PingFederate®

Web Access Management Integration Kit

Version 2.0

User Guide

Ping Identity®

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Version 2.0
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Introduction

The PingFederate Web Access Management (WAM) Integration Kit allows developers to integrate their applications with a PingFederate server acting as either an Identity Provider (IdP) or a Service Provider (SP). The WAM IdP Adapter allows an IdP enterprise to extend an existing investment by using the SAML or WS-Federation protocols to expand the reach of the WAM domain to partner applications. The WAM SP Adapter allows an SP enterprise to accept SAML or WS-Federation assertions and provide secure Internet Single sign-on (SSO) to applications protected by a supported WAM system.

Important: This kit is designed to work with WAM products from multiple vendors. A WAM plug-in is required to connect the integration kit with each third-party system. This kit ships with WAM plug-ins compatible with Oracle Access Manager (OAM) 11g R2, and with RSA Access Manager 6.1 (Note: The current RSA plugin does not support Adaptive Authentication. It is only qualified against Authentication Manager). A simple software development kit (SDK) is also included to create custom WAM plug-ins for other systems.

If you are creating a WAM plug-in for any third-party product other than OAM and RSA Access Manager, you must complete the tasks in the WAM plug-in SDK `README.txt` file located in the `<integration_kit_install_dir>/sdk` directory.

Intended Audience

This document is intended for system administrators with experience in the configuration and maintenance of the OAM Access Server or RSA Access Manager and other WAM tools, as well as developers with experience using JAVA SDKs. Please consult the WAM tool documentation if you encounter any difficulties in areas not directly associated with PingFederate or the WAM Integration Kit.

System Requirements

The following software must be installed in order to implement the WAM Integration Kit:

- PingFederate 6.x (or higher)
- WAM plug-in for the desired third-party system, built and deployed per the WAM plug-in SDK documentation
- Associated vendor-supplied libraries to support the WAM plug-in you are using.

  Fully functional WAM plug-ins for OAM and RSA are included in the WAM Integration Kit package.
- Separate third-party Web Agent configured using the WAM server administrative software

Important: PingFederate must be running in the same domain as the third-party WAM Web Agent for the applicable WAM Server.

ZIP Manifest

The distribution ZIP file for the Integration Kit contains the following:

- `ReadMeFirst.pdf` – contains links to this online documentation
- `/legal` – contains this document:
  - `Legal.pdf` – copyright and license information
- `/dist` – contains libraries needed to run the adapter:
  - `pf-wam-adapter-2.0.jar` – the WAM Adapter JAR file
  - `opentoken-adapter-2.5.1.jar` – OpenToken Adapter JAR file
- `/dist/oam` – contains Oracle Access Manager libraries needed to run the adapter:
  - `pf-oam-plugin.jar` – Pre-built OAM-compatible WAM plug-in JAR file
  - `PingCustomAuthPlugin.jar` – a Java-based PingFederate Custom Authentication Scheme
- `/dist/rsa` – contains RSA libraries needed to run the adapter:
  - `pf-rsa-plugin.jar` – Pre-built RSA-compatible WAM plug-in JAR file
  - `axm-runtime-api-6.1.4.jar` - RSA API library
  - `jsafeFIPS-6.1.jar` – RSA API library
  - `jsafeJCEFIPS-6.1.jar` – RSA API library
- `/sdk` – contains build scripts, documents, libraries, and sample code to build a WAM plug-in:
  - `README.txt` – contains instructions for creating a third-party WAM plug-in to interact with PingFederate.
  - `/docs` – contains documentation on how to build a WAM plug-in.
  - `/lib` – contains libraries and supporting files needed to build a WAM plug-in.
  - `/samples` – contains sample code used to build a WAM plug-in.

WAM Plug-ins

This kit ships with WAM plug-ins compatible with OAM 11g R2, RSA Access Manager 6.1, as well as a simple SDK to create custom WAM plug-ins for other systems, as described in these following sections.

Custom WAM Plug-in Installation

This section describes how to deploy a custom WAM plug-in for both IdP and SP adapters.

1. If you are creating a WAM plug-in for a third-party WAM product not bundled with this kit, you must complete the tasks in the WAM plug-in SDK `README.txt` file located in the `<integration_kit_install_dir>/sdk` directory.

Note: Contact the third-party vendor support department to obtain required third-party API libraries for creating a WAM plug-in to interact with PingFederate.

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2. After completing the tasks in the WAM plug-in SDK `README.txt` file, copy the resultant WAM plug-in output JAR file `pf-<WAM_TYPE>-plugin.jar` from the `<integration_kit_install_dir>SDK/lib` directory into the `<PF-install>/pingfederate/server/default/deploy` directory.

The WAM Integration Kit requires a plug-in to connect with a specific WAM product (see the WAM plug-in SDK in the distribution package for sample code and more details on building the plug-in). The SDK consists of build scripts, libraries, and sample code.

Note: The WAM plug-in SDK is designed specifically to connect the WAM Integration Kit with a third-party WAM product, using an API provided by the vendor.

WAM Plug-in Installation for RSA

This section describes how to deploy the pre-built RSA-compatible WAM plug-in for both IdP and SP adapters.

1. The additional RSA API libraries for creating a WAM plug-in to interact with PingFederate are included in the `<integration_kit_install_dir>/dist/rsa` directory.
   - `axm-runtime-api-6.1.4.jar`
   - `jsafeFIPS-6.1.jar`
   - `jsafeJCEFIPS-6.1.jar`
2. Copy the RSA API libraries, from the `<integration_kit_install_dir>/dist/rsa` directory into:

   `<PF_install>/pingfederate/server/default/deploy` directory.
3. Copy the `pf-rsa-plugin.jar` from the `<integration_kit_install_dir>/dist/rsa` directory into:

   `<PF_install>/pingfederate/server/default/deploy`
4. Complete the IdP and SP Adapter Installation prior to restarting the PingFederate server.

WAM Plug-in Installation for OAM

This section describes how to deploy the pre-built OAM-compatible WAM plug-in for both IdP and SP adapters.

1. Get the necessary OAM API library from the Oracle Identity Management Download site (`http://www.oracle.com/technetwork/middleware/downloads/oid-11g-161194.html`):

   `oamasdk-api.jar`
2. Copy the OAM API library provided by the vendor into the `<PF_install>/pingfederate/server/default/deploy` directory.
3. (Conditional) If OAM 10g is being used, copy the `pf-oam-plugin.jar` from the `<integration_kit_install_dir>/dist/oam` directory into:

`<PF_install>/pingfederate/server/default/deploy`

4. (Conditional) If OAM 11g is being used, copy the `pf-oam-11g-plugin.jar` from the `<integration_kit_install_dir>/dist/oam11g` directory into:

   `<PF_install>/pingfederate/server/default/deploy`

5. Complete the IdP and SP Adapter Installation prior to restarting the PingFederate server (see next section).

OAM-Specific Configuration

When configuring the OAM adapter, the following values are needed:

Field	Description	Example Value
Cookie Path	Relative path in the URL where the cookie is active.	/
Protected Resource	The path (and optionally, the hostname) that defines the protected resource. This value comes from your OAM configuration.	`http://<OAM Host Identifier>/<Resource Path>`
Error URL	Optional field containing a URL used as a redirection target in the event of an error during SSO when using this adapter.	
User Identifier	HTTP header used to identify the end userID.	OAM_REMOTE_USER
Session Token Name	The name of the encrypted cookie used for SSO.	ObSSOCookie
Session Token Loggedoff Value	The value the Session Token should be set to when the user has logged out of OAM.	loggedoutcontinue

Note: The above values are examples and are dependent on the OAM environment. Ask your Oracle administrator for the values required in your environment.

For more information about this configuration, see the Oracle Access Manager documentation.

IdP and SP Adapter Installation

This section describes how to install the WAM Integration Kit for both the IdP and the SP adapters.

Note: If you have already deployed version 2.5.1 (or higher) of the OpenToken Adapter, skip steps 1 through 3 in the following procedure.

1. Stop the PingFederate server if it is running.
2. Remove any existing OpenToken Adapter files (`opentoken*.jar`) and any existing WAM Adapter JAR file from the directory:

   `<PF_install>/pingfederate/server/default/deploy`

The adapter JAR file is `opentoken-adapter-<version>.jar`.

The WAM adapter JAR file is `pf-wam-adapter-<version>.jar`.

Note: If the adapter Jar filename indicates version 2.1 or less, also delete the supporting library `opentoken-java-1.x.jar` from the same directory.

3. Unzip the integration-kit distribution file and copy `opentoken-adapter-2.5.1.jar` from the `/dist` directory to the PingFederate directory.

   `<PF_install>/pingfederate/server/default/deploy`

4. From this distribution, copy the following file to the `/server/default/deploy` directory in your PingFederate server installation:

   `pf-wam-adapter-2.0.0.jar`

5. *If* you are running PingFederate 6.0 as a Windows service, *then*:

   Edit the `Java Library Path` section of the configuration file `pingfederate/sbin/wrapper/PingFederateService.conf`, adding the line:

   `wrapper.java.library.path.append_system_path=true`

6. Start the PingFederate server.

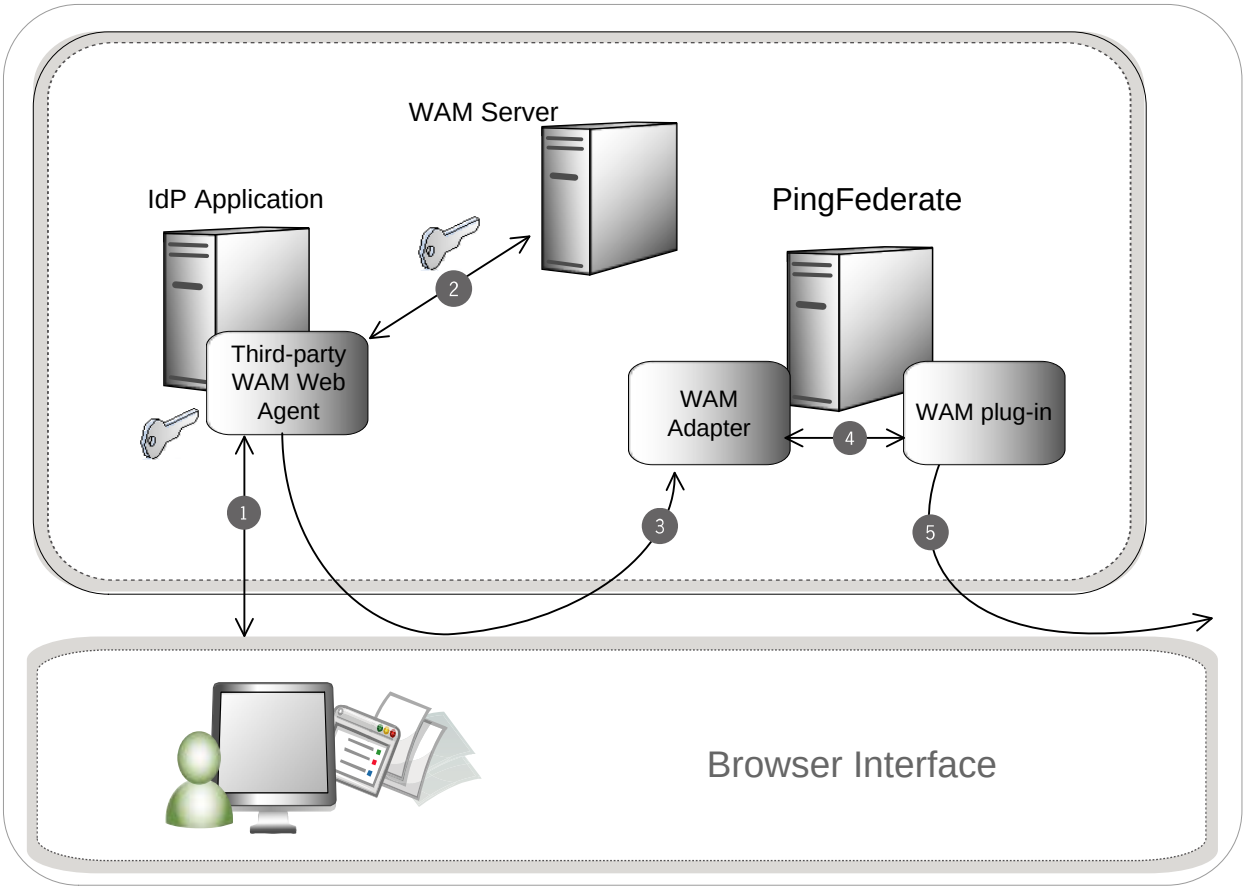
Implementing IdP Functionality

The WAM IdP Adapter uses the WAM Agent API to decrypt the WAM session cookie and pass attributes to the PingFederate server. You can then add attribute values to the attribute contract in the PingFederate administrative console and transfer them to a partner application in a SAML or WS-Federation assertion. (See Defining an Attribute Contract in the PingFederate *Administrator's Manual*.)

Note: In some instances and depending on your network configuration and other requirements at your site, applications may need to send attributes through OpenToken rather than relying on the WAM session token. An administrator can configure OpenToken settings as part of the WAM adapter configuration.

IdP Process Overview

The following figure illustrates the request flow and how the WAM IdP Adapter is leveraged in generating a SAML/WS-Federation assertion using a WAM session cookie.



Processing Steps

1. The user's browser attempts to access the IdP application. The third-party WAM Web Agent intercepts the request and asks for the user's identity. The user enters the requested credentials and submits the login page.
2. The WAM Server validates the user's credentials and creates a WAM session cookie. The user now has access to the application.
3. The user clicks a link that initiates an SSO transaction to the partner application. The request is redirected to the PingFederate IdP Server. The WAM session cookie generated in step 2 is included in the request.
4. The PingFederate WAM IdP Adapter uses the WAM plug-in to decrypt the WAM session cookie and then transfers the attributes to the PingFederate IdP Server. You can create an attribute contract to map the WAM session cookie and response attributes. (See Defining an Attribute Contract in the PingFederate *Administrator's Manual*.)
5. The PingFederate IdP server generates a SAML/WS-Federation assertion and redirects the request, with the assertion, back through the user's browser to the SP site.

Setting Up the IdP Adapter

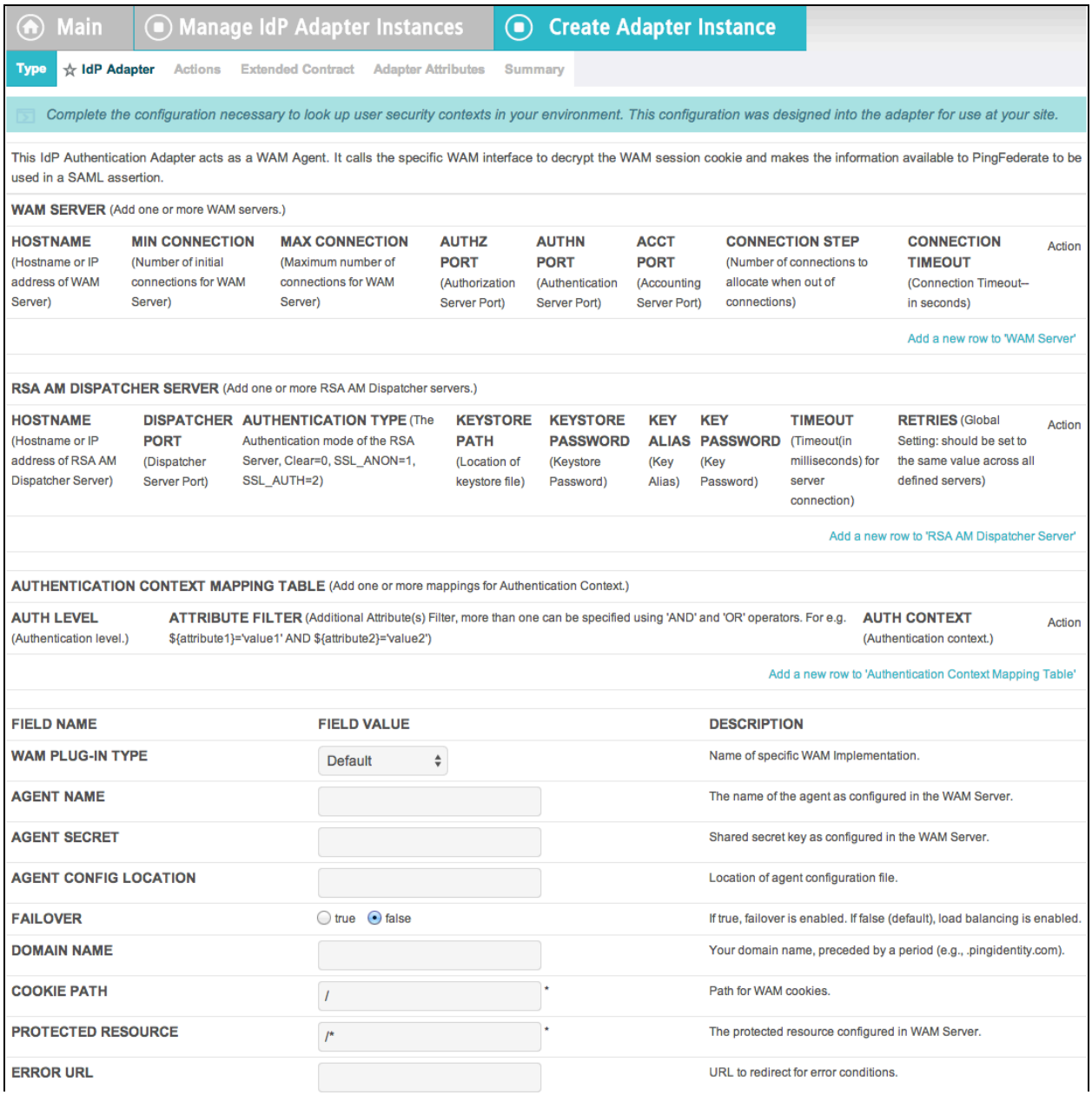
This section describes how to configure the WAM Integration Kit for an IdP.

Important: You must first create a third-party WAM Web Agent within your WAM tool. Several properties used to configure the agent are then used on the IdP Adapter screen discussed below. Refer to your WAM Server documentation for details on agent configuration.

1. Log on to the PingFederate administrative console and click **Adapters** under IdP Configuration on the Main Menu.
2. On the Manage IdP Adapter Instances screen, click **Create New Instance**.
3. On the Type screen, enter an Instance Name and Instance Id.

   The Name is any you choose for identifying this Adapter Instance. The ID is used internally and may not contain spaces or non-alphanumeric characters.
4. Select WAM IdP Adapter 2.0 as the Type and click **Next**.

Note: If you are configuring the adapter for a custom plug-in (not bundled with this kit), then continue to step 5. If you are configuring the RSA AM Dispatcher server, continue with step 6. If you are configuring OAM, continue at step 7.


Main
Manage IdP Adapter Instances
Create Adapter Instance
Type
IdP Adapter
Actions
Extended Contract
Adapter Attributes
Summary
Complete the configuration necessary to look up user security contexts in your environment. This configuration was designed into the adapter for use at your site.
This IdP Authentication Adapter acts as a WAM Agent. It calls the specific WAM interface to decrypt the WAM session cookie and makes the information available to PingFederate to be used in a SAML assertion.
WAM SERVER (Add one or more WAM servers.)
HOSTNAME (Hostname or IP address of WAM Server)
MIN CONNECTION (Number of initial connections for WAM Server)
MAX CONNECTION (Maximum number of connections for WAM Server)
AUTHZ PORT (Authorization Server Port)
AUTHN PORT (Authentication Server Port)
ACCT PORT (Accounting Server Port)
CONNECTION STEP (Number of connections to allocate when out of connections)
CONNECTION TIMEOUT (Connection Timeout--in seconds)
Action
Add a new row to 'WAM Server'
RSA AM DISPATCHER SERVER (Add one or more RSA AM Dispatcher servers.)
HOSTNAME (Hostname or IP address of RSA AM Dispatcher Server)
DISPATCHER PORT (Dispatcher Server Port)
AUTHENTICATION TYPE (The Authentication mode of the RSA Server, Clear=0, SSL_ANON=1, SSL_AUTH=2)
KEYSTORE PATH (Location of keystore file)
KEYSTORE PASSWORD (Keystore Password)
KEY ALIAS (Key Alias)
KEY PASSWORD (Key Password)
TIMEOUT (Timeout(in milliseconds) for server connection)
RETRIES (Global Setting: should be set to the same value across all defined servers)
Action
Add a new row to 'RSA AM Dispatcher Server'
AUTHENTICATION CONTEXT MAPPING TABLE (Add one or more mappings for Authentication Context.)
AUTH LEVEL (Authentication level.)
ATTRIBUTE FILTER (Additional Attribute(s) Filter, more than one can be specified using 'AND' and 'OR' operators. For e.g. ${attribute1}='value1' AND ${attribute2}='value2')
AUTH CONTEXT (Authentication context.)
Action
Add a new row to 'Authentication Context Mapping Table'
FIELD NAME
FIELD VALUE
DESCRIPTION
WAM PLUG-IN TYPE
Default
Name of specific WAM Implementation.
AGENT NAME
The name of the agent as configured in the WAM Server.
AGENT SECRET
Shared secret key as configured in the WAM Server.
AGENT CONFIG LOCATION
Location of agent configuration file.
FAILOVER
true
false
If true, failover is enabled. If false (default), load balancing is enabled.
DOMAIN NAME
Your domain name, preceded by a period (e.g., .pingidentity.com).
COOKIE PATH
/
*
Path for WAM cookies.
PROTECTED RESOURCE
/*
*
The protected resource configured in WAM Server.
ERROR URL
URL to redirect for error conditions.

USER IDENTIFIER	*	WAM attribute name representing a unique user identifier.
SESSION TOKEN NAME	*	WAM Session Cookie Name.
SESSION TOKEN LOGGEDOFF VALUE	*	Value representing a logged out session token.
HTTPONLY	☐	Enable this to set WAM Cookie as HttpOnly.
SECURE	☐	Enable this to set WAM Cookie as secure.
PINGFEDERATE BASE URL		The base URL for PingFederate. If specified, this value is used for creating the return URL if the Cookie Provider URL is specified.
AUTHORIZATION ERROR URL		URL to redirect for authorization errors.
COOKIE PROVIDER URL		The URL for the cookie provider where PingFederate should redirect the request if the WAM session cookie is in a separate domain. This service must be protected by WAM and would simply redirect back to the PingFederate resumePath.
COOKIE PROVIDER TARGET PARAMETER		The name of parameter used to send the return URL for cookie provider.
LOGIN URL		The URL for the authentication service where PingFederate should redirect the request if the WAM session cookie is unavailable in the request object. This service must be protected by WAM and would simply redirect back to the PingFederate resumePath.
PER-ADAPTER SLO URL		The URL to which a user is redirected for a SLO event.
AUTHENTICATION CONTEXT		A URN or other value that indicates how the user was authenticated. This value will be included in the SAML assertion (as 'AuthenticationMethod' for SAML 1.1). Default is 'unspecified'.
AUTHENTICATION LEVEL IDENTIFIER		Identifier used for the Authentication Level attribute.
REPAD TOKEN STRING	☐	Check this box to repad the token string for Base64 encoding (if required).

5. (Only for custom plug-ins for WAM servers other than OAM or RSA) On the IdP Adapter screen, click **Add a new row to 'WAM Server'** and provide the following information into the table:
   a. Enter the Hostname or the IP address where the WAM server is running.
   b. Specify the remaining WAM server values required for your configuration.
   c. Click **Update** in the Action column.
   d. Repeat this step as needed for additional custom WAM plug-ins.

   Skip the next step.

6. (Only for the RSA bundled plug-in) On the IdP Adapter screen, click **Add a new row to 'RSA AM Dispatcher Server'** and provide the following information in the table:

   Note: You must specify at least one RSA AM Dispatcher Server.

   a. Enter the Hostname or the IP address and the (optional) Dispatcher Port where the RSA AM Dispatcher server is running.

      Note: You must specify the authentication method that is used by the dispatcher server. If you have specified multiple dispatcher servers, each server can have individual authentication methods.

   b. Specify the Authentication Type used by the RSA Dispatcher Server.
      - **Clear** – clear text, no encryption

- **Anon** – anonymous SSL, SSL encryption only
- **Auth** – mutually authenticated SSL, SSL encryption with certificate-based encryption

c. If the selected Authentication Type is **Auth**, you must specify the following RSA server values:
   - **Keystore Path** – String filename of the private Keystore file (PKCS12 only)
   - **Keystore Password** – password for the private Keystore
   - **Key Alias** – the alias to your private key in the Keystore
   - **Key Password** – private Key Password for Keystore

d. (Optional) Specify the Timeout value required for your configuration.

e. Click **Update** in the Action column.

f. Repeat this step as needed for additional RSA Servers.

7. (Only for custom plug-ins for WAM servers and the OAM bundled plug-in) On the IdP Adapter screen, click **Add a new row to 'Authentication Context Mapping Table'** and provide the following information into the table:
   - Authentication Level – A specific value for a WAM system indicating the level of authentication an end-user has gone through.
   - Authentication Context – This is part of the SAML assertion.

   Click **Update** in the Action column. Repeat this step as needed.

8. Provide entries on the IdP Adapter screen, as described on the screen and in the table below.

Note: The selected WAM Plug-in Type may override optional/required fields. For example, if the selected WAM Plug-in Type is `OAM`, the Agent Config Location becomes a required field. Leaving this field blank generates an error message.

Field	Description
WAM Plug-in Type	Class name for the specific WAM implementation. **Note**: The WAM Plug-in Type determines optional/required fields.
Agent Name	This value must match the value used when the third-party WAM Web Agent was configured.
Agent Secret	This value must match the value used when the third-party WAM Web Agent was configured.
Agent Config Location	Required for OAM, this value must contain the full path to an XML network-configuration file generated by the access-management system.
Failover	The default is false, indicating load balancing is enabled and user-session states and configuration data are shared among multiple WAM servers. Select **true** to enable failover, indicating that when one server fails, the next server is used.
Domain Name	Enter the fully-qualified domain name (Cookie Domain where the WAM session cookie is stored), preceded by a period. For example: `.pingidentity.com`
Cookie Path	(Required) The root (`/`) directory is the default. Specify a different path for the WAM session cookie location, if necessary. Refer to your WAM Server documentation for details.
Protected Resource	(Required) All files in the root directory (/*) is the default. Specify a different path to the resources in the protected realm, if necessary.

Field	Description
Error URL	Enter a URL for redirecting the user if there are errors: for example, incorrect parameters in the link. This URL may contain query parameters. The URL has an `errorMessage` query parameter appended to it, which contains a brief description of the error that occurred. The error page can optionally display this message on the screen to provide guidance on remedying the problem. When employing the `errorMessage` query parameter in a custom error page, adhere to Web-application security best practices to guard against common content injection vulnerabilities. If no URL is specified, the appropriate default error landing page appears. (For more information, see Customizing User-Facing Screens in the PingFederate *Administrator's Manual*.) **Note**: If you define an error redirect URL, errors are sent to the error URL as well as logged in the PingFederate server log, but are not logged to the PingFederate audit log.
User Identifier	(Required) Defines which attribute that is parsed from the WAM session cookie is the user identifier for use in the assertion.
Session Token Name	(Required) WAM session cookie name.
Session Token LOGGEDOFF Value	(Required) Value representing a logged-out session token.
HTTP Only	Enable this option to set the WAM Session Cookie as HTTP Only. If this option is enabled, the browser will send the WAM Session Cookie via HTTP or HTTPS.
Secure	Enable this option to set the WAM Session Cookie as secure. If this option is enabled, the browser will send the WAM Session Cookie via HTTPS only.
PingFederate Base URL	The base URL for PingFederate. If specified, this value is used for creating the return URL if the Cookie Provider URL is used.
Authorization Error URL	URL to redirect for authorization errors.
Cookie Provider URL	The URL for the cookie provider where PingFederate should redirect the request if the WAM session cookie is in a separate domain. This service must be protected by the WAM server and would simply redirect back to the PingFederate `resumePath`.

Field	Description
Cookie Provider Target Parameter	The name of the parameter used to send the return URL for the cookie provider.
Login URL	An optional URL for the authentication service. If the WAM session cookie is not found in the request, PingFederate redirects the request to the URL page along with the relative `resumePath`. This service must be protected by the WAM Agent. For more information, see the IdP Deployment Note.
Per-Adapter SLO URL	If a URL is entered into this field, it will be used as the redirect target during SLO for this adapter instance, instead of the default value from Pingfederate.
Authentication Context	This may be any value agreed upon with your SP partner that indicates how the user was authenticated. The value is included in the SAML assertion. Standard URIs are defined in the SAML specifications (see the OASIS document saml-authn-context-2.0-os.pdf).
Authentication Level Identifier	Identifier used for the Authentication Level attribute.
Repad Token String	Enable this to pad the incoming session token (if required).

OPENTOKEN NAME		The name of the cookie or the request attribute that contains the OpenToken. This name should be unique for each adapter instance.
OPENTOKEN TRANSFER METHOD	○ Cookie ○ Query Parameter ◉ POST	How the OpenToken is transferred, either via a cookie, as a query parameter or through from post.
OPENTOKEN PASSWORD		The password used for encrypting extended attributes.
OPENTOKEN CIPHER SUITE	○ Null ◉ AES-256/CBC ○ AES-128/CBC ○ 3DES-168/CBC	The algorithm, cipher mode, and key size that should be used for encrypting the token.
OPENTOKEN COOKIE DOMAIN		The server domain, preceded by a period (e.g. .example.com). If no domain is specified, the value is obtained from the request.
OPENTOKEN COOKIE PATH	/	The path for the cookie that contains the opentoken.
OPENTOKEN TOKEN LIFETIME	300	The duration (in seconds) for which the opentoken is valid. Valid range is 1 to 28800.
OPENTOKEN SESSION LIFETIME	43200	The duration (in seconds) for which the opentoken may be re-issued without authentication. Valid range is 1 to 259200.
NOT BEFORE TOLERANCE	0	The amount of time (in seconds) to allow for clock skew between servers. Valid range is 0 to 3600.
SESSION COOKIE	☐	If checked, the OpenToken will be set as a session cookie (rather than a persistent cookie). Applies only if the OpenToken Transfer Method is set as 'Cookie'.
SECURE COOKIE	☐	If checked, the OpenToken cookie will be set only if the request is on a secure channel (https). Applies only if the OpenToken Transfer Method is set as 'Cookie'.
CREATE FORM LOGIN TOKEN	☐	Check to create a Form Login Token (e.g. ObFormLoginCookie).
FORM LOGIN COOKIE NAME	ObFormLoginCookie	Name of Form Login Cookie (e.g. ObFormLoginCookie).
FORM LOGIN COOKIE DOMAIN		The domain for the Form Login Cookie.
FORM LOGIN COOKIE PATH	/	The path for the Form Login Cookie (e.g. '/')
FORM LOGIN COOKIE IS SECURE	☐	If checked, the Form Login Cookie will have the 'secure' flag set.
FORM LOGIN COOKIE IS HTTP ONLY	☐	If checked, the Form Login Cookie will have the 'httpOnly' flag set.
FORM LOGIN TOKEN TRANSFER METHOD	◉ Cookie ○ Query Parameter	How the Form Login Token is transferred, either via a cookie or as a query parameter.
CREATE FORM LOGIN COOKIE FOR HOST	☐	If checked, the Form Login Cookie will be created for the host name in the request ignoring the Domain name provided above. Enabling this assumes that the WAM provider and PF are under same host name.
RU URL	◉ Base ○ Request ○ Relative	Determines how "ru" URL is derived: "Base": Full path using RH from 'PF BASE URL'; "Request": Full path using RH from HTTP request; "Relative": Use relative (no RH added)
RESET INVALID SESSION COOKIE	☐	If checked, invalid session cookie will be set to the configured logged-off value before redirecting to Login URL.

Hide Advanced Fields

9. (Optional) Click **Show Advanced Fields** to specify OpenToken configuration values or settings, depending on your network configuration and other requirements at your site. The Advanced Fields also contain fields for configuring tokens capturing the original request information if necessary. This functionality is based on the ObFormLoginCookie from OAM.

Note: If you want to configure the use of OpenToken as part of the WAM adapter configuration, then complete the fields as described on the screen and in the table below.

Field	Description
OpenToken Name	The name of the cookie or the request attribute that contains the OpenToken. This name should be unique for each adapter instance.
OpenToken Transfer Method	How the OpenToken is transferred, either via a cookie, as a query parameter, or through Form Post.
OpenToken Password	The password used for encrypting extended attributes. Note: This is also used for generating the configuration file used by the OpenToken agent, and is thus required even if the Cipher Suite is set to NULL.
OpenToken Cipher Suite	The algorithm, cipher mode, and key size that should be used for encrypting the token.
OpenToken Cookie Domain	The server domain, preceded by a period (e.g. .example.com). If no domain is specified, the value is obtained from the request.
OpenToken Cookie Path	The path for the cookie that contains the OpenToken.
OpenToken Token Lifetime	The duration (in seconds) for which the OpenToken is valid. Range is 1 to 28800.
OpenToken Session Lifetime	The duration (in seconds) for which the OpenToken may be re-issued without authentication. Range is 1 to 259200.
Not Before Tolerance	The amount of time (in seconds) to allow for clock skew between servers. Range is 0 to 3600.
Session Cookie	If checked, the OpenToken cookie will be set as a session cookie (rather than a persistent cookie). Applies only if the OpenToken Transfer Method is set as 'Cookie'.
Secure Cookie	If checked, the OpenToken cookie will be set only if the requests is on a secure channel (HTTPS). Applies only if the OpenToken Transfer Method is set as 'Cookie'.

Field	Description
Create Form Login Token	If checked, a Token will be created containing the information needed to retain the original request information if a redirect to a form authentication page is required. The token contents are implemented based on the requirements of the ObFormLoginCookie from OAM.
Form Login Cookie Name	The name to be given to the created Form Login Cookie (Ex: ObFormLoginCookie)
Form Login Cookie Domain	The server domain, preceded by a period (e.g. .example.com).
Form Login Cookie Path	The path for the cookie that contains the Form Login Cookie.
Form Login Cookie is Secure	Set the “secure” flag on the Form Login Cookie.
Form Login Cookie is HTTP Only	Set the “httpOnly” flag on the Form Login Cookie.
Form Login Token Transfer Method	How the Form Login Token is transferred, either via a cookie or as a query parameter.
Create Form Login Cookie for Host	If checked, the form login Cookie will be created for the host name in the request ignoring the Domain name provided above.
RU URL	Determines how "ru" URL is derived: "Base": Full path using RH from 'PF BASE URL'; "Request": Full path using RH from HTTP request; "Relative": Use relative (no RH added)
Reset Invalid Session Cookie	If checked, invalid session cookie will be set to the configured logged-off value before redirecting to Login URL.

10. Click **Next**.
11. On the Actions screen, click the **Test Connection** link to validate the WAM configuration.

Note: If using an OpenToken Adapter Configuration, click the **Invoke Download** link and then click **Export** to download the `agent-config.txt` properties to a directory that is readable by the WAM Web Agent.

12. Optionally, on the Extended Contract screen, configure additional attributes for the adapter. (See Key Concepts in the PingFederate *Administrator's Manual*.)
13. Click **Next**.
14. On the Adapter Attributes screen, select userId or wamSessionToken under Pseudonym. You may also select any extended attributes specified on the previous screen.

    For more information about this screen, see Setting Pseudonym Values and Masking in the PingFederate *Administrator's Manual*.

You may also choose to mask attribute values in PingFederate log files. More information is available on the **Help** page.

15. Click **Next**.
16. On the Summary screen, verify that the information is correct and click **Done**.
17. Click **Save** to complete the adapter configuration.

IdP Deployment Note

The adapter configuration supports a "login URL" parameter. If the WAM session cookie is not found in the request, then the PingFederate server redirects the request to the URL page along with the relative `resumePath`, which is generated from PingFederate and intended for asynchronous communication between the adapter and the external application. (The state is saved in PingFederate, and processing is resumed when the application redirects to the `resumePath`.)

The login URL page can authenticate the user and redirect the request back to PingFederate. An example of a JSP code snippet for redirecting the request is shown below.

```
<%
   String resumePath = request.getParameter("resumePath");
      if(resumePath != null) {
         resumePath = <PingFed_URL> + resumePath;
         response.sendRedirect(resumePath);
      }
%>
```

where `<PingFed_URL>` is the fully-qualified URL of the PingFederate server.

Testing the IdP Adapter

You can test this adapter using the IdP Quick-Start Applications that ship with PingFederate 5.x-6.2. For PingFederate versions 6.3 and later, the Quick-Start Applications are available from the Ping Identity download site (www.pingidentity.com/support-and-downloads).

Follow this procedure to verify adapter functions:

1. Set up PingFederate to run the SP Application according to instructions in the PingFederate Quick-Start Guide.
2. Configure an instance of the WAM Adapter.
3. Reconfigure the SP connection to use the WAM Adapter instance.

   Delete the existing adapter instance and map the WAM Adapter instance in its place. See IdP Adapter Mapping in the PingFederate *Administrator's Manual* for detailed information.

4. On a Web page protected by the third-party WAM Web Agent, create an "SSO" link to the PingFederate `startSSO` endpoint, including the sample SP's connection ID, in the following format:

   ```
   http[s]://<PF_host>:<port>/IdP/startSSO.ping
   ?PartnerSpId=<connection_id>
   ```

   where:

   - `<PF_host>` is the machine running the PingFederate server.
   - `<port>` is the PingFederate port (default value: `9031`).
   - `<connection_id>` is the Connection ID of the SP connection.

5. Access the protected Web page by authenticating through the WAM Web Agent and click the SSO link.

   You are logged on to the Quick-Start SP Application.

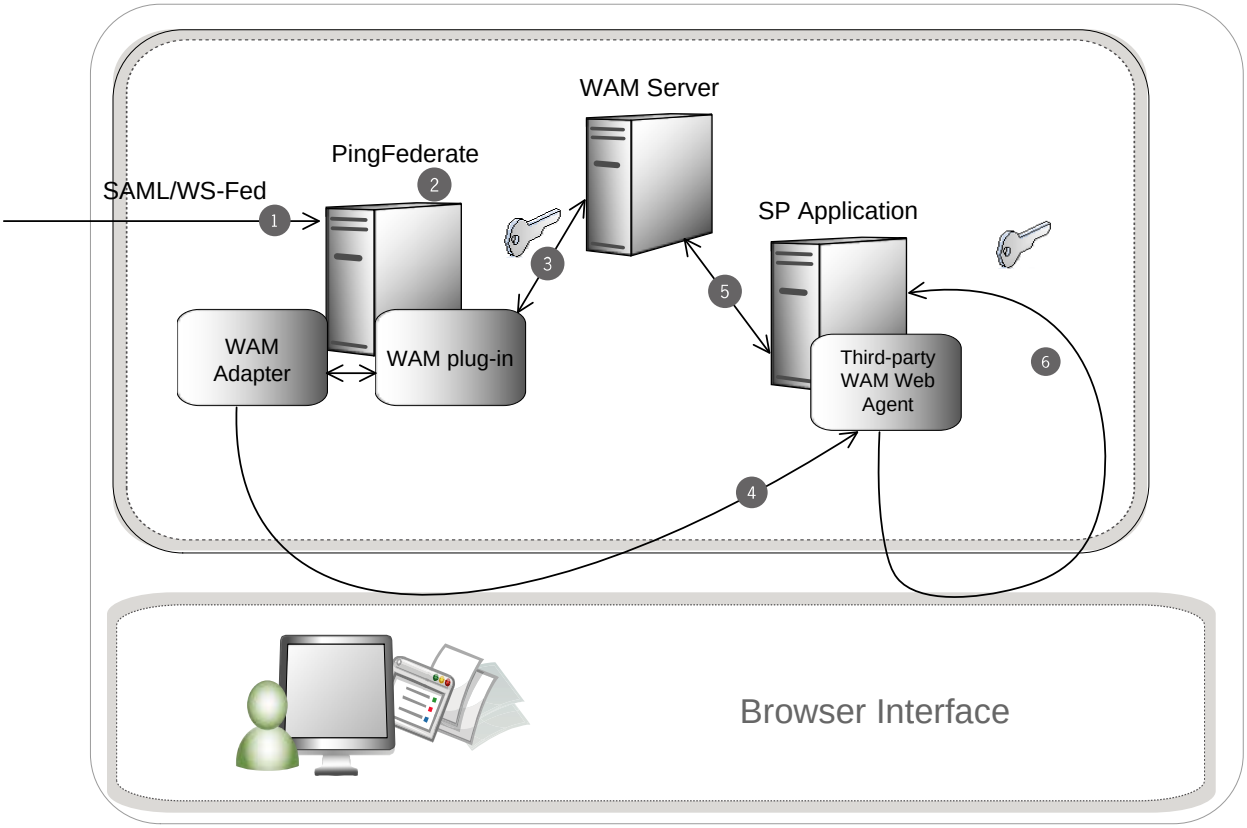
Implementing SP Functionality

The SP Adapter uses the WAM plug-in to create a WAM proprietary token based on the attributes received in the SAML/WS-Federation assertion.

Note: In some instances and depending on your network configuration and other requirements at your site, applications may need to send attributes through OpenToken rather than relying on the WAM session token. An administrator can configure OpenToken settings as part of the WAM adapter configuration.

SP Process Overview

The following figure illustrates the request flow and how the WAM SP Adapter leverages a SAML/WS-Federation assertion to create a WAM session cookie.



Processing Steps

1. The PingFederate SP server receives a SAML/WS-Federation assertion from the IdP.
2. PingFederate parses the assertion.
3. The WAM SP Adapter uses the WAM plug-in to create a WAM session cookie and embeds the cookie in the response.
4. A request containing the WAM session cookie is redirected to the browser.
5. The request is then redirected to the SP Application, which is protected by the third-party WAM Web Agent.
6. The third-party WAM Web Agent intercepts the request, extracts and validates the WAM session cookie, and allows access to the application.

Setting Up the SP Adapter

This section describes how to configure the WAM Integration Kit for an SP.

Important: You must first create a third-party WAM Web Agent within your WAM tool. Several properties used to configure the agent are then used on the Instance Configuration screen discussed below. Refer to your WAM Server documentation for details on agent configuration.

1. Log on to the PingFederate administrative console and click **Adapters** under SP Configuration on the Main Menu.

   For more information, see Configuring SP Adapters in the PingFederate *Administrator's Manual*.

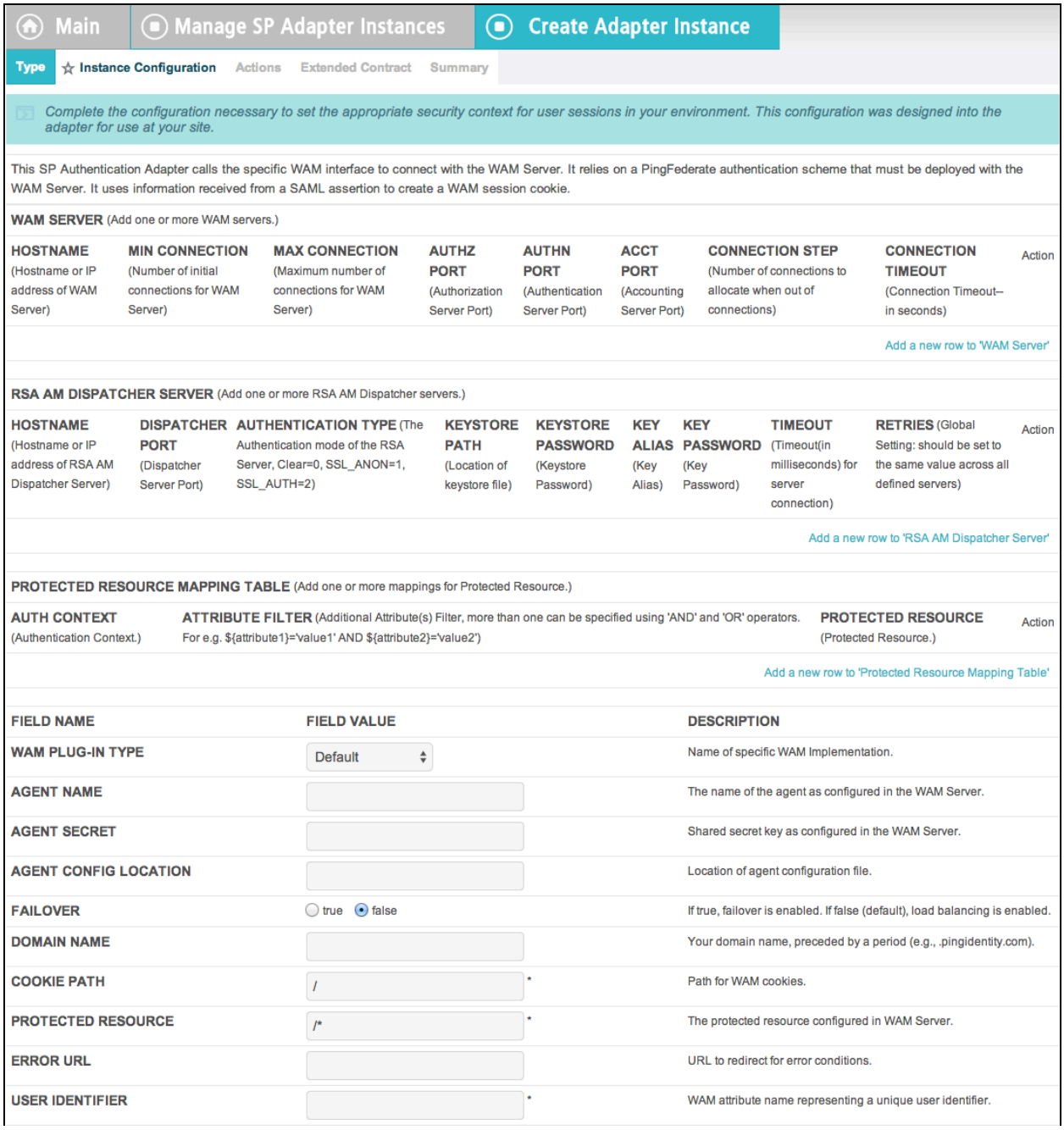
2. Click **Create New Instance**.

3. Enter the Instance Name and Instance Id.

   The name is any you choose for identifying this adapter instance. The ID is used internally and may not contain spaces or non-alphanumeric characters.

4. Select WAM SP Adapter 2.0 as the Type and click **Next**.

Note: If you are configuring the adapter for a custom plug-in (not bundled with this kit), then continue to step 5. If you are configuring the RSA AM Dispatcher server, then continue with step 6. If you are configuring OAM, continue at step 7.


Main
Manage SP Adapter Instances
Create Adapter Instance
Type
Instance Configuration
Actions
Extended Contract
Summary
Complete the configuration necessary to set the appropriate security context for user sessions in your environment. This configuration was designed into the adapter for use at your site.
This SP Authentication Adapter calls the specific WAM interface to connect with the WAM Server. It relies on a PingFederate authentication scheme that must be deployed with the WAM Server. It uses information received from a SAML assertion to create a WAM session cookie.
WAM SERVER (Add one or more WAM servers.)
HOSTNAME (Hostname or IP address of WAM Server)
MIN CONNECTION (Number of initial connections for WAM Server)
MAX CONNECTION (Maximum number of connections for WAM Server)
AUTHZ PORT (Authorization Server Port)
AUTHN PORT (Authentication Server Port)
ACCT PORT (Accounting Server Port)
CONNECTION STEP (Number of connections to allocate when out of connections)
CONNECTION TIMEOUT (Connection Timeout--in seconds)
Action
Add a new row to 'WAM Server'
RSA AM DISPATCHER SERVER (Add one or more RSA AM Dispatcher servers.)
HOSTNAME (Hostname or IP address of RSA AM Dispatcher Server)
DISPATCHER PORT (Dispatcher Server Port)
AUTHENTICATION TYPE (The Authentication mode of the RSA Server, Clear=0, SSL_ANON=1, SSL_AUTH=2)
KEYSTORE PATH (Location of keystore file)
KEYSTORE PASSWORD (Keystore Password)
KEY ALIAS (Key Alias)
KEY PASSWORD (Key Password)
TIMEOUT (Timeout(in milliseconds) for server connection)
RETRIES (Global Setting: should be set to the same value across all defined servers)
Action
Add a new row to 'RSA AM Dispatcher Server'
PROTECTED RESOURCE MAPPING TABLE (Add one or more mappings for Protected Resource.)
AUTH CONTEXT (Authentication Context.)
ATTRIBUTE FILTER (Additional Attribute(s) Filter, more than one can be specified using 'AND' and 'OR' operators. For e.g. ${attribute1}='value1' AND ${attribute2}='value2')
PROTECTED RESOURCE (Protected Resource.)
Action
Add a new row to 'Protected Resource Mapping Table'
FIELD NAME
FIELD VALUE
DESCRIPTION
WAM PLUG-IN TYPE
Default
Name of specific WAM Implementation.
AGENT NAME
The name of the agent as configured in the WAM Server.
AGENT SECRET
Shared secret key as configured in the WAM Server.
AGENT CONFIG LOCATION
Location of agent configuration file.
FAILOVER
true
false
If true, failover is enabled. If false (default), load balancing is enabled.
DOMAIN NAME
Your domain name, preceded by a period (e.g., .pingidentity.com).
COOKIE PATH
/
*
Path for WAM cookies.
PROTECTED RESOURCE
/*
*
The protected resource configured in WAM Server.
ERROR URL
URL to redirect for error conditions.
USER IDENTIFIER
*
WAM attribute name representing a unique user identifier.

SESSION TOKEN NAME	*	WAM Session Cookie Name.
SESSION TOKEN LOGGEDOFF VALUE	*	Value representing a logged out session token.
HTTPONLY		Enable this to set WAM Cookie as HttpOnly.
SECURE		Enable this to set WAM Cookie as secure.
PINGFEDERATE BASE URL		The base URL for PingFederate. If specified, this value is used for creating the return URL if the Cookie Provider URL is specified.
AUTHORIZATION ERROR URL		URL to redirect for authorization errors.
COOKIE PROVIDER URL		The URL for the cookie provider where PingFederate should redirect the request if the WAM session cookie is in a separate domain. This service must be protected by WAM and would simply redirect back to the PingFederate resumePath.
COOKIE PROVIDER TARGET PARAMETER		The name of parameter used to send the return URL for cookie provider.
AUTHENTICATION SERVICE URL		The URL to which the user is redirected for an SSO event. This URL overrides the Target Resource which is sent as a parameter to the Authentication Service.
AUTHENTICATION SCHEME SECRET	*	This is the shared secret between the adapter and custom authentication scheme deployed on WAM server.
PER-ADAPTER SLO URL		The URL to which a user is redirected for a SLO event.
ACCOUNT LINK SERVICE		The URL for Account Linking Service. This service must be protected by WAM and would simply redirect back to the PingFederate resumePath. The local user id is obtained from WAM session cookie.

5. (Only for custom plug-ins for WAM servers other than OAM or RSA) On the Instance Configuration screen, click **Add a new row to 'WAM Server'** and provide the following information into the table:

   a. Enter the Hostname or the IP address where the WAM server is running.

   b. Specify the remaining WAM server values required for your configuration.

   c. Click **Update** in the Action column.

   d. Repeat this step as needed for additional WAM plug-ins.

   Skip the next step.

6. (Only for the RSA bundled plug-in) On the Instance Configuration screen, click **Add a new row to 'RSA AM Dispatcher Server'** and provide the following information into the table:

   Note: You must specify at least one RSA AM Dispatcher Server.

   a. Enter the Hostname or the IP address and the (optional) Dispatcher Port where the RSA AM Dispatcher server is running.

      Note: You must specify the authentication method that is used by the dispatcher server. If you have specified multiple dispatcher servers, each server can have individual authentication methods.

   b. Specify the Authentication Type used by the RSA Dispatcher Server.

      - **Clear** – clear text, no encryption
      - **Anon** – anonymous SSL, SSL encryption only
      - **Auth** – mutually authenticated SSL, SSL encryption with certificate-based encryption

c. If the selected Authentication Type is **Auth**, you must specify the following RSA server values:

- **Keystore Path** – String filename of the private Keystore file (PKCS12 only)
- **Keystore Password** – password for the private Keystore
- **Key Alias** – the alias to your private key in the Keystore
- **Key Password** – private Key Password for Keystore

d. (Optional) Specify the Timeout value required for your configuration.

e. Click **Update** in the Action column.

f. Repeat this step as needed for additional RSA Servers.

7. (Optional: only for custom plug-ins for WAM servers and the OAM bundled plug-in) On the SP Adapter screen, click **Add a new row to 'Protected Resource Mapping Table'** and provide the following information into the table:

- Authentication Context – This is part of the SAML assertion.
- Attribute Filter – The names and values of attributes that the assertion must contain for this Protected Resource.
- Protected Resource – The protected resource to be accessed if the Authentication Context and Attribute Filters in the assertion match the provided values.

Click **Update** in the Action column. Repeat this step as needed.

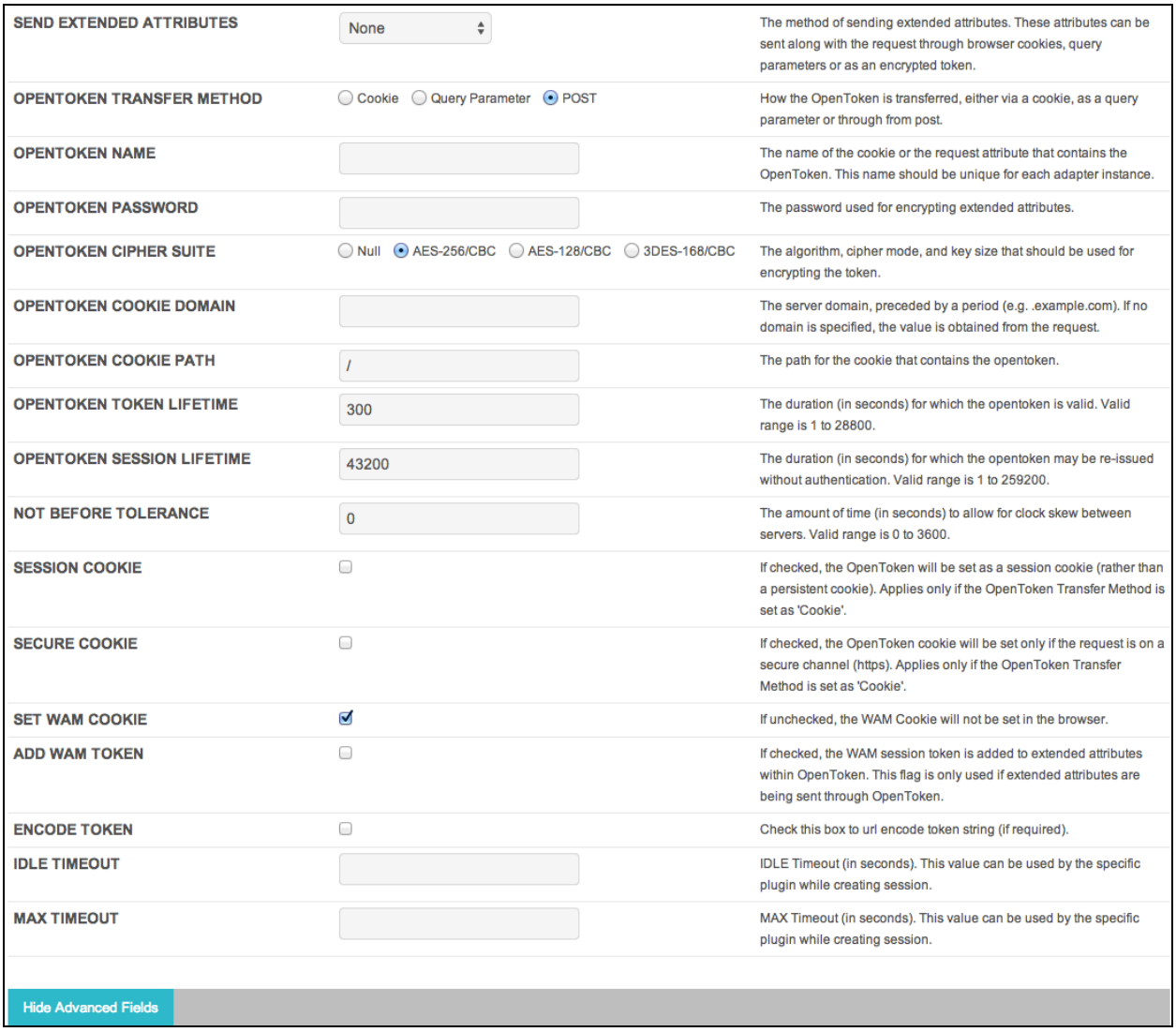
8. Provide entries on the Instance Configuration screen, as described on the screen and in the table below.

Note: The selected WAM Plug-in Type may override optional/required fields. For example, if the selected WAM Plug-in Type is OAM, the Agent Config Location becomes a required field. Leaving this field blank generates an error message.

Field	Description
WAM Plug-in Type	Class name for the specific WAM implementation. **Note**: WAM Plug-in Type determines optional/required fields.
Agent Name	This value must match the value used when the third-party WAM Web Agent was configured.
Agent Secret	This value must match the value used when the third-party WAM Web Agent was configured.
Agent Config Location	Required for OAM, this value must contain the full path to an XML network-configuration file generated by the access-management system.

Field	Description
Failover	The default is `false`, indicating load balancing is enabled and user-session states and configuration data are shared among multiple WAM servers. Select **true** to enable failover, indicating that when one server fails, the next server is used.
Domain Name	Enter the fully-qualified domain name (Cookie Domain where the WAM session cookie is stored), preceded by a period. For example: `.pingidentity.com`
Cookie Path	(Required) The root (`/`) directory is the default. Specify a different path for the WAM session cookie location, if necessary. Refer to your WAM Server documentation for details.
Protected Resource	(Required) All files in the root directory (/*) is the default. Specify a different path to the resources in the protected realm, if necessary.
Error URL	Enter a URL for redirecting the user if there are errors: for example, incorrect parameters in the link. This URL may contain query parameters. The URL has an `errorMessage` query parameter appended to it, which contains a brief description of the error that occurred. The error page can optionally display this message on the screen to provide guidance on remedying the problem. When employing the `errorMessage` query parameter in a custom error page, adhere to Web-application security best practices to guard against common content injection vulnerabilities. If no URL is specified, the appropriate default error landing page appears. (For more information, see Customizing User-Facing Screens in the PingFederate *Administrator's Manual*.) **Note**: If you define an error redirect URL, errors are sent to the error URL as well as logged in the PingFederate server log, but are not logged to the PingFederate audit log.
User Identifier	(Required) Defines which attribute that is parsed from the WAM session cookie is the user identifier for use in the assertion.
Session Token Name	(Required) WAM session cookie name.
Session Token LOGGEDOFF Value	(Required) Value representing a logged-out session token.

Field	Description
HTTP Only	Enable this option to set WAM Session Cookie as HTTP Only. If this option is enabled, the browser will send the WAM Session Cookie via HTTP or HTTPS.
Secure	Enable this option to set WAM Session Cookie as secure. If this option is enabled, the browser will only send the WAM Session Cookie via HTTPS only.
PingFederate Base URL	The base URL for PingFederate. If specified, this value is used for creating the return URL if Cookie Provider URL is being used.
Authorization Error URL	URL to redirect for authorization errors.
Cookie Provider URL	The URL for the cookie provider where PingFederate should redirect the request if the WAM session cookie is in a separate domain. This service must be protected by WAM and would simply redirect back to the PingFederate `resumePath`.
Cookie Provider Target Parameter	The name of the parameter used to send the return URL for the cookie provider.
Authentication Service URL	The URL to which the user is redirected for an SSO event. This URL overrides the Target Resource which is sent as a parameter to the Authentication Service.
Authentication Scheme Secret	(Required, except for RSA) The shared secret between the adapter and the custom authentication scheme deployed on the WAM server.
Per-Adapter SLO URL	If a URL is entered into this field, it will be used as the redirect target during SLO for this adapter instance, instead of the default value from Pingfederate.
Account Link Service	The URL for the Account Linking Service. This service must be protected by the WAM Web Agent and would simply redirect back to the PingFederate `resumePath`. The local user id is obtained from the WAM session cookie.


SEND EXTENDED ATTRIBUTES
None
The method of sending extended attributes. These attributes can be sent along with the request through browser cookies, query parameters or as an encrypted token.
OPENTOKEN TRANSFER METHOD
Cookie
Query Parameter
POST
How the OpenToken is transferred, either via a cookie, as a query parameter or through from post.
OPENTOKEN NAME
The name of the cookie or the request attribute that contains the OpenToken. This name should be unique for each adapter instance.
OPENTOKEN PASSWORD
The password used for encrypting extended attributes.
OPENTOKEN CIPHER SUITE
Null
AES-256/CBC
AES-128/CBC
3DES-168/CBC
The algorithm, cipher mode, and key size that should be used for encrypting the token.
OPENTOKEN COOKIE DOMAIN
The server domain, preceded by a period (e.g. .example.com). If no domain is specified, the value is obtained from the request.
OPENTOKEN COOKIE PATH
/
The path for the cookie that contains the opentoken.
OPENTOKEN TOKEN LIFETIME
300
The duration (in seconds) for which the opentoken is valid. Valid range is 1 to 28800.
OPENTOKEN SESSION LIFETIME
43200
The duration (in seconds) for which the opentoken may be re-issued without authentication. Valid range is 1 to 259200.
NOT BEFORE TOLERANCE
0
The amount of time (in seconds) to allow for clock skew between servers. Valid range is 0 to 3600.
SESSION COOKIE
If checked, the OpenToken will be set as a session cookie (rather than a persistent cookie). Applies only if the OpenToken Transfer Method is set as 'Cookie'.
SECURE COOKIE
If checked, the OpenToken cookie will be set only if the request is on a secure channel (https). Applies only if the OpenToken Transfer Method is set as 'Cookie'.
SET WAM COOKIE
If unchecked, the WAM Cookie will not be set in the browser.
ADD WAM TOKEN
If checked, the WAM session token is added to extended attributes within OpenToken. This flag is only used if extended attributes are being sent through OpenToken.
ENCODE TOKEN
Check this box to url encode token string (if required).
IDLE TIMEOUT
IDLE Timeout (in seconds). This value can be used by the specific plugin while creating session.
MAX TIMEOUT
MAX Timeout (in seconds). This value can be used by the specific plugin while creating session.
Hide Advanced Fields

9. (Optional) Click **Show Advanced Fields** to configure the sending of extended attributes or to specify OpenToken configuration values or settings. For more information, see OpenToken Adapter Configuration in the PingFederate *Administrator's Manual*.

Note: If you want to configure the use of OpenToken as part of the WAM adapter configuration, then complete the fields as described on the screen and in the table below.

You can change default values or settings, depending on your network configuration and other requirements at your site.

Field	Description
Send Extended Attributes	The method of sending extended attributes. These attributes can be sent along with the request through browser cookies, query parameters, or as an encrypted token. **Note:** To define the attributes on the Extended Contract screen (see step 12).
OpenToken Transfer Method	How the OpenToken is transferred, either via a cookie, as a query parameter, or as a Form Post.
OpenToken Name	The name of the cookie or the request attribute that contains the OpenToken. This name should be unique for each adapter instance.
OpenToken Password	The password used for encrypting extended attributes. Note: This is also used for generating the configuration file used by the OpenToken agent, and is thus required even if the Cipher Suite is set to NULL.
OpenToken Cipher Suite	The algorithm, cipher mode, and key size that should be used for encrypting the token.
OpenToken Cookie Domain	The server domain, preceded by a period (e.g. .example.com). If no domain is specified, the value is obtained from the request.
OpenToken Cookie Path	The path for the cookie that contains the OpenToken.
OpenToken Token Lifetime	The duration (in seconds) for which the OpenToken is valid. Range is 1 to 28800.
OpenToken Session Lifetime	The duration (in seconds) for which the OpenToken may be re-issued without authentication. Range is 1 to 259200.
Not Before Tolerance	The amount of time (in seconds) to allow for clock skew between servers. Range is 0 to 3600.
Session Cookie	If checked, OpenToken will be set as a session cookie (rather than a persistent cookie). Applies only if the OpenToken Transfer Method is set as 'Cookie'.

Field	Description
Secure Cookie	If checked, the OpenToken cookie will be set only if the requests is on a secure channel (https). Applies only if the OpenToken Transfer Method is set as 'Cookie'.
Set WAM Cookie	If unchecked, the WAM Cookie will not be set in the browser.
Add WAM Token	If checked, the WAM session token is added to extended attributes within OpenToken. This flag is only used if extended attributes are being sent through OpenToken.
Encode Token	Check this box to URL encode the token string if required by the WAM provider.
Idle Timeout	IDLE Timeout (in seconds). This value can be used by the specific plugin while creating session if required.
Max Timeout	MAX Timeout (in seconds). This value can be used by the specific plugin while creating session.

10. Click **Next**.
11. On the Actions screen, click the **Test Connection** link to validate the WAM Configuration.

> **Note:** If you are using an OpenToken Adapter Configuration, click the **Invoke Download** link and then click **Export** to download the `agent-config.txt` properties to a directory that is readable by the WAM Web Agent.

12. (Optional) On the Extended Contract screen for a connection, configure additional attributes for the adapter. Any attributes configured in this step are added to the request header.
13. Click **Next**.
14. On the Summary screen, verify that the information is correct and click **Done**. Then click **Save** to complete the adapter configuration.

Creating a Custom Authentication Scheme for OAM

The SP Adapter uses a custom authentication scheme when creating a WAM session and validates authentication requests coming from PingFederate. This section describes how to deploy the OAM-compatible Java-based PingFederate Custom Authentication Scheme.

1. From the `<integration_kit_install_dir>/dist` directory, import the following file into the OAM:

   `PingCustomAuthPlugin.jar`

   The `PingCustomAuthPlugin.jar` file is a custom authentication scheme that supports OAM.

2. Configure your Access Server to use the custom authentication plug-in by creating or modifying a custom authentication scheme.

   Refer to Oracle Support documentation for additional information.

   Note: The secret you specify when creating the custom authentication scheme must match the secret stored in the PingFederate SP Adapter.

SP Deployment Notes

The following notes provide additional information for using the WAM Integration Kit as an SP:

- The WAM SP Adapter relies on a custom authentication scheme to validate the authentication request coming from the PingFederate SP Adapter. The secret specified in the SP Adapter is verified against the one configured with the scheme. You can create custom authentication schemes for specific WAM systems using their API.

  The authentication scheme for OAM is included in the samples folder at the following location:

  `<integration_kit_install_dir>/sdk/samples/oam/PingCustomAuthPlugin.java`

- To support Account Linking, the Account Linking Service has to be implemented and then protected by the WAM Web Agent. This could be done as a `JSP` page that redirects back to PingFederate. The relative `resumePath` is sent as part of the request and the `JSP` page needs to create the absolute URL and redirect, as shown below.

```
<%
   String resumePath = request.getParameter("resumePath");
      if(resumePath != null) {
         resumePath = <PingFed_URL> + resumePath;
         response.sendRedirect(resumePath);
      }
%>
```

  where `<PingFed_URL>` is the fully-qualified URL of the PingFederate server.

  `resumePath` is generated from PingFederate and intended for asynchronous communication between the adapter and the external application. The state is saved in PingFederate and processing is resumed when the application redirects to the `resumePath`.

  The WAM SP Adapter retrieves the user information from the WAM session cookie and resumes SSO.

Testing the SP Adapter

You can test this adapter using the IdP Quick-Start Applications that ship with PingFederate 5.x-6.2. For PingFederate versions 6.3 and later, the Quick-Start Applications are available from the Ping Identity download site (www.pingidentity.com/support-and-downloads).

Follow this procedure to verify adapter functions:

1. Set up PingFederate to run the IdP Application according to instructions in the PingFederate Quick-Start Guide.

2. Configure an instance of the WAM Adapter (see Setting Up the SP Adapter on page 19).
3. Reconfigure the IdP connection to use the WAM Adapter instance.

   Delete the existing adapter instance for the connection and map the WAM Adapter instance in its place. See Configuring Adapter Mapping and User Lookup in the PingFederate *Administrator's Manual* for detailed information.
4. From the Main Menu, click **Adapters** under My SP Configuration.
5. Protect a Web page using the WAM Web Agent.
6. On the same Web server, create an unprotected Web page with a hyperlink to PingFederate's SP-initiated SSO endpoint in the following format:

   ```
   http[s]://<PF_host>:<port>/sp/startSSO.ping
   ?TargetResource=<protected_resource>
   &PartnerIdpId=<connection_id>
   ```

   where:

   - `<PF_host>` is the machine running the PingFederate server.
   - `<port>` is the port (default value: `9031`).
   - `<protected_resource>` is the Web page protected in the previous step.
   - `<connection_id>` is the Connection ID of the IdP connection.
7. Click the SSO link on the unprotected Web page.

   You should arrive at the IdP Quick-Start Application's login page.
8. Add at least one of the users in the username drop-down list to the WAM Server.

   Refer to your WAM platform documentation for more information.

   Alternatively, you can add users already in the WAM Server to the Quick-Start Application's user-properties file.
9. On the IdP Application's login page, log in with a username managed by your WAM platform.

   You should be redirected to a WAM platform-protected Web page. Independently, you can view cookies from your browser to see that a WAM session cookie has been created.