



# Cloud Access Management Integration

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## Getting Started

Cloud Access Management is a governance offering for multi-cloud environments. Use it quickly to discover who has access to what, how that access is being granted, and implement pre-configured policies that automate detection of compliance violations.

Within IdentityIQ, you can view additional detailed Cloud Access Management-based information about entitlements from identity warehouse, access requests, entitlement catalog, advanced analytics, and certifications. You can search for entitlements using Cloud Access Management-based values from entitlement catalog, manage access, advanced analytics, certifications, and targeted certification editor.

Whenever a summary of an entitlement is shown (e.g. in a table), there will be an easy, at a glance 'hint' to know if the entitlement has any cloud access.

When integrating Cloud Access Management with IdentityIQ, the following application types are supported:

- AWS
- Azure Active Directory

To install and configure Cloud Access Management with IdentityIQ, see [Setup](#).

# Setup

The Cloud Access Management integration feature will have to be installed and then configured to integrate with IdentityIQ.

For more information, see:

- [Installation](#)
- [Configuration](#)
- [Operating Verification](#)

## Installation

Use the following information to activate your Cloud Access Management installation.

1. Log on to your instance of IdentityIQ as an administrator.
2. Click on Global Settings under the gear icon and select the Import from File Page.
3. Click **Browse** and browse to the following directory: `identityiq_home\WEB-INF\config` where `identityiq_home` is the directory in which you extracted the `identityiq.war` file during the IdentityIQ installation procedure.
4. Select the `init-cam.xml` file and click **Import**.
5. When the import is complete, click **Done**.

A restart of currently running application servers is required after `init-cam.xml` is installed.

## Configuration

To view the configuration settings and values of the Cloud Access Management, complete the following steps:

1. Click **gear menu > Global Settings > Cloud Access Management Configuration**.
2. Enter your connection and configuration settings:

### Connection Information for Cloud Access Management Services

#### *Cloud Access Management Hostname*

The host of the Cloud Access Management website

#### *OAuth Token Hostname*

Hostname used to create the Cloud Access Management access token using the Client ID/Secret.

#### *Client ID / Client Secret*

Client ID is the identifier associated with the Cloud Access Management API service. The Client Secret is the OAuth secret associated with the Cloud Access Management API service.

# Advanced

## Read Timeout

The maximum time in seconds to wait for a response from Cloud Access Management APIs before failing.

## Connect Timeout

The maximum time in seconds to wait for a connection to succeed to Cloud Access Management APIs before failing.

3. After filling out the fields, click **Test Connection** to validate the configuration is valid and that IdentityIQ can successfully connect to Cloud Access Management.

# Event Properties

After Cloud Access Management has been installed and configured, it can start receiving events. By clicking this button, Cloud Access Management is notified to start sending data. After the data has initially been received, Initiate Events can be clicked again to request all data.

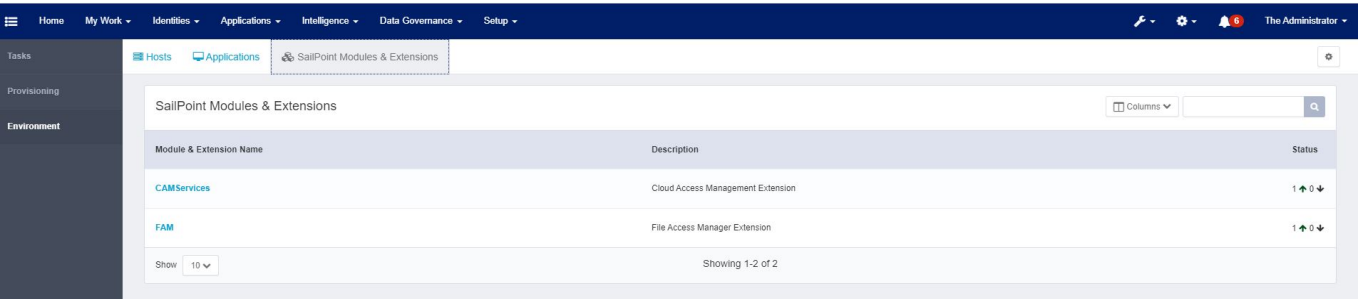
4. Save your changes.

# Operating Verification

To verify Cloud Access Management was installed and configured correctly, complete the following steps:

1. Navigate to the gear menu and click on **Administrator Console**.
2. Select **Environment**.
3. Click **SailPoint Modules & Extensions**.

Here, all the integrated modules can be viewed along with their status, host name, and last ping to their server.



SailPoint Modules & Extensions		
Module & Extension Name	Description	Status
CAMServices	Cloud Access Management Extension	1
FAM	File Access Manager Extension	1

The default interval for the monitoring is five minutes.

# Cloud Based Search Options

When Cloud Access Management is enabled, additional fields will be present in the Entitlement Catalog Advanced Search, the Manage Access Page, and the Advanced Analytics page.

For the Entitlement Catalog, the new fields under Effective Cloud Access are Cloud URI, Cloud Display Name, and Cloud Provider. These fields will search for data stored in IdentityIQ through Cloud Access Management Events.

HomeMy WorkIdentitiesApplicationsIntelligenceData GovernanceSetup

Tools

Settings

Help

6

The Administrator

Entitlement Catalog

Filter Entitlements

Advanced Search

ImportExportAdd New Entitlement

Import Entitlements from a CSV

Application

Type

Attribute

Value

Owner

Effective Access

Account Group Permissions

Target

Rights

Annotation

Effective Cloud Access

Cloud Uri

Cloud Display Name

Cloud Provider

Search

Reset

Application	Attribute	Display Name	Type	Description	Owner	Requestable	Classifications
PAM Demodata		0008f7e6ce9542f99568798...	Container				
PAM Demodata		0156cb17686c4fbe8353593...	Container				

For Manage Access, new filters are added for the Manage Access Page to search for managed attributes which are cloud based by classifications. This filter is multi-valued and lists the different clouds (AWS, Azure, etc). The two new fields are Role Classifications and Entitlement Classifications.

There is an additional field titled Entitlement Cloud Provider.

## Cloud Based Search Options

1 **Select Users**  
Find and select users for whom you want to manage access.

2 **Manage Access**  
Add access for the users you've selected.

3 **Review and Submit**  
Look over your selections and confirm.

Search By Keywords Search Access

Identities Selected: Aaron Nichols

Filter Access

Role Type

Entitlement Owner

Entitlement Rank

Role Classifications

Entitlement Classifications

Entitlement Application

Entitlement Authorization

Entitlement Attribute

Entitlement Email

Previous Next

Also for Manage Access, the Search Access has a powerful searching capability. When Cloud Access Management is enabled, searches that match the Cloud Display Name or Cloud URI (mentioned above) with any of the three cloud access types, will result in all roles and groups within that hierarchy.

Manage User Access

1 **Select Users**  
Find and select users for whom you want to manage access.

2 **Manage Access**  
Add access for the users you've selected.

3 **Review and Submit**  
Look over your selections and confirm.

Search By Keywords Search Access

Identities Selected: Mary Johnson

Search For Access

Use the search or filter options above to find access items.

Your search results will show up here.

[Browse all access items](#)

Previous Next



## Cloud Based Search Options

For Advanced Analytics, the new fields under Effective Cloud Access are Cloud URI, Cloud Display Name, and Cloud Provider. These fields will search for data stored in IdentityIQ through Cloud Access Management Events.



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The Administrator

Advanced Analytics

Search TypeEntitlement

Advanced Search

Entitlement Attributes

Standard Attributes

Attribute

Owner

Value

Application

Type

Classification

Effective Access

Searchable Attributes

attr\_demoAuthorization

attr\_demoEmail

attr\_demoRank

Account Group Permissions

Target

Rights

Annotation

Effective Cloud Access

Cloud Uri

Cloud Display Name

Cloud Provider

Entitlement Fields

☐ Annotation

☐ Application

☐ attr\_demoAuthorization

☐ attr\_demoEmail

☐ attr\_demoRank

☐ Attribute

☐ Classifications

☐ Display Name

☐ Owner

☐ Rights

☐ Target

☐ Type

☒ Value

Run Search

Clear Search

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# Cloud Based Locations

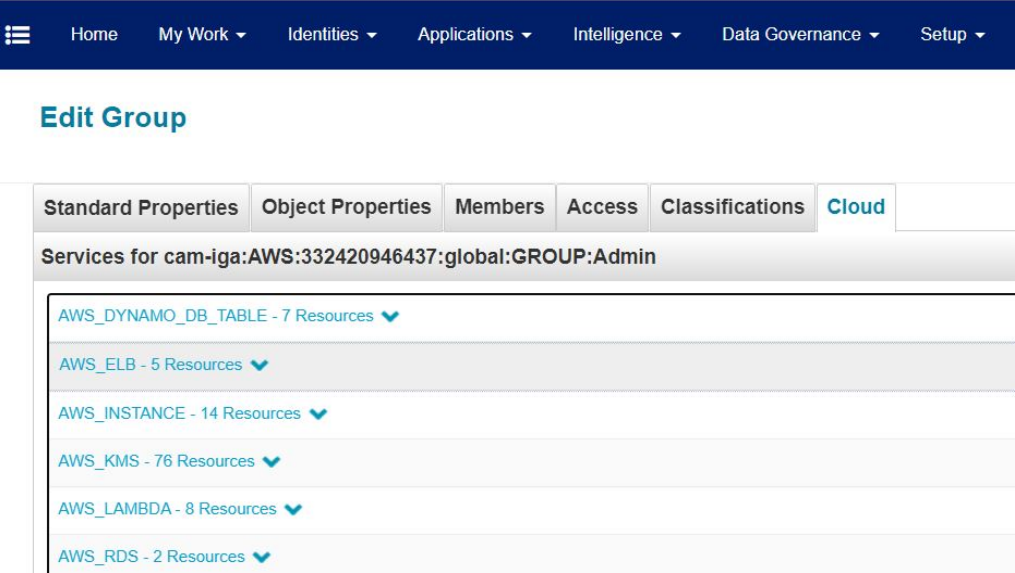
After the Cloud Access Management module is integrated, IdentityIQ will retrieve at display time additional entitlement details from Cloud Access Management and display them in a new Cloud tab.

## Cloud Tab Locations

This section will highlight all the locations of IdentityIQ where the new cloud tab will display when dealing with entitlements.

### Entitlement Catalog

When searching for entitlements within the Entitlement Catalog, select the desired cloud enabled entitlement. Next, select the Cloud tab.



### Identity Warehouse

After selecting an identity within the Identity Warehouse, navigate to the Entitlements tab and select a cloud enabled entitlement. The Cloud tab will show similar data as the Cloud tab for the Entitlement Catalog.

AttributesEntitlementsApplication AccountsPolicyHistoryRiskActivityUser RightsEvents

Oleg was last refreshed on 4/8/21 at 4:48:05 AM 

DirectEffective

Roles

Filter by role name 

Advanced Search

Name	Description	Classifications	Assigned By	Allowed By	Acquired	Application	Account Name
No data to display							

Entitlements

Filter by attribute 

Filter by application 

Show only additional entitlements 

Advanced Search

Attribute	Entitlement	Classifications	Application	Account Name
CustomerManagedPolicies	AzureUserPolicy		AWS - CAM	Oleg
Groups	Admin			
AWSManagedPolicies	AdministratorRole			
CustomerManagedPolicies	Amit-Sp-Travis			
InlinePolicies	OlegAssumeRole			
AWSManagedPolicies	AdministratorRole			
CustomerManagedPolicies	SecurityAuditPol			
Groups	Developer			
Groups	Arch			
InlinePolicies	OlegAssumeRole			
groups	Support			
servicePrincipals	AAD Request Va			
groups	Oleg-24-07			
groups	Oleg-17-06			
groups	DEMO-AWS-Dev			
servicePrincipals	OrkusTest			
servicePrincipals	AWS Oleg			
groups	OU1			

ga-oleg-aws Object Details

Standard PropertiesObject PropertiesMembersCloud

Roles

owner - AZURE

Application Definition

- When selecting an application within Application definition, navigate to the Accounts tab. Expand the user details having the cloud enabled entitlement.
- Select the desired group for an identity.
- The Object Details dialog will display. Click the Cloud tab.

## Cloud Based Locations

Details

Configuration

Correlation

Accounts

Risk

Activity Data

Sources

Rules

Password Policy

Filter by Name

Q

Account ID	Account Name	Status	Last Refresh
07221e19-9a23-4748-82c8-1434585c3e88	MS	Active	4/8/21
08da78ac-662f-4696-9731-d10e44db6b	Test Denys Volkov	Active	4/8/21
14764571-a965-4a00-ac95-d14b2c5966f	QaDenys	Active	4/8/21
16d229de-1a1b-40eb-8e96-d90374db0956	Manoj Gupiani	Active	4/8/21
22c2443-4a6a-40c1-95eb-b53db9eac24	Denys Volkov		
3291344c-3b14-40ea-ba61-9e9f3d58258c	test onboarder		
3389604-8744-4a30-afaa-547f9aed0f54	Kira Kellner		
3402bce3-101b-4421-a607-d0942099dc31	Tetiana Nemyr		
35f852c4-e6e9-4178-bdb4-8850c9453e26	Alex Vinnik		
3714d078-97d6-4c32-af10-e1a32f0cc056	Second Aurs		
3ad69f7-1cf6-4c22-8bc1-3bdc02a8624a	CrayonAdmin		
3eeaaebb-9512-4c89-9c0f-1b1e2c04db9f	Denys AutoTe		
4601a213-2c7a-47c6-a09f-9ecbde9c2289	Yurii Skrypn		
4842c99-ea10-4c04-b5ce-052dc878bf50	Denys Volkov		
537240c6-a805-46df-a3ab-d6993d5a9209	Doug Fierro		
54289c5b-95a2-4646-9631-4927050170c	DEMO-Devop		
63e4003f-7fed-4de3-916e-2f9e7b3c6912	Oleg		

Oleg-17-06 Object Details

Standard Properties

Object Properties

Members

Cloud

Roles

Services

contributor - AZURE

proper-access - AZURE

reader - AZURE

Close

IIQDisabled

false

IIQLocked

false

accountEnabled

true

displayName

Oleg

givenName

Oleg

groups

DEMO-AWS-DemoDevops-332420046437

Chap-17-06

Oleg-24-01

qa-defme-group-1

qa-oleg-aws

QU1

Support

mailNickname

Oleg

objectid

63e4003f-7fed-4de3-916e-2f9e7b3c6912

servicePrincipal

DEMO-AWS-332420046437

DEMO-AWS-332420046437

AWS Oleg

AWS Oleg

AWS Oleg

### ***Delegated Work Items***

After selecting a work item, click on the entitlement. The same dialog as the Identity Warehouse will display.

[View Work Item 207](#)

Summary

Work Item ID 207

Requester

The Administrator

Owner

Alan Bradley

Description

Certify the 'AzureAD' entitlement on 'CrayonAdmin'

Created

Mar 9, 2021 10:49:42 AM

Expiration

Mar 8, 2021 7:08:58 PM

Priority

Normal

History

None

Send Comment to Requester

Add Comment

Decisions

Recent Changes

Employee Data

Risk Data

Legend:

Approve

Revoke

Allow Exception

Delegate

Action Required

Additional Entitlements

Decision	Account Name	Attribute	Entitlements
<div> <div> <div></div> <div></div> <div></div> </div> </div>	CrayonAdmin	groups	Ou6

1

of 1

Show

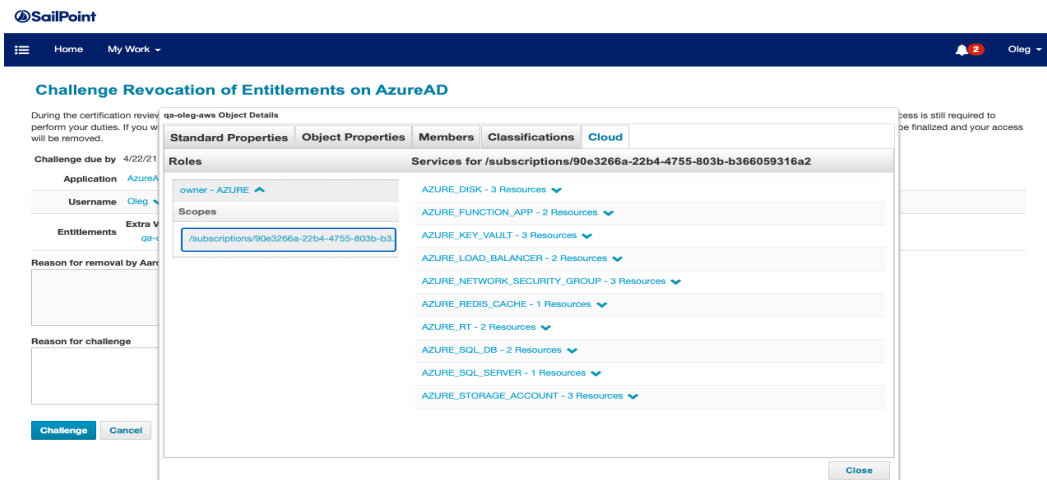
15

Items

Displaying 1 - 1 of 1

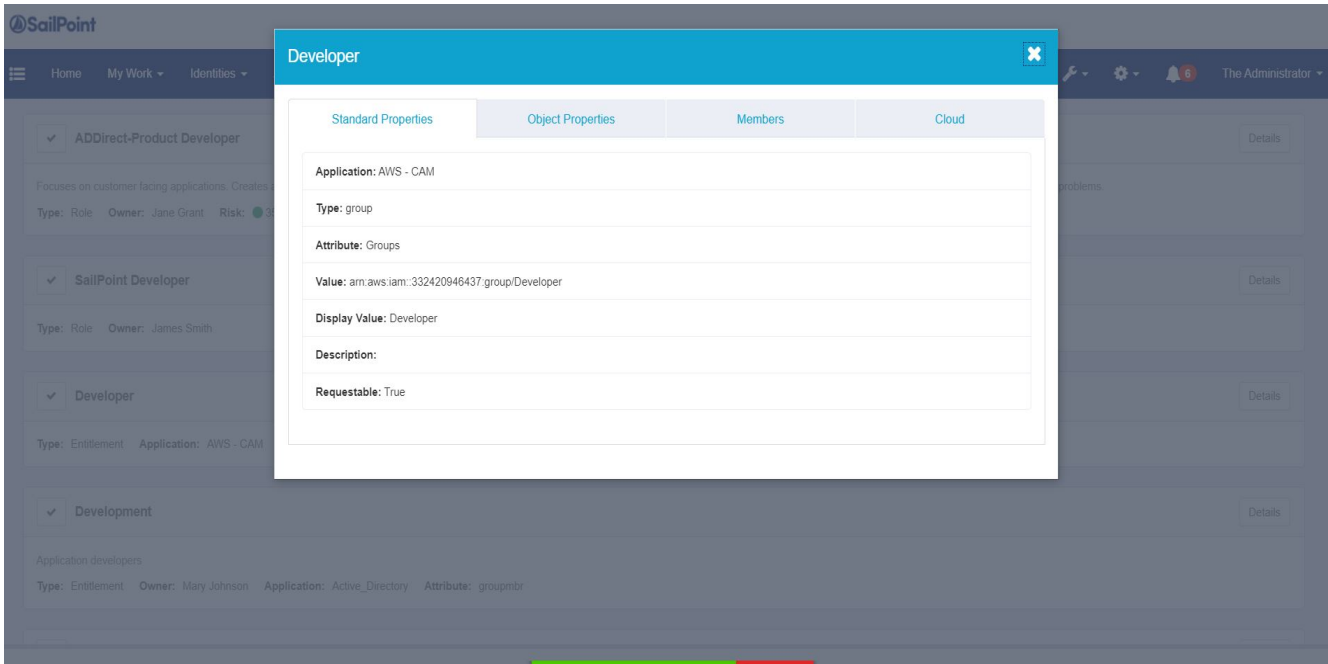
### Challenge Work Items

When a challenge phase is enabled, the cloud can be viewed on the particular entitlement in the Challenge Work Item.



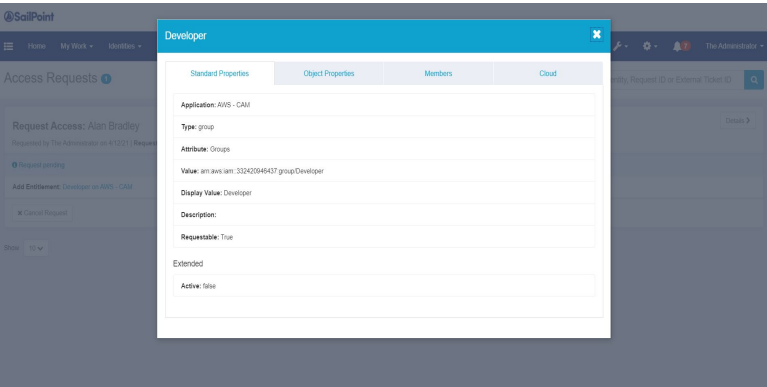
### Manage User Access

When selecting an identity to add or remove access from, scroll to the desired entitlement and click the Details option. The Cloud tab will display in this window.



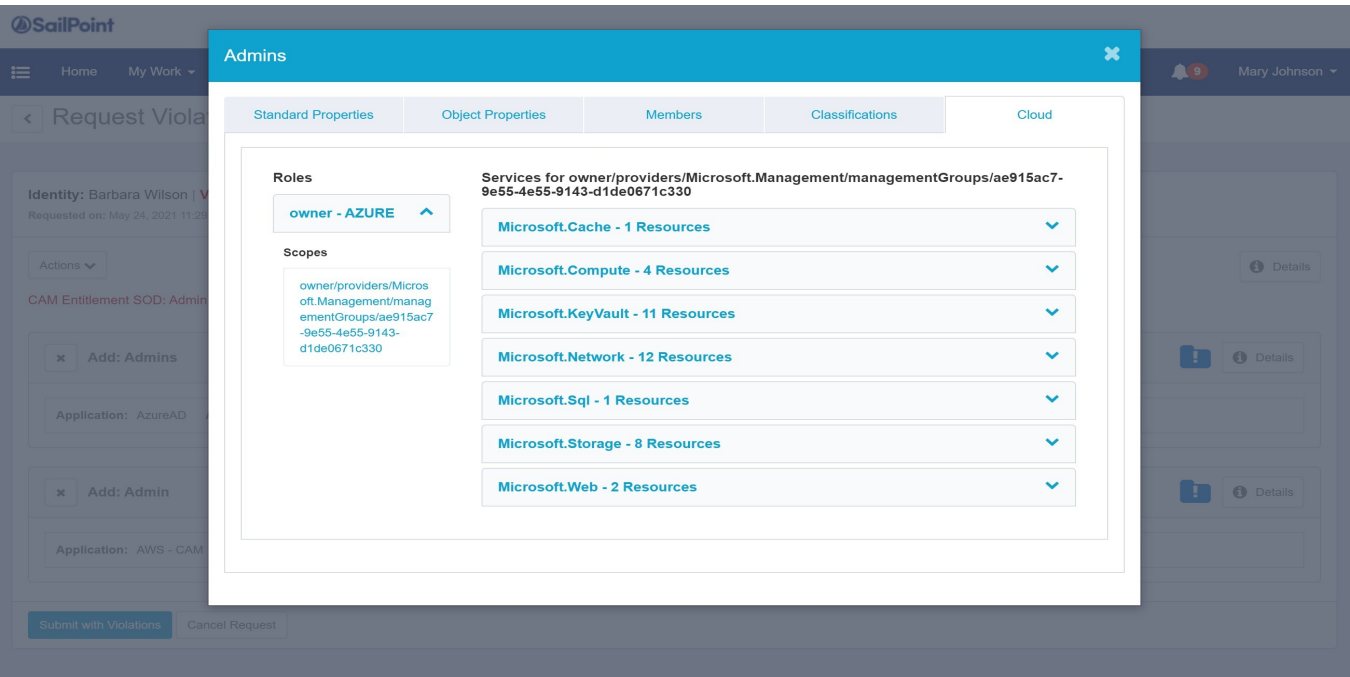
### Access Request

When adding an entitlement, this Cloud tab can be seen within Track My Requests.



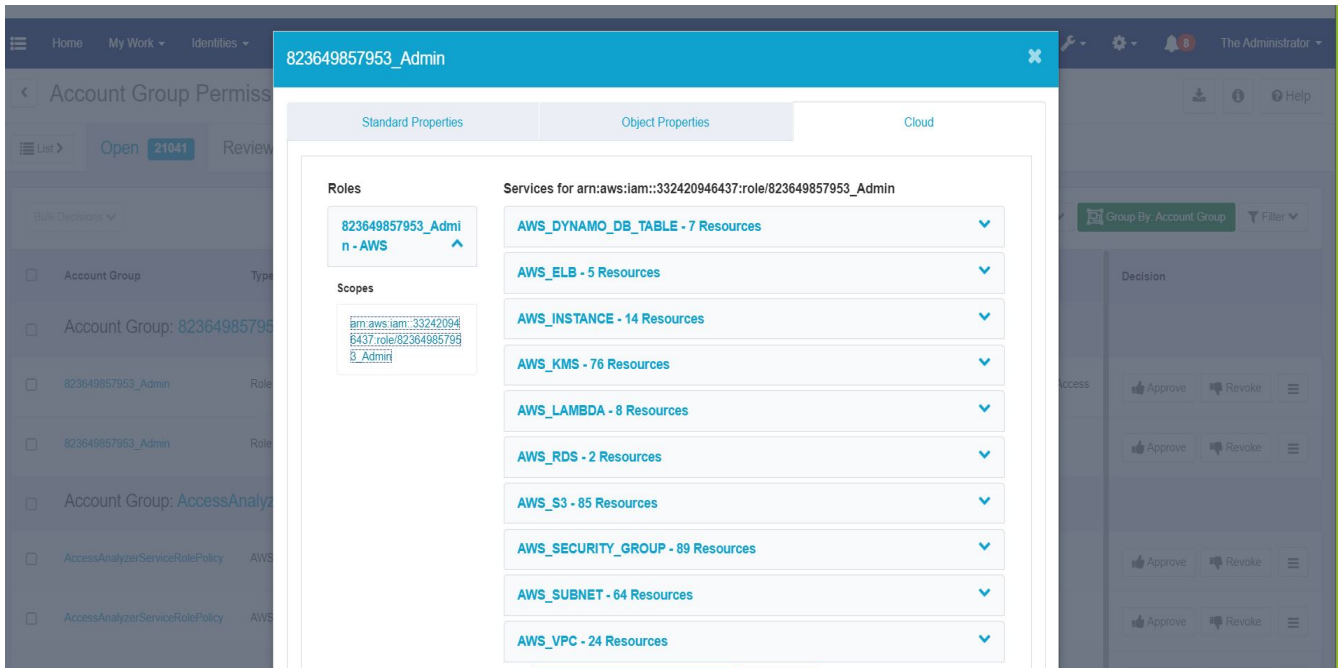
**Request Violation**

This Cloud tab will display when viewing a request violation work item. If a created policy conflicts between two cloud entitlements, this tab will display.



**Access Review**

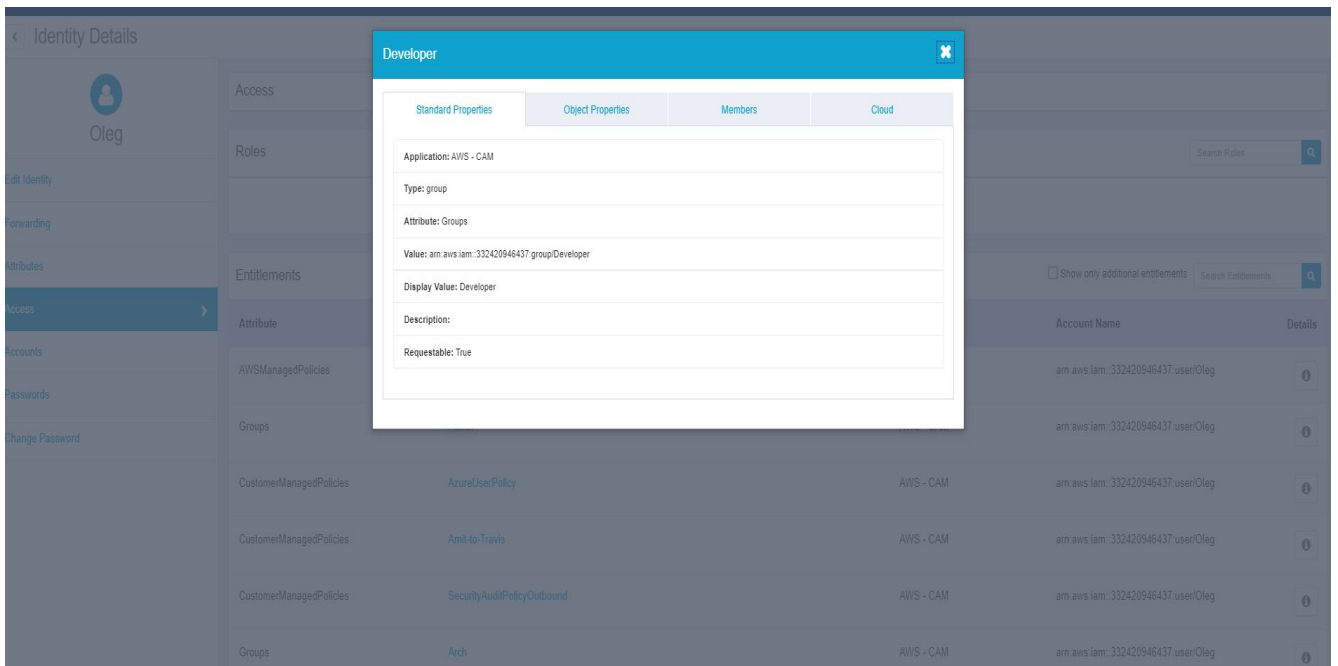
This Cloud tab will display when scheduling a certification. Choose the desired cloud application, then click on Account to view the Cloud tab.



### Identity Details Access Page

Navigate to the Manage Identity drop down and choose either **View Identity** or **Edit Identity**. Then, click on the **Access** tab to see the list of entitlements.

The cloud tab will only be visible in the Details dialog if it's a cloud supported managed attribute/entitlement.



# Cloud Classifications

Cloud Access Management classifications will be visible for cloud based entitlements. The classifications correspond to the cloud provider for which the entitlements are associated. The classifications for a cloud access group entitlement will also include the classifications of its cloud access roles. These classifications will display in the Classification column within the Entitlement Catalog (and other tables within IdentityIQ) as shown below.

## Entitlement Catalog

<input type="text" value="Oleg"/>			Advanced Search				Import	Export	Add New Entitlement
Application	Attribute	Display Name	Type	Description	Owner	Requestable	Classifications		
AzureAD	groups	Oleg-17-06	Group					Azure	
AzureAD	groups	Oleg-24-07	Group					AWS, Azure	
AWS - CAM	InlinePolicies	OlegAssumeRoleEC2	InlinePolicy						
AWS - CAM	InlinePolicies	OlegAssumeRoleS3	InlinePolicy						
AWS - CAM		OlegBoundaryLambda	Role					AWS	
AWS - CAM		OlegEC2	Role					AWS	
AWS - CAM		OlegLambda	Role					AWS	
AWS - CAM		OlegS3	Role					AWS	
AWS - CAM		OlegS3AzureIDP	Role					AWS	

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## Associations

Click the Cloud tab to retrieve information from the Cloud API. The following associations can be determined from the information retrieved from Cloud Access Management:

- Federated Group – a Cloud Access Management group that has associated Cloud Access Management role(s)
- Native Group – a Cloud Access Management group having no Cloud Access Management roles but is associated with Cloud Access Management services
- Cloud Access Management Role association

### Federated Groups

For federated and hybrid groups, two panels will display when looking at the Cloud Access Management details.

The left panel will display all associated role in an accordion style. When opened, the associated scope(s) with that role will listed under.

When a scope is selected, the right panel will populate with the associated Cloud Access Management service(s). These services are also listed in an accordion style. When a service is selected, the associated CAM resource (s) will be listed.

### Native Groups

Only services are listed in one panel.

## Targeted Certifications Cloud Filtering

When integrated with IdentityIQ, Cloud Access Management allows the user to define a Targeted Certification to specify cloud specific selection criteria for Roles and Additional Entitlements.

The selection criteria for Targeted Certifications is used to decide which entitlements and/or roles will be included as certifiables when the certification is generated.

The screenshot shows the 'Schedule Certification' page in the SailPoint interface. The left sidebar contains navigation links: 'Who to Certify' (All Identities), 'What to Certify' (All Roles, All Additional Entitlements, All Target Permissions), 'Choose Certifier' (Manager), 'Schedule' (4/7/21), and 'Additional Settings'. The main content area is titled 'What do you want to certify?' with a subtitle 'Define the items you would like to certify in this campaign.' and a 'Help' button. Below this, there are two radio buttons: 'Roles / Entitlements' (selected) and 'Accounts Only'. The 'Roles / Entitlements' section has a 'Roles' filter with a dropdown menu showing 'Classifications', 'Equals', and a search input. A dropdown menu is open showing 'AWS', 'Azure', 'Azure AD IdP', 'Cloud Type Unknown', and 'Google'. The 'Additional Entitlements' section has a 'Select Attribute...' dropdown and an 'Add Filter' button. There is also a checkbox for 'Include Accounts without Entitlements'. The 'Target Permissions' section has a checkbox and a 'Filter Target Permissions' button. At the bottom, there are 'Cancel' and 'Schedule Certification' buttons.

New search criteria have been added for Additional Entitlements. All new search criteria will appear as a pull-down option. They will only appear if Cloud Access Management is enabled.

- Cloud Access Scopes – Matches ManagedAttributes which have *any* of the given scopes indirectly from their Cloud Access Manager groups or roles.
- Cloud Access Roles – Matches ManagedAttributes which map to *any* of the given roles directly or indirectly from their Cloud Access Manager groups.
- Cloud Access Groups – Matches ManagedAttributes which map to *any* of the given groups.
- Cloud Provider – Matches ManagedAttributes which have a Cloud Access Manager group or (indirectly) a Cloud Access Manager role with *any* of the given clouds set directly.

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The Administrator

←

Schedule Certification

Who to Certify

All Identities

What to Certify

All Roles, All Additional Entitlements, All Target Permissions

Choose Certifier

Manager

Schedule

4/7/21

Additional Settings

What do you want to certify?

Define the items you would like to certify in this campaign.

🔗

Help

Roles / Entitlements

Accounts Only

Roles

Classifications

Equals

+

Add Filter

Additional Entitlements

Select Attribute ...

Cloud Access Groups

Cloud Access Roles

Cloud Access Scopes

Cloud Provider

Display Name

Certifying all Target Permissions

Filter Target Permissions

Cancel

Schedule Certification

SailPoint Cloud Access Management Integration

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## Updating the CAMSync Service

This section provides information about the CAMSync service and the cloud access hints.

### CAMSync Service

The cloud based search capability and cloud classifications rely on the new service CAMSync. The CAMSync service is responsible for synchronizing Cloud Access Management data into IIQ to enhance searching and classifications.

In a multi-server deployment, synchronization with the Cloud Access Management will only occur from the CAMSync service on one of the hosts. The active CAMSync service host will be chosen automatically, and automatic failover is supported.

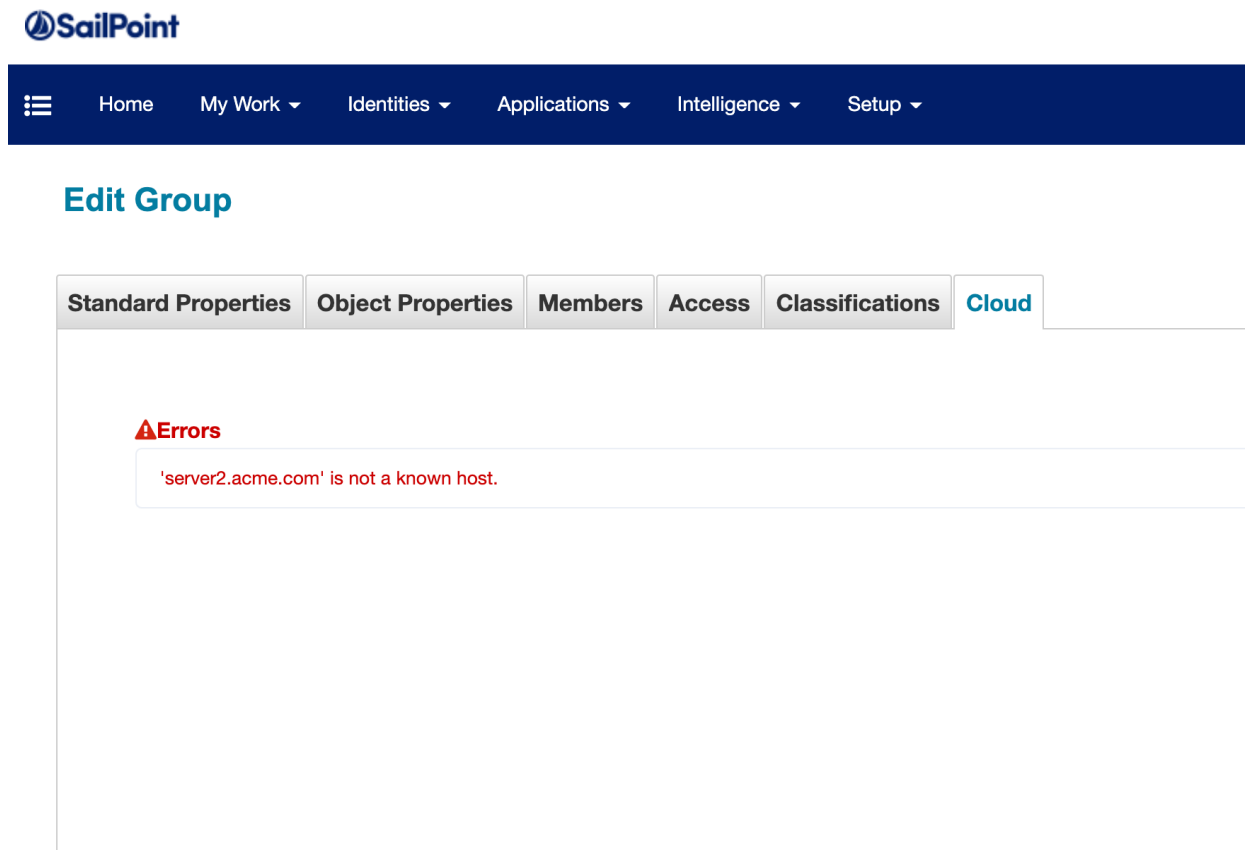
As described in [Configuration](#), the Initiate Events button under **Gear menu > Global Settings > Cloud Access Management Configuration** must be clicked once to initiate the flow from Cloud Access Management into IdentityIQ via the CAMSync service. All data from Cloud Access Management will be received, and future changes to the data will then arrive upon occurrence. However, for unusual circumstances, an additional click on the Initiate Events button can be done to force a full refresh of all data from Cloud Access Management again.

# Troubleshooting

The following are a couple of errors that may appear depending on if information was entered correctly.

## Wrong Hostname

When configuring Cloud Access Management within Global Settings, if the Cloud Access Management hostname was entered incorrectly, the following error will display when clicking the cloud tab within Edit Group.



## Wrong Client ID

When configuring Cloud Access Management within Global Settings, if the Cloud Access Management Client ID was entered incorrectly, the following error will display when clicking the cloud tab within Edit Group.

## Edit Group

Standard Properties
Object Properties
Members
Access
Classifications
Cloud

Errors

Failed to send request : Authorization failure with OAuth token provider. Check values for client id and client secret.

## Additional Configuration Details

The SystemConfiguration Configuration object contains the following key when Cloud Access Management is installed:

- <entry key="camEnabled" value="true"/>

The CAMConfiguration Configuration object contains the following keys:

Key	String	Description
clientId	string	OAuth client id
clientSecret	string	OAuth client secret (encrypted)
hostname	string	Cloud Access Management hostname
oauthHostname	string	OAuth access token hostname
connectTimeoutSeconds	integer	Maximum time in seconds to wait for a connection to succeed to Cloud Access Management APIs before failing. default = 10
readTimeoutSeconds	integer	Maximum time in seconds to wait for a response from Cloud Access Management APIs before failing default = 60
eventAcknowledgeEndpoint	string	default = /tqr/v1/messages/acknowledge
groupsEndpoint	string	default = /v1/resources/groups
messagesEndpoint	string	default = /tqr/v1/messages
rolesEndpoint	string	default = /v1/resources/roles
scopesEndpoint	string	default = /v1/resources/scopes

Key	String	Description
servicesEndpoint	string	default = /v1/resources/services
subscribersEndpoint	string	default = /tqr/v1/subscribers
subscriptionsEndpoint	string	default = /tqr/v1/subscriptions
supportedAppTypes	map	By default, AWS and Azure applications are supported.
doInitialization	boolean	Default of false. Upon clicking the Event Initialization button, this is set to true. When true, a CAMSync iteration will request an event initialization (getting all data). When the event initialization request has completed (whether success or failure), this is set back to false.
eventGroupId	string	Default of null. The first time the CAMConfigBean is instantiated (i.e. - whenever the CAMConfiguration is queried or modified the first time in Identity IQ), this is set to iiq_<uuid>, where uuid is generated.
initializationError	string	Default of null. If an error occurs during the initialization request, it is set in this field. A non-null initializationError will display on the CAM Configuration UI page.
initializationHost	string	Default of null. This is set to be the host that requests an event initialization.
initializedDate	date	Default of null. This is set to the date of an event initialization.

## Logging

The following logs can be helpful to troubleshoot the Cloud Access Management integration:

### # CAMSync service top-level

```
logger.camsyncservice.name=sailpoint.server.CAMSyncService
```

```
logger.camsyncservice.level=debug
```

### # Calls to Cloud Access Management APIs

```
logger.camservice.name=sailpoint.cam.CAMService
```

```
logger.camservice.level=info
```

### # CAMSync service event director

```
logger.cameventdir.name=sailpoint.cam.CAMEventDirector
```

```
logger.cameventdir.level=debug
```

**# CAMSync service event persistence**

```
logger.cloudaccessorizer.name=sailpoint.cam.CloudAccessorizer
```

```
logger.cloudaccessorizer.level=debug
```

**# CAMSync service event listening**

```
logger.camsynch.name=sailpoint.server.CAMSynchronizer
```

```
logger.camsynch.level=debug
```

**# Request CAM event data when creating new entitlements**

```
logger.camstats.name=sailpoint.api.aggregation.CAMStatisticsCommand
```

```
logger.camstats.level=DEBUG
```

**# Filters to search for Cloud Access Management based entitlements**

```
logger.camurisearch.name=sailpoint.search.CloudAccessUriFilterBuilder
```

```
logger.camurisearch.level=debug
```

```
logger.camdnsearch.name=sailpoint.search.CloudAccessDisplayNameFilterBuilder
```

```
logger.camdnsearch.level=debug
```

## Module Status

The status of the Cloud Access Management integration can be viewed under Gear icon > **Administrator Console** > **Environment** > **SailPoint Modules & Extensions**, and then click on the CAMServices name in the list.