data filtering, when adding/editing a DAM report.

Data Time Range

You can choose dynamic time period, or specific time range, for report's data filtering.

Select the **Last Period** option for dynamic time period. Input period value, and select period unit from **Day**, **Week** or **Month**.

The dynamic time range will be calculated every time when you run the report (manually or scheduled run). For example, when you select "last 2 days" for period, FortiDB will filter the alerts(or audits) received from 48 hours early to the report running moment.

To use specific time range, select **Date Range** option, input **from** date/time and **to** date/time.

Records Limit

Input the number for records entry limit, in **Limit to**.

This limit number is the maximum records available to display in report data table.

Custom Data Filters

Custom Data Filters allows you configure filtering criteria by columns conditions.

The Filters configuration is same as configuring filtering criteria for Alert/Audit Search Group.

See the [Configure Alert Filtering](#) for detail.

For DAM Alerts Report, you can select **Alert Group** option, select one group from dropdown list, to use the group's filtering setting for reporting.

For DAM Audits Report, you can select **Audit Group** option, select one group from dropdown list, to use the group's filtering setting for reporting.

Configuring Data Display

User-Defined DAM Report allows you configure data display.

Goto **Table View** tab to configure data table display, and goto **Analysis** tab to configure analysis charts.

Data Table View

To configure which data columns displayed in report, select columns from **Available Columns** list, add into **Columns in Report** list.

You can also configure the data groups in report's data table(optional).

In the **Group Data By** dropdown list, select the column name(s) by which you want to group data results. Optionally, specify a sort order in the **Order** dropdown(Ascending or Descending). And specify a Day, Week, Month, Quarter, or Year value by which to group date-related report results in the **Group date values by** dropdown.

Analysis Chart and its Statistics Table

You can add multiple analysis, with its statistics chart and table, into report. In **Analysis** tab page, each analysis is defined in a row. Click the **+** (**plus**) or **-** (**minus**) buttons to add or subtract analysis rows.

To configure analysis:

- Select **Chart type** - Pie or Bar
- Select which data column you want to count for statistics, from **Column type** dropdown list.
- For DAM Alert report, you can select **Severity** or **Status** as second Column type for **Bar** chart. The enumeration of Severity or Status will be list as Y-axis in statistics table.
- If the data come from multiple target databases, enable **Group by target** checkbox, to generate analysis chart and statistics table respectively for each target.
- Input the **Max item** number for data column.
- Enable **Count others**, will add **Others** into analysis chart/table as last column.

Schedule and Notification

Both Pre-Defined and User-Defined DAM Report, allows you configure the schedule and Email notification.



Note: Email Notification will be triggered only by scheduled report running.

Goto **Schedule** tab to configure schedule, and goto **Notification** tab to configure email notification.

Schedule

The report scheduler allows you to set up when to start report generation, how often to generate reports, and when to stop.

Select the **Enable Schedule** checkbox to enable scheduler.

For schedule, there are two ways that you can set up the scheduler:

Scheduled Type	Description	When to Run
Run Once	Report generation will occur once at the specific time you set in the Start at field.	The date range used to run the report when the time is in the Date Range field.
Recurring	Report generation will occur starting from the time set in the Start at field, and continue until the End by .	The Recurrence pattern can be Minutely, Hourly, Daily, Weekly, or Monthly. Enter the value for recurring time interval.

Email Notification for Schedule

Email Notification allows FortiDB send report file(s) with email at the scheduled time.

Select the **Enable Email** to enable email notification respectively.

For email notifications, you must designate one or more email receivers. Select one or more of the entries in the **Available Receivers** list box and add them to the **Selected Receivers** list



Note: You must set the Email server and user properties in the **Global Configuration** for Email notification.

Select **Report formats** of report file(s) you want to be included in email.

Compliance Reports

FortiDB Compliance reports contain data that are most necessary for IT internal controls. These reports can help achieve compliance with both internal and external requirements.

Some compliance reports need to be generated weekly, monthly, or quarterly.

Following compliance report templates are available to generate reports:

Name	Description	Required option settings
Abnormal or Unauthorized Changes to Data	This report tracks all changes made to data by any account other than the application user account.	Object Audit Options
Abnormal Termination of Database Activity	This report identifies failed database processes (i.e. Financial transactions or failed login attempts) originating from an application server.	Object Audit Options or User Audit Options

Name	Description	Required option settings
Abnormal Use of Service Accounts	This report identifies service accounts and the associated or related transaction origins. For example, the use of service account from an origin other than the application server would be identified.	Object Audit Options or User Audit Options
End of Period Adjustments	This report tracks changes to the general ledger at month, quarter, year end.	Object Audit Options
History Of Privilege Changes	This report tracks changes to user access rights that are elevated or lessened in the database over time.	Not required
Verification of Audit Settings	This report tracks changes to configurable audit parameters.	Not required



Note: The Compliance reports do not support monitoring column-level policies.

General Steps for Generating Compliance Reports

- 1 .Configure your target databases. See [Required Settings of Target Databases](#)
- 2 .Connect FortiDB to your target databases. See [Managing Target Databases](#)
- 3 .Configure FortiDB Compliance policies. See [Configuring Compliance Policy](#)
- 4 .Go to the General tab, and click Start Monitoring. For details, see [General tab](#)
- 5 .Assuming that several violations occurred in your target database, go to Compliance Reports under Report Management.
- 6 .Select one of the reports and export reports:
 - In the **Export as** field, select the format type you want to generate a report from the dropdown list: PDF, Excel, or CSV.
 - (Optional) Enter W/P reference and/or Customer name in each field.
 - Enter the **Date Range** for data retrieval.



Note: The date entered in these fields means 00:00 (midnight) of the day. For example, 9/23/09 means 00:00AM of 9/23/09

- Select one or more target databases, or enable **All Targets** checkbox for all databases.
- (Optional) You can set filters to display the specific data in the report.
- Select **Export** to generate and export report file.

Report: Abnormal Termination of Database Activity

This report identifies failed database processes (i.e. Financial transactions) originating from the application server. This should be reviewed on a daily basis by IT Management.

COBIT Objectives

Objective Number	Description
DS10.1	Routine transactions and processes between the application and the database are reviewed on a daily basis for successful completion by IT Management.

Setup Requirements**Compliance Policy:** Object Audit Options and/or User Audit Options**Report Columns**

The following columns are displayed in the report body.

Columns	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
Timestamp	The exact time the flagged activity was conducted
Terminal	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.
Error Code	The proprietary error code generated by the originating application.

Report: Abnormal or Unauthorized Changes to Data

This report tracks all changes made to data by any account other than the application user account. The report should be reviewed and commented on by appropriate management on a quarterly basis.

COBIT Objectives

Objective Number	Description
AI2.3	Unauthorized changes to data by non-application[13] accounts are tracked and reviewed by IT Management on a quarterly basis.

Setup Requirements**Compliance Policy:** Object Audit Options**Report Columns**

Columns	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
Timestamp	The exact time the flagged activity was conducted
Terminal	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 Filters section in order to filter out the other action types.

Report: Abnormal Use of Service Accounts

This report identifies the use of service accounts and the associated transaction origins. For example: The use of a service account from an origin other than the application server would be identified. The report should be reviewed and commented on by IT Management on a weekly basis.

COBIT Objectives

Objective Number	Description
DS5.3	Database transactions from unauthorized sources are tracked and reviewed by IT Management on a weekly basis

Setup Requirements

Compliance Policy: Object Audit Options and/or User Audit Options

Report Columns

The following columns are displayed in the report body.

Columns	Description
User ID	The ID of the database user that conducted the flagged activity
Terminal	The terminal IP address or name
Originating Application	The name, or other identifier, for the originating application, if the activity originated from an external application or from an application server
Number of Actions	The number of actions attempted by the account associated with the User ID
Timestamp	The exact time the flagged activity was conducted

Report: End of Period Adjustments

This report tracks changes to the general ledger at month/quarter/year end. The report should be reviewed and commented on by appropriate management on a monthly basis.

COBIT Objectives

Objective Number	Description
AI2.3	End of period adjustments to the general ledger are tracked and reviewed by Business Management on a monthly basis.

Setup Requirements

Compliance Policy: Object Audit Options

Report Columns

The following columns are displayed in the report body.

Columns	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
Timestamp	The exact time the flagged activity was conducted
Terminal	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.

Report: History of Privilege Changes

This report tracks privileged changes to database user access rights (i.e. granting of privileged or escalated access rights). The report identifies the database account that was changed, the type of privilege that was granted, the date of the change, and the account that initiated the change. The report should be reviewed by both IT and Business Management on a quarterly basis.

COBIT Objectives

Objective Number	Description
AI2.4, DS3.5, DS5.3, DS5.4	Changes to escalate database user access privileges are tracked for review on a quarterly basis by the IT manager and the application business manager

Setup Requirements

Compliance Policy: Just enable the policy. No settings of Object Audit or User Audit Options required.

Report Columns

The following columns are displayed in the report body.

Columns	Description
User ID	The ID of the database user that conducted the flagged activity
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
Privilege Details	The type of object privilege granted to, or revoked from, the grantee.
Timestamp	The exact time the flagged activity was conducted.

Report: Verification of Audit Settings

This report identifies any changes that have been made to the audit reporting and tracking capability of the database.

COBIT Objectives

Objective Number	Description
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.

Setup Requirements

There are two requirements:

1 .At least one of the auditing policies must be run in order to collect audit data:

- Data Policies
- Privilege Policies: using the audit data retrieval method
- Metadata Policies: using the audit data retrieval method

2 .For tracking audit activity with the Data policies, run the following commands

```
audit system audit; audit audit system; audit audit any;
```

and then Close and Open your database connection in Data policies.

Report Columns

The following columns are displayed in the report body.

Columns	Description
User ID	The ID of the database user that conducted the flagged activity
OS User	The OS User that conducted the flagged activity
Object	The name and owner of the database object that was directly manipulated by the flagged activity
Timestamp	The exact time the flagged activity was conducted
Terminal	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 enacted by the User ID.

Appliance - Command Line Interface (CLI)

Using the FortiDB CLI

This topic describes the basics of using the CLI (Command Line Interface). You can use CLI commands to view system information and to change system level settings.

To use the FortiDB CLI:

- 1 .Logon to the FortiDB appliance as the `admin` user or as a user with the FortiDB System Administrator role via the following methods:
 - Terminal to connect appliance's console port
 - Remote login with SSH or Telnet (determined by FortiDB's network interface settings)
- 2 .Enter the CLI command of interest.

Basic CLI Information

This topic provides basic information for using the FortiDB CLI.

Command help

You can press the question mark (?) key to display command help.

- Press the question mark (?) key at the command prompt to display a list of the commands available and a description of each command.
- Type a command followed by a space and press the question mark (?) key to display a list of the options available for that command and a description of each option.
- Type a command followed by an option and press the question mark (?) key to display a list of additional options available for that command-option combination and a description of each option.

Command completion

You can use the tab key or the question mark (?) key to complete commands.

- You can press the tab key at any prompt to scroll through the options available for that prompt.
- You can type the first characters of any command and press the tab key or the question mark (?) key to complete the command or to scroll through the options that are available at the current cursor position.
- After completing the first word of a command, you can press the space bar and then the tab key to scroll through the options available at the current cursor position.

Recalling commands

You can recall previously entered commands by using the Up and Down arrow keys to scroll through commands you have entered.

Editing commands

Use the **Left** and **Right** arrow keys to move the cursor back and forth in a recalled command. You can also use the **Backspace** and **Delete** keys and the control keys listed in the following table in order to edit the command.

Function	Key combination
Beginning of line	CTRL+A

Function	Key combination
End of line	CTRL+E
Back one character	CTRL+B
Forward one character	CTRL+F
Delete current character	CTRL+D
Previous command	CTRL+P
Next command	CTRL+N
Abort the command	CTRL+C
If used at the root prompt, exit the CLI	CTRL+C

Line continuation

To break a long command over multiple lines, use a `\` at the end of each line.

Command abbreviation

You can abbreviate commands and command options to the smallest number of non-ambiguous characters. For example, the command `get system status` can be abbreviated to `g sy st.`

File names and locations

Filenames and locations should consist only of letters, numbers, hyphens, and underscores. Do not use spaces or special characters. For example, `my_file` is an acceptable name; `my&file` is not.

Entering spaces in strings



Note: Spaces are not allowed in strings that represent filenames or file locations.

When a string value, for other than a filename or locations, contains a space, do one of the following:

- Enclose the string in quotation marks; `"Security Administrator"`, for example.
- Enclose the string in single quotes; `'Security Administrator'`, for example.
- Use a backslash ("`\`") preceding the space; `Security\ Administrator`, for example.

Entering quotation marks in strings

If you want to include a quotation mark, single quote or apostrophe in a string, you must precede the character with a backslash character. To include a backslash, enter two backslashes.

Entering a question mark (?) in a string

If you want to include a question mark (?) in a string, you must precede the question mark with **CTRL-V**. Entering a question mark without first entering **CTRL-V** causes the CLI to display possible command completions, terminating the string.

Special characters

The characters `<`, `>`, `(`, `)`, `#`, `'`, and `"` are not permitted in most FortiDB CLI fields nor are they permitted in the passwords used to protect configuration-file backups.

IP address formats

You can enter an IP address and subnet using either dotted decimal or slash-bit format. For example you can type either:

```
set ip 192.168.1.1 255
```

or

```
set ip 192.168.1.1/24
```

The IP address is displayed in the configuration file in dotted decimal format.

CLI Command Syntax

This topic provides general CLI-syntax information.

This guide uses the following conventions to describe command syntax:

- Angle brackets < > indicate variables.

For example:

```
execute restore config <filename_str>
```

You enter:

```
execute restore config myfile.bak
```

- Vertical bar and curly brackets { | } separate alternative, mutually exclusive required keywords.

For example:

```
set protocol {ftp | sftp}
```

You can enter:

```
set protocol ftp or set protocol sftp
```

- Square brackets [] indicate that a keyword or variable is optional.

For example:

```
show system interface [<name_str>]
```

To show the settings for all interfaces, you can enter `show system interface`. To show the settings for the `Port1` interface, you can enter `show system interface port1`.

- A space separates options that can be entered in any order and in any combination and that must be separated by spaces.

For example:

```
set allowaccess {https ping ssh}
```

You can enter any of the following:

```
- set allowaccess ping
- set allowaccess https ping
- set allowaccess ssh
- set allowaccess https ssh
- set allowaccess https ping ssh
```

In most cases to make changes to lists that contain options separated by spaces, you need to retype the whole list including all the options you want to apply and excluding all the options you want to remove.

- Special characters:

- The `\` is supported to escape spaces or as a line continuation character
- The single quotation mark `'` and the double quotation mark `"` are supported, but must be used in pairs.
- If there are spaces in a string, you must precede the spaces with the `\` escape character or put the string in a pair of quotation marks.

Administration Commands

This topic lists the system-administration commands that are available to the FortiDB user.

The following commands are available for the FortiDB CLI:

Command branch	Supported commands	Description
<i>config</i>	<ul style="list-style-type: none"> • system admin setting • system backup all-settings • system dns • system global • system interface • system ntp • system raid • system route 	Use <i>config</i> to configure objects of FortiDB functionality. Top-level objects are not configurable; they are containers for more specific lower-level objects. For example, the <i>system</i> object contains DNS addresses, interfaces, routes and so on. When these objects are multiple, such as routes, they are organized in the form of a table. You can add, delete or edit the entries in the table. Table entries each consist of keywords that you can set to particular values. Simpler objects, such as system DNS, are a single set of keywords.
<i>execute</i>	<ul style="list-style-type: none"> • backup all-settings • backup-remove fd-archive • backup-remove fd-report • date • format disk • generate certificate • ping • raid rebuild • reboot • reset • restart • restore all-settings • restore fd-archive • shutdown • time • top • traceroute 	Use <i>execute</i> to run static commands, to reset the FortiDB unit to factory defaults, or to back up or restore the FortiDB configuration. The <i>execute</i> commands are available only from the root prompt.
<i>show</i>	<ul style="list-style-type: none"> • system admin setting • system backup all-settings • system dns • system global • system interface 	Use <i>show</i> to display the FortiDB unit configuration. Only changes to the default configuration are displayed. You can use <i>show</i> within a <i>config</i> shell to display the configuration of that shell, or

Command branch	Supported commands	Description
	<ul style="list-style-type: none"> system ntp system route 	you can use <i>show</i> with a full path to display the configuration of the specified shell.
<i>diagnose</i>	<ul style="list-style-type: none"> log show tail remove system export fd_log system raid list network interface list network interface detail [port-name] 	Use <i>diagnose</i> commands to view the detail information of ethernet interfaces, or send the diagnostic information to an FTP serve.

config command

This topic contains the information about the *config* commands that are available to the FortiDB user.

You can use the FortiDB CLI in order to perform the following *config* tasks.

config system admin setting

The *config system admin setting* command allows you to configure web administration settings.

Syntax:

```
config system admin setting
  set http_port <integer>
  set https_port <integer>
  set idle_timeout <integer>
end
```

where:

Variables	Description	Default
http_port	The HTTP port number for web administration.	80
https_port	The HTTPS port number for web administration.	443
idle_timeout	The idle-timeout value which ranges from 1 to 480 minutes	5

Sample command: (This example sets an idle-timeout value of 2 minutes and port 444 for HTTPS web administration.)

```
config system admin setting
  set idle_timeout 2
  set https_port 444
end
```

config system backup all-setting

The *config system backup all-settings* command allows you to set or check the settings for scheduled backups.

Syntax:

```
config system backup all-settings
  set crtpasswd <passwd>
  set directory <dir_name>
  set passwd <pwd>
```

```

set protocol {ftp | sftp}
set server <string>
set status {enable | disable}
set time <hh:mm:ss>
set user <user_name>
set week_days {monday tuesday wednesday thursday friday}
end

```

where:

Keywords and variables	Description	Default
crptpasswd <passwd>	Optional password to protect backup content	None
directory <dir_name>	The directory on the backup server in which to save the backup file.	None
passwd <pwd>	The password for the backup server.	None
protocol {ftp sftp}	The backup protocol.	sftp
server <string>	The IP address or DNS-resolvable host name for the backup server.	None
status {enable disable}	Enable or disable scheduled backups.	disable
time <hh:mm:ss>	The time of day to perform the backup. Time is required in the form <hh:mm:ss>.	None
user <user_name>	The user account name for the backup server.	None
week_days {monday tuesday wednesday thursday friday}	The day(s) of the week on which to perform backups. You may select multiple days.	None

Sample command:

The backup server is at 172.20.120.11 using the admin account with no password and saving the backup in the /usr/local/backups directory. Backups will be done on Mondays at 1:00pm using ftp.

```

config system backup all-settings
  set status enable
  set server 172.20.120.11
  set user admin
  set directory /usr/local/backups
  set week_days monday
  set time 13:00:00
  set protocol ftp
end

```

config system dns

The *config system dns* command allows you to set the DNS server addresses.

Syntax:

```

config system dns
  set primary <dns_ip>
  set secondary <dns_ip>
end

```

where:

Keywords and variables	Description	Default
primary <dns_ip>	Enter the primary DNS server IP address.	65.39.139.53
secondary <dns_ip>	Enter the secondary DNS IP server address.	65.39.139.63

Sample Command:

```
config system dns
  set primary 65.39.139.53
  set secondary 65.39.139.63
end
```

config system global

The *config system global* command allows you to configure global settings that affect miscellaneous FortiDB features.

Syntax:

```
config system global
  set console-output {more | standard}
  set daylightsavetime {enable | disable}
  set hostname <unithostname>
  set ssl-low-encryption {enable disable}
  set swapmem {enable | disable}
  set timezone <timezone_number>
end
```

Where:

Keywords and variables	Description	Default
console-output {more standard}	Select how the output is displayed on the console. Select more to pause the output at each full screen until keypress. Select standard for continuous output without pauses.	standard
daylightsavetime {enable disable}	Enable or disable daylight saving time. If you enable daylight saving time, the FortiDB system automatically adjusts the system time when the time zone changes to or from daylight saving time.	enable
hostname <unithostname>	Enter a name for this FortiDB system.	FD-XXX. The default hostname varies depending on the appliances.
ssl-low-encryption {enable disable}	Enable or disable low-grade (40-bit) encryption.	disable
swapmem {enable disable}	Enable or disable virtual memory.	enable
timezone <timezone_number>	The number corresponding to your time zone. Press ? to list time zones and their numbers. Choose the time zone for the FortiDB system from the list and enter the correct number.	00

Sample Command:

The following command turns on daylight saving time, sets the FortiDB system name to FDB1K, and chooses the Eastern timezone for US & Canada.

```
config system global
  set daylightsavetime enable
  set hostname FDB1k
  set timezone 12
end
```

config system interface

The *config system interface* command allows you to edit the configuration of a FortiDB network interface.

Syntax:

```
config system interface
  edit <port>
  set allowaccess {http https ping ssh telnet}
  set ip <ipmask>
  set status {up | down}
end
```

Variable	Description	Default
<port>	<port> can be one of port1, port2, port3, port4.	No default.
allowaccess {http https ping ssh telnet}	Enter the types of management access permitted on this interface. Valid types are: http https ping ssh telnet. Separate multiple selected types with spaces. If you want to add or remove an option from the list, retype the list as required.	Varies for each interface.
ip <ipmask>	Enter the interface IP address and netmask. The IP address cannot be on the same subnet as any other interface.	No default
status {up down}	Start or stop the interface. If the interface is stopped it does not accept or send packets. If you stop a physical interface, VLAN interfaces associated with it also stop.	up

Sample Command:

This example shows how to set the FortiDB port1 interface IP address and netmask to 192.168.100.159 255.255.255.0, and the management access to ping, https, and ssh.

```
config system interface
  edit port1
  set allowaccess ping https ssh
  set ip 192.168.100.159 255.255.255.0
  set status up
end
```

config system ntp

The *config system ntp* command allows you to configure automatic time setting using a network time protocol (NTP) server.

Syntax:

```
config system ntp
  set server <server_ip>
  set status {enable | disable}
  set sync_interval <minutes>
end
```

Variable	Description	Default
server <server_ip>	Enter the IP address or fully qualified domain name of the NTP server.	No default.
status {enable disable}	Enable or disable NTP time setting.	disable
sync_interval <minutes>	Enter how often, in minutes, the FortiDB system synchronizes its time with the NTP server.	60

config system raid

The *config system raid* command allows you to view or configure hard disk raid.

Syntax:

```
config system raid
  set level raid1
end
```

Variable	Description	Default
level	Set raid level. Use this command to create harddisk raid.	must be "raid1"



Note:

- Create raid will remove all exist data in hard disks.
- Only 'raid1' and 'raid5'(just for FortiDB-2KB) are supported in this version of fortidb appliance. And please check your hardware specification to see if your appliance supports raid.
- To create raid, you must have 2 hard disks in appliance disk bays at least.
- Once create raid, the hard disk cannot go back with original partitions.



Note:

- Use CLI *get system raid* to get the raid level information.
- Use CLI *diagnose system raid list* to check current raid status.
- Use CLI *execute raid rebuild* to rebuild raid if it's corrupted.

For RAID5 of FortidB-2KB:

- Since the RAID 5 array needs at least 3 hard disks, only when there are more than 3 hard disks on the FortiDB-2KB appliance, the RAID 5 configuration is available.
- All the hard disks should be the same capacity, model, and vendor, to keep the disks have the same parameters.

To unset Raid 5:

- Unset operation will remove the RAID 5 array, so all the data will be lost. Do not do this operation if not necessary.
- 1 .Log-in into the FortiDB-2KB through CLI with the user "admin".
 - 2 .Type "config system raid", enter the configuration of RAID.
 - 3 .Type "unset level", Enter.
 - 4 .There will be a prompt to make sure that you really want to do this, for all the data on all hard disks will be lost.
 - 5 .Type "y" to continue, and the RAID 5 "unset" operation will start.
 - 6 .After the "unset" operation, the hard disk needs to be formatted. Type "execute format disk" to format the fist hard disk.
 - 7 .After automatically reboot, the FortiDB is available with the first hard disk.

config system route

The *config system route* command allows you to view or configure static routing table entries.

Syntax:

```

config system route
edit <seq_num>
set device <port>
set dst <dst_ip_mask>
set gateway <gw_ip>
end

```

Variable	Description	Default
<seq_num>	Enter an unused routing sequence number to create a new route. Enter an existing route number to edit that route.	No default.
device <port>	Enter the port used for this route.	No default.
dst <dst_ip_mask>	Enter the IP address and mask for the destination network.	0.0.0.0 0.0.0.0
gateway <gw_ip>	Enter the default gateway IP address for this network.	0.0.0.0

execute command

This topic explains the *execute* administration commands that are available to the FortiDB user.

You can use the FortiDB CLI in order to perform the following *execute* tasks:

execute backup all-settings

The FortiDB CLI allows you to back up your local database to a FTP server.



Note: Please press <enter> to get back to the original prompt after the backup has completed with the message saying "Transfer Finished."

Syntax:

```

execute backup all-settings <ftp server> <filepath> <username> <password>
[crptpasswd]

```

where:

Keywords and variables	Description
<ftp server>	IP address or hostname of FTP server.
<filepath>	Location on FTP server where you want the settings file to be placed. note: If you don't specify a name, you will get a default file called fdb_allbackup.dat.
<username>	User name of account that logs on to the FTP server.
<password>	Password of account that logs on to the FTP server.
[crptpasswd]	Optional password for protecting the settings file on the FTP server.

Sample command:

```

execute backup all-settings <your_ftp_server> . <your_ftp_username>
<your_ftp_password> myCrptpasswd

```

execute backup-remove fd-archive

This FortiDB CLI allows you to backup and then remove archives to a FTP server.



Note: Please press <enter> to get back to the original prompt after the backup has completed with the message saying "Transfer Finished."

Syntax:

```
execute backup-remove fd-archive <before-date> <ftp server> <username>
<password> [directory][filename]
```

where:

Keywords and variables	Description
<before-date>	Date of the last archive you want included in your backup. For example, if you specify 2008-12-31, the backup will include archives for up to this date. The format is YYYY-MM-DD (MM(1-12), DD(1-31)). YYYY is a 4-digit number representing the year. MM is a 2-digit number from 1 to 12 representing the month. DD is a 2-digit number from 1 to 31 representing the day of the month.
<ftp server>	IP address or hostname of FTP server.
<username>	User name of account that logs on to the FTP server.
<password>	Password of account that logs on to the FTP server.
[directory]	Location on FTP server where you want the tar file to be placed.
[filename]	Name for the tar file on the FTP server where you want the archives to be placed. The default file name is FD-ARCHIVE-<before-date>.tar.

Sample command:

```
execute backup-remove fd-archive 2008-07-30 <your_ftp_server>
<your_ftp_username> <your_ftp_password> . myArchives.tar
```

execute backup-remove fd-report

This FortiDB CLI allows you to backup and then remove reports to a FTP server.



Note: Please press <enter> to get back to the original prompt after the backup has completed with the message saying "Transfer Finished."

Syntax:

```
execute backup-remove fd-report <before-date> <ftp server> <username>
<password> [directory][filename]
```

where:

Keywords and variables	Description
<before-date>	Date of the last archive you want included in your backup. For example, if you specify 2008-12-31, the backup will include reports for up to this date. The format is YYYY-MM-DD (MM(1-12), DD(1-31)). YYYY is a 4-digit number representing the year. MM is a 2-digit number from 1 to 12 representing

Keywords and variables	Description
	the month. DD is a 2-digit number from 1 to 31 representing the day of the month.
<ftp server>	IP address or hostname of FTP server.
<username>	User name of account that logs on to the FTP server.
<password>	Password of account that logs on to the FTP server.
[directory]	Location on FTP server where you want the tar file to be placed.
[filename]	Name for the tar file on the FTP server where you want the reports to be placed. The default file name is FD-REPORT-<before-date>.tar.

Sample command:

```
execute backup-remove fd-report 2008-07-30 <your_ftp_server>
<your_ftp_username> <your_ftp_password> . myReports.tar
```

execute date

The *execute date* command allows you to get or set the system date. If you do not specify a date, the command returns the current system date.

Syntax:

```
execute date [<date_str>]
```

where:

Variable	Description
<date_str>	<p>This variable has the form mm/dd/yyyy.</p> <ul style="list-style-type: none"> • mm is the month and can be 01 to 12 • dd is the day of the month and can be 01 to 31 • yyyy is the year and can be 2001 to 2100 <p>Dates entered will be validated - mm and dd require 2 digits, and yyyy requires 4 digits.</p>

Sample command(This example sets the date to 17 September 2008):

```
execute date 09/17/2008
```

execute format disk

The *execute format disk* command allows you to format the hard disk on the FortiDB system. Executing this command will erase all device settings/images, VPN & Update Manager databases, and log data on the FortiDB system's hard drive. FortiDB's IP address and routing information will be preserved.

Syntax:

```
execute format disk
```

When you run this command, you will be prompted to confirm the request.

Warning: If you use this command without executing `backup all settings` command, you may not be able to view assessments or reports after you archive and restore your data. When you want to archive and format disk, make sure that you execute `config system backup all-settings` command before archiving.

execute generate certificate

The *execute generate certificate* command allows you to regenerate the certificate for FortiDB web administration.

Syntax:

```
execute generate certificate keysize {keysize}
```

The variable **{keysize}** is the subject's public key size for certificate. And the value must be **1024** or **2048**.



Note: The FortiDB system needs to be reboot after generating new certificate.

execute ping

The *execute ping* command allows you to send an ICMP echo request (ping) to test the network connection between the FortiDB system and another network device.

Syntax:

```
execute ping {<ip> | <hostname>}
```

where:

Variable	Description
<ip>	IP address of network device to contact
<hostname>	DNS resolvable hostname of network device to contact

Sample command(This example shows how to ping a host with the IP address 192.168.1.23):

```
execute ping 192.168.1.23
```

execute raid rebuild

The *execute raid rebuild* command allows you to rebuild the hard disk raid when the raid is corrupted.

Syntax:

```
execute raid rebuild
```



Note:

- Rebuild raid will clean all exist data in 2nd hard disk.
- If you just replace the 2nd disk from exist raid, the new inserted disk will get raid synchronizing automatically and does not need rebuild raid. But if the 2nd disks was part of raid volume before, usually need rebuild it.

execute reboot

The *execute reboot* command allows you to restart the FortiDB system. This command will disconnect all sessions on the FortiDB system.

Syntax:

```
execute reboot
```

execute reset

The *execute reset* command allows you to reset the FortiDB system to factory defaults. This command will disconnect all sessions and restart the FortiDB system.

Syntax:

```
execute reset {admin-password | all-settings | data}
```

where:

commands	Description
admin-password	Reset admin's password to default password.
all-settings	Reset the all settings.
data	Reset the database.

Sample command:

```
execute reset all-settings
```

execute restart

This FortiDB CLI allows you to restart the application server under which both FortiDB-VA (Vulnerability Assessment) and FortiDB-DAM (DB Activity Monitoring) are running.

Syntax:

```
execute restart appserver
```

execute restore all-settings

This FortiDB CLI allows you to restore previously backed up your local database, FortiDB system-configuration settings, archives and reports.

Syntax:

```
execute restore all-settings <ftp server> <filepath> <username> <password>
[crptpasswd]
```

where:

Variable	Description
<ftp server>	IP address or hostname of FTP server.
<filepath>	Location of, and filename for, the settings file on the FTP server.
<username>	User name of account that logs on to the FTP server.
<password>	Password of account that logs on to the FTP server.
[crptpasswd]	Optional password for protecting the settings file on the FTP server.



Note: This operation will replace your current settings and necessitate a reboot.

Sample command:

```
execute restore all-settings <your_ftp_server> ./fdb_allbackup.dat
<your_ftp_username> <your_ftp_password> myCrptpasswd
```

execute restore fd-archive

This FortiDB CLI allows you to restore previously backed up your archives.

Syntax:

```
execute restore fd-archive <ftp server> <filepath> <username> <password>
```

where:

Variable	Description
<ftp server>	IP address or hostname of FTP server.
<filepath>	Location of, and filename for, the settings file on the FTP server.
<username>	User name of account that logs on to the FTP server.
<password>	Password of account that logs on to the FTP server.



Note: This operation will replace your current settings and necessitate a reboot.

Sample command:

```
execute restore fd-archive <your_ftp_server> ./fdb_allbackup.dat
<your_ftp_username> <your_ftp_password>
```

execute shutdown

The *execute shutdown* command allows you to shut down the FortiDB system. This command will disconnect all sessions.

Syntax:

```
execute shutdown
```

execute time

The *execute time* command allows you to get or set the system time.

Syntax:

```
execute time [<time_str>]
```

where:

Variable	Description
<time _str>	<p>This variable has the form hh:mm:ss.</p> <ul style="list-style-type: none"> • hh is the hour and can be 00 to 23 • mm is the minutes and can be 00 to 59 • ss is the seconds and can be 00 to 59 <p>All parts of the time are required. Single digits are allowed for each of hh, mm, and ss.</p>

If you do not specify a time, the command returns the current system time.

Sample command (This example set the system time to 15:31:03):

```
execute time 15:31:03
```

execute top

The *execute top* command allows you to view the processes running on the FortiDB system.

Syntax:

```
execute top
```

To exit the display, type q. Other interactive commands are available while running top. For help on them, type h.

The execute top command displays the following information:

```
15:28:03 up 2 days, 0 users, load average: 0.06, 0.04, 0.01
Tasks: 82 total, 2 running, 80 sleeping, 0 stopped, 0 zombie
CPU(s): 0.0% us, 0.0% sy, 0.0% ni, 100.0% id, 0.0% wa, 0.0% hi, 0.0% si
Mem: 2069772K total, 485764K used, 1584008K free, 40124K buffers
Swap: 2069764K total, 0K used, 2069764K free, 7275k cached
```

```
PID  USER  PR   NI  VIRT  RES  SHR  S   %CPU  %MEM  TIME+  COMMAND
  1   root   18    0  3232  1012  720  S    0    0.0  0:07.12  init
  2   root   RT    0    0    0    0  S    0    0.0  0:00.00  migration/0
  3   root   34   19    0    0    0  S    0    0.0  0:00.00  ksoftirqd/0
  4   root   RT    0    0    0    0  S    0    0.0  0:00.00  migration/1
  5   root   39   19    0    0    0  S    0    0.0  0:00.00  ksoftirqd/1
  6   root   RT    0    0    0    0  S    0    0.0  0:00.00  migration/2
  7   root   33   19    0    0    0  S    0    0.0  0:00.00  ksoftirqd/2
  8   root   RT    0    0    0    0  S    0    0.0  0:00.00  migration/3
  9   root   34   19    0    0    0  S    0    0.0  0:00.00  ksoftirqd/3
 10  root   10   -5    0    0    0  S    0    0.0  0:00.00  events/0
 11  root   10   -5    0    0    0  S    0    0.0  0:00.00  events/1
 12  root   10   -5    0    0    0  S    0    0.0  0:00.00  events/2
 13  root   10   -5    0    0    0  S    0    0.0  0:00.00  events/3
 14  root   10   -5    0    0    0  S    0    0.0  0:00.00  khelper
 15  root   10   -5    0    0    0  S    0    0.0  0:00.00  kthread
 21  root   10   -5    0    0    0  S    0    0.0  0:00.00  kblockd/0
```

execute traceroute

The *execute traceroute* command allows you to test the connection between the FortiDB system and another network device, and display information about the network hops between the device and the FortiDB system.

Syntax:

```
execute traceroute {<address_ipv4> | <host-name>}
```

where:

Variable	Description
<address_ipv4>	IP address of network device.
<host-name>	FQDN hostname of network device.

Sample command:

```
execute traceroute <your_IPaddress>
```

show commands

This topic contains the information about the *show system* commands that are available to the FortiDB user. Only changes to the default configuration are displayed.

You can use the *show* command within a config shell to display the configuration of that shell, or you can use the *show* command with a full path to display the configuration of the specified shell. To display the configuration of all config shells, you can use the *show* command from the root prompt.

show system admin setting

The *show system admin setting* command allows you to display the change of system-administration settings.

Syntax:

```
show system admin setting
```

show system backup all-settings

The *show system backup all-settings* command allows you to display the change of system backup settings.

Syntax:

```
show system backup all-settings
```

show system dns

The *show system dns* command allows you to display the change of the DNS server addresses.

Syntax:

```
show system dns
```

Sample Result:

```
FD-XXX # show system dns
config system dns
    set primary 65.39.139.53
    set secondary 65.39.139.63
end
```

show system global

The *show system global* command allows you to display the change of global settings.

Syntax:

```
show system global
```

show system interface

The *show system interface* command allows you to display the change of a FortiDB network interface.

Syntax:

```
show system interface
```

Sample Result:

```
FD-XXX # show system interface
config system interface
    edit "port1"
        set ip 172.30.62.80 255.255.255.0
        set allowaccess ping https ssh telnet http
    end
```

show system ntp

The *show system ntp* command allows you to display the change of the automatic time setting using a network time protocol (NTP) server.

Syntax:

```
show system ntp
```

Sample Result:

```
FD-XXX # show system ntp
config system ntp
  set server "132.246.168.147"
  set status enable
  set sync_interval 120
end
```

show system route

The *show system route* command allows you to display the change of the static routing table entries.

Syntax:

```
show system route
```

Sample Result:

```
FD-XXX # show system route
config system route
  edit 1
    set device "port1"
    set gateway 172.30.62.254
  end
```

get and set commands

This topic describes some examples to use get command and set command.

get command

The *get* command allows you to retrieve system settings.

Here is an example which retrieves the current system-administration settings:

```
get system admin setting <Enter>
http_port          : 80
https_port         : 443
idle_timeout      : 2
```

set command

The *set* command allows you to set specific properties within a settings category.

Here is an example which uses *set* to change a default value for a property within the system-administration settings category:

```
show system admin setting <Enter>

config system admin setting <Enter>
(setting)# set idle_timeout 2
end

show system admin setting <Enter>
config system admin setting
  set idle_timeout 2
end
```

diagnose command

diagnose command display diagnostic information that helps you to troubleshoot problems.

You can use the FortiDB CLI in order to perform the following *diagnose* tasks.

diagnose log show|tail|remove

This FortiDB CLI allows you to show/remove debug logs

Syntax:

```
diagnose log show|tail|remove fortidb-log|tomcat-log|localhost-log
```

where:

Keywords	Description
show	Show the specified log.
tail	Print the tail of specified log, and continue to output appended data as the file grows.
remove	Remove the specified log.
fortidb-log	Log of FortiDB Application Server.
tomcat-log	Initialization Log from Tomcat.
localhost-log	Localhost log from Tomcat.

Sample command:

```
diagnose log tail fortidb-log
```

diagnose system export fd_log

This FortiDB CLI allows you to export debug log files to an FTP server

Syntax:

```
diagnose system export fd_log <ftp server> <user> <password> [directory]  
[filename]
```

where:

Variables	Description
<ftp server>	IP address or hostname of FTP server.
<username>	User name of account that logs on to the FTP server.
<password>	Password of account that logs on to the FTP server.
[directory]	Location on FTP server where you want the diagnostic file to be placed.
[filename]	Name of the zip file that contains several log files that will be put on the FTP server. If you don't specify a filename, you will get a default file called fortidb.zip.

Sample command:

```
diagnose system export fd_log <your_ftp_server> <your_ftp_username>  
<your_ftp_password> . myDiagnose.zip
```

diagnose system raid list

This FortiDB CLI allows you to check hard disk raid status

Syntax:

```
diagnose system raid list
```

diagnose network interface list

This FortiDB CLI allows you to view status of ethernet interfaces

Syntax:

```
diagnose network interface list
```

diagnose network interface detail

This FortiDB CLI allows you to view detail information of ethernet interface

Syntax:

```
diagnose network interface detail <port name>
```

where:

Variable	Description
<port name>	Ethernet interface name, such as 'port1'.

Sample command:

```
diagnose network interface detail port1
```

Contact Information

Getting Fortinet Contact Information

Please go to following Fortinet main website or Customer Service & Support website for contact information:

- <http://www.fortinet.com/>
- <http://support.fortinet.com/>

Or, after login FortiDB, click the 'Support' link at right top of any page, to goto the support website.

