

OpenAM 10.1.0 Administration Guide

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Abstract

Guide to configuring and using OpenAM features. OpenAM provides open source Authentication, Authorization, Entitlement and Federation software.



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Preface

This guide shows you how to configure, maintain, and troubleshoot OpenAM for single sign on and authorization, password reset, account lockout, cross-domain single sign on, and federation.

1. Who Should Use this Guide

This guide is written for access management designers and administrators who build, deploy, and maintain OpenAM services for their organizations. This guide covers the tasks you might repeat throughout the life cycle of an OpenAM release used in your organization.

This guide starts by introducing the OpenAM administrative interfaces and tools, and by showing how to manage OpenAM services. This guide continues by showing how to configure the principle features of OpenAM. It then demonstrates how to backup, restore, monitor, tune, and troubleshoot, OpenAM services.

You do not need to be an OpenAM wizard to learn something from this guide, though a background in access management and maintaining web application software can help. You do need some background in managing services on your operating systems and in your application servers. You can nevertheless get started with this guide, and then learn more as you go along.

2. Formatting Conventions

Some items are formatted differently from other text, like filenames, **commands**, and literal values.

```
$ echo Command line sessions are formatted with lines folded for easier reading.  
In HTML documents click the [-] image for a flat, copy-paste version. Click  
the [+] image for an expanded, line-wrapped version. > /dev/null
```

In many cases, sections pertaining to UNIX, GNU/Linux, Mac OS X, BSD, and so forth are marked (UNIX). Sections pertaining to Microsoft Windows might be marked (Windows). To avoid repetition, however, file system directory names are often given only in UNIX format as in /path/to/OpenAM, even if the text applies to C:\path\to\OpenAM as well.

Absolute path names usually begin with the placeholder /path/to/, which might translate to /opt/, C:\Program Files\, or somewhere else on your system. Unless you install from native packages, you create this location before you install.

```
class Test  
{
```

```
public static void main(String [] args)
{
    System.out.println("This is a program listing.");
}
```

3. Accessing OpenAM Documentation Online

Core documentation, such as what you are now reading, aims to be technically accurate and complete with respect to the software documented. Core documentation therefore follows a three-phase review process designed to eliminate errors. The review process should slow authors down enough that documentation you get with a stable release has had time to bake fully.

Fully baked core documentation is available at docs.forgerock.org.

The OpenAM Wiki regularly brings you more, fresh content. In addition, you are welcome to sign up and then edit the Wiki if you notice an error, or if you have something to share.

4. Joining the OpenAM Community

After you sign up at ForgeRock, you can also login to the Wiki and the issue database to follow what is happening with the project.

If you have questions regarding OpenAM which are not answered by the documentation, there is a mailing list which can be found at <https://lists.forgerock.org/mailman/listinfo/openam> where you are likely to find an answer. You can also make suggestions regarding updates at the documentation mailing list (<https://lists.forgerock.org/mailman/listinfo/docs>).

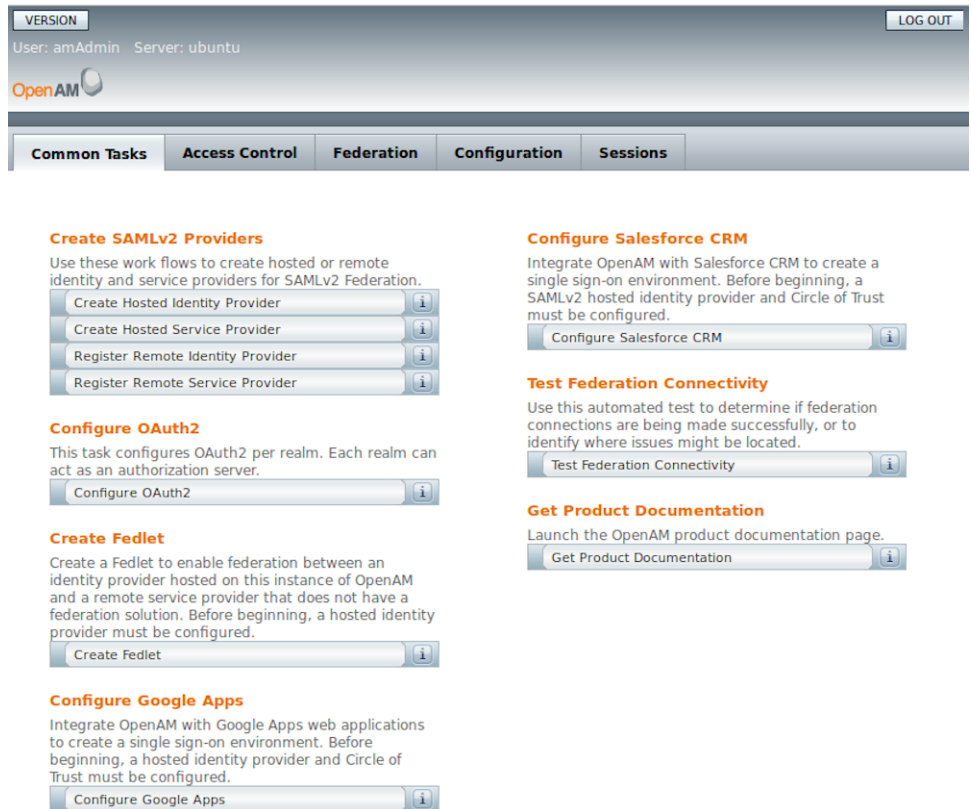
The Wiki has information on how to check out OpenAM source code. There is also a mailing list for OpenAM development that can be found at <https://lists.forgerock.org/mailman/listinfo/openam-dev>. Should you want to contribute a patch, test, or feature, or want to author part of the core documentation, first have a look on the ForgeRock site at how to get involved.

Chapter 1. Administration Interfaces & Tools

This chapter provides a brief introduction to the web-based OpenAM console. It also lists and describes each command line interface (CLI) administration tool.

1.1. OpenAM Web-Based Console

After you install OpenAM, login to the web-based console as OpenAM Administrator, amadmin with the password you set during installation. The URL to visit in your browser is something like `http://openam.example.com:8080/openam/console`, depending on the protocol (HTTP or HTTPS), host name (in this case `openam.example.com`), port number on which the web containers listens (in this case 8080), and deployment URI (in this case `/openam`).



The OpenAM Administrator has access rights to perform all administrative operations. Therefore, when you login as `amadmin`, you see the complete OpenAM console. In the background, OpenAM has set a cookie in your browser that lasts until the session expires, you logout, or you close your browser.¹

When you login to the OpenAM console as an end user, a user without any access to perform administrative operations, then instead of the OpenAM console, you see a page to view and update your account information.

The screenshot shows the OpenAM user profile page for 'Babs Jensen'. At the top, there's a header with 'VERSION', 'User: Babs Jensen', 'Server: openam', and 'LOG OUT | HELP'. Below the header, the user's name 'Babs Jensen; Barbara Jensen' is displayed. To the right are 'Save' and 'Reset' buttons, with a note '* Indicates required field'. The form contains several fields: 'First Name' (Barbara), 'Last Name' (Jensen), 'Full Name' (Babs Jensen), 'Password' (with an 'Edit' link), 'Email Address' (bjensen@example.com), 'Telephone Number' (+1 408 555 1862), and 'Home Address'. At the bottom, there are 'Password Reset Options' (with an 'Edit' link) and 'Universal ID' (id=bjensen,ou=user,o=openam).

If you configure OpenAM to grant administrative capabilities to another user, then that user also sees the console after login. For instance, the OpenAM Administrator granted Kirsten Vaughan privileges to administer the OpenAM Top Level Realm. (This can be done through the console under Access Control > / (Top Level Realm) > Privileges. Kirsten has authorization to read and write policy properties and configured policy agent properties.) When Kirsten logs in, she sees only part of the console capabilities.²

The screenshot shows the OpenAM 'Access Control' page. At the top, there's a header with 'VERSION', 'User: Kirsten Vaughan', 'Server: openam', and 'LOG OUT | HELP'. Below the header, the 'Access Control' tab is selected. A text box explains: 'A realm is the unit that OpenAM uses to organize configuration information. Authentication properties, authorization policies, data stores, subjects and other data can be defined within the realm. The top level realm is created when you deploy OpenAM. The top level realm is the root of the OpenAM instance and contains OpenAM configuration data.' Below this, there's a 'Realms' section with a search bar and a table. The table has columns for 'Realm Name' and 'Location'. The first row shows '/(Top Level Realm)' in the 'Realm Name' column and '/' in the 'Location' column.

1.2. OpenAM Command-Line Tools

The script tools in the following list have `.bat` versions for use on Microsoft Windows.

You can install the following OpenAM command-line tools.

¹Technically speaking, persistent cookies can remain valid when you close your browser. This section reflects OpenAM default behavior before you configure additional functionality.

²For more on delegated administration, see the chapter covering realms.

agentadmin

This tool lets you manage OpenAM policy agent installations.

Unpack this tool as part of policy agent installation.

ampassword

This tool lets you change OpenAM Administrator passwords, and display encrypted password values.

Install this from the `openam-distribution-ssoadmintools-10.1.0-Xpress.zip`.

amverifyarchive

This tool checks log archives for tampering.

Install this from `openam-distribution-ssoadmintools-10.1.0-Xpress.zip`.

openam-distribution-configurator-10.1.0-Xpress.jar

This executable .jar file lets you perform silent installation, configuring a deployed OpenAM server by applying settings from a configuration file, using the **java -jar configurator.jar -f config.file**. The .jar is provided with a sample configuration file.

The *config.file*, based on the sampleconfiguration file provided with the tool, must be adapted for your environment.

Install this from `openam-distribution-ssoconfigurortools-10.1.0-Xpress.zip`.

ssoadm

This tool provides a rich command-line interface for configuration of OpenAM core services.

In a test environment you can activate `ssoadm.jsp` to access the same functionality in your browser. To access many features of the **ssoadm** command through the OpenAM console, visit the `ssoadm.jsp` page in your browser after activating it when you installed OpenAM, for example `http://openam.example.com:8080/openam/ssoadm.jsp`.

Install this from `openam-distribution-ssoadmintools-10.1.0-Xpress.zip`.

To translate settings applied in OpenAM console to service attributes for use with **ssoadm**, login to the OpenAM console as `amadmin` and access the services page, such as `http://openam.example.com:8080/openam/services.jsp`.

ssodtool.sh

This extensible diagnostic tool runs in GUI mode by default, but can also be run in command-line mode. The tool helps you check configuration

settings and verify configuration integrity, test connectivity, and generate test reports.

Install this from `openam-distribution-diagnostics-10.1.0-Xpress.zip`.

The commands access the OpenAM configuration over HTTP (or HTTPS). When using the administration commands in a site configuration, the commands access the configuration through the front end load balancer.

Sometimes a command cannot access the load balancer, because:

- Network routing restrictions prevent the tool from accessing the load balancer.
- For testing purposes, the load balancer uses a self-signed certificate for HTTPS, and the tool does not have a way of trusting the self-signed certificate.
- The load balancer is temporarily unavailable.

In such cases you can work around the problem by adding an option such as the following to the **java** command in the tool's script. The option sets a comma-separated list of key-value pairs, where the key is the load balancer URL and the value is the server URL. (This all belongs on one line with no spaces in the script.)

```
-D"com.ipplanet.am.naming.map.site.to.server=https://lb.example.com:443/openam=  
http://server1.example.com:8080/openam,https://lb.example.com:443/openam=  
http://server2.example.com:8080/openam"
```

In the above example the load balancer is on the lb host, `https://lb.example.com:443/openam` is the site name, and the OpenAM servers in the site are on `server1` and `server2`.

1.3. OpenAM ssoadm.jsp

You can use the **ssoadm.jsp** page to access a large subset of the configuration capabilities of the **ssoadm** command. Yet, **ssoadm.jsp** is disabled by default to prevent potential misuse.

Procedure 1.1. To Enable ssoadm.jsp

1. Login as OpenAM administrator, `amadmin`.
2. Click Configuration > Servers and Sites tabs, then in the Servers list, click the link to configure your server.

3. Click the Advanced tab to display the Advanced Properties table, and then click Add to include the property that enables **ssoadm.jsp** before saving your change.

Property Name
ssoadm.disabled

Property Value
false

4. Browse to **ssoadm.jsp** to check that it is enabled.

The URL is something like `http://openam.example.com:8080/openam/ssoadm.jsp`, depending on your installation.

Chapter 2. Defining Authentication Services

An *authentication* service confirms the identity of a user or a client application.

This chapter describes how to configure authentication in OpenAM.

2.1. About Authentication in OpenAM

Access management is about controlling access to resources. OpenAM plays a role similar to border control at an international airport. Instead of having each and every airline company deal with access to each destination, all airlines redirects passengers to border control. Border control then determines who each passenger is according to passport credentials. Border control also checks whether the identified passenger is authorized to fly to the destination corresponding to the ticket, perhaps based on visa credentials. Then, at the departure gate, an agent enforces the authorization from border control, allowing the passenger to board the plane as long as the passenger has not gotten lost, or tried to board the wrong plane, or swapped tickets with someone else. Thus, border control handles access management at the airport.

OpenAM is most frequently used to protect web-accessible resources. Users browse to a protected web application page. Rather than have the web application manage user access itself, an agent in the server where the web application runs redirects the user to OpenAM for access management. OpenAM determines who the user is, and whether the user has the right to access the protected page. OpenAM then redirects the user back to the protected page, this time with authorization that the agent can check. The agent enforces the authorization from OpenAM, letting through the user with the right to access the page. Thus, OpenAM handles access management to web resources.

Notice that OpenAM basically needs to determine two things for access management: who the user is; whether the user has access to the protected page. *Authentication* is the term meaning the determination of who a user is. This chapter covers how to set up the authentication process. *Authorization* is the term meaning determination whether a user has access to a protected resource. Authorization is covered later.

To process authentication, OpenAM obtains credentials from the user or client application authenticating, based on the mechanisms defined to validate credentials and complete the authentication. In other words, how a user authenticates differs depending on the situation. Passengers for international flights authenticate with passports and visas. Passengers for domestic flights might authenticate with an identity card or a driver's license.

Customers withdrawing cash from an ATM authenticate with a card and a PIN.

As the authentication process depends on the situation, OpenAM allows you to configure authentication processes and then configure how they are applied depending on the situation. OpenAM uses *authentication modules* to handle different ways of authenticating. Basically, each authentication module handles one way of obtaining and verifying credentials. When a single set of credentials is not enough, or alternate sets of credentials can be used, you can choose to chain modules together. In OpenAM, this is called *authentication chaining*. When you chain authentication modules, you can configure each module as required, optional, requisite, or sufficient.¹

- When a *required* module fails, the rest of the chain is processed, but the authentication fails.

A required module might be used for login with email and password, but then fall through to another module to handle new users who have not yet signed up.

- When an *optional* module fails, authentication continues.

An optional module might be used to permit a higher level of access if the user can present a X.509 certificate for example.

- When a *requisite* module fails, authentication fails and authentication processing stops.

A requisite module might be used with exclusive SSO.

- When a *sufficient* succeeds, authentication is successful and later modules in the chain are skipped.

You could set Windows Desktop SSO as sufficient, so authenticated Windows users are let through, whereas web users have to traverse another authentication module such as one requiring an email address and a password.

With OpenAM, you can further set *authentication levels* per module, with higher levels being used typically to allow access to more restricted resources. The OpenAM SPIs also let you develop your own authentication modules, and post-authentication plugins. Client applications can specify the authentication level, module, user, and authentication service to use among those you have configured. As described later in this guide, you can

¹The four terms, required, optional, requisite, and sufficient, come from JAAS, the Java standard for authentication and authorization.

use *realms* to organize which authentication process applies for different applications or different domains, perhaps managed by different people.

OpenAM leaves the authentication process flexible so that you can adapt how it works to your situation. Although at first the number of choices can seem daunting, now that you understand the basic process, you begin to see how choosing authentication modules and arranging them in authentication chains lets you use OpenAM to protect access to a wide range of applications used in your organization.

2.2. Configuring Authentication Modules

The OpenAM console provides two places where the OpenAM administrator can configure authentication modules.

1. Under Configuration > Authentication, you configure available modules for use throughout OpenAM. What you set up here is inherited for use elsewhere.
2. Under Access Control > *Realm Name* > Authentication, you configure modules for your realm. What you set up at this level inherits from the global configuration, but you can override what is inherited. You can also add your own modules if necessary.

Individual module configuration depends completely on what the module does. Configuring the module that connects to Active Directory over LDAP to authenticate a user using user name and password requires connection information and details about where to search for users, whereas configuring the HOTP module for OTP authentication requires information about the password length and the mail server or SMS gateway for sending the password during authentication.

Tip

One parameter that all modules have is Authentication Level. You change Authentication Level from 0 to a positive integer in order to indicate those modules are seen as more secure. Then you configure authorization to require a minimum authentication level required to access protected resources.

2.2.1. Hints For the Active Directory Authentication Module

OpenAM connects to Active Directory over Lightweight Directory Access Protocol (LDAP). OpenAM provides separate Active Directory and LDAP modules to make it easier for you to use both Active Directory and also another directory service in an authentication chain.

ssoadm service name: sunAMAuthADService

Primary Active Directory Server

Secondary Active Directory Server

The default port for LDAP is 389. If you are connecting to Active Directory over SSL, the default port for LDAP/SSL is 636.

To allow users to change passwords through OpenAM, Active Directory requires that you connect over SSL.

If you want to use SSL or TLS for security, then scroll down to enable SSL/TLS Access to Active Directory Server. Make sure that OpenAM can trust the Active Directory certificate when using this option.

OpenAM first attempts to contact primary servers. If no primary server is available, then OpenAM attempts to contact secondaries.

When authenticating users from a directory server that is remote from OpenAM, set both the primary and secondary server values.

ssoadm attributes: primary is `iplanet-am-auth-ldap-server`; secondary is `iplanet-am-auth-ldap-server2`

DN to Start User Search

LDAP data is organized hierarchically, a bit like a file system on Windows or UNIX. More specific DNs likely result in better performance. When configuring the module for a particular part of the organization, you can perhaps start searches from a specific organizational unit such as `OU=sales,DC=example,DC=com`.

If multiple entries exist with identical search attribute values, make this value specific enough to return only one entry.

ssoadm attribute: `iplanet-am-auth-ldap-base-dn`

Bind User DN, Bind User Password

If OpenAM stores attributes in Active Directory, for example to manage account lockout, or if Active Directory requires that OpenAM authenticate in order to read users' attributes, then OpenAM needs the DN and password to authenticate to Active Directory.

The default is `amldapuser`. If the administrator authentication chain (default: `ldapService`) has been configured to include only the Active Directory module, then make sure that the password is correct before you logout. If it is incorrect, you will be locked out. If you do get locked out, you can login with the super user DN, which by default is `uid=amAdmin,ou=People,OpenAM-deploy-base`, where *OpenAM-deploy-base* was set during OpenAM configuration.

Hints For the Active Directory Authentication Module

ssoadm attributes: `iplanet-am-auth-ldap-bind-dn` and `iplanet-am-auth-ldap-bind-passwd`

Attributes, Filter, Scope

LDAP searches for user entries return entries with attribute values matching the filter you provide. For example if you search under `CN=Users,DC=example,DC=com` with a filter `"(MAIL=bjensen@example.com)"`, then the directory returns the entry that has `MAIL=bjensen@example.com`. In this example the attribute used to search for a user is `mail`. Multiple attribute values mean the user can authenticate with any one of the values. For example, if you have both `uid` and `mail`, then Barbara Jensen can authenticate with either `bjensen` or `bjensen@example.com`.

Should you require a more complex filter for performance, you add that to the User Search Filter text box. For example, if you search on `mail` and add User Search Filter (`objectClass=inetOrgPerson`), then OpenAM uses the resulting search filter `(&(mail=address)(objectClass=inetOrgPerson))`, where *address* is the mail address provided by the user.

Scope `OBJECT` means search only the entry specified as the DN to Start User Search, whereas `ONELEVEL` means search only the entries that are directly children of that object. `SUBTREE` means search the entry specified and every entry under it.

ssoadm attributes: `iplanet-am-auth-ldap-user-naming-attribute`, `iplanet-am-auth-ldap-user-search-attributes`, `iplanet-am-auth-ldap-search-filter`, and `iplanet-am-auth-ldap-search-scope`

SSL Access to Active Directory Server

If you enable SSL, OpenAM must be able to trust Active Directory certificates, either because the Active Directory certificates were signed by a CA whose certificate is already included in the trust store used by the container where OpenAM runs, or because you imported the certificates into the trust store.

ssoadm attribute: `iplanet-am-auth-ldap-ssl-enabled`

Return User DN to Authenticate

When enabled, and OpenAM uses Active Directory as the user store, the module returns the DN rather than the User ID, so the bind for authentication can be completed without a search to retrieve the DN.

ssoadm attribute: `iplanet-am-auth-ldap-return-user-dn`

Active Directory Server Check Interval

Used by the failover mechanism. Specifies the number of minutes between checks whether a previously unavailable Active Directory has become available again.

ssoadm attribute: `iplanet-am-auth-ldap-server-check`

User Creation Attributes

This list lets you map (external) attribute names from Active Directory to (internal) attribute names used by OpenAM.

ssoadm attribute: `iplanet-am-ldap-user-creation-attr-list`

Authentication Level

ssoadm attribute: `sunAMAuthADAuthLevel`

2.2.2. Hints For the Adaptive Risk Authentication Module

The Adaptive Risk module is designed to assess risk during authentication so that OpenAM can determine whether to require the user to complete further authentication steps. After configuring the Adaptive Risk module, insert it in your authentication chain with criteria set to sufficient as shown in the following example.

AdaptiveRisk - Properties Save Reset Back to Authentication

(3 Item(s))

Add Remove Reorder

<input checked="" type="checkbox"/>	Instance	Criteria	Options
<input type="checkbox"/>	LDAP	REQUIRED	
<input type="checkbox"/>	AdaptiveRisk	SUFFICIENT	
<input type="checkbox"/>	HOTP	REQUIRED	

In the example authentication chain shown, OpenAM has users authenticate first using the LDAP module providing a user ID and password combination. Upon success, OpenAM calls the Adaptive Risk module. The Adaptive Risk module assesses the risk based on your configured parameters. If the Adaptive Risk module calculates a total score below the threshold you set, the module returns success, and OpenAM finishes authentication processing without requiring further credentials. Otherwise the Adaptive Risk module evaluates the score to be above the risk threshold, and returns failure. OpenAM then calls the HOTP module, requiring the user to authenticate with a one-time password delivered to her by email or by SMS to her mobile phone.

When you configure the Adaptive Risk module to save cookies and profile attributes after successful authentication, OpenAM performs the save as post-authentication processing, only after the entire authentication chain returns success. You must set up OpenAM to save the data as part of post-authentication processing by editing the authentication chain to add `org.forgerock.openam.authentication.modules.adaptive.Adaptive` to the list of post authentication plugins.

ssoadm service name: `sunAMAuthAdaptiveService`

General

Authentication Level

ssoadm attribute: openam-auth-adaptive-auth-level

Adaptive Threshold

Risk threshold score. If the sum of the Scores is greater than the threshold, the Adaptive Risk module returns failure.

ssoadm attribute: openam-auth-adaptive-auth-threshold

Failed Authentication Check

When enabled, check the user profile for authentication failures since the last successful login. This check therefore requires OpenAM to have access to the user profile, and Account Lockout to be enabled (otherwise OpenAM does not record authentication failures).

ssoadm attribute: openam-auth-adaptive-failure-check

Score

Value to add to the total score if the user fails the Failed Authentication Check.

ssoadm attribute: openam-auth-adaptive-failure-score

Invert Result

When selected, add the Score to the total score if the user passes the Failed Authentication Check.

ssoadm attribute: openam-auth-adaptive-failure-invert

IP Address Range

IP Range Check

When enabled, check whether the client IP address is within one of the specified IP Ranges.

ssoadm attribute: openam-auth-adaptive-ip-range-check

IP Range

Specifies a list of IP ranges either in CIDR-style notation (*x.x.x.x/YY*) or as a range from one address to another (*x.x.x.x:y.y.y.y*, meaning from *x.x.x.x* to *y.y.y.y*). Currently supports only IPv4.

ssoadm attribute: openam-auth-adaptive-ip-range-range

Score

Value to add to the total score if the user fails the IP Range Check.

ssoadm attribute: openam-auth-adaptive-ip-range-score

Invert Result

When selected, add the Score to the total score if the user passes the IP Range Check.

ssoadm attribute: openam-auth-adaptive-ip-range-invert

IP Address History

IP History Check

When enabled, check whether the client IP address matches one of the known values stored on the profile attribute you specify. This check therefore requires that OpenAM have access to the user profile.

ssoadm attribute: openam-auth-adaptive-ip-history-check

Count to Save

Specifies how many IP address values to retain on the profile attribute you specify. Default: 5

ssoadm attribute: openam-auth-ip-adaptive-history-count

Profile Attribute Name

Name of the user profile attribute on which to store known IP addresses. Default: iphistory

ssoadm attribute: openam-auth-adaptive-ip-history-attribute

Save Successful IP Address

When enabled, save new client IP addresses to the known IP address list following successful authentication.

ssoadm attribute: openam-auth-adaptive-ip-history-save

Score

Value to add to the total score if the user fails the IP History Check.

ssoadm attribute: openam-auth-adaptive-ip-history-score

Invert Result

When selected, add the Score to the total score if the user passes the IP History Check.

ssoadm attribute: openam-auth-adaptive-ip-history-invert

Known Cookie

Cookie Value Check

When enabled, check whether the client browser request has the specified cookie and optional cookie value.

ssoadm attribute: openam-auth-adaptive-known-cookie-check

Cookie Name

Specifies the name of the cookie for which OpenAM checks when you enable the Cookie Value Check.

ssoadm attribute: openam-auth-adaptive-known-cookie-name

Cookie Value

Specifies the value of the cookie for which OpenAM checks. If no value is specified, OpenAM does not check the cookie value.

ssoadm attribute: openam-auth-adaptive-known-cookie-value

Save Cookie Value on Successful Login

When enabled, save the cookie as specified in the client's browser following successful authentication. If no Cookie Value is specified, the value is set to 1.

ssoadm attribute: openam-auth-adaptive-known-cookie-save

Score

Value to add to the total score if user passes the Cookie Value Check.

ssoadm attribute: openam-auth-adaptive-known-cookie-score

Invert Result

When selected, add the Score to the total score if the user passes the Cookie Value Check.

ssoadm attribute: openam-auth-adaptive-known-cookie-invert

Device Cookie

Device Registration Cookie Check

When enabled, check whether the client browser request has the specified cookie with the correct device registration identifier as the value.

ssoadm attribute: openam-auth-adaptive-device-cookie-check

Cookie Name

Specifies the name of the cookie for the Device Registration Cookie Check. Default: Device

ssoadm attribute: openam-auth-adaptive-device-cookie-name

Save Device Registration on Successful Login

When enabled, save the specified cookie with a hashed device identifier value in the client's browser following successful authentication.

ssoadm attribute: openam-auth-adaptive-device-cookie-save

Score

Value to add to the total score if the user fails the Device Registration Cookie Check.

ssoadm attribute: openam-auth-adaptive-device-cookie-score

Invert Result

When selected, add the Score to the total score if the user passes the Device Registration Cookie Check.

ssoadm attribute: openam-auth-adaptive-device-cookie-invert

Time Since Last Login

Time Since Last Login Check

When enabled, check whether the client browser request has the specified cookie that holds the encrypted last login time, and check that the last login time is more recent than a maximum number of days you specify.

ssoadm attribute: openam-auth-adaptive-time-since-last-login-check

Cookie Name

Specifies the name of the cookie holding the encrypted last login time value.

ssoadm attribute: openam-auth-adaptive-time-since-last-login-cookie-name

Max Time Since Last Login

Specifies a threshold age of the last login time in days. If the client's last login time is more recent than the number of days specified, then the client successfully passes the check.

ssoadm attribute: openam-auth-adaptive-time-since-last-login-value

Save Time of Successful Login

When enabled, save the specified cookie with the current time encrypted as the last login value in the client's browser following successful authentication.

ssoadm attribute: openam-auth-adaptive-time-since-last-login-save

Score

Value to add to the total score if the user fails the Time Since Last Login Check.

ssoadm attribute: openam-auth-adaptive-time-since-last-login-score

Invert Result

When selected, add the Score to the total score if the user passes the Time Since Last Login Check.

ssoadm attribute: openam-auth-adaptive-time-since-last-login-invert

Profile Attribute

Profile Risk Attribute Check

When enabled, check whether the user profile contains the specified attribute and value.

ssoadm attribute: openam-auth-adaptive-risk-attribute-check

Attribute Name

Specifies the attribute to check on the user profile for the specified value.

ssoadm attribute: openam-auth-adaptive-risk-attribute-name

Attribute Value

Specifies the value to match on the profile attribute. If the attribute is multi-valued, a single match is sufficient to pass the check.

ssoadm attribute: openam-auth-adaptive-risk-attribute-value

Score

Value to add to the total score if the user fails the Profile Risk Attribute Check.

ssoadm attribute: openam-auth-adaptive-risk-attribute-score

Invert Result

When selected, add the Score to the total score if the user passes the Profile Risk Attribute Check.

ssoadm attribute: openam-auth-adaptive-risk-attribute-invert

Geo Location

Geolocation Country Code Check

When enabled, check whether the client IP address location matches a country specified in the Valid Country Codes list.

ssoadm attribute: forgerock-am-auth-adaptive-geo-location-check

Geolocation Database location

Path to GeoIP data file used to convert IP addresses to country locations. Use the binary .dat file format, rather than .csv.

ssoadm attribute: openam-auth-adaptive-geo-location-database

Valid Country Codes

Specifies the list of country codes to match.

ssoadm attribute: openam-auth-adaptive-geo-location-values. Use | to separate multiple values.

Score

Value to add to the total score if the user fails the Geolocation Country Code Check.

ssoadm attribute: openam-auth-adaptive-geo-location-score

Invert Result

When selected, add the Score to the total score if the user passes the Geolocation Country Code Check.

ssoadm attribute: openam-auth-adaptive-geo-location-invert

Request Header

Request Header Check

When enabled, check whether the client browser request has the specified header with the correct value.

ssoadm attribute: openam-auth-adaptive-req-header-check

Request Header Name

Specifies the name of the request header for the Request Header Check.

ssoadm attribute: openam-auth-adaptive-req-header-name

Request Header Value

Specifies the value of the request header for the Request Header Check.

ssoadm attribute: openam-auth-adaptive-req-header-value

Score

Value to add to the total score if the user fails the Request Header Check.

ssoadm attribute: openam-auth-adaptive-req-header-score

Invert Result

When selected, add the Score to the total score if the user passes the Request Header Check.

ssoadm attribute: openam-auth-adaptive-req-header-invert

2.2.3. Hints For the Anonymous Authentication Module

This module lets you track and manage anonymous users, perhaps forcing further authentication later when a user moves to access resources that require more protection.

ssoadm service name: iPlanetAMAuthAnonymousService

Valid Anonymous Users

Specifies valid anonymous user IDs in addition to the default.

ssoadm attribute: iplanet-am-auth-anonymous-users-list

Default Anonymous User Name

Specifies the user ID assigned by the module if the Valid Anonymous Users list is empty. Default: anonymous

ssoadm attribute: iplanet-am-auth-anonymous-default-user-name

Case Sensitive User IDs

Whether case matters for anonymous user IDs.

ssoadm attribute: iplanet-am-auth-anonymous-case-sensitive

Authentication Level

ssoadm attribute: iplanet-am-auth-anonymous-auth-level

2.2.4. Hints For the Certificate Authentication Module

X.509 digital certificates can enable secure authentication without the need for user names and passwords or other credentials. Certificate authentication can be handy to manage authentication by applications. If all certificates are signed by a recognized Certificate Authority (CA), then you might get away without additional configuration. If you need to look up public keys of OpenAM clients, this module can also look up public keys in an LDAP directory server.

When you store certificates and certificate revocation lists (CRL) in an LDAP directory service, you must configure both how to access the directory service and also how to look up the certificates and CRLs, based on the fields in the certificates that OpenAM clients present to authenticate.

Access to the LDAP server and how to search for users is similar to LDAP module configuration as in Section 2.2.11, "Hints For the LDAP Authentication Module". The primary difference is that, unlike for LDAP configuration, OpenAM retrieves the user identifier from a field in the certificate that the client application presents, then uses that identifier to search for the LDAP directory entry that holds the certificate, which should match the certificate presented. For example, if the Subject field of

a typical certificate has a DN C=FR, O=Example Corp, CN=Barbara Jensen, and Barbara Jensen's entry in the directory has cn=Barbara Jensen, then you can use CN=Barbara Jensen from the Subject DN to search for the entry with cn=Barbara Jensen in the directory.

ssoadm service name: iPlanetAMAuthCertService

Match Certificate in LDAP

When enabled, OpenAM searches for a match for the user's certificate in the LDAP directory. If a match is found and not revoked according to a CRL or OCSP validation, then authentication succeeds.

ssoadm attribute: iplanet-am-auth-cert-check-cert-in-ldap

Subject DN Attribute Used to Search LDAP for Certificates

Indicates which attribute and value in the certificate Subject DN is used to find the LDAP entry holding the certificate.

ssoadm attribute: iplanet-am-auth-cert-attr-check-ldap

Match Certificate to CRL

When enabled, OpenAM checks whether the certificate has been revoked according to a CRL in the LDAP directory.

ssoadm attribute: iplanet-am-auth-cert-check-crl

Issuer DN Attribute Used to Search LDAP for CRLs

Indicates which attribute and value in the certificate Issuer DN is used to find the CRL in the LDAP directory.

ssoadm attribute: iplanet-am-auth-cert-attr-check-crl

HTTP Parameters for CRL Update

Your certificate authority should provide the URL to use here, from which OpenAM can get CRL updates.

ssoadm attribute: iplanet-am-auth-cert-param-get-crl

Match CA Certificate to CRL

When enabled, OpenAM checks the CRL against the CA certificate to ensure it has not been compromised.

ssoadm attribute: sunAMValidateCACert

OCSP Validation

Enable this to use Online Certificate Status Protocol (OCSP) instead of CRLs to check certificates' revocation status.

If you enable this, you also must configure OSCP for OpenAM under Configuration > Server and Sites > Default Server Settings, or Configuration > Server and Sites > *Server Name* > Security.

ssoadm attribute: `iplanet-am-auth-cert-check-ocsp`

LDAP Server Where Certificates are Stored

The default port for LDAP is 389. If you are connecting to the directory service over SSL, the default port for LDAP/SSL is 636. When a secure connection, scroll down to enable Use SSL/TLS for LDAP Access.

ssoadm attribute: `iplanet-am-auth-cert-ldap-provider-url`

LDAP Search Start DN

Valid base DN for the LDAP search, such as `dc=example,dc=com`.

ssoadm attribute: `iplanet-am-auth-cert-start-search-loc`

LDAP Server Principal User, LDAP Server Principal Password

If OpenAM stores attributes in the LDAP directory, for example to manage account lockout, or if the LDAP directory requires that OpenAM authenticate in order to read users' attributes, then OpenAM needs the DN and password to authenticate to the LDAP directory.

ssoadm attributes: `iplanet-am-auth-cert-principal-user`, and `iplanet-am-auth-cert-principal-passwd`

Use SSL for LDAP Access

If you use SSL for LDAP access, OpenAM must be able to trust the LDAP server certificate.

ssoadm attribute: `iplanet-am-auth-cert-use-ssl`

Certificate Field Used to Access User Profile

If the user profile is in a different entry from the user certificate, then this can be different from subject DN attribute used to find the entry with the certificate. When you select other, provide an attribute name in the Other Certificate Field Used to Access User Profile text box.

ssoadm attribute: `iplanet-am-auth-cert-user-profile-mapper`

SubjectAltNameExt Value Type to Access User Profile

Use this if you want to look up the user profile from an RFC 822 style name, or a User Principal Name as used in Active Directory.

ssoadm attribute: `iplanet-am-auth-cert-user-profile-mapper-ext`

Trusted Remote Hosts

Hosts trusted to send certificates to OpenAM, such as load balancers doing SSL termination, or OpenAM distributed authentication UI instances.

ssoadm attribute: `iplanet-am-auth-cert-gw-cert-auth-enabled`

HTTP Header Name for Client Certificate

If you configure trusted hosts, specify the HTTP header name for the client certificate inserted by the trusted host.

ssoadm attribute: `sunAMHttpParamName`

Authentication Level

ssoadm attribute: `iplanet-am-auth-cert-auth-level`

2.2.5. Hints For the Core Authentication Module

The Core module is a sort of meta-module.

The Core module lets you set up the list of modules available, and specify what types of client applications can authenticate with which modules. It also lets you configure connection pools for access to directory servers, and whether to retain objects used during authentication for use during logout. Furthermore, the Core module lets you set defaults used when configuring authentication in a particular realm.

ssoadm service name: `iPlanetAMAuthService`

Pluggable Authentication Module Classes

Add class names for custom authentication modules to this list.

ssoadm attribute: `iplanet-am-auth-authenticators`

Supported Authentication Modules for Clients

This list serves to limit what types of authentication modules can be used with specify types of client applications. The client type is an arbitrary string, such as the default `genericHTML`, which is set by OpenAM when the Client Detection Service is enabled.

ssoadm attribute: `iplanet-am-auth-supported-auth-modules`

LDAP Connection Pool Size, Default LDAP Connection Pool Size

Sets a minimum and maximum number of LDAP connections in the pool for connecting to a directory server. When tuning for production, start with 10:65 (10 minimum, 65 maximum). Explicit settings for specific servers override the default.

This attribute is for LDAP and Membership authentication services only.

This connection pool is different than the SDK connection pool configured in `serverconfig.xml`.

ssoadm attributes: `iplanet-am-auth-ldap-connection-pool-size` , and `iplanet-am-auth-ldap-connection-pool-default-size`

Remote Auth Security

Require the authenticating application to send its SSOToken. This allows the Authentication Service to obtain the username and password associated with the application.

ssoadm attribute: sunRemoteAuthSecurityEnabled

Keep Post Process Objects for Logout Processing, Keep Authentication Module Objects for Logout Processing

When enabled, retain objects used to process authentication or post authentication operations in the user session until the user logs out.

ssoadm attributes: sunAMAuthKeepPostProcessInstances, and sunAMAuthKeepAuthModuleIntances

User Profile

Whether a user profile needs to exist in the user data store, or should be created on successful authentication.

Dynamic

Specifies that on successful authentication the Authentication Service creates a user profile if one does not already exist. OpenAM then issues the SSOToken. OpenAM creates the user profile in the user data store configured for the realm.

Dynamic with User Alias

Specifies that on successful authentication the Authentication Service creates a user profile that contains the User Alias List attribute which defines one or more aliases that for mapping a user's multiple profiles.

Ignored

Specifies that a user profile is not required for the Authentication Service to issue an SSOToken after a successful authentication.

Required

Specifies that on successful authentication the user must have a user profile in the user data store configured for the realm in order for the Authentication Service to issue an SSOToken.

ssoadm attribute: iplanet-am-auth-dynamic-profile-creation

Administrator Authentication Configuration

Defines the authentication chain used by administrators when the process needs to be different from the authentication chain defined for end users. The authentication chain must first be created before it is displayed as an option in this attribute's drop down list.

ssoadm attribute: `iplanet-am-auth-admin-auth-module`

User Profile Dynamic Creation Default Roles

Specifies the Distinguished Name (DN) of a role to be assigned to a new user whose profile is created when either of the Dynamic options is selected under the User Profile attribute. There are no default values. The role specified must be within the realm for which the authentication process is configured.

This role can be either an OpenAM or Sun DSEE role, but it cannot be a filtered role. If you wish to automatically assign specific services to the user, you have to configure the Required Services attribute in the User Profile.

ssoadm attribute: `iplanet-am-auth-default-role`

Persistent Cookie Mode

Determines whether users can return to their authenticated session after restarting the browser. When enabled, the persistent cookie can be used to reauthenticate until the persistent cookie expires (as specified by the value of the Persistent Cookie Maximum Time attribute), or until the user explicitly logs out. By default, the Authentication Service uses only memory cookies (expires when the browser is closed).

The client must explicitly request a persistent cookie by adding `iPSPCookie=yes` as a parameter to the login URL. OpenAM sets a `DProPCookie` as described in Section 2.5, “Authenticating To OpenAM”.

ssoadm attribute: `iplanet-am-auth-persistent-cookie-mode`

Persistent Cookie Maximum Time

Specifies the interval after which a persistent cookie expires. The interval begins when the user's session is successfully authenticated. The maximum value is 2147483647 (in seconds, so a bit more than 68 years). The field accepts any integer value less than the maximum.

ssoadm attribute: `iplanet-am-auth-persistent-cookie-time`

Alias Search Attribute Name

After a user is successfully authenticated, the user's profile is retrieved. This field specifies a second LDAP attribute to use in a search for the profile if a search using the first LDAP attribute fails to locate a matching user profile. Primarily, this attribute is used when the user identification returned from an authentication module is not the same as that specified in User Naming Attribute. For example, a RADIUS server might return `abc1234` but the user name is `abc`. There is no default value for this attribute. The field takes any valid LDAP attribute.

ssoadm attribute: `iplanet-am-auth-alias-attr-name`

Default Authentication Locale

Specifies the default language subtype to be used by the Authentication Service. The default value is `en_US`.

ssoadm attribute: `iplanet-am-auth-locale`

Organization Authentication Configuration

Defines the default authentication chain used by the realm's users. The authentication chain must first be created before it is displayed as an option in this attribute's drop down list.

ssoadm attribute: `iplanet-am-auth-org-config`

Login Failure Lockout Mode

Selecting this attribute enables a physical lockout. Physical lockout will inactivate an LDAP attribute (defined in the Lockout Attribute Name property) in the user's profile. This attribute works in conjunction with several other lockout and notification attributes.

ssoadm attribute: `iplanet-am-auth-login-failure-lockout-mode`

Login Failure Lockout Count

Defines the number of attempts that a user has to authenticate, within the time interval defined in Login Failure Lockout Interval, before being locked out.

ssoadm attribute: `iplanet-am-auth-login-failure-count`

Login Failure Lockout Interval

Defines the time in minutes during which failed login attempts are counted. If one failed login attempt is followed by a second failed attempt, within this defined lockout interval time, the lockout count starts, and the user is locked out if the number of attempts reaches the number defined in Login Failure Lockout Count. If an attempt within the defined lockout interval time proves successful before the number of attempts reaches the number defined in Login Failure Lockout Count, the lockout count is reset.

ssoadm attribute: `iplanet-am-auth-login-failure-duration`

Email Address to Send Lockout Notification

Specify one (or more) email address(es) to which notification is sent if a user lockout occurs.

Separate multiple addresses with spaces, and append `|locale|charset` to addresses for recipients in non-English locales.

ssoadm attribute: `iplanet-am-auth-lockout-email-address`

Warn User After N Failures

The number of authentication failures after which OpenAM displays a warning message that the user will be locked out.

ssoadm attribute: `iplanet-am-auth-lockout-warn-user`

Login Failure Lockout Duration

Defines how many minutes a user must wait after a lockout before attempting to authenticate again. Entering a value greater than 0 enables memory lockout and disables physical lockout. Memory lockout means the user's account is locked in memory for the number of minutes specified. The account is unlocked after the time period has passed.

ssoadm attribute: `iplanet-am-auth-lockout-duration`

Lockout Duration Multiplier

Defines a value with which to multiply the value of the Login Failure Lockout Duration attribute for each successive lockout. For example, if Login Failure Lockout Duration is set to 3 minutes, and the Lockout Duration Multiplier is set to 2, the user is locked out of the account for 6 minutes. Once the 6 minutes has elapsed, if the user again provides the wrong credentials, the lockout duration is then 12 minutes. With the Lockout Duration Multiplier, the lockout duration is incrementally increased based on the number of times the user has been locked out.

ssoadm attribute: `sunLockoutDurationMultiplier`

Lockout Attribute Name

Defines the LDAP attribute used for physical lockout. The default value is `inetuserstatus`, although the field in the OpenAM console is empty. The Lockout Attribute Value field must also contain an appropriate value.

ssoadm attribute: `iplanet-am-auth-lockout-attribute-name`

Lockout Attribute Value

Specifies the action to take on the attribute defined in Lockout Attribute Name. The default value is `inactive`, although the field in the OpenAM console is empty. The Lockout Attribute Name field must also contain an appropriate value.

ssoadm attribute: `iplanet-am-auth-lockout-attribute-value`

Invalid Attempts Data Attribute Name

Specifies the LDAP attribute used to hold the number of failed authentication attempts towards Login Failure Lockout Count.

ssoadm attribute: `sunAMAuthInvalidAttemptsDataAttrName`

Default Success Login URL

Accepts a list of values that specifies where users are directed after successful authentication. The format of this attribute is *client-type|URL* although the only value you can specify at this time is a URL which assumes the type HTML. The default value is `/openam/console`. Values that do not specify HTTP have that appended to the deployment URI.

ssoadm attribute: `iplanet-am-auth-login-success-url`

Default Failure Login URL

Accepts a list of values that specifies where users are directed after authentication has failed. The format of this attribute is *client-type|URL* although the only value you can specify at this time is a URL which assumes the type HTML. Values that do not specify HTTP have that appended to the deployment URI.

ssoadm attribute: `iplanet-am-auth-login-failure-url`

Authentication Post Processing Classes

Specifies one or more Java classes used to customize post authentication processes for successful or unsuccessful logins. The Java class must implement the `com.sun.identity.authentication.spi.AMPostAuthProcessInterface` OpenAM interface.

A .jar containing the post processing class belongs in the `WEB-INF/lib` directory of the deployed OpenAM instance. If you do not build a .jar, add the class files under `WEB-INF/classes`. For deployment, add the .jar or classes into a custom OpenAM .war file.

ssoadm attribute: `iplanet-am-auth-post-login-process-class`

Generate UserID Mode

When enabled, the Membership module generates a list of alternate user identifiers if the one entered by a user during the self-registration process is not valid or already exists. The user identifiers are generated by the class specified in the Pluggable User Name Generator Class property.

ssoadm attribute: `iplanet-am-auth-username-generator-enabled`

Pluggable User Name Generator Class

Specifies the name of the class used to generate alternate user identifiers when Generate UserID Mode is enabled. The default value is `com.sun.identity.authentication.spi.DefaultUserIDGenerator`.

ssoadm attribute: `iplanet-am-auth-username-generator-class`

Identity Types

Lists the type or types of identities for which OpenAM searches.

ssoadm attribute: sunAMIdentityType

Pluggable User Status Event Classes

Specifies one or more Java classes used to provide a callback mechanism for user status changes during the authentication process. The Java class must implement the `com.sun.identity.authentication.spi.AMAuthCallBack` OpenAM interface. OpenAM supports account lockout and password changes. OpenAM supports password changes through the LDAP authentication module, and so the feature is only available for the LDAP module.

A .jar containing the user status event class belongs in the `WEB-INF/lib` directory of the deployed OpenAM instance. If you do not build a .jar, add the class files under `WEB-INF/classes`. For deployment, add the .jar or classes into a custom OpenAM .war file.

ssoadm attribute: sunAMUserStatusCallbackPlugins

Store Invalid Attempts in Data Store

Enables the storage of information regarding failed authentication attempts as the value of the Invalid Attempts Data Attribute Name in the user data store. In order to store data in this attribute, the OpenAM schema has to be loaded. Information stored includes number of invalid attempts, time of last failed attempt, lockout time and lockout duration. Storing this information in the identity repository allows it to be shared among multiple instances of OpenAM.

ssoadm attribute: sunStoreInvalidAttemptsInDS

Module Based Authentication

Enables users to authenticate using module-based authentication. Otherwise, all attempts at authentication using the `module=module-name` login parameter result in failure.

ssoadm attribute: sunEnableModuleBasedAuth

User Attribute Mapping to Session Attribute

Enables the authenticating user's identity attributes (stored in the identity repository) to be set as session properties in the user's SSO Token. The value takes the format *User-Profile-Attribute|Session-Attribute-Name*. If *Session-Attribute-Name* is not specified, the value of *User-Profile-Attribute* is used. All session attributes contain the `am.protected` prefix to ensure that they cannot be edited by the Client SDK.

For example, if you define the user profile attribute as `mail` and the user's email address (available in the user session) as `user.mail`, the entry for this attribute would be `mail|user.mail`. After

a successful authentication, the `SSOToken.getProperty(String)` method is used to retrieve the user profile attribute set in the session. The user's email address is retrieved from the user's session using the `SSOToken.getProperty("am.protected.user.mail")` method call.

Properties that are set in the user session using User Attribute Mapping to Session Attributes can not be modified (for example, `SSOToken.setProperty(String, String)`). This results in an `SSOException`. Multi-value attributes, such as `memberOf`, are listed as a single session variable with a `|` separator.

ssoadm attribute: `sunAMUserAttributesSessionMapping`

Valid goto URL domains

List external domains to which clients can be redirected after authentication.

ssoadm attribute: `iplanet-am-auth-valid-goto-domains`

Default Authentication Level

The level set here applies when no authentication level has been specified in the Authentication Level field for a realm.

ssoadm attribute: `iplanet-am-auth-default-auth-level`

2.2.6. Hints For the Data Store Authentication Module

The Data Store authentication module allows a login using the Identity Repository of the realm to authenticate users. Using the Data Store module removes the requirement to write an authentication plug-in module, load, and then configure the authentication module if you need to authenticate against the same data store repository. Additionally, you do not need to write a custom authentication module where flat-file authentication is needed for the corresponding repository in that realm.

Yet, the Data Store module is generic. It does not implement data store-specific capabilities such as the password policy and password reset features provided by LDAP modules. Therefore the Data Store module returns failure when such capabilities are invoked.

ssoadm service name: `sunAMAuthDataStoreService`

ssoadm attributes: `amAuthDataStore`, and `sunAMAuthDataStoreAuthLevel`

2.2.7. Hints For the Federation Authentication Module

The Federation authentication module is used by a service provider to create a user session after validating single sign-on protocol messages.

This authentication module is used by the SAML, SAMLv2, ID-FF, and WS-Federation protocols.

ssoadm service name: sunAMAuthFederationService

ssoadm attribute: sunAMAuthFederationAuthLevel

2.2.8. Hints For the HOTP Authentication Module

The HMAC One-Time Password authentication module works together with the Data Store module to retrieve a user's mail address or telephone number to send a one-time password to complete authentication.

To use HOTP you set up an authentication chain with the Data Store module as the requisite first module, and the HOTP module as the second requisite module. When authentication succeeds against the Data Store module, OpenAM passes the Email Address and Telephone Number attributes from the user profile to the HOTP module. For the HOTP module to use either attribute, the Email Address must contain a valid email address, or the Telephone Number must contain a valid SMS telephone number.

You can set the HOTP module to automatically generate a password when users begin logging into the system. You can also setup a mobile phone, mobile carrier, and email attributes for tighter controls over where the messages are generated and what provider the messages go through to reach the user.

ssoadm service name: sunAMAuthHOTPService

SMS Gateway Implementation Class

Change this if you must customize the SMS gateway implementation. The default class sends an SMS or email, depending on the configuration.

ssoadm attribute: sunAMAuthHOTPMSGGatewayImplClassName

SMTP Host Name

Host name of the mail server supporting Simple Message Transfer Protocol for electronic mail.

ssoadm attribute: sunAMAuthHOTPSMTPHostName

SMTP Host Port

The default SMTP port is 25, 465 (when connecting over SSL).

ssoadm attribute: sunAMAuthHOTPSMTPHostPort

SMTP User Name

User name for OpenAM to connect to the mail server.

ssoadm attribute: sunAMAuthHOTPSMTPUserName

SMTP User Password

Password for OpenAM to connect to the mail server.

ssoadm attribute: sunAMAuthHOTPSMTPUserPassword

SMTP Connection

If OpenAM connects to the mail server securely, OpenAM must be able to trust the server certificate.

ssoadm attribute: sunAMAuthHOTPSMTPSSLEnabled

Email From Address

The From: address when sending a one-time password by mail.

ssoadm attribute: sunAMAuthHOTPSMTPFromAddress

One Time Password Validity Length (in minutes)

One-time passwords are valid for 5 minutes after they are generated by default.

ssoadm attribute: sunAMAuthHOTPPasswordValidityDuration

One Time Password Length (in digits)

Set the length of the one-time password to 6 or 8 digits.

ssoadm attribute: sunAMAuthHOTPPasswordLength

One Time Password Delivery

Send the one-time password by SMS, by mail, or both.

ssoadm attribute: sunAMAuthHOTPPasswordDelivery

Mobile Phone Number Attribute Names

Provides the attribute name used for the text message. The default value is telephoneNumber.

ssoadm attribute: openamTelephoneAttribute

Mobile Carrier Attribute Name

Provides the name of the carrier that will send the text message.

ssoadm attribute: openamSMSCarrierAttribute

Email Attribute Name

Provides the attribute name used to email the OTP. The default value is mail (email).

ssoadm attribute: openamEmailAttribute

Auto Send OTP Code

Setup the HOTP module to automatically generate an email or text message when users begin the login process.

ssoadm attribute: sunAMAuthHOTPAutoClicking

Authentication Level

ssoadm attribute: sunAMAuthHOTPAuthLevel

2.2.9. Hints For the HTTP Basic Authentication Module

HTTP basic authentication takes a user name and password from HTTP authentication and tries authentication against the backend module in OpenAM, depending on what you configure as the Backend Module Name.

ssoadm service name: iPlanetAMAuthHTTPBasicService

Backend Module Name

Specifies the module that checks the user credentials.

ssoadm attribute: iplanet-am-auth-http-basic-module-configured

Authentication Level

ssoadm attribute: iplanet-am-auth-httpbasic-auth-level

2.2.10. Hints For the JDBC Authentication Module

The Java Database Connectivity (JDBC) module lets OpenAM connect to a database such as MySQL or Oracle DB to authenticate users.

ssoadm service name: sunAMAuthJDBCService

Connection Type

Choose Connection pool is retrieved via JNDI to connect using the Java Naming and Directory Interface connection pool supported by the web container in which OpenAM runs. Choose Non-persistent JDBC connection to connect directly through the JDBC driver.

ssoadm attribute: sunAMAuthJDBCConnectionType

Connection Pool JNDI Name

When using Connection pool is retrieved via JNDI, this specifies the pool. How you configure connection pooling depends on the web container where you run OpenAM. Refer to the documentation for your web container for instructions on setting up connection pooling.

ssoadm attribute: sunAMAuthJDBCIndiName

JDBC Driver

When using Non-persistent JDBC connection, this specifies the JDBC driver provided by the database.

The .jar containing the JDBC driver belongs in the WEB-INF/lib directory of the deployed OpenAM instance, and so you should add it to a custom OpenAM .war file that you deploy.

ssoadm attribute: sunAMAuthJDBCdriver

JDBC URL

When using Non-persistent JDBC connection, this specifies the URL to connect to the database.

ssoadm attribute: sunAMAuthJDBCurl

Connect This User to Database

Specify the user name to open the database connection.

ssoadm attribute: sunAMAuthJDBCdbuser

Password for Connecting to Database

Specify the password for the user opening the database connection.

ssoadm attribute: sunAMAuthJDBCdbpassword

Password Column String

Specify the database column name where passwords are stored.

ssoadm attribute: sunAMAuthJDBCPasswordColumn

Prepared Statement

Specify the SQL query to return the password corresponding to the user to authenticate.

ssoadm attribute: sunAMAuthJDBCStatement

Class to Transform Password Syntax

Specify the class that transforms the password retrieved to the same format as provided by the user.

The default class expects the password in clear text. Custom classes must implement the JDBCPasswordSyntaxTransform interface.

ssoadm attribute: sunAMAuthJDBCPasswordSyntaxTransformPlugin

Authentication Level

ssoadm attribute: sunAMAuthJDBCAuthLevel

2.2.11. Hints For the LDAP Authentication Module

OpenAM connects to directory servers using Lightweight Directory Access Protocol (LDAP). To build an easy-to-manage, high performance, pure Java, open source directory service, try OpenDJ directory services.

ssoadm service name: `iPlanetAMAuthLDAPService`

Primary LDAP Server

Secondary LDAP Server

Directory servers generally use built-in data replication for high availability. Thus a directory service likely consists of a pool of replicas to which OpenAM can connect to retrieve and update directory data. You set up primary and secondary servers in case a replica is down due to maintenance or to a problem with a particular server.

Set one primary and optionally one secondary directory server for each OpenAM server. For the current OpenAM server, specify each directory server as a *host:port* combination. For other OpenAM servers in the deployment, you can specify each directory server as *server-name|host:port*, where *server-name* is the Server Name of the OpenAM server from the list under Configuration > Servers and Sites, and *host:port* identifies the directory server.

When authenticating users from a directory service that is remote from OpenAM, set both the primary and secondary server values.

The default port for LDAP is 389. If you are connecting to the directory over SSL, the default port for LDAP/SSL is 636.

If you want to use SSL or TLS for security, then scroll down to enable SSL/TLS Access to LDAP Server. Make sure that OpenAM can trust the servers' certificates when using this option.

ssoadm attributes: primary is `iplanet-am-auth-ldap-server`, secondary is `iplanet-am-auth-ldap-server2`, and `iplanet-am-auth-ldap-ssl-enabled`

DN to Start User Search

LDAP data is organized hierarchically, a bit like a file system on Windows or UNIX. More specific DNs likely result in better search performance. When configuring the module for a particular part of the organization, you can perhaps start searches from a specific organizational unit such as `ou=sales,dc=example,dc=com`.

If multiple entries exist with identical search attribute values, make this value specific enough to return only one entry.

ssoadm attribute: `iplanet-am-auth-ldap-base-dn`

Bind User DN, Bind User Password

If OpenAM stores attributes in the directory, for example to manage account lockout, or if the directory requires that OpenAM authenticate in order to read users' attributes, then OpenAM needs the DN and password to authenticate to the directory.

The default is `cn=Directory Manager`. Make sure that password is correct before you logout. If it is incorrect, you will be locked out. If this should occur, you can login with the super user DN, which by default is `uid=amAdmin,ou=People,OpenAM-deploy-base`, where *OpenAM-deploy-base* you set during OpenAM configuration.

ssoadm attributes: `iplanet-am-auth-ldap-bind-dn, iplanet-am-auth-ldap-bind-passwd`

Attributes, Filter, Scope

LDAP searches for user entries return entries with attribute values matching the filter you provide. For example if you search under `ou=people,dc=example,dc=com` with a filter `"(mail=bjensen@example.com)"`, then the directory returns the entry that has `mail=bjensen@example.com`. In this example the attribute used to search for a user is `mail`. Multiple attribute values mean the user can authenticate with any one of the values. For example, if you have both `uid` and `mail`, then Barbara Jensen can authenticate with either `bjensen` or `bjensen@example.com`.

Should you require a more complex filter for performance, you add that to the User Search Filter text box. For example, if you search on `mail` and add User Search Filter `(objectClass=inetOrgPerson)`, then OpenAM uses the resulting search filter `(&(mail=address)(objectClass=inetOrgPerson))`, where *address* is the mail address provided by the user.

Scope OBJECT means search only the entry specified as the DN to Start User Search, whereas ONELEVEL means search only the entries that are directly children of that object. SUBTREE means search the entry specified and every entry under it.

ssoadm attributes: `iplanet-am-auth-ldap-user-naming-attribute, iplanet-am-auth-ldap-user-search-attributes, iplanet-am-auth-ldap-search-filter, and iplanet-am-auth-ldap-search-scope`

Return User DN to Authenticate

When enabled, and OpenAM uses the directory service as the user store, the module returns the DN rather than the rather than the User ID, so the bind for authentication can be completed without a search to retrieve the DN.

ssoadm attribute: `iplanet-am-auth-ldap-return-user-dn`

LDAP Server Check Interval

Specifies the number of minutes between checks that the primary LDAP server continues to respond.

ssoadm attribute: `iplanet-am-auth-ldap-server-check`

User Creation Attributes

This list lets you map (external) attribute names from Active Directory to (internal) attribute names used by OpenAM.

ssoadm attribute: `iplanet-am-ldap-user-creation-attr-list`

Minimum Password Length

Specify the minimum acceptable password length.

ssoadm attribute: `iplanet-am-auth-ldap-min-password-length`

Trust All Server Certificates

When enabled, blindly trust server certificates, including self-signed test certificates.

ssoadm attribute: `iplanet-am-auth-ldap-ssl-trust-all`

LDAP Behera Password Policy Support

When enabled, support interoperability with servers that implement the Internet-Draft, Password Policy for LDAP Directories.

Support for this Internet-Draft is limited to the LDAP authentication module. Other components of OpenAM, such as the password change functionality in the `/idm/EndUser` page, do not support the Internet-Draft. In general, outside of the LDAP authentication module, OpenAM binds to the directory server as an administrator, such as Directory Manager. When OpenAM binds to the directory server as an administrator rather than as an end user, many features of the Internet-Draft password policies do not apply.

ssoadm attribute: `iplanet-am-auth-ldap-behera-password-policy-enabled`

Authentication Level

ssoadm attribute: `iplanet-am-auth-ldap-auth-level`

2.2.12. Hints For the Membership Authentication Module

The Membership module permits self-registration for new users. You can then have OpenAM create new user profiles in the identity repository.

ssoadm service name: `iPlanetAMAuthMembershipService`

Minimum Password Length

Specify the minimum acceptable number of characters in the password provided during self-registration.

ssoadm attribute: `iplanet-am-auth-membership-min-password-length`

Default User Roles

Specifies the Distinguished Name (DN) of a role to be assigned to a new user whose profile is created. There are no default values. The role specified must be within the realm for which the authentication process is configured.

This role can be either an OpenAM or Sun DSEE role, but it cannot be a filtered role. If you wish to automatically assign specific services to the user, you have to configure the Required Services attribute in the User Profile.

ssoadm attribute: `iplanet-am-auth-membership-default-roles`

User Status After Registration

If you choose Inactive, then the new user has no access to services until an administrator activates the account.

ssoadm attribute: `iplanet-am-auth-membership-default-user-status`

Authentication Level

ssoadm attribute: `iplanet-am-auth-membership-auth-level`

2.2.13. Hints For the MSISDN Authentication Module

The Mobile Station Integrated Services Digital Network (MSISDN) authentication module enables non-interactive authentication using a mobile subscriber ISDN associated with a terminal such as a mobile phone. The module checks the subscriber ISDN against the value found on a user's entry in an LDAP directory service.

ssoadm service name: `sunAMAuthMSISDNService`

Trusted Gateway IP Address

Specifies a list of IP addresses of trusted clients that can access MSISDN modules. Either restrict the clients allowed to access the MSISDN module by add each IPv4 address here, or leave the list empty to allow all clients to access the module. If you specify the value none, no clients are allowed access.

ssoadm attribute: `sunAMAuthMSISDNTrustedGatewayList`

MSISDN Number Argument

Specifies a list of parameter names that identify which parameters to search in the request header or cookie header for the MSISDN number.

For example, if you define x-Cookie-Param, AM_NUMBER, and COOKIE-ID, the MSISDN authentication service checks those parameters for the MSISDN number.

ssoadm attribute: sunAMAuthMSISDNParameterNameList

LDAP Server and Port

The default port for LDAP is 389. If you are connecting to the directory over SSL, the default port for LDAP/SSL is 636.

If you want to use SSL or TLS for security, then scroll down to enable SSL/TLS Access to LDAP. Make sure that OpenAM can trust the servers' certificates when using this option.

ssoadm attribute: sunAMAuthMSISDNLdapProviderUrl

LDAP Start Search DN

Specify the DN of the entry where the search for the user's MSISDN number should start.

ssoadm attribute: sunAMAuthMSISDNBaseDn

Attribute To Use To Search LDAP

Specify the name of the attribute in the user's profile that contains the MSISDN number to search for the user. The default is sunIdentityMSISDNNumber.

ssoadm attribute: sunAMAuthMSISDNUserSearchAttribute

LDAP Server Principal User

If OpenAM must authenticate to the directory server in order to search, then specify the bind DN. The default is cn=amldapuser,ou=DSAME Users,dc=example,dc=com.

ssoadm attribute: sunAMAuthMSISDNPrincipalUser

LDAP Server Principal Password

Specify the password corresponding to the bind DN.

ssoadm attribute: sunAMAuthMSISDNPrincipalPasswd

SSL/TLS for LDAP Access

If you choose to use SSL or TLS for security, then make sure that OpenAM can trust the servers' certificates.

ssoadm attribute: sunAMAuthMSISDNUseSsl

MSISDN Header Search Attribute

Specify the headers to use for searching the request for the MSISDN number.

- Cookie Header tells OpenAM to search the cookie.
- Request Header tells OpenAM to search the request header.
- Request Parameter tells OpenAM to search the request parameters.

ssoadm attribute: sunAMAuthMSISDNHeaderSearch

LDAP Attribute Used to Retrieve User Profile

Specify the LDAP attribute that is used during a search to return the user profile for MSISDN authentication service. The default is uid.

ssoadm attribute: sunAMAuthMSISDNUserNamingAttribute

Return User DN to DataStore

Enable this option only when the OpenAM directory is the same as the directory configured for MSISDN searches. When enabled, this option allows the authentication module to return the DN instead of the User ID. OpenAM thus does not need to perform an additional search with the user ID to find the user's entry.

ssoadm attribute: sunAMAuthMSISDNReturnUserDN

Authentication Level

ssoadm attribute: sunAMAuthMSISDNAuthLevel

2.2.14. Hints For the OATH Module

The Open Authentication (OATH) module provides a more secure method for users to access their accounts with the help of a device, such as their mobile phone or Yubikey. Users can log into OpenAM and update their information more securely from a one-time password (OTP) displayed on their device. The OATH module includes the OATH standard protocols (RFC 4226 and RFC 6238). The OATH module has several enhancements to the HMAC One-Time Password (HOTP) Authentication Module, but does not replace the original module for those already using HOTP prior to the 10.1.0 release. The OATH module includes HOTP authentication and Time-Based One-Time Password (TOTP) authentication. Both types of authentication require an OATH compliant device that can provide the OTP.

HOTP authentication generates the OTP every time the user requests a new OTP on their device. The device tracks the number of times the user requests a new OTP, called the counter. The OTP displays for a period of time you designate in the setup, so the user may be further in the counter on their device than on their account. OpenAM will resynchronize the counter when the user finally logs in. To accommodate this, you set the number of passwords a user can generate before their device cannot be resynchronized. For example, if you set the number of HOTP Window Size to 50 and a two-year

old presses the button 30 on the user's device to generate a new OTP, the counter in OpenAM will review the OTPs until it reaches the OTP entered by the user. If the two-year old presses the button 51 times, you will need to reset the counter to match the number on the device's counter before the user can login to OpenAM. HOTP authentication does not check earlier passwords, so if the user attempts to reset the counter on their device, they will not be able to login until you reset the counter in OpenAM to match their device.

TOTP authentication constantly generates a new OTP based on a time interval you specify. The device tracks the last two passwords generated and the current password. The Last Login Time monitors the time when a user logs in to make sure that user is not logged in several times within the present time period. Once a user log into OpenAM, they must wait for the time it takes TOTP to generate the next two passwords and display them. This prevents others from being able to access the users account using the OTP they entered. The user's account can be accessed again after the generation of the third new OTP is generated and displayed on their device. For this reason, the TOTP Time-Step Interval should not be so long as to lock users out, with a recommended time of 30 seconds.

An authentication chain can be created to generate an OTP from either HOTP or TOTP.

ssoadm service name: iPlanetAMAuthOATHService

One Time Password Length (in digits)

Set the length of the OTP between 6 and 9 digits long. The default value is 6 digits.

ssoadm attribute: iPlanetAMAuthOATHPasswordLength

Secret Key Attribute Name

The name of the attribute where the key will be stored in the user profile.

ssoadm attribute: iPlanetAMAuthOATHSecretKeyAttribute

OATH Algorithm

Select whether to use HOTP or TOTP. You can create an authentication chain to allow for a greater variety of devices. The default value is HOTP.

ssoadm attribute: iPlanetAMAuthOATHAlgorithm

HOTP Window Size

The number of requests that the system and the device can be off to resynchronize the password. If a user passes this number of requests before logging into the system, the password will not work. The default value is 100.

ssoadm attribute: iPlanetAMAuthOATHHOTPWindowSize

Counter Attribute Name

The name of the HOTP attribute where the counter will be stored in the user profile.

ssoadm attribute: `iPlanetAMAuth0ATHHOTPCounterAttribute`

Add Checksum Digit

Adds a checksum digit at the end of the HOTP password to verify it was entered correctly. The default value is No.

ssoadm attribute: `iPlanetAMAuth0ATHAddChecksum`

Truncation Offset

Advanced feature that is device specific. Any value below 0 or above 15 will turn off the functionality. The default value is -1. If not required by the device, leave at the default setting.

ssoadm attribute: `iPlanetAMAuth0ATHTruncationOffset`

TOTP Time Step Interval

Defines how long the password will appear on the user's device (in seconds). We recommend keeping this number low, for example 30 seconds, because once a user logs out, they will not be able to login again until two full time cycles have passed. The default value is 30 seconds.

ssoadm attribute: `iPlanetAMAuth0ATHSizeofTimeStep`

TOTP Time Steps

The number of requests that the system and the device can be off to resynchronize the password. If a user passes this number of requests before logging into the system, the password will not work. The default value is 2.

ssoadm attribute: `iPlanetAMAuth0ATHStepsinWindow`

Last Login Time

The name of the attribute where both HOTP and TOTP authentication will store information on when a person last logged in.

ssoadm attribute: `iPlanetAMAuth0ATHLastLoginTimeAttributeName`

Authentication Level

ssoadm attribute: `sunAMAuthHOTPAuthLevel`

2.2.15. Hints For the OAuth 2.0 Authentication Module

The OAuth 2.0 authentication module lets OpenAM authenticate clients of OAuth resource servers. References in this section are to RFC 6749, The OAuth 2.0 Authorization Framework.

Note

The default settings are for Facebook.

ssoadm service name: sunAMAuthOAuthService

Client ID

OAuth `client_id` as described in section 2.2 of RFC 6749.

ssoadm attribute: `iplanet-am-auth-oauth-client-id`

Client Secret

OAuth `client_secret` as described in section 2.3 of RFC 6749.

ssoadm attribute: `iplanet-am-auth-oauth-client-secret`

Authentication Endpoint URL

URL to the end point handling OAuth authentication as described in section 3.1 of RFC 6749. The default value is `https://www.facebook.com/dialog/oauth`.

ssoadm attribute: `iplanet-am-auth-oauth-auth-service`

Access Token Endpoint URL

URL to the end point handling access tokens as described in section 3.2 of RFC 6749. The default value is `https://graph.facebook.com/oauth/access_token`.

ssoadm attribute: `iplanet-am-auth-oauth-token-service`

User Profile Service URL

User profile URL that returns profile information in JSON format. The default value is `https://graph.facebook.com/me`.

ssoadm attribute: `iplanet-am-auth-oauth-user-profile-service`

Scope

Comma separated list of user profile attributes that the application requires. The default value is `email,read_stream`.

ssoadm attribute: `iplanet-am-auth-oauth-scope`

Proxy URL

URL to the `/oauth2c/OAuthProxy.jsp` file, part of OpenAM.

ssoadm attribute: `iplanet-am-auth-oauth-sso-proxy-url`

Account Mapper

Class implementing account mapping. The default value is `org.forgerock.openam.authentication.modules.oauth2.DefaultAccountMapper`.

ssoadm attribute: `org-forgerock-auth-oauth-account-mapper`

Account Mapper Configuration

Map of OAuth Provider user account attributes used to find the local profile of the authenticated user, with values in the form *provider-attr=local-attr*. Default values `email=mail` and `id=facebook-id`.

ssoadm attribute: `org-forgerock-auth-oauth-account-mapper-configuration`

Attribute Mapper

Class implementing attribute mapping. Default: `org.forgerock.openam.authentication.modules.oauth2.DefaultAttributeMapper`

ssoadm attribute: `org-forgerock-auth-oauth-attribute-mapper`

Attribute Mapper Configuration

Map of OAuth Provider user account attributes to local user profile attributes, with values in the form *provider-attr=local-attr*.

ssoadm attribute: `org-forgerock-auth-oauth-attribute-mapper-configuration`

Save attributes in the session

When enabled, add the mapped attributes to the session saved. The default mode is Enabled.

ssoadm attribute: `org-forgerock-auth-oauth-save-attributes-to-session-flag`

Email attribute in OAuth2 Response

Specifies the attribute identifying email address in the response from the profile service in the OAuth provider. This setting is used to send an email address with an activation code for accounts created dynamically.

ssoadm attribute: `org-forgerock-auth-oauth-mail-attribute`

Create account if it does not exist

When enabled, if the user profile does not exist, optionally retrieve a password and activation code from the user, and then create the profile. The default mode is Enabled.

When the OAuth 2.0 client is configured to create new accounts, the SMTP settings must also be valid. As part of account creation, the OAuth

2.0 client authentication module sends the resource owner an email with an account activation code. To send the mail, OpenAM uses the SMTP settings you provide here in the OAuth 2.0 client configuration.

ssoadm attribute: org-forgerock-auth-oauth-createaccount-flag

Prompt for password setting and activation code

When enabled, the user sets a password, receives an activation code by email. The user must correctly set both in order for the account to be created. The default mode is Enabled.

ssoadm attribute: org-forgerock-auth-oauth-prompt-password-flag

Map to anonymous user

When enabled, map the OAuth authenticated user to the anonymous user you specify. No account is created, even if Create account if it does not exist is enabled.

ssoadm attribute: org-forgerock-auth-oauth-map-to-anonymous-flag

Anonymous User

Specifies an anonymous user that exists in the current realm. The default is anonymous.

ssoadm attribute: org-forgerock-auth-oauth-anonymous-user

OAuth 2.0 Provider logout service

Specifies the optional URL of the OAuth Provider.

ssoadm attribute: org-forgerock-auth-oauth-logout-service-url

Logout options

Specifies whether not to log the user out without prompting from the OAuth Provider on logout, to log the user out without prompting, or to prompt the user regarding whether to logout from the OAuth provider.

ssoadm attribute: org-forgerock-auth-oauth-logout-behaviour

Mail Server Gateway implementation class

Class to interact with the mail server. Default: org.forgerock.openam.authentication.modules.oauth2.DefaultEmailGatewayImpl

ssoadm attribute: org-forgerock-auth-oauth-email-gwy-impl

SMTP host

Host name of the mail server. The default is localhost.

ssoadm attribute: org-forgerock-auth-oauth-smtp-hostname

- SMTP port
SMTP port number for the mail server. The default value is 25.
- ssoadm** attribute: org-forgerock-auth-oauth-smtp-port
- SMTP User Name
If the mail server requires authentication to send mail, specifies the user name.
- ssoadm** attribute: org-forgerock-auth-oauth-smtp-username
- SMTP User Password
If the mail server requires authentication to send mail, specifies the password.
- ssoadm** attribute: org-forgerock-auth-oauth-smtp-password
- SMTP SSL Enabled
When enabled, connect to the mail server over SSL. OpenAM must be able to trust the SMTP server certificate.
- ssoadm** attribute: org-forgerock-auth-oauth-smtp-ssl_enabled
- SMTP From address
Specifies the message sender address, such as no-reply@example.com. The default value is info@forgerock.com.
- ssoadm** attribute: org-forgerock-auth-oauth-smtp-email-from
- Authentication Level
ssoadm attribute: iplanet-am-auth-oauth-auth-level

The following tables show endpoint URLs for OpenAM when configured as an OAuth 2.0 provider, and also URLs for large OAuth 2.0 providers. The default endpoints are for Facebook as the OAuth 2.0 provider.

In addition to the endpoint URLs you can set other fields, like scope and attribute mapping, depending on the provider you use.

Table 2.1. Endpoint URLs for OpenAM

OpenAM Field	Details
Authentication Endpoint URL	/oauth2/authorize under the deployment URL.
	Example: https://openam.example.com:8443/openam/oauth2/authorize.

OpenAM Field	Details
Access Token Endpoint URL	/oauth2/access_token under the deployment URL. Example: https://openam.example.com:8443/openam/oauth2/access_token.
User Profile Service URL	/oauth2/tokeninfo under the deployment URL. Example: https://openam.example.com:8443/openam/oauth2/tokeninfo.

Table 2.2. Endpoint URLs for Facebook

OpenAM Field	Details
Authentication Endpoint URL	https://www.facebook.com/dialog/oauth
Access Token Endpoint URL	https://graph.facebook.com/oauth/access_token
User Profile Service URL	https://graph.facebook.com/me
OAuth 2.0 Provider logout service	http://www.facebook.com/logout.php

Table 2.3. Endpoint URLs for Google

OpenAM Field	Details
Authentication Endpoint URL	https://accounts.google.com/o/oauth2/auth
Access Token Endpoint URL	https://accounts.google.com/o/oauth2/token
User Profile Service URL	https://www.googleapis.com/oauth2/v1/userinfo
OAuth 2.0 Provider logout service	https://mail.google.com/mail/?logout

Table 2.4. Endpoint URLs for MSN

OpenAM Field	Details
Authentication Endpoint URL	https://oauth.live.com/authorize
Access Token Endpoint URL	https://oauth.live.com/token
User Profile Service URL	https://apis.live.net/v5.0/me
OAuth 2.0 Provider logout service	http://oauth.live.com/logout

2.2.16. Hints For the RADIUS Authentication Module

The Remote Authentication Dial-In User Service (RADIUS) module lets OpenAM authenticate users against RADIUS servers.

ssoadm service name: iPlanetAMAuthRadiusService

Server 1

Specify the IP address or fully qualified domain name of the primary RADIUS server. The default is 127.0.0.1 (localhost loopback).

ssoadm attribute: iplanet-am-auth-radius-server1

Server 2

Specify the IP address or fully qualified domain name of the secondary RADIUS server. The default is 127.0.0.1.

ssoadm attribute: iplanet-am-auth-radius-server2

Shared Secret

Specify the shared secret for RADIUS authentication. The shared secret should be as secure as a well-chosen password.

ssoadm attribute: iplanet-am-auth-radius-secret

Port Number

Specify the RADIUS server port. Default is 1645.

ssoadm attribute: iplanet-am-auth-radius-server-port

Timeout

Specify how many seconds to wait for the RADIUS server to respond. The default value is 3 seconds.

ssoadm attribute: iplanet-am-auth-radius-timeout

Health check interval

Used for failover. Specify how often OpenAM performs a health check on a previously unavailable RADIUS server by sending an invalid authentication request. Default: 5 minutes

ssoadm attribute: openam-auth-radius-healthcheck-interval

Authentication Level

ssoadm attribute: iplanet-am-auth-radius-auth-level

2.2.17. Hints For the SAE Authentication Module

The Secure Attribute Exchange (SAE) module lets OpenAM authenticate a user who has already authenticated with an entity that can vouch for the

user to OpenAM, so that OpenAM creates a session for the user. This module is useful in virtual federation, where an existing entity instructs the local OpenAM instance to use federation protocols to transfer authentication and attribute information to a partner application.

ssoadm service name: sunAMAuthSAEService

ssoadm attribute: sunAMAuthSAEAuthLevel

2.2.18. Hints For the SecurID Authentication Module

The SecurID module lets OpenAM authenticate users with RSA Authentication Manager software and RSA SecurID authenticators.

ssoadm service name: iPlanetAMAuthSecurIDService

ACE/Server Configuration Path

Specify the directory in which the SecurID ACE/Server `sdconf.rec` file is located, which by default is expected under the configuration directory for OpenAM, such as `$HOME/openam/openam/auth/ace/data`. The directory must exist before OpenAM can use SecurID authentication.

ssoadm attribute: iplanet-am-auth-securid-server-config-path

Authentication Level

ssoadm attribute: iplanet-am-auth-securid-auth-level

2.2.19. Hints For the Windows Desktop SSO Authentication Module

The Windows Desktop SSO module uses Kerberos authentication. The user presents a Kerberos token to OpenAM through the Simple and Protected GSS-API Negotiation Mechanism (SPNEGO) protocol. The Windows Desktop SSO authentication module enables desktop single sign on such that a user who has already authenticated with a Kerberos Key Distribution Center can authenticate to OpenAM without having to provide the login information again. Users might need to set up Integrated Windows Authentication in Internet Explorer to benefit from single sign on when logged on to a Windows desktop.

ssoadm service name: iPlanetAMAuthWindowsDesktopSSOService

Service Principal

Specify the Kerberos principal for authentication in the following format.

```
HTTP/host.domain@dc-domain-name
```

Here, *host* and *domain* correspond to the host and domain names of the OpenAM instance, and *dc-domain-name* is the domain name of the

Windows Kerberos domain controller server. The *dc-domain-name* can differ from the domain name for OpenAM.

You set up the account on the Windows domain controller, creating a computer account for OpenAM and associating the new account with a service provider name.

ssoadm attribute: `iplanet-am-auth-windowsdesktopsso-principal-name`

Keytab File Name

Specify the full path of the keytab file for the Service Principal. You generate the keytab file using the Windows **ktpass** utility.

ssoadm attribute: `iplanet-am-auth-windowsdesktopsso-keytab-file`

Kerberos Realm

Specify the Kerberos Key Distribution Center realm. For the Windows Kerberos service this is the domain controller server domain name.

ssoadm attribute: `iplanet-am-auth-windowsdesktopsso-kerberos-realm`

Kerberos Server Name

Specify the fully qualified domain name of the Kerberos Key Distribution Center server, such as that of the domain controller server.

ssoadm attribute: `iplanet-am-auth-windowsdesktopsso-kdc`

Return Principal with Domain Name

When enabled, OpenAM automatically returns the Kerberos principal with the domain controller's domain name during authentication.

ssoadm attribute: `iplanet-am-auth-windowsdesktopsso-returnRealm`

Authentication Level

ssoadm attribute: `iplanet-am-auth-windowsdesktopsso-auth-level`

2.2.20. Hints For the Windows NT Authentication Module

The Windows NT module lets OpenAM authenticate against a Microsoft Windows NT server.

This module requires that you install a Samba client in a bin directory under the OpenAM configuration directory such as `$HOME/openam/openam/bin`.

ssoadm service name: `iPlanetAMAuthNTService`

Authentication Domain

Specify the Windows domain name to which users belong.

ssoadm attribute: `iplanet-am-auth-nt-domain`

Authentication Host

Specify the NetBIOS name of the Windows NT host to which to authenticate users.

ssoadm attribute: `iplanet-am-auth-nt-host`

Samba Configuration File Name

Specify the full path to the Samba configuration file.

ssoadm attribute: `iplanet-am-auth-samba-config-file-name`

Authentication Level

ssoadm attribute: `iplanet-am-auth-nt-auth-level`

2.2.21. Hints For the WSSAuth Authentication Module

The Web Service Security (WSSAuth) module lets OpenAM validate a user name, password combination received as an authentication token in a request from a Web Service Client to a Web Service Provider.

ssoadm service name: `sunAMAuthWSSAuthModuleService`

User search attribute

Specify a user attribute to search for a user. Default is `uid`.

ssoadm attribute: `sunWebservicesUserSearchAttribute`

User realm

Specify the realm to which users belong. For the OpenAM Security Token Service, this is `/`.

ssoadm attribute: `sunWebServicesUserRealm`

User password attribute

Specify the password attribute or that of the password equivalent. The default is `userPassword`.

ssoadm attribute: `sunWebservicesUserPasswordAttribute`

Authentication Level

ssoadm attribute: `sunWebservicesAuthenticationLevel`

2.3. Configuring Authentication Chains

Once you have configured authentication modules, and added the modules to the list of module instances, you can configure authentication chains. Authentication chains let you handle situations where alternative modules are needed, or where a single set of credentials is not sufficient.

Procedure 2.1. To Create an Authentication Chain

1. On the Access Control tab page of the OpenAM console, click the realm for which to create the authentication chain.
2. On the Authentication tab page for the realm, scroll to the bottom of the page, and click the New button in the Authentication Chaining table.
3. Give the new authentication chain a name, and add instances of the modules to use in the chain.
4. Assign at least criteria (optional, required, requisite, sufficient) as described above in Section 2.1, “About Authentication in OpenAM”. You can also configure where OpenAM redirects the user upon successful and failed authentication, and plug in your post-authentication processing classes as necessary.
5. If you need modules in the chain to share user credentials, then set options for the module.

`iplanet-am-auth-shared-state-enabled`

Set `iplanet-am-auth-shared-state-enabled=true` to allow subsequent modules in the authentication chain to use the credentials, such as user name and password, captured by this module. (Default: true)

`iplanet-am-auth-store-shared-state-enabled`

Set `iplanet-am-auth-store-shared-state-enabled=true` to store the captured credentials. Shared state is cleared when the user successfully authenticates, quits the chain, or logs out. (Default: false)

`iplanet-am-auth-shared-state-behavior-pattern`

Set `iplanet-am-auth-shared-state-behavior-pattern=tryFirstPass` (the default) to try authenticating with the captured password. If authentication fails, then OpenAM prompts the user for the credentials again.

Set `iplanet-am-auth-shared-state-behavior-pattern=useFirstPass` to authenticate with the captured password. If authentication fails, then the module fails.

For example, consider a chain with two modules sharing credentials according to the default settings. The first module in the chain has the option `iplanet-am-auth-shared-state-enabled=true`, and criteria `REQUIRED`. The second module in the chain has options `iplanet-am-auth-shared-state-enabled=true`, `iplanet-am-auth-shared-state-behavior-pattern=tryFirstPass`, and criteria `REQUIRED`. A successful authentication sequence happens as follows. The user

enters her credentials for the first module, successfully authenticating. The first module shares the credentials with the second module, successfully authenticating the user without prompting again for her credentials, unless the credentials for the first module do not successfully authenticate here to the second module.

6. Save your work.

Procedure 2.2. To Select the Default Chain

Before you select the default chain for users, and especially for administrators, test the authentication chain first. For example, <http://openam.example.com:8080/openam/UI/Login?service=NewChain>. If you cannot log in, then go back and fix the authentication chain's configuration before making it the default.

1. On the Access Control tab page of the OpenAM console, click the realm for which to set the default authentication chain.
2. If necessary, on the Authentication tab page for the realm, adjust the drop-down lists for Organization Authentication Configuration and Administrator Authentication Configuration to the appropriate authentication chains.

The Organization Authentication Configuration serves when users access `/openam/UI/Login`.

The Administrator Authentication Configuration serves when users access `/openam/console`.

You can set these independently to separate administrative login from user login. For example, you can change the default user chain, but leave the default administrator chain as is to avoid locking yourself out as administrator. By default, `amadmin` can login at `/openam/UI/Login`. You can change that for your deployment.

3. Save your work.

2.4. Post Authentication Plugins

Post authentication plugins include custom processing at the end of the authentication process, immediately before the subject is authenticated. Common uses of post authentication plugins include setting cookies and session variables. Post authentication plugins are often used in conjunction with policy agents. The post authentication plugin sets custom session properties, and then the policy agent injects the custom properties into the request header to the protected application.

In the OpenAM console, you add post authentication plugins to an authentication chain by adding their class names to the Post Authentication Processing Class list under Access Control > *Realm Name* > Authentication > Authentication Chaining > *Auth Chain Name*.

Standard Post Authentication Plugins

OpenAM provides some post authentication plugins as part of the standard product delivery.

Class name:
`org.forgerock.openam.authentication.modules.adaptive.Adaptive`
The adaptive authentication plugin serves to save cookies and profile attributes after successful authentication.

Add it to your authentication chains that use the adaptive authentication module configured to save cookies and profile attributes.

Class name:
`org.forgerock.openam.authentication.modules.oauth2.OAuth2PostAuthnPlugin`
The OAuth 2.0 post authentication plugin builds a global logout URL used by `/oauth2c/OAuthLogout.jsp` after successful OAuth 2.0 client authentication. This logs the resource owner out with the OAuth 2.0 provider when logging out of OpenAM.

Before using this plugin, configure the OAuth 2.0 authentication module with the correct OAuth 2.0 Provider logout service URL, and set the Logout options to Log out or Prompt. This plugin cannot succeed unless those parameters are correctly set.

Sometimes OAuth 2.0 providers change their endpoints, including their logout URLs. When using a provider like Facebook, Google, or MSN make sure you are aware when they change their endpoint locations so that you can change your client configuration accordingly.

Class name:
`org.forgerock.openam.authentication.plugins.AccountExpirePlugin`
The account expiration post authentication plugin sets an account expiration date after successful authentication. OpenAM uses this to prevent expired accounts from being used to authenticate.

The default of 30 days can be changed using the advanced OpenAM server property, `org.forgerock.openam.authentication.accountExpire.days`.

If necessary, you can also write your own custom post authentication plugin as described in the *Developer's Guide* chapter on *Creating a Post Authentication Plugin*.

2.5. Authenticating To OpenAM

This section explains how to connect to OpenAM for user authentication by adding parameters to the login URL when testing your configuration.

The base URL to authenticate to OpenAM points to `/UI/Login` under the deployment URL, such as `http://openam.example.com:8080/openam/UI/Login`.² You can, however, specify parameters in the query string of the URL to request a specific authentication configuration. For example, `http://openam.example.com:8080/openam/UI/Login?module=LDAP` requests that OpenAM use the LDAP authentication module.

OpenAM accepts the following parameters in the query string. With the exception of `IDToken` parameters, use no more than one occurrence of each.

arg=newsession

Request that OpenAM end the user's current session and start a new session.

Example: `http://openam.example.com:8080/openam/UI/Login?arg=newsession`

authlevel

Request that OpenAM authenticate the user using a module with at least the specified authentication level that you have configured.

As this parameter determines authentication module selection, do not use it with `module`, `service`, or `user`.

Example: `http://openam.example.com:8080/openam/UI/Login?authlevel=1`

ForceAuth

If `ForceAuth=true`, request that OpenAM force the user to authenticate even if she already has a valid session. On successful authentication, OpenAM updates the session token.

Example: `http://openam.example.com:8080/openam/UI/Login?ForceAuth=true`

goto

On successful authentication, or successful logout, request that OpenAM redirect the user to the specified location. Values must be URL encoded.

Example: `http://openam.example.com:8080/openam/UI/Login?goto=http%3A%2F%2Fwww.example.com%2Fsuccess.html`

²The base URL to logout is similar, for example `http://openam.example.com:8080/openam/UI/Logout`.

gotoOnFail

On authentication failure, request that OpenAM redirect the user to the specified location. Values must be URL encoded.

Example: `http://openam.example.com:8080/openam/UI/Login?goto=http%3A%2F%2Fwww.example.com%2Ffailure.html`

IDToken1, IDToken2, ..., IDTokenN

Pass the specified credentials as IDToken parameters in the URL. The IDToken credentials map to the fields in the login page for the authentication module, such as IDToken1 as user ID and IDToken2 as password for basic user name, password authentication. The order depends on the callbacks in login page for the module; IDTokenN represents the Nth callback of the login page.

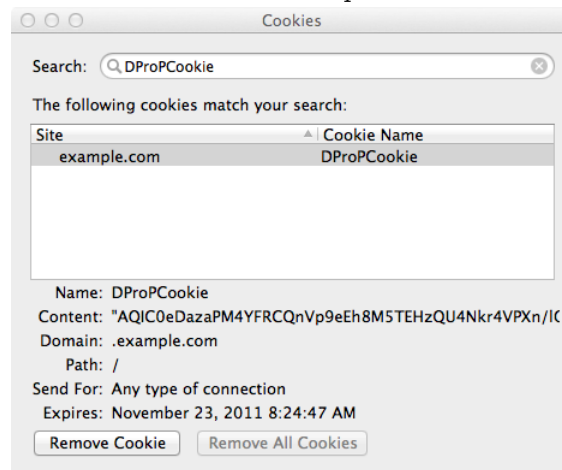
Example: `http://openam.example.com:8080/openam/UI/Login?IDToken1=bjensen&IDToken2=hifalutin`

iPSPCookie=yes

Request that OpenAM return a persistent cookie that remains in the browser after the browser is closed, allowing the user to login again without being prompted for credentials. This only works if you have configured persistent cookie mode for the realm where the user logs in.

Example: `http://openam.example.com:8080/openam/UI/Login?iPSPCookie=yes`

OpenAM sets an DProPCookie that persists until expiry. The following screen shot shows an example.



An alternative persistent cookie mechanism extends the lifetime of the normal iPlanetDirectoryPro using the

advanced server settings, `openam.session.persist_am_cookie` or `openam.session.allow_persist_am_cookie`, and `com.ipplanet.am.cookie.timeToLive`.

To set the mechanism globally for the server, browse in the OpenAM console to Configuration > Servers and Sites > *Server Name* > Advanced, and then set `openam.session.persist_am_cookie` to true and `com.ipplanet.am.cookie.timeToLive` to the cookie lifetime in seconds.

To allow users to use this mechanism on a per-session basis, browse in the OpenAM console to Configuration > Servers and Sites > *Server Name* > Advanced, and then set `openam.session.allow_persist_am_cookie` to true and `com.ipplanet.am.cookie.timeToLive` to the cookie lifetime in seconds. (If the OpenAM .war deployed does not include the console, set these properties in the .properties configuration file.) Also configure the session properties either globally under Configuration > Global > Session > Dynamic Attributes, or per realm under Access Control > *Realm Name* > Services > Session. Then, to request the cookie, use `openam.session.persist_am_cookie=Yes` as one of the query string parameters in the login URL.

locale

Request that OpenAM display the user interface in the specified, supported locale. Locale can also be set in the user's profile, in the HTTP header from her browser, configured in OpenAM, and so on.

Example: `http://openam.example.com:8080/openam/UI/Login?locale=fr`

module

Request that OpenAM use the authentication module instance as configured for the realm where the user is authenticating.

As this parameter determines authentication module selection, do not use it with `authlevel`, `service`, or `user`.

Example: `http://openam.example.com:8080/openam/UI/Login?module=DataStore`

realm

Request that OpenAM authenticate the user to the specified realm.

Example: `http://openam.example.com:8080/openam/UI/Login?realm=sales`

service

Request that OpenAM authenticate the user with the specified authentication chain.

As this parameter determines authentication module selection, do not use it with `authlevel`, `module`, or `user`.

Example: `http://openam.example.com:8080/openam/UI/Login?service=ExternalChain`

user

Request that the user, specified by her OpenAM universal ID, authenticate according to the chain specified in her profile.

As this parameter determines authentication module selection, do not use it with `authlevel`, `module`, or `service`.

Example: `http://openam.example.com:8080/openam/UI/Login?user=admin`

2.6. Configuring Account Lockout

OpenAM supports two different approaches to *account lockout*, where OpenAM locks an account after repeated authentication failures. Lockout works with modules for which users can enter a password incorrectly.

- Memory lockout locks the user account, keeping track of the locked state only in memory, and then unlocking the account after a specified delay. Memory lockout is also released when OpenAM restarts.
- Persistent (physical) lockout sets the user account status to inactive in the user profile. For persistent lockout, OpenAM tracks failed authentication attempts by writing to the user repository.

Persistent account lockout works independently of account lockout mechanisms in the underlying directory server that serves as the user data store.

You configure account lockout by editing settings for the core authentication module. Access the settings in OpenAM console under Access Control > *Realm Name* > Authentication > All Core Settings..., and then scroll down to the Account Lockout section. The inline help explains the settings in detail.

- Enable lockout by checking Login Failure Lockout Mode, setting the number of attempts, and setting the lockout interval and duration.

You can also opt to warn users after several consecutive failures, or to multiply the lockout duration on each successive lockout.

- You can set up email notification upon lockout to an administrator if OpenAM is configured to send mail. (Servers and Sites > *Server Name* > General > Mail Server.)
- For persistent lockout, OpenAM sets the value of the user's `inetuserstatus` profile attribute to inactive. You can also specify another attribute to update on lockout. You can further set a non-default attribute on which

to store the number of failed authentication attempts. When you do store the number of failed attempts in the data store, other OpenAM servers accessing the user data store can also see the number.

If you need to unlock a user's account, find the user under Access Control > *Realm Name* > Subjects > User, set the user's User Status to Active, and click Save.

Chapter 3. Defining Authorization Policies

Authorization is determining whether to grant or deny a user access to a resource. *Policies* define how to determine whether to grant or deny access. This chapter describes how to configure authorization policies managed by OpenAM.

3.1. About Authorization in OpenAM

Applications rely on OpenAM for access management, which breaks down into authentication, or determining who is trying to access a resource, and authorization, or determining whether to grant or deny access. This is because whether access is granted generally depends on what the rules about access are, who is trying to gain access, and perhaps some other conditions, such as whether the access itself needs to happen over a secure channel or what time of day it is. To return to the international airport example, the rule may be that passengers with valid passports and visa presenting valid plane tickets are allowed through to the gate where the plane is waiting to take off, but only under the condition that the plane is going to leave soon. (You cannot expect to get to the gate today with a scheduled departure for three months from now.)

To allow OpenAM to determine whether to grant access, you define authorization policies. A policy includes *rules* that match what resources a user aims to access in what way and whether to grant or deny that access, *subjects* to whom the policy applies, and potentially *conditions* under which the policy applies. When queried about whether to let a user through to a protected resource, OpenAM decides to authorize access or not based on the applicable policy. OpenAM then communicates its decision to the application using OpenAM for access management, or in the common case to the policy agent installed in the server where the application runs. The application or the agent then enforces the authorization decision from OpenAM.

For example, consider the case where OpenAM protects a web site page that users access to update their profiles. An OpenAM policy agent installed in the web server intercepts client requests to enforce policy. The policy says that authenticated users can access the page to update their profiles as long come in over HTTPS, rather than HTTP.

When a user browses to the page to update her profile, the OpenAM policy agent intercepts the request. The policy agent notices that the request is to access a protected resource, but the request is coming from a user who has not yet logged in and has no authorization to visit the page. The agent therefore redirects the user to OpenAM.

OpenAM receives the redirected user, serving a login page that collects her email and password. With the email and password credentials, OpenAM

authenticates the user, and gives her a session. OpenAM then redirects the user to the policy agent, which gets the policy decision from OpenAM for the page she wants to access, and grants access to the page. OpenAM and the policy agent use cookies set in the user's browser to reference her session. While the user has a valid session with OpenAM, she can go away to another page in her browser, come back to the update profile page, and gain access without having to enter her email and password again.

Notice how OpenAM and the policy agent handle the access in the example. The web site developer can offer a profile page, but the web site developer never has to manage login, nor has to handle who can access a page. As OpenAM administrator, you can change authentication and authorization independently of updates to the web site. You might need to agree with web site developers on how OpenAM identifies users so web developers can find their particular profiles, or identify the user by her own name when she logs in. Yet your organization is now spared from new web site development projects when you want to add external access to your Intranet for roaming users, open certain of your sites to partners, only let managers access certain pages of your HR web site, or allow users already logged in to their desktops to visit protected web sites without having to type their user names and passwords again.

When OpenAM denies a request due to a condition that could be corrected by further authentication, OpenAM can send advice to the policy agent, and the policy agent can then take remedial action. For instance, suppose a user comes to a web site having authenticated with an email address and password, which is configured as authentication level 0. Had the user authenticated over the VPN which relies on one-time password authentication, she would have had authentication level 1 in her session. Yet, because she has authentication level 0, she currently cannot access the page she wants, which requires authentication level 1. OpenAM can send advice in this case, prompting the agent or application to redirect her to authenticate again with a one-time password, gaining authentication level 1, and thus having OpenAM grant her access to the protected page.

Policies can include *response providers*. Response providers extend HTTP headers with additional information beyond an "allow" or "deny" decision. For example, a response provider can return a message about why access was denied.

3.2. Configuring Policies

An OpenAM authorization policy defines who can access what, under what conditions. The OpenAM agents enforcing policy call upon OpenAM to make policy decisions. Decisions from OpenAM can be as simple as "allow" or "deny." Decisions from OpenAM can alternatively provide additional

information required for policy enforcement. OpenAM policies use response providers to return such additional information.

Procedure 3.1. To Create a Policy

1. In the OpenAM console, select Access Control > *Realm Name* > Policies, then click New Policy...
2. Provide at minimum a name for the policy.

Procedure 3.2. To Configure a Policy For a Web Site

Once a policy is created, you can further specify rules, subjects, conditions, and response providers.

OpenAM has, by default, three kinds of resources that you can protect with a policy.

- A *Discovery Service*, used in federated access management, locates the web service providing the data needed to complete an operation. Your policy protects what clients can look up and what they can update.
- A *Liberty Personal Profile Service*, used in federated access management, provides an identity's basic profile information. Your policy protects what clients can query and what they can modify.
- A *URL Policy Agent* protects resources on a specific web site or web application. Your policy protects what URLs client applications can access with HTTP GET and POST operations.

Follow these steps to configure a policy to protect a web site or web application.

1. In the OpenAM console, select Access Control > *Realm Name* > Policies > *Policy Name* to display the policy to edit.
2. In the Rules table, click New... to create a rule, identifying a URL to protect.
 - a. Select URL Policy Agent (with resource name), and click Next.
 - b. Name the new rule, add the URL to protect in the Resource Name field, and set whether to allow or deny HTTP GET and POST requests to the URL.

Your Resource Name can use wildcards.¹

- A `*` matches zero or more characters including `/`, but
- A `*` at the end of the Resource Name immediately following `/` matches one or more characters including `/`.
- Multiple forward slashes do not match a single forward slash, so `mult/*/dirs` matches `mult/iple/dirs`, yet `mult/*/dirs` does not match `mult/dirs`.
- Trailing forward slashes are not recognized as part of a Resource Name. Therefore `http://www.example.com/images//` and `http://www.example.com/images` are equivalent.
- A `-*` matches all characters except forward slash (`/`) or question mark (`?`), and cannot be escaped. As it does not match `/`, `-*` does not span multiple levels in a URL.

OpenAM does not let you mix `*` and `-*` in the same URL.

To check for a match, OpenAM first normalizes both the policy resource name URL pattern you provide, and also the actual requested resource URL. In addition to sorting the query string field-value pairs, OpenAM ensures that both the URL pattern and the resource URL include the port number. If no port number is specified, OpenAM uses 80 for HTTP or 443 for HTTPS. In other words, `http://www.example.com/*` gets normalized to `http://www.example.com:80/*`. Also, `http://*/*` gets normalized to `http://*:80/*`. Notice that `http://*/*` does matches when the port number is 80, but not when the port number is something else, such as `http://www.example.com:1080/index.html`.

c. Click Finish.

The new rule is not yet saved until you click the Save button in the Edit Policy screen.

3. In the Subjects table, click New... to define a subject, identifying the users to whom the policy applies.

¹This explanation focuses on how this works for web resources such as `http://www.example.com:80/index.html`, where the delimiter is `/`, the wildcard is `*`, and the one-level wildcard is `-*`. By default, comparisons are not case sensitive. The delimiter, wildcards and case sensitivity are configurable. To see examples of other configurations, browse in the OpenAM console to Configuration > Global > Policy Configuration > Resource Comparator.

- a. In the Select Subject Type screen, make your selection, and then click next.
 - Authenticated Users refers to users who have authenticated with OpenAM, even if they do not have profiles in the realm where you define the policy.
 - OpenAM Identity Subject refers to users or groups you can find under Access Control > Realm Name > Subjects.
 - Web Services Clients are for federated access management.
- b. Name the subject.
- c. If you want to apply the policy to everyone but the subjects you identified, then select Exclusive.

For example

- d. If you selected OpenAM Identity Subject, use the Filter section to find and add to your list the subjects to whom to apply the policy.
 - e. Click Finish.
4. In the Conditions table, click New... to create a condition, constraining the circumstances under which the policy applies.
 - a. Select the Condition Type from the list.
 - Active Session Time lets you make the policy depend on how long the user's session has been active, and even to terminate the session if deemed too old, such that the user must authenticate again.
 - Authentication by Module Chain lets you make the policy depend on the realm where the user authenticated, and on the authentication chain used to authenticate.
 - Authentication by Module Instance lets you make the policy depend on the realm where the user authenticated, and on the authentication module used to authenticate, as well as setting timeouts for application authentication.
 - Authentication Level (greater than or equal to) lets you make the policy depend on the realm where the user authenticated, and on a minimum acceptable authentication level.

- Authentication Level (less than or equal to) lets you make the policy depend on the realm where the user authenticated, and on a maximum acceptable authentication level.
- Authentication to a Realm lets you make the policy depend on the realm where the user authenticated.
- Current Session Properties lets you make the policy depend on attributes set in the user's session.
- Identity Membership lets you make the policy depend on a list of OpenAM subjects that you select, and whether the user belongs to the list of users or is a member of a group you selected.
- IP Address/DNS Name lets you apply the policy to clients in specific IP address ranges or coming from a particular DNS domain.
- LDAP Filter Condition lets you make the policy depend on whether the user's entry can be found using the LDAP search filter you specify in the directory configured for the policy service, which by default is the identity repository. See Configuration > Global > Policy Configuration > Realm Attributes > Primary LDAP Server.

Alternatively you can set this for the realm under Access Control > *Realm Name* > Services > Policy Configuration.

- Resource/Environment/IP Address lets you make the policy apply using a complex condition such as whether the user is making a request from the localhost and has authenticated with the LDAP authentication module.
 - Time (day, date, time, and timezone) lets you make the policy depend on when the policy is evaluated.
- b. Based on the Condition Type you choose, configure the condition, and then click Finish.
5. In the Response Providers table, click New... to set up a response provider that adds attributes retrieved from the user entry in the identity repository into the headers of the request at policy decision time.
 - a. Name the provider.
 - b. Add static attributes having the form *attribute=value*.
 - c. Add dynamic attributes having the form *responseAttr=repoAttr*, where *responseAttr* is the attribute name to be put into the header of the

request, and *repoAttr* is the attribute name used in the identity repository.

d. Click Finish.

6. Save your work.

3.3. How OpenAM Reaches Policy Decisions

OpenAM has to match policies to resources to take policy decisions. For a policy to match, the resource has to match a resources identified in a rule. The user making the request has to match a subject. Furthermore, at least one condition for each condition type has to be satisfied.

If more than one policy matches, OpenAM has to reconcile differences. When multiple policies match, the order in which OpenAM uses them to make a policy decision is not deterministic. However, a deny decision overrides an allow decision, and so by default once OpenAM reaches a deny decision its stops checking further policies. (If you want OpenAM to continue checking despite the deny, see Configuration > Global > Policy Configuration > Continue Evaluation on Deny Decision.)

3.4. Managing Policies Outside the Console

When you first create policies, the OpenAM console helps you to get started quickly. Yet, when you have many policies to manage you might find it easier to script operations, starting from policies originally created in the console, then exported to XML.

Procedure 3.3. To Export Policies From the Console

You can export policies created in the console to an XML Policies document.

- Use the **ssoadm list-policies** command.

```
$ ssoadm
list-policies
--realm "/"
--adminid amadmin
--password-file /tmp/pwd.txt

Policy definitions were returned under realm, /.
<?xml version="1.0" encoding="ISO-8859-1"?>
<!DOCTYPE Policies
PUBLIC "-//OpenSSO Policy Administration DTD//EN"
"jar://com/sun/identity/policy/policyAdmin.dtd">

<!-- extracted from realm, / -->
<Policies>
<Policy name="URL Policy" createdby="id=amadmin,ou=user,o=openam"
lastmodifiedby="id=amadmin,ou=user,o=openam" creationdate="1312553988059"
```

```
lastmodifieddate="1315403023466" referralPolicy="false" active="true" >
<Rule name="Allow GET with parameters">
<ServiceName name="iPlanetAMWebAgentService" />
<ResourceName name="http://www.example.com/ching/*?" />
<AttributeValuePair>
<Attribute name="GET" />
<Value>allow</Value>
</AttributeValuePair>
</Rule>
<Rule name="Allow GET and POST">
<ServiceName name="iPlanetAMWebAgentService" />
<ResourceName name="http://www.example.com/ching/*" />
<AttributeValuePair>
<Attribute name="POST" />
<Value>allow</Value>
</AttributeValuePair>
<AttributeValuePair>
<Attribute name="GET" />
<Value>allow</Value>
</AttributeValuePair>
</Rule>
<Subjects name="Subjects:1312553593870WmIuFvI=" description="">
<Subject name="All Authenticated Users" type="AuthenticatedUsers"
includeType="inclusive">
</Subject>
</Subjects>
</Policy>
</Policies>
```

Procedure 3.4. To Import Policies Using the Command Line

In a production environment where you manage operations using scripts rather than the console, use exported, file-based policies edited for your needs, and then import the policies using **ssoadm**.

1. Create your XML policy file.

```
$ cat policy.xml
<?xml version="1.0" encoding="ISO-8859-1"?>
<!DOCTYPE Policies
PUBLIC "-//OpenSSO Policy Administration DTD//EN"
"jar://com/sun/identity/policy/policyAdmin.dtd">
<!-- New policy, same as the old policy -->
<Policies>
<Policy name="New Policy" referralPolicy="false" active="true" >
<Rule name="Allow GET with parameters">
<ServiceName name="iPlanetAMWebAgentService" />
<ResourceName name="http://www.example.com/ching/*?" />
<AttributeValuePair>
<Attribute name="GET" />
<Value>allow</Value>
</AttributeValuePair>
</Rule>
<Rule name="Allow GET and POST">
<ServiceName name="iPlanetAMWebAgentService" />
<ResourceName name="http://www.example.com/ching/*" />
<AttributeValuePair>
<Attribute name="POST" />
<Value>allow</Value>
```



```
</AttributeValuePair>
<AttributeValuePair>
  <Attribute name="GET" />
  <Value>allow</Value>
</AttributeValuePair>
</Rule>
<Subjects name="Subjects" description="Everybody authenticated">
  <Subject name="All Authenticated Users" type="AuthenticatedUsers"
    includeType="inclusive">
  </Subject>
</Subjects>
</Policy>
</Policies>
```

2. Use the **ssoadm create-policies** command.

```
$ ssoadm
  create-policies
  --realm "/"
  --adminid amadmin
  --password-file /tmp/pwd.txt
  --xmlfile policy.xml

Policies were created under realm, /.
```

3.5. Delegating Policy Management & Decisions

You use a *referral* to delegate policy management, and to delegate policy decision making.

Referrals are covered in the chapter on Realms.

Chapter 4. Defining Entitlements

This chapter covers how to define entitlements for fine-grained authorization to access particular resources.

4.1. About Entitlements

OpenAM *entitlements* serve much the same purpose as OpenAM policies, defining who has access to what, under what conditions. OpenAM stores and manages policies centrally using the standard eXtensible Access Control Markup Language (XACML). You can access OpenAM entitlements and policy decisions using the RESTful web interface, for even lighter weight policy enforcement than with OpenAM policy agents.

The OpenAM entitlements service uses XACML terminology to refer to the different points dealing with policy.

- OpenAM serves as a *policy administration point* (PAP) where you define, store, and manage policies. OpenAM uses the configuration directory to store entitlements, whereas profiles are stored in the identity repository (user data store).
- OpenAM also serves as a *policy decision point* (PDP), evaluating policies and issuing authorization decisions, and as a *policy information point*, providing the information needed for authorization decisions.
- OpenAM policy agents act as *policy enforcement points*, obtaining decisions from PDPs to protect access to resources.

Entitlement policies define who has who has access to what, under what conditions, in the same way that other OpenAM policies define policy. Entitlement policies do let you define virtual subjects and subjects based on attribute lookup to determine who has access to the resources.

Entitlements apply for *applications*, which in this context mean protected resources that share a common set of actions and related policies. For example, the web agent application protects web resources accessed through HTTP GET and POST actions using a web policy agent to enforce decisions to allow or deny access. You can also define more specific applications as demonstrated by the examples delivered with OpenAM.

Delegations grant specific users privileges to manage policies.

4.2. Managing Entitlements on the Command Line

To manage entitlements, you can use the **ssoadm** command. The **ssoadm** command provides several other subcommands for managing entitlements in addition to those shown here.

Procedure 4.1. To Export Policies

- Use the **ssoadm list-xacml** command to export policies.

```
$ ssoadm list-xacml --realm / --adminid amadmin --password-file /tmp/pwd.txt

<?xml version="1.0" encoding="UTF-8" standalone="yes"?>
<PolicySet PolicyCombiningAlgId="urn:oasis:names:tc:xacml:3.0:
  rule-combining-algorithm:deny-overrides" Version="2011.10.07.12.22.04.705"
  PolicySetId="/:2011.10.07.12.22.04.704" xmlns="urn:oasis:names:tc:xacml:3.0:
  core:schema:cd-1">
  <Target/>
  ... other policies ...
  <Policy RuleCombiningAlgId="urn:oasis:names:tc:xacml:3.0:
    rule-combining-algorithm:deny-overrides" Version="2011.10.07.11.51.27.444"
    PolicyId="New Policy">
    ... policy content here ...
  </Policy>
</PolicySet>
```

Procedure 4.2. To Import an Entitlements Policy

- Use the **ssoadm create-xacml** command to import a policy.

```
$ ssoadm
  create-xacml
  --realm /
  --xmlfile policy.xml
  --adminid amadmin
  --password-file /tmp/pwd.txt
```

Procedure 4.3. To Create an Application

- Use the **ssoadm create-appl** command to create an application type.

```
$ cat application.txt
resources=http://myapp.example.com:80/*
subjects=com.sun.identity.admin.model.IdRepoUserViewSubject
subjects=com.sun.identity.admin.model.VirtualViewSubject
subjects=com.sun.identity.admin.model.OrViewSubject
subjects=com.sun.identity.admin.model.AndViewSubject
conditions=com.sun.identity.admin.model.DateRangeCondition
conditions=com.sun.identity.admin.model.DaysOfWeekCondition
conditions=com.sun.identity.admin.model.IpRangeViewCondition
conditions=com.sun.identity.admin.model.DnsNameViewCondition
conditions=com.sun.identity.admin.model.TimeRangeCondition
conditions=com.sun.identity.admin.model.TimezoneCondition
conditions=com.sun.identity.admin.model.OrViewCondition
conditions=com.sun.identity.admin.model.AndViewCondition
conditions=com.sun.identity.admin.model.NotViewCondition
entitlementCombiner=com.sun.identity.entitlement.DenyOverride
$ ssoadm
  create-appl
  --realm /
  --applicationtype iPlanetAMWebAgentService
  --name myApp
  --adminid amadmin
```

Managing Entitlements on the Command Line

```
--password-file /tmp/pwd.txt  
--datafile application.txt  
myApp was created.
```

Chapter 5. Configuring Realms

This chapter shows how to configure OpenAM *realms*, which are used to group configuration and identities together. For example, you might have one realm for OpenAM administrators and agents, and another realm for users. In this two-realm setup, the OpenAM administrator can login to the administrative realm to manage the services, but cannot authenticate as OpenAM administrator to the realm that protects web sites with HR and financial information.

OpenAM associates a realm with at least one identity repository and authentication process. OpenAM also associates the realm with authorization policies and entitlements for users, and privileges for administrators. Each realm can have its own configuration for services.

When you first configure OpenAM, OpenAM sets up the default / (Top Level Realm), containing OpenAM configuration data, and allowing authentication using the identity repository you choose during initial configuration. The top level realm might hold the overall configuration for Example.com for instance.

You create new realms to subdivide authentication, and authorization, and to delegate management of sub-realms. For example, your organization might require separate realms for payroll, human resources, and IT management domains and their applications.

Procedure 5.1. To Create a New Realm

You can create a new realm through the OpenAM console as described below, or by using the **ssoadm create-realm** command.

1. Login to the OpenAM console as OpenAM Administrator, `amadmin`.
2. On the Access Control tab > Realms table, click New... to open the New Realm page, where you configure the realm.

If you configure the realm to be inactive, then users cannot use it to authenticate or be granted access to protected resources.

Realm/DNS aliases must be meaningful in DNS terms, such as `hr.example.com` or `pay.example.com`.

3. Save your work after defining the configuration for the new realm.

You configure a realm through the console starting from the Access Control tab > Realms table. By default the new realm inherits configuration from the global configuration. The default identity repository is the one you choose

when configuring OpenAM after deployment. The default authentication mechanism corresponds to that identity repository as well. You can, however, constrain authentication to rely on different data stores, and set policy for agents to define authorization in the realm.

Procedure 5.2. To Delegate Administration

You can delegate administration in a realm. OpenAM grants administrative capabilities to members of groups having administrative privileges.

You can grant privileges through the OpenAM console as described below, or by using the **ssoadm add-privileges** command.

1. On the Access Control tab > Realms table, click the realm for which you want to delegate administration to view the realm configuration.
2. On the Privileges tab, click the name of the group to whom you intend to grant access.
3. Select the administrative privileges to delegate for the realm, and then save your work.

Procedure 5.3. To Delegate Policy Management

When you delegate access management for a realm, you might want to delegate policy management. You can delegate policy management by creating a referral.

1. In the OpenAM console, browse to Access Control > *Realm Name* > Policies, where *Realm Name* is the realm *from which* you intend to delegate policy.
2. Click the New Referral... button in the Policies table.
3. In the New Referral screen, provide at minimum a name for the referral.
4. Set up rules to identify the resources to which the referral applies.

You specify only a rule Name, and a Resource Name for the resource to manage, so that the realm administrator has access to set up the policy for the specified resource.

5. Set up referrals to identify the realms *to which* to delegate policy management.

You can delegate to peer realms or sub realms (child realms), but not to parent realms.

-
6. Save your work.

At this point you can let the realm administrator know that she can create policies in her realm for the resources you specified in the rules of the referral.

Procedure 5.4. To Configure a Data Store for a Realm

When you first set up a realm, the new realm inherits the data store from the parent realm. Yet, if your administrators are in one realm and your users in another, your new child realm might retrieve users from a different data store.

1. In the OpenAM console, browse to Access Control > *Realm Name* > Data Store.
2. Click New... in the Data Stores table to create a data store profile, and to provide the information needed to connect to the data store.
3. In the first screen, name the data store and select the type of data store to use.

Most data stores are directory services, though the Database Repository lets you connect to an SQL database through JDBC.

4. In the second screen, provide information on how to connect to your data store, and then click Finish to save your work.

See the chapter on authentication for hints on connecting to Active Directory, LDAP directory, and JDBC data sources.

5. Click the Subjects tab, and make sure the connection to your new data store is working, by searching for a known identity.

By default the Subjects list only retrieves 100 entries from the data store. Narrow your search if you do not see the identity you are looking for in the list.

6. If you no longer need the connection to the inherited data store *in this realm*, then you can delete its entry in the Data Stores table.

Also, once you change the data store for a realm, you might opt to change the authentication module configuration as described in the chapter on authentication to use your realm data store, rather than the inherited settings.

Procedure 5.5. To Configure a Web or J2EE Agent For Login to a Realm

You might choose to configure your agent in one realm, yet have your real users authenticate through another realm. In this case, you want your agents to redirect users to authenticate to their realm, rather than the agent realm.

1. In the OpenAM console, browse to Access Control > *Realm Name* > Agents > *Web or J2EE Agent Type* > *Agent Name* > OpenAM Services.
2. Add login and logout URLs, including the realm in the query string.

For example, if your *Realm Name* is hr, and you access OpenAM at `http://openam.example.com:8080/openam`:

- Login URL: `http://openam.example.com:8080/openam/UI/Login?realm=hr`
- Logout URL: `http://openam.example.com:8080/openam/UI/Logout?realm=hr`

3. Save your work.

Procedure 5.6. To Serve Multiple Tenants Using Realms

You can use realms in a multi-tenant deployment, where configuration settings and user identities are specific to a realm, and are not made available to other realms.

For example consider a deployment with the following characteristics.

- The FQDN for OpenAM and the top-level realm is `openam.example.com`.
- OpenAM also hosts `realm1.example.com`, and `realm2.example.com`. In other words, OpenAM receives all HTTP(S) connections for these host names. Perhaps they share an IP address, or OpenAM listens on all interfaces.

For example, a service provider could have a centralized authentication and authorization service available to multiple customers (tenants) from different companies. The centralized service must not allow employees of one tenant to authenticate to another tenant, nor to be authorized to access resources from another tenant. The separation is achieved using one realm per tenant, such that all users, policies, configuration settings, and changes remain specific to the tenant's realm.

Yet, unless you further configure OpenAM, when an employee is directed to `http://realm1.example.com:8080/openam`, and OpenAM redirects that access to `http://openam.example.com:8080/openam`. If the user to authenticate is

present only in `realm1`, then authentication fails even with proper credentials. Instead the tenant having `realm1` must always use URLs specifying the realm as in `http://openam.example.com:8080/openam/UI/Login?realm=realm1`, unfortunately revealing the top-level realm and exposing extra information about the service.

To prevent redirection and having to expose the top-level realm domain, perform the following steps.

1. If the domains differ at the second-level or top-level domain, then OpenAM must handle cookies for all realms.

In the OpenAM console under Configuration > System > Platform > Cookie Domains, add domains as necessary.

If for example you installed OpenAM in domain `openam.example.net`, and have realms `realm1.example.org`, `realm2.example.com`, then the list would include `.example.net`, `.example.org`, and `.example.com`.

2. Set the FQDN for each realm in Realm/DNS Alias under Access Control > *Realm Name* > General.
3. Return to the top level, and then set the property `com.sun.identity.server.fqdnMap` under Configuration > Servers and Sites > *Server Name* > Advanced.

In a multi-server installation such as an OpenAM site configuration, set the property under Configuration > Servers and Sites > Default Server Settings > Advanced instead.

For each realm, set `com.sun.identity.server.fqdnMap[realm-fqdn]` to *realm-fqdn*. For example, set `com.sun.identity.server.fqdnMap[realm1.example.com]` to `realm1.example.com`.

4. In a site configuration if you have OpenAM Java SDK clients that access the fully qualified domain name you set in the map, you must turn off site monitoring on the client side in order to use the FQDN specified in the server configuration.

To turn off site monitoring on your client, set `openam.naming.sitemonitor.disabled=true` in the client configuration.

5. Restart OpenAM for the change to `com.sun.identity.server.fqdnMap` to take effect.

After restart, OpenAM works without redirecting from `http://realm1.example.com:8080/openam` to `http://openam.example.com:8080/openam`.

Chapter 6. Configuring Policy Agent Profiles

You install policy agents in web servers and web application containers to enforce access policies OpenAM applies to protected web sites and web applications. Policy agents depend on OpenAM for all authentication and authorization decisions. Their primary responsibility consists in enforcing what OpenAM decides in a way that is unobtrusive to the user. In organizations with many servers, you might well install many policy agents.

Policy agents can have local configurations where they are installed, but usually you store all policy agent configuration information in the OpenAM configuration store, defining policy agent profiles for each, and then you let the policy agents access their profiles through OpenAM such that you manage all agent configuration changes centrally. This chapter describes how to set up policy agent profiles in OpenAM for centralized configuration.

6.1. Identity Gateway or Policy Agent?

OpenAM includes both the Identity Gateway and also a variety of policy agents. Both the Identity Gateway and also the policy agents enforce policy, redirecting users to authenticate when necessary, and controlling access to protected resources. Yet, the Identity Gateway runs as a self-contained reverse proxy located between the users and the protected applications. Policy agents are installed into the servers where applications run, intercepting requests in that context.

The Identity Gateway works well with applications where you want to protect access, but you cannot install a policy agent. For example, you might have a web application running in a server for which no policy agent has been developed. Or you might be protecting an application where you simply cannot install a policy agent.

Policy agents have the advantage, where you can install them, of sitting within your existing server infrastructure. Once you have agents installed into the servers with web applications or sites to protect, then you can manage their configurations centrally from OpenAM.

Of course, for organizations with both servers where you can install policy agents and also applications that you must protect without touching the server, you can use policy agents on the former and the Identity Gateway for the latter.

6.2. Kinds of Agent Profiles

When you open the OpenAM console to configure agents for the top level realm, you see a number of different kinds to choose. Web and J2EE policy agents are the most common, requiring the least integration effort.

Web

You install web agents in web servers to protect web sites.

J2EE

You install J2EE agents in web application containers to protect web applications.

Web Service Provider

WSP agents are for use with Web Services Security.

Web Service Client

WSC agents are for use with Web Services Security.

Discovery

The Discovery Service agent has the trust authority configuration that OpenAM uses to communicate with a Liberty Discovery Service.

STS Client

The Security Token Service client agent is for securing requests to the Security Token Service.

2.2 Agents

Version 2.2 web and J2EE policy agents hold their configuration locally, connecting to OpenAM with a user name, password combination. This kind of agent is provided for backwards compatibility.

OAuth 2.0 Client Agent

OAuth 2.0 clients are registered using this type of policy agent profile.

Agent Authenticator

The agent authenticator can read agent profiles by connecting to OpenAM with a user name, password combination, but unlike the agent profile administrator, cannot change agent configuration.

6.3. Creating Agent Profiles

This section concerns creating agent profiles, and creating groups that let agents inherit settings when you have many agents with nearly the same profile settings.

Procedure 6.1. To Create an Agent Profile

To create a new web or J2EE policy agent profile, you need a name and password for the agent, and the URLs to OpenAM and the application to protect.

1. On the Access Control tab page of the OpenAM console, click the link for the realm in which you manage agents.

- Click the Agents tab, click the tab page for the kind of agent you want to create, and then click the New... button in the Agent table.
- Provide a name for the agent, and also the URLs to OpenAM and to the application to protect, then click Create.

The screenshot shows the OpenAM console interface. At the top, there's a header bar with 'VERSION', 'LOG OUT', and 'HELP' buttons. Below the header, it says 'User: amAdmin Server: openam-ter' and the OpenAM logo. The main content area is titled 'New Agent' and contains several form fields. There are 'Create' and 'Cancel' buttons at the top right of the form. A note indicates that an asterisk (*) denotes a required field. The form fields include: Name (filled with 'New Web Agent'), Password (masked with dots), Re-Enter Password (masked with dots), Configuration (radio buttons for 'Local' and 'Centralized', with 'Centralized' selected), Server URL (filled with 'http://openam.example.com:8080/openam' and a subtext 'protocol/host:port/deploymentUri e.g. http://opensso.sample.com:58080/opensso'), and Agent URL (filled with 'http://www.example.com:80' and a subtext 'protocol/host:port e.g. http://agent1.sample.com:1234').

- After creating the agent profile, you can click the link to the new profile to adjust and export the configuration.

Procedure 6.2. To Create an Agent Profile Group & Inherit Settings

Agent profile groups let you set up multiple agents to inherit settings from the group. To create a new web or J2EE agent profile group, you need a name and the URL to the OpenAM server in which you store the profile.

- On the Access Control tab page of the OpenAM console, click the link for the realm in which you manage agents.
- Click the Agents tab, click the tab page for the kind of agent you want to create, and then click the New... button in the Group table.

After creating the group profile, you can click the link to the new group profile to fine-tune or export the configuration.

- Inherit group settings by selecting your agent profile, and then selecting the group name in the Group drop-down list near the top of the profile page.

You can then adjust inheritance by clicking Inheritance Settings on the agent profile page.

6.4. Delegating Agent Profile Creation

If you want to create policy agent profiles when installing policy agents, then you need the credentials of an OpenAM user who can read and write agent profiles.

You can use the OpenAM administrator account when creating policy agent profiles. If however you delegate policy agent installation, then you might not want to share OpenAM administrator credentials with everyone who installs policy agents.

Follow these steps to create *agent administrator* users for a realm.

1. In OpenAM console, browse to Access Control > *Realm Name* > Subjects.
2. Under Group click New... and create a group for agent administrators.
3. Switch to the Privileges tab for the realm, and click the name of the group you created.
4. Select "Read and write access to all configured Agents," and then Save your work.
5. Return to the Subjects tab, and under User create as many agent administrator users as needed.
6. For each agent administrator user, edit the user profile.

Under the Group tab of the user profile, add the user to agent profile administrator group, and then Save your work.

7. Provide each system administrator who installs policy agents with their agent administrator credentials.

When installing the policy agent with the `--custom-install` option, the system administrator can choose the option to create the profile during installation, and then provide the agent administrator user name and the path to a read-only file containing the agent administrator password.

6.5. Configuring Web Policy Agents

When you create a web policy agent profile and install the agent, you can choose to store the agent configuration centrally and configure the agent through OpenAM console. Alternatively, you can choose to store the agent configuration locally and configure the agent by changing values in the properties file. This section covers centralized configuration, indicating the corresponding properties for use in a local configuration file where applicable.¹

¹The configuration file syntax is that of a standard Java properties file, though backslash escapes can be used only to wrap long lines. See `java.util.Properties.load` for a description of the format. The value of a property specified multiple times is not defined.

Tip

To show the agent properties in configuration file format that correspond to what you see in the console, click Export Configuration after editing agent properties.

This corresponds to the local Java properties configuration file that is set up when you install an agent, for example in Agent_001/config/OpenSSOAgentConfiguration.properties.

After changing properties specified as "Hot swap: no" you must restart the agent for the changes to take effect.

6.5.1. Configuring Web Policy Agent Global Properties

This section covers global web agent properties. After creating the agent profile, you access these properties in the OpenAM console under Access Control > *Realm Name* > Agents > Web > *Agent Name* > Global.

Profile properties

Group

For assigning the agent to a previously configured web agent group in order to inherit selected properties from the group.

Password

Agent password used when creating the password file and when installing the agent.

Status

Status of the agent configuration.

Location of Agent Configuration Repository

Indicates agent's configuration located either on agent's host or centrally on OpenAM server.

Agent Configuration Change Notification

Enable agent to receive notification messages from OpenAM server for configuration changes.

Property: com.sun.identity.agents.config.change.notification.enable

Enable Notifications

If enabled, the agent receives policy updates from the OpenAM notification mechanism to maintain its internal cache. If disabled, the agent must poll OpenAM for changes.

Property: com.sun.identity.agents.config.notification.enable

Hot swap: no

Agent Notification URL

URL used by agent to register notification listeners.

Property: `com.sun.identity.client.notification.url`

Hot swap: no

Agent Deployment URI Prefix

The default value is *agent-root-URL/amagent*.

Property: `com.sun.identity.agents.config.agenturi.prefix`

Hot swap: no

Configuration Reload Interval

Interval in minutes to fetch agent configuration from OpenAM. Used if notifications are disabled. Default: 60.

Property: `com.sun.identity.agents.config.polling.interval`

Hot swap: no

Configuration Cleanup Interval

Interval in minutes to cleanup old agent configuration entries unless they are referenced by current requests. Default: 30.

Property: `com.sun.identity.agents.config.cleanup.interval`

Hot swap: no

Agent Root URL for CDSSO

The agent root URL for CDSSO. The valid value is in the format *protocol://hostname:port/* where *protocol* represents the protocol used, such as *http* or *https*, *hostname* represents the host name of the system where the agent resides, and *port* represents the port number on which the agent is installed. The slash following the port number is required.

If your agent system also has virtual host names, add URLs with the virtual host names to this list as well. OpenAM checks that goto URLs match one of the agent root URLs for CDSSO.

General properties

SSO Only Mode

When enabled, agent only enforces authentication (SSO), but no policies for authorization.

Property: `com.sun.identity.agents.config.sso.only`

Resources Access Denied URL

The URL of the customized access denied page. If no value is specified (default), then the agent returns an HTTP status of 403 (Forbidden).

Property: `com.sun.identity.agents.config.access.denied.url`

Agent Debug Level

Default is Error. Increase to Message or even All for fine-grained detail.

Property: `com.sun.identity.agents.config.debug.level`

You can set the level in the configuration file by module using the format `module[:level][,module[:level]]*`, where *module* is one of AuthService, NamingService, PolicyService, SessionService, PolicyEngine, ServiceEngine, Notification, PolicyAgent, RemoteLog, or all, and *level* is one of the following.

- 0: Disable logging from specified module

At this level the agent nevertheless logs messages having the level value always.

- 1: Log error messages
- 2: Log warning and error messages
- 3: Log info, warning, and error messages
- 4: Log debug, info, warning, and error messages
- 5: Like level 4, but with even more debugging messages

When you omit *level*, the agent uses the default level, which is the level associated with the all module.

The following example used in the local configuration sets the log overall level to debug for all messages.

```
com.sun.identity.agents.config.debug.level=all:4
```

Agent Debug File Rotation

When enabled, rotate the debug file when specified file size is reached.

Property: `com.sun.identity.agents.config.debug.file.rotate`

Agent Debug File Size

Debug file size in bytes beyond which the log file is rotated. The minimum is 3000 bytes, and lower values are reset to 3000 bytes. Default: 10 MB.

Property: `com.sun.identity.agents.config.debug.file.size`

Audit properties

Audit Access Types

Types of messages to log based on user URL access attempts.

Property: `com.sun.identity.agents.config.audit.accesstype`

Valid values for the configuration file property include `LOG_NONE`, `LOG_ALLOW`, `LOG_DENY`, and `LOG_BOTH`.

Audit Log Location

Specifies where audit messages are logged. By default, audit messages are logged remotely.

Property: `com.sun.identity.agents.config.log.disposition`

Valid values for the configuration file property include `REMOTE`, `LOCAL`, and `ALL`.

Remote Log Filename

Name of file stored on OpenAM server that contains agent audit messages if log location is remote or all.

Property: `com.sun.identity.agents.config.remote.logfile`

Hot swap: no

Remote Audit Log Interval

Periodic interval in minutes in which audit log messages are sent to the remote log file.

Property: `com.sun.identity.agents.config.remote.log.interval`

Default: 5

Hot swap: no

Rotate Local Audit Log

When enabled, audit log files are rotated when reaching the specified size.

Property: `com.sun.identity.agents.config.local.log.rotate`

Local Audit Log Rotation Size

Beyond this size limit in bytes the agent rotates the local audit log file if rotation is enabled.

Property: `com.sun.identity.agents.config.local.log.size`

Default: 50 MB

Fully Qualified Domain Name Checking properties

FQDN Check

Enables checking of FQDN default value and FQDN map values.

Property: `com.sun.identity.agents.config.fqdn.check.enable`

FQDN Default

Fully qualified domain name that the users should use in order to access resources. Without this value, the web server can fail to start, thus you set the property on agent installation, and only change it when absolutely necessary.

This property ensures that when users access protected resources on the web server without specifying the FQDN, the agent can redirect the users to URLs containing the correct FQDN.

Property: `com.sun.identity.agents.config.fqdn.default`

FQDN Virtual Host Map

Enables virtual hosts, partial hostname and IP address to access protected resources. Maps invalid or virtual name keys to valid FQDN values so the agent can properly redirect users and the agents receive cookies belonging to the domain.

To map `myserver` to `myserver.mydomain.example`, enter `myserver` in the Map Key field, and enter `myserver.mydomain.example` in the Corresponding Map Value field. This corresponds to `com.sun.identity.agents.config.fqdn.mapping[myserver]=myserver.mydomain.example`.

Invalid FQDN values can cause the web server to become unusable or render resources inaccessible.

Property: `com.sun.identity.agents.config.fqdn.mapping`

6.5.2. Configuring Web Policy Agent Application Properties

This section covers application web agent properties. After creating the agent profile, you access these properties in the OpenAM console under Access Control > *Realm Name* > Agents > Web > *Agent Name* > Application.

Not Enforced URL Processing properties

Ignore Path Info for Not Enforced URLs

When enabled, the path info and query are stripped from the request URL before being compared with the URLs of the not enforced list for those URLs containing a wildcard character. This prevents a user from accessing `http://host/index.html` by requesting `http://host/`

index.html/hack.gif when the not enforced list includes `http://host/*.gif`.

For a more generally applicable setting, see Ignore Path Info properties.

Property:

`com.sun.identity.agents.config.ignore.path.info.for.not.enforced.list`

Not Enforced URLs

List of URLs for which no authentication is required. You can use wildcards to define a pattern for a URL.

The `*` wildcard matches all characters except question mark (`?`), cannot be escaped, and spans multiple levels in a URL. Multiple forward slashes do not match a single forward slash, so `*` matches `mult/iple/dirs`, yet `mult/*/dirs` does not match `mult/dirs`.

The `-*` wildcard matches all characters except forward slash (`/`) or question mark (`?`), and cannot be escaped. As it does not match `/`, `-*` does not span multiple levels in a URL.

OpenAM does not let you mix `*` and `-*` in the same URL.

Examples include `http://www.example.com/logout.html`, `http://www.example.com/images/*`, `http://www.example.com/css/-*`, and `http://www.example.com/*.jsp?locale=*`.

Trailing forward slashes are not recognized as part of a resource name. Therefore `http://www.example.com/images//` and `http://www.example.com/images` are equivalent.

Property: `com.sun.identity.agents.config.notenforced.url`

Invert Not Enforced URLs

Only enforce not enforced list of URLs. In other words, enforce policy only for those URLs and patterns specified in the list.

Property: `com.sun.identity.agents.config.notenforced.url.invert`

Fetch Attributes for Not Enforced URLs

When enabled, the agent fetches profile attributes for not enforced URLs by doing policy evaluation.

Property:

`com.sun.identity.agents.config.notenforced.url.attributes.enable`

Not Enforced IP Processing properties

Not Enforced Client IP List

No authentication and authorization are required for the requests coming from these client IP addresses.

Property: `com.sun.identity.agents.config.notenforced.ip`

CIDR Client IP Specification (Not yet in OpenAM console)

As of version 3.0.4, web policy agents with this property set to `cidr` can use IPv4 netmasks and IP ranges instead of wildcards as values for Not Enforced Client IP addresses. Version 3.0.5 adds support for IPv6, including the IPv6 loopback address, `::1`.

When the parameter is defined, wildcards are ignored in Not Enforced Client IP settings. Instead, you can use settings such as those shown in the following examples.

Netmask Example

To disable policy agent enforcement for addresses in 192.168.1.1 to 192.168.1.255, use the following setting.

```
com.sun.identity.agents.config.notenforced.ip = 192.168.1.1/24
```

The following example shows a configuration using IPv6.

```
com.sun.identity.agents.config.notenforced.ip = 2001:5c0:9168:0:0:0:0:2/128
```

Currently the policy agent stops evaluating properties after reaching an invalid netmask in the list.

IP Range Example

To disable policy agent enforcement for addresses between 192.168.1.1 to 192.168.4.3 inclusive, use the following setting.

```
com.sun.identity.agents.config.notenforced.ip = 192.168.1.1-192.168.4.3
```

The following example shows a configuration using IPv6.

```
com.sun.identity.agents.config.notenforced.ip = 2001:5c0:9168:0:0:0:0:1-2001:5c0:9168:0:0:0:0:2
```

Property: `com.forgerock.agents.config.notenforced.ip.handler`

Hot swap: no

Client IP Validation

When enabled, validate that the subsequent browser requests come from the same IP address that the SSO token is initially issued against.

Property: `com.sun.identity.agents.config.client.ip.validation.enable`

Profile Attributes Processing properties

Profile Attribute Fetch Mode

When set to `HTTP_COOKIE` or `HTTP_HEADER`, profile attributes are introduced into the cookie or the headers, respectively.

Property:

`com.sun.identity.agents.config.profile.attribute.fetch.mode`

Profile Attribute Map

Maps the profile attributes to HTTP headers for the currently authenticated user. Map Keys are LDAP attribute names, and Map Values are HTTP header names.

To populate the value of profile attribute CN under CUSTOM-Common-Name: enter CN in the Map Key field, and enter CUSTOM-Common-Name in the Corresponding Map Value field. This corresponds to `com.sun.identity.agents.config.profile.attribute.mapping[cn]=CUSTOM-Common-Name`.

In most cases, in a destination application where an HTTP header name shows up as a request header, it is prefixed by HTTP_, lower case letters become upper case, and hyphens (-) become underscores (_). For example, common-name becomes HTTP_COMMON_NAME.

Property: `com.sun.identity.agents.config.profile.attribute.mapping`

Response Attributes Processing properties

Response Attribute Fetch Mode

When set to HTTP_COOKIE or HTTP_HEADER, response attributes are introduced into the cookie or the headers, respectively.

Property:

`com.sun.identity.agents.config.response.attribute.fetch.mode`

Response Attribute Map

Maps the policy response attributes to HTTP headers for the currently authenticated user. The response attribute is the attribute in the policy response to be fetched.

To populate the value of response attribute uid under CUSTOM-User-Name: enter uid in the Map Key field, and enter CUSTOM-User-Name in the Corresponding Map Value field. This corresponds to `com.sun.identity.agents.config.response.attribute.mapping[uid]=Custom-User-Name`.

In most cases, in a destination application where an HTTP header name shows up as a request header, it is prefixed by HTTP_, lower case letters become upper case, and hyphens (-) become underscores (_). For example, response-attr-one becomes HTTP_RESPONSE_ATTR_ONE.

Property: `com.sun.identity.agents.config.response.attribute.mapping`

Session Attributes Processing properties

Session Attribute Fetch Mode

When set to HTTP_COOKIE or HTTP_HEADER, session attributes are introduced into the cookie or the headers, respectively.

Property:

`com.sun.identity.agents.config.session.attribute.fetch.mode`

Session Attribute Map

Maps session attributes to HTTP headers for the currently authenticated user. The session attribute is the attribute in the session to be fetched.

To populate the value of session attribute UserToken under CUSTOM-userid: enter UserToken in the Map Key field, and enter CUSTOM-userid in the Corresponding Map Value field. This corresponds to `com.sun.identity.agents.config.session.attribute.mapping[UserToken]=CUSTOM-userid`.

In most cases, in a destination application where an HTTP header name shows up as a request header, it is prefixed by HTTP_, lower case letters become upper case, and hyphens (-) become underscores (_). For example, success-url becomes HTTP_SUCCESS_URL.

Property: `com.sun.identity.agents.config.session.attribute.mapping`

Common Attributes Fetching Processing properties

Attribute Multi Value Separator

Specifies separator for multiple values. Applies to all types of attributes such as profile, session and response attributes. Default: |.

Property:

`com.sun.identity.agents.config.attribute.multi.value.separator`

6.5.3. Configuring Web Policy Agent SSO Properties

This section covers SSO web agent properties. After creating the agent profile, you access these properties in the OpenAM console under Access Control > *Realm Name* > Agents > Web > *Agent Name* > SSO

Cookie properties

Cookie Name

Name of the SSO Token cookie used between the OpenAM server and the agent. Default: iPlanetDirectoryPro.

Property: `com.sun.identity.agents.config.cookie.name`

Hot swap: no

Cookie Security

When enabled, the agent marks cookies secure, sending them only if the communication channel is secure.

Property: `com.sun.identity.agents.config.cookie.secure`

Hot swap: no

HTTPOnly Cookies (Not yet in OpenAM console)

As of version 3.0.5, web policy agents with this property set to true mark cookies as HTTPOnly, to prevent scripts and third-party programs from accessing the cookies.

Property: `com.sun.identity.cookie.httponly`

Cross Domain SSO properties

Cross Domain SSO

Enables Cross Domain Single Sign On.

Property: `com.sun.identity.agents.config.cdsso.enable`

CDSSO Servlet URL

List of URLs of the available CDSSO controllers that the agent can use for CDSSO processing. For example, `http://openam.example.com:8080/openam/cdcservlet`.

Property: `com.sun.identity.agents.config.cdsso.cdcservlet.url`

Cookies Domain List

List of domains, such as `.example.com`, in which cookies have to be set in CDSSO. If this property is left blank, then the fully qualified domain name of the cookie for the agent server is used to set the cookie domain, meaning that a host cookie rather than a domain cookie is set.

To set the list to `.example.com`, and `.example.net` using the configuration file property, include the following.

```
com.sun.identity.agents.config.cdsso.cookie.domain[0]=.example.com
com.sun.identity.agents.config.cdsso.cookie.domain[1]=.example.net
```

Property: `com.sun.identity.agents.config.cdsso.cookie.domain`

Cookie Reset properties

Cookie Reset

When enabled, agent resets cookies in the response before redirecting to authentication.

Property: `com.sun.identity.agents.config.cookie.reset.enable`

Cookie Reset Name List

List of cookies in the format `name[=value][;Domain=value]`.

Concrete examples include the following with two list items configured.

- `LtpaToken,` corresponding to `com.sun.identity.agents.config.cookie.reset[0]=LtpaToken.` The default domain is taken from FQDN Default.
- `token=value;Domain=subdomain.domain.com,` corresponding to `com.sun.identity.agents.config.cookie.reset[1]=token=value;Domain=subdomain.domain.com`

Property: `com.sun.identity.agents.config.cookie.reset`

6.5.4. Configuring Web Policy Agent OpenAM Services Properties

This section covers OpenAM services web agent properties. After creating the agent profile, you access these properties in the OpenAM console under Access Control > *Realm Name* > Agents > Web > *Agent Name* > OpenAM Services.

Login URL properties

OpenAM Login URL

OpenAM login page URL, such as `http://openam.example.com:8080/openam/UI/Login`, to which the agent redirects incoming users without sufficient credentials so then can authenticate.

Property: `com.sun.identity.agents.config.login.url`

OpenAM Conditional Login URL (Not yet in OpenAM console)

To conditionally redirect users based on the incoming request URL, set this property.

This takes the incoming request URL to match, a vertical bar (`|`), and then a comma-separated list of URLs to which to redirect incoming users.

If the string before the vertical bar matches an incoming request URL, then the policy agent uses the list of URLs to determine how to redirect the user-agent. If the global property FQDN Check (`com.sun.identity.agents.config.fqdn.check.enable`) is enabled for the policy agent, then the policy agent iterates through the list until it finds an appropriate redirect URL that matches the FQDN check. Otherwise, the policy agent redirects the user-agent to the first URL in the list.

Configuring Web
Policy Agent OpenAM
Services Properties

Property: `com.forgerock.agents.conditional.login.url`

Examples: `com.forgerock.agents.conditional.login.url[0]=`
`login.example.com/|http://openam1.example.com/openam/UI/Login,`
`http://openam2.example.com/openam/UI/Login,`
`com.forgerock.agents.conditional.login.url[1]= login.example.com|`
`http://openam3.example.com/openam/UI/Login, http://`
`openam4.example.com/openam/UI/Login`

Agent Connection Timeout

Timeout period in seconds for an agent connection with OpenAM auth server.

Property: `com.sun.identity.agents.config.auth.connection.timeout`

Default: 2

Polling Period for Primary Server

Interval in minutes, agent polls to check the primary server is up and running. Default: 5.

Property: `com.sun.identity.agents.config.poll.primary.server`

Hot swap: no

Logout URL properties

OpenAM Logout URL

OpenAM logout page URL, such as `http://openam.example.com:8080/openam/UI/Logout`.

Property: `com.sun.identity.agents.config.logout.url`

Agent Logout URL properties

Logout URL List

List of application logout URLs, such as `http://www.example.com/logout.html`. The user is logged out of the OpenAM session when these URLs are accessed. When using this property, specify a value for the Logout Redirect URL property.

Property: `com.sun.identity.agents.config.agent.logout.url`

Logout Cookies List for Reset

Cookies to be reset upon logout in the same format as the cookie reset list.

Property: `com.sun.identity.agents.config.logout.cookie.reset`

Logout Redirect URL

User gets redirected to this URL after logout. Specify this property alongside a Logout URL List.

Property: `com.sun.identity.agents.config.logout.redirect.url`

Policy Client Service properties

Policy Cache Polling Period

Polling interval in minutes during which an entry remains valid after being added to the agent's cache.

Property:

`com.sun.identity.agents.config.policy.cache.polling.interval`

Hot swap: no

SSO Cache Polling Period

Polling interval in minutes during which an SSO entry remains valid after being added to the agent's cache.

Property: `com.sun.identity.agents.config.sso.cache.polling.interval`

Hot swap: no

User ID Parameter

Agent sets this value for User Id passed in the session from OpenAM to the REMOTE_USER server variable. Default: UserToken.

Property: `com.sun.identity.agents.config.userid.param`

User ID Parameter Type

User ID can be fetched from either SESSION and LDAP attributes. Default: SESSION.

Property: `com.sun.identity.agents.config.userid.param.type`

Fetch Policies from Root Resource

When enabled, the agent caches the policy decision of the resource and all resources from the root of the resource down. For example, if the resource is `http://host/a/b/c`, then the root of the resource is `http://host/`. This setting can be useful when a client is expect to access multiple resources on the same path. Yet, caching can be expensive if very many policies are defined for the root resource.

Property: `com.sun.identity.agents.config.fetch.from.root.resource`

Hot swap: no

Retrieve Client Hostname

When enabled, get the client hostname through DNS reverse lookup for use in policy evaluation. This setting can impact performance.

Property: `com.sun.identity.agents.config.get.client.host.name`

Policy Clock Skew

Time in seconds used adjust time difference between agent system and OpenAM. Clock skew in seconds = `AgentTime - OpenAMServerTime`.

Use this property to adjust for small time differences encountered despite use of a time synchronization service. When this property is not set and agent time is greater than OpenAM server time, the agent can make policy calls to the OpenAM server before the policy subject cache has expired, or you can see infinite redirection occur.

Property: `com.sun.identity.agents.config.policy.clock.skew`

Hot swap: no

6.5.5. Configuring Web Policy Agent Miscellaneous Properties

This section covers miscellaneous web agent properties. After creating the agent profile, you access these properties in the OpenAM console under Access Control > *Realm Name* > Agents > Web > *Agent Name* > Miscellaneous.

Advice Handling properties

Composite Advice Handling (Not yet in OpenAM console)

As of version 3.0.4, when set to true, the agent sends composite advice in the query (GET request) instead of sending it through a POST request.

Property: `com.sun.am.use_redirect_for_advice`

Locale properties

Agent Locale

The default locale for the agent.

Property: `com.sun.identity.agents.config.locale`

Hot swap: no

Anonymous user properties

Anonymous User

Enable or disable `REMOTE_USER` processing for anonymous users.

Property: `com.sun.identity.agents.config.anonymous.user.enable`

Cookie Processing properties

Encode special chars in Cookies

When enabled, encode special chars in cookie by URL encoding. This is useful when profile, session, and response attributes contain special characters, and the attributes fetch mode is set to HTTP_COOKIE.

Property:

`com.sun.identity.agents.config.encode.cookie.special.chars.enable`

Profile Attributes Cookie Prefix

Sets cookie prefix in the attributes headers. Default: HTTP_.

Property:

`com.sun.identity.agents.config.profile.attribute.cookie.prefix`

Profile Attributes Cookie Maxage

Maximum age in seconds of custom cookie headers. Default: 300.

Property:

`com.sun.identity.agents.config.profile.attribute.cookie.maxage`

URL Handling properties

URL Comparison Case Sensitivity Check

When enabled, enforce case sensitivity in both policy and not enforced URL evaluation.

Property: `com.sun.identity.agents.config.url.comparison.case.ignore`

Encode URL's Special Characters

When enabled, encodes the URL which has special characters before doing policy evaluation.

Property:

`com.sun.identity.agents.config.encode.url.special.chars.enable`

Ignore Naming URL properties

Ignore Preferred Naming URL in Naming Request

When enabled, do not send a preferred naming URL in the naming request.

Property: `com.sun.identity.agents.config.ignore.preferred.naming.url`

Ignore Server Check properties

Ignore Server Check

When enabled, do not check whether OpenAM is up before doing a 302 redirect.

Property: `com.sun.identity.agents.config.ignore.server.check`

Ignore Path Info properties

Ignore Path Info in Request URL

When enabled, strip path info from the request URL while doing the Not Enforced List check, and URL policy evaluation. This is designed to prevent a user from accessing a URI by appending the matching pattern in the policy or not enforced list.

For example, if the not enforced list includes `http://host/*.gif`, then stripping path info from the request URI prevents access to `http://host/index.html` by using `http://host/index.html?hack.gif`.

However, when a web server is configured as a reverse proxy for a J2EE application server, the path info is interpreted to map a resource on the proxy server rather than the application server. This prevents the not enforced list or the policy from being applied to the part of the URI below the application server path if a wildcard character is used.

For example, if the not enforced list includes `http://host/webapp/servlet/*` and the request URL is `http://host/webapp/servlet/example.jsp`, the path info is `/servlet/example.jsp` and the resulting request URL with path info stripped is `http://host/webapp/`, which does not match the not enforced list. Thus when this property is enabled, path info is not stripped from the request URL even if there is a wildcard in the not enforced list or policy.

Make sure therefore when this property is enabled that there is nothing following the wildcard in the not enforced list or policy.

Property: `com.sun.identity.agents.config.ignore.path.info`

Multi-byte Enable properties

Native Encoding of Profile Attributes

When enabled, the agent encodes the LDAP header values in the default encoding of operating system locale. When disabled, the agent uses UTF-8.

Property: `com.sun.identity.agents.config.convert.mbyte.enable`

Goto Parameter Name properties

Goto Parameter Name

Property used only when CDSSO is enabled. Only change the default value, goto when the login URL has a landing page specified such as, `com.sun.identity.agents.config.cdsso.cdcervlet.url`
= `http://openam.example.com:8080/openam/cdcervlet?goto=` `http://`

`www.example.com/landing.jsp`. The agent uses this parameter to append the original request URL to this `cdcservlet` URL. The landing page consumes this parameter to redirect to the original URL.

As an example, if you set this value to `goto2`, then the complete URL sent for authentication is `http://openam.example.com:8080/openam/cdcservlet?goto=http://www.example.com/landing.jsp?goto2=http://www.example.com/original.jsp`.

Property: `com.sun.identity.agents.config.redirect.param`

Deprecated Agent properties

Anonymous User Default Value

User ID of unauthenticated users. Default: `anonymous`.

Property: `com.sun.identity.agents.config.anonymous.user.id`

6.5.6. Configuring Web Policy Agent Advanced Properties

This section covers advanced web agent properties. After creating the agent profile, you access these properties in the OpenAM console under Access Control > *Realm Name* > Agents > Web > *Agent Name* > Advanced.

Client Identification properties

If the agent is behind a proxy or load balancer, then the agent can get client IP and host name values from the proxy or load balancer. For proxies and load balancer that support providing the client IP and host name in HTTP headers, you can use the following properties.

When multiple proxies are load balancers sit in the request path, the header values can include a comma-separated list of values with the first value representing the client, as in `client,next-proxy,first-proxy`.

Client IP Address Header

HTTP header name that holds the IP address of the client.

Property: `com.sun.identity.agents.config.client.ip.header`

Client Hostname Header

HTTP header name that holds the hostname of the client.

Property: `com.sun.identity.agents.config.client.hostname.header`

Load Balancer properties

Load Balancer Setup

Enable if a load balancer is used for OpenAM services.

Property: `com.sun.identity.agents.config.load.balancer.enable`

Hot swap: no

Override Request URL Protocol

Enable if the agent is sitting behind a SSL/TLS off-loader, load balancer, or proxy such that the protocol users use is different from the protocol the agent uses. When enabled, the protocol is overridden with the value from the Agent Deployment URI Prefix (property: `com.sun.identity.agents.config.agenturi.prefix`).

Property: `com.sun.identity.agents.config.override.protocol`

Override Request URL Host

Enable if the agent is sitting behind a SSL/TLS off-loader, load balancer, or proxy such that the host name users use is different from the host name the agent uses. When enabled, the host is overridden with the value from the Agent Deployment URI Prefix (property: `com.sun.identity.agents.config.agenturi.prefix`).

Property: `com.sun.identity.agents.config.override.host`

Override Request URL Port

Enable if the agent is sitting behind a SSL/TLS off-loader, load balancer, or proxy such that the port users use is different from the port the agent uses. When enabled, the port is overridden with the value from the Agent Deployment URI Prefix (property: `com.sun.identity.agents.config.agenturi.prefix`).

Property: `com.sun.identity.agents.config.override.port`

Override Notification URL

Enable if the agent is sitting behind a SSL/TLS off-loader, load balancer, or proxy such that the URL users use is different from the URL the agent uses. When enabled, the URL is overridden with the value from the Agent Deployment URI Prefix (property: `com.sun.identity.agents.config.agenturi.prefix`).

Property: `com.sun.identity.agents.config.override.notification.url`

Post Data Preservation properties

POST Data Preservation

Enables HTTP POST data preservation. This feature is available in the Apache 2.2, Microsoft IIS 6, Microsoft IIS 7, and Sun Java System Web Server web policy agents as of version 3.0.3.

Property: `com.sun.identity.agents.config.postdata.preserve.enable`

POST Data Entries Cache Period

POST cache entry lifetime in minutes. Default: 10.

Property: `com.sun.identity.agents.config.postcache.entry.lifetime`

POST Data Preservation Cookie Name (Not yet in OpenAM Console)

When HTTP POST data preservation is enabled, override properties are set to true, and the agent is behind a load balancer, then this property sets the name and value of the sticky cookie to use.

Property: `com.sun.identity.agents.config.postdata.preserve.lbcookie`

Sun Java System Proxy Server properties

Override Proxy Server's Host and Port

When enabled ignore the host and port settings.

Property: `com.sun.identity.agents.config.proxy.override.host.port`

Hot swap: no

Microsoft IIS Server properties

Authentication Type

The agent should normally perform authentication, so this is not required. If necessary, set to none.

Property: `com.sun.identity.agents.config.iis.auth.type`

Hot swap: no

Replay Password Key

DES key for decrypting the basic authentication password in the session.

Property: `com.sun.identity.agents.config.replaypasswd.key`

Filter Priority

The loading priority of filter, DEFAULT, HIGH, LOW, or MEDIUM.

Property: `com.sun.identity.agents.config.iis.filter.priority`

Filter configured with OWA

Enable if the IIS agent filter is configured for OWA.

Property: `com.sun.identity.agents.config.iis.owa.enable`

Change URL Protocol to https

Enable to avoid IE6 security pop-ups.

Property:

`com.sun.identity.agents.config.iis.owa.enable.change.protocol`

Idle Session Timeout Page URL

URL of the local idle session timeout page.

Property:

`com.sun.identity.agents.config.iis.owa.enable.session.timeout.url`

IBM Lotus Domino Server properties

Check User in Domino Database

When enabled, the agent checks whether the user exists in the Domino name database.

Property: `com.sun.identity.agents.config.domino.check.name.database`

Use LTPA token

Enable if the agent needs to use LTPA Token.

Property: `com.sun.identity.agents.config.domino.ltpa.enable`

LTPA Token Cookie Name

The name of the cookie that contains the LTPA token.

Property: `com.sun.identity.agents.config.domino.ltpa.cookie.name`

LTPA Token Configuration Name

The configuration name that the agent uses in order to employ the LTPA token mechanism.

Property: `com.sun.identity.agents.config.domino.ltpa.config.name`

LTPA Token Organization Name

The organization name to which the LTPA token belongs.

Property: `com.sun.identity.agents.config.domino.ltpa.org.name`

Custom properties

Custom Properties

Additional properties to augment the set of properties supported by agent. Such properties take the following forms.

- `customproperty=custom-value1`
- `customlist[0]=customlist-value-0`
- `customlist[1]=customlist-value-1`

- custommap[key1]=custommap-value-1
- custommap[key2]=custommap-value-2

Property: com.sun.identity.agents.config.freeformproperties

6.6. Configuring J2EE Policy Agents

When you create a J2EE policy agent profile and install the agent, you can choose to store the agent configuration centrally and configure the agent through OpenAM console. Alternatively, you can choose to store the agent configuration locally and configure the agent by changing values in the properties file. This section covers centralized configuration, indicating the corresponding properties for use in a local configuration file where applicable.²

Tip

To show the agent properties in configuration file format that correspond to what you see in the console, click Export Configuration after editing agent properties.

After changing properties specified as "Hot swap: no" you must restart the agent.

6.6.1. Configuring J2EE Policy Agent Global Properties

This section covers global web agent properties. After creating the agent profile, you access these properties in the OpenAM console under Access Control > *Realm Name* > Agents > J2EE > *Agent Name* > Global.

Profile properties

Group

For assigning the agent to a previously configured web agent group in order to inherit selected properties from the group.

Password

Agent password used when creating the password file and when installing the agent.

Status

Status of the agent configuration.

²The configuration file syntax is that of a standard Java properties file, though backslash escapes can be used only to wrap long lines. See `java.util.Properties.load` for a description of the format. The value of a property specified multiple times is not defined.

Agent Notification URL

URL used by agent to register notification listeners.

Property: `com.sun.identity.client.notification.url`

Hot swap: no

Location of Agent Configuration Repository

Indicates agent's configuration located either on agent's host or centrally on OpenAM server.

Configuration Reload Interval

Interval in seconds to fetch agent configuration from OpenAM. Used if notifications are disabled. Default: 0

Property: `com.sun.identity.agents.config.load.interval`

Agent Configuration Change Notification

Enable agent to receive notification messages from OpenAM server for configuration changes.

Property: `com.sun.identity.agents.config.change.notification.enable`

Agent Root URL for CDSSO

The agent root URL for CDSSO. The valid value is in the format *protocol://hostname:port/* where *protocol* represents the protocol used, such as *http* or *https*, *hostname* represents the host name of the system where the agent resides, and *port* represents the port number on which the agent is installed. The slash following the port number is required.

If your agent system also has virtual host names, add URLs with the virtual host names to this list as well. OpenAM checks that goto URLs match one of the agent root URLs for CDSSO.

General properties

Agent Filter Mode

Specifies how the agent filters requests to protected web applications. The global value functions as a default, and applies for protected applications that do not have their own filter settings. Valid settings include the following.

ALL

Enforce both the J2EE policy defined for the web container where the protected application runs, and also OpenAM policies.

When setting the filter mode to ALL, set the Map Key, but do not set any Corresponding Map Value.

J2EE_POLICY

Enforce only the J2EE policy defined for the web container where the protected application runs.

NONE

Do not enforce policies to protect resources. In other words, turn off access management. Not for use in production.

SSO_ONLY

Enforce only authentication, not policies.

URL_POLICY

Enforce only OpenAM, URL resource based policies.

When setting the filter mode to `URL_POLICY`, set the Map Key to the application name and the Corresponding Map Value to `URL_POLICY`.

Property: `com.sun.identity.agents.config.filter.mode`

Hot swap: no

HTTP Session Binding

When enabled the agent invalidates the HTTP session upon login failure, when the user has no SSO session, or when the principal user name does not match the SSO user name.

Property: `com.sun.identity.agents.config.httpsession.binding`

Login Attempt Limit

When set to a value other than zero, this defines the maximum number of failed login attempts allowed during a single browser session, after which the agent blocks requests from the user.

Property: `com.sun.identity.agents.config.login.attempt.limit`

Custom Response Header

Specifies the custom headers the agent sets for the client. The key is the header name. The value is the header value.

Property: `com.sun.identity.agents.config.response.header`

For example, `com.sun.identity.agents.config.response.header[Cache-Control]=no-cache`.

Redirect Attempt Limit

When set to a value other than zero, this defines the maximum number of redirects allowed for a single browser session, after which the agent blocks the request.

Property: `com.sun.identity.agents.config.redirect.attempt.limit`

Agent Debug Level

Default is Error. Increase to Message or even All for fine-grained detail.

Property: `com.iplanet.services.debug.level`

User Mapping properties

User Mapping Mode

Specifies the mechanism used to determine the user ID.

Property: `com.sun.identity.agents.config.user.mapping.mode`

User Attribute Name

Specifies the data store attribute that contains the user ID.

Property: `com.sun.identity.agents.config.user.attribute.name`

User Principal Flag

When enabled, OpenAM uses both the principal user name and also the user ID for authentication.

Property: `com.sun.identity.agents.config.user.principal`

User Token Name

Specifies the session property name for the authenticated user's ID.
Default: `UserToken`.

Property: `com.sun.identity.agents.config.user.token`

Audit properties

Audit Access Types

Types of messages to log based on user URL access attempts.

Property: `com.sun.identity.agents.config.audit.accesstype`

Valid values for the configuration file property include `LOG_NONE`, `LOG_ALLOW`, `LOG_DENY`, and `LOG_BOTH`.

Audit Log Location

Specifies where audit messages are logged. By default, audit messages are logged remotely.

Property: `com.sun.identity.agents.config.log.disposition`

Valid values for the configuration file property include `REMOTE`, `LOCAL`, and `ALL`.

Remote Log Filename

Name of file stored on OpenAM server that contains agent audit messages if log location is remote or all.

Property: `com.sun.identity.agents.config.remote.logfile`

Hot swap: no

Rotate Local Audit Log

When enabled, audit log files are rotated when reaching the specified size.

Property: `com.sun.identity.agents.config.local.log.rotate`

Local Audit Log Rotation Size

Beyond this size limit in bytes the agent rotates the local audit log file if rotation is enabled.

Property: `com.sun.identity.agents.config.local.log.size`

Default: 50 MB

Fully Qualified Domain Name Checking properties

FQDN Check

Enables checking of FQDN default value and FQDN map values.

Property: `com.sun.identity.agents.config.fqdn.check.enable`

FQDN Default

Fully qualified domain name that the users should use in order to access resources.

This property ensures that when users access protected resources on the web server without specifying the FQDN, the agent can redirect the users to URLs containing the correct FQDN.

Property: `com.sun.identity.agents.config.fqdn.default`

FQDN Virtual Host Map

Enables virtual hosts, partial hostname and IP address to access protected resources. Maps invalid or virtual name keys to valid FQDN values so the agent can properly redirect users and the agents receive cookies belonging to the domain.

To map `myserver` to `myserver.mydomain.example`, enter `myserver` in the Map Key field, and enter `myserver.mydomain.example` in the Corresponding Map Value field. This corresponds to `com.sun.identity.agents.config.fqdn.mapping[myserver]=myserver.mydomain.example`.

Property: `com.sun.identity.agents.config.fqdn.mapping`

6.6.2. Configuring J2EE Policy Agent Application Properties

This section covers application web agent properties. After creating the agent profile, you access these properties in the OpenAM console under Access Control > *Realm Name* > Agents > J2EE > *Agent Name* > Application.

Login Processing properties

Login Form URI

Specifies the list of absolute URIs corresponding to a protected application's `web.xml` `form-login-page` element, such as `/myApp/jsp/login.jsp`.

Property: `com.sun.identity.agents.config.login.form`

Login Error URI

Specifies the list of absolute URIs corresponding to a protected application's `web.xml` `form-error-page` element, such as `/myApp/jsp/error.jsp`.

Property: `com.sun.identity.agents.config.login.error.uri`

Use Internal Login

When enabled, the agent uses the internal default content file for the login.

Property: `com.sun.identity.agents.config.login.use.internal`

Login Content File Name

Full path name to the file containing custom login content when Use Internal Login is enabled.

Property: `com.sun.identity.agents.config.login.content.file`

Logout Processing properties

Application Logout Handler

Specifies how logout handlers map to specific applications. The key is the web application name. The value is the logout handler class.

To set a global logout handler for applications without other logout handlers defined, leave the key empty and set the value to the global logout handler class name, `GlobalApplicationLogoutHandler`.

To set a logout handler for a specific application, set the key to the name of the application, and the value to the logout handler class name.

Property: `com.sun.identity.agents.config.logout.application.handler`

Application Logout URI

Specifies request URIs that indicate logout events. The key is the web application name. The value is the application logout URI.

To set a global logout URI for applications without other logout URIs defined, leave the key empty and set the value to the global logout URI, `/logout.jsp`.

To set a logout URI for a specific application, set the key to the name of the application, and the value to the application logout page.

Property: `com.sun.identity.agents.config.logout.uri`

Logout Request Parameter

Specifies parameters in the HTTP request that indicate logout events. The key is the web application name. The value is the logout request parameter.

To set a global logout request parameter for applications without other logout request parameters defined, leave the key empty and set the value to the global logout request parameter, `logoutparam`.

To set a logout request parameter for a specific application, set the key to the name of the application, and the value to the application logout request parameter, such as `logoutparam`.

Property: `com.sun.identity.agents.config.logout.request.param`

Logout Introspect Enabled

When enabled, the agent checks the HTTP request body to locate the Logout Request Parameter you set.

Property: `com.sun.identity.agents.config.logout.introspect.enabled`

Logout Entry URI

Specifies the URIs to return after successful logout and subsequent authentication. The key is the web application name. The value is the URI to return.

To set a global logout entry URI for applications without other logout entry URIs defined, leave the key empty and set the value to the global logout entry URI, `/welcome.html`.

To set a logout entry URI for a specific application, set the key to the name of the application, and the value to the application logout entry URI, such as `/myApp/welcome.html`.

Property: `com.sun.identity.agents.config.logout.entry.uri`

Access Denied URI Processing properties

Resource Access Denied URI

Specifies the URIs of custom pages to return when access is denied. The key is the web application name. The value is the custom URI.

To set a global custom access denied URI for applications without other custom access denied URIs defined, leave the key empty and set the value to the global custom access denied URI, `/sample/accessdenied.html`.

To set a custom access denied URI for a specific application, set the key to the name of the application, and the value to the application access denied URI, such as `/myApp/accessdenied.html`.

Property: `com.sun.identity.agents.config.access.denied.uri`

Not Enforced URI Processing properties

Not Enforced URIs

List of URIs for which no authentication is required, and the agent does not protect access. You can use wildcards to define a pattern for a URI.

The `*` wildcard matches all characters except question mark (`?`), cannot be escaped, and spans multiple levels in a URI. Multiple forward slashes do not match a single forward slash, so `*` matches `mult/iple/dirs`, yet `mult/*/dirs` does not match `mult/dirs`.

The `-*` wildcard matches all characters except forward slash (`/`) or question mark (`?`), and cannot be escaped. As it does not match `/`, `-*` does not span multiple levels in a URI.

OpenAM does not let you mix `*` and `-*` in the same URI.

Examples include `/logout.html`, `/images/*`, `/css/-*`, and `/*.jsp?locale=*`.

Trailing forward slashes are not recognized as part of a resource name. Therefore `/images//` and `/images` are equivalent.

Property: `com.sun.identity.agents.config.notenforced.uri`

Invert Not Enforced URIs

Only enforce not enforced list of URIs. In other words, enforce policy only for those URIs and patterns specified in the list.

Property: `com.sun.identity.agents.config.notenforced.uri.invert`

Not Enforced URIs Cache Enabled

When enabled, the agent caches evaluation of the not enforced URI list.

Property:

`com.sun.identity.agents.config.notenforced.uri.cache.enable`

Not Enforced URIs Cache Size

When caching is enabled, this limits the number of not enforced URIs cached.

Property: `com.sun.identity.agents.config.notenforced.uri.cache.size`

Default: 1000

Refresh Session Idle Time

When enabled, the agent reset the session idle time when granting access to a not enforced URI, prolonging the time before the user must authenticate again.

Property:

`com.sun.identity.agents.config.notenforced.refresh.session.idletime`

Not Enforced IP Processing properties

Not Enforced Client IP List

No authentication and authorization are required for the requests coming from these client IP addresses.

Property: `com.sun.identity.agents.config.notenforced.ip`

Not Enforced IP Invert List

Only enforce the not enforced list of IP addresses. In other words, enforce policy only for those client addresses and patterns specified in the list.

Property: `com.sun.identity.agents.config.notenforced.ip.invert`

Not Enforced IP Cache Flag

When enabled, the agent caches evaluation of the not enforced IP list.

Property: `com.sun.identity.agents.config.notenforced.ip.cache.enable`

Not Enforced IP Cache Size

When caching is enabled, this limits the number of not enforced addresses cached.

Property: `com.sun.identity.agents.config.notenforced.ip.cache.size`

Default: 1000

Profile Attributes Processing properties

Profile Attribute Fetch Mode

When set to HTTP_COOKIE or HTTP_HEADER, profile attributes are introduced into the cookie or the headers, respectively. When set to REQUEST_ATTRIBUTE, profile attributes are part of the HTTP request.

Property:

`com.sun.identity.agents.config.profile.attribute.fetch.mode`

Profile Attribute Map

Maps the profile attributes to HTTP headers for the currently authenticated user. Map Keys are LDAP attribute names, and Map Values are HTTP header names.

To populate the value of profile attribute CN under CUSTOM-Common-Name: enter CN in the Map Key field, and enter CUSTOM-Common-Name in the Corresponding Map Value field. This corresponds to `com.sun.identity.agents.config.profile.attribute.mapping[cn]=CUSTOM-Common-Name`.

In most cases, in a destination application where an HTTP header name shows up as a request header, it is prefixed by HTTP_, lower case letters become upper case, and hyphens (-) become underscores (_). For example, common-name becomes HTTP_COMMON_NAME.

Property: `com.sun.identity.agents.config.profile.attribute.mapping`

Response Attributes Processing properties

Response Attribute Fetch Mode

When set to HTTP_COOKIE or HTTP_HEADER, response attributes are introduced into the cookie or the headers, respectively. When set to REQUEST_ATTRIBUTE, response attributes are part of the HTTP response.

Property:

`com.sun.identity.agents.config.response.attribute.fetch.mode`

Response Attribute Map

Maps the policy response attributes to HTTP headers for the currently authenticated user. The response attribute is the attribute in the policy response to be fetched.

To populate the value of response attribute uid under CUSTOM-User-Name: enter uid in the Map Key field, and enter CUSTOM-User-Name in the Corresponding Map Value field. This corresponds to `com.sun.identity.agents.config.response.attribute.mapping[uid]=Custom-User-Name`.

In most cases, in a destination application where an HTTP header name shows up as a request header, it is prefixed by HTTP_, lower case letters become upper case, and hyphens (-) become underscores (_). For example, response-attr-one becomes HTTP_RESPONSE_ATTR_ONE.

Property: `com.sun.identity.agents.config.response.attribute.mapping`

Common Attributes Fetching Processing properties

Cookie Separator Character

Specifies the separator for multiple values of the same attribute when it is set as a cookie. Default: |.

Property: `com.sun.identity.agents.config.attribute.cookie.separator`

Fetch Attribute Date Format

Specifies the `java.text.SimpleDateFormat` of date attribute values used when an attribute is set in an HTTP header. Default: `EEE, d MMM yyyy hh:mm:ss z`.

Property: `com.sun.identity.agents.config.attribute.date.format`

Attribute Cookie Encode

When enabled, attribute values are URL encoded before being set as a cookie.

Property: `com.sun.identity.agents.config.attribute.cookie.encode`

Session Attributes Processing properties

Session Attribute Fetch Mode

When set to `HTTP_COOKIE` or `HTTP_HEADER`, session attributes are introduced into the cookie or the headers, respectively. When set to `REQUEST_ATTRIBUTE`, session attributes are part of the HTTP response.

Property:
`com.sun.identity.agents.config.session.attribute.fetch.mode`

Session Attribute Map

Maps session attributes to HTTP headers for the currently authenticated user. The session attribute is the attribute in the session to be fetched.

To populate the value of session attribute `UserToken` under `CUSTOM-userid`: enter `UserToken` in the Map Key field, and enter `CUSTOM-userid` in the Corresponding Map Value field. This corresponds to `com.sun.identity.agents.config.session.attribute.mapping[UserToken]=CUSTOM-userid`.

In most cases, in a destination application where an HTTP header name shows up as a request header, it is prefixed by HTTP_, lower case letters become upper case, and hyphens (-) become underscores (_). For example, success-url becomes HTTP_SUCCESS_URL.

Property: `com.sun.identity.agents.config.session.attribute.mapping`

Privilege Attributes Processing properties

Default Privileged Attribute

Specifies the list of privileged attributes granted to all users with a valid OpenAM session, such as AUTHENTICATED_USERS.

Property:

`com.sun.identity.agents.config.default.privileged.attribute`

Privileged Attribute Type

Specifies the list of privileged attribute types fetched for each user.

Property: `com.sun.identity.agents.config.privileged.attribute.type`

Privileged Attributes To Lower Case

Specifies how privileged attribute types should be converted to lower case.

Property:

`com.sun.identity.agents.config.privileged.attribute.tolowercase`

Privileged Session Attribute

Specifies the list of session property names, such as UserToken which hold privileged attributes for authenticated users.

Property:

`com.sun.identity.agents.config.privileged.session.attribute`

Enable Privileged Attribute Mapping

When enabled, lets you use Privileged Attribute Mapping.

Property:

`com.sun.identity.agents.config.privileged.attribute.mapping.enable`

Privileged Attribute Mapping

OpenAM allows original attribute values to be mapped to other values. For example, you can map UUIDs to principal names in roles specified in a web application's deployment descriptor. For example, to map the UUID `id=employee,ou=group,o=openam` to the principal name `am_employee_role` in the deployment descriptor, set the key to `id=employee,ou=group,o=openam`, and the value to `am_employee_role`.

Property:

`com.sun.identity.agents.config.privileged.attribute.mapping`

Custom Authentication Processing properties

Custom Authentication Handler

Specifies custom authentication handler classes for users authenticated with the application server. The key is the web application name and the value is the authentication handler class name.

Property: `com.sun.identity.agents.config.auth.handler`

Custom Logout Handler

Specifies custom logout handler classes to log users out of the application server. The key is the web application name and the value is the logout handler class name.

Property: `com.sun.identity.agents.config.logout.handler`

Custom Verification Handler

Specifies custom verification classes to validate user credentials with the local user repository. The key is the web application name and the value is the validation handler class name.

Property: `com.sun.identity.agents.config.verification.handler`

6.6.3. Configuring J2EE Policy Agent SSO Properties

This section covers SSO web agent properties. After creating the agent profile, you access these properties in the OpenAM console under Access Control > *Realm Name* > Agents > J2EE > *Agent Name* > SSO

Cookie properties

Cookie Name

Name of the SSO Token cookie used between the OpenAM server and the agent. Default: `iPlanetDirectoryPro`.

Property: `com.iplanet.am.cookie.name`

Hot swap: no

Caching properties

SSO Cache Enable

When enabled, the agent exposes SSO Cache through the agent SDK APIs.

Property: `com.sun.identity.agents.config.amsso.cache.enable`

Cross Domain SSO properties

Cross Domain SSO

Enables Cross Domain Single Sign On.

Property: `com.sun.identity.agents.config.cdsso.enable`

CDSSO Redirect URI

Specifies a URI the agent uses to process CDSSO requests.

Property: `com.sun.identity.agents.config.cdsso.redirect.uri`

CDSSO Servlet URL

List of URLs of the available CDSSO controllers that the agent can use for CDSSO processing. For example, `http://openam.example.com:8080/openam/cdcservlet`.

Property: `com.sun.identity.agents.config.cdsso.cdcservlet.url`

CDSSO Clock Skew

When set to a value other than zero, specifies the clock skew in seconds that the agent accepts when determining the validity of the CDSSO authentication response assertion.

Property: `com.sun.identity.agents.config.cdsso.clock.skew`

CDSSO Trusted ID Provider

Specifies the list of OpenAM servers or identity providers the agent trusts when evaluating CDC Liberty Responses.

Property: `com.sun.identity.agents.config.cdsso.trusted.id.provider`

CDSSO Secure Enable

When enabled, the agent marks the SSO Token cookie as secure, thus the cookie is only transmitted over secure connections.

Property: `com.sun.identity.agents.config.cdsso.secure.enable`

CDSSO Domain List

List of domains, such as `.example.com`, in which cookies have to be set in CDSSO.

Property: `com.sun.identity.agents.config.cdsso.domain`

Cookie Reset properties

Cookie Reset

When enabled, agent resets cookies in the response before redirecting to authentication.

Property: `com.sun.identity.agents.config.cookie.reset.enable`

Cookie Reset Name List

List of cookies to reset if Cookie Reset is enabled.

Property: `com.sun.identity.agents.config.cookie.reset.name`

Cookie Reset Domain Map

Specifies how names from the Cookie Reset Name List correspond to cookie domain values when the cookie is reset.

Property: `com.sun.identity.agents.config.cookie.reset.domain`

Cookie Reset Path Map

Specifies how names from the Cookie Reset Name List correspond to cookie paths when the cookie is reset.

Property: `com.sun.identity.agents.config.cookie.reset.path`

6.6.4. Configuring J2EE Policy Agent OpenAM Services Properties

This section covers OpenAM services web agent properties. After creating the agent profile, you access these properties in the OpenAM console under Access Control > *Realm Name* > Agents > J2EE > *Agent Name* > OpenAM Services.

Login URL properties

OpenAM Login URL

OpenAM login page URL, such as `http://openam.example.com:8080/openam/UI/Login`, to which the agent redirects incoming users without sufficient credentials so then can authenticate.

Property: `com.sun.identity.agents.config.login.url`

OpenAM Conditional Login URL (Not yet in OpenAM console)

To conditionally redirect users based on the incoming request URL, set this property.

This takes the incoming request URL to match, a vertical bar (`|`), and then a comma-separated list of URLs to which to redirect incoming users.

If the string before the vertical bar matches an incoming request URL, then the policy agent uses the list of URLs to determine how to redirect the user-agent. If the global property FQDN Check (`com.sun.identity.agents.config.fqdn.check.enable`) is enabled for the policy agent, then the policy agent iterates through the list until it finds an appropriate redirect URL that matches the FQDN check. Otherwise, the policy agent redirects the user-agent to the first URL in the list.

Property: `com.forgerock.agents.conditional.login.url`

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Examples: `com.forgerock.agents.conditional.login.url[0]=
login.example.com|http://openam1.example.com/openam/UI/Login,
http://openam2.example.com/openam/UI/Login,
com.forgerock.agents.conditional.login.url[1]= login.example.com|
http://openam3.example.com/openam/UI/Login, http://
openam4.example.com/openam/UI/Login`

Login URL Prioritized

When enabled, OpenAM uses the priority defined in the OpenAM Login URL list as the priority for Login and CDSSO URLs when handling failover.

Property: `com.sun.identity.agents.config.login.url.prioritized`

Login URL Probe

When enabled, OpenAM checks the availability of OpenAM Login URLs before redirecting to them.

Property: `com.sun.identity.agents.config.login.url.probe.enabled`

Login URL Probe Timeout

Timeout period in milliseconds for OpenAM to determine whether to failover between Login URLs when Login URL Probe is enabled.

Property: `com.sun.identity.agents.config.login.url.probe.timeout`

Default: 2000

Logout URL properties

OpenAM Logout URL

OpenAM logout page URLs, such as `http://openam.example.com:8080/openam/UI/Logout`. The user is logged out of the OpenAM session when accessing these URLs.

Property: `com.sun.identity.agents.config.logout.url`

OpenAM Conditional Logout URL (Not yet in OpenAM console)

The values take the incoming request URL to match and a comma-separated list of URLs to which to redirect users logging out.

Property: `com.forgerock.agents.conditional.logout.url`

Example: `com.forgerock.agents.conditional.logout.url[0]=
logout.example.com|http://openam1.example.com/openam/UI/Logout,
http://openam2.example.com/openam/UI/Logout`

Logout URL Prioritized

When enabled, OpenAM uses the priority defined in the OpenAM Logout URL list as the priority for Logout URLs when handling failover.

Property: `com.sun.identity.agents.config.logout.url.prioritized`

Logout URL Probe

When enabled, OpenAM checks the availability of OpenAM Logout URLs before redirecting to them.

Property: `com.sun.identity.agents.config.logout.url.probe.enabled`

Logout URL Probe Timeout

Timeout period in milliseconds for OpenAM to determine whether to failover between Logout URLs when Logout URL Probe is enabled.

Property: `com.sun.identity.agents.config.logout.url.probe.timeout`

Default: 2000

Authentication Service properties

OpenAM Authentication Service Protocol

Specifies the protocol used by the OpenAM authentication service.

Property: `com.ipplanet.am.server.protocol`

Hot swap: no

OpenAM Authentication Service Host Name

Specifies the OpenAM authentication service host name.

Property: `com.ipplanet.am.server.host`

Hot swap: no

OpenAM Authentication Service Port

Specifies the OpenAM authentication service port number.

Property: `com.ipplanet.am.server.port`

Hot swap: no

Policy Client Service properties

Enable Policy Notifications

When enabled, OpenAM sends notification about changes to policy.

Property: `com.sun.identity.agents.notification.enabled`

Hot swap: no

Policy Client Polling Interval

Specifies the time in minutes after which the policy cache is refreshed.

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Property: `com.sun.identity.agents.polling.interval`

Default: 3

Hot swap: no

Policy Client Cache Mode

Set to cache mode subtree when only a small number of policy rules are defined. For large numbers of policy rules, set to self.

Property: `com.sun.identity.policy.client.cacheMode`

Hot swap: no

Policy Client Boolean Action Values

Specifies the values, such as allow and deny, that are associated with boolean policy decisions.

Default: `iPlanetAMWebAgentService|GET|allow|deny:iPlanetAMWebAgentService|POST|allow|deny`

Property: `com.sun.identity.policy.client.booleanActionValues`

Hot swap: no

Policy Client Resource Comparators

Specifies the comparators used for service names in policy.

Default: `serviceType=iPlanetAMWebAgentService|class=com.sun.identity.policy.plugins.HTTPURLResourceName|wildcard=| delimiter=|caseSensitive=false`

Property: `com.sun.identity.policy.client.resourceComparators`

Hot swap: no

Policy Client Clock Skew

Time in seconds used adjust time difference between agent system and OpenAM. Clock skew in seconds = `AgentTime - OpenAMServerTime`.

Default: 10.

Property: `com.sun.identity.agents.config.policy.clockSkew`

Hot swap: no

URL Policy Env GET Parameters

Specifies the list of HTTP GET request parameters whose names and values the agents sets in the environment map for URL policy evaluation by the OpenAM server.

Property: `com.sun.identity.agents.config.policy.env.get.param`

URL Policy Env POST Parameters

Specifies the list of HTTP POST request parameters whose names and values the agents sets in the environment map for URL policy evaluation by the OpenAM server.

Property: `com.sun.identity.agents.config.policy.env.post.param`

URL Policy Env jsession Parameters

Specifies the list of HTTP session attributes whose names and values the agents sets in the environment map for URL policy evaluation by the OpenAM server.

Property: `com.sun.identity.agents.config.policy.env.jsession.param`

Use HTTP-Redirect for composite advice

When enabled, the remote policy client is configured to use HTTP-Redirect instead of HTTP-POST for composite advice.

Property: `com.sun.identity.agents.config.policy.advice.use.redirect`

User Data Cache Service properties

Enable Notification of User Data Caches

When enabled, receive notification from OpenAM to update user management data caches.

Property: `com.sun.identity.idm.remote.notification.enabled`

Hot swap: no

User Data Cache Polling Time

If notifications are not enabled and set to a value other than zero, specifies the time in minutes after which the agent polls to update cached user management data.

Property: `com.iplanet.am.sdk.remote.pollingTime`

Default: 1

Hot swap: no

Enable Notification of Service Data Caches

When enabled, receive notification from OpenAM to update service configuration data caches.

Property: `com.sun.identity.sm.notification.enabled`

Hot swap: no

Service Data Cache Time

If notifications are not enabled and set to a value other than zero, specifies the time in minutes after which the agent polls to update cached service configuration data.

Property: `com.sun.identity.sm.cacheTime`

Default: 1

Hot swap: no

Session Client Service properties

Enable Client Polling

When enabled, the session client polls to update the session cache rather than relying on notifications from OpenAM.

Property: `com.ipplanet.am.session.client.polling.enable`

Hot swap: no

Client Polling Period

Specifies the time in seconds after which the session client requests an update from OpenAM for cached session information.

Property: `com.ipplanet.am.session.client.polling.period`

Default: 180

Hot swap: no

6.6.5. Configuring J2EE Policy Agent Miscellaneous Properties

This section covers miscellaneous web agent properties. After creating the agent profile, you access these properties in the OpenAM console under Access Control > *Realm Name* > Agents > J2EE > *Agent Name* > Miscellaneous.

Locale properties

Locale Language

The default language for the agent.

Property: `com.sun.identity.agents.config.locale.language`

Hot swap: no

Locale Country

The default country for the agent.

Property: `com.sun.identity.agents.config.locale.country`

Hot swap: no

Port Check Processing properties

Port Check Enable

When enabled, activate port checking, correcting requests on the wrong port.

Property: `com.sun.identity.agents.config.port.check.enable`

Port Check File

Specifies the name of the file containing the content to handle requests on the wrong port when port checking is enabled.

Property: `com.sun.identity.agents.config.port.check.file`

Port Check Setting

Specifies which ports correspond to which protocols. The agent uses the map when handling requests with invalid port numbers during port checking.

Property: `com.sun.identity.agents.config.port.check.setting`

Bypass Principal List properties

Bypass Principal List

Specifies a list of principals the agent bypasses for authentication and search purposes, such as guest or testuser.

Property: `com.sun.identity.agents.config.bypass.principal`

Agent Password Encryptor properties

Encryption Provider

Specifies the agent's encryption provider class.

Default: `com.iplanet.services.util.JCEEncryption`

Property: `com.iplanet.security.encryptor`

Hot swap: no

Ignore Path Info properties

Ignore Path Info in Request URL

When enabled, strip path info from the request URL while doing the Not Enforced List check, and URL policy evaluation. This is designed to

prevent a user from accessing a URI by appending the matching pattern in the policy or not enforced list.

For example, if the not enforced list includes `/*.gif`, then stripping path info from the request URL prevents access to `http://host/index.html` by using `http://host/index.html?hack.gif`.

Property: `com.sun.identity.agents.config.ignore.path.info`

Deprecated Agent Properties properties

Goto Parameter Name

Property used only when CDSSO is enabled. Only change the default value, goto when the login URL has a landing page specified such as, `com.sun.identity.agents.config.cdsso.cdcervlet.url = http://openam.example.com:8080/openam/cdcervlet?goto= http://www.example.com/landing.jsp`. The agent uses this parameter to append the original request URL to this cdcserlet URL. The landing page consumes this parameter to redirect to the original URL.

As an example, if you set this value to `goto2`, then the complete URL sent for authentication is `http://openam.example.com:8080/openam/cdcervlet?goto= http://www.example.com/landing.jsp?goto2=http://www.example.com/original.jsp`.

Property: `com.sun.identity.agents.config.redirect.param`

Legacy User Agent Support Enable

When enabled, provide support for legacy browsers.

Property: `com.sun.identity.agents.config.legacy.support.enable`

Legacy User Agent List

List of header values that identify legacy browsers. Entries can use the wildcard character, `*`.

Property: `com.sun.identity.agents.config.legacy.user.agent`

Legacy User Agent Redirect URI

Specifies a URI the agent uses to redirect legacy user agent requests.

Property: `com.sun.identity.agents.config.legacy.redirect.uri`

6.6.6. Configuring J2EE Policy Agent Advanced Properties

This section covers advanced web agent properties. After creating the agent profile, you access these properties in the OpenAM console under Access Control > *Realm Name* > Agents > J2EE > *Agent Name* > Advanced.

Client Identification properties

If the agent is behind a proxy or load balancer, then the agent can get client IP and host name values from the proxy or load balancer. For proxies and load balancer that support providing the client IP and host name in HTTP headers, you can use the following properties.

When multiple proxies are load balancers sit in the request path, the header values can include a comma-separated list of values with the first value representing the client, as in `client,next-proxy,first-proxy`.

Client IP Address Header

HTTP header name that holds the IP address of the client.

Property: `com.sun.identity.agents.config.client.ip.header`

Client Hostname Header

HTTP header name that holds the hostname of the client.

Property: `com.sun.identity.agents.config.client.hostname.header`

Web Service Processing properties

Web Service Enable

Enable web service processing.

Property: `com.sun.identity.agents.config.webservice.enable`

Web Service End Points

Specifies a list of web application end points that represent web services.

Property: `com.sun.identity.agents.config.webservice.endpoint`

Web Service Process GET Enable

When enabled, the agent processes HTTP GET requests for web service endpoints.

Property:
`com.sun.identity.agents.config.webservice.process.get.enable`

Web Service Authenticator

Specifies a class implementing `com.sun.identity.agents.filter.IWebServiceAuthenticator`, used to authenticate web service requests.

Property:
`com.sun.identity.agents.config.webservice.responseprocessor`

Web Service Response Processor

Specifies a class implementing `com.sun.identity.agents.filter.IWebServiceResponseProcessor`, used to process web service responses.

Property:

`com.sun.identity.agents.config.webservice.responseprocessor`

Web Service Internal Error Content File

Specifies a file the agent uses to generate an internal error fault for the client application.

Property:

`com.sun.identity.agents.config.webservice.internalerror.content`

Web Service Authorization Error Content File

Specifies a file the agent uses to generate an authorization error fault for the client application.

Property:

`com.sun.identity.agents.config.webservice.autherror.content`

Alternate Agent URL properties

Alternative Agent Host Name

Specifies the host name of the agent protected server to show to client browsers, rather than the actual host name.

Property: `com.sun.identity.agents.config.agent.host`

Alternative Agent Port Name

Specifies the port number of the agent protected server to show to client browsers, rather than the actual port number.

Property: `com.sun.identity.agents.config.agent.port`

Alternative Agent Protocol

Specifies the protocol used to contact the agent from the browser client browsers, rather than the actual protocol used by the server. Either `http` or `https`.

Property: `com.sun.identity.agents.config.agent.protocol`

JBoss Application Server properties

WebAuthentication Available

When enabled, allow programmatic authentication with the JBoss container using the WebAuthentication feature.

Property: `com.sun.identity.agents.config.jboss.webauth.available`

Cross Site Scripting Detection properties

Possible XSS code elements

Specifies strings that, when found in the request, cause the agent to redirect the client to an error page.

Property: `com.sun.identity.agents.config.xss.code.elements`

XSS detection redirect URI

Maps applications to URIs of customized pages to which to redirect clients upon detection of XSS code elements.

For example, to redirect clients of MyApp to `/myapp/error.html`, enter MyApp as the Map Key and `/myapp/error.html` as the Corresponding Map Value.

Property: `com.sun.identity.agents.config.xss.redirect.uri`

Post Data Preservation properties

POST Data Preservation

Enables HTTP POST data preservation, storing POST data before redirecting the browser to the login screen, and then autosubmitting the same POST after successful authentication to the original URL.

Property: `com.sun.identity.agents.config.postdata.preserve.enable`

Missing PDP entry URI

Specifies a list of application-specific URIs if the referenced Post Data Preservation entry cannot be found in the local cache because it has exceeded its POST entry TTL. Either the agent redirects to a URI in this list, or it shows an HTTP 403 Forbidden error.

Property:
`com.sun.identity.agents.config.postdata.preserve.cache.noentry.url`

POST entry TTL

POST data storage lifetime in milliseconds. Default: 300000.

Property:
`com.sun.identity.agents.config.postdata.preserve.cache.entry.ttl`

PDP Stickysession mode

Specifies whether to create a cookie, or to append a query string to the URL to assist with sticky load balancing.

Property:
`com.sun.identity.agents.config.postdata.preserve.stickysession.mode`

PDP StickySession key-value

Specifies the key-value pair for stickySession mode. For example, a setting of lb=myserver either sets an lb cookie with myserver value, or adds lb=myserver to the URL query string.

Property:

`com.sun.identity.agents.config.postdata.preserve.stickySession.value`

Custom properties

Custom Properties

Additional properties to augment the set of properties supported by agent. Such properties take the following forms.

- `customproperty=custom-value1`
- `customlist[0]=customlist-value-0`
- `customlist[1]=customlist-value-1`
- `custommap[key1]=custommap-value-1`
- `custommap[key2]=custommap-value-2`

Property: `com.sun.identity.agents.config.freeformproperties`

6.7. Configuring Web Service Provider Policy Agents

This section covers Web Service Provider (WSP) properties. WSPs both validate incoming web service requests from Web Service Clients (WSC), and also secure outgoing responses sent back to WSCs.

After creating a WSP profile, you access WSP properties in the OpenAM console under Access Control > *Realm Name* > Agents > Web Service Provider > *Agent Name*.

General properties

Group

For assigning the agent to a previously configured agent group in order to inherit selected properties from the group.

Password

Agent password used when creating the password file and when installing the agent.

Status

Status of the agent configuration.

Universal Identifier
OpenAM identifier for the agent configuration.

Security properties

Security Mechanism
Specifies the mechanisms allowed to validate the web service request.

Authentication Chain
Specifies which OpenAM authentication chain consumes the credentials from the web service request to authenticate the WSC.

Token Conversion Type
Specifies how to covert the incoming token before issuing requests to other WSPs.

Preserve Security Headers in Message
Yes means the agent preserves SOAP security headers from the request for subsequent processing.

Detect Message Replay
Yes means the agent checks whether the request is a replay of an earlier request, and if so, rejects the request.

Detect User Token Replay
Yes means the agent checks whether the user token is a replay from an earlier requests, and if so, rejects the request.

Private Key Type
Specifies the type of key, such as `PublicKey`, used to verify the request signature.

Liberty Service Type URN
Specifies the Universal Resource Name for the Liberty service type used for lookups.

DNS Claim
Specifies a Uniform Resource Identitier shared by the WSP and WSC.

Credential for User Token
Specifies the user name and password credentials compared with the user name security token in a request.

SAML Configuration properties

SAML Attribute Mapping
Maps SAML attribute names from the incoming request to attribute names as retrieved from the SSOToken or the identity repository, used

to have the Security Token Service generate an appropriate SAML assertion.

SAML NameID Mapper Plugin

Specifies the class name of a plugin used to perform SAML account mapping.

SAML Attributes Namespace

Identifies the attribute name space used when generating SAML assertions.

Include Memberships

Yes means the agent includes the principal's membership as a SAML attribute.

Signing and Encryption properties

Is Request Signature Verified

Yes means verify signatures in requests.

Is Response Signed Enabled

Yes means the agent signs the specified parts of the response with its x509 certificate.

Signing Reference Type

Specifies how the x509 certificate used to sign responses is referenced in the response.

Is Request Decrypted

Yes means do decrypt the specified parts of incoming requests.

Is Response Encrypted

Yes means do encrypt the outgoing response.

Encryption Algorithm

Specifies whether to use Advanced Encryption Standard, corresponding to an Encryption Strength of 128, 192, or 256, or to use Triple DES with a key length of 0, 112, or 168.

Encryption Strength

Specifies the key length used for encryption.

Key Store properties

Public Key Alias of Web Service Client

Specifies the alias of the certificate in the key store used to verify request signatures and encrypt responses.

Private Key Alias

Specifies the alias of the certificate in the key store used to sign responses and decrypt requests.

Key Store Usage

If you use your own, custom key store, specify how to access it here.

End Points properties

Web Service Security Proxy End Point

If the WSC sends requests through a web service proxy, specify that as the end point here.

Web Service End Point

Specifies the end point to which the WSC sends requests.

Kerberos Configuration properties

Kerberos Domain Server

Specifies the fully qualified domain name of the Kerberos Distribution Center service.

Kerberos Domain

Specifies the Kerberos Distribution Center domain name. For Windows environments this is the domain controller domain name.

Kerberos Service Principal

Specifies the Kerberos principal used by OpenAM, using the form `HTTP/openam-fqdn@krb-domain`, where *openam-fqdn* is the fully qualified domain name for OpenAM, and *krb-domain* is the Kerberos Domain.

Kerberos Key Tab File

Specifies the Kerberos keytab file using the form *openam-host*.HTTP.keytab, where *openam-host* is the host name for OpenAM.

Verify Kerberos Signature

Yes means the agent signs the Kerberos token.

6.8. Configuring Web Service Client Policy Agents

This section covers Web Service Client (WSC) properties. WSCs both secure outgoing requests sent to Web Service Providers (WSP), and also validate incoming from WSPs.

After creating a WSC profile, you access WSC properties in the OpenAM console under Access Control > *Realm Name* > Agents > Web Service Client > *Agent Name*.

General properties

Group

For assigning the agent to a previously configured agent group in order to inherit selected properties from the group.

Password

Agent password used when creating the password file and when installing the agent.

Status

Status of the agent configuration.

Universal Identifier

OpenAM identifier for the agent configuration.

Security properties

Security Mechanism

Specifies the mechanism used to secure web service requests.

STS Configuration

Specifies the agent used to secure requests to the Security Token Service.

Discovery Configuration

Specifies the agent used to secure requests to the Discovery Service.

User Authentication Required

Yes means users must authenticate to access the WSC's protected page.

Preserve Security Headers in Message

Yes means the agent preserves SOAP security headers in the request for subsequent processing.

User Pass Through Security Token

Yes means the agent passes along the Security Token from the Subject, rather than generating a token or requesting it from the Security Token Service.

Liberty Service Type URN

Specifies the Universal Resource Name for the Liberty service type used for lookups.

Credential for User Token

Specifies the user name and password credentials shared with the WSP and used to generate a Username Security Token.

DNS Claim

Specifies a Uniform Resource Identifier shared by the WSP and WSC.

SAML Configuration properties

SAML Attribute Mapping

Maps SAML attribute names from the outgoing request to attribute names as retrieved from the SSOToken or the identity repository.

SAML NameID Mapper Plugin

Specifies the class name of a plugin used to perform SAML account mapping.

SAML Attributes Namespace

Identifies the attribute name space used when generating SAML assertions.

Include Memberships

Yes means the agent includes the principal's membership as a SAML attribute.

Signing and Encryption properties

Is Request Signed Enabled

Yes means the agent signs the specified parts of the request with its x509 certificate.

Signing Reference Type

Specifies how the x509 certificate used to sign requests is referenced in the request.

Is Response Signature Verified

Yes means verify signatures in responses.

Is Request Encryption Enabled

Yes means do encrypt the specified parts of outgoing requests.

Encryption Algorithm

Specifies whether to use Advanced Encryption Standard, corresponding to an Encryption Strength of 128, 192, or 256, or to use Triple DES with a key length of 0, 112, or 168.

Encryption Strength

Specifies the key length used for encryption.

Is Response Decrypted

Yes means do decrypt the incoming response.

Key Store properties

Public Key Alias of Web Service Provider

Specifies the alias of the certificate in the key store used to sign requests and decrypt responses.

Private Key Alias

Specifies the alias of the certificate in the key store used to verify response signatures and encrypt requests.

Key Store Usage

If you use your own, custom key store, specify how to access it here.

End Points properties

Web Service Security Proxy End Point

If the WSC sends requests through a web service proxy, specify that as the end point here.

Web Service End Point

Specifies the end point to which the WSC sends requests.

Kerberos Configuration properties

Kerberos Domain Server

Specifies the fully qualified domain name of the Kerberos Distribution Center service.

Kerberos Domain

Specifies the Kerberos Distribution Center domain name. For Windows environments this is the domain controller domain name.

Kerberos Service Principal

Specifies the Kerberos principal used by OpenAM, using the form `HTTP/openam-fqdn@krb-domain`, where *openam-fqdn* is the fully qualified domain name for OpenAM, and *krb-domain* is the Kerberos Domain.

Kerberos Ticket Cache Directory

Specifies the directory in which Kerberos Ticket Granting Tickets (TGT) are cached. The **kinit** command stores the TGT from the KDC here.

6.9. Configuring Discovery Service Client Policy Agents

This section covers Discover Service Client properties. Discovery Service clients get Liberty security tokens from a Liberty Discovery Service.

After creating a Discovery Client profile, you access Discovery agent properties in the OpenAM console under Access Control > *Realm Name* > Agents > STS Client > *Agent Name*.

Group

For assigning the agent to a previously configured agent group in order to inherit selected properties from the group.

Password

Agent password used when creating the password file and when installing the agent.

Status

Status of the agent configuration.

Private Key Alias

Specifies the alias of the private key used to sign requests and decrypt responses.

Discovery Service End Point

Specifies the end point with which the trust authority client communicates for service registration and service lookups.

Authentication Web Service End Point

Specifies the end point with which the web services client communicates to get end user SSO Tokens and Discover Service resource offerings.

6.10. Configuring Security Token Service Client Policy Agents

This section covers Security Token Service (STS) Client properties. STS clients both secure outgoing requests to trust authorities, and also validate incoming requests from trust authorities. You can configure STS clients to work with OpenAM's Security Token Service and with its Discovery Service.

After creating an STS Client profile, you access STS Client properties in the OpenAM console under Access Control > *Realm Name* > Agents > STS Client > *Agent Name*.

General properties

Group

For assigning the agent to a previously configured agent group in order to inherit selected properties from the group.

Password

Agent password used when creating the password file and when installing the agent.

Status

Status of the agent configuration.

WS-Trust Version

Specifies whether to use WS-Trust 1.3 or 1.0.

Universal Identifier

OpenAM identifier for the agent configuration.

Security properties

Security Mechanism

Specifies the mechanism used to secure the STS request.

STS Configuration

Specifies the STS Client agent profile to use if the security mechanism is STS Security.

Preserve Security Headers in Message

Yes means the agent preserves SOAP security headers for subsequent processing.

Credential for User Token

Specifies the user name and password credentials the agent uses to generate a Username security token.

Requested Key Type

Specifies the type of key, such as PublicKey, used to encrypt responses.

Requested Claims

Specifies the Uniform Resource Identifiers for the claims to be represented in the Security Token.

DNS Claim

Specifies a Uniform Resource Identifier shared by the agent and the WSC.

SAML Configuration properties

SAML Attribute Mapping

Maps SAML attribute names from the incoming request to attribute names as retrieved from the SSOToken or the identity repository, used to have the Security Token Service generate an appropriate SAML assertion.

SAML NameID Mapper Plugin

Specifies the class name of a plugin used to perform SAML account mapping.

SAML Attributes Namespace

Identifies the attribute name space used when generating SAML assertions.

Include Memberships

Yes means the agent includes the principal's membership as a SAML attribute.

Signing and Encryption properties

Is Response Signature Verified

Yes means verify signatures in responses.

Is Request Signed Enabled

Yes means the agent signs the specified parts of the request with its x509 certificate.

Signing Reference Type

Specifies how the x509 certificate used to sign requests is referenced in the request.

Is Request Encryption Enabled

Yes means do encrypt the specified parts of requests.

Is Response Decrypted

Yes means do decrypt the response.

Encryption Algorithm

Specifies whether to use Advanced Encryption Standard, corresponding to an Encryption Strength of 128, 192, or 256, or to use Triple DES with a key length of 0, 112, or 168.

Encryption Strength

Specifies the key length used for encryption.

Key Store properties

Public Key Alias of Web Service Provider

Specifies the alias of the certificate in the key store used to verify response signatures and encrypt requests.

Private Key Alias

Specifies the alias of the certificate in the key store used to sign requests and decrypt responses.

Key Store Usage

If you use your own, custom key store, specify how to access it here.

End Points properties

Security Token Service End Point

Specifies the URL to the Security Token Service end point.

Security Token Service MEX End Point

Specifies the URL to the Security Token Service message exchange end point.

Kerberos Configuration properties

Kerberos Domain Server

Specifies the fully qualified domain name of the Kerberos Distribution Center service.

Kerberos Domain

Specifies the Kerberos Distribution Center domain name. For Windows environments this is the domain controller domain name.

Kerberos Service Principal

Specifies the Kerberos principal used by OpenAM, using the form `HTTP/openam-fqdn@krb-domain`, where *openam-fqdn* is the fully qualified domain name for OpenAM, and *krb-domain* is the Kerberos Domain.

Kerberos Ticket Cache Directory

Specifies the directory in which Kerberos Ticket Granting Tickets (TGT) are cached. The **kinit** command stores the TGT from the KDC here.

6.11. Configuring Version 2.2 Policy Agents

This section covers version 2.2 agent properties. Version 2.2 agents store their configurations locally, with a user name, password combination used to connect to OpenAM.

After creating the agent profile, you access agent properties in the OpenAM console under Access Control > *Realm Name* > Agents > 2.2 Agents > *Agent Name*.

Password

Specifies the password the agent uses to connect to OpenAM.

Status

Specifies whether the agent profile is active, and so can be used.

Description

Specifies a short description for the agent.

Agent Key Value(s)

Additional key-value pairs that OpenAM uses to receive agent requests concerning credential assertions.

OpenAM currently supports one property, `agentRootURL=protocol://host:port/` where the key is case-sensitive.

6.12. Configuring OAuth 2.0 Clients

When you want to register an OAuth 2.0 client with OpenAM as the OAuth 2.0 authorization server, create an OAuth 2.0 Client agent profile. After creating the agent profile, you can further configure the properties in the OpenAM console under Access Control > *Realm Name* > Agents > OAuth 2.0 Client > *Client Name*.

Group

Set this if you have configured an OAuth 2.0 Client agent group.

Status

Whether the client profile is active for use.

Client password

The client password as described by RFC 6749 in the section, Client Password.

Client type

Confidential clients can maintain confidentiality of their credentials. Public clients cannot.

A web application running on a server where its credentials are protected is an example of a confidential client.

A JavaScript client running in a browser is an example of a public client.

Redirection URIs

Specify client redirection endpoint URIs as described by RFC 6749 in the section, Redirection Endpoint. OpenAM's OAuth 2.0 authorization service redirects the the resource owner's user-agent back to this endpoint during the authorization code grant process. If your client has more than one redirection URI, then it must specify the redirection URI to use in the authorization request.

Scopes

Specify scopes in *scope* or *scope|locale|localized description* format. These scopes are to be presented to the resource owner when the resource owner is asked to authorize client access to protected resources.

Display name

Specify a client name to display to the resource owner when the resource owner is asked to authorize client access to protected resources. Valid formats include *name* or *locale|localized name*.

Display description

Specify a client description to display to the resource owner when the resource owner is asked to authorize client access to protected resources. Valid formats include *description* or *locale|localized description*.

Default Scope(s)

Specify scopes in *scope* or *scope|locale|localized description* format. These scopes are set automatically when tokens are issued.

6.13. Configuring Agent Authenticators

An *agent authenticator* has read-only access to multiple agent profiles defined in the same realm, typically allowing an agent to read web service agent profiles.

After creating the agent profile, you access agent properties in the OpenAM console under Access Control > *Realm Name* > Agents > Agent Authenticator > *Agent Name*.

Password

Specifies the password the agent uses to connect to OpenAM.

Status

Specifies whether the agent profile is active, and so can be used.

Agent Profiles allow to Read

Specifies which agent profiles in the realm the agent authenticator can read.

Agent Root URL for CDSSO

Specifies the list of agent root URLs for CDSSO. The valid value is in the format *protocol://hostname:port/* where *protocol* represents the protocol used, such as *http* or *https*, *hostname* represents the host name of the system where the agent resides, and *port* represents the port number on which the agent is installed. The slash following the port number is required.

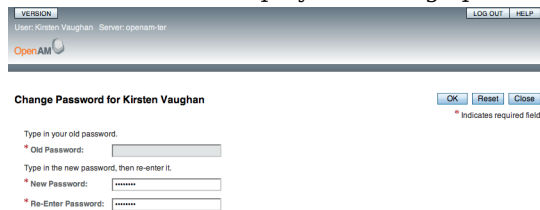
If your agent system also has virtual host names, add URLs with the virtual host names to this list as well. OpenAM checks that goto URLs match one of the agent root URLs for CDSSO.

Chapter 7. Configuring Password Reset

This chapter focuses on how to enable users to reset their own passwords in secure fashion.

7.1. About Password Reset

Users who know their passwords, but must reset them because for example the password is going to expire, can reset their passwords by successfully authenticating to OpenAM, visiting their end user pages, such as `http://openam.example.com:8080/openam/idm/EndUser`, and clicking Edit next to the Password field to display the change password page.



The screenshot shows the OpenAM user interface. At the top, there's a header bar with 'VERSION', 'User: Kirsten Vaughan', 'Server: openam-10', and 'LOG OUT | HELP' buttons. Below this is the OpenAM logo. The main content area is titled 'Change Password for Kirsten Vaughan' and includes 'OK', 'Reset', and 'Close' buttons. A note states '* Indicates required field'. The form contains four fields: 'Type in your old password:' with a text input, '* Old Password:' with a text input, 'Type in the new password, then re-enter it.' with a text input, '* New Password:' with a masked text input, and '* Re-Enter Password:' with a masked text input.

You therefore do not need to configure password reset for users who can remember their current password. Instead, you point them to the `idm/EndUser` page to let them do it themselves.

7.2. Resetting Forgotten Passwords

OpenAM can provide self-service password reset for forgotten passwords. To enable self-service password reset, you must configure the password reset service itself, which consists mainly of setting up secret questions, and configuring an SMTP mail server to send reset passwords to the users of the service.

Tip

Users must be able to access their mail after the service resets their passwords, or they will not be able to receive the new password. Do not therefore set up the service to reset the password used to access the email account specified in the user's profile.

Procedure 7.1. To Set Up the Password Reset Service

You can configure the password reset service for OpenAM, letting each realm inherit the global settings.

1. When OpenAM is configured with default settings, it uses the `ldapService` authentication chain, which relies on the `DataStore` authentication

module. The DataStore authentication module provides a generic authentication mechanism for OpenAM data stores, and therefore cannot handle specific data store settings, such as the directory server password policy setting to force password changes on reset. When you use settings the module cannot handle, then authentication can fail.

If you must configure the directory server to force password changes on reset, then also configure a separate authentication chain for users. The separate authentication chain must require the LDAP authentication module rather than the DataStore authentication module.

You can create and configure authentication chains, and assign them in the OpenAM console under Access Control > *Realm Name* > Authentication.

The OpenAM administrator, `amadmin`, uses the DataStore authentication module. If you set Access Control > /(Top Level Realm) > Authentication > Core > Organization Authentication Configuration to use your LDAP based authentication chain for users, let the Administrator Authentication Configuration continue to use the DataStore based authentication chain. To login to the OpenAM console as `amadmin`, access the administrator console service instead of the UI login service endpoint. For example: `http://openam.example.com:8080/openam/console`.

2. In the OpenAM console, browse to Configuration > Global > Password Reset in the Global Properties list.
3. In the Password Reset page, use the following hints to adjust settings, and then save your work.

In addition to the User Validation and Secret Question values provided, you must configure at least the Bind DN and Bind Password of the user who can reset passwords in the LDAP data store.

User Validation

OpenAM uses this LDAP attribute and the value entered by the user to look up the user profile in the data store.

Secret Question

This list corresponds to property values held in the file `WEB-INF/classes/amPasswordReset.properties` under the directory where OpenAM is deployed.

For localized versions of this file, copy `WEB-INF/classes/amPasswordReset.properties` to `WEB-INF/classes/amPasswordReset.properties_locale`, and localize only the values of the questions. For example if the default properties file contains:

Resetting Forgotten Passwords

```
favourite-restaurant=What is your favorite restaurant?
```

Then `WEB-INF/classes/amPasswordReset.properties` ought to contain:

```
favourite-restaurant=Quel est votre restaurant préféré ?
```

If you change these files, you must restart OpenAM.

Search Filter

An additional LDAP search filter you specify here is &ed with the filter constructed for user validation to find the user entry in the data store.

Base DN

If you specify no base DN for the search, the search for the user entry starts from the base DN for the realm.

Bind DN

The DN of the user with access to change passwords in the LDAP data store.

Bind Password

The password of the user with access to change passwords in the LDAP data store.

Password Reset Option

Classname of a plugin that implements the `PasswordGenerator` interface.

Password Change Notification Option

Classname of a plugin that implements the `NotifyPassword` interface.

Password Reset

Enables the service.

Personal Question

When enabled, allows the user to create custom secret questions.

Maximum Number of Questions

Maximum number of questions to ask during password reset.

Force Change Password on Next Login

When enabled, the user must change her password next time she logs in after OpenAM resets her password.

Password Reset Failure Lockout

When enabled, the user only gets the specified number of tries before her account is locked.

Password Reset Failure Lockout Count

If Password Reset Failure Lockout is enabled, this specifies the maximum number of tries to reset a password within the specified interval before the user's account is locked.

Password Reset Failure Lockout Interval

This interval applies when Password Reset Failure Lockout is enabled, and when Password Reset Failure Lockout Count is set. During this interval, a user can try to reset her password the specified number of times before being locked out. For example, if this interval is 5 minutes and the count is set to 3, a user gets 3 tries during a given 5 minute interval to reset her password.

Email Address to Send Lockout Notification

This specifies the administrator address(es) which receive(s) notification on user account lockout. Each address must be a full email address such as admin@example.com, or admin@host.domain.

OpenAM must be able to send mail through an SMTP-capable service for this to work. See Procedure 7.2, “To Set Up SMTP Mail Notification”.

Warn User After N Failures

If you configure Password Reset Failure Lockout, set this to warn users who are about to use up their count of tries.

Password Reset Failure Lockout Duration

If you configure Password Reset Failure Lockout, set this to a number of minutes other than 0 so that lockout is temporary, requiring only that the locked-out user wait to try again to reset her password, rather than necessarily require help from an administrator.

Password Reset Lockout Attribute Name

If you configure Password Reset Failure Lockout, then OpenAM sets sets data store attribute to inactive upon lockout.

If set to inactive, then a user who is locked out cannot attempt to reset her password if the Password Reset Failure Lockout Duration is 0.

4. If you changed Secret Questions in the WEB-INF/classes/amPasswordReset.properties file or in any localized versions, restart OpenAM for the changes to take effect.

Procedure 7.2. To Set Up SMTP Mail Notification

By default, OpenAM expects the SMTP service to listen on localhost:25. You can change these settings.

1. In the OpenAM console, click the Configuration > Servers and Sites > Default Server Settings.
2. In the Edit server-default page, scroll down to Mail Server to change the Mail Server Host Name or Mail Server Port Number.
3. Save your work.

Procedure 7.3. To Prepare Users to Reset Passwords

Before a user can reset her password, she must choose answers for secret questions.

1. When her account is first created, direct the user to her `idm/EndUser` page, such as `http://openam.example.com:8080/openam/idm/EndUser`, where she can provide a valid email address to recover the reset password and can edit Password Reset Options.

VERSION LOG OUT HELP

User: Password Reset User Server: openam-1sr

OpenAM

Password Reset User Save Reset

* Indicates required field

First Name: Password

* Last Name: User

* Full Name: Password Reset User

Password: Edit

Email Address: my.email@example.com

Telephone Number:

Home Address:

Password Reset Options: Edit

Universal ID: id=pwduser,ou=user,o=openam

By default OpenAM console redirects end users to this page when they login.

2. After the user updates her secret questions, she can use the password reset service when necessary.

Resetting Forgotten Passwords

The screenshot shows the OpenAM web interface. At the top, there is a header bar with a 'VERSION' button on the left and a 'LOG OUT' button on the right. Below the header, it displays 'User: Password User' and 'Server: openam.example.com'. The OpenAM logo is also present. Below this is a 'Password Reset Options' dialog box. The dialog has a title bar and three buttons: 'Save', 'Reset', and 'Close'. Inside the dialog, there is a section titled 'Questions (2 Questions)'. It contains a table with two columns: 'Question' and 'Answer'. The first row has a checked checkbox, the question 'What is your favorite restaurant?', and the answer 'Anything Tibetan'. The second row has a checked checkbox, the question 'What is your favorite password?', and the answer 'secret12'.

Question	Answer
<input checked="" type="checkbox"/> What is your favorite restaurant?	Anything Tibetan
<input checked="" type="checkbox"/> What is your favorite password?	secret12

Note

Answers to secret questions are case sensitive.

Procedure 7.4. To Direct Users to Reset Passwords

Having setup her email and answers to secret questions, the user can use the reset password service.

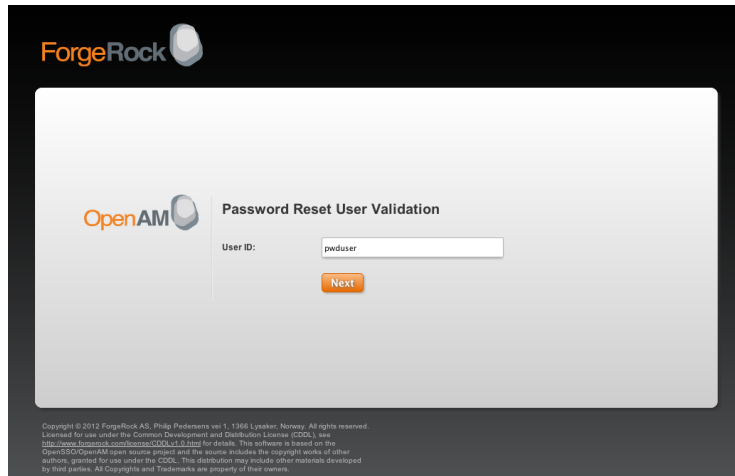
Create a test subject and use these steps to validate your configuration.

1. Send the user with a forgotten password to enter her user ID at the password reset URL.

If the user is in the default realm use password at the end of the URL to OpenAM, as in `http://openam.example.com:8080/openam/password`.

If the password reset service is enabled only for the user's realm and not the parent realm, or the realm to reset the password is different from the user's default realm, use `ui/PWResetUserValidation?realm=realm name`, as in `http://openam.example.com:8080/openam/ui/PWResetUserValidation?realm=realm name`.

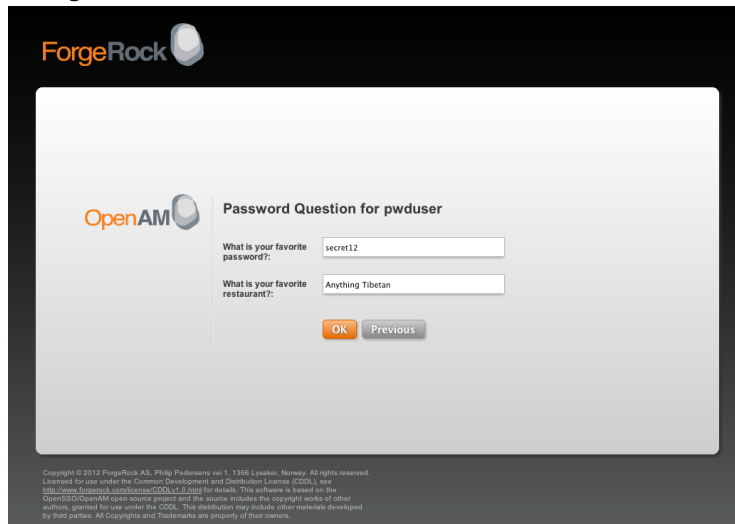
Resetting Forgotten Passwords



The screenshot shows the ForgeRock OpenAM interface for password reset. The title is "Password Reset User Validation". It features a text input field for "User ID:" containing the text "pwduser" and an orange "Next" button. The OpenAM logo is on the left. At the bottom, there is a small copyright notice: "Copyright © 2012 ForgeRock AS. Philip Pedersen and 1,136 Lyseaker, Norway. All rights reserved. Licensed for use under the Common Development and Distribution License (CDDL) here <http://www.forgerock.com/licenses/CDDL.v1.0.html> for details. This software is based on the OpenSSO OpenAM open source project and the source includes the copyright works of other authors, granted for use under the CDDL. This distribution may include other materials developed by third parties. All Copyrights and Trademarks are property of their owners."

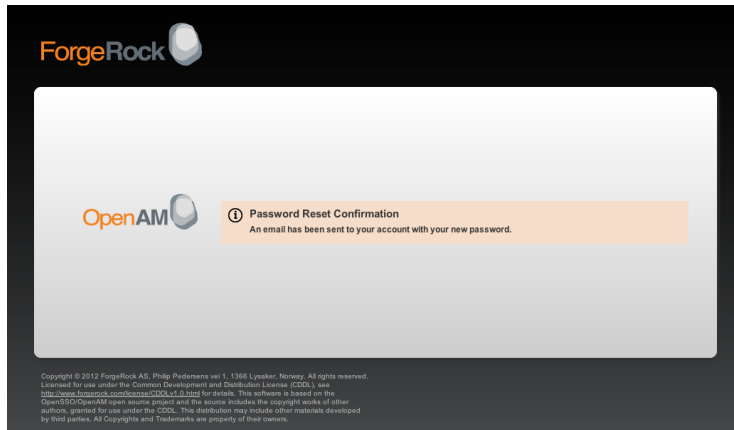
2. The user answers the specified questions, and clicks OK.

OpenAM resets the password, sending mail to the SMTP service you configured.



The screenshot shows the ForgeRock OpenAM interface for password reset questions. The title is "Password Question for pwduser". It features two text input fields: "What is your favorite password?:" with the text "secret12" and "What is your favorite restaurant?:" with the text "Anything Tibetan". Below the fields are two buttons: an orange "OK" button and a grey "Previous" button. The OpenAM logo is on the left. At the bottom, there is a small copyright notice: "Copyright © 2012 ForgeRock AS. Philip Pedersen and 1,136 Lyseaker, Norway. All rights reserved. Licensed for use under the Common Development and Distribution License (CDDL) here <http://www.forgerock.com/licenses/CDDL.v1.0.html> for details. This software is based on the OpenSSO OpenAM open source project and the source includes the copyright works of other authors, granted for use under the CDDL. This distribution may include other materials developed by third parties. All Copyrights and Trademarks are property of their owners."

Resetting Forgotten Passwords



The user receives the email with a line such as the following.

Your OpenAM password was changed to: 647bWlUw

3. The user logs in using the new password.

If you configured the system to force a change on password reset, then OpenAM requires the user to change her password.

Chapter 8. Configuring Cross-Domain Single Sign On

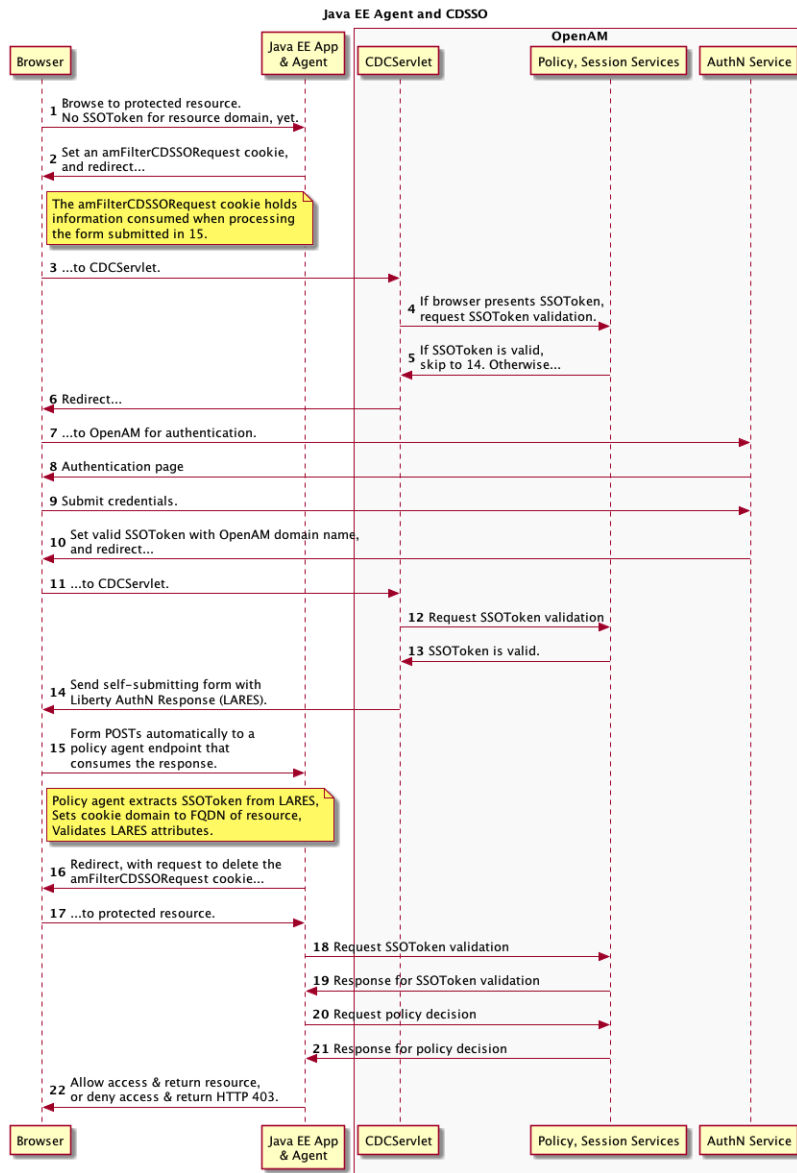
This chapter shows you how to configure cross-domain single sign on (CDSSO). When you have multiple domains in a single organization, CDSSO lets your OpenAM servers in one domain work with policy agents from other domains.

CDSSO is an OpenAM-specific capability. For single sign on across multiple organizations or when integrating with other access management software, use OpenAM's federation capabilities.

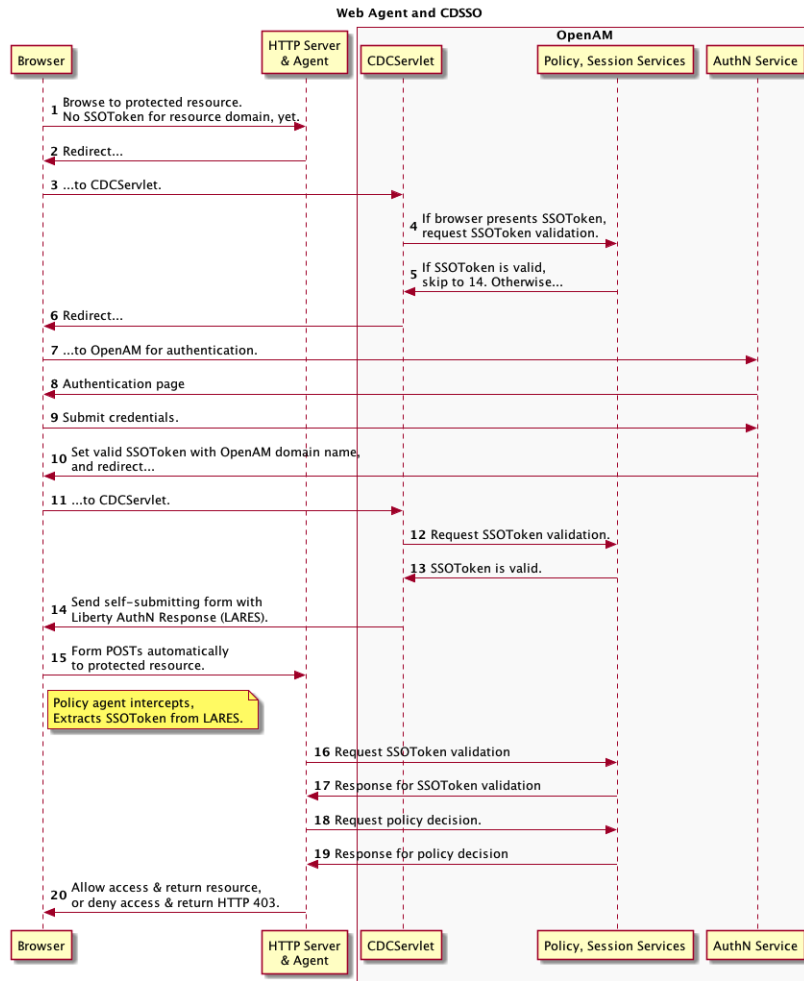
Cross-domain single sign on provides a safe mechanism for managing access across multiple different domains that you control. CDSSO lets OpenAM authenticate users redirected by policy agents in other DNS domains.

Single sign on depends on cookies to store session information. Yet for security reasons, browsers do not let a web site in one domain to get access to a cookie from another domain. With CDSSO, the policy agents work around this by negotiating with OpenAM to allow access.

The Java EE policy agent allows CDSSO by using a mechanism to write the SSO token from OpenAM authentication to a cookie with the domain the host where the agent runs. The following sequence diagram illustrates this mechanism.



Whereas the Java EE policy agent has an endpoint specifically to handle the cookie domain translation, the web policy agent handles the request directly as shown in the following sequence diagram.



Procedure 8.1. To Enable CDSSO For a Java EE Policy Agent

1. In the OpenAM console, browse to Access Control > *Realm Name* > Agents > J2EE > *Agent Name* > SSO.
2. Select Enable Cross Domain SSO.
3. Check that the CDSSO Redirect URI is set.

Depending on where you deployed your Java EE agent application, the default is something like /agentapp/sunwCDSSORedirectURI.

-
4. Set the list of URLs for CDSSO Servlet URL to the Cross Domain Controller Servlet URLs of the servers the agent accesses, such as `http://openam.example.com:8080/openam/cdcservlet`.

If the agent accesses OpenAM through a load balancer, use the load balancer URLs, such as `http://load-balancer.example.com:8080/openam/cdcservlet`.

5. Leave the CDSSO Clock Skew set to 0.

Make sure instead that the clocks on the servers where you run OpenAM and policy agents are synchronized.

6. Set the list of URLs for CDSSO Trusted ID Provider to the Cross Domain Controller Servlet URLs of the OpenAM servers the agent accesses, such as `http://openam.example.com:8080/openam/cdcservlet`.

This list should include one CDC Servlet URL for every OpenAM server the agent might access. You do not need to include site or load balancer URLs.

7. To protect the SSO token from network snooping, you can select CDSSO Secure Enable to mark the SSO token cookie as secure.

If you select this, then the SSO token cookie can only be sent over a secure connection (HTTPS).

8. Add the domains involved in CDSSO in the CDSSO Domain List.

9. If necessary, update the Agent Root URL for CDSSO list on the Global tab page.

If the policy agent is on a server with virtual host names, add the virtual host URLs to the list.

If the policy agent is behind a load balancer, add the load balancer URL to the list.

10. Save your work.

Procedure 8.2. To Enable CDSSO For a Web Policy Agent

1. In the OpenAM console, browse to Access Control > *Realm Name* > Agents > Web > *Agent Name* > SSO.
2. Select Enable Cross Domain SSO.
3. Set the list of URLs for CDSSO Servlet URL to the Cross Domain Controller Servlet URLs of the servers the agent accesses, such as `http://openam.example.com:8080/openam/cdcservlet`.

If the agent accesses OpenAM through a load balancer, use the load balancer URLs, such as `http://load-balancer.example.com:8080/openam/cdcservlet`.

4. Add the domains involved in CDSSO in the Cookies Domain List.
5. If necessary, update the Agent Root URL for CDSSO list on the Global tab page.

If the policy agent is on a server with virtual host names, add the virtual host URLs to the list.

If the policy agent is behind a load balancer, add the load balancer URL to the list.

6. Save your work.

Procedure 8.3. To Protect Against CDSSO Cookie Hijacking

When cookies are set for an entire domain such as `.example.com`, an attacker who steals a cookie can use it from any host in the domain such as `untrusted.example.com`. Cookie hijacking protection restricts cookies to the fully-qualified domain name (FQDN) of the host where they are issued, such as `openam-server.example.com` and `server-with-agent.example.com`, using CDSSO to handle authentication and authorization.

For CDSSO with cookie hijacking protection, when a client successfully authenticates OpenAM issues the master SSO token cookie for its FQDN. OpenAM issues *restricted token* cookies for the other FQDNs where the policy agents reside. The client ends up with cookies having different session identifiers for different FQDNs, and the OpenAM server stores the correlation between the master SSO token and restricted tokens, such that the client only has one master session internally in OpenAM.

To protect against cookie hijacking you restrict the OpenAM server domain to the server where OpenAM runs. This sets the domain of the SSO token cookie to the host running the OpenAM server that issued the token. You also enable use of a unique SSO token cookie. For your Java EE policy agents, you enable use of the unique SSO token cookie in the agent configuration as well.

1. In the OpenAM console, browse to Configuration > System > Platform.
2. Remove the domain such as `.example.com` from the Cookies Domains list, and replace it with the server host name such as `openam.example.com`, or if OpenAM is behind a load balancer with the load balancer host name, such as `load-balancer.example.com`.
3. Save your work.

-
4. In the OpenAM console, browse to Configuration > Servers and Sites > *Server Name* > Default Server Settings, and then make these changes:
 - a. Set the property `com.sun.identity.enableUniqueSS0TokenCookie` to `true`.
 - b. Add the property `com.sun.identity.authentication.uniqueCookieDomain`, setting the value to the fully-qualified domain name of the OpenAM server, such as `openam.example.com`.

Save your work.

5. For each Java EE policy agent, browse in the OpenAM console to Access Control > *Realm Name* > Agents > J2EE > *Agent Name* > Advanced > Custom Properties, and add `com.sun.identity.enableUniqueSS0TokenCookie=true` to the list.
6. Save your work.

Chapter 9. Managing SAML 2.0 Federation

This chapter addresses how to set up and manage SAML 2.0 SSO for single sign on and single log out across resources belonging to organizations participating in a circle of trust.

9.1. About SAML 2.0 SSO & Federation

SAML 2.0 SSO is part of federated access management. Federation lets access management cross organizational boundaries. Federation helps organizations share identities and services without giving away their identity information, or the services they provide.

To bridge heterogeneous systems, federation requires interoperability, and thus depends on standards for orchestrating interaction and exchanging information between providers. OpenAM federation relies on standards such as Security Assertion Markup Language (SAML) 2.0. SAML 2.0 describes the messages, how they are relayed, how they are exchanged, and common use cases.

To achieve SAML 2.0 SSO, OpenAM separates *identity providers* from *service providers*, lets you include them in a *circle of trust*, and has you configure how the providers in the circle of trust interact.

- An identity provider stores and serves identity profiles, and handles authentication.
- A service provider offers services that access protected resources, and handles authorization.
- A circle of trust groups at least one identity provider and at least one service provider who agree to share authentication information, with assertions about authenticated users that let service providers make authorization decisions.

Providers in a circle of trust share *metadata*, configuration information that federation partners require to access each others' services.

- SAML 2.0 SSO maps attributes from accounts at the identity provider to attributes on accounts at the service provider. The identity provider makes assertions to the service provider, for example to attest that a user has authenticated with the identity provider. The service provider then consumes assertions from the identity provider to make authorization decisions, for example to let an authenticated user complete a purchase that gets charged to the user's account at the identity provider.

In federation deployments where not all providers support SAML 2.0, OpenAM can act as a multi-protocol hub, translating for providers who rely

on other and older standards such as SAML 1.x, Liberty Alliance Project frameworks, and WS-Federation (for integration with Active Directory Federation Services, for example).

9.2. Setting Up SAML 2.0 SSO

Before you set up SAML 2.0 SSO in OpenAM, you must:

- Know which providers participate in the circle of trust.
- Know how your OpenAM installations act as identity providers, or service providers.
- Agree with other providers on a synchronized clock or time service to share for provider systems.

Processing messages you exchange requires synchronized time keeping.

- For identity information exchanged with other participants in a circle of trust, define how to map user attributes you share. Your user profile attribute names map to user profile attribute names at other providers.

For example, if you exchange user identifiers with your partners, and you call it `uid` whereas another partner calls it `userid`, then you map your `uid` to your partner's `userid`.

- Import the keys used to sign assertions into the JKS key store in your OpenAM configuration directory. You can use the Java **keytool** command.

The OpenAM configuration key store is located at the top level of the configuration directory, such as `$HOME/openam/keystore.jks`. The password, stored in `$HOME/openam/.keypass`, is `changeit` by default. Also by default the only key available is for a self-signed certificate (alias: `test`) installed with OpenAM.

During set up, you must share metadata for providers that you host with other providers in the circle of trust. You must also configure remote providers, connecting to other providers by importing their metadata.

In OpenAM terms, a hosted provider is one served by the current OpenAM server, whereas a remote provider is one hosted elsewhere.

Procedure 9.1. To Create a Hosted Identity Provider

1. On the OpenAM console Common Tasks page, click Create Hosted Identity Provider.

2. Unless you already have metadata for the provider, accept the Name for this identity provider in the field provided, or provide your own unique identifier.

The default name is the URL to the current server which hosts the identity provider.

3. Select the Signing Key you imported into the OpenAM key store.
4. Either add the provider to the circle of trust you already created, or select Add to new and provide a New Circle of Trust name.
5. For the attributes you share, map service provider attribute names (Name in Assertion), to user profile names from your identity repository (Local Attribute Name).
6. Click Configure to save your configuration.
7. Export the XML-based metadata from your provider to share with other providers in your circle of trust.

```
$ curl -o metadata.xml
http://idp.example:8080/openam/saml2/jsp/exportmetadata.jsp?entityid=
http://idp.example:8080/openam&realm=/realm-name
```

When you have configured only the top-level realm, /, you can omit the query string.

Alternatively, provide the URL, to other providers so they can load the metadata.

Procedure 9.2. To Create a Hosted Service Provider

1. On the OpenAM console Common Tasks page, click Create Hosted Service Provider.
2. Unless you already have metadata for the provider, accept the Name for this service provider in the field provided, or provide your own unique identifier.

The default name is the URL to the current server which hosts the service provider.

3. Either add the provider to the circle of trust you already created, or select Add to new and provide a New Circle of Trust name.
4. If the identity provider has not already mapped the attributes you share, map identity provider attribute names (Name in Assertion), to user profile names from your identity repository (Local Attribute Name).

5. Click Configure to save your configuration.
6. Export the XML-based metadata from your provider to share with other providers in your circle of trust.

```
$ curl -o metadata.xml  
http://sp.example:8080/openam/saml2/jsp/exportmetadata.jsp?entityid=  
http://sp.example:8080/openam&realm=realm-name
```

When you have configured only the top-level realm, /, you can omit the query string.

Alternatively, provide the URL, to other providers so they can load the metadata.

Procedure 9.3. To Create a Remote Identity Provider

1. Obtain the identity provider metadata, or the URL where you can obtain it.
2. On the OpenAM console Common Tasks page, click Register Remote Identity Provider.
3. Provide the identity provider metadata or link to obtain metadata.
4. Either add the provider to the circle of trust you already created, or select Add to new and provide a New Circle of Trust name.
5. Click Configure to save your configuration.

Procedure 9.4. To Create a Remote Service Provider

1. Obtain the service provider metadata, or the URL where you can obtain it.
2. On the OpenAM console Common Tasks page, click Register Remote Service Provider.
3. Provide the identity provider metadata or link to obtain metadata.
4. If the identity provider has not already mapped the attributes you share, map identity provider attribute names (Name in Assertion), to user profile names from your identity repository (Local Attribute Name).
5. Either add the provider to the circle of trust you already created, or select Add to new and provide a New Circle of Trust name.
6. Click Configure to save your configuration.

Procedure 9.5. To Create a Fedlet for Service Providers

When your organization acts as the identity provider, and you want quickly to enable service providers to federate their services with yours, you can provide them with a *fedlet*. A fedlet is a small web application

1. If you have not done so already, set up your identity provider.
2. Enter the URL where the service provider will deploy the fedlet you create, and name the fedlet. If you create multiple fedlets, use the URL as a unique name that shows who has deployed the fedlet.
3. For the attributes you share, map service provider attribute names (Name in Assertion), to user profile names from your identity repository (Local Attribute Name).
4. Click Create to generate the Fedlet.zip file under the OpenAM configuration directory, such as `$HOME/openam/myfedlets/httpwwwexamplecom80myapp/Fedlet.zip`.
5. Give the Fedlet.zip file to the service provider for deployment.

9.2.1. Deploying the Identity Provider Discovery Service

When your circle of trust includes multiple identity providers, then service providers must discover which identity provider corresponds to a request. You can deploy the identity provider discovery service for this purpose as a separate web application.

Browsers only send cookies for the originating domain. Therefore when a browser accesses the service provider in the `sp.example` domain, the service provider has no way of knowing whether the user has perhaps already authenticated at `this-idp.example` or at `that-idp.example`. The providers therefore host an identity provider discovery service in a common domain, such as `disco.example`, and use that service to discover where the user logged in. The identity provider discover service essentially writes and reads cookies from the common domain. The providers configure their circle of trust to use the identity provider discovery service as part of SAML 2.0 federation.

Deploying the identity provider discovery service involves the following stages.

1. Create the .war file for the discovery service.
2. Deploy the .war file into your web application container.
3. Configure the discovery service.

4. Add the identity provider discovery service endpoints for writing cookies to and reading cookies from the common domain to the circle of trust configurations for the providers.
5. Share metadata between identity providers and the service provider.

Procedure 9.6. To Create the Discovery Service Web Application

Before you start, have access to metadata for the identity and service providers in the circle of trust.

1. Unpack the opensso.war file into a temporary directory.

```
$ mkdir /tmp/disco ; cd /tmp/disco  
$ jar xf ~/Downloads/opensso/deployable-war/opensso.war
```

2. Create the disco.war file.

```
$ cd ~/Downloads/opensso/deployable-war  
$ sh createwar.sh --staging /tmp/disco --type idpdiscovery --warfile disco.war  
  
WAR file was created.
```

Procedure 9.7. To Deploy the Discovery Service on Tomcat

How you deploy the discovery service .war file depends on your web application container. The procedure in this section shows how to deploy on Apache Tomcat.

1. Put the disco.war you created in the Tomcat webapps/ directory.

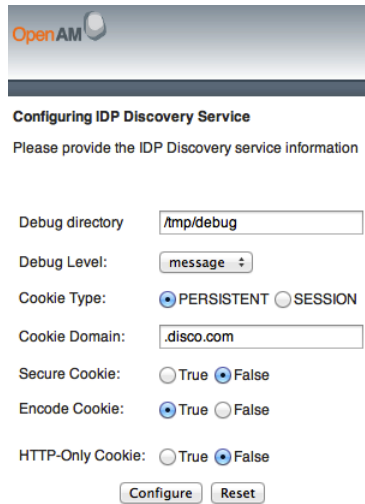
```
$ mv disco.war /path/to/tomcat/webapps/
```

2. Access the configuration screen through your browser.

In this example, Apache Tomcat listens for HTTP requests on `idp.disco.example:8080`, and Tomcat has unpacked the application under `/disco`, so the URL is `http://idp.disco.example:8080/disco`, which redirects to `Configurator.jsp`.

Procedure 9.8. To Configure the Discovery Service

1. Configure the identity provider discovery service.



The screenshot shows the OpenAM web interface for configuring the IDP Discovery Service. The page has a header with the OpenAM logo. Below the header, the title "Configuring IDP Discovery Service" is displayed, followed by the instruction "Please provide the IDP Discovery service information". The configuration form includes several fields and options: "Debug directory" is a text input field containing "/tmp/debug"; "Debug Level" is a dropdown menu set to "message"; "Cookie Type" has two radio buttons, "PERSISTENT" (selected) and "SESSION"; "Cookie Domain" is a text input field containing ".disco.com"; "Secure Cookie" has two radio buttons, "True" and "False" (selected); "Encode Cookie" has two radio buttons, "True" (selected) and "False"; and "HTTP-Only Cookie" has two radio buttons, "True" and "False" (selected). At the bottom of the form are two buttons: "Configure" and "Reset".

Hints for discovery service configuration parameters follow.

Debug Directory

The discovery service logs to flat files in this directory.

Debug Level

Default is error. Other options include error, warning, message, and off.

Set this to message in order to see the service working when you run your initial tests.

Cookie Type

Set to PERSISTENT if you have configured OpenAM to use persistent cookies, meaning single sign on cookies that can continue to be valid after the browser is closed.

Cookie Domain

The cookie domain is the common cookie domain used in your circle of trust for identity provider discovery, in this case .disco.example.

Secure Cookie

Set this to true if clients should only return cookies when a secure connection is used.

Encode Cookie

Leave this true unless your OpenAM installation requires that you do not encode cookies. Normally cookies are encoded such that cookies remain valid in HTTP.

HTTP-Only Cookie

Set to true to use HTTPOnly cookies if needed to help prevent third-party programs and scripts from accessing the cookies.

2. Restrict permissions to the discovery service configuration file in `$HOME/libIDPDiscoveryConfig.properties`, where `$HOME` corresponds to the user who runs the web container where you deployed the service.

Procedure 9.9. To Add the Discovery Service to Your Circles of Trust

Each provider has a circle of trust including itself. You configure each of these circles of trust to use the identity provider discovery service as described in the following steps.

1. On the service provider console, login as OpenAM Administrator.
2. On the service provider console, under Federation > Circle of Trust Configuration > *Circle of Trust Name* add SAML2 Writer and Reader Service URLs for the identity provider discovery service endpoints, and Save your work.

In this example, the writer URL is `http://idp.disco.example:8080/disco/saml2writer`, and the reader URL is `http://idp.disco.example:8080/disco/saml2reader`.

3. On each identity provider console, login as OpenAM Administrator.
4. On the identity provider console, under Federation > Circle of Trust Configuration > *Circle of Trust Name* also add SAML2 Writer and Reader Service URLs for the identity provider discovery service endpoints, and Save your work.

Procedure 9.10. To Share Identity & Service Provider Metadata

Before performing these steps, install the administration tools for each provider as described in *To Set Up Administration Tools*. The administration tools include the **ssoadm** tool that you need to export metadata.

1. On each identity provider console, register the service provider as a remote service provider adding to the circle of trust you configured to use the identity provider discovery service.

Deploying the Identity Provider Discovery Service

The URL to the service provider metadata is something like `http://www.sp.example:8080/openam/saml2/jsp/exportmetadata.jsp`.

2. Obtain metadata for each identity provider.

```
$ ssh www.this-idp.example
$ cd /path/to/openam-tools/admin/openam/bin
$ ./ssoadm create-metadata-templ -y "http://www.this-idp.example:8080/openam"
-u amadmin -f /tmp/pwd.txt -i /idp -m this-standard.xml -x this-extended.xml
Hosted entity configuration was written to this-extended.xml.
Hosted entity descriptor was written to this-standard.xml.

$ ssh www.that-idp.example
$ cd /path/to/openam-tools/admin/openam/bin
$ ./ssoadm create-metadata-templ -y "http://www.that-idp.example:8080/openam"
-u amadmin -f /tmp/pwd.txt -i /idp -m that-standard.xml -x that-extended.xml

Hosted entity configuration was written to that-extended.xml.
Hosted entity descriptor was written to that-standard.xml.
```

3. For each identity provider extended metadata file, change the value of the hosted attribute to 0, meaning the identity provider is remote.
4. On the service provider, add the identity providers to the circle of trust using the identity provider metadata.

```
$ ssh www.sp.example
$ cd /path/to/openam-tools/admin/openam/bin
$ ./ssoadm import-entity -t discocot -m ~/Downloads/this-standard.xml
-x ~/Downloads/this-extended.xml -u amadmin -f /tmp/pwd.txt

Import file, /Users/mark/Downloads/this-standard.xml.
Import file, /Users/mark/Downloads/this-extended.xml.
$ ./ssoadm import-entity -t discocot -m ~/Downloads/that-standard.xml
-x ~/Downloads/that-extended.xml -u amadmin -f /tmp/pwd.txt

Import file, /Users/mark/Downloads/that-standard.xml.
Import file, /Users/mark/Downloads/that-extended.xml.
```

5. Test your work by using the Federation Connectivity Test that you start from the service provider console under Common Tasks > Test Federation Connectivity.

When the test is done, you can see messages from the `CookieWriterServlet` in the `libIDPDiscovery` log file where you set up logging when you configured the identity provider discovery service, such as `/tmp/debug/libIDPDiscovery`. Output generated during a test follows, with some lines folded to fit on the printed page.

```
08/08/2012 11:43:38:341 AM CEST: Thread[http-bio-8080-exec-4,5,main]
CookieUtils.init : idpDiscoveryOnlyWar=true
08/08/2012 11:43:38:341 AM CEST: Thread[http-bio-8080-exec-4,5,main]
CookieWriterServlet Initializing...
08/08/2012 11:43:38:341 AM CEST: Thread[http-bio-8080-exec-4,5,main]
```

```
CookieWriterServlet.doGetPost: Preferred Cookie Name is _saml_idp
08/08/2012 11:43:38:341 AM CEST: Thread[http-bio-8080-exec-4,5,main]
CookieWriterServlet.doGetPost: URL Scheme is null, set to https.
08/08/2012 11:43:38:341 AM CEST: Thread[http-bio-8080-exec-4,5,main]
CookieWriterServlet.doGetPost: Preferred IDP Cookie Not found
08/08/2012 11:43:38:342 AM CEST: Thread[http-bio-8080-exec-4,5,main]
CookieWriterServlet.doGetPost: Cookie Type is PERSISTENT
08/08/2012 11:43:38:342 AM CEST: Thread[http-bio-8080-exec-4,5,main]
CookieWriterServlet.doGetPost: Cookie value is
aHR0cDovL3d3dy50aGF0LWlkC5jb2060DA4MC9vcGVuYW0=
08/08/2012 11:43:38:342 AM CEST: Thread[http-bio-8080-exec-4,5,main]
CookieWriterServlet.doGetPost: Preferred Cookie Name _saml_idp
08/08/2012 11:43:38:343 AM CEST: Thread[http-bio-8080-exec-4,5,main]
CookieWriterServlet.doGetPost: Redirect to
http://www.that-idp.example:8080/openam/SSORedirect/metaAlias/idp?resInfoID=
s28bc4db004f1365d78d07d69846c54a3c850fe801
08/08/2012 11:43:46:957 AM CEST: Thread[http-bio-8080-exec-4,5,main]
CookieWriterServlet.doGetPost: Preferred Cookie Name is _saml_idp
08/08/2012 11:43:46:957 AM CEST: Thread[http-bio-8080-exec-4,5,main]
CookieUtils.cookieValue=aHR0cDovL3d3dy50aGF0LWlkC5jb2060DA4MC9vcGVuYW0=,
result=aHR0cDovL3d3dy50aGF0LWlkC5jb2060DA4MC9vcGVuYW0=
08/08/2012 11:43:46:957 AM CEST: Thread[http-bio-8080-exec-4,5,main]
CookieWriterServlet.doGetPost: Cookie Type is PERSISTENT
08/08/2012 11:43:46:957 AM CEST: Thread[http-bio-8080-exec-4,5,main]
CookieWriterServlet.doGetPost: Cookie value is
aHR0cDovL3d3dy50aGF0LWlkC5jb2060DA4MC9vcGVuYW0=
08/08/2012 11:43:46:957 AM CEST: Thread[http-bio-8080-exec-4,5,main]
CookieWriterServlet.doGetPost: Preferred Cookie Name _saml_idp
08/08/2012 11:43:46:957 AM CEST: Thread[http-bio-8080-exec-4,5,main]
CookieWriterServlet.doGetPost: Redirect to
http://www.that-idp.example:8080/openam/SSORedirect/metaAlias/idp?resInfoID=
s2ce9c465cf39c96f31e1dcf009cf9943695d82901
```

9.3. Configuring Identity Providers

Once you have set up an identity provider, you can configure it through the OpenAM console under Federation > Entity Providers > *Provider Name*.

9.3.1. Hints for Assertion Content

Use the following hints to adjust settings on the Assertion Content tab page.

Signing and Encryption

Request/Response Signing

Specifies what parts of messages the identity provider requires the service provider to sign digitally.

Encryption

When selected, the service provider must encrypt NameID elements.

Certificate Aliases

Specifies aliases for certificates in the OpenAM key store that are used to handle digital signatures, and to handle encrypted messages.

NameID Format

NameID Format List

Specifies the supported name identifiers for users that are shared between providers for single sign on. If no name identifier is specified when initiating single sign on, then the identity provider uses the first one in the list.

NameID Value List

Maps name identifier formats to user profile attributes. The persistent and transient name identifiers need not be mapped.

Authentication Context

Mapper

Specifies a class that implements the IDPAuthnContextMapper interface and sets up the authentication context.

Default Authentication Context

Specifies the authentication context used if no authentication context specified in the request.

Supported Contexts

Specifies the supported authentication contexts, where the Key and Value can specify a corresponding OpenAM authentication method, and the Level corresponds to an authentication module authentication level.

Assertion Time

Not-Before Time Skew

Grace period in seconds for the NotBefore time in assertions.

Effective Time

Validity in seconds of an assertion.

Basic Authentication

Enabled, User Name, Password

When enabled, authenticate with the specified user name and password at SOAP end points.

Assertion Cache

Enabled

When enabled, cache assertions.

Bootstrapping

Discovery Bootstrapping

When enabled, generate a Discovery Service Resource Offering during the Liberty-based single sign on.

9.3.2. Hints for Assertion Processing

Use the following hints to adjust settings on the Assertion Processing tab page.

Attribute Mapper

Attribute Mapper

Specifies a class that implements the attribute mapping.

Attribute Map

Maps SAML attributes to user profile attributes.

Account Mapper

Account Mapper

Specifies a class that implements AccountMapper to map remote users to local user profiles.

Local Configuration

Auth URL

URL where users are redirected to authenticate.

External Application Logout URL

URL to which to send an HTTP POST including all cookies when receiving a logout request. To add a user session property as a POST parameter, include it in the URL query string as a `appsessionproperty` parameter.

9.3.3. Hints for Services

Use the following hints to adjust settings on the Services tab page.

MetaAlias

MetaAlias

Used to locate the providers entity identifier, specified as `[/realm-name]*/provider-name`, where neither *realm-name* nor *provider-name* can contain slash characters (/). For example: `/realm/sub-realm/idp`.

IDP Service Attributes

Artifact Resolution Service

Specifies the end point to handle artifact resolution. The Index is a unique number identifier for the end point.

Single Logout Service

Specifies the end points to handle single logout, depending on the SAML binding selected.

Manage NameID Service

Specifies the end points to handle name identifiers, depending on the SAML binding selected.

Single SignOn Service

Specifies the end points to handle single sign on.

NameID Mapping

URL

Specifies the end point to handle name identifier mapping.

9.3.4. Hints for Advanced Settings

Use the following hints to adjust settings on the Advanced tab page.

SAE Configuration

IDP URL

Specifies the end point to handle Secure Attribute Exchange requests.

Application Security Configuration

Specifies how to handle encryption for Secure Attribute Exchange operations.

ECP Configuration

IDP Session Mapper

Specifies the class that finds a valid session from an HTTP servlet request to an identity provider with a SAML Enhanced Client or Proxy profile.

Session Synchronization

Enabled

When enabled, the identity provider notifies service providers to log the user out when a session expires.

IDP Finder Implementation

IDP Finder Implementation Class

Specifies a class that finds the preferred identity provider to handle a proxied authentication request.

IDP Finder JSP

Specifies a JSP that presents the list of identity providers to the user.

Enable Proxy IDP Finder For All SPs

When enabled, apply the finder for all remote service providers.

Relay State URL List

Relay State URL List

List of URLs to which to redirect users after the request has been handled. Used if not specified in the service provider extended metadata.

IDP Adapter

IDP Adapter Class

Specifies a class to invoke immediately before sending a SAML 2.0 response.

9.4. Configuring Service Providers

Once you have set up a service provider, you can configure it through the OpenAM console under Federation > Entity Providers > *Provider Name*.

9.4.1. Hints for Assertion Content

Use the following hints to adjust settings on the Assertion Content tab page.

Signing and Encryption

Request/Response Signing

Specifies what parts of messages the service provider requires the identity provider to sign digitally.

Encryption

The identity provider must encrypt selected elements.

Certificate Aliases

Specifies aliases for certificates in the OpenAM key store that are used to handle digital signatures, and to handle encrypted messages.

NameID Format

NameID Format List

Specifies the supported name identifiers for users that are shared between providers for single sign on. If no name identifier is specified when initiating single sign on, then the service provider uses the first one in the list supported by the identity provider.

Disable Federation persistence if NameID Format is unspecified

When enabled, the NameID Format in the authentication response is `urn:oasis:names:tc:SAML:1.1:nameid-format:unspecified`, and the Account Mapper has identified the local user, the service provider does not persist federation information in the user profile.

Authentication Context

Mapper

Specifies a class that implements the `SPAuthnContextMapper` interface and sets up the authentication context.

Default Authentication Context

Specifies the authentication context used if no authentication context specified in the request.

Supported Contexts

Specifies the supported authentication contexts. The Level corresponds to an authentication module authentication level.

Comparison Type

How the authentication context in the assertion response must compare to the supported contexts.

Assertion Time

Assertion Time Skew

Grace period in seconds for the `NotBefore` time in assertions.

Basic Authentication

Enabled, User Name, Password

When enabled, authenticate with the specified user name and password at SOAP end points.

9.4.2. Hints for Assertion Processing

Use the following hints to adjust settings on the Assertion Processing tab page.

Attribute Mapper

Attribute Mapper

Specifies a class that implements the attribute mapping.

Attribute Map

Maps SAML attributes to user profile attributes.

Auto Federation

Enabled

When enabled, automatically federate user's accounts at different providers based on the specified profile attribute.

Attribute

Specifies the user profile attribute to match accounts at different providers.

Account Mapper

Account Mapper

Specifies a class that implements AccountMapper to map remote users to local user profiles.

Use Name ID as User ID

When selected, fall back to using the name identifier from the assertion to find the user.

Artifact Message Encoding

Encoding

Specifies the message encoding format for artifacts.

Transient User

Transient User

Specifies the user profile to which to map all identity provider users when sending transient name identifiers.

URL

Local Authentication URL

Specifies the local login URL.

Intermediate URL

Specifies a URL to which the user is redirected after authentication but before the original URL requested.

External Application Logout URL

Specifies the URL to which to send an HTTP POST including all cookies when receiving a logout request. To add a user session property as a POST parameter, include it in the URL query string as a `appsessionproperty` parameter.

Default Relay State URL

Default Relay State URL

Specifies the URL to which to redirect users after the request has been handled. Used if not specified in the response.

Adapter

Adapter

Specifies a class that implements the `FederationSPAdapter` interface and performs application specific processing during the federation process.

Adapter Environment

Specifies environment variables passed to the adapter class.

9.4.3. Hints for Services

Use the following hints to adjust settings on the Services tab page.

MetaAlias

MetaAlias

Used to locate the providers entity identifier, specified as `[/realm-name]*/provider-name`, where neither *realm-name* nor *provider-name* can contain slash characters (/). For example: `/realm/sub-realm/sp`.

SP Service Attributes

Single Logout Service

Specifies the end points to handle single logout, depending on the SAML binding selected.

Manage NameID Service

Specifies the end points to handle name identifiers, depending on the SAML binding selected.

Assertion Consumer Service

Specifies the end points to consume assertions, with Index corresponding to the index of the URL in the standard metadata.

9.4.4. Hints for Advanced Settings

Use the following hints to adjust settings on the Advanced tab page.

SAE Configuration

SP URL

Specifies the end point to handle Secure Attribute Exchange requests.

SP Logout URL

Specifies the end point of the service provider that can handle global logout requests.

Application Security Configuration

Specifies how to handle encryption for Secure Attribute Exchange operations.

ECP Configuration

Request IDP List Finder Implementation

Specifies a class that returns a list of preferred identity providers trusted by the SAML Enhanced Client or Proxy profile.

Request IDP List Get Complete

Specifies a URI reference used to retrieve the complete identity provider list if the IDPList element is not complete.

Request IDP List

Specifies a list of identity providers for the SAML Enhanced Client or Proxy to contact, used by the default implementation of the IDP Finder.

IDP Proxy

IDP Proxy

When enabled, allow proxied authentication for this service provider.

Introduction

When enabled, use introductions to find the proxy identity provider.

Proxy Count

Specifies the maximum number of proxy identity providers.

IDP Proxy List

Specifies a list of URIs identifying preferred proxy identity providers.

Session Synchronization

Enabled

When enabled, the service provider notifies identity providers to log the user out when a session expires.

Relay State URL List

Relay State URL List

List of URLs to which to redirect users after the request has been handled. Used if not specified in the service provider extended metadata.

9.5. Configuring Circles of Trust

Once you have set up a circle of trust, you can configure it through the OpenAM console under Federation > Circle of Trust > *Circle of Trust Name*.

Name

String to refer to the circle of trust.

Description

Short description of the circle of trust.

IDFF Writer Service URL

Liberty Identity Federation Framework service that writes identity provider entity identifiers to Common Domain cookies after successful authentication, used in identity provider discovery. Example: `http://disco.example:8080/openam/idffwriter`.

IDFF Reader Service URL

Liberty Identity Federation Framework service that reads identity provider entity identifiers from Common Domain cookies, used in identity provider discovery. Example: `http://disco.example:8080/openam/transfer`.

SAML2 Writer Service URL

SAML 2.0 service that writes identity provider entity identifiers to Common Domain cookies after successful authentication, used in identity provider discovery. Example: `http://disco.example:8080/openam/saml2writer`.

SAML2 Reader Service URL

SAML 2.0 service that reads identity provider entity identifiers from Common Domain cookies, used in identity provider discovery. Example: `http://disco.example:8080/openam/saml2reader`.

Status

Whether this circle of trust is operational.

Realm

Name of the realm participating in this circle of trust.

Entity Providers

Known hosted and remote identity and service providers participating in this circle of trust.

9.6. Using SAML 2.0 Single Sign-On & Single Logout

OpenAM SAML 2.0 Federation provides JSPs where you can direct users to do single sign-on (SSO) and single logout (SLO) across providers in a circle of trust. OpenAM has two JSPs for SSO and two JSPs for SLO, allowing you to initiate both processes either from the identity provider side, or from the service provider side.

SSO lets users sign in once and remain authenticated as they access services in the circle of trust.

SLO attempts to log a user out of all providers in the circle of trust.

The JSP pages are found under the context root where you deployed OpenAM, in `saml2/jsp/`.

`spSSOInit.jsp`

Used to initiate SSO from the service provider side, so call this on the service provider not the identity provider. This is also mapped to the endpoint `spssoinit` under the context root.

Examples: `http://www.sp.example:8080/openam/saml2/jsp/spSSOInit.jsp`,
`http://www.sp.example:8080/openam/spssoinit`

`idpSSOInit.jsp`

Used to initiate SSO from the identity provider side, so call this on the identity provider not the service provider. This is also mapped to the endpoint `idpssoinit` under the context root.

Examples: `http://www.idp.example:8080/openam/saml2/jsp/idpSSOInit.jsp`, `http://www.idp.example:8080/openam/idpssoinit`

`spSingleLogoutInit.jsp`

Used to initiate SLO from the service provider side, so call this on the service provider not the identity provider.

Example: `http://www.sp.example:8080/sp/saml2/jsp/spSingleLogoutInit.jsp`

`idpSingleLogoutInit.jsp`

Used to initiate SLO from the identity provider side, so call this on the identity provider not the service provider.

Example: `http://www.idp.example:8080/idp/saml2/jsp/idpSingleLogoutInit.jsp`

When you invoke these JSPs, there are several parameters to specify. Which parameters you can use depends on the JSP.

idpSSOInit.jsp Parameters

metaAlias

(Required) Use this parameter to specify the local alias for the provider, such as metaAlias=/myRealm/idp. This parameter takes the format */realm-name/provider-name* as described in MetaAlias. You do not repeat the slash for the top level realm, for example metaAlias=/idp.

spEntityID

(Required) Use this parameter to indicate the remote service provider. Make sure you URL encode the value. For example, specify spEntityID=http://www.sp.example:8080/openam as spEntityID=http%3A%2F%2Fwww.sp.example%3A8080%2Fopenam.

affiliationID

(Optional) Use this parameter to specify a SAML affiliation identifier.

binding

(Optional) Use this parameter to indicate what binding to use for the operation. For example, specify binding=HTTP-POST to use HTTP POST binding with a self-submitting form. In addition to binding=HTTP-POST, you can also use binding=HTTP-Artifact.

NameIDFormat

(Optional) Use this parameter to specify a SAML Name Identifier format identifier such as urn:oasis:names:tc:SAML:2.0:nameid-format:persistent, or urn:oasis:names:tc:SAML:2.0:nameid-format:transient.

RelayState

(Optional) Use this parameter to specify where to redirect the user when the process is complete. Make sure you URL encode the value. For example, RelayState=http%3A%2F%2Fopenam.forgerock.org takes the user to http://openam.forgerock.org.

RelayStateAlias

(Optional) Use this parameter to specify the parameter to use as the RelayState. For example, if your query string has target=http%3A%2F%2Fopenam.forgerock.org&RelayStateAlias=target, this is like setting RelayState=http%3A%2F%2Fopenam.forgerock.org.

spSSOInit.jsp Parameters

idpEntityID

(Required) Use this parameter to indicate the remote identity provider. Make sure you URL encode the value. For example, specify idpEntityID=http://www.idp.example:8080/openam as idpEntityID=http%3A%2F%2Fwww.idp.example%3A8080%2Fopenam.

metaAlias

(Required) Use this parameter to specify the local alias for the provider, such as `metaAlias=/myRealm/sp`. This parameter takes the format */realm-name/provider-name* as described in *MetaAlias*. You do not repeat the slash for the top level realm, `metaAlias=/sp`.

affiliationID

(Optional) Use this parameter to specify a SAML affiliation identifier.

AllowCreate

(Optional) Use this parameter to indicate whether the identity provider can create a new identifier for the principal if none exists (`true`) or not (`false`).

AssertionConsumerServiceIndex

(Optional) Use this parameter to specify an integer that indicates the location to which the Response message should be returned to the requester.

AuthComparison

(Optional) Use this parameter to specify a comparison method to evaluate the requested context classes or statements. OpenAM accepts the following values: `better`, `exact`, `maximum`, and `minimum`.

AuthnContextClassRef

(Optional) Use this parameter to specify authentication context class references. Separate multiple values with pipe characters (`|`).

AuthnContextDeclRef

(Optional) Use this parameter to specify authentication context declaration references. Separate multiple values with pipe characters (`|`).

AuthLevel

(Optional) Use this parameter to specify the authentication level of the authentication context that OpenAM should use to authenticate the user.

binding

(Optional) Use this parameter to indicate what binding to use for the operation. For example, specify `binding=HTTP-POST` to use HTTP POST binding with a self-submitting form. In addition to `binding=HTTP-POST`, you can also use `binding=HTTP-Artifact`.

Destination

(Optional) Use this parameter to specify a URI Reference indicating the address to which the request is sent.

ForceAuthN

(Optional) Use this parameter to indicate whether the identity provider should force authentication (`true`) or can reuse existing security contexts (`false`).

isPassive

(Optional) Use this parameter to indicate whether the identity provider should authenticate passively (true) or not (false).

NameIDFormat

(Optional) Use this parameter to specify a SAML Name Identifier format identifier such as urn:oasis:names:tc:SAML:2.0:nameid-format:persistent, or urn:oasis:names:tc:SAML:2.0:nameid-format:transient.

RelayState

(Optional) Use this parameter to specify where to redirect the user when the process is complete. Make sure you URL encode the value. For example, RelayState=http%3A%2F%2Fopenam.forgerock.org takes the user to http://openam.forgerock.org.

RelayStateAlias

(Optional) Use this parameter to specify the parameter to use as the RelayState. For example, if your query string has target=http%3A%2F%2Fopenam.forgerock.org&RelayStateAlias=target, this is like setting RelayState=http%3A%2F%2Fopenam.forgerock.org.

reqBinding

(Optional) Use this parameter to indicate what binding to use for the authentication request. Valid values include urn:oasis:names:tc:SAML:2.0:bindings:HTTP-Redirect (default) and urn:oasis:names:tc:SAML:2.0:bindings:HTTP-POST.

sunamcompositeadvice

(Optional) Use this parameter to specify a URL encoded XML blob that specifies the authentication level advice. For example, the following XML indicates a requested authentication level of 1. Notice the required : before the 1.

```
<Advice>
  <AttributeValuePair>
    <Attribute name="AuthLevelConditionAdvice"/>
    <Value>/:1</Value>
  </AttributeValuePair>
</Advice>
```

idpSingleLogoutInit.jsp Parameters

binding

(Required) Use this parameter to indicate what binding to use for the operation. For example, specify binding=HTTP-POST to use HTTP POST binding with a self-submitting form rather than the default HTTP redirect binding. In addition to binding=HTTP-POST, you can also use binding=HTTP-Artifact.

Consent

(Optional) Use this parameter to specify a URI that is a SAML Consent Identifier.

Destination

(Optional) Use this parameter to specify a URI Reference indicating the address to which the request is sent.

Extension

(Optional) Use this parameter to specify a list of Extensions as string objects.

goto

(Optional) Use this parameter to specify where to redirect the user when the process is complete. RelayState takes precedence over this parameter.

logoutAll

(Optional) Use this parameter to specify that the identity provider should send single logout requests to service providers without indicating a session index.

RelayState

(Optional) Use this parameter to specify where to redirect the user when the process is complete. Make sure you URL encode the value. For example, RelayState=http%3A%2F%2Fopenam.forgerock.org takes the user to http://openam.forgerock.org.

spSingleLogoutInit.jsp Parameters

binding

(Required) Use this parameter to indicate what binding to use for the operation. For example, specify binding=HTTP-POST to use HTTP POST binding with a self-submitting form rather than the default HTTP redirect binding. In addition to binding=HTTP-POST, you can also use binding=HTTP-Artifact.

idpEntityID

(Required for Fedlets) Use this parameter to indicate the remote identity provider. If the binding is not set, then OpenAM uses this parameter to find the default binding. Make sure you URL encode the value. For example, specify idpEntityID=http://www.sp.example:8080/openam as idpEntityID=http%3A%2F%2Fwww.idp.example%3A8080%2Fopenam.

NameIDValue

(Required for Fedlets) Use this parameter to indicate the SAML Name Identifier for the user.

SessionIndex

(Required for Fedlets) Use this parameter to indicate the sessionIndex of the user session to terminate.

Consent

(Optional) Use this parameter to specify a URI that is a SAML Consent Identifier.

Destination

(Optional) Use this parameter to specify a URI Reference indicating the address to which the request is sent.

Extension

(Optional) Use this parameter to specify a list of Extensions as string objects.

goto

(Optional) Use this parameter to specify where to redirect the user when the process is complete. RelayState takes precedence over this parameter.

RelayState

(Optional) Use this parameter to specify where to redirect the user when the process is complete. Make sure you URL encode the value. For example, RelayState=http%3A%2F%2Fopenam.forgerock.org takes the user to http://openam.forgerock.org.

spEntityID

(Optional, for Fedlets) Use this parameter to indicate the Fedlet entity ID. When missing, OpenAM uses the first entity ID in the metadata.

Example 9.1. SSO & SLO From the Service Provider

The following URL takes the user from the service provider side to authenticate at the identity provider and then come back to the end user profile page at the service provider after successful SSO. Lines are folded to show you the query string parameters.

```
http://www.sp.example:8080/openam/saml2/jsp/spSSOInit.jsp?metaAlias=/sp
&idpEntityID=http%3A%2F%2Fwww.idp.example%3A8080%2Fopenam
&RelayState=http%3A%2F%2Fwww.sp.example%3A8080%2Fopenam%2Fidm%2FEndUser
```

The following URL initiates SLO from the service provider side, leaving the user at http://openam.forgerock.org.

```
http://www.sp.example:8080/sp/saml2/jsp/spSingleLogoutInit.jsp?metaAlias=/sp
&idpEntityID=http%3A%2F%2Fdesktop.example.example%3A8080%2Fopenam
&RelayState=http%3A%2F%2Fopenam.forgerock.org
```

9.7. Configuring OpenAM For the ECP Profile

The SAML 2.0 Enhanced Client or Proxy (ECP) profile is intended for use when accessing services over devices like simple phones, medical devices, and set-top boxes that lack the capabilities needed to use the more widely used SAML 2.0 Web Browser SSO profile.

The ECP knows which identity provider to contact for the user, and is able to use the reverse SOAP (PAOS) SAML 2.0 binding for the authentication request and response. The PAOS binding uses HTTP and SOAP headers to pass information about processing SOAP requests and responses, starting with a PAOS HTTP header that the ECP sends in its initial request to the server. The PAOS messages continue with a SOAP authentication request in the server's HTTP response to the ECP's request for a resource, followed by a SOAP response in an HTTP request from the ECP.

An enhanced client, such as a browser with a plugin or an extension, can handle these communications on its own. An enhanced proxy is an HTTP server such as a WAP gateway that can support the ECP profile on behalf of client applications.

OpenAM supports the SAML 2.0 ECP profile on the server side for identity providers and service providers. You must build the ECP.

By default an OpenAM identity provider uses the `com.sun.identity.saml2.plugins.DefaultIDPECPSessionMapper` class to find a user session for requests to the IDP from the ECP. The default session mapper uses OpenAM cookies as it would for any other client application. If for some reason you must change the mapping after writing and installing your own session mapper, you can change the class under Federation > Entity Providers > *idp-name* > IDP > Advanced > ECP Configuration.

By default an OpenAM service provider uses the `com.sun.identity.saml2.plugins.ECPIDPFinder` class to return identity providers from the list under Federation > Entity Providers > *sp-name* > SP > Advanced > ECP Configuration > Request IDP List. You must populate the list with identity provider entity IDs.

The endpoint for the ECP to contact on the OpenAM service provider is /SPEC as in `http://www.sp.example:8080/openam/SPEC`. The ECP provides two query string parameters to identify the service provider and to specify the URL of the resource to access.

`metaAlias`

This specifies the service provider, by default `metaAlias=/realm-name/sp`, as described in `MetaAlias`.

`RelayState`

This specifies the resource the client aims to access such as `RelayState=http%3A%2F%2Fopenam.forgerock.org%2Findex.html`.

For example, the URL to access the service provider and finally the resource at `http://openam.forgerock.org/index.html` could be `http://www.sp.example:8080/openam/SPEC?metaAlias=sp&RelayState=http%3A%2F%2Fopenam.forgerock.org%2Findex.html`.

9.8. Managing Federated Accounts

Identity providers and service providers must be able to communicate about users. Yet in some cases the identity provider can choose to communicate a minimum of information about an authenticated user, with no user account maintained on the service provider side. In other cases the identity provider and service provider can choose to link user accounts in a persistent way, in a more permanent way, or even in automatic fashion by using some shared value in the user's profiles such as an email address or by dynamically creating accounts on the service provider when necessary. OpenAM supports all these alternatives.

9.8.1. Using Transient Federation Identifiers

OpenAM allows you to link accounts using transient name identifiers, where the identity provider shares a temporary identifier with the service provider for the duration of the user session. Nothing is written to the user profile.

Transient identifiers are useful where the service is anonymous, and all users have similar access on the service provider side.

To use transient name identifiers, specify the name ID format `urn:oasis:names:tc:SAML:2.0:nameid-format:transient` when initiating single sign on.

The examples below work in an environment where the identity provider is `www.idp.example` and the service provider is `www.sp.example`. Both providers have deployed OpenAM on port 8080 under deployment URI `/openam`.

To initiate single sign on from the service provider, access the following URL with at least the query parameters shown.

```
http://www.sp.example:8080/openam/saml2/jsp/spSSOInit.jsp?
idpEntityID=http%3A%2F%2Fwww.idp.example%3A8080%2Fopenam
&metaAlias=/sp
&NameIDFormat=urn:oasis:names:tc:SAML:2.0:nameid-format:transient
```

For a complete list of query parameters, see `spSSOInit.jsp` Parameters.

To initiate single sign on from the identity provider, access the following URL with at least the query parameters shown.

```
http://www.idp.example:8080/openam/saml2/jsp/idpSSOInit.jsp?
spEntityID=http%3A%2F%2Fwww.sp.example%3A8080%2Fopenam
```

```
&metaAlias=/idp  
&NameIDFormat=urn:oasis:names:tc:SAML:2.0:nameid-format:transient
```

For a complete list of query parameters, see `idpSSOInit.jsp` Parameters.

The accounts are only linked for the duration of the session. Once the user logs out for example the accounts are no longer linked.

9.8.2. Using Persistent Federation Identifiers

OpenAM lets you use persistent pseudonym identifiers to federate user identities, linking accounts on the identity provider and service provider with a SAML persistent identifier.

Persistent identifiers are useful for establishing links between otherwise unrelated accounts.

The examples below work in an environment where the identity provider is `www.idp.example` and the service provider is `www.sp.example`. Both providers have deployed OpenAM on port 8080 under deployment URI `/openam`.

To initiate single sign on from the service provider, access the following URL with at least the query parameters shown.

```
http://www.sp.example:8080/openam/saml2/jsp/spSSOInit.jsp?  
idpEntityID=http%3A%2F%2Fwww.idp.example%3A8080%2Fopenam  
&metaAlias=/sp  
&NameIDFormat=urn:oasis:names:tc:SAML:2.0:nameid-format:persistent
```

For a complete list of query parameters, see `spSSOInit.jsp` Parameters.

To initiate single sign on from the identity provider, access the following URL with at least the query parameters shown.

```
http://www.idp.example:8080/openam/saml2/jsp/idpSSOInit.jsp?  
spEntityID=http%3A%2F%2Fwww.sp.example%3A8080%2Fopenam  
&metaAlias=/idp  
&NameIDFormat=urn:oasis:names:tc:SAML:2.0:nameid-format:persistent
```

For a complete list of query parameters, see `idpSSOInit.jsp` Parameters.

On successful login, the accounts are persistently linked, with persistent identifiers stored in the user's accounts on the identity provider and the service provider.

9.8.3. Changing Federation of Persistently Linked Accounts

OpenAM implements the SAML 2.0 Name Identifier Management profile, allowing you to change a persistent identifier that has been set to federate accounts, and also to terminate federation for an account.

Changing Federation of Persistently Linked Accounts

When user accounts are stored in an LDAP directory server, name identifier information is stored on the `sun-fm-saml2-nameid-info` and `sun-fm-saml2-nameid-infokey` attributes of a user's entry.¹ You can retrieve the name identifier value by checking the value of `sun-fm-saml2-nameid-infokey`.

For example, if the user's entry in the directory shows `sun-fm-saml2-nameid-infokey: http://www.idp.example:8080/openam|http://www.sp.example:8080/openam| XyffEsr6Vixbnt0BSqIglLFMGjR2`, then the name identifier is `XyffEsr6Vixbnt0BSqIglLFMGjR2`.

You can use this identifier to initiate a change request from the service provider as in the following example.

```
http://www.sp.example:8080/openam/saml2/jsp/spMNIRquestInit.jsp?  
idpEntityID=http%3A%2F%2Fwww.idp.example%3A8080%2Fopenam  
&metaAlias=/sp  
&requestType=NewID  
&IDPProvidedID=XyffEsr6Vixbnt0BSqIglLFMGjR2
```

You can also initiate the change request from the identity provider as in the following example.

```
http://www.idp.example:8080/openam/saml2/jsp/idpMNIRquestInit.jsp?  
spEntityID=http%3A%2F%2Fwww.sp.example%3A8080%2Fopenam  
&metaAlias=/idp  
&requestType=NewID  
&SPProvidedID=XyffEsr6Vixbnt0BSqIglLFMGjR2
```

idpMNIRquestInit.jsp Parameters

spEntityID

(Required) Use this parameter to indicate the remote service provider. Make sure you URL encode the value. For example, specify `spEntityID=http://www.sp.example:8080/openam` as `spEntityID=http%3A%2F%2Fwww.sp.example%3A8080%2Fopenam`.

metaAlias

(Required) Use this parameter to specify the local alias for the provider, such as `metaAlias=/myRealm/idp`. This parameter takes the format */realm-name/provider-name* as described in *MetaAlias*. You do not repeat the slash for the top level realm, for example `metaAlias=/idp`.

requestType

(Required) Type of manage name ID request, either `NewID` to change the ID, or `Terminate` to remove the information that links the accounts on the identity provider and service provider.

¹These attribute types are configurable in the OpenAM console under Configuration > Global > SAMLv2 Service Configuration.

SPProvidedID
(Required if requestType=NewID) Name identifier in use as described above.

affiliationID
(Optional) Use this parameter to specify a SAML affiliation identifier.

relayState
(Optional) Use this parameter to specify where to redirect the user when the process is complete. Make sure you URL encode the value. For example, relayState=http%3A%2F%2Fopenam.forgerock.org takes the user to http://openam.forgerock.org.

spMNIRquestInit.jsp Parameters

idpEntityID
(Required) Use this parameter to indicate the remote identity provider. Make sure you URL encode the value. For example, specify idpEntityID=http://www.idp.example:8080/openam as idpEntityID=http%3A%2F%2Fwww.idp.example%3A8080%2Fopenam.

metaAlias
(Required) Use this parameter to specify the local alias for the provider, such as metaAlias=/myRealm/sp. This parameter takes the format */realm-name/provider-name* as described in MetaAlias. You do not repeat the slash for the top level realm, metaAlias=/sp.

requestType
(Required) Type of manage name ID request, either NewID to change the ID, or Terminate to remove the information that links the accounts on the identity provider and service provider.

IDPProvidedID
(Required if requestType=NewID) Name identifier in use as described above.

affiliationID
(Optional) Use this parameter to specify a SAML affiliation identifier.

relayState
(Optional) Use this parameter to specify where to redirect the user when the process is complete. Make sure you URL encode the value. For example, relayState=http%3A%2F%2Fopenam.forgerock.org takes the user to http://openam.forgerock.org.

You can terminate federation as described in Section 9.8.4, “Terminating Federation of Persistently Linked Accounts”.

9.8.4. Terminating Federation of Persistently Linked Accounts

OpenAM lets you terminate account federation, where the accounts have been linked with a persistent identifier as described in Section 9.8.2, “Using Persistent Federation Identifiers”.

The examples below work in an environment where the identity provider is `www.idp.example` and the service provider is `www.sp.example`. Both providers have deployed OpenAM on port 8080 under deployment URI `/openam`.

To initiate the process of terminating account federation from the service provider, access the following URL with at least the query parameters shown.

```
http://www.sp.example:8080/openam/saml2/jsp/spMNIRRequestInit.jsp?  
  idpEntityID=http%3A%2F%2Fwww.idp.example%3A8080%2Fopenam  
  &metaAlias=/sp  
  &requestType=Terminate
```

To initiate the process of terminating account federation from the identity provider, access the following URL with at least the query parameters shown.

```
http://www.idp.example:8080/openam/saml2/jsp/idpMNIRRequestInit.jsp?  
  spEntityID=http%3A%2F%2Fwww.sp.example%3A8080%2Fopenam  
  &metaAlias=idp  
  &requestType=Terminate
```

9.8.5. Configuring Auto-Federation

OpenAM lets you configure the service provider to link an account based on an attribute value from the identity provider. When you know the user accounts on both the identity provider and the service provider share a common attribute value, such as an email address or other unique user identifier, you can use this method to link accounts without user interaction. See Procedure 9.11, “To Auto-Federate Accounts Based on an Attribute Value”.

OpenAM also lets you map users on the identity provider temporarily to a single anonymous user account on the service provider, in order to exchange attributes about the user without a user-specific account on the service provider. This approach can be useful when the service provider either needs no user-specific account to provide a service, or when you do not want to retain a user profile on the service provider but instead you make authorization decisions based on attribute values from the identity provider. See Procedure 9.12, “To Auto-Federate Using a Single Service Provider Account”.

OpenAM further allows you to use attributes from the identity provider to create accounts dynamically on the service provider. When using this method, you should inform the user and obtain consent to create the account

if necessary. See Procedure 9.13, “To Auto-Federate With Dynamic Service Provider Account Creation”.

Procedure 9.11. To Auto-Federate Accounts Based on an Attribute Value

The following steps demonstrate how to auto-federate accounts based on an attribute value that is the same in both accounts.

Perform the following steps on the hosted identity provider(s), and again on the hosted service provider(s).

1. Login to the OpenAM console as administrator.
2. Browse to Federation > *hosted-provider-name* > Assertion Processing.
3. If the attribute to use for auto-federation is not yet in the attribute map, add the attribute mapping, and then Save your work.
4. On the hosted service provider, under Auto Federation, select Enabled and enter the local attribute name in the Attribute field, and then Save your work.

Procedure 9.12. To Auto-Federate Using a Single Service Provider Account

The following steps demonstrate how to auto-federate using a single anonymous user account on the service provider.

Perform the following steps on the hosted identity provider(s), and again on the hosted service provider(s).

1. Login to the OpenAM console as administrator.
2. Browse to Federation > *hosted-provider-name* > Assertion Processing.
3. If you want to get attributes from the identity provider and the attributes are is not yet in the attribute map, add the attribute mapping, and then Save your work.
4. On the hosted service provider, under Transient User, set the single account to which to map all users, such as anonymous, and then Save your work.
5. After completing configuration on the providers, use transient identifiers to federate as described in Section 9.8.1, “Using Transient Federation Identifiers”.

Procedure 9.13. To Auto-Federate With Dynamic Service Provider Account Creation

The following steps demonstrate how to auto-federate, dynamically creating an account on the service provider if necessary.

1. Set up auto-federation as described in Procedure 9.11, “To Auto-Federate Accounts Based on an Attribute Value”. The attributes you map from the identity provider are those that the service provider sets on the dynamically created accounts.
2. On the service provider console, browse to Access Control > *realm-name* > Authentication > All Core Settings..., and Dynamic or Dynamic with User Alias, which are described in *Hints For the Core Authentication Module*, and then Save your work.
3. To test your work, create a user on the identity provider, log out of the console, and initiate SSO logging in as the user you created.

To initiate SSO, browse to one of the OpenAM SAML 2.0 JSPs with the appropriate query parameters. The following is an example URL for service provider initiated SSO.

```
http://www.sp.example:8080/openam/saml2/jsp/spSSOInit.jsp?  
idpEntityID=http%3A%2F%2Fwww.idp.example%3A8080%2Fopenam  
&metaAlias=/sp
```

On success, check <http://www.sp.example:8080/openam/idm/EndUser> to see the new user account.

9.8.6. Linking Federated Accounts in Bulk

If you manage both the identity provider and service provider, you can link accounts out-of-band, in bulk. You make permanent connections for a list of identity provider and service provider by using the **ssoadm** bulk federation commands.

Before you can run the bulk federation commands, first establish the relationship between accounts, set up the providers as described in Section 9.2, “Setting Up SAML 2.0 SSO”, and install the **ssoadm** command as described in *To Set Up Administration Tools*.

To understand the relationships between accounts, consider an example where the identity provider is at idp.example.org and the service provider is at sp.example. A demo user account has the Universal ID, `id=demo,ou=user,dc=example,dc=org`, on the identity provider. That maps to the Universal ID, `id=demo,ou=user,dc=example,dc=com`, on the service provider.

The **ssoadm** command then needs a file that maps local user IDs to remote user IDs, one per line, separated by the vertical bar character |. Each line of the file appears as follows.

```
local-user-ID|remote-user-ID
```

In the example, starting on the service provider side, the line for the demo user reads as follows.

```
id=demo,ou=user,dc=example,dc=com|id=demo,ou=user,dc=example,dc=org
```

All the users' accounts mapped in your file must exist at the identity provider and the service provider when you run the commands to link them.

Link the accounts using the **ssoadm** bulk federation commands.

1. Prepare the data with the **ssoadm do-bulk-federation** command.

The following example starts on the service provider side.

```
$ cat /tmp/user-map.txt
id=demo,ou=user,dc=example,dc=com|id=demo,ou=user,dc=example,dc=org
$ ssoadm do-bulk-federation --metaalias /sp
--remoteentityid http://idp.example.org:8080/openam
--useridmapping /tmp/user-map.txt
--nameidmapping /tmp/name-map.txt
--adminid amadmin --password-file /tmp/pwd.txt
--spec saml2
```

Bulk Federation for this host was completed. To complete the federation, name Id mapping file should be loaded to remote provider.

2. Copy the name ID mapping output file to the other provider.

```
$ scp /tmp/name-map.txt idp.example.org:/tmp/name-map.txt
openam@idp.example.org's password:
name-map.txt                               100% 177      0.2KB/s   00:00
```

3. Import the name ID mapping file with the **ssoadm import-bulk-fed-data** command.

The following example is performed on the identity provider side.

```
$ ssoadm import-bulk-fed-data
--adminid amadmin --password-file /tmp/pwd.txt
--metaalias /idp --bulk-data-file /tmp/name-map.txt
```

Bulk Federation for this host was completed.

At this point the accounts are linked.

9.9. Using SAML 2.0 Artifacts

By default OpenAM transmits SAML messages by value. This makes it possible to access the SAML messages in the user agent. You can instead request that OpenAM transmit SAML messages by reference using SAML artifacts, which are small values that reference a SAML message. Providers then communicate directly to resolve artifacts, rather than sending the messages through the user agent.

When initiating single sign-on using `idpSSOInit.jsp` or `spSSOInit.jsp` for example, add `binding=HTTP-Artifact` to the list of query parameters. The following example works in an environment where the identity provider is `www.idp.example` and the service provider is `www.sp.example`. Both providers have deployed OpenAM on port 8080 under deployment URI `/openam`.

```
http://www.sp.example:8080/openam/saml2/jsp/spSSOInit.jsp?  
  idpEntityID=http%3A%2F%2Fwww.idp.example%3A8080%2Fopenam  
  &metaAlias=/sp  
  &binding=HTTP-Artifact
```

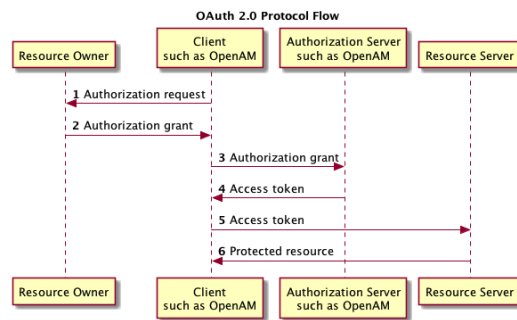
Chapter 10. Managing OAuth 2.0 Authorization

This chapter covers OpenAM support for the OAuth 2.0 authorization framework. The chapter begins by showing where OpenAM fits into the OAuth 2.0 authorization framework, and then shows how to configure the functionality.

10.1. About OAuth 2.0 Support in OpenAM

RFC 6749, *The OAuth 2.0 Authorization Framework*, provides a standard way for *resource owners* to grant *client* applications access to the owners' web-based resources. The canonical example involves a user (resource owner) granting access to a printing service (client) to print photos that the user has stored on a photo-sharing server.

The section describes how OpenAM supports the OAuth 2.0 authorization framework in terms of the roles that OpenAM plays.¹ The following sequence diagram indicates the primary roles OpenAM can play in the OAuth 2.0 protocol flow.



10.1.1. OpenAM as OAuth 2.0 Authorization Server

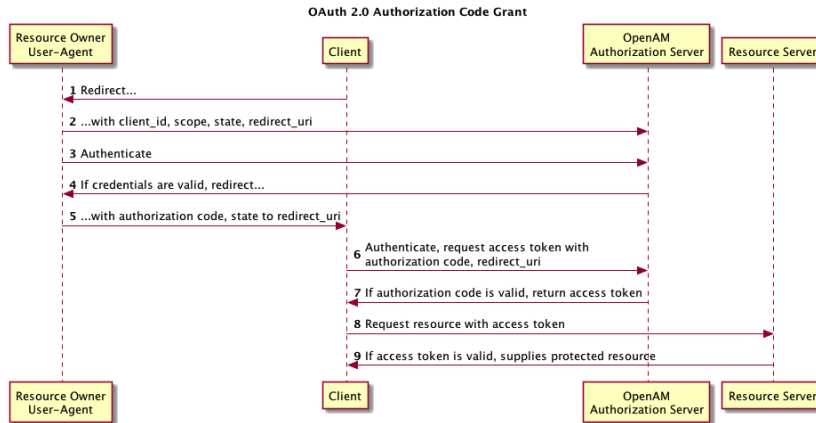
OpenAM can function as an OAuth 2.0 *authorization server*. In this role, OpenAM authenticates resource owners and obtains their authorization in order to return access tokens to clients.

When using OpenAM as authorization server, you register clients with OpenAM by using OAuth 2.0 policy agent profiles. OpenAM supports both confidential and public clients.

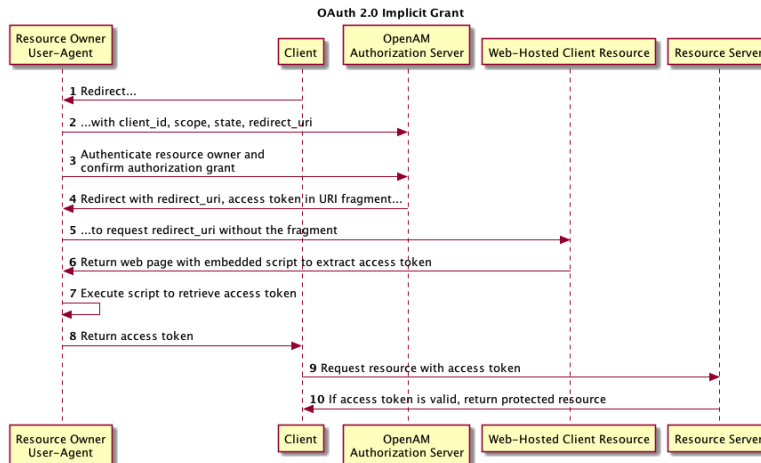
OpenAM supports the four main grants for obtaining authorization described in RFC 6749: the authorization code grant, the implicit grant, the resource owner password credentials grant, and the client credentials grant.

¹Read RFC 6749 to understand the authorization framework itself.

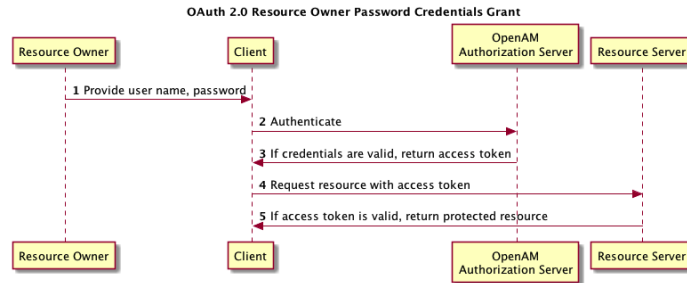
The authorization code grant starts with the client, such as a web-based service, redirecting the resource owner's user-agent to the OpenAM authorization service. After authenticating the resource owner again obtaining the resource owner's authorization, OpenAM redirects the resource owner's user-agent back to the client with an authorization code that the client uses to request the access token. The following sequence diagram outlines a successful process from initial client redirection through to the client accessing the protected resource.



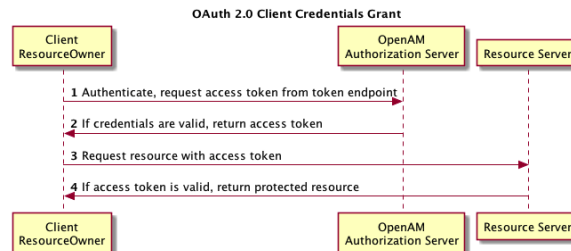
The implicit grant is designed for clients implemented to run inside the resource-owner user agent. Instead of providing an authorization code that the client must use to retrieve an access token, OpenAM returns the access token directly in the fragment portion of the redirect URI. The following sequence diagram outlines the successful process.



The resource owner password credentials grant lets the client use the resource owner's user name and password to get an access token directly. Although this grant might seem to conflict with an original OAuth goal of not having to share resource owner credentials with the client, it can make sense in a secure context where other authorization grant types are not available, such as a client that is part of a device operating system using the resource owner credentials once and thereafter using refresh tokens to continue accessing resources. The following sequence diagram shows the successful process.



The client credentials grant uses client credentials as an authorization grant. This grant makes sense when the client is also the resource owner, for example. The following sequence diagram shows the successful process.



See RFC 6749 for details on the authorization grant process, and for details on how clients should make authorization requests and handle authorization responses.

OpenAM OAuth 2.0 Endpoints

In addition to the standard authorization and token endpoints described in RFC 6749, OpenAM also exposes a token information endpoint for resource servers to get information about access tokens so they can determine how to respond to requests for protected resources. OpenAM as authorization server exposes the following endpoints for clients and resource servers.

/oauth2/authorize

Authorization endpoint defined in RFC 6749, used to obtain an authorization grant from the resource owner

Example: `https://openam.example.com:8443/openam/oauth2/authorize`

/oauth2/access_token

Token endpoint defined in RFC 6749, used to obtain an access token from the authorization server

Example: `https://openam.example.com:8443/openam/oauth2/access_token`

/oauth2/tokeninfo

Endpoint not defined in RFC 6749, used to validate tokens, and to retrieve information such as scopes

Given an access token, a resource server can perform an HTTP GET on `/oauth2/tokeninfo?access_token=token-id` to retrieve a JSON object indicating `token_type`, `expires_in`, `scope`, and the `access_token` ID.

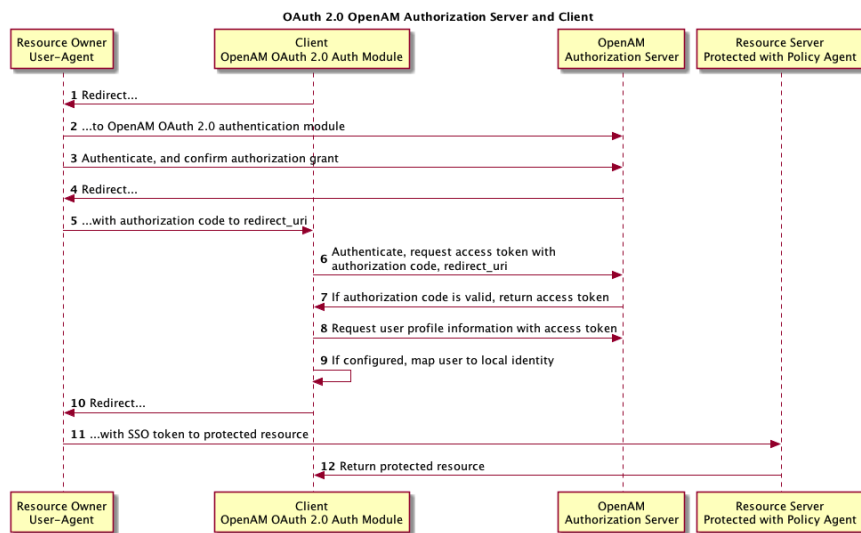
Example: `https://openam.example.com:8443/openam/oauth2/tokeninfo`

For examples, see the *Developer's Guide* section, *OAuth 2.0 Authorization*.

10.1.2. OpenAM as OAuth 2.0 Client & Resource Server Solution

OpenAM can function as an OAuth 2.0 client for installations where the web resources are protected by OpenAM. To configure OpenAM as an OAuth 2.0 client, you set up an OpenAM OAuth 2.0 authentication module instance, and then integrate the authentication module into your authentication chains as necessary.

When OpenAM functions as an OAuth 2.0 client, OpenAM provides an OpenAM SSO session after successfully authenticating the resource owner and obtaining authorization. This means the client can then access resources protected by policy agents. In this respect the OpenAM OAuth 2.0 client is just like any other authentication module, one that relies on an OAuth 2.0 authorization server to authenticate the resource owner and obtain authorization. The following sequence diagram shows how the client gains access to protected resources in the scenario where OpenAM functions as both authorization server and client for example.



As the OAuth 2.0 client functionality is implemented as an OpenAM authentication module, you do not need to deploy your own resource server implementation when using OpenAM as an OAuth 2.0 client. Instead, use policy agents or OpenIG to protect resources.

To configure OpenAM as an OAuth 2.0 client, see *Hints For the OAuth 2.0 Authentication Module*.

10.1.3. Using Your Own Client & Resource Server

OpenAM returns bearer tokens as described in RFC 6750, *The OAuth 2.0 Authorization Framework: Bearer Token Usage*. Notice in the following example JSON response to an access token request that OpenAM returns a refresh token with the access token. The client can use the refresh token to get a new access token as described in RFC 6749.

```
{
  "expires_in": 599,
  "token_type": "Bearer",
  "refresh_token": "f6dcf133-f00b-4943-a8d4-ee939fc1bf29",
  "access_token": "f9063e26-3a29-41ec-86de-1d0d68aa85e9"
}
```

In addition to implementing your client, the resource server must also implement the logic for handling access tokens. The resource server can use the `/oauth2/tokeninfo` endpoint to determine whether the access token is still valid, and to retrieve the scopes associated with the access token.

The default OpenAM implementation of OAuth 2.0 scopes assumes that the space-separated (%20 when URL encoded) list of scopes in an access token request correspond to names of attributes in the resource owner's profile.

To take a concrete example, consider an access token request where `scope=mail%20cn` and where the resource owner is the default OpenAM demo user. (The demo user has no email address by default, but you can add one, such as `demo@example.com` to the demo user's profile.) When the resource server performs an HTTP GET on the token information endpoint, `/oauth2/tokeninfo?access_token=token-id`, OpenAM populates the `mail` and `cn` scopes with the email address (`demo@example.com`) and common name (`demo`) from the demo user's profile. The result is a something like the following token information response.

```
{
  "mail": "demo@example.com",
  "scope": [
    "mail",
    "cn"
  ],
  "cn": "demo",
  "realm": "/",
  "token_type": "Bearer",
  "expires_in": 577,
  "access_token": "f9063e26-3a29-41ec-86de-1d0d68aa85e9"
}
```

OpenAM is designed to allow you to plug in your own scopes implementation if the default implementation does not do what your deployment requires. See *Customizing OAuth 2.0 Scope Handling* for an example.

10.2. Configuring the OAuth 2.0 Authorization Service

You configure the OAuth 2.0 authorization service for a particular realm, starting from the Common Tasks page of the OpenAM console. This process also protects the authorization endpoint using a standard policy.

Procedure 10.1. To Set Up the OAuth 2.0 Authorization Service

Follow these steps.

1. In the OpenAM console, select Common Tasks > Configure OAuth2.
2. On the Configure OAuth2 page, enter the Realm for the authorization service.
3. If necessary, adjust the lifetimes for authorization codes (10 minutes is the recommended setting in RFC 6749), access tokens, and refresh tokens.

4. Select Issue Refresh Tokens unless you do not want the authorization service to supply a refresh token when returning an access token.
5. If you want to use the default scope implementation, whereby scopes are taken to be resource owner profile attribute names, then keep the default setting.

If you have a custom scope implementation, put it on the OpenAM classpath, and provide the class name as Scope Implementation Class.

6. Click Create to complete the process.

In addition to setting up an OAuth 2.0 authorization server for the realm, OpenAM sets up a policy to protect the authorization endpoint. The policy appears in the list of policies for the realm. Its name is OAuth2ProviderPolicy.

You can adjust the authorization server configuration after you create it in the OpenAM console under Access Control > *Realm Name* > Services > OAuth2 Provider.

You can adjust global defaults in the OpenAM console under Configuration > Global > OAuth2 Provider.

10.3. Registering OAuth 2.0 Clients With the Authorization Service

You register an OAuth 2.0 client with the OpenAM OAuth 2.0 authorization service by creating and configuring an OAuth 2.0 Client agent profile.

At minimum you must have the client identifier and client password in order to register your OAuth 2.0 client.

Procedure 10.2. To Create an OAuth 2.0 Client Agent Profile

- Use either of these two facilities.
 - In the OpenAM console, access the client registration endpoint at /oauth2/registerClient.jsp.

The full URL depends on where you deployed OpenAM. For example, <https://openam.example.com:8443/openam/oauth2/registerClient.jsp>.

The Register a Client page lets you quickly create and configure an OAuth 2.0 client in a simple web page without inline help.

- In the OpenAM console under Access Control > *Realm Name* > Agents > OAuth 2.0 Client > Agent, click New..., then provide the client

identifier and client password, and finally click create to create the profile.

This page requires that you perform additional configuration separately.

Procedure 10.3. To Configure an OAuth 2.0 Client Agent Profile

After initially registering or creating a client agent profile as necessary.

1. In the OpenAM console, browse to Access Control > *Realm Name* > Agents > OAuth 2.0 Client > Agent > *Client Name* to open the Edit *Client Name* page.
2. Adjust the configuration as needed using the inline help for hints, and also the documentation section *Configuring OAuth 2.0 Clients*.

An important decision to make at this point is whether your client is a confidential client or a public client. This depends on whether your client can keep its credentials confidential, or whether its credentials can be exposed to the resource owner or other parties. If your client is a web-based application running on a server, such as the OpenAM OAuth 2.0 client, then you can keep its credentials confidential. If your client is a user-agent based client, such as a JavaScript client running in a browser, or a native application installed on a device used by the resource owner, then yours is a public client.

3. When finished, Save your work.

10.4. Managing OAuth 2.0 Tokens

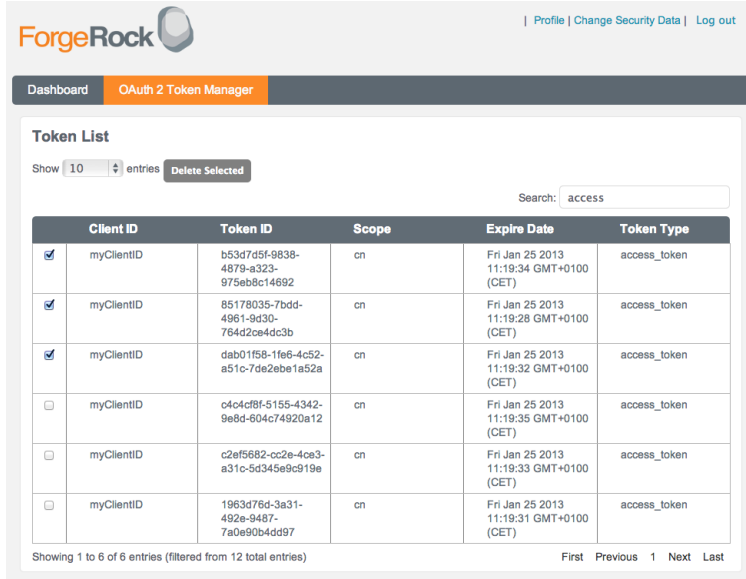
OpenAM exposes a RESTful API that lets administrators read, list, and delete OAuth 2.0 tokens. OAuth 2.0 clients can also manage their own tokens. See the *Developer's Guide* section on the *OAuth 2.0 Token Administration Endpoint* for details.

OpenAM also lets resource owners browse and delete OAuth 2.0 tokens that they authorized. Resource owners can do this from the OAuth 2 Token Manager page.

To access the page, login to OpenAM at /XUI, such as <https://openam.example.com:8443/openam/XUI/>, as the resource owner. Then click the OAuth 2 Token Manager link at the top of the page.

For example, the following screen shows the demo user (user name: demo, password: changeit) browsing access tokens on OAuth 2 Token Manager page, after the OAuth 2.0 client with identifier myClientID has been granted tokens by using the Resource Owner Password Credentials Grant as shown in the *Developer's Guide*.

Configuring OpenAM as Authorization Server & Client



The screenshot shows the ForgeRock OpenAM OAuth 2 Token Manager interface. At the top, there's a navigation bar with 'Dashboard' and 'OAuth 2 Token Manager' (selected). Below this is a 'Token List' section. It includes a search bar with 'access' entered, a 'Show 10 entries' dropdown, and a 'Delete Selected' button. The main part of the interface is a table with columns: Client ID, Token ID, Scope, Expire Date, and Token Type. There are six rows of data, each with a checkbox in the first column. The first three rows have their checkboxes checked. The last three rows have their checkboxes unchecked. The table shows tokens for 'myClientID' with various Token IDs, all with a scope of 'cn' and an expiration date of 'Fri Jan 25 2013 11:19:34 GMT+0100 (CET)'. The Token Type for all is 'access_token'. At the bottom, it says 'Showing 1 to 6 of 6 entries (filtered from 12 total entries)' and has pagination links: 'First', 'Previous', '1', 'Next', 'Last'.

	Client ID	Token ID	Scope	Expire Date	Token Type
<input checked="" type="checkbox"/>	myClientID	b53d7d5f-9838-4879-a323-975eb8c14692	cn	Fri Jan 25 2013 11:19:34 GMT+0100 (CET)	access_token
<input checked="" type="checkbox"/>	myClientID	85178035-7bdd-4961-9d30-764d2ce4dc3b	cn	Fri Jan 25 2013 11:19:28 GMT+0100 (CET)	access_token
<input checked="" type="checkbox"/>	myClientID	dab01f58-1fe6-4c52-a51c-7de2ebe1a52a	cn	Fri Jan 25 2013 11:19:32 GMT+0100 (CET)	access_token
<input type="checkbox"/>	myClientID	04c4cf8f-5155-4342-9e8d-604c74920a12	cn	Fri Jan 25 2013 11:19:35 GMT+0100 (CET)	access_token
<input type="checkbox"/>	myClientID	c2ef5682-cc2e-4ce3-a31c-5d345e9c919e	cn	Fri Jan 25 2013 11:19:33 GMT+0100 (CET)	access_token
<input type="checkbox"/>	myClientID	1963d76d-3a31-492e-9487-7a0e90b4dd97	cn	Fri Jan 25 2013 11:19:31 GMT+0100 (CET)	access_token

10.5. Configuring OpenAM as Authorization Server & Client

This section takes a high-level look at how to set up OpenAM both as an OAuth 2.0 authorization server and also as a client in order to protect resources by using a policy agent. The high-level steps are as follows.

1. Set up a policy agent or OpenIG to protect your web resources, including the policy used to protect the resources.

Make sure you can access the resources using an authentication module that you already know before working with OAuth 2.0.

2. Configure OpenAM's OAuth 2.0 authorization service as described in Section 10.2, "Configuring the OAuth 2.0 Authorization Service".
3. Configure an OpenAM OAuth 2.0 authentication module instance using the *Hints For the OAuth 2.0 Authentication Module* with the OpenAM authorization service endpoints.
4. Register the OAuth 2.0 authentication module as an OAuth 2.0 confidential client as described in Section 10.3, "Registering OAuth 2.0 Clients With the Authorization Service".
5. Logout and access the protected resources to see the process in action.

Example 10.1. Web Site Protected With OAuth 2.0

This example pulls everything together (except security considerations), using OpenAM as an OAuth 2.0 authorization server, OAuth 2.0 client, and "resource server" by protecting web resources with a policy agent.

This example uses two hosts, `oauth2.example.com` where OpenAM is deployed at `http://oauth2.example.com:8080/openam`, and `www.example.com` where the resources to protect are deployed in Apache Tomcat at `http://www.example.com:8080/examples`.

1. Set up an OpenAM policy agent and policy in the top-level realm, `/`, to protect resources. So far this is standard OpenAM, unrelated to OAuth 2.0.

See the *OpenAM Policy Agent 3.1.0 Installation Guide* for instructions on installing a policy agent. This example relies on the Apache Tomcat Java EE policy agent, configured to protect resources in Apache Tomcat at `http://www.example.com:8080/`.

The policies for this example protect the Apache Tomcat examples under `http://www.example.com:8080/examples/`, allowing GET and POST operations by all authenticated users. For more information on creating policies, see *Configuring Policies*.

After setting up the policy agent and the policy, you can make sure everything is working by attempting to access a protected resource, in this case `http://www.example.com:8080/examples/`. The policy agent should redirect you to OpenAM to authenticate with the default authentication module, where you can login as user `demo` password `changeit`. After successful authentication, OpenAM redirects your browser back to the protected resource and the policy agent lets you get the protected resource, in this case the Tomcat examples top page.

Apache Tomcat Examples

- [Servlets examples](#)
- [JSP Examples](#)
- [WebSocket Examples](#)

2. Configure OpenAM's OAuth 2.0 authorization service as described in Section 10.2, "Configuring the OAuth 2.0 Authorization Service".

The authorization endpoint to protect in this example is at `http://oauth2.example.com:8080/openam/oauth2/authorize`.

3. Configure an OpenAM OAuth 2.0 authentication module instance for the top-level realm.

Configuring OpenAM as Authorization Server & Client

Under Access Control > / (Top-Level Realm) > Authentication > Module Instances, click New. Name the module OAuth2, and select the OAuth 2.0 type, then click OK to save your work.

Then click Authentication > Module Instances > OAuth2 to open the OAuth 2.0 client configuration page. This page offers numerous options. The key settings for this example are the following.

Client Id

This is the client identifier used to register your client with OpenAM's authorization server, and then used when your client must authenticate to OpenAM.

Set this to myClientID for this example.

Client Secret

This is the client password used to register your client with OpenAM's authorization server, and then used when your client must authenticate to OpenAM.

Set this to password for this example. Make sure you use strong passwords when you actually deploy OAuth 2.0.

Authentication Endpoint URL

In this example, <http://oauth2.example.com:8080/openam/oauth2/authorize>.

Access Token Endpoint URL

In this example, http://oauth2.example.com:8080/openam/oauth2/access_token.

User Profile Service URL

In this example, <http://oauth2.example.com:8080/openam/oauth2/tokeninfo>.

Scope

In this example, cn.

The demo user has common name demo by default, so by setting this to cn (Common Name), OpenAM can get the value of the attribute without the need to create additional subjects, or to update existing subjects.

Account Mapper Configuration

In this example, cn=cn.

Account Mapper Configuration

In this example, `cn=cn`.

Account Mapper Configuration

In this example, `cn=cn`.

Create account if it does not exist

In this example, disable this functionality.

OpenAM can create local accounts based on the account information returned by the authorization server. For this example, map all users to the anonymous account to keep it simple.

Map to anonymous user

In this example, enable this functionality.

4. Register the OAuth 2.0 authentication module as an OAuth 2.0 confidential client as described in Section 10.3, “Registering OAuth 2.0 Clients With the Authorization Service”.

Under Access Control > / (Top-Level Realm) > Agents > OAuth 2.0 Client > Agents > `myClientID`, adjust the following settings.

Client type

In this example, `confidential`. OpenAM protects its credentials as an OAuth 2.0 client.

Redirection URIs

In this example, `http://oauth2.example.com:8080/openam/oauth2c/OAuthProxy.jsp`.

Scopes

In this example, `cn`.

5. Before you try it out, you must make the following additional change to the configuration.

Your OpenAM OAuth 2.0 client authentication module is not part of the default chain, and therefore OpenAM does not call it unless you specifically request the OAuth 2.0 client authentication module.

To cause the policy agent to request your OAuth 2.0 client authentication module explicitly, browse in OpenAM console to your *policy agent profile configuration*, in this case Access Control > / (Top-Level Realm) > Agents > J2EE > Agents > Tomcat > OpenAM Services > OpenAM Login URL, and add `http://oauth2.example.com:8080/openam/UI/Login?module=OAuth2`, moving it to the top of the list.

Save your work.

This ensures that the policy agent directs the resource owner to OpenAM with the instruction to authenticate using the OAuth2 authentication module.

6. Try it out.

First make sure you are logged out of OpenAM, for example by browsing to the logout URL, in this case `http://oauth2.example.com:8080/openam/UI/Logout`.

Next attempt to access the protected resource, in this case `http://www.example.com:8080/examples/`.

If everything is set up properly, the policy agent redirects your browser to the login page of OpenAM with `module=OAuth2` among other query string parameters. After you authenticate, for example as user `demo`, password `changeit`, OpenAM presents you with an authorization decision page.

OAuth authorization page

Application requesting scope

Example.com Intranet:

Example.com requests access to your profile

The following private info is requested

When you click Allow, the authorization service creates an SSO session, and redirects the client back to the resource, thus allowing the client to access the protected resource.

Apache Tomcat Examples

- [Servlets examples](#)
- [JSP Examples](#)
- [WebSocket Examples](#)

10.6. Security Considerations

OAuth 2.0 messages involve credentials and access tokens that allow the bearer to retrieve protected resources. Therefore, do not let an attacker capture requests or responses. Protect the messages going across the network.

RFC 6749 includes a number of Security Considerations, and also requires Transport Layer Security (TLS) to protect sensitive messages. Make sure you read the section covering *Security Considerations*, and that you can implement them in your deployment.

Also, especially when deploying a mix of other clients and resource servers, take into account the points covered in the Internet-Draft, *OAuth 2.0 Threat Model and Security Considerations*, before putting your service into production.

Chapter 11. Backing Up and Restoring OpenAM Configurations

This chapter shows how to backup and restore OpenAM configuration data. This chapter *does not cover backup and restore of user data*, which in a critical production system should be stored separately.

Procedure 11.1. To Back Up OpenAM Configuration

OpenAM stores service configuration data in a directory. During normal production operations, you rely on directory replication to maintain multiple, current copies of OpenAM service configuration. For disaster recovery, however, you backup to and restore the service configuration from XML, using the **ssoadm** command.

1. Backup OpenAM service configuration using the **ssoadm** command.

```
$ ssoadm export-svc-cfg -u amadmin -e fZatIu680iqccJMXosSRyVjMsWJIX+SA  
-f /tmp/pwd.txt -o ~/backup-`date` -u +%F-%m-%S`.xml  
Service Configuration was exported.
```

In this example, the secret key for encrypting the password in `-e fZatIu680iqccJMXosSRyVjMsWJIX+SA` was taken from the Password Encryption Key field in the OpenAM console under Configuration > Servers and Sites > *Server Name* > Security.

2. Stop OpenAM.
3. Back up the instance file that points to the configuration directory.

This file is named after the instance location, such as `$HOME/.openamcfg/AMConfig_path_to_tomcat_webapps_openam_`, where `$HOME` is that of the user running the web container where OpenAM is deployed.

4. Back up the files in the configuration directory.

The content of the file you backed up in the previous step is the path to the configuration directory, such as `$HOME/openam`.

5. Start OpenAM.

Procedure 11.2. To Restore OpenAM Configuration

The following steps restore OpenAM configuration data from backup as described in Procedure 11.1, “To Back Up OpenAM Configuration”.

Tip

If using the default OpenAM configuration data store, run **ssoadm embedded-status** to check the data store status to determine whether you must restore the configuration files including the embedded data store, or only the service configuration.

1. Deploy the OpenAM web application as you did for installation, but do not start OpenAM or configure it.

In a site configuration, perform this step on all servers.

2. Restore files in the configuration directory as necessary.

In a site configuration, perform this step on all servers.

3. Restore the bootstrap files as necessary.

In a site configuration, perform this step on all servers.

4. Start OpenAM.

In a site configuration, perform this step on all servers before proceeding.

5. Restore OpenAM service configuration using the **ssoadm** command.

```
$ ssoadm import-svc-cfg -u amadmin -e fZatIu680iqccJMXosSRyVjMsWJIx+SA  
-f /tmp/pwd.txt -X ~/backup-2011-09-13-09-00.xml  
  
Directory Service contains existing data. Do you want to delete it? [y|N] y  
Please wait while we import the service configuration...  
Service Configuration was imported.
```

In a site configuration, you perform this step only once.

If the password for amadmin has been changed through the OpenAM console, then use the bind password for the root DN of the configuration store.

6. Restart OpenAM.

In a site configuration, perform this step on all servers.

Chapter 12. Managing Certificates

This chapter shows you how to handle certificates used to protect network communication and for authentication.

In theory, you should not have to concern yourself with certificates when working with OpenAM. OpenAM core services and J2EE policy agents depend on the certificates installed for use with the web application container in which they run. OpenAM web policy agents depend on the certificates installed for use with the web server. Theoretically, each certificate has been signed by a well-known Certificate Authority (CA), whose certificate is already installed in the Java CA certificates trust store (`$JAVA_HOME/jre/lib/security/cacerts`, default password `changeit`) and in browsers, and so is recognized by other software used without you having to configure anything.

In practice, you might not have the budget for CA signed certificates in your lab or test environment, where you might constantly be installing new configurations, using and throwing away certificates for experiments and repeated tests. In the lab, therefore, you set up OpenAM to use self-signed certificates that you generate at no cost, but that are not recognized, and therefore not trusted out of the box.

How you configure the containers where OpenAM and your applications run to use self-signed certificates depends on your web application server or web server software. Yet, the basic principles apply.

- First, your container requires its own certificate for setting up secure connections.
- Second, the clients connecting must be able to trust the container certificate. Generally this means that clients must recognize the container certificate because they have a copy of the public certificate stored somewhere the client trusts.
- Third, if you use certificate authentication in OpenAM, OpenAM must also be able to find a copy of the client's public certificate to trust the client, most likely by finding a match with the certificate stored in the client profile from the identity repository. How you include client certificates in their identity repository entries depends on your identity repository more than it depends on OpenAM.

Some client applications let you trust certificates blindly. This can be helpful when working in your lab or test environment with self-signed certificates. For example, you might want to use HTTPS with the OpenAM RESTful API without having the client recognize the self-signed server certificate.

```
$ curl "https://openam.example.com:8443/openam/identity/authenticate?
  username=bjensen&password=hifalutin"
curl: (60) Peer certificate cannot be authenticated with known CA certificates
```

More details here: <http://curl.haxx.se/docs/sslcerts.html>

```
curl performs SSL certificate verification by default, using a "bundle"
of Certificate Authority (CA) public keys (CA certs). If the default
bundle file isn't adequate, you can specify an alternate file
using the --cacert option.
If this HTTPS server uses a certificate signed by a CA represented in
the bundle, the certificate verification probably failed due to a
problem with the certificate (it might be expired, or the name might
not match the domain name in the URL).
If you'd like to turn off curl's verification of the certificate, use
the -k (or --insecure) option.
$ curl --insecure "https://openam.example.com:8443/openam/identity/authenticate?
username=bjensen&password=hifalutin"
token.id=AQIC5wM2LY4SfczMax8jegpSiaigB96NOWylLilsd0PUMjY.*AAJTSQACMDE.*
```

Procedure 12.1. To Set Up OpenAM With HTTPS on Tomcat

The container where you install OpenAM requires a certificate in order to set up secure connections. The following steps demonstrate one way to set up Tomcat with an HTTPS connector, using the Java **keytool** command to manage the certificate and key stores. Once Tomcat can do HTTPS, you deploy OpenAM as you normally would, over HTTPS.

1. Stop Tomcat.
2. Create a certificate and store it in a new key store.

```
$ cd /path/to/tomcat/conf/
$ keytool -genkey -alias openam.example.com -keyalg RSA -keystore keystore.jks
Enter keystore password:
What is your first and last name?
  [Unknown]:  openam.example.com
What is the name of your organizational unit?
  [Unknown]:  Eng
What is the name of your organization?
  [Unknown]:  ForgeRock.com
What is the name of your City or Locality?
  [Unknown]:  Grenoble
What is the name of your State or Province?
  [Unknown]:  Isere
What is the two-letter country code for this unit?
  [Unknown]:  FR
Is CN=openam.example.com, OU=Eng, O=ForgeRock.com, L=Grenoble, ST=Isere,
C=FR correct?
  [no]:  yes

Enter key password for <openam.example.com>
(RETURN if same as keystore password):
```

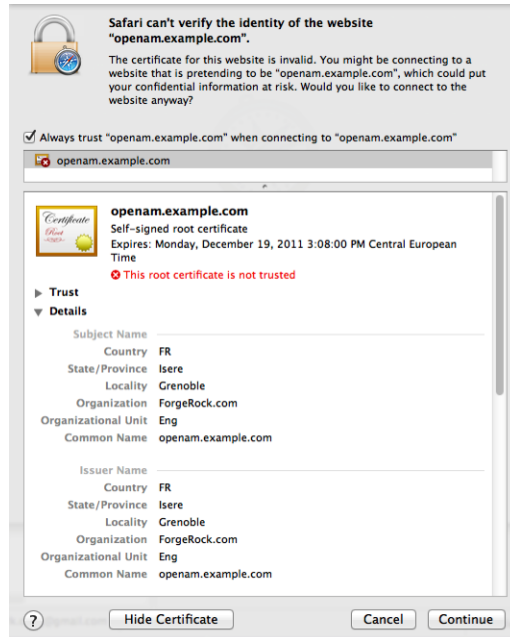
3. Uncomment the SSL connector configuration in Tomcat's `conf/server.xml`, specifying your key store file and password.

```
<!-- Define a SSL HTTP/1.1 Connector on port 8443
This connector uses the JSSE configuration, when using APR, the
connector should be using the OpenSSL style configuration
described in the APR documentation -->
```

```
<!--
-->
<Connector port="8443" protocol="HTTP/1.1" SSLEnabled="true"
maxThreads="150" scheme="https" secure="true"
keystoreFile="/path/to/tomcat/conf/keystore.jks"
keystorePass="changeit"
clientAuth="false" sslProtocol="TLS" />
```

4. Start Tomcat.
5. Verify that you can connect to Tomcat on port 8443 over HTTPS.

Your browser does not trust the certificate, because the certificate is self-signed, not signed by any of the CAs your browser knows.



You recognize the Subject and Issuer of your certificate, and so can choose to trust the certificate, effectively saving it into your browser's trust store.

6. Deploy and configure OpenAM as you normally would.

Procedure 12.2. To Share Self-Signed Certificates

When you use a self-signed certificate for your container, clients connecting must be able to trust the container certificate. Your browser makes this an easy, but manual process. For other client applications, you must import the certificate into the trust store used by the client. By default, Java

applications can use the `$JAVA_HOME/jre/lib/security/cacerts` store. The default password is `changeit`.¹ The steps that follow demonstrate how to import a self-signed certificate into the Java `cacerts` store.

1. Export the certificate from the key store.

```
$ cd /path/to/tomcat/conf/
$ keytool -exportcert -alias openam.example.com -file openam.crt -keystore
  keystore.jks
Enter keystore password:
Certificate stored in file <openam.crt>
```

2. Import the certificate into the trust store.

```
$ keytool -importcert -alias openam.example.com -file openam.crt
  -trustcacerts -keystore $JAVA_HOME/jre/lib/security/cacerts
Enter keystore password:
Owner: CN=openam.example.com, OU=Eng, O=ForgeRock.com, L=Grenoble, ST=Isere,
  C=FR
Issuer: CN=openam.example.com, OU=Eng, O=ForgeRock.com, L=Grenoble, ST=Isere,
  C=FR
Serial number: 4e789e40
Valid from: Tue Sep 20 16:08:00 CEST 2011 until: Mon Dec 19 15:08:00 CET 2011
Certificate fingerprints:
  MD5: 31:08:11:3B:15:75:87:C2:12:08:E9:66:00:81:61:8D
  SHA1: AA:90:2F:42:0A:F4:A9:A5:0C:90:A9:FC:69:FD:64:65:D9:78:BA:1D
  Signature algorithm name: SHA1withRSA
  Version: 3
Trust this certificate? [no]: yes
Certificate was added to keystore
```

Procedure 12.3. To Change the Signing Key for Federation

The following steps cover how to change the signing key for an identity provider. This procedure involves creating a self-signed certificate in a new key store file, and also preparing encrypted password files so that OpenAM can access the key store and the private key.

1. If you do not already have the new signing key in your key store, generate a new key and key store.

The following example starts an interactive **keytool** session that requests information needed to generate a new key valid for two years, and puts it in a key store named `keystore.jks`. You can perform this step in a temporary location, and then move the files generated once you have completed your work.

Keep track of the passwords you enter here, as you use them in the next step.

¹Alternatively, you can specify the trust store for a Java application, such as `-Djavax.net.ssl.trustStore=/path/to/truststore.jks -Djavax.net.ssl.trustStorePassword=changeit`.


```
$ cd /tmp
$ keytool -genkeypair -alias newkey -keyalg RSA -keysize 1024 -validity 730
-storetype JKS -keystore keystore.jks
Enter keystore password:
Re-enter new password:
What is your first and last name?
[Unknown]: openam.example.com
What is the name of your organizational unit?
[Unknown]: Eng
What is the name of your organization?
[Unknown]: ForgeRock.com
What is the name of your City or Locality?
[Unknown]: Grenoble
What is the name of your State or Province?
[Unknown]: Isere
What is the two-letter country code for this unit?
[Unknown]: FR
Is CN=openam.example.com, OU=Eng, O=ForgeRock.com, L=Grenoble, ST=Isere,
C=FR correct?
[no]: yes

Enter key password for <newkey>
(RETURN if same as keystore password):
Re-enter new password:
```

Self-signed keys are not automatically recognized by other entities. You must also share the self-signed key as described in Procedure 12.2, “To Share Self-Signed Certificates”.

2. Using the passwords you entered in the previous step, prepare the password files to encrypt.

Create two files, each containing only a password in clear text. You can create the files in the same directory as the key store.

- `keypass.cleartext` contains the clear text key password for the private key you generated.
- `storepass.cleartext` contains the clear text key store password.

3. If you have not already done so, install the administration tools as described in *To Set Up Administration Tools*.
4. Prepare encrypted password files for use by OpenAM.

```
$ ./ampassword --encrypt keypass.cleartext > .keypass
$ ./ampassword --encrypt storepass.cleartext > .storepass
```

Remove the `*.cleartext` files after preparing the encrypted versions.

5. Replace the default OpenAM key store and password files with the ones that you have created.

The following example works with an installation of OpenAM where the deployment URI is /openam.

```
$ cp keystore.jks .keypass .storepass ~/openam/openam/
```

6. Restart OpenAM, or the container where it runs, so that OpenAM can use the new key store and encrypted password files.
7. Login to OpenAM console as administrator, and then set the new signing key in one of two ways.
 - a. If you have not yet configured your identity provider, select Common Tasks > Create Hosted Identity Provider, and then follow the instructions, selecting your key from the Signing Key drop-down list.
 - b. If you have already configured your identity provider, browse to Federation > *provider-name* > Assertion Content > Signing and Encryption, and then edit the signing key certificate alias.

Save your work.

8. Share updated metadata with other entities in your circle of trust as described in *Setting Up SAML 2.0 SSO*.

Chapter 13. Monitoring OpenAM Services

This chapter covers how to monitor OpenAM services to ensure appropriate performance and service availability.

13.1. Monitoring Interfaces

OpenAM lets you monitor OpenAM over protocol through web pages, Java Management Extensions (JMX), or Simple Network Management Protocol (SNMP). The services are based on JMX.

To configure monitoring services, login to OpenAM console as OpenAM administrator, and browse to Configuration > System > Monitoring. Alternatively you can use the **ssoadm set-attr-defs** command.

```
$ ssoadm
set-attr-defs
--servicename iPlanetAMMonitoringService
--schematype Global
--adminid amadmin
--password-file /tmp/pwd.txt
--attributevalues iplanet-am-monitoring-enabled=true
```

Restart OpenAM for the changes to take effect. You must also restart OpenAM if you disable monitoring.

13.1.1. Web Based Monitoring

You can configure OpenAM to allow you to access a web based view of OpenAM MBeans on port 8082 where the core server runs, such as <http://openam-ter.example.com:8082/>. Either use the console, or use the **ssoadm** command.

```
$ ssoadm
set-attr-defs
--servicename iPlanetAMMonitoringService
--schematype Global
--adminid amadmin
--password-file /tmp/pwd.txt
--attributevalues iplanet-am-monitoring-http-enabled=true
```

The default authentication file allows you to authenticate over HTTP as user demo, password changeit. The user name and password are kept in the file specified, with the password encrypted.

```
$ cat openam/openam/openam_mon_auth
demo AQICMBCKLwx6G3vzK3TYYRbtTpNYAagVIPNP
```

Or

```
$ cat openam/openam/opensso_mon_auth
```

demo AQICvSe+tXEg8TUUT8ekzHb8IRzVSvm1Lc2u

You can encrypt a new password using the **ampassword** command. After changing the authentication file, you must restart OpenAM for the changes to take effect.

MBean View

[Project OpenDMKopendmk-1.0-b02]

- **MBean Name:**
SUN_OPENSSO_SERVER_MIB/ssoServerServerTable:ssoServerServerEntry.serverHostName=openam-ter.example.com,ssoServerServerEntry.serverPort=8080
- **MBean Java Class:** com.sun.identity.monitoring.SsoServerServerEntryImpl

Reload Period in seconds:

0

[Back to Agent View](#)

MBean description:

Information on the management interface of the MBean

List of MBean attributes:

Name	Type	Access	Value
ServerHostName	java.lang.String	RO	openam-ter.example.com
ServerId	java.lang.Integer	RO	1
ServerPort	java.lang.Integer	RO	8080
ServerProtocol	java.lang.String	RO	http
ServerStatus	java.lang.Integer	RO	1

13.1.2. JMX Monitoring

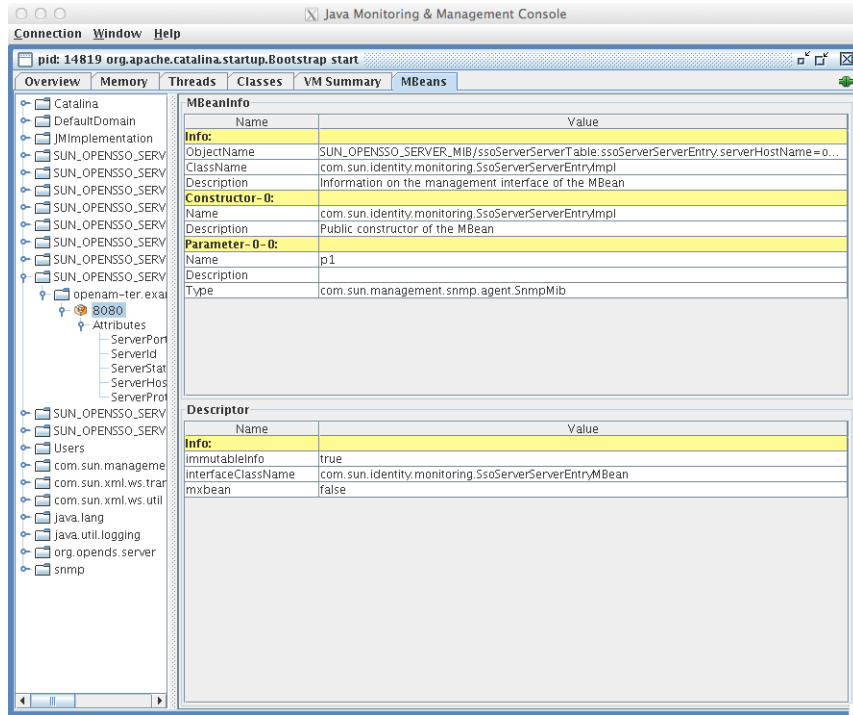
You can configure OpenAM to allow you to listen for Java Management eXtension (JMX) clients, by default on port 9999. Either use the OpenAM console page under Configuration > System > Monitoring and make sure both Monitoring Status and Monitoring RMI interface status are both set to Enabled, or use the **ssoadm** command.

```
$ ssoadm
set-attr-defs
--servicename iPlanetAMMonitoringService
--schematype Global
--adminid amadmin
--password-file /tmp/pwd.txt
--attributevalues iplanet-am-monitoring-enabled=true
iplanet-am-monitoring-rmi-enabled=true
```

A number of tools support JMX, including **jvisualvm** and **jconsole**. When you use **jconsole** to browse OpenAM MBeans for example, the default URL for the OpenAM running on the local system is service:jmx:rmi:///jndi/rmi://localhost:9999/server.

```
$ jconsole service:jmx:rmi:///jndi/rmi://localhost:9999/server &
```

You can also browse the MBeans by connecting to your web application container, and browsing to the OpenAM MBeans. By default, JMX monitoring for your container is likely to be accessible only locally, using the process ID.



Also see *Monitoring and Management Using JMX* for instructions on how to connect remotely, how to use SSL, and so forth.

13.1.3. SNMP Monitoring

You can configure OpenAM to allow you to listen on port 8085 for SNMP monitoring. Either use the console, or use the **ssoadm** command.

```
$ ssoadm
set-attr-defs
--servicename iPlanetAMMonitoringService
--schematype Global
--adminid amadmin
--password-file /tmp/pwd.txt
--attributevalues iplanet-am-monitoring-snmp-enabled=true
```

13.2. Is OpenAM Up?

You can check over HTTP whether OpenAM is up, using `isAlive.jsp`. Point your application to the file under the OpenAM URL, such as `http://openam.example.com:8080/openam/isAlive.jsp`.

If you get a success code (with `Server is ALIVE:` in the body of the page returned), then OpenAM is up.

13.3. Log Management

OpenAM implements logging as a service. This means remote clients such as your OpenAM policy agents can log messages to the central logging service.

13.3.1. Logging in OpenAM Core Services

By default OpenAM logs to files in the configuration directory for the instance, such as `$HOME/openam/log/` for log files, and `$HOME/openam/debug/` for debug files. You can also configure OpenAM to log through JDBC to a database such as MySQL or Oracle DB.

OpenAM sends messages to different log files, each named after the service logging the message, with two different types log files per service: `.access` and `.error`. Thus the current log files for the authentication service are named `amAuthentication.access` and `amAuthentication.error`.

See the Log Messages reference for details.

OpenAM lets you change the log level on the fly. OpenAM also supports log rotation, secure logging, and log message buffering.

To configure OpenAM logging properties overall, login to the OpenAM console as OpenAM administrator, and browse to Configuration > System > Logging.

To adjust the debug level while OpenAM is running, login to the OpenAM console as OpenAM administrator, and browse to Configuration > Servers and Sites > *Server Name* > General, and then scroll down to Debugging. The default level for debug logging is Error. This level is appropriate for normal production operations, in which case no debug log messages are expected.

Setting debug log level to Warning increases the volume of messages. Setting debug log level to Message dumps detailed trace messages. Unless told to do so by qualified support personnel, do not use Warning and Message levels in production.

During development, you might find it useful to log all debug messages to a single file. In order to do so, set Merge Debug Files to on.

After changing this setting, restart OpenAM or the container in which it runs for the change to take effect.

13.3.2. Logging in OpenAM Policy Agents

By default, OpenAM Policy Agents log to local files in their configuration directories for debugging. The exact location depends on where you installed the agent.

By default OpenAM policy agents send log messages remotely to OpenAM when you log auditing information about URL access attempts. To configure audit logging for a centrally managed policy agent, login to the OpenAM console as administrator, and browse to Access Control > *Realm Name* > Agents > *Agent Type* > *Agent Name* > Global, and then scroll down to the Audit section.

13.3.3. Debug Logging by Service

OpenAM lets you capture debug log messages selectively for a specific service. This can be useful when you must turn on debugging in a production system where you want to avoid excessive logging, but must gather messages when you reproduce a problem.

Perform these steps to capture debug messages for a specific service.

1. Login to OpenAM console as administrator, `amadmin`.
2. Browse to `Debug.jsp`, for example `http://openam.example.com:8080/openam/Debug.jsp`.

No links to this page are provided in the console.

3. Select the service to debug and also the level required given the hints provided in the `Debug.jsp` page.

The change takes effect immediately.

4. Promptly reproduce the problem you are investigating.
5. After reproducing the problem, immediately return to the `Debug.jsp` page, and revert to normal log levels to avoid filling up the disk where debug logs are stored.

13.3.4. Rotating Debug Logs

By default OpenAM does not rotate debug logs. To rotate debug logs, edit `WEB-INF/classes/debugconfig.properties` where OpenAM is deployed.

The `debugconfig.properties` file includes the following properties.

`org.forgerock.openam.debug.prefix`

This property specifies the debug log file prefix applied when OpenAM rotates a debug log file. The property has no default. It takes a string as the property value.

`org.forgerock.openam.debug.suffix`

This property specifies the debug log file suffix applied when OpenAM rotates a debug log file. The property takes a `SimpleDateFormat` string. The default is `-MM.dd.yyyy-kk.mm`.

`org.forgerock.openam.debug.rotation`

This property specifies an interval in minutes between debug log rotations. Set this to a value greater than zero to enable debug log rotation.

After you edit the `debugconfig.properties` file, you must restart OpenAM or the web container where it runs for the changes to take effect.

13.4. Session Management

OpenAM console lets the administrator view and manage current user sessions under the Sessions tab page.

VERSION LOG OUT

User: amAdmin Server: openam-ter

OpenAM

Common Tasks Access Control Federation Configuration Sessions

Current Sessions

View: openam-ter.example.com:8080

Sessions

*jensen Search

Sessions (1 Item(s))

Invalidate Session

<input checked="" type="checkbox"/>	User Id	Time Remaining (minutes)	Max Session Time (minutes)	Time Idle(minutes)	Max Idle Time (minutes)
<input type="checkbox"/>	bjensen	119	120	0	30

To end a user session manually, select the user's session, and then click the Invalidate Session button. As a result, the user has to authenticate again.

Chapter 14. Tuning OpenAM

This chapter covers key OpenAM tunings to ensure smoothly performing access and federation management services, and to maximize throughput while minimizing response times.

Note

The recommendations provided here are guidelines for your testing rather than hard and fast rules for every situation. Said another way, the fact that a given setting is configurable implies that no one setting is right in all circumstances.

The extent to which performance tuning advice applies depends to a large extent on your requirements, on your workload, and on what resources you have available. Test suggestions before rolling them out into production.

As a rule of thumb, an OpenAM server in production with a 3 GB heap can handle 100,000 sessions. Although you might be tempted to use a larger heap with a 64-bit JVM, smaller heaps are easier to manage. Thus, rather than scaling single servers up to increase the total number of simultaneous sessions, consider scaling out by adding more servers instead. The suggestions that follow pertain to production servers.

14.1. OpenAM Server Settings

OpenAM has a number of settings that can be tuned to increase performance.

14.1.1. General Settings

The following general points apply.

- Set debug level to error.
- Disable session failover debugging.
- Set container-level logging to a low level such as error or severe.

14.1.2. LDAP Settings

Tune both your LDAP data stores and also your LDAP authentication modules.

To change LDAP data store settings, browse to Access Control > *Realm Name* > Data Stores > *Data Store Name* in the OpenAM console.

Table 14.1. LDAP Data Store Settings

Property	Default Value	Suggestions
LDAP Connection Pool Minimum Size	Pool 1	The minimum LDAP connection pool size; a good tuning value for this property is 10.
LDAP Connection Pool Maximum Size	Pool 10	The maximum LDAP connection pool size; a high tuning value for this property is 65, though you might well be able to reduce this for your deployment. Ensure your LDAP server can cope with the maximum number of clients across all the OpenAM servers.

To change connection pool settings for the LDAP authentication module, browse to Configuration > Authentication > Core in the OpenAM console.

Table 14.2. LDAP Data Store Settings

Property	Default Value	Suggestions
Default LDAP Connection Pool Size	1:10	The minimum and maximum LDAP connection pool used by the LDAP authentication module. This should be tuned to 10:65 for production.
Caching	False	Turn on the caching feature in the LDAP data store.
Maximum Age of Cached Items	600	This is 10 minutes and does not normally need tuning.
Maximum Size of the Cache	10240	This is 10k and is very small for a cache. A 1 MB cache (1048576) is a better starting point.

14.1.3. Notification Settings

OpenAM has two thread pools used to send notifications to clients. The Service Management Service thread pool can be tuned in OpenAM console under Configuration > Servers and Sites > Default Server Settings > SDK.

Table 14.3. SMS Notification Settings

Property	Default Value	Suggestions
Notification Pool Size	10	This is the size of the thread pool used to send notifications. In production this value

Property	Default Value	Suggestions
		should be fine unless lots of clients are registering for SMS notifications.

The session service has its own thread pool to send notifications. This is configured under Configuration > Servers and Sites > Default Server Settings > Session.

Table 14.4. Session Service Notification Settings

Property	Default Value	Suggestions
Notification Pool Size	10	This is the size of the thread pool used to send notifications. In production this should be around 25-30.
Notification Thread Pool Threshold	5000	This is the maximum number of notifications in the queue waiting to be sent. The default value should be fine in the majority of installations.

14.1.4. Session Settings

The session service has additional properties to tune, which are configured under Configuration > Servers and Sites > Default Server Settings > Session.

Table 14.5. Session Settings

Property	Default Value	Suggestions
Maximum Sessions	5000	In production this value can safely be set into the 100,000's. The maximum session limit is really controlled by the maximum size of the JVM heap which must be tuned appropriately to match the expected number of concurrent sessions.
Sessions Purge Delay	0	This should be zero to ensure sessions are purged immediately.

14.2. Java Virtual Machine Settings

This section gives some initial guidance on configuring the JVM for running OpenAM. These settings provide a strong foundation to the JVM before

a more detailed garbage collection tuning exercise, or as best practice configuration for production.

Table 14.6. Heap Size Settings

JVM Parameters	Suggested Value	Description
-Xms & -Xmx	At least 1024m, - production environments 2048m to 3072m. This setting depends on the available physical memory, and on whether a 32 or 64- bit JVM is used.	
-server	-	Ensures the server JVM is used
-Xss	132k	The stack size for each thread
-XX:PermSize & -XX:MaxPermSize	Set both to 96m	Controls the size of the permanent generation in the JVM
- Dsun.net.client.defaultReadTimeout	60000	Controls the read timeout in the Java HTTP client implementation
- Dsun.net.client.defaultConnectTimeout	High setting: 30000 (30 seconds)	This applies only to the Sun/Oracle HotSpot JVM. Controls the connect timeout in the Java HTTP client implementation When you have hundreds of incoming requests per second, reduce this value to avoid a huge connection queue. This applies only to the Sun/Oracle HotSpot JVM.

Table 14.7. Garbage Collection Settings

JVM Parameters	Suggested Value	Description
-verbose:gc	-	Verbose garbage collection reporting
-Xloggc:	\$CATALINA_HOME/logs/gc.log	Location of the verbose garbage collection log file
-XX:+PrintClassHistogram	-	Prints a heap histogram when a SIGTERM signal is received by the JVM
-XX:+PrintGCDetails	-	Prints detailed information about garbage collection
-XX:+PrintGCTimeStamps	-	Prints detailed garbage collection timings
-XX:+HeapDumpOnOutOfMemoryError	-	Out of Memory errors generate a heap dump automatically
-XX:HeapDumpPath	\$CATALINA_HOME/logs/heapdump.hprof	Location of the heap dump
-XX:+UseConcMarkSweepGC	-	Use the concurrent mark sweep garbage collector
-XX: +UseCMSCompactAtFullCollection	-	Aggressive compaction at full collection
-XX:+CMSClassUnloadingEnabled	-	Allow class unloading during CMS sweeps

Chapter 15. Changing Host Names

When you change the OpenAM host name, you must make manual changes to the configuration. This chapter describes what to do. If you also must move an embedded configuration directory from one host to another, see the OpenDJ documentation on *Moving Servers*.

Changing OpenAM host names involves the following high level steps.

- Adding the new host name to the Realm/DNS Aliases list
- Exporting, editing, then importing the configuration

This step relies on the **ssoadm** command, which you install separately from OpenAM as described in *To Set Up Administration Tools*.

- Stopping OpenAM and editing configuration files
- Removing the old host name from the Realm/DNS Aliases list

Before you start, make sure you have a current backup of your current installation. See *Backing Up and Restoring OpenAM Configurations* for instructions.

Procedure 15.1. To Add the New Host Name As an Alias

1. Login to OpenAM console as administrator, `amadmin`.
2. Under Access Control > / (Top Level Realm), add the new host name to the Realm/DNS Aliases list, and then save your work.

Procedure 15.2. To Export, Edit, & Import the Service Configuration

1. Export the service configuration.

```
$ ssoadm export-svc-cfg -u amadmin -e fZatIu680iqccJMXosSRyVjMsWJIx+SA  
-f /tmp/pwd.txt -o config.xml
```

```
Service Configuration was exported.
```

In this example, the secret key for encrypting the password in `-e fZatIu680iqccJMXosSRyVjMsWJIx+SA` was taken from the Password Encryption Key field in the OpenAM console under Configuration > Servers and Sites > *Server Name* > Security.

2. Edit the service configuration file.
 - Change the fully qualified domain name, such as `openam.example.com`, throughout the file.

-
- If you are changing the deployment descriptor, such as /openam, then change the value of `com.ipplanet.am.services.deploymentDescriptor`.

Also change the deployment descriptor in the `propertiesViewBeanURL="deployment-descriptor/auth/ACServiceInstanceList"` attribute.

Also change the deployment descriptor in the `propertiesViewBeanURL="deployment-descriptor/auth/ACModuleList"` attribute.

Also change the deployment descriptor in a `<Value>` element that is a child of an `<AttributeValuePair>` element.

Also change the deployment descriptor where it occurs throughout the file in the full URL to OpenAM, such as `http://openam.example.com:8080/deployment-descriptor`.

- If you are changing the port number, then change the value of `com.ipplanet.am.server.port`.

Also change the port number in `host:port` combinations throughout the file.

- If you are changing the domain name, then change the cookie domain such as `<Value>.example.com</Value>` throughout the file.

3. Import the updated service configuration.

```
$ ssoadm import-svc-cfg -u amadmin -e fZatIu680iqccJMXosSRyVjMsWJIx+SA
-f /tmp/pwd.txt -X config.xml

Directory Service contains existing data. Do you want to delete it? [y|N] y
Please wait while we import the service configuration...
Service Configuration was imported.
```

Procedure 15.3. To Edit OpenAM Configuration Files For the New Host Name

1. Stop the web container where OpenAM runs.
2. Edit the bootstrap file, such as `/home/user/openam/bootstrap`, changing the FQDN, port, and deployment descriptor for OpenAM as necessary.
3. If you are changing the deployment descriptor, then move the folder containing OpenAM configuration, such as `/home/user/openam/`, to match the new deployment descriptor, such as `/home/user/openam2/`.

-
4. If you are changing the location or deployment descriptor, change the name of the file in the `/home/user/.openamcfg` folder, such as `AMConfig_path_to_tomcat_webapps_openam_` to match the new location and deployment descriptor.

Also edit the path name in the file to match the change you made when moving the folder.

5. Restart the web container where OpenAM runs.

Procedure 15.4. To Remove the Old Host Name As an Alias

1. Login to OpenAM console as administrator, `amadmin`.
2. Under Access Control > / (Top Level Realm), remove the old host name from the Realm/DNS Aliases list, and then save your work.

Chapter 16. Securing OpenAM

This chapter identifies best practices for securing your OpenAM deployment.

16.1. Avoiding Obvious Defaults

OpenAM includes default settings to make it easier for you to evaluate the software. Avoid these default settings in production deployments.

- When connecting to LDAP, bind with a specific administrative account rather than a root DN account if possible.
- Change the default iPlanetDirectoryPro cookie name both in OpenAM (`com.iplanet.am.cookie.name`) and in your policy agent profiles (`com.sun.identity.agents.config.cookie.name`).
- When installing OpenAM, do not use `/openam` or `/opensso` as the deployment URI.
- Set valid goto URL domains for OpenAM in the core authentication module configuration. The parameter is described in the section providing *Hints For the Core Authentication Module* (`iplanet-am-auth-valid-goto-domains`).
- Create an administrator in the top-level realm with a different ID than the default `amadmin`.
- Create specific administrator users to track better who makes configuration changes.
- Set the OpenAM advanced property `openam.auth.soap.rest.generic.authentication.exception` to `true`. This causes OpenAM to return the same exception both when the user does not exist, and also when the password is not valid.

16.2. Protecting Network Access

Reduce the opportunity for unauthorized access by exposing only what is necessary.

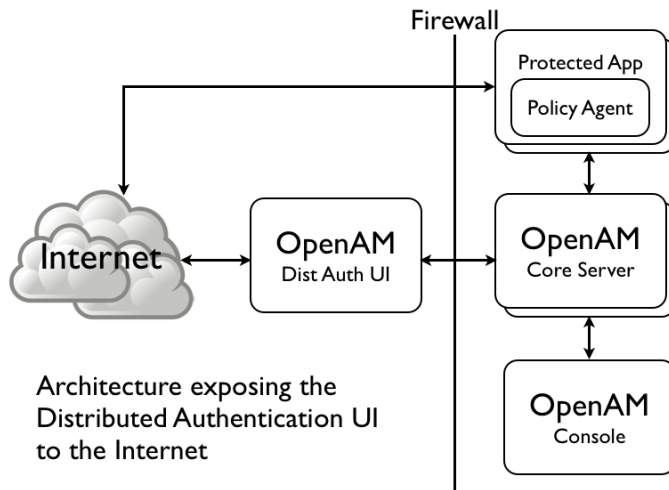
- Do not deploy OpenAM console on Internet-facing servers.

Limit the number of endpoints exposed to the Internet.

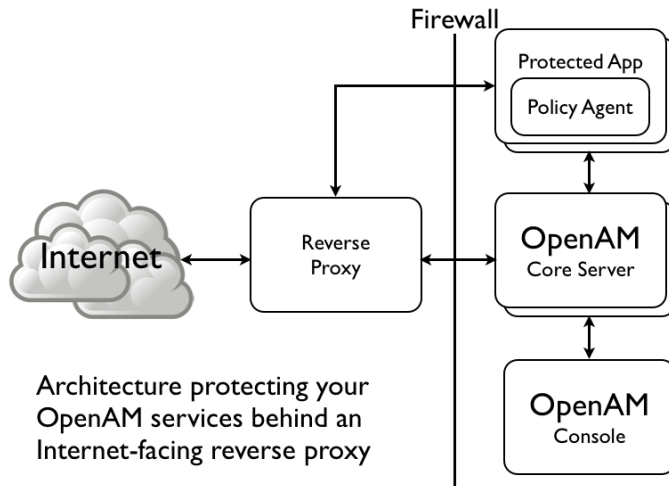
To achieve this, deploy only the core server on Internet-facing servers. See *Determine Which War File to Deploy*.

Even better, further limit what is exposed by deploying only the distributed authentication user interface on Internet-facing servers. See *Installing*

OpenAM Distributed Authentication for installation instructions. The following figure shows the recommended architecture.



If you must provide Internet-facing user access to OpenAM, either use a reverse proxy in front of OpenAM to allow access only to the necessary URLs, or use the distributed authentication user interface. The following figure shows the recommended architecture.



For access to the console, deploy the full OpenAM application¹ on a separate system that is reachable only from internal systems. Do not include the full OpenAM server in the load-balanced pool of OpenAM servers serving applications.

- Leave `ssoadm.jsp` disabled in production. (Advanced property: `ssoadm.disabled=true`)
- If possible in your deployment, control access to OpenAM console by network address, such that administrators can only connect from well-known systems and networks.
- Restrict access to URIs that you do not use, and prevent internal endpoints such as `/session/service` from being reachable over the Internet.

16.3. Securing OpenAM Administration

Keep administration of access management services separate from management of the services themselves.

- Create realms for your organization(s) and separate administrative users from end users. For instructions, see *Configuring Realms*. You must then either:
 - Use the `realm=realm-name` query string parameter when redirecting users to OpenAM, which gives you a way to isolate the URLs used by an application.
 - Create fully qualified domain name realm/DNS aliases, and use them to control access to the realms.
- When customizing `config/auth/default*/Login.jsp`, make sure that you do not introduce any security vulnerabilities such as cross-site scripting due to unvalidated input.
- Create a policy agent profile for each policy agent. See *Configuring Policy Agent Profiles* for instructions.

16.4. Securing Communications

Keep communications secure by using encryption, properly configured cookies, and request and response signatures.

- Protect network traffic by using HTTPS and LDAPS where possible.
- When using HTTPS, use secure cookies.

¹Console only deployment is no longer supported.

- Where possible, use subdomain cookies, and control subdomains in a specific DNS master.
- Use cookie hijacking protection with restricted tokens, where each policy agent uses different SSO tokens for the same user. See *To Protect Against CDSSO Cookie Hijacking* for instructions.
- When using SAML 2.0:
 - Sign authentication requests, authentication responses, and single logout requests.
 - If the other entities in your circle of trust can handle encryption, then use encryption as well.
 - Use your own key, not the test key provided with OpenAM.

16.5. Administering the amadmin Account

You can make changes to the password and user name for the main OpenAM administrative account.

You can change the user name of the amadmin administrative account to something more obscure, such as superroot. However, the capabilities of that alternative administrative account would not be complete, due to some hard-coding of amadmin in the source files. When changing the password for the main OpenAM administrative account, you must make a corresponding change to the authentication datastore. That datastore could be OpenDJ. The steps you would take to change the OpenAM top-level administrative password and account name are shown in the following sections.

Procedure 16.1. To Change the Password for the Top-Level Administrator (normally amadmin)

1. Login to the OpenAM console as the administrator, normally amadmin.
2. Under Access Control > / (Top Level Realm) > Subjects > User, select the name of the current top-level administrative user.
3. In the page that appears, navigate to the Password row and click Edit.
4. In the window that appears, enter the desired new password in the New Password and Re-Enter Password text boxes.
5. Click OK to implement the change. If you want to cancel, click Close or just close the window.
6. You'll also need to change the password for the administrator on the directory server. If you are using OpenDJ, refer to the *OpenDJ 2.5.0*

Administration Guide section on Resetting Administrator Passwords. If you are using a different directory server, you will have to refer to the documentation for that server.

In the following steps, you will identify the new administrative user by assigning it to the `com.sun.identity.authentication.super.user` directive. You may also need to create an OpenAM account for the new administrative user. Don't forget to make sure that new administrative account is configured in the corresponding directory server such as OpenDJ.

Procedure 16.2. To Change the Account Name for the Top-Level Administrator (normally amadmin)

1. Login to the OpenAM console as the administrator, normally amadmin.
2. Navigate to the page where you can set the properties for different classes. Select Configuration > Servers and Sites > *Server Name* > Advanced.
3. In the Advanced Properties window that appears, click Add.
4. You'll see blank entries in the end of the list of Property Names and Property Values. In the empty Property Name text box, enter `com.sun.identity.authentication.super.user`.
5. In the corresponding Property Values test box, enter appropriate values for the new administrative user in LDAP Data Interchange Format (LDIF). For example, the following entry would set up an administrative user named superroot, in the organizational unit named peoplepeople, associated with the example.com domain:
`uid=superroot,ou=people,dc=example,dc=com`.
6. Click Save to save the changes that you've made.
7. If the account doesn't already exist in OpenAM or on a connected directory server, you'll need to create it. To do so, select Access Control > / (Top Level Realm) > Subject > User > New. In the New User window that appears, create the new user. Make sure to enter an appropriate password and make that user Active. The ID for that new user is the user name.
8. As noted earlier, you'll also need to make sure that the corresponding account on the directory server has at least CN=Directory Manager privileges. If you're using OpenDJ, refer to the chapter on *Configuring Privileges & Access Control* in the *OpenDJ Administration Guide*.

If you do change the account name of the top-level administrative account, you should be aware that the original amadmin account is "hard-coded" in

the source code of several files. The code in these files may affect the functionality of a top-level administrative user with a name other than `amadmin`.

One of the improvements that we plan to make to OpenAM is to eliminate these instances of hard-coding. Until we make such improvements, the `amadmin` user would retain privileges related to the `LoginState` and some IDM-related classes.

Chapter 17. Troubleshooting

This chapter covers how to get debugging information and troubleshoot issues in OpenAM deployments.

Solutions to Common Issues

This section offers solutions to common problems when working with OpenAM.

17.1. OpenAM Installation

Q: OpenAM configuration could not write to the configuration directory. Where must I change permissions, and what permissions are required?

A: If the user running the web container has a \$HOME directory, then the configuration directory is stored there, and you probably do not have this problem. If you do not know the user running the web container, use the **ps** command to check. In the following example, the user is mark, the web container tomcat.

```
$ ps -ef | grep tomcat
mark      1739      1  0 14:47...
```

For a container installed from native packages with a dedicated user, \$HOME may not be where you think it is. Look at the user's entry in /etc/passwd to locate the home directory. The user running the web container where you install OpenAM must be able to read from and write in this directory.

If you cannot change the permissions to the user's home directory, you can, as a workaround, unpack openam-server-10.1.0-Xpress.war, set the configuration.dir property in the WEB-INF/classes/bootstrap.properties to a directory with appropriate permissions, and repack openam.war with the adjusted file before deploying that.

```
$ cd ~/Downloads/openam/openam-server-10.1.0-Xpress.war
$ mkdir unpacked ; cd unpacked
$ jar xf ../openam-server-10.1.0-Xpress.war
$ vi WEB-INF/classes/bootstrap.properties
$ grep ^config WEB-INF/classes/bootstrap.properties
configuration.dir=/my/readwrite/config/dir
$ jar cf ../openam.war *
```

Q: Deployment failed due to lack of memory. What do I do?

A: OpenAM requires at least a maximum heap size of 1024 MB, with a 256 MB maximum permanent generation heap size. For the Sun JVM,

ensure the container starts with `-Xmx1024m -XX:MaxPermSize=256m` for these settings.

If you do not know the settings used when the web container was started, use the **ps** command to check. In the following example, the web container is tomcat.

```
$ ps -ef | grep tomcat | grep Xm
... -Xmx1024m -XX:MaxPermSize=256m ...
```

Make sure you have at least 2 GB of RAM on the system where you run OpenAM to avoid running out of memory.

If you make it through deployment and seem to be running out of memory later, you can confirm memory errors in OpenAM by searching the `config-dir/openam/debug/*` files for `java.lang.OutOfMemoryError`.

- Q:** Deployment failed due to invalid hostname configuration. What do I do?
- A:** OpenAM requires that you use a fully qualified domain name (FQDN) that the host can resolve.

```
$ ping openam-ter.example.com
PING openam-ter (192.168.56.2) 56(84) bytes of data.
64 bytes from openam (192.168.56.2): icmp_seq=1 ttl=64 time=0.025 ms
64 bytes from openam (192.168.56.2): icmp_seq=2 ttl=64 time=0.032 ms
64 bytes from openam (192.168.56.2): icmp_seq=3 ttl=64 time=0.030 ms
```

For a test deployment (at home, on a laptop), you can use fake FQDNs in `/etc/hosts` (%SystemRoot%\system32\drivers\etc\hosts on Windows), depending on how your network is configured.

```
$ cat /etc/hosts | grep openam
192.168.56.2 openam openam.example.com
192.168.56.3 openam-bis openam-bis.example.com
192.168.56.5 openam-ter openam-ter.example.com
```

- Q:** I configured OpenAM, and now am seeing the configuration screen again. Who deleted my configuration?
- A:** OpenAM uses a file in `$HOME/.openamcfg/` to bootstrap and find its configuration. The file is named after the path to OpenAM and contains the path to the configuration. The following example shows what the file looks like for OpenAM deployed in Apache Tomcat under `/path/to/tomcat/webapps/openam`, and running as user `amuser` with `$HOME /home/amuser`.

```
$ cat .openamcfg/AMConfig_path_to_tomcat_webapps_openam_
/home/amuser/openam
```

If OpenAM cannot find its configuration, then it displays the configuration screen.

17.2. OpenAM Administration

Q: I cannot use the browser-based equivalent of **ssoadm**, `http://openam.example.com:8080/openam/ssoadm.jsp`. Why not?

A: For security reasons, `ssoadm.jsp` is not activated by default. To activate it, browse to Configuration > Servers and Sites > Servers > *ServerName* > Advanced, and then add a property named `ssoadm.disabled` with value `false`.

Q: I added OpenDJ as a data store, and now I cannot add a user. OpenAM gives me the following error.

```
ERROR: LDAPv3Repo.create failed. errorCode=65 Entry
uid=test,ou=people,dc=example,dc=com violates the Directory Server
schema configuration because it includes attribute inetUserStatus which
is not allowed by any of the objectclasses defined in that
entry
```

A: When you set up a New Data Store to use OpenDJ as an identity repository under Access Control > *Realm Name* > Data Stores > New..., you need to check the Load schema when finished box if you want OpenAM to add the schema to OpenDJ. The box is not selected by default.

The full version of OpenAM includes directory server schema in the `~/Downloads/openam/ldif/` directory. To add the schema to OpenDJ afterwards, you can try the following command.

```
$ /path/to/OpenDJ/bin/ldapmodify
--port 1389
--bindDN "cn=Directory Manager"
--bindPassword password
--filename ~/Downloads/openam/ldif/fam_sds_schema.ldif
Processing MODIFY request for CN=schema
MODIFY operation successful for DN CN=schema
```

Q: I have session failover configured for an OpenAM site. I see many connections in `TIME_WAIT` state, and the connections seem to be used only for communication between OpenAM servers in that site. What should I set to have fewer connections in `TIME_WAIT`?

A: When you have session failover configured for a site, OpenAM servers run health checks against other servers in the same site. By default, the health checks are run every second (1000 milliseconds) with a timeout of 1 second (1000 milliseconds).

If there is network latency between servers in a site, for example if you are running your servers in virtual machines, the default settings might not be right for your deployment. In that case, consider changing the following advanced server properties.

- By lengthening `com.ipplanet.am.session.failover.cluster.stateCheck.timeout` and `com.ipplanet.am.session.failover.cluster.stateCheck.period` to something longer than the default, you can work around issues with network latency.
- By setting `com.sun.identity.urlchecker.dorequest` to `true` or `false`, you can change whether OpenAM performs an HTTP GET request or only checks the Socket connection of `com.sun.identity.urlchecker.targeturl` as a health check.

To set advanced properties, either use the OpenAM console page under Configuration > Servers and Sites > Default Server Settings > Advanced, or set the properties using the **ssoadm update-server-cfg** command as in the following example, which updates the default server configuration:

```
$ ./ssoadm update-server-cfg -s default -u amadmin -f /tmp/pwd.txt  
-a com.ipplanet.am.session.failover.cluster.stateCheck.timeout=2000
```

OpenAM Glossary

Agent administrator	User having privileges only to read and write policy agent profile configuration information, typically created to delegate policy agent profile creation to the user installing a policy agent
Authentication	The act of confirming the identity of a principal
Authentication module	OpenAM authentication unit that handles one way of obtaining and verifying credentials
Authentication chaining	A series of authentication modules configured together which a principal must negotiate as configured in order to authenticate successfully
Access control	Control to grant or to deny access to a resource
Account lockout	The act of making an account temporarily or permanently inactive after successive authentication failures
Agent authenticator	Entity with read-only access to multiple agent profiles defined in the same realm; allows an agent to read web service profiles
Application	In the context of OpenAM entitlements, protected resources that share a common set of actions and related policies
Attribute based access control (ABAC)	Access control that is based on attributes of a user, such as how old a user is or whether she is a paying customer
Authentication level	Positive integer associated with an authentication module, usually used to require success with more stringent authentication measures when requesting resources requiring special protection
Authorization	The act of determining whether to grant or to deny a principal access to a resource
Authorization Server	In OAuth 2.0, issues access tokens to the client after authenticating a resource owner and confirming that the owner authorizes the client to access the protected resource. OpenAM can play this role in the OAuth 2.0 authorization framework.
Auto-federation	Arrangement to federate a principal's identity automatically based on a common attribute value

	shared across the principal's profiles at different providers
Bulk federation	Batch job permanently federating user profiles between a service provider and an identity provider based on a list of matched user identifiers that exist on both providers
Circle of trust	Group of providers, including at least one identity provider, who have agreed to trust each other to participate in a SAML 2.0 provider federation
Client	In OAuth 2.0, requests protected web resources on behalf of the resource owner given the owner's authorization. OpenAM can play this role in the OAuth 2.0 authorization framework.
Conditions	Optional conditions under which a policy applies
Configuration data store	LDAP directory service holding OpenAM configuration data
Cross-domain single sign on (CDSSO)	OpenAM capability allowing single sign on across different DNS domains
Delegation	In the context of OpenAM entitlements, a means of granting specific users privileges to manage policies
Entitlement	XACML-based policy
Extended metadata	Federation configuration information specific to OpenAM
Extensible Access Control Markup Language (XACML)	Standard, XML-based access control policy language, including a processing model for making authorization decisions based on policies
Federation	Standardized means for aggregating identities, sharing authentication and authorization data information between trusted providers, and allowing principals to access services across different providers without authenticating repeatedly
Fedlet	Service provider application capable of participating in a circle of trust and allowing federation without installing all of OpenAM on the service provider side; OpenAM lets you create both .NET and Java Fedlets.

Hot swappable	Refers to configuration properties for which changes can take effect without restarting the container where OpenAM runs
Identity	Set of data that uniquely describes a person or a thing such as a device or an application
Identity federation	Linking of a principal's identity across multiple providers
Identity provider (IdP)	Entity that produces assertions about a principal (such as how and when a principal authenticated, or that the principal's profile has a specified attribute value)
Identity repository	Data store holding user profiles and group information; different identity repositories can be defined for different realms.
Java EE policy agent	Java web application installed in a web container that acts as a policy agent, filtering requests to other applications in the container with policies based on application resource URLs
Metadata	Federation configuration information for a provider
Policy	Set of rules that define who is granted access to a protected resource when, how, and under what conditions
Policy administration point (PAP)	Entity that manages and stores policy definitions
Policy agent	Agent that intercepts requests for resources, directs principals to OpenAM for authentication, and enforces policy decisions from OpenAM
Policy decision point (PDP)	Entity that evaluates access rights and then issues authorization decisions
Policy enforcement point (PEP)	Entity that intercepts a request for a resource and then enforces policy decisions from a PDP
Policy information point	Entity that provides extra information such as user profile attributes that a PDP needs in order to make a decision
Principal	Entity that can be authenticated (such as a user, a device, or an application)

Provider federation	Agreement among providers to participate in a circle of trust
Realm	OpenAM unit for organizing configuration and identity information, making it possible to delegate administration for part of OpenAM configuration; realms can be used for example when different parts of an organization using OpenAM have different policies and different identity repositories
Referral	Means to delegate policy management and decision making for a realm
Resource	Something a principal can access over the network such as a web page
Resource owner	In OAuth 2.0, entity who can authorize access to protected web resources, such as an end user
Resource server	In OAuth 2.0, server hosting protected web resources, capable of handling access tokens to respond to requests for such resources
Response providers	Policy extensions that define additional information to return in an authorization decision beyond "allow" or "deny"
Role based access control (RBAC)	Access control that is based on whether a user has been granted a set of permissions (a role)
Rules	Definitions identifying how a policy matches resources to which access is granted or denied
Security Assertion Markup Language (SAML)	Standard, XML-based language for exchanging authentication and authorization data between identity providers and service providers
Service provider (SP)	Entity that consumes assertions about a principal (and provides a service that the principal is trying to access)
Session	In OpenAM a user session is the interval that starts with the user authenticating through OpenAM and ends when the user logs out, or when her session is terminated. OpenAM manages user sessions across one or more applications by issuing a session token used to identify the session and by tracking the session state in order to handle session events like logout and timeout, to permit session constraints, and to notify applications involved in SSO when a session ends.

Session failover	Capability to allow another OpenAM server to manage a session when the OpenAM server that initially authenticated the principal goes offline
Session token	Unique identifier issued by OpenAM after successful authentication, used to track a principal's session
Single log out (SLO)	Capability allowing a principal to end a session once, thereby ending her session across multiple applications
Single sign on (SSO)	Capability allowing a principal to authenticate once and gain access to multiple applications without authenticating again
Standard metadata	Standard federation configuration information that you can share with other access management software
Subject	Entity that can request access to a resource
User data store	Data storage service holding principals' profiles; underlying storage can be an LDAP directory service, a relational database, or a custom IdRepo implementation
Web policy agent	Native library installed in a web server that acts as a policy agent with policies based on web page URLs

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