



# Integrating Active Directory with File Access Manager

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## Capabilities

This connector enables you to use IdentityIQ File Access Manager to access and analyze data stored in Active Directory and do the following:

- Analyze the structure of your stored data.
- Monitor user activity in the resources.
- Verify user permissions on the resources, and compare them against requirements.

See the IdentityIQ File Access Manager documentation for a full description.

## Connector Overview

### **Activity Monitor**

File Access Manager Activity Monitor (Activity Monitor) for Active Directory (AD) is based on the native changes auditing capability in AD. AD writes these changes to the various domain controller event logs and the monitor collects them centrally so there is no need to install connectors on domain controllers.

The Activity Monitor service correlates the events and digests them, which makes events possible for people to read.

### **GPO Auditing**

GPO auditing uses a proprietary method with no local connectors on the DCs. The method accesses all GPOs on all DCs through the SYSVOL share, and correlates GPO audit change events with the content of the GPOs.

### **Domain Controllers**

To access the domain controllers, the Activity Monitor reads the list of all Domain Controllers from the domain every hour.

### **Crawling**

Crawling and Permissions Collection work with standard LDAP queries to retrieve all the domain objects and analyze their respective permissions.

The Activity Monitor and Permissions Collector services can be installed on any server, including servers that are NOT members of the monitored domain. An application must be configured in File Access Manager for each monitored domain, with a separate set of Activity Monitor/Permissions Collection services, as described below.

## Prerequisites

Make sure your system fits the descriptions below before starting the installation.

### Software Requirements

IdentityIQ File Access Manager requires the latest ASP.NET Core 3.1.x Hosting Bundle. This bundle consists of .NET Runtime and ASP .NET Core Runtime. You can download the latest 3.1.x Hosting Bundle version from [here](#).

### Enabling the Audit Policy

IdentityIQ File Access Manager relies on the standard Active Directory advanced audit. The advanced audit overrides the simple audit, making the former obsolete. Be sure to migrate existing simple auditing to Advanced Auditing before proceeding.

This guide does not deal with complex GPO scenarios. Be sure that changes do not affect GPO precedence or corrupt other GPOs. Below is the settings in the Domain Controllers GPO.

Apply the following in a Domain Controller GPO.

1. Open “Default Domain Controller Policy”.
2. Navigate to *Computer Configuration > Policies > Windows Settings > Security Settings > Advanced Audit Policy Configuration > Audit Policies*.
3. Set **Audit to success** in all the following settings:
  - *Account Management > Audit User Account Management*
  - *DS Access > Audit Directory Services Changes*
  - *Logon/Logoff > Audit Account Lockout*
  - *Policy Change > Audit Policy Change*
  - *Policy Change > Audit Authentication Policy Change*
  - *Policy Change > Audit Authorization Policy Change*

#### **To enable login audits:**

Set Audit Kerberos Authentication Service to Success in Account Logon

### Active Directory User Permissions

The Active Directory user configured in the Application configuration below must be granted permissions to manage the audit settings of the domain objects, as well as to access the Domain Controller event logs.

## Prerequisites

---

1. Grant Manage Auditing and Security Log Privilege
  - a. Open Default Domain Controller Policy on a DC.
  - b.
    - Navigate to *Computer Configuration > Policies > Windows Settings > Security Settings > Local Policies > User Rights Assignment* and set the following settings:
    - Open *Manage auditing and security log* by double clicking or pressing **Enter**.
    - Add the domain user to the Users/Groups list.

The syntax of the user added to the list must be Domain\User.

2. Add the user to the “Event log readers” security group.

## Communications Requirements

| Requirement                                   | Source                                 | Destination                            | Port                |
|---|--|--|---------------------|
| IdentityIQ File Access Manager Message Broker | Permissions Collector                  | RabbitMQ                               | 5671                |
| IdentityIQ File Access Manager server access  | Activity Monitor/Permissions Collector | IdentityIQ File Access Manager Servers | 8000-8008           |
| Event log remote                              | Activity Monitor                       | All Domain Controllers                 | MS RPC (135)        |
| SYSVOL access                                 | Activity Monitor                       | All Domain Controllers                 | CIFS/SMB (139, 445) |
| Additional queries                            | Activity Monitor/Permissions Collector | All Domain Controllers                 | LDAP (389)          |

The ‘Remote Event Log Management (RPC)’ inbound allow firewall rule must be enabled on the Active Directory (Domain Controller) servers,



## Connector Installation Flow Overview

To install the Active Directory connector:

1. Configure all the prerequisites.
2. Add a new Active Directory application in the Business Website.
3. Install the relevant services:
  - Activity Monitor
  - Permissions Collector

# Collecting Data Stored in an External Application

## Connector / Collector terminology:

### **Connector**

The collection of features, components and capabilities that comprise IdentityIQ File Access Manager support for an endpoint.

### **Collector**

The “Agent” component or service in a Permission Collection architecture.

### **Engine**

The core service counterpart of this architecture.

### **Identity Collector**

A logical component used to fetch identities from an identity store and holds the configuration, settings for that identity store, and the relations between these identities.

The identity collector has no “physical” manifest.

- The actual work is done by the Collector Synchronizer.

The list below describes the high level installation process required to collect and analyze data from an external application. Most of these should already be set up in your IdentityIQ File Access Manager installation. See the server Installation guide for further details.

### **Install a Permission Collection central engine**

One or more central engines, installed using the server installer

### **Create an Application in File Access Manager**

From the Business Website. The application is linked to central engines listed above.

### **Add an Activity Monitor**

To collect activities for this application - run the Collector Installation Manager and add an application under Activity Monitoring.

### **Install Permission Collectors (optional)**

Optionally, you can install collectors that will run on a separate server and take some of the work from the central PC and DC engines (Where supported). When installing a collector, you attach it to an engine. If no collectors are installed, the central services act as both the engine and the collector.

To install a collector, you must have the **RabbitMQ** service installed for communication between the central engines and the collectors. RabbitMQ is installed

For further details, see section **Application > Central Service > Collector Relations** in the IdentityIQ File Access Manager Administrator Guide

## Adding an Active Directory Application

In order to integrate with Active Directory, we must first create an application entry in IdentityIQ File Access Manager. This entry includes the identification, connection details, and other parameters necessary to create the link.

To add an application, use the **New Application Wizard**.

1. Navigate to *Admin > Applications*
2. Click **Add New** to open the wizard.

### Select Wizard Type

1. Click **Standard Application**
2. Click **Next** to open the **General Details** page.

### General Details

#### **Application Type**

Active Directory

#### **Application Name**

Logical name of the application

#### **Description**

Description of the application

#### **Tags**

Select tags for the application from the dropdown menu, and / or type a new name, and press **Enter** to create a new tag. The dropdown list of tags filters out matching tags as you type and displays up to 50 tags.

The **tags** replace the **Logical container** field that was used when creating applications in releases before 8.2

#### **Event Manager Server**

This option is available if there are more than one event manager servers configured in the system.

Select an event manager from the drop down menu

#### **Identity Collector**

Select from the Identity Collector dropdown menu.

- You can create identity collectors in the administrative client. *Applications > Configuration > Permissions Management > Identity Collectors*

See section "OOTB Identity Collection" in the Collector Installation Manager IdentityIQ File Access Manager Administrator Guide for further details.

- If adding a new identity collector, press the **Refresh** button to update the Identity Collector dropdown list.

Click **Next** to open the Connection Details page.

## Connection Details

### **Domain Name**

FQDN of the domain.

### **SSL**

Must be checked to connect with LDAPS.

### **Domain NetBIOS Name**

The short name of the domain.

### **Base DN**

Distinguished Name (DN) – The level in the AD tree from which to perform a search. This field should remain empty unless needed.

### **Username**

The samAccountName of the user defined in the prerequisites, or the UPN if the user is from a different trusted domain.

### **Password**

The user's password

If the user is from a different trusted domain, type the UPN in the User field (username@fqdn), and type the short name of the domain in the Domain NetBIOS Name.

### **Specific Server Connection**

Connection through a specific server instead of selecting a DC dynamically

### **Pool Size**

Number of parallel LDAP connections to DCs (Default is set to 50).

### **Timeout**

Timeout for each LDAP query in seconds (Default is set to 15 sec).

Click **Next**.

## Configuring and Scheduling the Permissions Collection


Permissions can be analyzed to determine the application permissions of an out-of-the-box application, provided you have defined an identity store for File Access Manager to use in its analysis, and you have run a crawl for the application.

The permission collector is a software component responsible for analyzing the permissions in an application.

The Central Permission Collector Service is responsible for running the Permission Collector and Crawler tasks.

If the “IdentityIQ FAM Central Permission Collector” wasn’t installed during the installation of the server, this configuration setting will be disabled.

### **To configure the Permission Collection**

- Open the edit screen of the required application
  - a. Navigate to **Admin > Applications**
  - b. Scroll through the list, or use the filter to find the application
  - c. Click the edit icon  on the line of the application
- Press **Next** till you reach the **Crawler & Permissions Collection** settings page.

The actual entry fields vary according to the application type

When entering this page in edit mode, you can navigate between the various configuration windows using the **Next** and **Back** buttons.

### **Central Permissions Collection Service**

Select a central permission collection service from the dropdown list. You can create permissions collection services as part of the service installation process. See section "Services Configuration" in the IdentityIQ File Access Manager Administrator Guide for further details.

### **Calculate Effective Permissions**

Calculate effective permissions during the permissions collection run

### **Calculate Riskiest Permissions**

Calculates the riskiest permission on a resource – for example, Full Control is riskier than Read permissions if both are on a resource

This option is available when selecting **Calculate Effective Permissions**.

### **Skip Identities Sync during Permission Collection**

Skip identity synchronization before running permission collection tasks when the identity collector is common to different connectors.

This option is checked by default.

## **Scheduling a Task**

### **Create a Schedule**

Click on this option to view the schedule setting parameters.

### **Schedule Task Name**

A name for this scheduling task

When creating a new schedule, the system generates a default name in the following format:

{appName} - {type} Scheduler

You can override or keep this name suggestion.

### **Schedule**

Select a scheduling frequency from the dropdown menu.

- **Schedule Types and Intervals**

#### **Once**

Single execution task runs.

#### **Run After**

Create dependency of tasks. The task starts running only upon successful completion of the first task.

#### **Hourly**

Set the start time.

#### **Daily**

Set the start date and time.

#### **Weekly**

Set the day(s) of the week on which to run.

#### **Monthly**

The start date defines the day of the month on which to run a task.

#### **Quarterly**

A monthly schedule with an interval of 3 months.

#### **Half Yearly**

A monthly schedule with an interval of 6 months.

#### **Yearly**

A monthly schedule with an interval of 12 months.

### **Date and time fields**

Fill in the scheduling times. These fields differ, depending upon the scheduling frequency selected.


### **Active check box**

Check this to activate the schedule.

Click **Next**.

## **Configuring and Scheduling the Crawler**

*To set or edit the Crawler configuration and scheduling*

- Open the edit screen of the required application
  - a. Navigate to **Admin > Applications**
  - b. Scroll through the list, or use the filter to find the application
  - c. Click the edit icon  on the line of the application
- Press **Next** till you reach the **Crawler & Permissions Collection** settings page.

The actual entry fields vary according to the application type

### **Create a Schedule**

Click to open the schedule panel. See [Scheduling a Task](#)


### **Setting the Crawl Scope**

There are several options to set the crawl scope:

- Setting explicit list of resources to include and / or exclude from the scan.
- Creating a regex to define resources to exclude.

### **Including and Excluding Paths by List**

#### ***To set the paths to include or exclude in the crawl process for an application***

- Open the edit screen of the required application
  - a. Navigate to **Admin > Applications**
  - b. Scroll through the list, or use the filter to find the application
  - c. Click the edit icon  on the line of the application
- Press **Next** till you reach the **Crawler & Permissions Collection** settings page.


The actual entry fields vary according to the application type

1. Scroll down to the Crawl configuration settings.
2. Click **Advanced Crawl Scope Configuration** to open the scope configuration panel.
3. Click Include / Exclude Resources to open the input fields.
4. To add a resource to a list, type in the full path to include / exclude in the top field and click **+** to add it to the list.
5. To remove a resource from a list, find the resource from the list, and click the **x** icon on the resource row.

When creating exclusion lists, excludes take precedence over includes.

### **Excluding Paths by Regex**

#### ***To set filters of paths to exclude in the crawl process for an application using regex***

- Open the edit screen of the required application
  - a. Navigate to **Admin > Applications**
  - b. Scroll through the list, or use the filter to find the application
  - c. Click the edit icon  on the line of the application
- Press **Next** till you reach the **Crawler & Permissions Collection** settings page.

The actual entry fields vary according to the application type

1. Click **Exclude Paths by Regex** to open the configuration panel.
2. Type in the paths to exclude by Regex, See regex examples in the section below. Since the system does not collect BRs that match this Regex, it also does not analyze them for permissions. See the example below in section [Business Resource Structure](#) to better understand the business resource full path structure.

### Crawler Regex Exclusion Examples

The following are examples of crawler Regex exclusions:

**Exclude all shares which start with one or more shares names:**

Starting with `\\server_name\shareName`

Regex: `\\\\server_name\\shareName$`

Starting with `\\server_name\shareName` or `\\server_name\OtherShareName`

Regex: `\\\\server_name\\(shareName|OtherShareName)$`

**Include ONLY shares which start with one or more shares names:**

Starting with `\\server_name\shareName`

Regex: `^(?!\\\\server_name\\shareName($|\\.*)) .*`

Starting with `\\server_name\shareName` or `\\server_name\OtherShareName`

Regex: `^(?!\\\\server_name\\(shareName|OtherShareName)($|\\.*)) .*`



### Narrow down the selection:

Include **ONLY** the C\$ drive shares: \\server\_name\C\$

Regex: `^(?!\\\\server_name\\C\$($|\\.*)).*`

Include **ONLY** one folder under a share: \\server\share\folderA

Regex: `^(?!\\\\server_name\\share\$($|\\folderA$|\\folderA\\.*)).*`

Include **ONLY** all administrative shares

Regex: `^(?!\\\\server_name\\[a-zA-Z]\$($|)).*`

To write a backslash or a Dollar sign, add a backslash before it as an escape character.

To add a condition in a single command, use a pipe character “|”.

### Excluding Top Level Resources

Use the top level exclusion screen to select top level roots to exclude from the crawl. This setting is done per application.

#### To exclude top level resources from the crawl process

1. Open the application screen

*Admin > Applications*

2. Find the application to configure and click the drop down menu on the application line. Select **Exclude Top Level Resources** to open the configuration panel.

3. **Run Task**

The Run Task button triggers a task that runs a short detection scan to detect the current top level resources.

Before running the task for the first time, the message above this button is:

#### **"Note: Run task to detect the top-level resources"**

If the top level resource list has changed in the application while you are on this screen, press this button to retrieve the updated structure.

Once triggered, you can see the task status in

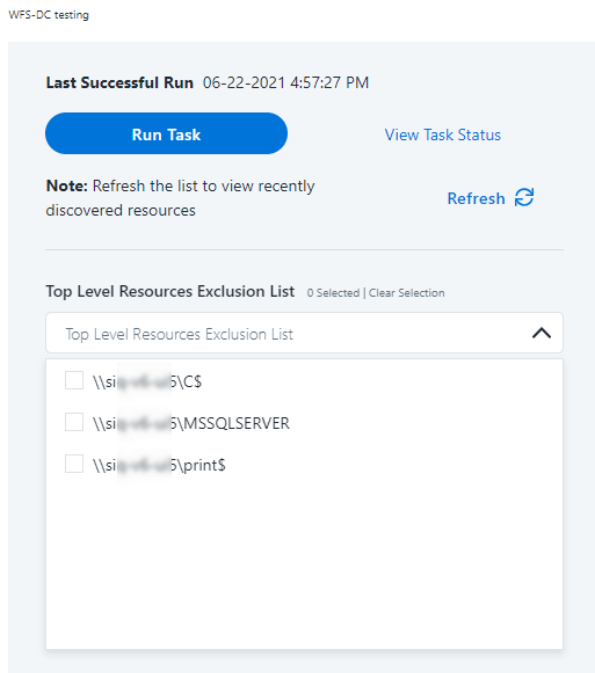
*Settings > Task Management > Tasks*

This will only work if the user has access to the task page

When the task has completed, press **Refresh** to update the page with the list of top level resources.

4. Click the top level resource list, and select top level resources to exclude.
5. Click **Save** to save the change.
6. To refresh the list of top level resources, run the task again. Running the task will not clear the list of top level resources to exclude.

### Top Level Resources Exclusion



### ***Special Consideration for Long File Paths in Crawl***

If you need to support long file paths above 4,000 characters for the crawl, set the flag

**`excludeVeryLongResourcePaths`**

in the Permission Collection Engine App.config file to true.

By default this value will be commented out and set to false.

This key ensures, when enabled, that paths longer than 4000 characters are excluded from the applications' resource discovery (Crawl), to avoid issues while storing them in the SQLServer database.

When enabled, business resources with full paths longer than 4000 characters, and everything included in the hierarchical structure below them, will be excluded from the crawl, and will not be collected by File Access Manager. This scenario is extremely rare.

You should not enable exclusion of long paths, unless you experience an issue.

### ***Background***

File Access Manager uses a hashing mechanism to create a unique identifier for each business resource stored in the File Access Manager database. The hashing mechanism in SQL Server versions 2014 and earlier, is unable to process (hash) values with 4,000 or more characters.

Though resources with paths of 4000 characters or longer are extremely rare, File Access Manager is designed to handle that limitation.

### **Identifying the Problem**

When using an SQL Server database version 2014 and earlier

The following error message in the Permission Collection Engine log file:

```
System.Data.SqlClient.SqlException (0x80131904): String or binary data would be truncated.
```

In all other cases, this feature should not be enabled.

### **Setting the Long Resource Path Key**

The Permission Collection Engine App.config file is `RoleAnalyticsServiceHost.exe.config`, and can be found in the folder

`%SailPoint_Home%\FileAccessManager\[Permission Collection instance]\`

Search for the key **excludeVeryLongResourcePaths** and correct it as described above.

## **Configuring Activity Monitoring**

Configure the activity monitoring process frequency.

### **Polling Interval (sec)**

Activity fetching interval [in seconds]. Default is set to 60 seconds,

### **Report Interval (sec)**

Activity Monitor Health reporting interval [in seconds]. Default is set to 60 seconds.

### **Local Buffer Size (MB)**

Local buffer size for activities [in MB]. Default is set to 200MB.

This cyclic buffer is used to store activities on the Application Monitor's machine in case of network errors that prevent the activities from being sent.

## **Configuring Data Enrichment Connectors**

The Data Enrichment Connectors (DEC) configuration enables us to select data enrichment sources. These can be used to add information from other sources about identities.

An enrichment source could be a local HR database that is used to combine users' job descriptions or departments to the information stored in the identity store.

Select the data enrichment connectors to enrich monitored activities from the Available DECs text box.

Use the > or >> arrows to move the selected DECs to the Current DECs text box.

The user can select multiple DECs. Simply select each desired DEC.

You can create a new DEC in the Administrative Client (*Applications > Configuration > Activity Monitoring > Data Enrichment Connectors*). After creating a new DEC, Click **Refresh** to refresh the dropdown list.

The chapter **Connectors** of the IdentityIQ File Access Manager Administrator Guide provides more information on Data Enrichment Connectors, including what they are, how to configure them, and how they fit in the Activity Flow.

## Installing Services: Collector Installation

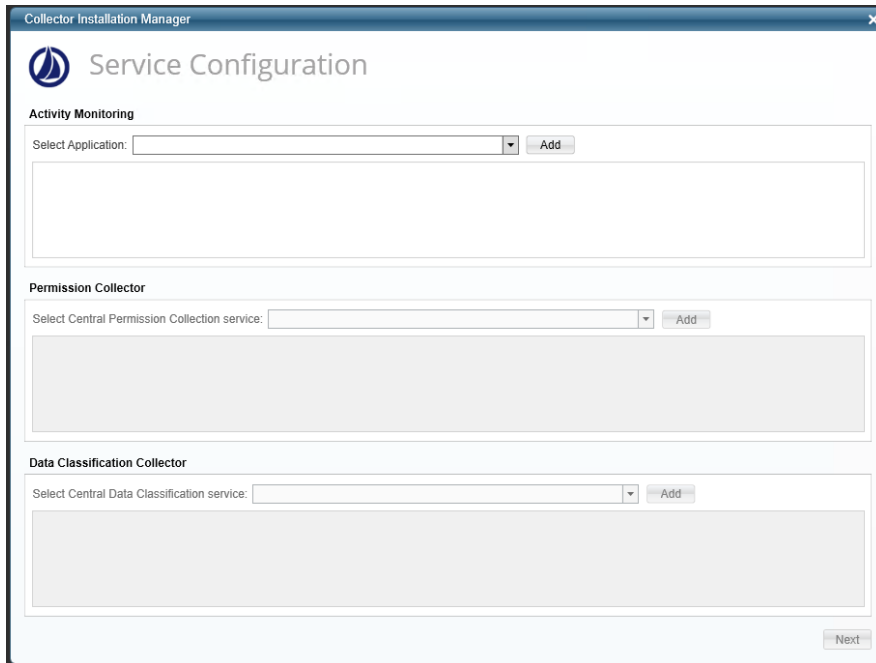
1. Run the **Collector Installation Manager** as an Administrator.  
The installation files are in the installation package under the folder **Collectors**.

The Collector Installation Manager window displays.



2. Enter the credentials to connect to IdentityIQ File Access Manager.
  - a. ServerName/IP should be pointed to the Agent Configuration Manager service server.
  - b. An IdentityIQ File Access Manager user with Collector Manager permission (permission to install collectors). For Active Directory authentication, use the format domain\username.
3. Click **Next**.

The Service Configuration window displays.



4. If you are installing the Activity Monitoring collector, select the application, and click **Add**.

In some applications, additional credentials may be required to allow granting elevated permission for activity monitoring collection.

5. If you are installing the Permission Collector, select the Central Permission Collector to which to connect this service, and click **Add**
6. Click **Next**.

The Installation Folder window displays.

If this is the first time you are installing collectors on this machine, you will be prompted to select an installation folder, in which all future collectors will also be installed.

7. Browse and select the location of the target folder for installation.
8. Browse and select the location of the folder for system logs.
9. Click **Next**.
10. The system begins installing the selected components.
11. Click **Finish**

The Finish button is displayed after all the selected components have been installed.

The *IdentityIQ File Access Manager Administrator Guide* provides more information on the collector services.

# Verifying the Active Directory Connector Installation

## Installed Services

Verify that the services installed for the connector are available and active. Using windows Service manager, or other tool, look for the IdentityIQ File Access Manager services, and see that they are running.

for example:

- File Access Manager Central Activity Monitor - <Application\_Name> service is running.
- File Access Manager Central Permissions Collection - <Application\_Name> service is running.

## Log Files

Check the log files listed below for errors

- "%SAILPOINT\_HOME\_LOGS%\PermissionCollection\_<Service\_Name>.log"
- "%SAILPOINT\_HOME\_LOGS%\ACTIVE DIRECTORY-<Application\_Name>.log"

## Monitored Activities

1. Simulate activities on Active Directory.
2. Wait a minute (approximately).
3. Verify that the activities display in the IdentityIQ File Access Manager website under  
*Forensics > Activities*

## Permissions Collection

1. Run the Crawler and Permissions Collector tasks (*Settings > Task Management > Scheduled Tasks*)
2. Verify that:
  - The tasks completed successfully
  - Business resources were created in the resource explorer (*Admin > Applications > [application column] > Manage Resources*)
  - Permissions display in the Permission Forensics page (*Forensics > Permissions*)

## Troubleshooting

Check the issues below for common problems and suggested ways of handling them.

### Activities are not Shown in the Business Website

- Verify that all prerequisites were set.
- Check the Activity Monitor logs for errors.

### Errors in Accessing the Domain Controllers

If there are errors in accessing the domain controllers, such as RPC server or server not available:

- Verify that this domain controller is running on Windows 2008 or above.
- Open the event viewer of the domain controller on which the change was made, with the user configured in the Application configuration.  
If the viewer fails to open, verify that the user has the permissions described in the prerequisites section.
- Search for events with IDs 5136-5141.  
Verify the connection to the domain controller in which the change was made, and verify that the change audit policy was enabled as written in the prerequisites section.

### No Events Found

- Run the following command on the domain controller:  

```
Auditpol /get /subcategory: "directory service changes"
```
- Verify that the settings described in [Enabling the Audit Policy](#) section are "Success".
  - If these settings are not defined, trigger a GPO update by running the following command:  

```
gpupdate /force
```
  - If the settings are still not defined, verify that the GPO is properly configured in, and applied to, the domain controller.

### Cannot Access Event Log

#### ***Event Viewer of the domain controller fails to open***

Open the event viewer of the domain controller on which the change was made, with the user configured in the Application configuration.

If the viewer fails to open, verify that the user has the permissions described in [Active Directory User Permissions](#).

#### ***Access is Denied(5) Error when trying to access Directory Services***



Navigate to *Event Viewer (DC server name) > Applications and services Logs > Directory Services* and verify that you have access to it.

If you get an **Access is Denied(5)** error (See image) , contact your Active Directory owner and ask to remove this restriction for the relevant SecurityIQ user. The access to Directory Service should be granted with EventLogReader group association.

