User Guide

/ Web Agents 5.5

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Abstract

Guide to installing ForgeRock® Access Management web agents. ForgeRock Access Management provides authentication, authorization, entitlement, and federation software.

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Preface

This guide shows you how to install ForgeRock Access Management web server agents, as well as how to integrate with ForgeRock Access Management. Read the Release Notes before you get started.

This guide is written for anyone installing web agents to interface with supported web servers application containers.

About ForgeRock Identity Platform™ Software

ForgeRock Identity Platform™ serves as the basis for our simple and comprehensive Identity and Access Management solution. We help our customers deepen their relationships with their customers, and improve the productivity and connectivity of their employees and partners. For more information about ForgeRock and about the platform, see https://www.forgerock.com.

Chapter 1

Introducing Web Agents

A *web agent* is an Access Management add-on component that operates as a policy enforcement point (PEP) for a website deployed on a web server.

Web agents intercept inbound requests to websites and interact with AM to:

- Ensure that clients provide appropriate authentication.
- Enforce AM resource-based policies [1].

This chapter covers how web agents work and how they can protect your websites.

1.1. Web Agent Components

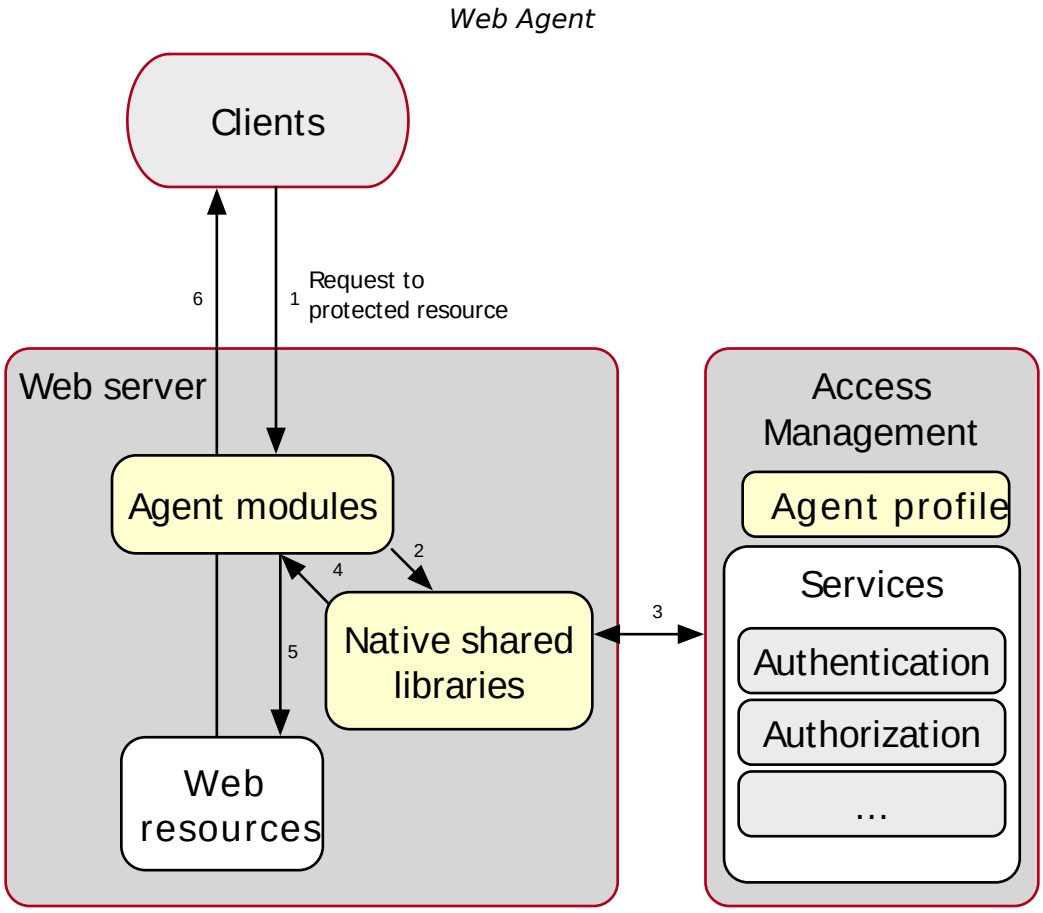
Web agents comprise two main components:

- **Agent Modules**. Intercept and process inbound requests to protected resources.
- **Native Shared Libraries**. Enable agents to interact with AM.

The *agent profile* is not strictly part of the web agent, but plays an important part in the agent's operation. It contains a set of configuration properties that define the web agent's behavior.

The following figure illustrates the web agent's components when the agent profile is stored in AM's configuration store:

[1] You can configure the web agent to only enforce user authentication. For more information, see "Web Agent Single Sign-on (SSO) Only Mode".



1.2. Configuration Location

Web agent configuration properties determine the behavior of the agent. AM stores configuration properties either centrally or locally:

- **Centralized configuration**

  AM stores the web agent properties in the AM configuration store. Storing the agent configuration centrally allows you to configure your agents using the AM console, the **ssoadm** command, and the REST API.

To access the centralized web agent configuration, navigate to Realms > *Realm Name* > Applications > Agents > Web > *Agent Name* in the AM console.

For more information on creating centrally-stored agent profiles, see "Creating Agent Profiles".

- **Local configuration**

  The web agent installer creates the file `/web_agents/agent_version/instances/Agent_nnn/config/agent.conf` to store the web agent configuration properties. The installer populates this file with enough information to make the web agent start. To manage the configuration, edit the file to add properties, remove properties, and change value. You cannot update this file using the AM console, the **ssoadm** command, or the REST API.

  The `agent.conf` must contain at least the following properties:

```
### Bootstrap properties
com.sun.identity.agents.config.organization.name = /
com.sun.identity.agents.config.username = ApacheAgentProfile
com.sun.identity.agents.config.password = o7OuvnaDnQ==
com.sun.identity.agents.config.key = OGM1MWEwZWMtNmM4Zi00Yg=
com.sun.identity.agents.config.naming.url = https://openam.example.com:8443/openam

### Configuration properties
com.sun.identity.agents.config.repository.location = local
org.forgerock.openam.agents.config.jwt.name = am-auth-jwt
com.sun.identity.agents.config.cdsso.redirect.uri = agent/cdsso-oauth2
org.forgerock.openam.agents.config.policy.evaluation.application = iPlanetAMWebAgentService
org.forgerock.openam.agents.config.policy.evaluation.realm = /
com.sun.identity.agents.config.polling.interval = 60
com.sun.identity.agents.config.sso.cache.polling.interval = 3
com.sun.identity.agents.config.policy.cache.polling.interval = 3
com.sun.identity.agents.config.cookie.name = iPlanetDirectoryPro
com.sun.identity.agents.config.debug.file.size = 10000000
com.sun.identity.agents.config.local.logfile = /web_agents/nginx15_agent/instances/agent_1/logs/debug/
debug.log
com.sun.identity.agents.config.local.audit.logfile = /web_agents/nginx15_agent/instances/agent_1/logs/
audit/audit.log
com.sun.identity.agents.config.debug.level = Error
```

  The properties previously discussed are provided with an example value. For information on each of these properties, see "Configuring Web Agent Properties".

1.3. Request Process Flow

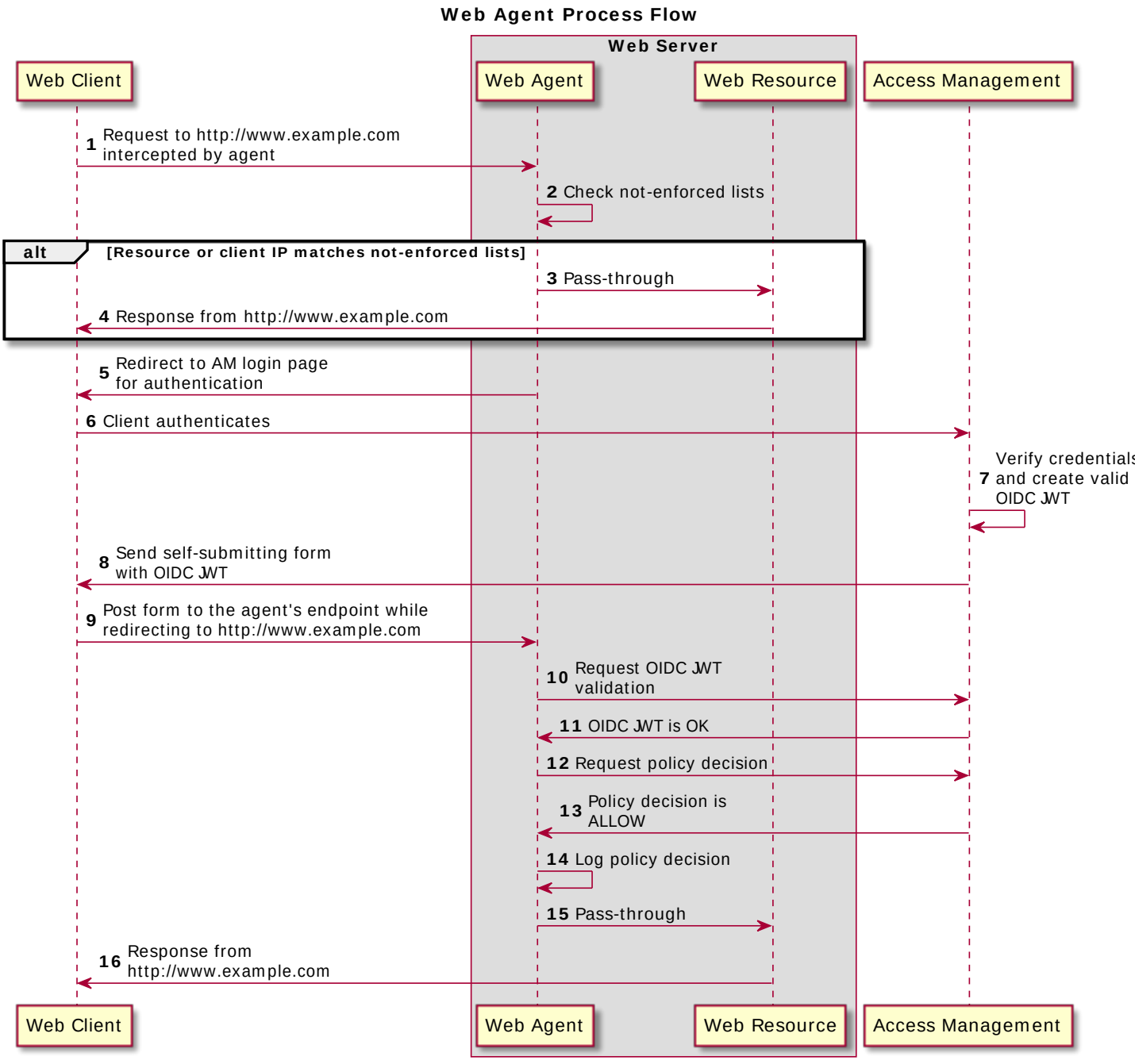
Suppose you wanted to withdraw money from your bank account using an ATM. The ATM would not allow you to access your account unless you identified yourself to the bank with your card and PIN number. For a joint account, you may also require additional authorization to access the funds.

Web agents work on a similar premise. When a client requests access to a resource, the web agent intercepts the request. Then, AM validates the identity of the client as well as authorizes access the protected resource.

The following sequence diagram shows the simplified[2] flow that occurs when an unauthenticated client requests a resource protected by a web agent and AM:

[2]For a detailed diagram, see About Cross-Domain Single Sign-On in the *ForgeRock Access Management Authentication and Single Sign-On Guide*.

Web Agent Interaction



1. An unauthenticated client attempts to access a resource at `www.example.com`. The agent intercepts the inbound request.
2. The agent evaluates whether the requested resource or the client IP address matches any rule contained in the *not-enforced lists*.
3. *Alternate Flow*. The requested resource or the client IP address matches a not-enforced rule. The agent allows access to the resource.
4. *Alternate Flow*. The client receives a response from `www.example.com`. The flow ends.
5. The requested resource or the client IP address does not match a not-enforced rule. The agent redirects the client to log in to AM.
6. The client authenticates to AM.
7. AM's Authentication Service verifies the client's credentials and creates a valid OpenID Connect (OIDC) JSON Web Token (JWT) with session information.
8. AM sends the client a self-submitting form with the OIDC JWT.
9. The client posts the self-submitting form to the agent's endpoint while redirecting to `www.example.com` again. The agent intercepts the requests and consumes the form.
10. The agent contacts AM to validate the session contained in the OIDC JWT.
11. AM validates the session.
12. The agent contacts AM's Policy Service, requesting a decision about whether the client is authorized to access the resource.
13. AM's Policy Service returns `ALLOW`.
14. The agent writes the policy decision to the audit log.
15. The agent enforces the policy decision. Since the Policy Service returned `ALLOW`, the agent performs a pass-through operation to return the resource to the client.
16. The client accesses the resource at `www.example.com`.

1.4. Web Agent Features

The Web Agent provides a number of features to help you protect your applications:

- Multiple Sites and Virtual Host Support
- Web Agent Single Sign-on (SSO) Only Mode

- Not-Enforced URL and Client IP Lists
- Notification System
- Attribute Fetch Modes
- FQDN Checking
- Cookie Reset Properties
- Cross-Domain Single Sign-On
- Supporting Load Balancers
- Continuous Security
- Redirection and Conditional Redirection
- POST Data Preservation
- Caching Capabilities

1.4.1. Multiple Sites and Virtual Host Support

Web Agent instances can be configured to operate with multiple websites in IIS, and with multiple virtual hosts in Apache.

Each configuration instance is independent and has its own configuration file, debug logs, and audit logs. Each instance can connect to a different AM realm, or even different AM servers.

For more information, see "Installing Apache Web Agents on a Virtual Host" and "Installing the IIS Web Agent".

1.4.2. Web Agent Single Sign-on (SSO) Only Mode

The agent intercepts all inbound client requests to access a protected resource and processes the request based on a global configuration property, `com.sun.identity.agents.config.sso.only`. The configuration setting determines the mode of operation that should be carried out on the intercepted inbound request.

When `com.sun.identity.agents.config.sso.only` is `true`, the web agent only manages user authentication. The filter invokes the AM Authentication Service to verify the identity of the user. If the user's identity is verified, the user is issued a session token through AM's Session Service.

When `com.sun.identity.agents.config.sso.only` is `false`, which is the default, the web agents will also manage user authorization, by using the policy engine in AM.

For more information, see "Configuring SSO Properties".

1.4.3. Not-Enforced URL and Client IP Lists

The web agent supports properties to bypass authentication and grant immediate access to resources not requiring protection, such as images, stylesheets, or static HTML pages.

You can configure a Not-Enforced URL List using the `com.sun.identity.agents.config.notenforced.url` property that grants the user access to resources whose URLs match those in the list.

For example, you can set URL patterns with wildcards in the AM console using the following patterns:

```
/logout.html
/images/*
/css/-*-
/*.jsp?locale=*
```

For more information on wildcard usage, see Specifying Resource Patterns with Wildcards.

To add not enforced URLs, navigate to Applications > Agents > Web > *Agent Name* > Application, and configure the Not Enforced URLs property.

You can specify the HTTP method that must be used to access the URL in order for it to be not enforced. For example, if you did not want to enforce `OPTIONS` HTTP requests to your scripts, you can specify a not-enforced URL rule as follows:

```
com.sun.identity.agents.config.notenforced.url[OPTIONS,1]=/scripts/*
```

Create separate rules to match multiple HTTP methods for a single URL, for example:

```
com.sun.identity.agents.config.notenforced.url[OPTIONS,1]=/scripts/*
com.sun.identity.agents.config.notenforced.url[TRACE,2]=/scripts/*
```

Tip

Due to the different format for not enforced rules that apply an HTTP method filter, when using centralized configuration you must create these rules as Custom Properties. To do so, navigate to Applications > Agents > Web > *Agent Name* > Advanced, and add the not enforced rule into the Custom Properties field.

The web agent supports a Not-Enforced Client IP List, which specifies the client IP addresses that can be excluded from authentication and authorization. This property is useful to allow administrators access to the web site from a certain IP address or allow a search engine access to the web resources.

For finer control, you can configure a not-enforced policy that applies to requests to specified URLs, which also come from a list of specified IP addresses. See Not-Enforced URL from IP Processing Properties.

For more information on not-enforced lists, see "Configuring Application Properties".

1.4.4. Notification System

AM can notify web agents about configuration and session state changes through WebSockets. Web agents can subscribe to three notification feeds:

- **Configuration Notifications**. When the administrator makes a change to a hot-swappable web agent configuration property, AM sends a notification to the web agent to reread the agent profile from AM.

  Configuration notifications are applicable when you store the web agent profile in AM's configuration data store.

- **Session Notifications**. When a client logs out or a CTS-based session expires, AM sends a notification to the web agent to remove the client's entry from the session cache.

- **Policy Notifications**. When an administrator changes a policy, AM sends a notification to the web agent to empty the session and policy cache.

Enabling notifications affects the validity of the web agent caches. For more information, see "Caching Capabilities". To enable notifications, configure the Agent Configuration Change Notification and Enable Notifications properties as described in the Profile Properties section.

The AM advanced server configuration property, `org.forgerock.openam.notifications.agents.enabled`, controls whether the AM server sends notifications to connected web agents. This property is enabled by default.

Note

Ensure that load balancers and reverse proxies configured in your environment support WebSockets.

1.4.5. Attribute Fetch Modes

Web Agents provide the capability to fetch and inject user information into HTTP headers, request objects, and cookies and pass them on to the protected client applications. The client applications can then personalize content using these attributes in their web pages or responses.

Specifically, you can configure the type of attributes to be fetched and the associated mappings for the attributes names used in AM to those values used in the containers. The web web agent securely fetches the user and session data from the authenticated user as well as policy response attributes.

For example, you can have a web page that addresses the user by name retrieved from the user profile, for example "Welcome Your Name!" AM populates part of the request (header, form data) with the CN from the user profile, and the web site consumes and displays it.

For more details, see Profile Attributes Processing Properties.

1.4.6. FQDN Checking

The web agent requires that clients accessing protected resources use valid URLs with fully qualified domain names (FQDNs). If invalid URLs are referenced, policy evaluation can fail as the FQDN will not match the requested URL, leading to blocked access to the resource. Misconfigured URLs can also result in incorrect policy evaluation for subsequent access requests.

There are cases where clients may specify resource URLs that differ from the FQDNs stored in AM policies, for example, in load balanced and virtual host environments. To handle these cases, the web agent supports FQDN Checking properties: `FQDN Default` and `FQDN Virtual Host Map` properties.

The `FQDN Default` property specifies the default URL with valid hostname. The property ensures that the web agent can redirect to a URL with a valid hostname should it discover an invalid URL in the client request.

The `FQDN Virtual Host Map` property stores map keys and their corresponding values, allowing invalid URLs, load balanced URLs, and virtual host URLs to be correctly mapped to valid URLs. Each entry in the Map has precedence over the `FQDN Default` setting, so that if no valid URLs exist in the `FQDN Virtual Host Map` property, the agent redirects to the value specified in the `FQDN Default` property.

If you want the agent to redirect to a URL other than the one specified in the `FQDN Default` property, then it is good practice to include any anticipated invalid URLs in the `FQDN Virtual Host Map` property and map it to a valid URL.

For more details, see Fully Qualified Domain Name Checking Properties.

1.4.7. Cookie Reset Properties

Web agents can reset cookies prior to redirecting the client to a login page for authentication by issuing a Set-Cookie header to the client to reset the cookie values.

Cookie reset is typically used when multiple parallel authentication mechanisms are in play with the web agent and another authentication system. The web agent can reset the cookies set by the other mechanism before redirecting the client to a login page.

Note

To be able to set, and reset secure or HTTP Only cookies, in addition to the cookie reset properties, you must also set the relevant cookie option, as follows:

- To reset secure cookies, enable the `com.sun.identity.agents.config.cookie.secure` property.
- To reset HTTP only cookies, enable the `com.sun.identity.cookie.httponly` property.

For more information about these properties, see Cookie Properties.

If you have enabled attribute fetching using cookies to retrieve user data, it is good practice to use cookie reset, which will reset the cookies when accessing an enforced URL without a valid session.

For more information about cookie reset properties, see Cookie Reset.

1.4.8. Cross-Domain Single Sign-On

Cross-domain single sign-on (CDSSO) is an AM capability that lets users access multiple independent services from a single login session, using the web agent to transfer a validated session ID on a single DNS domain or across domains.

Without AM's CDSSO, SSO cannot be implemented across domains; the session cookie from one domain would not be accessible from another domain. For example, in a configuration where the AM server (`openam.example.com`) is in a different DNS domain than the web agent (`myapp.website.com`), single sign-on would not be possible.

Web Agents work in CDSSO mode by default, regardless of the DNS domain of the AM servers and the DNS domain of the web agents.

For more information and implementation details, see About Single Sign-On and Configuring Cross-Domain Single Sign-On in the *ForgeRock Access Management Authentication and Single Sign-On Guide*.

1.4.9. Supporting Load Balancers

The web agent provides a number of advanced properties for load balancer deployments fronting multiple web agents. Properties are available to get the client IP and host name from the load balancer.

If the web agent is running behind a load balancer, you can configure the web agent to set a sticky cookie or a query parameter in the URL to ensure subsequent requests are routed to the same instance to preserve session data.

These mechanisms ensure that unauthenticated POST data can be preserved. Web agents store POST data in the cache and do not share the data among the agents behind the load balancer.

For more details, see "*Configuring Environments With Load Balancers and Reverse Proxies*".

Also, web agents can communicate with an AM site configured behind a load balancer. To improve AM server performance in this scenario, ensure that the value of the `amlbcookie` cookie is set up to the AM's server ID. For more information, see *Configuring Site Sticky Load Balancing*.

1.4.10. Continuous Security

Because web agents are the first point of contact between users and your business applications, they can collect inbound login requests' cookie and header information which an AM server-side authorization script can then process.

For example, you may decide that only incoming requests containing the `InternalNetwork` cookie can access intranet resources outside working hours.

For more information about configuring continuous security properties, see Continuous Security Properties.

1.4.11. Redirection and Conditional Redirection

Web agents provide the capability to redirect users to a specific AM instance, an AM site, or a website other than AM. You can also redirect users based on the incoming request URL by configuring conditional redirection, which is available for login and logout requests.

For example, you can configure the web agent such that any login request made from the `france.example.com` domain is redirected to the `openam.france.example.com` AM site. You can also configure the web agent to redirect any user to a specific page after logout.

You may also decide to configure conditional login redirection to specify the realm to which users must authenticate.

Web agents support the following login modes:

- Default Login Redirection Mode
- Custom Login Redirection Mode

1.4.11.1. Default Login Redirection Mode

By default, Web Agents 5.x and AM use OpenID Connect (OIDC) JSON web tokens (JWT) for authentication. Unauthenticated users are redirected to the `oauth2/authorize` endpoint. This endpoint invokes both the XUI and other endpoints within AM, such as:

- `oauth2/authorize`
- `json/authenticate`
- `json/sessions`
- `json/serverinfo`
- `XUI/*`

Unauthenticated users must be able to reach, at least, AM's `oauth2/authorize` endpoint, as well as the AM XUI page to which the agent redirects for authentication.

When configuring the agent for default login redirection, consider the following points:

- **Ensure that the Allow Custom Login Mode property is disabled** (`org.forgerock.openam.agents.config.allow.custom.login` is set to `false`), to allow the agent to redirect to AM XUI pages.
- **Configure one of the following properties:**
  - OpenAM Conditional Login URL (`com.forgerock.agents.conditional.login.url`), when the login page is an AM instance.
  - Regular Expression Conditional Login URL (`org.forgerock.agents.config.conditional.login.pattern` and `org.forgerock.agents.config.conditional.login.url`), when the login page is an AM instance.

For more information, see Login URL Properties.

- **The login flow is as follows:**

  1. The agent receives a request to access a page from an unauthorized user.
  2. The agent matches the request with the domains and URLs specified by the `org.forgerock.openam.agents.config.conditional.login.url` property, and redirects the user to the appropriate custom login page.
  3. The user logs in to the login page in the AM XUI. AM authenticates the user.
  4. The login page redirects back to the agent.

1.4.11.2. Custom Login Redirection Mode

Web Agents support a custom login redirection mode by configuring the custom login mode property `org.forgerock.openam.agents.config.allow.custom.login`.

When this property is set to `true`, the agent expects the custom login page to set an SSO token in the user's browser after authentication. The agent will present the SSO token to AM, which would then convert it into an OIDC JWT.

Enable the custom login redirection mode when:

- Your environment already has customized login pages that expect user sessions to be stored in SSO tokens instead of in OIDC JWTs, whether these are XUI login pages or not.
- Your environment is configured so the users cannot access the AM servers at all. Note that configuring AM behind a reverse proxy does not fall into this category.
- Your environment is configured so the custom login pages are not part of AM's XUI.

When configuring the agent for custom login redirection, consider the following points:

- **Ensure that the Allow Custom Login Mode property is enabled** (the `org.forgerock.openam.agents.config.allow.custom.login` property is set to `true`.
- **Configure any of the following properties:**
  - OpenAM Login URL (`com.sun.identity.agents.config.login.url`)
  - OpenAM Conditional Login URL (`com.forgerock.agents.conditional.login.url`), when the custom login page is not an AM instance.
  - Regular Expression Conditional Login URL (`org.forgerock.agents.config.conditional.login.pattern` and `org.forgerock.agents.config.conditional.login.url`), when the custom login page is not an AM instance.

For more information, see Login URL Properties.

- **The login flow is as follows:**

  1. The agent receives a request to access a page from an unauthenticated user.
  2. The agent checks the backwards-compatible conditional login properties:

     - If configured, the agent redirects the user to the custom login page specified by the OpenAM Login URL property.
     - If not configured, the agent matches the request with the domains and URLs specified by any of the Conditional Login URL properties, and redirects the user to the appropriate custom login page.

     During the redirection process, the agent appends to the request `goto` parameter and a nonce contained in the `state` parameter.
  3. The user logs in to the custom login page.
  4. The custom login page sets an SSO token in AM's session cookie (by default, `iPlanetDirectoryPro`) in the user's browser and redirects back to the agent using the `goto` parameter provided.

     If the agent is unable to access AM's session cookie, or if the session cookie contains an invalid SSO token, the login process will fail.
  5. The agent contacts AM to log the user in to the appropriate realm and AM converts the SSO token into an OIDC JWT.

1.4.12. POST Data Preservation

Web agents can preserve HTML form data submitted as an HTTP POST by unauthenticated clients.

At a high level, when an unauthenticated client posts HTML POST data to a protected resource, the web agent stores the data in its cache and redirects the client to the login screen. Upon successful authentication, the agent recovers the data stored in the cache and autosubmits it to the protected resource.

Consider enabling POST data preservation if users or clients in your environment submit large amounts of data, such as blog posts and wiki pages, and their sessions are short-lived.

Web agents guarantee the integrity of the data and the authenticity of the client as follows:

- Each unauthenticated form POST to a protected resource generates a random unique identifier. This identifier is then handled as follows:

  - The agent places it into a cookie and provides the cookie to the client.
  - The agent sends it to AM along with the authentication request for the client.

- After authentication, AM returns the session for the client alongside with the unique identifier. If the client cannot provide the identifier (because the cookie is missing) or the identifier differs from the one returned by AM, the web agent denies access to the stored POST data.

  The unique identifier and the cookie protect the client against cross-site request forgery (CSRF) attacks by ensuring a request cannot be replayed after authentication unless it was originally sent in the same browser session within a finite time.

For more information about the POST data preservation cache and its properties, see "Caching Capabilities" and Post Data Preservation Properties.

1.4.13. Caching Capabilities

Web Agents implement the following caches to speed up agent operation:

Configuration Cache

The configuration cache stores web agent configuration properties.

When a web agent starts up, it either makes a call to AM to retrieve a copy of the agent profile (centralized configuration) or reads the agent profile from the local configuration file (local configuration). Then, the agent stores the configuration in its cache. The information stored in the cache is valid until one of the following events occur:

- AM notifies the agent of changes to hot-swappable web agent configuration properties. This only applies to deployments that use centralized configuration.
- The information in cache reaches the expiration time specified by the `com.sun.identity.agents.config.polling.interval` property.

When a configuration property in the cache is invalid, the web agent clears the cached property value and rereads it from the agent profile.

Session and Policy Cache

Stored in the shared memory pool defined by the `AM_MAX_SESSION_CACHE_SIZE` environment variable, the session and policy cache stores session and policy information.

The default size of the cache is 16 MB, but you may need to increase its size if you plan to hold many active sessions in the cache at any given time. For more information about the environment variable, see "Configuring Web Agent Environment Variables".

After authentication, AM presents the client with a JWT containing session information. The web agent stores part of that session information in the cache. When a client attempts to access a protected resource, the web agent checks whether there is a policy decision cached for the resource:

- If there is a policy decision, the agent reuses it without contacting AM.
- If there is no policy decision, the validity of the client's session determines the agent's behavior:

- If the client's session is valid, the web agent requests a policy decision from AM, caches it, and then enforces it.
- If the client's session is not valid, the agent redirects the client to AM for authentication regardless of why the session is invalid. The web agent does not specify the reason why the client needs to authenticate.

  Once the client authenticates and the session is cached, the web agent requests a policy decision from AM, caches it, and then enforces it.

Session and policy decisions are valid in the cache until one of the following events occur:

Session and Policy Validity in Cache

Event	What is invalidated?
Session contained in the JWT expires	Session and policy decisions related to the session
Client logs out from AM (and session notifications are enabled)	Session and policy decisions related to the session
Session reaches the expiration time specified by the `com.sun.identity.agents.config.sso.cache.polling.interval` property	Session
Policy decision reaches the expiration time specified by the `com.sun.identity.agents.config.policy.cache.polling.interval` property	Policy decision
Administrator makes a change to policy configuration (and policy notifications are enabled)	All sessions and all policy decisions

Important

A web agent that loses connectivity with AM cannot request policy decision. Therefore, the web agent denies access to inbound requests that do not have a policy decision cached until the connection is restored.

For more information about properties related to the session and policy decision cache, see Policy Client Service Properties.

POST Data Preservation Cache

Stored in files saved in the agent installation directory, the POST data preservation cache stores short-lived POST data.

When POST data preservation is enabled (`com.sun.identity.agents.config.postdata.preserve.enable`), the web agent caches HTML form data submitted as an HTTP POST by unauthenticated clients. By default, this data is stored in the directory specified by the `org.forgerock.agents.config.postdata.preserve.dir` property.

POST data information is cached for the amount of time specified by the POST Data Entries Cache Period (`com.sun.identity.agents.config.postcache.entry.lifetime`) property.

For more information about POST data preservation, see "POST Data Preservation" and Post Data Preservation Properties.

Chapter 2

Preparing for Installation

This chapter covers tasks to perform before installing web agents in your environment. The following table contains a list of the tasks:

Task	Section
Download web agent binaries	Section 2.1
Secure communications between AM and the web agents	Section 2.2
Create agent profiles	Section 2.3
Configure your environment when communication between AM and agents happens behind load balancers or reverse proxies	Section 2.4

2.1. Downloading and Unzipping Web Agents

Navigate to the ForgeRock BackStage website and choose the agent to download based on your version, architecture, and operating system requirements. Remember to verify the checksum of the downloaded file against the checksum posted on the download page.

Unzip the file in the directory where you plan to store the web agent's configuration and log files. The following directories are extracted:

`bin/`

Contains the installation and configuration program **agentadmin**.

`config/`

Contains configuration templates used by the **agentadmin** command during installation.

`instances/`

Contains configuration files, and audit and debug logs for individual instances of the web agents. The directory is empty when first extracted.

`legal/`

Contains licensing information including third-party licenses.

`lib/`

Contains shared libraries used by the web agent.

`log/`

Contains log files written during installation. The directory is empty when first extracted.

When the web agent is running, the directory may also contain the following files:

- POST data preservation files (configurable in the `org.forgerock.agents.config.postdata.preserve.dir` property).
- The `system_n.log` file, where the agent logs information related to agent tasks running in the background.

  Web agents timestamp events in coordinated universal time (UTC).
- The backup of the site and application configuration files created after running the **agentadmin -g** command (IIS web agent only).
- Files related to the web agent caches (IIS web agent only).

2.2. Configuring Access Management Servers to Communicate With Web Agents

AM communicates all authentication and authorization information to web agents using OpenID Connect (OIDC) JSON web tokens (JWT). To secure the integrity of the JSON payload (outlined in the JSON Web Algorithm specification RFC 7518), AM and the web agent support signing the tokens for communication with the RS256 algorithm.

AM also uses an HMAC signing key to protect requested `ACR` claims values between sending the user to the authentication endpoint, and returning from successful authentication.

By default, AM uses a demo key and an autogenerated secret for these purposes. For production environments, perform the steps in one of the following procedures to create new key aliases and configure them in AM:

- "To Configure Access Management Secret IDs for the Agents' OAuth 2.0 Provider in AM 6.0 or earlier"
- "To Configure Access Management Secret IDs for the Agents' OAuth 2.0 Provider in AM 6.5 or later"

To Configure Access Management Secret IDs for the Agents' OAuth 2.0 Provider in AM 6.0 or earlier

By default, AM 6.0 or earlier signs the JWTs with the `test` key alias provided in AM's JCEKS keystore and sign the claims with a secret autogenerated at time.

Perform the following steps to create and set up a new key and a new secret in AM 6.0 or earlier:

1. Create the following aliases in one of the secret stores configured in AM, for example, the default JCEKS keystore:
   a. Create an RSA key pair.

      For more information about creating a key alias in the AM keystore, see the section Creating Key Aliases of the *ForgeRock Access Management Setup and Maintenance Guide*.

   b. Create an HMAC secret.
2. In the AM console, navigate to Configure > Global Services > OAuth2 Provider.
3. Perform the following actions:
   a. Replace the `test` key alias in the ID Token Signing Key Alias for Agent Clients field with the new RSA key alias.
   b. Replace the value in the Authenticity Secret field with the new HMAC secret.

      Note that you may already have a secret configured for this secret ID, since it is also used for signing certain OpenID Connect ID tokens and remote consent requests.
   c. Save your changes.

   No further configuration is required in the agents.

To Configure Access Management Secret IDs for the Agents' OAuth 2.0 Provider in AM 6.5 or later

By default, AM 6.5 or later is configured to:

- Sign the JWTs with the secret mapped to the `am.global.services.oauth2.oidc.agent.idtoken.signing` secret ID. This secret ID defaults to the `rsajwtsigningkey` key alias provided in AM's JCEKS keystore.
- Sign the claims with the secret mapped to the `am.services.oauth2.jwt.authenticity.signing` secret ID. This secret ID defaults to the `hmacsigningtest` key alias available in AM's JCEKS keystore.

Perform the following steps to create and set up new keys on a keystore secret store:

1. Create the following aliases in one of the secret stores configured in AM, for example, the default JCEKS keystore:
   a. Create an RSA key pair.
   b. Create an HMAC secret.
2. In the AM console, navigate to Configure > Secret Stores > *Keystore Secret Store Name* > Mappings.

3. Configure the following secret IDs:

   a. Configure the new RSA key alias in the `am.global.services.oauth2.oidc.agent.idtoken.signing` secret ID.

   b. Configure the new HMAC secret in the `am.services.oauth2.jwt.authenticity.signing` secret ID.

      Note that you may already have a secret configured for this secret ID, since it is also used for signing certain OpenID Connect ID tokens and remote consent requests. For more information, see Secret ID Mapping Defaults in the *ForgeRock Access Management Setup and Maintenance Guide*.

   c. Save your changes.

   For more information about secret stores, see the chapter Setting Up Secret Stores of the *ForgeRock Access Management Setup and Maintenance Guide*.

   No further configuration is required in the agents.

2.3. Creating Agent Profiles

A web agent requires a profile to connect to and communicate with AM, regardless of whether it is stored centrally in AM or on the agent server.

To Create an Agent Profile in AM Using the Console

Create an agent profile using the AM console by performing the following steps:

1. In the AM console, navigate to Realms > *Realm Name* > Applications > Agents > *Agent Type*, and then select the `Add Agent Type Agent` button in the Agent tab.

2. Complete the web form using the following hints:

   Agent ID

   The ID of the agent profile. This ID is used during the agent installation.

   Agent URL

   The URL the web or Java agent protects, such as `http://www.example.com:80`

   In centralized configuration mode, the Agent URL is used to populate the agent profile for services, such as notifications.

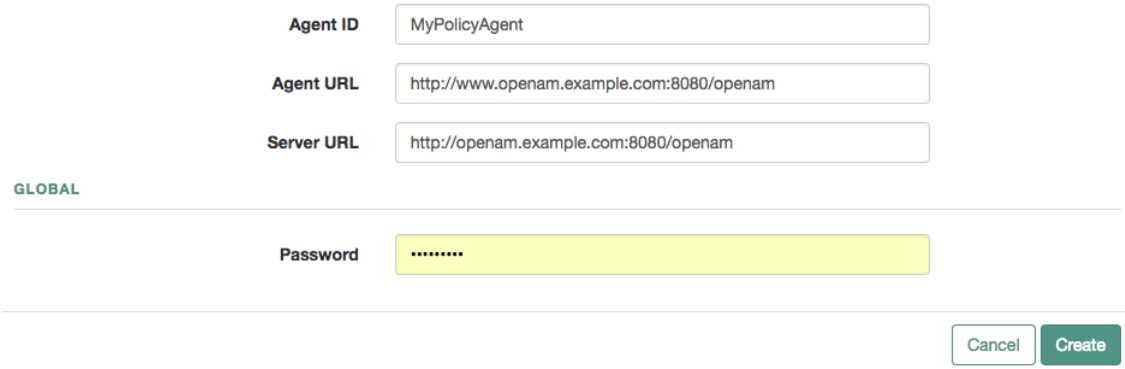
   Server URL

   The full URL to an AM instance. If AM is deployed in a site configuration (behind a load balancer), enter the site URL.

In centralized configuration mode, Server URL is used to populate the agent profile for use with as login, logout, naming, and cross-domain SSO.

Password

The password the agent uses to authenticate to AM. Use this password when installing an agent.



To Create an Agent Profile Using the ssoadm Command

You can create a web agent profile in AM using the **ssoadm** command-line tool. You do so by specifying the agent properties either as a list of attributes, or by using an agent properties file as shown below. Export an existing web agent configuration before you start to see what properties you want to set when creating the agent profile.

Perform the following steps to create a web agent profile using the **ssoadm** command:

1. Make sure the **ssoadm** command is installed. See the section Installing and Using the Tools in the *ForgeRock Access Management Install Guide*.

2. Determine the list of properties to set in the agent profile using the configuration exported previously and store them in a file, for example, `myWebAgent.properties`.

3. Create a password file, for example `$HOME/.pwd.txt`. The file should only contain the password string, on a single line.

   The password file must be read-only for the user who creates the agent profile, and must not be accessible to other users:

   ```
   $ chmod 400 $HOME/.pwd.txt
   ```

4. Create the agent profile, specifying `--agenttype WebAgent`:

```
$ ssoadm create-agent \
  --realm / \
  --agentname myWebAgent \
  --agenttype WebAgent \
  --adminid amadmin \
  --password-file $HOME/.pwd.txt \
  --datafile myWebAgent.properties

Agent configuration was created.
```

5. Review the new profile in the AM console under Realms > *Realm Name* > Applications > Agents > Web > *Agent Name*.

To Create an Agent Profile Group and Inherit Settings

Agent profile groups let you set up multiple agents to inherit settings from the group. To create a new agent profile group, perform the following steps:

1. In the AM console, navigate to Realms > *Realm Name* > Applications > Agents > Web.
2. Select Add Group in the Group tab, and provide an ID for the group and the URL to the AM server in which to store the profile.

   After creating the group profile, you can select the link to the new group profile to fine-tune or export the configuration.
3. 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 OpenAM Services agent profile tab.

2.4. Supporting Load Balancers and Reverse Proxies Between AM and the Agents

When your environment has reverse proxies or load balancers configured between the agents and AM, you must perform additional configuration in both AM and your environment before installing the agents.

Failure to do so may cause the agent installation to fail, or it may compromise the agent's functionality.

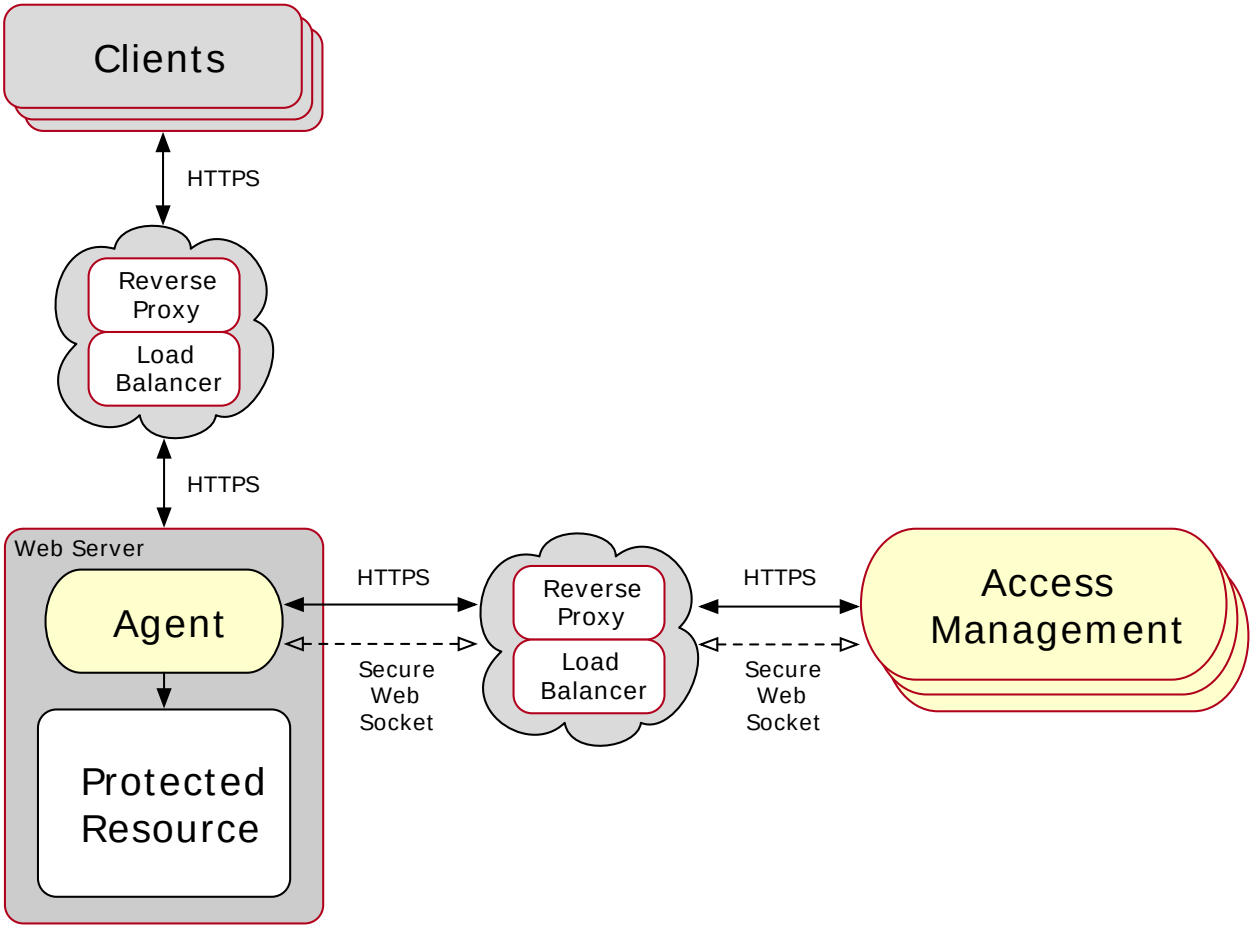
For more information, see "*Configuring Environments With Load Balancers and Reverse Proxies*".

Chapter 3

Configuring Environments With Load Balancers and Reverse Proxies

When working with AM and agents, the most common deployment scenario is to configure a load balancer and a reverse proxy between the clients and the agents, and another load balancer and reverse proxy between the agent and an AM site, as shown in the following diagram:

Web Agents in Environments with Load Balancers and Reverse Proxies



Usually, you want to anonymize client traffic as it gets into your network by using a reverse proxy, then balance the load among different web servers and agents.

AM sites are usually deployed behind a load balancer so the load can be spread among different instances. A reverse proxy may be deployed in front of the AM site to protect its APIs, too.

Note that the reverse proxy and the load balancer may be the same entity. In very complex environments, there may be more than the depicted load balancers and reverse proxies deployed in the network.

In any case, when installing web agents in an environment with load balancers or reverse proxies, you must consider the communication between the clients and the web agents, and between the agents and the AM servers.

Refer to the following sections for more information:

- "Regarding Communication Between AM and Agents".
- "Regarding Communication Between Clients and Agents".

3.1. Regarding Communication Between AM and Agents

Before attempting to install web agents in an environment where AM is behind a load balancer, reverse proxy, or both, consider the following points:

Agent's IP Address and/or FQDN

When a load balancer or a reverse proxy is configureed between AM and the web agents, the agents' IP addresses and FQDNs are concealed by the load balancer/reverse proxy's own IP or FQDN. As a result, AM cannot determine the agents' base URL as expected.

This could cause trouble during the installation process and also hinder functionality such as redirection using the `goto` parameter.

Therefore, you must configure the following:

- The load balancer or reverse proxy, to forward the agents' IP address and/or FQDN in a header.
- The AM site, to recover the forwarded headers. For more information, see "Configuring AM to Use Forwarded Headers".

> **Note**
>
> A load balancer or reverse proxy conceals the AM instances' IP addresses and FQDNs. When installing web agents, use the load balancer or reverse proxy IP address or FQDN as the point of contact for the AM site.

AM Sessions and Session Stickiness

When web agents communicate with an AM site that is behind a load balancer, you can improve policy evaluation performance by setting up AM's sticky cookie (by default, `amlbcookie`) to the AM's server ID. For more information, see Configuring Site Sticky Load Balancing in the *ForgeRock Access Management Installation Guide*.

> **Important**
>
> When configuring multiple agents behind a load balancer or reverse proxy, you must take into consideration whether you use one or multiple agent profiles, since it impacts sticky load balancer requirements:

- If the agents are configured with multiple agent profiles you must configure sticky load balancing. This is because the agent profile name is contained in the OpenID Connect JWT the agent and AM use to communicate. Without session stickiness, there is no way to make sure that the appropriate JWT ends in the appropriate web agent instance.
- If multiple agents are configured with the same agent profile, you can decide whether to configure sticky load balancing or not depending on other requirements of your environment.

WebSockets

Your load balancers and reverse proxies must support the WebSocket protocol for communication between the web agents and the AM servers.

For more information, refer to the load balancer or proxy documentation.

Tip

For an example of how to configure Apache HTTP as a reverse proxy, see "Configuring Apache HTTP Server as a Reverse Proxy Example".

3.1.1. Configuring AM to Use Forwarded Headers

When web agents are behind a load balancer or reverse proxy, you must configure AM to recover the forwarded headers that expose the agents' real IP address or FQDN.

To Configure Access Management to Use Forwarded Headers

To configure how AM obtains the base URL of web agents, use the Base URL Source service:

1. Log in to the AM console as an administrative user, such as `amAdmin`.
2. Navigate to Realms > *Realm Name* > Services.
3. Select Add a Service, select Base URL Source, and then select Create, leaving the fields empty.
4. Configure the service with the following properties:

   - **Base URL Source**: X-Forwarded-* headers

     This property allows AM to retrieve the base URL from the `Forwarded` header field in the HTTP request. The Forwarded HTTP header field is standardized and specified in *RFC 7239*.

   - **Context path**: *AM's deployment uri*. For example, `/openam`.

   Leave the rest of the fields empty.

Tip

For more information about the Base URL Source service, see Base URL Source in the *ForgeRock Access Management Reference*.

5. Save your changes.

3.2. Regarding Communication Between Clients and Agents

When your environment has load balancers or reverse proxies between clients and agents, you must consider the following points:

Client's IP Address and/or FQDNs

When configuring web agents behind a load balancer or reverse proxy, the clients' IP addresses and FQDNs are hidden by the load balancer's IP or FQDN, which results in agents not being able to determine the clients' base URLs.

Therefore, you must configure the load balancer or reverse proxy to forward the client's IP address and/or the client's FQDN in a header. Failure to do so will will prevent the agent from performing policy evaluation, and applying not-enforced and conditional login/logout rules.

For more information, see "Configuring Client Identification Properties".

POST Data Preservation

When using POST data preservation, you must use sticky load balancing to ensure that the client always hits the same agent and, therefore, their saved POST data.

Web agents provide properties to set either a sticky cookie or a URL query string for load balancers and reverse proxies.

For more information, see "Configuring POST Data Preservation for Load Balancers or Reverse Proxies".

Web Server FQDNs, Ports, and Protocols

When the protected web servers and their agents are behind a load balancer or reverse proxy, it is imperative that the agent is configured to match the load balancer FQDN, port, and protocol.

Failure to do so would make the agent to return HTTP 403 errors when clients request access to resources.

There are two use-cases:

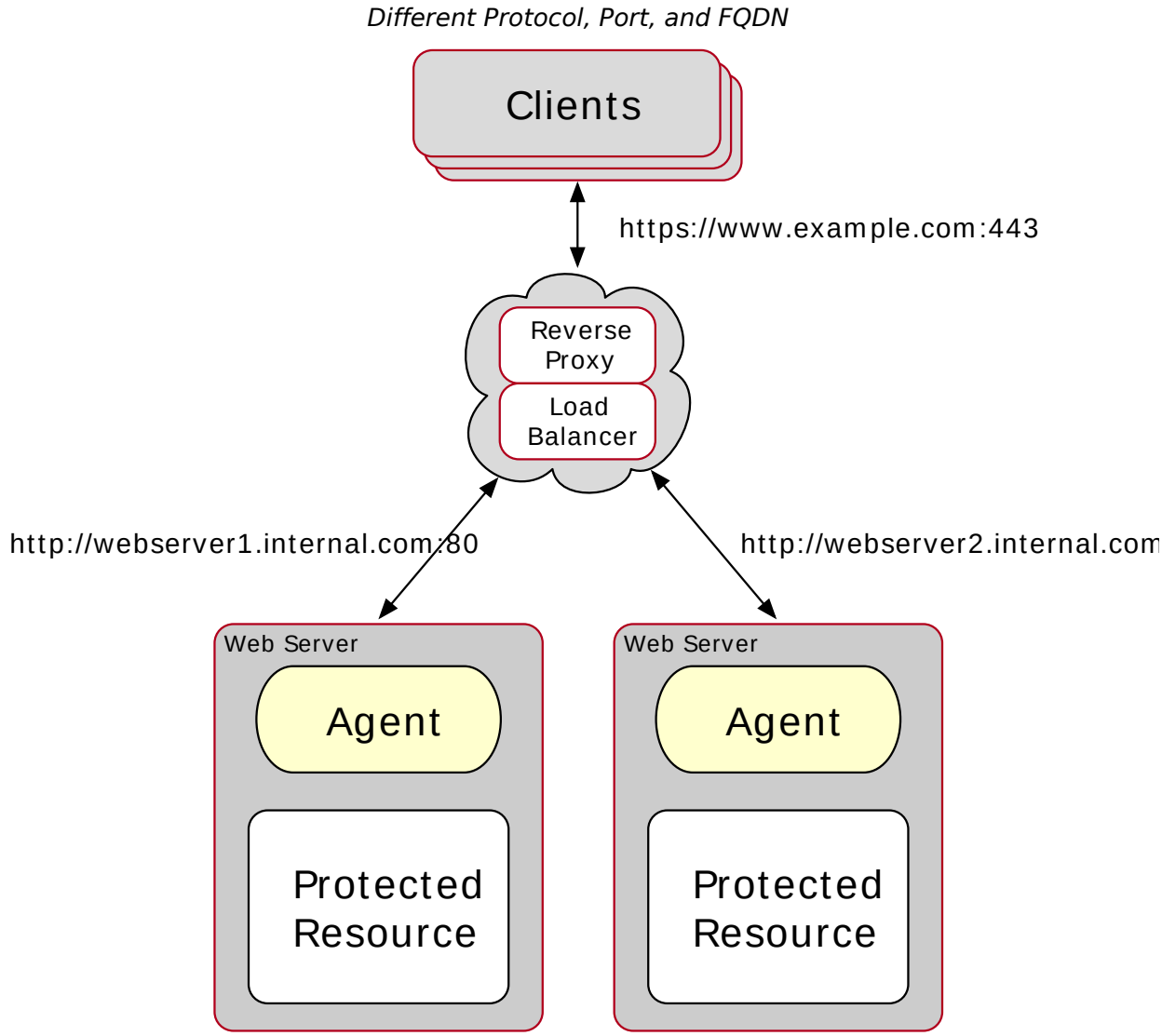
- The load balancer or reverse proxy forwards requests and responses between clients and protected web servers only. In this case, ports and protocols configured in the web server match those on the load balancer or reverse proxy, but FQDNs do not.
- The load balancer or reverse proxy also performs SSL offloading, terminating the SSL traffic and converting the requests reaching the web server to HTTP. This reduces the load on the protected servers, since the processing of the public key is usually done by a hardware accelerator.

  In this case, neither ports, protocols, or FQDNs match.

For more information about matching FQDNs, ports and protocols, see "Matching Protected Web Server Ports, Protocols, and FQDNs".

3.2.1. Matching Protected Web Server Ports, Protocols, and FQDNs

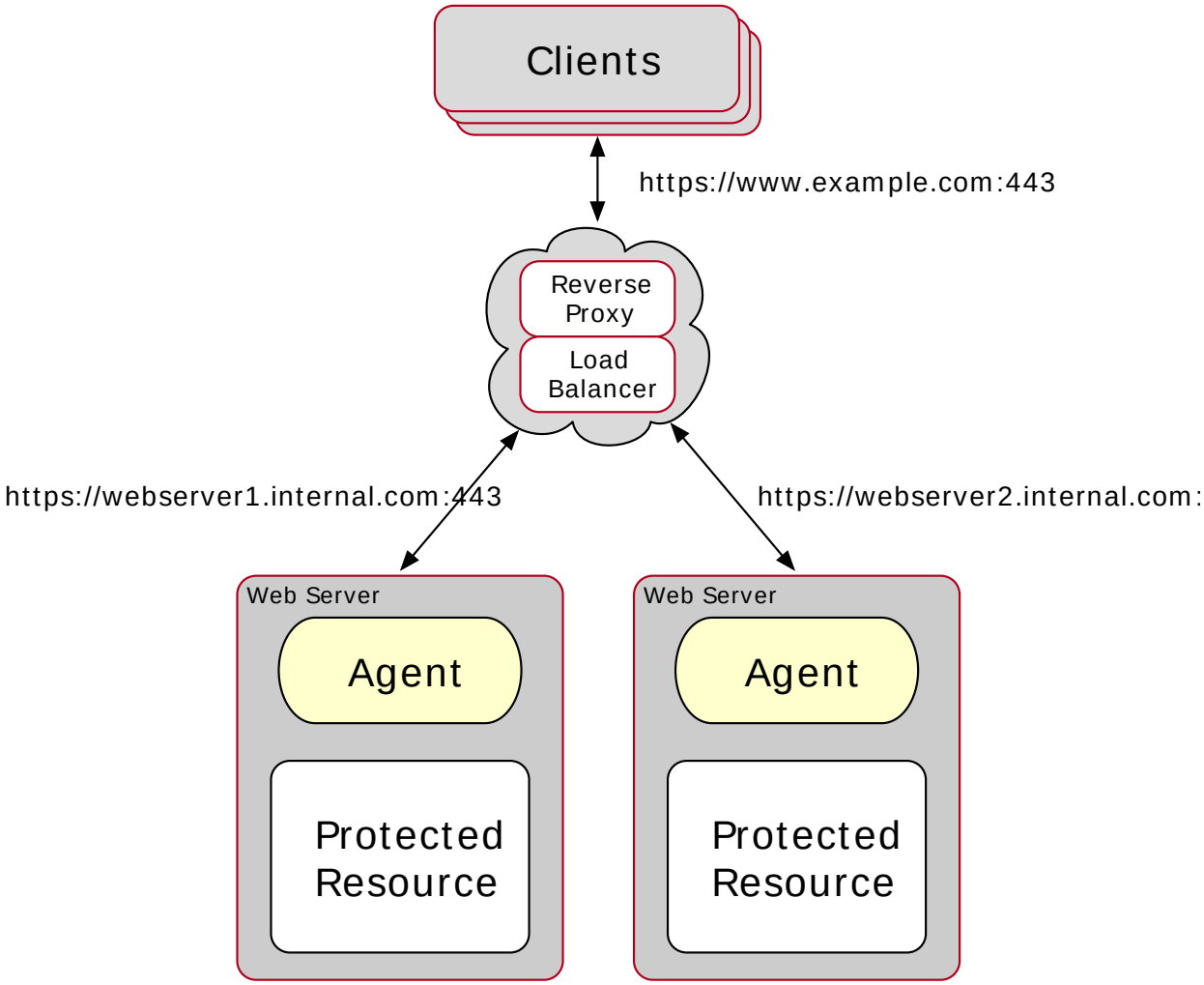
When the protocol and port configured on the load balancer or reverse proxy differ from those configured on the protected web server, you must override them in the web agent configuration. The following diagram illustrates this scenario:



In this case, configure the web agents following the steps in "To Override Protocol, Host, and Port".

When the protocol and port configured on the load balancer or reverse proxy match those configured on the protected web server, you must map the agent host name to the load balancer or reverse proxy host name. The following diagram illustrates this scenario:

Same Protocol and Port, Different FQDN



In this case, configure the web agents following the steps in "To Map the Agent Host Name to the Load Balancer or Reverse Proxy Host Name".

To Override Protocol, Host, and Port

Use the Agent Deployment URI Prefix setting to override the agent protocol, host, and port with that of the load balancer or reverse proxy.

Important

The web agent configuration for SSL offloading has the side effect of preventing FQDN checking and mapping. As a result, URL rewriting and redirection does not work correctly when the web agent is accessed directly and not through the load balancer or proxy. This should not be a problem for client traffic, but potentially could be an issue for applications accessing the protected server directly, from behind the load balancer.

This procedure explains how to do so for a centralized web agent profile configured in the AM console. The steps also mention the properties for web agent profiles that rely on local, file-based configurations:

1. Log in to the AM console as an administrative user with rights to modify the web agent profile.
2. Navigate to Realms > *Realm Name* > Applications > Agents > Web > *Agent Name*.
3. In the Global tab, set the Agent Deployment URI Prefix to that of the load balancer or proxy.

   The value you set here is used when overriding protocol, host, and port on the protected server with the web agent.

   The property to set is `com.sun.identity.agents.config.agenturi.prefix`.
4. In the Advanced tab, perform the following steps:
   a. Enable Override Request URL Protocol.

      The equivalent property setting is `com.sun.identity.agents.config.override.protocol=true`.
   b. Enable Override Request URL Host.

      The equivalent property setting is `com.sun.identity.agents.config.override.host=true`.
   c. Enable Override Request URL Port.

      The equivalent property setting is `com.sun.identity.agents.config.override.port=true`.
5. Save your work.
6. Restart the web server where the agent is installed.

To Map the Agent Host Name to the Load Balancer or Reverse Proxy Host Name

When protocols and port numbers match, configure fully qualified domain name (FQDN) mapping.

This procedure explains how to do so for a centralized web agent profile configured in the AM console. The steps also mention the properties for web agent profiles that rely on local, file-based configurations:

1. Log in to the AM console as an administrative user with rights to modify the web agent profile.

2. Navigate to Realms > *Realm Name* > Applications > Agents > Web > *Agent Name*.
3. In the Global tab, enable FQDN check.

   The equivalent property setting is `com.sun.identity.agents.config.fqdn.check.enable=true`.
4. Set the FQDN Default field to the fully qualified domain name of the load balancer or proxy, such as `lb.example.com`, rather than the protected server FQDN where the web agent is installed.

   The equivalent property setting is `com.sun.identity.agents.config.fqdn.default=lb.example.com`.
5. Append the FQDN of the load balancer or proxy to the Agent Root URL for CDSSO field.

   The equivalent property setting is `sunIdentityServerDeviceKeyValue[n]=lb.example.com`.
6. Map the load balancer or proxy FQDN to the FQDN where the web agent is installed in the FQDN Virtual Host Map key-pair map. For example, set the key `agent.example.com` (protected server) and a value `lb.example.com` (load balancer or proxy).

   The equivalent property setting is `com.sun.identity.agents.config.fqdn.mapping[agent.example.com]=lb.example.com`.
7. Save your work.
8. Restart the web server where the agent is installed.

3.2.2. Configuring Client Identification Properties

After configuring your proxies or load balancers to forward the client's FQDN and/or IP address, configure the web agents to check the appropriate headers.

To Configure the Web Agent Client Identification Properties

This procedure explains how to configure the client identification properties for a centralized web agent profile configured in the AM console. The steps also mention the properties for web agent profiles that rely on local, file-based configurations:

1. Log in to the AM console with a user that has permissions to modify the web agent profile.
2. Navigate to Realms > *Realm Name* > Applications > Agents > Web > *Agent Name* > Advanced.
3. (Optional) In the Client IP Address Header field, configure the name of the header containing the IP address of the client. For example, `X-Forwarded-For`.

   The equivalent property setting is `com.sun.identity.agents.config.client.ip.header=X-Forwarded-Fo`.

   Configure this property if your AM policies are IP address-based, you configured the agent for not-enforced IP rules, or if you configured the agent to take any decision based on the client's IP address.

4. (Optional) In the Client Hostname Header field, configure the name of the header containing the FQDN of the client. For example, `X-Forwarded-Host`.

   The equivalent property setting is `com.sun.identity.agents.config.client.hostname.header=X-Forwarded-Host`.

   Configure this property if your AM policies are URL-based, you configured the agent for not-enforced URL rules, or if you configured the agent to take any decision based on the client's URL.

5. Save your changes.

3.2.3. Configuring POST Data Preservation for Load Balancers or Reverse Proxies

When configuring POST data preservation behind a load balancer or a reverse proxy, you must configure both your load balancer/reverse proxy and the web agents for session stickiness.

To Configure POST Data Preservation Stickiness Properties

1. Log in to the AM console with a user that has permissions to modify the web agent profile.
2. Navigate to Realms > *Realm Name* > Applications > Agents > Web > *Agent Name* > Advanced.
3. Decide whether the web agent should create a cookie or append a string to the URL to assist with sticky load balancing.

   In the Advanced field, configure the `com.sun.identity.agents.config.postdata.preserve.stickysession.mode` property with one of the following options:

   - **COOKIE**. The web agent will create a cookie for POST data preservation session stickiness. The contents of the cookie is configured in the next step.
   - **URL**. The web agent will append to the URL a string specified in the next step.

4. In the Advanced field, configure a key-pair value separated by the **=** character as the value of the `com.sun.identity.agents.config.postdata.preserve.stickysession.value` property.

   For example, specifying `lb=myserver` either sets a cookie called `lb` with `myserver` as a value, or appends `lb=myserver` to the URL query string.

5. (Optional) When using cookies, in the Advanced field, configure the name of the sticky cookie as the value of the `com.sun.identity.agents.config.postdata.preserve.lbcookie` property. For example, `lb`.
6. Save your changes.
7. Configure your load balancer or reverse proxy to ensure session stickiness when the cookie or URL query parameter are present.

Chapter 4

Installing Web Agents

You install web agents in web servers and web application containers to enforce access policies AM applies to protected web sites and web applications. Web agents depend on AM for all authentication and authorization decisions. The primary responsibility of web agents is to enforce what AM decides in a way that is unobtrusive to the user.

When installing web agents consider that a single web agent installation can hold multiple web agent instances. As installing more than one web agent in a web server is not supported, install only one web agent per web server and configure as many agent instances as you require.

The following table contains a list of sections containing information about installing web agents on supported platforms:

Task	Section
Install web agents on Apache HTTP Server or IBM HTTP Server	Section 4.1
Install web agents on Microsoft Internet Information Services (IIS)	Section 4.2
Install web agents on NGINX Plus	Section 4.3

4.1. Installing the Apache Web Agent

This section covers prerequisites and installation procedures for Web Agents 5.5 on Apache HTTP Servers and IBM HTTP Servers.

The examples on this chapter use Apache and the Apache HTTP Server agent path. For IBM HTTP Servers, replace the Apache HTTP Server agent path, `apache_24_agent`, with the IBM HTTP agent path, `httpserver7_agent`.

4.1.1. Before You Install

1. Download the web agent from BackStage. For more information, see "Downloading and Unzipping Web Agents".
2. Consider the following points before installing web agents on Apache:
   - Avoid installing the web server as root. Instead, create a web server user and install it as that user.

- The web agent replaces authentication functionality provided by Apache, for example, the `mod_auth_*` modules. Integration with built-in Apache authentication directives, such as `AuthName`, `FilesMatch`, and `Require` is not supported.
- SELinux can prevent the web server from accessing agent libraries and the agent from being able to write to audit and debug logs. See "*Troubleshooting*".
- Ensure AM is installed and running, so that you can contact AM from the system running the web agent.
- Agents require OpenSSL or the native Windows SSL libraries to be present. These libraries help to secure communications, for example when connecting to AM using WebSockets.

  For information about supported OpenSSL libraries, see "Supported OpenSSL Versions" in the *Release Notes*.

  On Windows, the native SSL libraries are used by default. To switch to OpenSSL, perform the following steps:

  - Configure the `org.forgerock.agents.config.secure.channel.disable` property by performing the following steps:

    a. Edit the `/web_agents/apache_24_agent/instances/Agent_nnn/config/agent.conf` file.

    b. Add the `org.forgerock.agents.config.secure.channel.disable=true` property under the Bootstrap Properties section.

    c. Restart the Apache server.

    You must perform this step whether the web agent is configured in centralized mode or not.

  - Ensure the OpenSSL libraries are either located or referenced as shown in the following table:

OpenSSL Libraries Location by Operating System

Operating System	OpenSSL Library	Location or Variable
Windows 32-bit	`libeay32.dll` `ssleay32.dll`	`\windows\syswow64`
Windows 64-bit	`libeay64.dll` `ssleay64.dll`	`\windows\system32`
Linux	`libcrypto.so` `libssl.so`	`$LD_LIBRARY_PATH` or `$LD_LIBRARY_PATH_64`
AIX	`libcrypto.so` `libssl.so`	`$LIBPATH`

4.1.1.1. Tuning Apache Multi-Processing Modules

The Apache HTTP Server and the IBM HTTP Server include Multi-Processing Modules (MPMs) that extend the basic functionality of a web server to support the wide variety of operating systems and customizations for a particular site.

You must configure and tune the MPMs before installing the Apache Web Agent, as follows:

- Configure either the `mpm-event` or the `mpm-worker` modules for Unix-based servers, or the `mpm_winnt` module for Windows servers.

  The `prefork-mpm` module may cause performance issues to both the agent and AM.

- Ensure that there are enough processes and threads available to service the expected number of client requests.

  MPM-related performance is configured in the `conf/extra/http-mpm.conf` file. The key properties in this file are `ThreadsPerChild` and `MaxClients`. Together, these the properties control the maximum number of concurrent requests that can be processed by Apache. The default configuration allows for 150 concurrent clients spread across 6 processes of 25 threads each.

  ```
  <IfModule mpm_worker_module>
  StartServers          2
  MaxClients          150
  MinSpareThreads      25
  MaxSpareThreads      75
  ThreadsPerChild      25
  MaxRequestsPerChild   0
  </IfModule>
  ```

  For the web agent notification feature, the `MaxSpareThreads`, `ThreadLimit` and `ThreadsPerChild` default values must *not* be altered; otherwise the notification queue listener thread cannot be registered.

  Any other values apart from these three in the worker MPM can be customized. For example, it is possible to use a combination of `MaxClients` and `ServerLimit` to achieve a high level of concurrent clients.

4.1.2. Installing the Apache Web Agent

Complete the following procedures to install Web Agent 5.5 on Apache:

To Complete Pre-Installation Tasks

Perform the following steps to create the configuration required by the web agent before installing it:

1. Create at least one policy in AM to protect resources with the agent, as described in the procedure *Implementing Authorization Using the Access Management Console*.
2. Create an agent profile in AM, required by the web agent to connect and communicate with AM. For more information, see "Creating Agent Profiles".

3. Ensure that the key pair configured for signing the OpenID Connect JWTs exchanged between AM and the web agents is not the default `test` key pair. For more information, see "Configuring Access Management Servers to Communicate With Web Agents".

4. Configure AM to protect the cross-domain single sign-on (CDSSO) session cookie from hijacking. For more information, see Implementing Cross-Domain Single Sign-On in the *ForgeRock Access Management Authentication and Single Sign-On Guide*.

5. Consider the communication between the agents and the AM servers, and between the agents and the clients when installing agents in environments with load balancers and/or reverse proxies. For more information, see "*Configuring Environments With Load Balancers and Reverse Proxies*".

6. Create a text file containing only the password specified when creating the agent profile, and protect it:

   Windows example:

   ```
   C:\> echo password > pwd.txt
   ```

   In Windows Explorer, right-click the password file, for example `pwd.txt`, select Read-Only, and then click OK

   Note

   Windows 2008 R2 users must not create the password file using PowerShell.

   UNIX example:

   ```
   $ echo password > /tmp/pwd.txt
   ```

   ```
   $ chmod 400 /tmp/pwd.txt
   ```

To Install the Apache Web Agent

1. Check the information in "Before You Install" before proceeding.

2. Shut down the Apache server where you plan to install the agent.

3. Make sure AM is running.

4. Run the **agentadmin --i** command to install the agent. You will be prompted to read and accept the software license agreement for the agent installation.

   - UNIX example:

     ```
     $ cd /web_agents/apache24_agent/bin/
     $ ./agentadmin --i
     ```

   - Windows example:

```
C:\> cd web_agents\apache24_agent\bin
C:\path\to\web_agents\apache24_agent\bin> agentadmin.exe --i
```

5. When prompted for information, enter the inputs appropriate for your deployment.

Tip

You can cancel the web agent installation at anytime by pressing **CTRL+C**

a. Enter the full path to the Apache configuration file. The installer modifies this file to include the web agent configuration and module.

```
Enter the complete path to the httpd.conf file which is used by Apache HTTP
Server to store its configuration.
[ q or 'ctrl+c' to exit ]
Configuration file [/opt/apache/conf/httpd.conf]: /etc/httpd/conf/httpd.conf
```

b. When installing the web agent as the `root` user, the **agentadmin** command can change the directory ownership to the same user and group specified in the Apache configuration. Determine which user or group is running the Apache server by viewing the `Group` and `User` directives in the Apache server configuration file. Enter `yes` to alter directory ownership, press **Enter** to accept the default: `no`.

```
Change ownership of created directories using
User and Group settings in httpd.conf
[ q or 'ctrl+c' to exit ]
(yes/no): [no]: yes
```

Failure to set permissions causes issues, such as the Apache server not starting up, getting a blank page when accessing a protected resource, or the web agent generating errors during log file rotation.

c. The installer can import settings from an existing web agent on the new installation and skips prompts for any values present in the existing configuration file. You will be required to re-enter the agent profile password.

Enter the full path to an existing agent configuration file to import the settings, or press **Enter** to skip the import.

```
To set properties from an existing configuration enter path to file
[ q or 'ctrl+c' to exit, return to ignore ]
Existing agent.conf file:
```

d. Enter the full URL of the AM instance the web agents will be using. Ensure that the deployment URI is specified.

Note

If your environment has a reverse proxy configured between AM and the agent, set the AM URL to the proxy URL instead. For example, `https://proxy.example.com:443/openam`. For more information about

setting up the environment for reverse proxies, see "Configuring Apache HTTP Server as a Reverse Proxy Example".

```
Enter the URL where the AM server is running. Please include the
deployment URI also as shown below:
(http://openam.sample.com:58080/openam)
[ q or 'ctrl+c' to exit ]
OpenAM server URL: http://openam.example.com:8080/openam
```

e. Enter the full URL of the server the agent is running on.

```
Enter the Agent URL as shown below:
(http://agent.sample.com:1234)
[ q or 'ctrl+c' to exit ]
Agent URL: http://www.example.com:80
```

f. Enter the name given to the agent profile created in AM.

```
Enter the Agent profile name
[ q or 'ctrl+c' to exit ]
Agent Profile name: webagent4
```

g. Enter the AM realm containing the agent profile. Realms are case-sensitive.

```
Enter the Agent realm/organization
[ q or 'ctrl+c' to exit ]
Agent realm/organization name: [/]: /
```

h. Enter the full path to the file containing the agent profile password created earlier.

```
Enter the path to a file that contains the password to be used
for identifying the Agent
[ q or 'ctrl+c' to exit ]
The path to the password file: /tmp/pwd.txt
```

i. The installer displays a summary of the configuration settings you specified.

- If a setting is incorrect, type `no`, or press **Enter**. The installer loops through the configuration prompts again, using your provided settings as the default. Press **Enter** to accept each one, or enter a replacement setting.
- If the settings are correct, type `yes` to proceed with installation.

```
Installation parameters:

   OpenAM URL: http://openam.example.com:8080/openam
   Agent URL: http://www.example.com:80
   Agent Profile name: webagent4
   Agent realm/organization name: /
   Agent Profile password source: /tmp/pwd.txt

Confirm configuration (yes/no): [no]: yes
Validating...
Validating... Success.
Cleaning up validation data...
Creating configuration...
Installation complete.
```

Upon successful completion, the installer adds the agent as a module to the Apache configuration file. You can find a backup configuration file in the Apache configuration directory, called `http.conf_amagent_date_and_time_of_installation`.

The installer also sets up configuration and log directories for the agent instance. Each agent instance that you install on the system has its own numbered configuration and logs directory. The first agent's configuration and logs are located under the directory `web_agents/apache24_agent/instances/agent_1/`.

The configuration files and log locations are as follows:

`config/agent.conf`

Contains the bootstrap properties the web agent requires to connect to AM and download its configuration. Also contains properties that are only used if you configure the web agent to use local configuration.

`logs/audit/`

Audit log directory, used if the `local` or `all` audit locations are enabled.

`logs/debug/`

Debug directory where the `debug.log` debug file resides. Useful in troubleshooting web agent issues.

6. (Unix only) Configure whether the Apache agent instance should share runtime resources and shared memory, or not.

   For more information, see "Configuring Whether Unix Web Agents Should Share Runtime Resources and Shared Memory".

7. Ensure the user or group running the Apache HTTP server has the appropriate permissions on the following directories:

   Read Permission

- `/web_agents/apache_24_agent/lib`

Read and Write Permission

- `/web_agents/apache_24_agent/instances/agent_nnn`
- `/web_agents/apache_24_agent/log`

To determine which user or group is running the Apache HTTP server, check the `Group` and `User` directives in the Apache HTTP server configuration file.

Failure to set permissions causes issues, such as the Apache HTTP server not starting up, getting a blank page when accessing a protected resource, or the web agent generating errors during log file rotation.

> **Note**
>
> You may see the same issues if SELinux is enabled in `enforcing` mode and it is not configured to allow access to agent directories. For more information, see "*Troubleshooting*".

8. Run the configuration validator for the new agent instance you just created.

   The validator will ensure, among other things, that WebSocket communication between your web server and AM is possible.

   Perform the following steps to find the agent instance and run the **agentadmin** command:

   a. Change directories to the location where your web agent instances are installed. For example, `/path/to/web_agents/agent_name/instances`

   b. Find the agent instance you just created, for example, `agent_2`.

   c. Run the **agentadmin** command with the following options:

      ```
      agentadmin --V agent_instance am_user /path/to/am_user_password_file realm_name
      ```

      For example:

```
$ sudo -u daemon /path/to/web_agents/agent_name/bin/agentadmin --V
 \
agent_2 demo_user /path/to/demo_user_password_file /
Saving output to /Software/web_agents/apache24_agent/bin//../log/validate_20190522104659.log

Running configuration validation for agent_2:

Agent instance is configured with 1 naming.url value(s):
1. https://openam.example.com:8443/openam is valid
selected https://openam.example.com:8443/openam as naming.url value
validate_bootstrap_configuration: ok
validate_ssl_libraries: ok
validate_agent_login: ok
get_allocator_blockspace_sz(): trying for configured cache size 16777216 bytes
validate_system_resources: ok
validate_session_profile: ok
validate_websocket_connection: ok
validate_worker_init_shutdown: ok

Result: 7 out of 7 tests passed, 0 skipped.
```

Note that you should run the configuration validator as the same user that runs the web server. For example, the Apache HTTP Server `daemon` user. For more information about the `--V` option, see "Command-Line Tool Reference".

If `validate_websocket_connection` is `not ok`, ensure your web server and the network infrastructure between the web server and the AM servers support WebSockets.

Web agents require WebSocket communication.

9. Start the Apache server.

To Check the Apache Web Agent Installation

1. Check the Apache HTTP server error log after you start the server to make sure startup completed successfully:

```
[Tue Sep 08 15:51:27.667625 2016] AH00163:
Apache/2.4.6 (CentOS) OpenAM Web Agent/5.5
 configured
-- resuming normal operations
```

2. Make an HTTP request to a resource protected by the agent, then check the `/web_agents/apache24_agent/instances/Agent_1/logs/debug/debug.log` file to verify that no errors occurred on startup. Expected output should resemble the following:

```
2016-11-18 11:59:22.255 +0000    INFO [4900:6260]

##########################################################
OpenAM Web Agent
Version: 5.5
Revision: 5bf61d2
Build date: Nov  8 2016 11:29:54
##########################################################
```

3. (Optional) If you have a policy configured, you can test that your web agent is processing requests. For example, when you make an HTTP request to a resource protected by the agent you should be redirected to AM to authenticate. As an example, authenticate as user `demo`, password `changeit`. After you authenticate, AM redirects you back to the resource you tried to access.

4.1.3. Installing Apache Web Agents on a Virtual Host

Complete the following procedures to install Web Agent 5.5 on Apache virtual hosts.

Installing on an Apache virtual host is a manual process, which involves copying an instance directory created by the **agentadmin** installer and adding to the Apache configuration file of the virtual host.

To Prepare for Web Agent Installation on an Apache Virtual Host

Perform the following steps to create the configuration required to install a web agent on an Apache virtual host:

1. Install a web agent in the default root configuration of the Apache installation. For more information, see "Installing the Apache Web Agent"
2. Create an agent profile in AM for the web agent. For more information, see "Creating Agent Profiles".
3. Create at least one policy in AM to protect resources on the virtual host, as described in the procedure *Implementing Authorization Using the Access Management Console*.

To Install the Apache Web Agent on Apache Virtual Hosts

This procedure assumes you have installed a web agent on the default root configuration of your Apache installation, with configuration in `/web_agents/apache24_agent/instances/agent_1`. To install on a virtual host, copy this configuration folder, modify required settings, and enable the web agent in the virtual host configuration file.

1. Check the information in "Before You Install" before proceeding.
2. Shut down the Apache server where you plan to install the agent.
3. Locate the web agent configuration instance to duplicate, and make a copy, for example `agent_2`:
   - UNIX example:

     ```
     $ cd /web_agents/apache24_agent/instances
     $ cp -r agent_1 agent_2
     ```

   - Windows example:

     ```
     c:\> cd c:\web_agents\apache24_agent\instances
     c:\path\to\web_agents\apache24_agent\instances> xcopy /E /I agent_1 agent_2
     ```

4. Give the user that runs the virtual host modify privileges to the new instance folder. The following examples demonstrate giving privileges to the `agent_2` configuration instance to a user named *apache*:

   - UNIX example:

     ```
     $ cd /web_agents/apache24_agent/instances
     $ chown -hR apache agent_2
     ```

   - Windows example:

     ```
     c:\> cd c:\web_agents\apache24_agent\instances
     c:\path\to\web_agents\apache24_agent\instances> icacls "agent_2" /grant apache:M
     ```

5. In the new instance folder, edit the `/config/agent.conf` configuration file as follows:

   a. Alter the value of `com.sun.identity.agents.config.username` to be the name of the agent profile you created in AM for the virtual host.

   b. Configure the virtual host's web agent encryption key and password. Consider the following scenarios and choose the one that suits your environment best:

      - **Scenario 1**. The password of the virtual host's agent profile is the same as the password of the Apache root's agent profile[1].

        The encryption key and encryption password of the Apache root's agent and the virtual host's agent must match. Because you copied the configuration file, you do not need to perform any additional action.

      - **Scenario 2**. The password of the virtual host's agent profile is different from the password of the Apache root's agent profile[1].

        You need to generate a new encryption key and encrypt the new password before configuring them in the virtual host's agent profile. Perform the following steps:

        1. Generate a new encryption key by running the **agentadmin** command with the `--k` option. For example:

           ```
           $ agentadmin --k
           Encryption key value: YWM0OThlMTQtMzMxOS05Nw==
           ```

        2. Unix users only: Store the agent profile password in a file, for example, `newpassword.file`.

        3. Encrypt the agent's profile password with the encryption key by running the **agentadmin** command with the `--p` option.

           Unix example:

[1] The Apache root's profile refers to the web agent installation you performed as part of the prerequisites to install web agents on virtual hosts.

```
$ ./agentadmin --p "YWM0OThlMTQtMzMxOS05Nw==" "`cat newpassword.file`"
Encrypted password value: 07bJOSeM/G8ydO4=
```

Windows example:

```
$ agentadmin.exe --p "YWM0OThlMTQtMzMxOS05Nw==" "newpassword"
Encrypted password value: 07bJOSeM/G8ydO4=
```

4. In the virtual host's `agent.conf` file, set the following properties:

   - `com.sun.identity.agents.config.key`. Its value is the generated encryption key. For example:

     ```
     com.sun.identity.agents.config.key = YWM0OThlMTQtMzMxOS05Nw==
     ```

   - `com.sun.identity.agents.config.password`. Its value is the encrypted password. For example:

     ```
     com.sun.identity.agents.config.password = 07bJOSeM/G8ydO4=
     ```

c. Replace any references to the original instance directory with the new instance directory. For example, replace the string `agent_1` with `agent_2` wherever it occurs in the configuration file.

   Configuration options that are likely to require alterations include:

   - `com.sun.identity.agents.config.local.logfile`
   - `com.sun.identity.agents.config.local.audit.logfile`

d. Replace any references to the original website being protected with the new website being protected. For example, replace `http://www.example.com:80/amagent` with `http://customers.example.com:80/amagent`.

   Configuration options that are likely to require alterations include:

   - `com.sun.identity.agents.config.agenturi.prefix`
   - `com.sun.identity.agents.config.fqdn.default`

e. Save and close the configuration file.

6. Edit the Apache configuration file. This is the same file specified when installing the web agent on the default Apache website. For example, `/etc/httpd/conf/httpd.conf`.

   a. At the end of the file the installer will have added three new lines of settings, for example:

      ```
      LoadModule amagent_module /web_agents/apache24_agent/lib/mod_openam.so
      AmAgent On
      AmAgentConf /web_agents/apache24_agent/bin/../instances/agent_1/config/agent.conf
      ```

      Leave the first line, `LoadModule ...`, and move the other two lines on the virtual host configuration element of the default site, for example:

```
<VirtualHost *:80>
# This first-listed virtual host is also the default for *:80
ServerName www.example.com
ServerAlias example.com
DocumentRoot "/var/www/html"
AmAgent On
AmAgentConf /web_agents/apache24_agent/instances/agent_1/config/agent.conf
</VirtualHost>
```

b. Copy the same two lines on the new virtual host, and replace `agent_1` with the new agent configuration instance folder, for example `agent_2`:

```
<VirtualHost *:80>
ServerName customers.example.com
DocumentRoot "/var/www/customers"
AmAgent On
AmAgentConf /web_agents/apache24_agent/instances/agent_2/config/agent.conf
</VirtualHost>
```

Tip

If the new virtual host configuration is in a separate file, copy the two configuration lines on the `VirtualHost` element within that file.

7. Save and close the Apache configuration file.

8. (Unix only) Configure whether the Apache agent instance should share runtime resources and shared memory, or not.

   For more information, see "Configuring Whether Unix Web Agents Should Share Runtime Resources and Shared Memory".

9. Ensure the user or group running the Apache HTTP server has the appropriate permissions on the following directories:

   Read Permission

   - `/web_agents/apache_24_agent/lib`

   Read and Write Permission

   - `/web_agents/apache_24_agent/instances/agent_nnn`
   - `/web_agents/apache_24_agent/log`

   To determine which user or group is running the Apache HTTP server, check the `Group` and `User` directives in the Apache HTTP server configuration file.

Failure to set permissions causes issues, such as the Apache HTTP server not starting up, getting a blank page when accessing a protected resource, or the web agent generating errors during log file rotation.

Note

You may see the same issues if SELinux is enabled in `enforcing` mode and it is not configured to allow access to agent directories. For more information, see "*Troubleshooting*".

10. Run the configuration validator for the new agent instance you just created.

    The validator will ensure, among other things, that WebSocket communication between your web server and AM is possible.

    Perform the following steps to find the agent instance and run the **agentadmin** command:

    a. Change directories to the location where your web agent instances are installed. For example, `/path/to/web_agents/agent_name/instances`

    b. Find the agent instance you just created, for example, `agent_2`.

    c. Run the **agentadmin** command with the following options:

    ```
    agentadmin --V agent_instance am_user /path/to/am_user_password_file realm_name
    ```

    For example:

    ```
    $ sudo -u daemon /path/to/web_agents/agent_name/bin/agentadmin --V
     \
    agent_2 demo_user /path/to/demo_user_password_file /
    Saving output to /Software/web_agents/apache24_agent/bin//../log/validate_20190522104659.log

    Running configuration validation for agent_2:

    Agent instance is configured with 1 naming.url value(s):
    1. https://openam.example.com:8443/openam is valid
    selected https://openam.example.com:8443/openam as naming.url value
    validate_bootstrap_configuration: ok
    validate_ssl_libraries: ok
    validate_agent_login: ok
    get_allocator_blockspace_sz(): trying for configured cache size 16777216 bytes
    validate_system_resources: ok
    validate_session_profile: ok
    validate_websocket_connection: ok
    validate_worker_init_shutdown: ok

    Result: 7 out of 7 tests passed, 0 skipped.
    ```

    Note that you should run the configuration validator as the same user that runs the web server. For example, the Apache HTTP Server `daemon` user. For more information about the `--V` option, see "Command-Line Tool Reference".

If `validate_websocket_connection` is `not ok`, ensure your web server and the network infrastructure between the web server and the AM servers support WebSockets.

Web agents require WebSocket communication.

11. Start the Apache server.

To Check the Apache Web Agent Installation

1. Check the Apache HTTP server error log after you start the server to make sure startup completed successfully:

```
[Tue Sep 08 15:51:27.667625 2016] AH00163:
Apache/2.4.6 (CentOS) OpenAM Web Agent/5.5
 configured
-- resuming normal operations
```

2. Make an HTTP request to a resource protected by the agent, then check the `/web_agents/apache24_agent/instances/Agent_1/logs/debug/debug.log` file to verify that no errors occurred on startup. Expected output should resemble the following:

```
2016-11-18 11:59:22.255 +0000    INFO [4900:6260]

##################################################
OpenAM Web Agent
Version: 5.5
Revision: 5bf61d2
Build date: Nov  8 2016 11:29:54
##################################################
```

3. (Optional) If you have a policy configured, you can test that your web agent is processing requests. For example, when you make an HTTP request to a resource protected by the agent you should be redirected to AM to authenticate. As an example, authenticate as user `demo`, password `changeit`. After you authenticate, AM redirects you back to the resource you tried to access.

4.1.4. Installing the Apache Web Agent Silently

You can run a silent, non-interactive installation by running **agentadmin --s**, along with arguments used to configure the instance.

The required arguments, and the order in which to specify them are:

Web server configuration file

Enter the full path to the Apache configuration file. The installer modifies this file to include the web agent configuration and module.

OpenAM URL

Enter the full URL of the AM instance the web agents will be using. Ensure the deployment URI is specified.

To balance agent connections to an AM site, enter the URL of the load balancer in front of the AM site.

> **Note**
>
> If your environment has a reverse proxy configured between AM and the agent, set the AM URL to the proxy URL instead. For example, `https://proxy.example.com:443/openam`. For more information about setting up the environment for reverse proxies, see "Configuring Apache HTTP Server as a Reverse Proxy Example".

Agent URL

Enter the full URL of the server the agent is running on.

Realm

Enter the AM realm containing the agent profile. Realms are case-sensitive.

Agent profile name

Enter the name given to the agent profile created in AM.

Agent profile password

Enter the full path to the file containing the agent profile password.

`--changeOwner`

To have the installer change the ownership of created directories to be the same User and Group as specified in the Apache configuration, specify the optional `--changeOwner` switch.

`--acceptLicence`

You can suppress the license agreement prompt during a silent, non-interactive install by including the `--acceptLicence` parameter. The inclusion of the option indicates that you have read and accepted the terms stated in the license. To view the license agreement, open `/path/to/web_agents/agent_type/legal/Forgerock_License.txt`.

`--forceInstall`

Optionally have the installer proceed with a silent installation even if it cannot connect to the specified AM server during installation, rather than exiting.

Complete the following procedures to install a web agent silently on Apache:

To Complete Pre-Installation Tasks

Perform the following steps to create the configuration required by the web agent before installing it:

1. Create at least one policy in AM to protect resources with the agent, as described in the procedure *Implementing Authorization Using the Access Management Console*.

2. Create an agent profile in AM, required by the web agent to connect and communicate with AM. For more information, see "Creating Agent Profiles".

3. Ensure that the key pair configured for signing the OpenID Connect JWTs exchanged between AM and the web agents is not the default `test` key pair. For more information, see "Configuring Access Management Servers to Communicate With Web Agents".

4. Configure AM to protect the cross-domain single sign-on (CDSSO) session cookie from hijacking. For more information, see Implementing Cross-Domain Single Sign-On in the *ForgeRock Access Management Authentication and Single Sign-On Guide*.

5. Consider the communication between the agents and the AM servers, and between the agents and the clients when installing agents in environments with load balancers and/or reverse proxies. For more information, see "*Configuring Environments With Load Balancers and Reverse Proxies*".

6. Create a text file containing only the password specified when creating the agent profile, and protect it:

   Windows example:

   ```
   C:\> echo password > pwd.txt
   ```

   In Windows Explorer, right-click the password file, for example `pwd.txt`, select Read-Only, and then click OK

   > **Note**
   >
   > Windows 2008 R2 users must not create the password file using PowerShell.

   UNIX example:

   ```
   $ echo password > /tmp/pwd.txt
   ```

   ```
   $ chmod 400 /tmp/pwd.txt
   ```

To install the Apache Web Agent Silently

1. Check the information in "Before You Install" before proceeding.

2. Shut down the Apache server where you plan to install the agent.

3. Make sure AM is running.

4. Run the **agentadmin --s** command with the required arguments. For example:

```
$ agentadmin --s \
  "/etc/httpd/conf/httpd.conf" \
  "http://openam.example.com:8080/openam" \
  "http://www.example.com:80" \
  "/" \
  "webagent4" \
  "/tmp/pwd.txt" \
  --changeOwner \
  --acceptLicence

OpenAM Web Agent for Apache Server installation.

Validating...
Validating... Success.
Cleaning up validation data...
Creating configuration...
Installation complete.
```

5. (Unix only) Configure whether the Apache agent instance should share runtime resources and shared memory, or not.

   For more information, see "Configuring Whether Unix Web Agents Should Share Runtime Resources and Shared Memory".

6. Ensure the user or group running the Apache HTTP server has the appropriate permissions on the following directories:

   Read Permission

   - `/web_agents/apache_24_agent/lib`

   Read and Write Permission

   - `/web_agents/apache_24_agent/instances/agent_nnn`
   - `/web_agents/apache_24_agent/log`

   To determine which user or group is running the Apache HTTP server, check the `Group` and `User` directives in the Apache HTTP server configuration file.

   Failure to set permissions causes issues, such as the Apache HTTP server not starting up, getting a blank page when accessing a protected resource, or the web agent generating errors during log file rotation.

   Note

   You may see the same issues if SELinux is enabled in `enforcing` mode and it is not configured to allow access to agent directories. For more information, see "*Troubleshooting*".

7. Run the configuration validator for the new agent instance you just created.

The validator will ensure, among other things, that WebSocket communication between your web server and AM is possible.

Perform the following steps to find the agent instance and run the **agentadmin** command:

a. Change directories to the location where your web agent instances are installed. For example, `/path/to/web_agents/agent_name/instances`

b. Find the agent instance you just created, for example, `agent_2`.

c. Run the **agentadmin** command with the following options:

```
agentadmin --V agent_instance am_user /path/to/am_user_password_file realm_name
```

For example:

```
$ sudo -u daemon /path/to/web_agents/agent_name/bin/agentadmin --V
 \
agent_2 demo_user /path/to/demo_user_password_file /
Saving output to /Software/web_agents/apache24_agent/bin//../log/validate_20190522104659.log

Running configuration validation for agent_2:

Agent instance is configured with 1 naming.url value(s):
1. https://openam.example.com:8443/openam is valid
selected https://openam.example.com:8443/openam as naming.url value
validate_bootstrap_configuration: ok
validate_ssl_libraries: ok
validate_agent_login: ok
get_allocator_blockspace_sz(): trying for configured cache size 16777216 bytes
validate_system_resources: ok
validate_session_profile: ok
validate_websocket_connection: ok
validate_worker_init_shutdown: ok

Result: 7 out of 7 tests passed, 0 skipped.
```

Note that you should run the configuration validator as the same user that runs the web server. For example, the Apache HTTP Server `daemon` user. For more information about the `--V` option, see "Command-Line Tool Reference".

If `validate_websocket_connection` is `not ok`, ensure your web server and the network infrastructure between the web server and the AM servers support WebSockets.

Web agents require WebSocket communication.

8. Start the Apache server.

To Check the Apache Web Agent Installation

1. Check the Apache HTTP server error log after you start the server to make sure startup completed successfully:

```
[Tue Sep 08 15:51:27.667625 2016] AH00163:
Apache/2.4.6 (CentOS) OpenAM Web Agent/5.5
 configured
-- resuming normal operations
```

2. Make an HTTP request to a resource protected by the agent, then check the `/web_agents/apache24_agent/instances/Agent_1/logs/debug/debug.log` file to verify that no errors occurred on startup. Expected output should resemble the following:

```
2016-11-18 11:59:22.255 +0000    INFO [4900:6260]

##################################################
OpenAM Web Agent
Version: 5.5
Revision: 5bf61d2
Build date: Nov  8 2016 11:29:54
##################################################
```

3. (Optional) If you have a policy configured, you can test that your web agent is processing requests. For example, when you make an HTTP request to a resource protected by the agent you should be redirected to AM to authenticate. As an example, authenticate as user `demo`, password `changeit`. After you authenticate, AM redirects you back to the resource you tried to access.

4.2. Installing the IIS Web Agent

This section covers prerequisites and installation procedures for Web Agents 5.5 on IIS.

4.2.1. Before You Install

1. Download the web agent from BackStage. For more information, see "Downloading and Unzipping Web Agents".

2. Consider the following points before installing web agents on IIS servers:

   - Ensure AM is installed and running, so that you can contact AM from the system running the web agent.
   - Web agents requires IIS to be run in Integrated mode.
   - Web agents use the native Windows SSL libraries by default if the AM server uses SSL/TLS. You can choose to use OpenSSL instead.

     To enable OpenSSL, perform the following steps:

     - Configure the `org.forgerock.agents.config.secure.channel.disable` property by performing the following steps:

       a. Edit the `/web_agents/iis_agent/instances/Agent_nnn/config/agent.conf` file.

b. Add the `org.forgerock.agents.config.secure.channel.disable=true` property under the Bootstrap Properties section.

c. Restart the IIS service.

You must perform this step whether the web agent is configured in centralized mode or not.

- Ensure the OpenSSL libraries are available in the locations shown in the following table:

OpenSSL DLL Locations on 32-bit and 64-bit Windows

OpenSSL DLL	Location
`libeay32.dll` `ssleay32.dll`	`\windows\syswow64`
`libeay64.dll` `ssleay64.dll`	`\windows\system32`

Note

Windows 64-bit servers require both 32-bit and 64-bit OpenSSL libraries.

For information about supported OpenSSL libraries, see "Supported OpenSSL Versions" in the *Release Notes*.

- A web agent configured for a site or a parent application protects any application configured within. The same is true for protected applications containing applications within.

  The following restrictions apply to the previous statements:

  - Web agents configured in a site or parent application do not protect children applications that do not inherit the parent's IIS configuration.

  - Agents configured for a site or parent application running under a 64-bit pool *will not* protect child applications running under 32-bit pools due to architectural differences; 32-bit applications cannot load 64-bit web agent libraries and, therefore, will not be protected.

    The same is true for the opposite scenario.

    In this case, the child applications require their own web agent installation, as explained in the next item of this list. Both 32-bit and 64-bit agent libraries are supplied with the IIS Web Agent binaries.

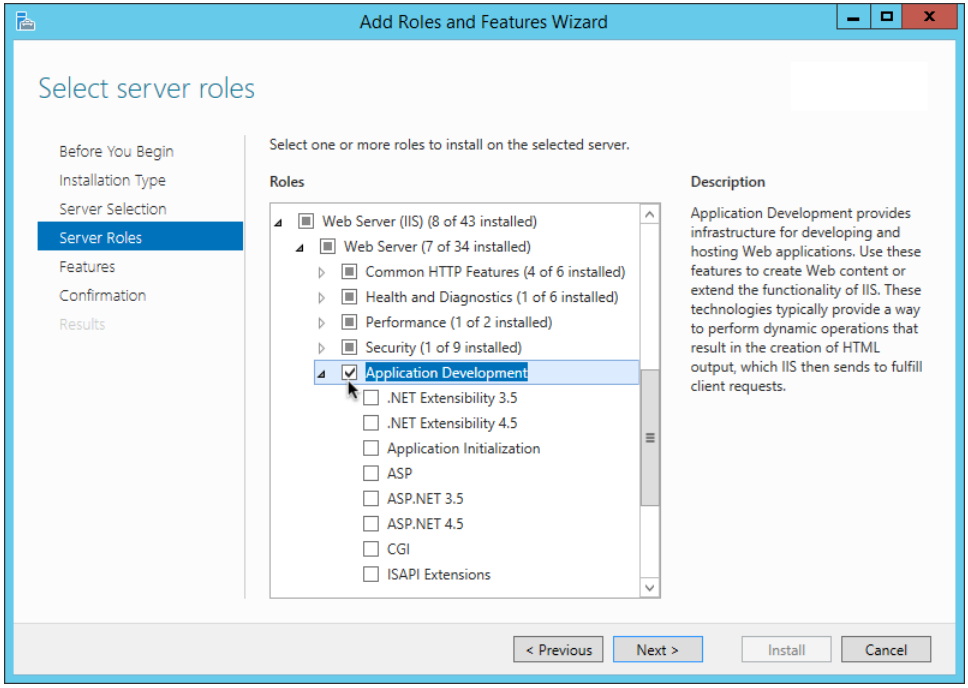
- If an application requires a specific web agent configuration or, for example, the application is a 32-bit application configured within a 64-bit site, follow the procedures in this section to create a new web agent instance for it. Configuring a web agent on an application overrides the application's parent web agent configuration, if any.

Important

You must install the web agent on the child application before installing a web agent in the parent. Trying to install a web agent on a child that is already protected will result in error.

- You can disable the web agent protection at any level of the IIS hierarchy, with the following constraints:
  - Disabling the web agent in a parent application disables the protection on all children applications that do not have a specific web agent instance installed on them.
  - Disabling the web agent in a child application does not disable protection on its parent application.
- Web agents require that the *Application Development* component is installed alongside the core IIS services. Application Development is an optional component of the IIS web server. The component provides required infrastructure for hosting web applications.

Adding the Application Development Component to IIS



4.2.2. Installing the IIS Web Agent

Complete the following procedures to install Web Agent 5.5 on IIS servers.

To Complete Pre-Installation Tasks

Perform the following steps to create the configuration required by the web agent before installing it:

1. Create at least one policy in AM to protect resources with the agent, as described in the procedure *Implementing Authorization Using the Access Management Console*.
2. Create an agent profile in AM, required by the web agent to connect and communicate with AM. For more information, see "Creating Agent Profiles".
3. Ensure that the key pair configured for signing the OpenID Connect JWTs exchanged between AM and the web agents is not the default `test` key pair. For more information, see "Configuring Access Management Servers to Communicate With Web Agents".
4. Configure AM to protect the cross-domain single sign-on (CDSSO) session cookie from hijacking. For more information, see Implementing Cross-Domain Single Sign-On in the *ForgeRock Access Management Authentication and Single Sign-On Guide*.
5. Consider the communication between the agents and the AM servers, and between the agents and the clients when installing agents in environments with load balancers and/or reverse proxies. For more information, see "*Configuring Environments With Load Balancers and Reverse Proxies*".
6. Create a text file containing only the password specified when creating the agent profile, and protect it:

   Windows example:

   ```
   C:\> echo password > pwd.txt
   ```

   In Windows Explorer, right-click the password file, for example `pwd.txt`, select Read-Only, and then click OK

   Note

   Windows 2008 R2 users must not create the password file using PowerShell.

   UNIX example:

   ```
   $ echo password > /tmp/pwd.txt
   ```

   ```
   $ chmod 400 /tmp/pwd.txt
   ```

To Install the IIS Web Agent

1. Check the information in "Before You Install" before proceeding.

2. Log on to Windows as a user with administrator privileges.

3. Make sure AM is running.

4. Run **agentadmin.exe** with the `--i` switch to install the agent. You will be prompted to read and accept the software license agreement for the agent installation.

```
c:\> cd web_agents\iis_agent\bin
c:\web_agents\iis_agent\bin> agentadmin.exe --i
```

5. When prompted for information, enter the input appropriate for your deployment.

Tip

You can cancel the web agent installation at anytime by pressing **CTRL+C**

a. Choose the site and application in which to install the web agent.

The **agentadmin** command reads the IIS server configuration and converts the IIS hierarchy into an ID composed of three values separated by the **.** character:

- The first value specifies an IIS site. The number `1` specifies the first site in the server.
- The second value specifies an application configured in an IIS site. The number `1` specifies the first application in the site.
- The third value specifies an internal value for the web agent.

The following is an example IIS server configuration read by the **agentadmin** command:

```
IIS Server Site configuration:
==================================
id       details
==================================

         Default Web Site
         application path:/, pool DefaultAppPool
1.1.1    virtualDirectory path:/, configuration: C:\inetpub\wwwroot\web.config

         MySite
         application path:/, pool: MySite
2.1.1    virtualDirectory path:/, configuration C:\inetpub\MySite\web.config
         application path:/MyApp1, pool: MySite
2.2.1    virtualDirectory path:/  configuration C:\inetpub\MySite\MyApp1\web.config
         application path:/MyApp1/MyApp2, pool: MySite
2.3.1    virtualDirectory path:/  configuration C:\inetpub\MySite\MyApp1\MyApp2\web.config

Enter IIS Server Site identification number.
[ q or 'ctrl+c' to exit ]
Site id: 2.1.1
```

- The ID `2.1.1` corresponds to the first application, `/` configured in a second IIS site, `MySite`. You would choose this ID to install the web agent at the root of the site.

- The ID `2.2.1` corresponds to a second application, `MyApp1`, configured in a second IIS site, `MySite`. You would choose this ID to install the web agent in the `MyApp1` application.
- The ID `2.3.1` corresponds to a child application, `MyApp1/MyApp2`, configured in the second application, `MyApp1`, configured in a second IIS site, `MySite`. You would choose this ID to install the web agent in the sub-application, `MyApp1/MyApp2`.

b. The installer can import settings from an existing web agent on the new installation and skips prompts for any values present in the existing configuration file. You will be required to re-enter the agent profile password.

Enter the full path to an existing agent configuration file to import the settings, or press **Enter** to skip the import.

```
To set properties from an existing configuration enter path to file
[ q or 'ctrl+c' to exit, return to ignore ]
Existing agent.conf file:
```

c. Enter the full URL of the AM instance the web agents will be using. Ensure the deployment URI is specified.

Note

If your environment has a reverse proxy configured between AM and the agent, set the AM URL to the proxy URL instead. For example, `https://proxy.example.com:443/openam`. For more information about setting up the environment for reverse proxies, see "Configuring Apache HTTP Server as a Reverse Proxy Example".

```
Enter the URL where the AM server is running. Please include the
deployment URI also as shown below:
(http://openam.sample.com:58080/openam)
[ q or 'ctrl+c' to exit ]
OpenAM server URL: https://openam.example.com:8443/openam
```

d. Enter the full URL of the site the agent will be running in.

```
Enter the Agent URL as shown below:
(http://agent.sample.com:1234)
[ q or 'ctrl+c' to exit ]
Agent URL: http://customers.example.com:80
```

e. Enter the name given to the agent profile created in AM.

```
Enter the Agent profile name
[ q or 'ctrl+c' to exit ]
Agent Profile name: iisagent
```

f. Enter the AM realm containing the agent profile. Realms are case-sensitive.

```
Enter the Agent realm/organization
[ q or 'ctrl+c' to exit ]
Agent realm/organization name: [/]: /
```

g. Enter the full path to the file containing the agent profile password created earlier.

```
Enter the path to a file that contains the password to be used
for identifying the Agent
[ q or 'ctrl+c' to exit ]
The path to the password file: c:\pwd.txt
```

h. The installer displays a summary of the configuration settings you specified.

- If a setting is incorrect, type `no`, or press **Enter**. The installer loops through the configuration prompts using your provided settings as the default. Press **Enter** to accept each one, or enter a replacement setting.
- If the settings are correct, type `yes` to proceed with installation.

```
Installation parameters:

   OpenAM URL: https://openam.example.com:8443/openam
   Agent URL: http://customers.example.com:80
   Agent Profile name: iisagent
   Agent realm/organization name: /
   Agent Profile password source: c:\pwd.txt

Confirm configuration (yes/no): [no]: yes
Validating...
Validating... Success.
Cleaning up validation data...
Creating configuration...
Installation complete.
```

Upon successful completion, the installer adds the agent as a module to the IIS site configuration.

The installer also sets up configuration and log directories for the agent instance. Each agent instance that you install on the system has its own numbered configuration and logs directory. The first agent's configuration and logs are located under the directory `web_agents\iis_agent\instances\agent_1\`.

Note

The installer grants full access permissions on the created instance folder to the user that the selected IIS site is running under, so that log files can be written correctly.

The configuration files and log locations are as follows:

`config/agent.conf`

Contains the bootstrap properties the web agent requires to connect to AM and download its configuration. Also contains properties that are only used if you configure the web agent to use local configuration.

`logs/audit/`

Audit log directory, used if the `local` or `all` audit locations are enabled.

`logs/debug/`

Debug directory where the `debug.log` debug file resides. Useful in troubleshooting web agent issues.

6. Run the configuration validator for the new agent instance you just created.

   The validator will ensure, among other things, that WebSocket communication between your web server and AM is possible.

   Perform the following steps to find the agent instance and run the **agentadmin** command:

   a. Change directories to the location where your web agent instances are installed. For example, `/path/to/web_agents/agent_name/instances`

   b. Find the agent instance you just created, for example, `agent_2`.

   c. Run the **agentadmin** command with the following options:

   ```
   agentadmin --V agent_instance am_user /path/to/am_user_password_file realm_name
   ```

   For example:

   ```
   $ sudo -u daemon /path/to/web_agents/agent_name/bin/agentadmin --V
    \
   agent_2 demo_user /path/to/demo_user_password_file /
   Saving output to /Software/web_agents/apache24_agent/bin//../log/validate_20190522104659.log

   Running configuration validation for agent_2:

   Agent instance is configured with 1 naming.url value(s):
   1. https://openam.example.com:8443/openam is valid
   selected https://openam.example.com:8443/openam as naming.url value
   validate_bootstrap_configuration: ok
   validate_ssl_libraries: ok
   validate_agent_login: ok
   get_allocator_blockspace_sz(): trying for configured cache size 16777216 bytes
   validate_system_resources: ok
   validate_session_profile: ok
   validate_websocket_connection: ok
   validate_worker_init_shutdown: ok

   Result: 7 out of 7 tests passed, 0 skipped.
   ```

Note that you should run the configuration validator as the same user that runs the web server. For example, the Apache HTTP Server `daemon` user. For more information about the `--V` option, see "Command-Line Tool Reference".

If `validate_websocket_connection` is `not ok`, ensure your web server and the network infrastructure between the web server and the AM servers support WebSockets.

Web agents require WebSocket communication.

7. (Optional) If you installed the web agent in an application, configure the web agent's CDSSO Redirect URI property, `com.sun.identity.agents.config.cdsso.redirect.uri`, to the application path by performing the following steps:

   a. Navigate to Realms > *Realm Name* > Agents > Web > *Agent Name* > SSO > Cross Domain SSO.

   b. Add the application path to the default value of the CDSSO Redirect URI property. For example, if you installed the web agent in an application such as `MyApp1/MyApp2`, set the property to `MyApp1/MyApp2/agent/cdsso-oauth2`.

   c. Save your changes.

4.2.3. Installing IIS Web Agents Silently

You can run a silent, non-interactive installation by running **agentadmin.exe --s**, along with arguments used to configure the instance.

The required arguments, and the order in which to specify them are:

Web server configuration file

Enter the ID number of the IIS site in which to install the web web agent. For a description of the supported IDs, see "To Install the IIS Web Agent".

> **Tip**
>
> To list the sites in an IIS server, run **agentadmin.exe --n**

OpenAM URL

Enter the full URL of the AM instance the web agents will be using. Ensure the deployment URI is specified.

To balance agent connections to an AM site, enter the URL of the load balancer in front of the AM site.

> **Note**
>
> If your environment has a reverse proxy configured between AM and the agent, set the AM URL to the proxy URL instead. For example, `https://proxy.example.com:443/openam`. For more information about setting up the environment for reverse proxies, see "Configuring Apache HTTP Server as a Reverse Proxy Example".

Agent URL

Enter the full URL of the IIS site the agent will be running on.

Realm

Enter the AM realm containing the agent profile. Realms are case-sensitive.

Agent profile name

Enter the name given to the agent profile created in AM.

Agent profile password

Enter the full path to the file containing the agent profile password.

`--changeOwner`

Optionally have the installer change the ownership of created directories to be the same user that is running the selected IIS site.

`--acceptLicence`

You can suppress the license agreement prompt during a silent, non-interactive install by including the `--acceptLicence` parameter. The inclusion of the option indicates that you have read and accepted the terms stated in the license. To view the license agreement, open `/path/to/web_agents/agent_type/legal/Forgerock_License.txt`.

`--forceInstall`

Add this optional switch to have the installer proceed with a silent installation even if it cannot connect to the specified AM server during installation, rather than exiting.

Complete the following procedures to install a web agent silently on an IIS server:

To Complete Pre-Installation Tasks

Perform the following steps to create the configuration required by the web agent before installing it:

1. Create at least one policy in AM to protect resources with the agent, as described in the procedure *Implementing Authorization Using the Access Management Console*.

2. Create an agent profile in AM, required by the web agent to connect and communicate with AM. For more information, see "Creating Agent Profiles".

3. Ensure that the key pair configured for signing the OpenID Connect JWTs exchanged between AM and the web agents is not the default `test` key pair. For more information, see "Configuring Access Management Servers to Communicate With Web Agents".

4. Configure AM to protect the cross-domain single sign-on (CDSSO) session cookie from hijacking. For more information, see Implementing Cross-Domain Single Sign-On in the *ForgeRock Access Management Authentication and Single Sign-On Guide*.

5. Consider the communication between the agents and the AM servers, and between the agents and the clients when installing agents in environments with load balancers and/or reverse proxies. For more information, see "*Configuring Environments With Load Balancers and Reverse Proxies*".

6. Create a text file containing only the password specified when creating the agent profile, and protect it:

   Windows example:

   ```
   C:\> echo password > pwd.txt
   ```

   In Windows Explorer, right-click the password file, for example `pwd.txt`, select Read-Only, and then click OK

   Note

   Windows 2008 R2 users must not create the password file using PowerShell.

   UNIX example:

   ```
   $ echo password > /tmp/pwd.txt
   ```

   ```
   $ chmod 400 /tmp/pwd.txt
   ```

To install Web Agents in IIS Silently

1. Check the information in "Before You Install" before proceeding.

2. Make sure AM is running.

3. Run the **agentadmin --s** command with the required arguments. For example:

```
c:\web_agents\iis_agent\bin> agentadmin.exe --s ^
  "2.1.1" ^
  "https://openam.example.com:8443/openam" ^
  "http://iis.example.com:80" ^
  "/" ^
  "iisagent" ^
  "c:\pwd.txt" ^
  --changeOwner ^
  --acceptLicence

OpenAM Web Agent for IIS Server installation.

Validating...
Validating... Success.
Cleaning up validation data...
Creating configuration...
Installation complete.
```

4. Run the configuration validator for the new agent instance you just created.

   The validator will ensure, among other things, that WebSocket communication between your web server and AM is possible.

   Perform the following steps to find the agent instance and run the **agentadmin** command:

   a. Change directories to the location where your web agent instances are installed. For example, `/path/to/web_agents/agent_name/instances`

   b. Find the agent instance you just created, for example, `agent_2`.

   c. Run the **agentadmin** command with the following options:

      ```
      agentadmin --V agent_instance am_user /path/to/am_user_password_file realm_name
      ```

      For example:

```
$ sudo -u daemon /path/to/web_agents/agent_name/bin/agentadmin --V
 \
agent_2 demo_user /path/to/demo_user_password_file /
Saving output to /Software/web_agents/apache24_agent/bin//../log/validate_20190522104659.log

Running configuration validation for agent_2:

Agent instance is configured with 1 naming.url value(s):
1. https://openam.example.com:8443/openam is valid
selected https://openam.example.com:8443/openam as naming.url value
validate_bootstrap_configuration: ok
validate_ssl_libraries: ok
validate_agent_login: ok
get_allocator_blockspace_sz(): trying for configured cache size 16777216 bytes
validate_system_resources: ok
validate_session_profile: ok
validate_websocket_connection: ok
validate_worker_init_shutdown: ok

Result: 7 out of 7 tests passed, 0 skipped.
```

Note that you should run the configuration validator as the same user that runs the web server. For example, the Apache HTTP Server `daemon` user. For more information about the `--V` option, see "Command-Line Tool Reference".

If `validate_websocket_connection` is `not ok`, ensure your web server and the network infrastructure between the web server and the AM servers support WebSockets.

Web agents require WebSocket communication.

5. (Optional) If you installed the web agent in a parent application, enable the web agent for its child applications by following the steps in "To Disable And Enable Web Agent Protection for Children Applications".

4.2.4. Enabling and Disabling IIS Web Agents

The following table contains a list of procedures containing information about enabling and disabling IIS web agent protection:

Task	Section
Enable or disable web agent protection on an IIS site or application	Procedure 4.14
Enable or disable web agent protection on a child application	Procedure 4.15

To Disable and Enable Web Agents

Follow the steps on this procedure to enable and disable web agents installed in an application. Note that the **agentadmin** command only shows instances of the web agent; if you need to enable or disable the protection of children applications, see "To Disable And Enable Web Agent Protection for Children Applications".

1. Log on to Windows as a user with administrator privileges.
2. Run **agentadmin.exe --l** to output a list of the installed web agent configuration instances.

```
c:\web_agents\iis_agent\bin> agentadmin.exe --l
OpenAM Web Agent configuration instances:

   id:            agent_1
   configuration: c:\web_agents\iis_agent\bin\..\instances\agent_1
   server/site:   2.2.1
```

   Make a note of the ID value of the configuration instance you want to disable or enable.
3. Perform one of the following steps:
   - To disable the web agent in a site, run **agentadmin.exe --d**, and specify the ID of the web web agent configuration instance to disable.

```
c:\web_agents\iis_agent\bin> agentadmin.exe --d agent_1

Disabling agent_1 configuration...
Disabling agent_1 configuration... Done.
```

   - To enable the web agent in a site, run **agentadmin.exe --e**, and specify the ID of the web web agent configuration instance to enable.

```
c:\web_agents\iis_agent\bin> agentadmin.exe --e agent_1

Enabling agent_1 configuration...
Enabling agent_1 configuration... Done.
```

To Disable And Enable Web Agent Protection for Children Applications

Perform the steps in this procedure to enable and disable web agent protection for children applications:

1. Edit the child application's `web.config` configuration.
2. Decide whether to enable or disable web agent protection:
   - **Disabling web agent protection**. Add the following lines to the child application's `web.config` file:

```
<OpenAmModule enabled="false" configFile="C:\web_agents\iis_agent\instances\agent_1\config
\agent.conf" />
<modules>
   <add name="OpenAmModule64" preCondition="bitness64" />
</modules>
```

     Note that the path specified in `configFile` may be different for your environment.
   - **Enabling web agent protection**. Web agents configured in a site or parent application also protect any applications that are inheriting the IIS configuration from that site or parent.

If you have disabled the web agent's protection for a child application following the steps in this procedure, remove the lines added to the `web.config` file to enable protection again.

4.2.5. Enable IIS Basic Authentication and Password Replay Support

The IIS web agent now supports IIS basic authentication and password replay. You must use the appropriate software versions.

Given the proper configuration and with Active Directory as a user data store for AM, the IIS web agent can provide access to the IIS server variables. The instructions for configuring the capability follow in this section, though you should read the section in full, also paying attention to the required workarounds for Microsoft issues.

When configured as described, the web agent requests IIS server variable values from AM, which gets them from Active Directory. The web agent then sets the values in HTTP headers so that they can be accessed by your application.

The following IIS server variables all take the same value when set: `REMOTE_USER`, `AUTH_USER`, and `LOGON_USER`. The web agent either sets all three, or does not set any of them.

When you enable Logon and Impersonation in the console (`com.sun.identity.agents.config.iis.logonuser=true` in the web agent configuration), the web agent performs Windows logon and sets the user impersonation token in the IIS session context.

When you enable Show Password in HTTP Header in the console (`com.sun.identity.agents.config.iis.password.header=true` in the web agent configuration), the web agent adds it in the `USER_PASSWORD` header.

The web agent does not modify any other IIS server variables related to the authenticated user's session.

The web agent requires that IIS runs in Integrated mode. Consider the following points for integration with additional Microsoft products:

- For Microsoft Office integration, you must use Microsoft Office 2007 SP2 or later.
- For Microsoft SharePoint integration, you must use Microsoft SharePoint Server 2007 SP2 or later.

You must also apply workarounds as described for the following Microsoft issues.

Microsoft Support Issue: 841215

Link: http://support.microsoft.com/kb/841215

Description: Error message when you try to connect to a Windows SharePoint document library: "System error 5 has occurred".

Summary: Enable Basic Authentication on the client computer.

Microsoft Support Issue: 870853

Link: http://support.microsoft.com/kb/870853

Description: Office 2003 and 2007 Office documents open read-only in Internet Explorer.

Summary: Add registry keys as described in Microsoft's support document.

Microsoft Support Issue: 928692

Link: http://support.microsoft.com/kb/928692

Description: Error message when you open a Web site by using Basic authentication in Expression Web on a computer that is running Windows Vista: "The folder name is not valid".

Summary: Edit the registry as described in Microsoft's support document.

Microsoft Support Issue: 932118

Link: http://support.microsoft.com/kb/932118

Description: Persistent cookies are not shared between Internet Explorer and Office applications.

Summary: Add the web site the list of trusted sites.

Microsoft Support Issue: 943280

Link: http://support.microsoft.com/kb/943280

Description: Prompt for Credentials When Accessing FQDN Sites From a Windows Vista or Windows 7 Computer.

Summary: Edit the registry as described in Microsoft's support document.

Microsoft Support Issue: 968851

Link: http://support.microsoft.com/kb/968851

Description: SharePoint Server 2007 Cumulative Update Server Hotfix Package (MOSS server-package): April 30, 2009.

Summary: Apply the fix from Microsoft if you use SharePoint.

Microsoft Support Issue: 2123563

Link: http://support.microsoft.com/kb/2123563

Description: You cannot open Office file types directly from a server that supports only Basic authentication over a non-SSL connection.

Summary: Enable SSL encryption on the web server.

To Configure IIS Basic Authentication and Password Replay Support

Follow these steps:

1. Generate and store an encryption key:

   a. Generate the key using `com.sun.identity.common.DESGenKey` and the `.jar` files where you deployed AM, as in the following example. The Java command below is broken out into multiple lines for display purposes only:

   ```
   $ cd /tomcat/webapps/openam/WEB-INF/lib
   $ java -cp forgerock-util-3.0.0.jar:openam-core-6.jar:\
      openam-shared-6.jar com.sun.identity.common.DESGenKey
   Key ==> sxVoaDRAN0o=
   ```

   Windows users should use semi-colons (";"), instead of colons (":") in the commands. The Java command below is broken out into multiple lines for display purposes only:

   ```
   c:\> cd \tomcat\webapps\openam\WEB-INF\lib
   c:\> java -cp forgerock-util-3.0.0.jar;openam-core-6.jar; ^
       openam-shared-6.jar com.sun.identity.common.DESGenKey
   Key ==> sxVoaDRAN0o=
   ```

   b. In the AM console navigate to Realms > *Realm Name* > Applications > Agents > Web > *Agent Name* > Advanced > Microsoft IIS Server > Replay Password Key (property name: `com.sun.identity.agents.config.replaypasswd.key`), enter the generated key, and then click Save.

   c. In the AM console, navigate to Deployment > Servers > *Server Name* > Advanced > then add a property `com.sun.am.replaypasswd.key` with the key you generated as the value, and then click Save.

2. In the AM console, navigate to Realms > *Realm Name* > Authentication > Settings > Post Authentication Processing > Authentication Post Processing Classes, then add the class `com.sun.identity.authentication.spi.ReplayPasswd`, and then click Save.

3. If you require Windows logon, or you need to use basic authentication with SharePoint or OWA, then you must configure Active Directory as a user data store, and you must configure the IIS web agent profile User ID Parameter and User ID Parameter Type so that the web agent requests AM to provide the appropriate account information from Active Directory in its policy response.

   Skip this step if you do not use SharePoint or OWA and no Windows logon is required.

   Make sure the AM data store is configured to use Active Directory as the user data store.

   In the AM console under Realms > *Realm Name* > Applications > Agents > Web > *Agent Name* > OpenAM Services > Policy Client Service, set User ID Parameter and User ID Parameter

Type, and then save your work. For example if the real username for Windows domain logon in Active Directory is stored on the `sAMAccountName` attribute, then set the User ID Parameter to `sAMAccountName`, and the User ID Parameter Type to `LDAP`.

Setting the User ID Parameter Type to `LDAP` causes the web agent to request that AM get the value of the User ID Parameter attribute from the data store, in this case, Active Directory. Given that information, the web agent can set the HTTP headers `REMOTE_USER`, `AUTH_USER`, or `LOGON_USER` and `USER_PASSWORD` with Active Directory attribute values suitable for Windows logon, setting the remote user, and so forth.

4. To set the encrypted password in the `AUTH_PASSWORD` header, navigate to Realms > *Realm Name* > Applications > Agents > Web > *Agent Name* > Advanced > Microsoft IIS Server, then select Show Password in HTTP Header, and then click Save.

5. To have the agent perform Windows logon (for user token impersonation), navigate to Realms > *Realm Name* > Applications > Agents > Web > *Agent Name* > Advanced > Microsoft IIS Server, then select Logon and Impersonation, and then click Save.

6. In the AM console, navigate to Realms > *Realm Name* > Applications > Agents > Web > *Agent Name* > Advanced > Microsoft IIS Server, then set Authentication Type to `basic`, and then click Save.

7. (Optional) To access Microsoft Office from SharePoint pages, configure AM to persist the authentication cookie. For details, see "Persistent Cookie Module" in the *ForgeRock Access Management Authentication and Single Sign-On Guide*.

4.3. Installing the NGINX Plus Web Agent

This section covers prerequisites and installation procedures for Web Agents 5.5 into NGINX Plus servers.

The examples in this chapter use the NGINX Plus R12 agent path. For NGINX Plus R13 agents, replace the R12 agent path, `nginx15_agent`, with the R13 agent path, `nginx13_agent`.

4.3.1. Before You Install

1. Download the web agent from BackStage. For more information, see "Downloading and Unzipping Web Agents".

2. Consider the following points before installing web agents on NGINX Plus servers:

   - Avoid installing the web server as root. Instead, create a web server user and install as that user.

   - Ensure AM is installed and running, so that you can contact AM from the system running the web agent.

- OpenSSL libraries are required to be available for the agent to operate in NGINX.

  Ensure the OpenSSL libraries `libcrypto.so` and `libssl.so` are located or referenced in the `$LD_LIBRARY_PATH` or `$LD_LIBRARY_PATH_64` paths.

  For information about supported OpenSSL libraries, see "Supported OpenSSL Versions" in the *Release Notes*.

- SELinux can prevent the web server from accessing agent libraries and the agent from being able to write to audit and debug logs. See "*Troubleshooting*".

4.3.2. Installing the NGINX Plus Web Agent

Complete the following procedures to install a web agent in an NGINX Plus server.

To Complete Pre-Installation Tasks

Perform the following steps to create the configuration required by the web agent before installing it:

1. Create at least one policy in AM to protect resources with the agent, as described in the procedure *Implementing Authorization Using the Access Management Console*.

2. Create an agent profile in AM, required by the web agent to connect and communicate with AM. For more information, see "Creating Agent Profiles".

3. Ensure that the key pair configured for signing the OpenID Connect JWTs exchanged between AM and the web agents is not the default `test` key pair. For more information, see "Configuring Access Management Servers to Communicate With Web Agents".

4. Configure AM to protect the cross-domain single sign-on (CDSSO) session cookie from hijacking. For more information, see Implementing Cross-Domain Single Sign-On in the *ForgeRock Access Management Authentication and Single Sign-On Guide*.

5. Consider the communication between the agents and the AM servers, and between the agents and the clients when installing agents in environments with load balancers and/or reverse proxies. For more information, see "*Configuring Environments With Load Balancers and Reverse Proxies*".

6. Create a text file containing only the password specified when creating the agent profile, and protect it:

   Windows example:

   ```
   C:\> echo password > pwd.txt
   ```

   In Windows Explorer, right-click the password file, for example `pwd.txt`, select Read-Only, and then click OK

Note

Windows 2008 R2 users must not create the password file using PowerShell.

UNIX example:

```
$ echo password > /tmp/pwd.txt
```

```
$ chmod 400 /tmp/pwd.txt
```

To Install the NGINX Plus Web Agent

1. Check the information in "Before You Install" before proceeding.
2. Shut down the NGINX Plus server where you plan to install the agent.
3. Make sure AM is running.
4. Run the **agentadmin --i** command to install the agent. You will be prompted to read and accept the software license agreement for the agent installation:

```
$ cd /web_agents/nginx15_agent/bin/
$ ./agentadmin --i
```

5. When prompted for information, enter the inputs appropriate for your deployment.

Tip

You can cancel the web agent installation at anytime by pressing **CTRL+C**

a. Enter the full path to the NGINX Plus server configuration file, `nginx.conf`:

```
Enter the complete path to your NGINX server configuration file
 [ q or 'ctrl+c' to exit ]
 [nginx.conf]: /etc/nginx/nginx.conf
```

b. The installer can import settings from an existing web agent to the new installation and skips prompts for any values present in the existing configuration file. You will be required to re-enter the agent profile password.

Enter the full path to an existing agent configuration file to import the settings, or press **Enter** to skip the import:

```
To set properties from an existing configuration enter path to file
 [ q or 'ctrl+c' to exit, return to ignore ]
 Existing OpenSSOAgentBootstrap.properties file:
```

c. Enter the full URL of the AM instance this agent should connect to:

Note

If your environment has a reverse proxy configured between AM and the agent, set the AM URL to the proxy URL instead. For example, `https://proxy.example.com:443/openam`. For more information about setting up the environment for reverse proxies, see "Configuring Apache HTTP Server as a Reverse Proxy Example".

```
Enter the URL where the AM server is running. Please include the
 deployment URI also as shown below:
 (http://openam.sample.com:58080/openam)
 [ q or 'ctrl+c' to exit ]
 OpenAM server URL: https://openam.example.com:8443/openam
```

d. Enter the full URL of the server the agent is running on.

```
Enter the Agent URL as shown below:
 (http://agent.sample.com:1234)
 [ q or 'ctrl+c' to exit ]
 Agent URL: http://www.example.com:80
```

e. Enter the name given to the agent profile created in AM:

```
Enter the Agent profile name
 [ q or 'ctrl+c' to exit ]
 Agent Profile name: nginx_agent
```

f. Enter the AM realm containing the agent profile. Realms are case-sensitive:

```
Enter the Agent realm/organization
 [ q or 'ctrl+c' to exit ]
 Agent realm/organization name: [/]: /
```

g. Enter the full path to the file containing the agent profile password created in the prerequisites:

```
Enter the path to a file that contains the password to be used
 for identifying the Agent
 [ q or 'ctrl+c' to exit ]
 The path to the password file: /tmp/pwd.txt
```

h. The installer displays a summary of the configuration settings you specified.

- If a setting is incorrect, type `no`, or press **Enter**. The installer loops through the configuration prompts again, using your provided settings as the default. Press **Enter** to accept each one, or enter a replacement setting.
- If the settings are correct, type `yes` to proceed with installation:

```
Installation parameters:

 OpenAM URL: https://openam.example.com:8443/openam
 Agent URL: http://www.example.com:80
 Agent Profile name: nginx_agent
 Agent realm/organization name: /
 Agent Profile password source: /tmp/pwd.txt

 Confirm configuration (yes/no): [no]: yes
 Validating...
 Validating... Success.

 Cleaning up validation data...

 Creating configuration...

 In order to complete the installation of the agent, update the configuration file /etc/nginx
/nginx.conf

 if this is the first agent in the installation, please insert the following directives into
 the top section of the NGINX configuration
 load_module /web_agents/nginx15_agent/lib/openam_ngx_auth_module.so;

 then insert the following directives into the server or location NGINX configuration sections
 that you wish this agent to protect:
 openam_agent on;
 openam_agent_configuration /web_agents/nginx15_agent/instances/agent_1/config/agent.conf;

 Please ensure that the agent installation files have read/write permissions for the NGINX
 server's user

 Please press any key to continue.

 Installation complete.
```

The installer sets up configuration and log directories for the agent instance. Each agent instance has its own numbered configuration and logs directories. The first agent is located under the directory `/web_agents/nginx15_agent/instances/agent_1/`.

The configuration files and log locations are as follows:

`config/agent.conf`

Contains the bootstrap properties the web agent requires to connect to AM and download its configuration. Also contains properties that are only used if the web agent is configured to use local configuration.

`logs/audit/`

Audit log directory, used if the `local` or `all` audit locations are enabled.

`logs/debug/`

Debug directory that contains the `debug.log` file. Useful in troubleshooting web agent issues.

6. Finish the NGINX Plus web agent installation by performing the steps in "To Complete the NGINX PLus Web Agent Installation".

4.3.3. Installing NGINX Plus Web Agents Silently

You can run a silent, non-interactive installation by running **agentadmin --s**, along with arguments used to configure the instance, but you must complete the configuration by performing the steps in "To Complete the NGINX PLus Web Agent Installation".

The required arguments, and the order in which to specify them are:

Web server configuration file

Enter the full path to the NGINX Plus server configuration file. The installer modifies this file to include the web agent configuration and module.

OpenAM URL

Enter the full URL of the AM instance the web agents should connect to. Ensure the deployment URI is specified.

To balance agent connections to an AM site, enter the URL of the load balancer in front of the AM site.

> **Note**
>
> If your environment has a reverse proxy configured between AM and the agent, set the AM URL to the proxy URL instead. For example, `https://proxy.example.com:443/openam`. For more information about setting up the environment for reverse proxies, see "Configuring Apache HTTP Server as a Reverse Proxy Example".

Agent URL

Enter the full URL of the server the agent is running on.

Realm

Enter the AM realm containing the agent profile. Realms are case-sensitive.

Agent profile name

Enter the name of the agent profile created in AM.

Agent profile password

Enter the full path to the file containing the agent profile password.

`--acceptLicence`

You can suppress the license agreement prompt during a silent, non-interactive install by including the `--acceptLicence` parameter. The inclusion of the option indicates that you have read

and accepted the terms stated in the license. To view the license agreement, open `/path/to/web_agents/agent_type/legal/Forgerock_License.txt`.

`--forceInstall`

Optionally have the installer proceed with a silent installation even if it cannot connect to the specified AM server during installation, rather than exiting.

Complete the following procedures to install a web agent silently on an NGINX Plus server:

To Complete Pre-Installation Tasks

Perform the following steps to create the configuration required by the web agent before installing it:

1. Create at least one policy in AM to protect resources with the agent, as described in the procedure *Implementing Authorization Using the Access Management Console*.
2. Create an agent profile in AM, required by the web agent to connect and communicate with AM. For more information, see "Creating Agent Profiles".
3. Ensure that the key pair configured for signing the OpenID Connect JWTs exchanged between AM and the web agents is not the default `test` key pair. For more information, see "Configuring Access Management Servers to Communicate With Web Agents".
4. Configure AM to protect the cross-domain single sign-on (CDSSO) session cookie from hijacking. For more information, see Implementing Cross-Domain Single Sign-On in the *ForgeRock Access Management Authentication and Single Sign-On Guide*.
5. Consider the communication between the agents and the AM servers, and between the agents and the clients when installing agents in environments with load balancers and/or reverse proxies. For more information, see "*Configuring Environments With Load Balancers and Reverse Proxies*".
6. Create a text file containing only the password specified when creating the agent profile, and protect it:

   Windows example:

   ```
   C:\> echo password > pwd.txt
   ```

   In Windows Explorer, right-click the password file, for example `pwd.txt`, select Read-Only, and then click OK

   Note

   Windows 2008 R2 users must not create the password file using PowerShell.

   UNIX example:

```
$ echo password > /tmp/pwd.txt
```

```
$ chmod 400 /tmp/pwd.txt
```

To install the NGINX Plus Web Agent Silently

1. Check the information in "Before You Install" before proceeding.
2. Shut down the NGINX Plus server where you plan to install the agent.
3. Make sure AM is running.
4. Run the **agentadmin --s** command with the required arguments. For example:

```
$ agentadmin --s \
 "/etc/nginx/nginx.conf" \
 "https://openam.example.com:8443/openam" \
 "http://www.example.com:80" \
 "/" \
 "nginx_agent" \
 "/tmp/pwd.txt" \
 --acceptLicence

OpenAM Web Agent for NGINX Server installation.

Validating...

Validating... Success.

Cleaning up validation data...

Creating configuration...

In order to complete the installation of the agent, update the configuration file /etc/nginx/nginx
.conf

if this is the first agent in the installation, please insert the following directives into the top
 section of the NGINX configuration
load_module /web_agents/nginx15_agent/lib/openam_ngx_auth_module.so;

then insert the following directives into the server or location NGINX configuration sections that you
 wish this agent to protect:
openam_agent on;
openam_agent_configuration /web_agents/nginx15_agent/instances/agent_3/config/agent.conf;

Please ensure that the agent installation files have read/write permissions for the NGINX server's
 user

Please press any key to continue.
```

5. Finish the NGINX Plus web agent installation by performing the steps in "To Complete the NGINX PLus Web Agent Installation".

4.3.4. Complete the NGINX Plus Web Agent Installation

After you have performed the procedures on either "Installing the NGINX Plus Web Agent" or "Installing NGINX Plus Web Agents Silently", perform the steps in the following procedure to complete the instalation of the NGINX Plus web agent:

To Complete the NGINX PLus Web Agent Installation

1. Edit the NGINX Plus server configuration file `nginx.conf` to load the web agent module `openam_ngx_auth_module.so`, if it is not already configured:

```
$ vi nginx.conf
user  nginx;
worker_processes  auto;

error_log  /var/log/nginx/error.log notice;
pid        /var/run/nginx.pid;
load_module /web_agents/nginx15_agent/lib/openam_ngx_auth_module.so;
 ...
```

2. Edit the NGINX Plus server configuration file containing the context you want to protect and add web agent directives to it. The following directives are supported:

   `openam_agent` ***`[on | off]`***

   Controls if an agent instance is `on` or `off` for a particular `http`, `server`, or `location` context.

   - Set the `openam_agent` directive to `on` for a context to protect it and its contents.

     If a context already protected requires a specific web agent configuration, follow the procedures in this section again to create a new web agent instance for it. The installer will configure the next available web agent instance, for example, `agent_2`.

   - Set the `openam_agent` directive to `off` for a context to disable the web agent protection for that context and its contents. If the context has a parent, disabling the directive does not affect the protection for the parent.

   Consider the following examples:

   Example 1

```
server {
  listen       80 default_server;
  server_name  localhost;
  openam_agent on;
  openam_agent_configuration /web_agents/nginx15_agent/instances/agent_1/config/agent.conf;
  #charset koi8-r;
  #access_log  /var/log/nginx/log/host.access.log  main;

  location / {
    root   /www/;
    index  index.html index.htm;
  }

  location /customers {
    openam_agent on;
    openam_agent_configuration /web_agents/nginx15_agent/instances/agent_2/config/agent.conf;
    root   /www/customers
    index  index.html
  }

  location /market {
    root   /www/marketplace
    index  index.html
  }
}
```

The web agent instance `agent_1` configured at the `server` context is protecting the `/` and `/market` `location` contexts. The `location` context `/customers` is protected by a second web agent instance, `agent_2`.

Example 2

```
server {
  listen       80 default_server;
  server_name  localhost;
  openam_agent on;
  openam_agent_configuration /web_agents/nginx15_agent/instances/agent_1/config/agent.conf;
  #charset koi8-r;
  #access_log  /var/log/nginx/log/host.access.log  main;

   location / {
     root   /www/;
     index  index.html index.htm;
   }

   location /customers {
     openam_agent  off
     root   /www/customers
     index  index.html
   }

   location /market {
     root   /www/marketplace
     index  index.html
  }
}
```

The web agent instance `agent_1` is protecting the `server` context and the `/` and `/market` `location` contexts. Protection is disabled for the `/customers` `location` context.

3. Configure whether the NGINX Plus agent instance should share runtime resources and shared memory, or not.

   For more information, see "Configuring Whether Unix Web Agents Should Share Runtime Resources and Shared Memory".

4. Ensure the user or group running the NGINX Plus server has the appropriate permissions over the following directories:

   Read Permission

   - `/web_agents/nginx15_agent/lib`

   Read and Write Permission

   - `/web_agents/nginx15_agent/instances/agent_nnn`
   - `/web_agents/nginx15_agent/log`

   To determine which user or group is running the NGINX Plus server, check the `User` directive in the NGINX Plus server configuration file.

   Failure to set permissions causes issues, such as the NGINX Plus server not starting up, getting a blank page when accessing a protected resource, or the web agent generating errors during log file rotation.

   Note

   You may see the same issues if SELinux is enabled in `enforcing` mode and it is not configured to allow access to agent directories. For more information, see "*Troubleshooting*".

5. Run the configuration validator for the new agent instance you just created.

   The validator will ensure, among other things, that WebSocket communication between your web server and AM is possible.

   Perform the following steps to find the agent instance and run the **agentadmin** command:

   a. Change directories to the location where your web agent instances are installed. For example, `/path/to/web_agents/agent_name/instances`

   b. Find the agent instance you just created, for example, `agent_2`.

   c. Run the **agentadmin** command with the following options:

```
agentadmin --V agent_instance am_user /path/to/am_user_password_file realm_name
```

For example:

```
$ sudo -u daemon /path/to/web_agents/agent_name/bin/agentadmin --V
 \
agent_2 demo_user /path/to/demo_user_password_file /
Saving output to /Software/web_agents/apache24_agent/bin//../log/validate_20190522104659.log

Running configuration validation for agent_2:

Agent instance is configured with 1 naming.url value(s):
1. https://openam.example.com:8443/openam is valid
selected https://openam.example.com:8443/openam as naming.url value
validate_bootstrap_configuration: ok
validate_ssl_libraries: ok
validate_agent_login: ok
get_allocator_blockspace_sz(): trying for configured cache size 16777216 bytes
validate_system_resources: ok
validate_session_profile: ok
validate_websocket_connection: ok
validate_worker_init_shutdown: ok

Result: 7 out of 7 tests passed, 0 skipped.
```

Note that you should run the configuration validator as the same user that runs the web server. For example, the Apache HTTP Server `daemon` user. For more information about the `--V` option, see "Command-Line Tool Reference".

If `validate_websocket_connection` is `not ok`, ensure your web server and the network infrastructure between the web server and the AM servers support WebSockets.

Web agents require WebSocket communication.

6. Start the NGINX Plus server.

Tip

The NGINX Plus server only sets the `REMOTE_USER` variable if the request contains an HTTP Authorization header, but the NGINX agent does not set an an HTTP Authorization header after the user has authenticated. Therefore, if you need to set the variable so CGI scripts can use it, configure the agent to create a custom header with the required attribute (see Profile Attributes Processing Properties) and then configure the NGINX Plus server to capture that header and convert it into the `REMOTE_USER` variable.

To Check the NGINX Plus Web Agent Installation

1. Check the NGINX Plus logs after starting the server to ensure the startup completed successfully.

   By default, the NGINX Plus server logs the startup messages in the operating system's syslog file, for example, `/var/log/messages`. Expected output should resemble the following:

```
Apr 25 02:17:38 myserver systemd: Starting NGINX Plus - high performance web server...
Apr 25 02:17:38 FR-server nginx: nginx: the configuration file /etc/nginx/nginx.conf syntax is ok
Apr 25 02:17:38 FR-server nginx: nginx: configuration file /etc/nginx/nginx.conf test is successful
Apr 25 02:17:38 FR-server systemd: Started NGINX Plus - high performance web server.
```

2. Make an HTTP request to a resource protected by the agent, then check the `/web_agents/nginx15_agent/log/system_0.log` file to verify that no errors occurred on startup. Expected output should resemble the following:

```
22019-03-26 08:17:44 GMT INFO
[0x7fb89e7a6700:22]: OpenAM Web Agent Version: 5.5
Revision: be24acb, Container: NGINX Plus Linux 64bit (Ubuntu18),
Build date: Mar 21 2019 13:43:12
```

3. (Optional) If you have a policy configured, you can test that your web agent is processing requests. For example, when you make an HTTP request to a resource protected by the agent, you should be redirected to AM to authenticate. As an example, authenticate as user `demo`, password `changeit`. After you authenticate, AM redirects you back to the resource you tried to access.

Chapter 5

Post-Installation Tasks

This chapter covers tasks to perform after installing web agents in your environment. The following table contains a list of the tasks:

Task	Section
Configure web agents to log audit messages	Section 5.1
Configure whether Unix web agents should share runtime resources and shared memory	Section 5.2
Configure your environment when communication between clients and agents happens behind load balancers or reverse proxies	Section 5.3

5.1. Configuring Audit Logging

Web agents support logging audit events for security, troubleshooting, and regulatory compliance. You can store web agent audit event logs in the following ways:

- **Remotely**. Log audit events to the audit event handler configured in the AM realm. In a site comprised of several AM servers, web agents write audit logs to the AM server that satisfies the web agent's request for client authentication or resource authorization.

  Web agents cannot log audit events remotely if:

  - AM's Audit Logging Service is disabled.
  - No audit event handler is configured in the realm where the web agent is configured.
  - All audit event handlers configured in the realm where the web agent is configured are disabled.

  For more information about audit logging in AM, see the chapter Setting Up Audit Logging in the *ForgeRock Access Management Setup and Maintenance Guide*.

- **Locally**. Log audit events in JSON format to a file in the web agent installation directory, `/web_agents/agent_type/logs/audit/`.

- **Locally and remotely**. Log audit events:

  - To a file in the agent installation directory.

- To the audit event handler configured in the AM realm in which the agent profile is configured.

The following is an example of an agent log record:


```
{
   "timestamp":"2017-10-30T11:56:57Z",
   "eventName":"AM-ACCESS-OUTCOME",
   "transactionId":"608831c4-7351-4277-8a5f-b1a83fe2277e",
   "userId":"id=demo,ou=user,dc=openam,dc=forgerock,dc=org",
   "trackingIds":[
      "fd5c8ccf-7d97-49ba-a775-76c3c06eb933-82095",
      "fd5c8ccf-7d97-49ba-a775-76c3c06eb933-82177"
   ],
   "component":"Web Policy Agent",
   "realm":"/",
   "server":{
      "ip":"127.0.0.1",
      "port":8020
   },
   "request":{
      "protocol":"HTTP/1.1",
      "operation":"GET"
   },
   "http":{
      "request":{
         "secure":false,
         "method":"GET",
         "path":"http://my.example.com:8020/examples/",
         "cookies":{
            "am-auth-jwt":"eyJ0eXAiOiJKV1QiLCJhbGciOi[...]"
            "i18next":"en",
            "amlbcookie":"01",
            "iPlanetDirectoryPro":"Ts2zDkGUqgtkoxR[...]"
         }
      }
   },
   "response":{
      "status":"DENIED"
   },
   "_id":"fd5c8ccf-7d97-49ba-a775-76c3c06eb933-81703"
}
```


Note

Local audit logs do not have an `_id` attribute, which is an internal AM id.

The audit log format adheres to the log structure shared across the ForgeRock Identity Platform. For more information about the audit log format, see the section Audit Logging File Format in the *ForgeRock Access Management Setup and Maintenance Guide*.

Web agents support propagation of the transaction ID across the ForgeRock platform using the HTTP header `X-ForgeRock-TransactionId`. For more information about configuring the header, see *ForgeRock Access Management Setup and Maintenance Guide*.

By default, web agents do not write audit log records. To configure audit logging, perform the following procedure:

To Configure Audit Logging

The procedure assumes the web agent uses centralized configuration. Property names are also provided for local configuration agents.

1. In the AM console, navigate to Realms > *Realm Name* > Applications > Agents > *Web* > *Agent Name* > Global > Audit.
2. In the Audit Access Type property (`com.sun.identity.agents.config.audit.accesstype`), select the type of messages to log. For example, select `LOG_ALL` to log access allowed and access denied events.
3. In the Audit Log Location property (`com.sun.identity.agents.config.log.disposition`), select whether to write the audit logs locally to the agent installation (`LOCAL`), remotely to AM (`REMOTE`), or to both places (`ALL`). For example, keep `REMOTE` to log audit events to the AM instances.
4. (Optional) In the Local Audit Log Rotation Size property (`com.sun.identity.agents.config.local.log.size`), specify the maximum size, in bytes, of the audit log files.

   This is a bootstrap property. If you change the value of this property, restart the web server where the agent runs for the changes to take effect.

5.2. Configuring Whether Unix Web Agents Should Share Runtime Resources and Shared Memory

By default, the Unix Apache and NGINX Plus agent shared memory, runtime resources, and installation files are shared among the agent instances. For example, the `Agent_1` and `Agent_2` instances write the same session log and audit files (even though each one writes to their own file), use the same agent policy cache, and run a single set of worker processes and background tasks.

You can control how to share the resources, if at all, by configuring *agent groups*, which are groups of agent instances that share runtime resources and shared memory.

5.2.1. Choosing Whether to Share Resources

You can choose to configure several related agent instances to share resources, and configure others to be independent.

Despite sharing resources, agent instances can be started and stopped individually and can run as different users as long as the agent resources can be shared by their effective user and groups.

Choosing whether to share runtime resources and shared memory is an important decision that depends on your environment. Consider the information in the following table before configuring your agents:

Impact of Sharing Resources

Impact	Advantage	Caution
Shared agent policy and session cache	Potentially reduces overhead of requests to AM for authentication and authorization.	Cache may fill with irrelevant entries.
	Reduced memory consumption.	Sharing the cache among different locations or virtual hosts may not be desirable.
	-	Agent instances that are members of the same agent group must be configured in the the same Apache or NGINX Plus installation.
Reduced number of background threads. (Single WebSocket connection to AM for notifications)	Reduced system resource usage.	Ensure the `AM_MAX_AGENTS` environment variable is set to, at least, the total number of agent instances in the installation.
Agent instances share runtime files and semaphores	Reduced system resource usage.	Must ensure files and resources can be accessed by all the agent instances[a].

[a] For example, add the users running the instances to the same group and configure the resources to have `660` permissions. For more information, see `AM_RESOURCE_PERMISSIONS`.

5.2.2. Configuring Agent Groups

An *agent group* is a group of agent instances that share runtime resources and shared memory. They are defined by adding the `AmAgentID` (Apache agent only) and the `openam_agent_instance` (NGINX Plus agent only) directives to the Apache and NGINX Plus configuration files.

When configuring the agent groups and the directives, take into account the following constraints:

- Neither the Apache or the NGINX Plus agent set the directives during installation.
- The `AmAgentID` directive defaults to `0` and the `openam_agent_instance` directive defaults to `1` when unset.
- The value of the directives must increase by one for each agent group configured. For example, since the default value of the `AmAgentID` directive is `0`, the next agent group must be `1`.
- Agent instances that are members of the same agent group must be part of the same Apache or NGINX Plus installation.
- By default, the maximum number of agent instances in a single installation is `32`. For more information about changing this limit, see `AM_MAX_AGENTS`.

The following table shows an example of six agent Apache instances split into three different agent groups:

Apache Agent Groups Example

Agent Instances	Directive Configuration	Description
`Agent_1` and `Agent_2`	Not Set (defaults to 0)	The instances share runtime resources and policy cache.
`Agent_3`, `Agent_4`, and `Agent_5`	1	The instances share runtime resources and policy cache.
`Agent_6`	2	The instance does not share runtime resources and policy cache with any other instance.

To configure the agent group, set the `AmAgentID` or `openam_agent_instance` directives and their value along with the rest of the agent directives in the `httpd.conf` or `nginx.conf` files:

`AmAgentID` (Apache only)

The following is an example of a `httpd.conf` file with the `AmAgentID` directive configured:

```
<VirtualHost *:80>
ServerName www.site1.com
DocumentRoot /home/www/site1.com
AssignUserID site1 www-data
LoadModule amagent_module /web_agents/apache24_agent/lib/mod_openam.so
AmAgent On
AmAgentConf /web_agents/apache24_agent/bin/../instances/agent_1/config/agent.conf
AmAgentID 1
...
</VirtualHost>

<VirtualHost *:8080>
ServerName www.site2.com
DocumentRoot /home/www/site3.com
AssignUserID site2 www-data
LoadModule amagent_module /web_agents/apache24_agent/lib/mod_openam.so
AmAgent On
AmAgentConf /web_agents/apache24_agent/bin/../instances/agent_2/config/agent.conf
AmAgentID 1
...
</VirtualHost>
```

In this example, each virtual host is protected by a different instance of the agent, yet both agent instances belong to the agent group `1`. They share runtime resources and shared memory.

`openam_agent_instance` (NGINX Plus only)

The following is an example of the `nginx.conf` file with the `openam_agent_instance` directive configured:

```
server {
listen       80 default_server;
server_name  localhost;
openam_agent on;
openam_agent_configuration /web_agents/nginx15_agent/bin/../instances/agent_3/config/agent.conf;
openam_agent_instance 2
...
   location /customers {
   openam_agent on;
   openam_agent_configuration /web_agents/nginx15_agent/bin/../instances/agent_4/config/agent.conf;
   openam_agent_instance 2
   root   /www/customers
   index  index.html
}
...
```

In this example, `agent_1` protects the server context while `agent_2` protects a location. Both instances belong to the agent group `1` and share runtime resources and shared memory.

5.3. Supporting Load Balancers and Reverse Proxies Between Clients and Agents

When your environment has reverse proxies or load balancers configured between the agents and the clients, you must perform additional configuration in the agents to account for the anonymization of both the clients and the agents.

Failure to do so may cause policy evaluation and other agent features to fail.

For more information, see "*Configuring Environments With Load Balancers and Reverse Proxies*".

Chapter 6
Upgrading Web Agents

The process of upgrading a web agent consists of uninstalling the old agent and installing a new one. There is no requirement to create a new agent profile.

To upgrade web agents, perform the following procedure:

To Upgrade Web Agents

1. Refer to the Release Notes for information about changes in support and functionality.
2. Back up the web agent installation and the web server configuration directories. For example:

   ```
   $  cp -r /path/to/web_agents/apache24_agent /path/to/backup
   $  cp -r /path/to/apache/httpd/conf /path/to/backup
   ```

   If the configuration is stored centrally in AM, back it up as described in the *ForgeRock Access Management Maintenance Guide*.
3. Redirect client traffic away from the protected web site.
4. Stop the web server where the web agent is installed.
5. Remove the old web agent.

   For example, to remove an old web agent installed in Apache HTTP server, see "Removing the Apache Web Agent". If the uninstall process has changed, refer to the version of the *Web Agent Guide* that corresponds to your web agent.
6. Install the new web agent.

   For example, to install the new Apache web agent, see "Installing the Apache Web Agent".

   If your policy agent runs in local mode, provide the `OpenSSOAgentBootstrap.properties` or `agent.conf` files to the installer if you want to reuse bootstrap properties, such as the AM URL, the agent profile name, and others.
7. Review the agent configuration:

   - If the agent configuration is stored in the AM configuration store, review the Release Notes and the ForgeRock Access Management Release Notes to check what is new and possible changes to AM and the agent. Then, adjust the agent configuration if required using the AM console.

- If the agent configuration is stored locally, review the Release Notes, and the ForgeRock Access Management Release Notes to check what is new and possible changes to AM and the agent. Then, update the `agent.conf` file manually to contain the properties required for your environment. Use the backed-up copy of the configuration file for guidance.

  Important

  Ensure the `agent.conf` file contains all required properties. Failure to configure the `agent.conf` properly can result in unexpected agent errors or a crash. For a list of required properties, see "Configuration Location".

8. If you provided the `OpenSSOAgentBootstrap.properties` or `agent.conf` files to the installer and you are upgrading from a web agent version earlier than 4.1.0 hotfix 23, re-encrypt the password specified in the `com.sun.identity.agents.config.password` property:

   a. Obtain the encryption key from the value of the `com.sun.identity.agents.config.key` property in the new `agent.conf` file.

   b. Unix users only: Store the agent profile password in a file, for example, `newpassword.file`.

   c. Encrypt the agent's profile password with the encryption key by running the **agentadmin** command with the `--p` option.

   Unix example:

   ```
   $ ./agentadmin --p "YWM0OThlMTQtMzMxOS05Nw==" "`cat newpassword.file`"
   Encrypted password value: 07bJOSeM/G8ydO4=
   ```

   Windows example:

   ```
   $ agentadmin.exe --p "YWM0OThlMTQtMzMxOS05Nw==" "newpassword"
   Encrypted password value: 07bJOSeM/G8ydO4=
   ```

   d. Set the encrypted password as the value of the `com.sun.identity.agents.config.password` property in the new `agent.conf` file.

9. (NGINX Plus and Unix Apache agents only) Consider whether the agents should share runtime resources and shared memory. For more information, see "Configuring Whether Unix Web Agents Should Share Runtime Resources and Shared Memory".

10. Ensure the communication between AM and the web agent is secured with the appropriate keys. For more information, see "Configuring Access Management Servers to Communicate With Web Agents".

11. Start the web server where the web agent is installed.

Note

Web Agents 5 changed the default size of the web agent's session and policy cache from 1G GB to 16 MB. In the unlikely case that an old Apache agent could not release the shared memory, the new Apache agent may not start. For more information, see "*Troubleshooting*".

12. Validate that the web agent is performing as expected.

    For example, navigate to a protected page on the web site and confirm whether you can access it according to your configuration.

    Tip

    You can run the **agentadmin** command with the `--V` option to troubleshoot agent configuration issues in your environment. For more information, see "Command-Line Tool Reference".

13. Allow client traffic to flow to the protected web site.

Chapter 7
Removing Web Agents

The following table contains a list of sections containing information about removing web agents on supported platforms:

Task	Section
Remove web agents on Apache HTTP server or IBM HTTP Server	Section 7.1
Remove web agents on Microsoft Internet Information Services (IIS)	Section 7.2
Remove web agents on NGINX Plus	Section 7.3

7.1. Removing the Apache Web Agent

Complete the following steps to remove an Apache agent:

To remove the Apache Web Agent

1. Shut down the Apache server where the agent is installed.
2. Run **agentadmin --l** to output a list of the installed web agent configuration instances.

   Make a note of the ID value of the configuration instance you want to remove.
3. Run **agentadmin --r**, and specify the ID of the web agent configuration instance to remove. A warning is displayed. Type `yes` to proceed with removing the configuration instance.

```
$ ./agentadmin --r agent_3

Warning! This procedure will remove all OpenAM Web Agent references from
a Web server configuration. In case you are running OpenAM Web Agent in a
multi-virtualhost mode, an uninstallation must be carried out manually.

Continue (yes/no): [no]: yes

Removing agent_3 configuration...
Removing agent_3 configuration... Done.
```

4. Start the Apache server.

7.2. Removing the IIS Web Agent

This section contains a procedure to remove an IIS web agent from a site of an application, which does not remove its libraries, and a procedure to remove the IIS web agent completely from an IIS installation.

To Remove the IIS Web Agent from an IIS Site or Application

Perform the steps in this procedure to remove a single instance of the IIS web agent:

1. Log on to Windows as a user with administrator privileges.
2. Run **agentadmin.exe --l** to output a list of the installed web agent configuration instances.

```
c:\web_agents\iis_agent\bin> agentadmin.exe --l
OpenAM Web Agent configuration instances:

id:            agent_1
configuration: c:\web_agents\iis_agent\bin\..\instances\agent_1
server/site:   2.2.1
```

   Make a note of the ID value of the configuration instance you want to remove.

3. Run **agentadmin.exe --r**, and specify the ID of the web agent configuration instance to remove.

```
c:\web_agents\iis_agent\bin> agentadmin.exe --r agent_1

Removing agent_1 configuration...
Removing agent_1 configuration... Done.
```

Important

The `--r` option does not remove the web agent libraries. To remove all web agent instances and libraries, see "To Remove Web Agents from IIS".

To Remove Web Agents from IIS

Perform the steps in this procedure to remove all web agents from the IIS installation, for example, during an upgrade.

1. Log on to Windows as a user with administrator privileges.
2. Run **agentadmin --g**. A warning is displayed. Type `yes` to proceed with removing the configuration instance.

```
c:\web_agents\iis_agent\bin> agentadmin.exe --g

Warning! This procedure will remove all OpenAM Web Agent references from
IIS Server configuration.

Continue (yes/no): [no]: yes

Removing agent module from IIS Server configuration...
Removing agent module from IIS Server configuration... Done.
```

7.3. Removing the NGINX Plus Web Agent

Complete the following steps to remove an NGINX Plus web agent:

To remove the NGINX Plus Web Agent

1. Shut down the NGINX Plus server where the agent is installed.
2. Run the **agentadmin --l** command to output a list of installed web agent instances. For example:

```
$ ./agentadmin --l

OpenAM Web Agent configuration instances:

id:            agent_1
configuration: /web_agents/nginx15_agent/instances/agent_1
server/site:   /etc/nginx/nginx.conf

id:            agent_2
configuration: /web_agents/nginx15_agent/instances/agent_2
server/site:   /etc/nginx/nginx.conf

id:            agent_3
configuration: /web_agents/nginx15_agent/instances/agent_3
server/site:   /etc/nginx/nginx.conf
```

   Make a note of the ID value of the configuration instance you want to remove.
3. Run the **agentadmin --r** command and specify the ID of the wen agent instance to remove. A warning is displayed. Type `yes` to remove the instance.

```
$ ./agentadmin --r agent_3

Warning! This procedure will remove the OpenAM Web Agent configuration for agent_3
but not references to it your NGINX server configuration file: /etc/nginx/nginx.conf.

Continue (yes/no): [no]: yes

In order to complete the removal of the agent from your NGINX installation,
remove the openam_agent_ directives for this agent
from your NGINX configuration file: /etc/nginx/nginx.conf
and, if this is the only agent in the installation,
remove the load_module directive for the openam_agent_auth_module
in the NGINX configuration file.

Please press any key to continue.


Removing agent_3 configuration... Done.
```

4. Edit the NGINX Plus configuration file that contains the context protected by the removed web agent instance.
5. Delete the `openam_agent_` directives from the context.

   If this is the last agent in the NGINX Plus server, remove the directive that loads the `openam_ngx_auth_module.so` library.
6. Restart the NGINX Plus server.

Chapter 8
Troubleshooting

This chapter offers solutions to issues during installation of AM web agents.

Tip

The **agentadmin** command offers a validation mode for the agent that can help you troubleshoot issues in your environment; for example, after an agent upgrade or a network change. For more information, see the `--V` option in agentadmin(1).

Solutions to Common Issues

This section offers solutions to common problems when installing AM web agents:

Q: I am trying to install a web agent on Windows, which will connect to an AM server running over HTTPS, but the installer reports the following:

```
init_ssl(): ssleay32.dll is not available (error: 87)
init_ssl(): libeay32.dll is not available (error: 87)
```

A: If OpenSSL is correctly installed, on Windows 7 or Windows Server 2008 R2 systems, apply the update provided in Microsoft knowledge base article KB2533623. See Microsoft Security Advisory: Insecure library loading could allow remote code execution.

Q: I am trying to install the web agent on a server with SELinux enabled in `enforcing` mode and I am getting error messages after installation, or the web server does not start up. What happened?

A: When installing web agents on Linux or Unix servers, you must ensure that the user that runs the web server process has read and write permissions for the agent installation directory and files.

If SELinux is enabled in `enforcing` mode, you must also ensure that SELinux is configured to allow the web server process to perform read and write operations to the agent installation directory and files. By default, SELinux only allows the web server process to read files in well-known authorized locations, such as the `/var/www/html` directory.

For environments where security can be more relaxed, consider setting SELinux or the `httpd_t` context in `permissive` mode for troubleshooting purposes.

Refer to the Linux documentation for more information about configuring SELinux.

Q: Why are logs not being written to the `/log/system_0.log` and `/log/monitor_0.pipe` files? I am seeing this error:

```
unable to open event channel
```

A: It is likely that the agent does not have permission to be able to write to the `/log/system_0.log` and `/log/monitor_0.pipe` log files.

This can occur if you used the **agentadmin --V** validator command using a user account that is different than the account used to run your web server.

You should run the validator command as the same user that runs the web server, for example, by using the **sudo** command.

To fix the issue, change the ownership of these files to match the user or group that is running your web server.

Q: My Apache HTTP server is not using port 80. But when I install the web agent it defaults to port 80. How do I fix this?

A: You probably set `ServerName` in the Apache HTTP Server configuration to the host name, but did not specify the port number.

Instead you must set both the host name and port number for `ServerName` in the configuration. For example, if you have Apache HTTP Server configured to listen on port 8080, then set `ServerName` appropriately as in the following excerpt:

```
<VirtualHost *:8080>
ServerName www.localhost.example:8080
```

Q: My web server and web agent are installed as root, and the agent cannot rotate logs. I am seeing this error:

```
Could not rotate log file ... (error: 13)
```

What should I do?

A: If the web server is running with a non-root user, for example, the `daemon` user, you must ensure that user has the following permissions:

Read Permission

- `/web_agents/agent_name/lib`

Read and Write Permission

- `/web_agents/agent_name/instances/agent_nnn`
- `/web_agents/agent_name/log`

Apply execute permissions on the folders listed above, recursively, for the user that runs the web server.

For IIS web agents, change the ownership of the files using the **agentadmin --o** command. For more information, see "Command-Line Tool Reference".

Tip

You may also see similar issues if SELinux is enabled in `enforcing` mode and it is not configured to allow access to agent directories.

Q: How do I increase security against possible phishing attacks through open redirect?

A: You can specify a list of valid URL resources against which AM validates the `goto` and `gotoOnFail` URL using the Valid `goto` URL Resource service.

AM only redirects a user if the `goto` and `gotoOnFail` URL matches any of the resources specified in this setting. If no setting is present, it is assumed that the `goto` and `gotoOnFail` URL is valid.

To set the Valid `goto` URL Resources, use the AM console, and navigate to Realms > *Realm Name* > Services. Click Add, select Validation Service, and then add one or more valid `goto` URLs.

You can use the "*" wildcard to define resources, where "*" matches all characters except "?". For example, you can use the wildcards, such as `https://website.example.com/*` or `https://website.example.com/*?*`. For more specific patterns, use resource names with wildcards as described in the procedure, *Constraining Post-Login Redirects*.

Q: I have installed the Unix Apache web agent and now neither Apache nor the web agent start up or log any message. If I remove the web agent, the Apache server starts again. What can be the problem?

A: To troubleshoot a web agent or web server that does not start, set the web agent logging level to the maximum by performing the following steps:

1. Set the environment variable `AM_SYSTEM_LOG_LEVEL` to `All` in your command line session. For example:

   ```
   $ export AM_SYSTEM_LOG_LEVEL=ALL
   ```

2. Restart the Apache server.

3. Check the logs generated in the `web_agent/apache_24_agent/log/system_n.log` file.

Web agents reserve memory for the policy and session cache based on the `AM_MAX_SESSION_CACHE_SIZE` environment variable. If the server where the web agent is installed does not have enough shared memory available, the web agent may log messages like the following:

```
017-11-10 12:06:00.492 +0000   DEBUG [1:7521][source/shared.c:1451]am_shm_create2() about to create
 block-clusters_0, size 1074008064
2017-11-10 12:06:00.492 +0000   ERROR [1:7521]am_shm_create2(): ftruncate failed, error: 28
```

The error message means the web agent tries to reserve 1074008064 bytes of memory, but there is not enough shared memory available. Several reasons may explain why the shared memory is running low, such as:

- A new application or additional workload may be stretching the server resources to the limit.

  In this case, ensure that the server has enough shared memory available to satisfy the need of all the applications.

- A web agent may not have been able to release its shared memory after stopping. Therefore, even if the shared memory is technically not in use, it is still reserved and cannot be reassigned unless freed.

  Different operating systems manage the shared memory in different ways. Refer to your operating system documentation for information about checking shared memory usage.

You can reduce the amount of memory the web agent reserves for the session and policy cache by setting the `AM_MAX_SESSION_CACHE_SIZE` environment variable to a value between 1048576 (1 MB) and 1074008064 bytes (1 GB). For more information, see "Configuring Web Agent Environment Variables".

Troubleshooting a component that does not start and does not generate logs may be difficult to diagnose. Contact the ForgeRock Support team for more help and information.

Q: I have client-based (stateless) sessions configured in AM, and I am getting infinite redirection loops. In the `debug.log` file I can see messages similar to the following:

```
2018-03-15 16:23:10.538 +0000 ERROR [c5319caa-beeb-5a44-a098-d5575e768348]state identifier not
 present in authentication state
2018-03-15 16:23:10.538 +0000 WARNING [c5319caa-beeb-5a44-a098-d5575e768348]unable to verify pre-
authentication cookie
2018-03-15 16:23:10.538 +0000 WARNING [c5319caa-beeb-5a44-a098-
d5575e768348]convert_request_after_authn_post(): unable to retrieve pre-authentication request data
2018-03-15 16:23:10.538 +0000 DEBUG [c5319caa-beeb-5a44-a098-d5575e768348] exit status: forbidden
 (3), HTTP status: 403, subrequest 0
```

What is happening?

A: In this case, the redirection loop happens because the client-based (stateless) session cookie is surpassing the maximum supported browser header size. Since the cookie is incomplete, AM cannot validate it.

To ensure the session cookie does not surpass the browser supported size, configure either signing and compression or encryption and compression.

For more information, see the *ForgeRock Access Management Authentication and Single Sign-On Guide*.

Q: I have upgraded my agent and, in the logs, I can see errors similar to the following::

```
redirect_uri_mismatch. The redirection URI provided does not match a pre-registered value.
com.iplanet.sso.SSOException: Invalid Agent Root URL
com.iplanet.sso.SSOException: Goto URL not valid for the agent Provider ID
```

What should I do?

A: Web agents 5.5 only accept requests sent to the URL specified by the Agent Root URL for CDSSO property. For example, `http://agent.example.com:8080/`.

As a security measure, web agents prevent you from accessing the agent on URLs not defined in the Agent Root URL for CDSSO property. Add entries to this property when:

- Accessing the agent through different protocols. For example, `http://agent.example.com/` and `https://agent.example.com/`.
- Accessing the agent through different virtual host names. For example, `http://agent.example.com/` and `http://internal.example.com/`.
- Accessing the agent through different ports. For example, `http://agent.example.com/` and `http://agent.example.com:8080/`.

Q: My web agent is not protecting my website. In the logs, I can see errors similar to the following:

```
2018-02-14 13:10:52.816 -0500  ERROR [86169084-5648-6f4d-a706-30f5343d9220]config_fetch():  failed to
 load configuration for agent: myagent myagent, error -24
2018-02-14 13:10:52.816 -0500  ERROR [86169084-5648-6f4d-a706-30f5343d9220]amagent_auth_handler():
 failed to get agent configuration instance, error: invalid agent session*
```

What is happening?

A: The web agent is unable to log in to AM. Possible causes are:

- Network connection between the agent and AM is unavailable.
- The `com.sun.identity.agents.config.naming.url` property, which specifies the URL of AM, may be misconfigured. For more information, see "Configuring Bootstrap Properties".

Q: I have upgraded my Unix Apache or IBM HTTP Server web agent and even though notifications are enabled, the web agent does not update its configuration. What is happening?

A: To troubleshoot this issue, set the web agent logging level to the maximum by performing the following steps:

1. Set the environment variable `AM_SYSTEM_LOG_LEVEL` to `ALL` in your command line session. For example:

   ```
   $ export AM_SYSTEM_LOG_LEVEL=ALL
   ```

2. Restart the Apache or IBM HTTP server.
3. Check the logs generated in the `web_agent/agent_type/log/system_n.log` file.

Sometimes stopping or upgrading an agent may not clean up the pipe file the agent uses to communicate with AM. If the newly started agent cannot create the pipe to communicate with AM because it already exists, the agent would log messages like the following:

```
2017-12-05 17:12:07.324 UTC   DEBUG [1:10551398][source/monitor.c:503]monitor startup
2017-12-05 17:12:07.325 UTC   ERROR [102:10551398]monitor unable to get semaphore
2017-12-05 17:12:56.552 UTC   DEBUG [304:10551398][source/config.c:295]config_initialise():  agent
 configuration read from cache, agent: / wpa-aix7-Httpd7-32bit
```

If you see similar error messages, perform the following steps to delete the pipe file:

1. Stop the Apache or IBM HTTP server.
2. Change directories to the `/tmp` directory.
3. Delete the `monitor.pipe` file.
4. Retart the Apache or IBM HTTP server.

Q: After upgrading, the default Apache welcome page appears instead of my custom error pages. What should I do?

A: Check your Apache `ErrorDocument` configuration. If the custom error pages are not in the document root of the Apache server, you should enclose the `ErrorDocument` directives in `Directory` elements. For example:

```
<Directory "/web/docs">
   ErrorDocument 403 myCustom403Page.html
</Directory>
```

Refer to the Apache documentation for more details on the `ErrorDocument` directive.

Q: After starting a web agent installation, I see a failure in the logs:

```
2016-11-09 19:51:52 send_login_request(): authenticate response status code: 0 (empty)
2016-11-09 19:51:52 am_agent_login(): closing connection after failure
2016-11-09 19:51:52 error validating OpenAM agent configuration
2016-11-09 19:51:52 installation error
2016-11-09 19:51:52 installation exit
```

A: During a web agent installation, the installation can fail if AM's validation of the agent configuration exceeds the default timeout of 4 seconds.

You can set the `AM_NET_TIMEOUT` environment variable to change the default timeout, and then rerun the installation. For more information, see Web Agent Environment Properties.

Q: My web agent is not protecting my website. In the `debug.log` file I can see messages similar to the following:

```
2019-06-27 01:54:25 GMT DEBUG [162ba6eb-cf88-3d7f-f92c-ee8b21971b4c]: (source/oidc.c:265) agent_realm
 does not have the expected value: JWT
 {
   "sub":"demo",
   "auditTrackingId":"267d1f56-0b97-4830-ae91-6be4b8b7099f-5840",
   "iss":"https://openam.example.com:8443/openam/oauth2/Customers",
   "tokenName":"id_token",
   "nonce":"D3AE96656D6D634489AF325D90C435A2",
   "aud":"webagent",
   "s_hash":"rxwxIoqDFiwt4MxSwiBa-w",
   "azp":"webagent",
   "auth_time":1561600459,
   "forgerock":{
      "ssotoken":"wi8tHql...MQAA*",
      "suid":"267d1f56-0b97-4830-ae91-6be4b8b7099f-5647"
   },
   "realm":"/Customers",
   "exp":1561607661,
   "tokenType":"JWTToken",
   "iat":1561600461,
   "agent_realm":"/Customers"
}
 2019-06-27 01:54:25 GMT WARNING [162ba6eb-cf88-3d7f-f92c-ee8b21971b4c]: redirect_after_authn():
 unable to validate JWT
```

What is happening?

A: If you configured the agent profile in a realm other than AM's top-level realm (*/*), you must configure the web agent `com.sun.identity.agents.config.organization.name` bootstrap property with the realm where the agent profile is located. For example, `/Customers`.

Realm names are case-sensitive. Failure to set the realm name exactly as configured in AM will cause the agent to fail to recognize the realm.

Q: I am getting HTTP 403 Forbidden messages when accessing protected resources and I can see errors similar to the following in the `debug.log` file:

```
2019-06-27 11:10:04 GMT WARNING [69d4632c-82af-b853-0f340vb7b754]: too many pending authentications
2019-06-27 11:10:04 GMT ERROR  [69d4632c-82af-76da-b853-0f340vb7b754]: save_pre_authn_state(): unable
 to save state for request
```

What is happening?

A: Agents store authentication transaction state in an internal cookie called `agent-authn-tx`. This cookie, which has a maximum size of 4096 bytes, can fill up if the agent receives a large number of parallel unauthenticated requests to access protected resources.

To work around this issue, configure resources not requiring protection, such as CSS files, images, and static HTML pages in not-enforced lists. For more information, see "Not-Enforced URL and Client IP Lists".

Chapter 9
Reference

9.1. Configuring Web Agent Properties

When you create a web agent profile and install the agent, you can choose to store the agent configuration centrally and configure the agent using the AM 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]

Some properties do not yet appear in the AM console, so they need to be configured as custom properties, see Custom Properties, or locally in the agent properties configuration file, `agent.conf`.

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

9.1.1. Configuring Bootstrap Properties

Web agents use bootstrap properties to start up and connect to AM. They are defined within the local configuration `agent.conf` file only, and would not work if set up using the AM console.

Bootstrap Properties

`com.sun.identity.agents.config.organization.name`

Specifies the AM realm where the agent profile is located. For example, `/Customers`.

Realm names are case-sensitive. Failure to set the realm name exactly as configured in AM will cause the agent to fail to recognize the realm.

Default: `/`

`com.sun.identity.agents.config.username`

The name of the agent profile in AM.

Default: not set

[1] The configuration file syntax is that of a standard Java properties file. See java.util.Properties.load for a description of the format. The value of a property specified multiple times is not defined.

`com.sun.identity.agents.config.password`

The password required by the agent profile, encrypted with the key specified in `com.sun.identity.agents.config.key`.

To encrypt an agent profile password, run the **agentadmin** command with the `--p` option. For an example, see "Command-Line Tool Reference".

Default: not set

`com.sun.identity.agents.config.key`

The encryption key used to encrypt the agent profile password, which should be provided in `com.sun.identity.agents.config.password`.

To create a encryption key, run the **agentadmin** command with the `--k` option. For an example, see "Command-Line Tool Reference".

Default: not set

`org.forgerock.agents.config.tls`

Specifies a space-separated list of security protocols preceded by a dash **-** that will *not* be used when connecting to AM.

The supported protocols are the following:

- `SSLv3`
- `TLSv1`
- `TLSv1.1`
- `TLSv1.2` (Default)

This property is relevant to all web agents using OpenSSL libraries.

Default: `-SSLv3 -TLSv1 -TLSv1.1`

You can also change the default value by setting an environment variable, `AM_SSL_OPTIONS`. For more information, see "Configuring Web Agent Environment Variables".

> **Note**
>
> SSLv2 is disabled always regardless of setting.

`org.forgerock.agents.init.retry.max`

This is the maximum number of consecutive agent initialization retries.

Default: 0 (when not set)

`org.forgerock.agents.init.retry.wait`

This is the wait time in seconds between retries.

Default: 0 (when not set)

`com.sun.identity.agents.config.connect.timeout`

Set this to the number of seconds to wait for a connection to AM before timing out and cancelling the connection. Applies to TCP *connect* operations.

Default: `4`

`com.sun.identity.agents.config.receive.timeout`

Set this to the number of seconds to wait for a response from AM before timing out and dropping the connection. Applies to TCP *receive* operations.

Default: `4`

`com.sun.identity.agents.config.naming.url`

Specifies a space-separated list of AM URLs to which the web agent connects. Set this property to the URL of the load balancer in front of the AM instances (or load balancers, in case of disaster-recovery configurations).

When the web agent cannot connect to the first URL of the list, it automatically connects to the next available URL. The agent will stay connected to the new URL until the URL fails, or the agent is restarted.

Default: AM_URL/openam/

9.1.2. Configuring Global Properties

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

This section describes the following property groups:

- Profile Properties
- General Properties
- Audit Properties
- Fully Qualified Domain Name Checking Properties

Profile Properties

Group
`agentgroup`

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

Password

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

If you change this password, you must update manually the password of the bootstrap property `com.sun.identity.agents.config.password`.

Status

Status of the agent configuration.

Location of Agent Configuration Repository

Whether the agent's configuration is managed centrally through AM (`centralized`) or locally in the web agent configuration file (`local`).

If you change this to a local configuration, you can no longer manage the web agent configuration through the AM console.

Default: centralized

Property: `com.sun.identity.agents.config.repository.location`

Agent Configuration Change Notification

Specifies whether AM sends a notification to the web agent to reread the agent profile after a change to a hot-swappable property. This property only applies when you store the agent profile in AM's configuration data store.

Default: `true`

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

Hot-swap: yes

Web Socket Connection Interval

Specifies the time in minutes after which web agents reopen their WebSocket connection to AM. This property helps ensure a balanced distribution of connections across the AM servers on the site.

Default: `30`

Property: `org.forgerock.openam.agents.config.balance.websocket.connection.interval.in.minutes`

Hot-swap: yes

JWT Cookie Name

Specifies the name of the cookie that holds the OpenID Connect JSON web token (JWT) on the user's browser.

Before changing the name of this cookie, consider the following points:

- This cookie is only used by the web agent and is never presented to AM.
- The name of this cookie must be unique across the set of cookies the user's browser receives, since some browsers behave in unexpected ways when receiving several cookies with the same name. For example, you should not set the JWT cookie name to `iPlanetDirectoryPro`, which is the default name of AM's session cookie.

Default: `am-auth-jwt`

Property: `org.forgerock.openam.agents.config.jwt.name`

Hot-swap: yes

Enable Notifications

Specifies whether AM sends notifications to the web agent to:

- Refresh the session cache when a session times out or a client logs out from AM.
- Refresh the policy cache when the administrator changes a policy.

Default: true

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

Hot-swap: no

Agent Notification URL

This property does not apply to Web Agents 5.5, although it may appear in the AM console. When creating a web agent profile, the AM console configures a default value for this property to maintain compatibility with earlier versions of the web agent. The default value should be removed. For more information, see the Release Notes.

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

Agent Deployment URI Prefix

Default: *`agent-root-URL`*`/amagent`

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

Hot-swap: yes

Configuration Reload Interval

Interval in minutes to fetch agent configuration from AM. Used if notifications are disabled.

Default: `60`

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

Hot-swap: no

Configuration Cleanup Interval

This property does not apply to Web Agents 5.5, although it may appear in the AM console.

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

Agent Root URL for CDSSO

The 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. AM checks that the `goto` URLs match one of the agent root URLs for CDSSO.

Default: *`agent-root-URL`*

Property: `sunIdentityServerDeviceKeyValue[`*`n`*`]`

Enable Agent Keepalive Connections (Not yet in the AM console)[2]

Specifies how the web agent connects to AM during the session validation process.

Session validation is a process composed of several requests going to and coming from AM. When this property is set to `false`, the agent opens a single connection to AM which is reused to satisfy every request required for a session, then closes it. When set to `true`, the agent opens and closes a connection for every request required when validating a session.

Setting this property to `false` reduces the overhead of opening and closing connections to AM. However, if you use load balancers or reverse proxy servers that do not allow applications to keep connections open, you must set this property to `true`.

Default: `true`

Property: `org.forgerock.agents.config.keepalive.disable`

General Properties

SSO Only Mode

When enabled, the agent enforces authentication, so that upon verification of the user's identity, the user receives a session token.

When `true` , the web agent only manages user authentication. The filter invokes the AM Authentication Service to verify the identity of the user. If the user's identity is verified, the user is issued a session token through AM's Session Service.

When `false`, which is the default, the web agents will also manage user authorization, by using the policy engine in AM.

Tip

Sessions in AM have an idle timeout after which they expire. In general, when users access protected resources through an agent, the agent requests policy decision in behalf of that user, which resets the idle timeout.

If the agent is configured in SSO mode or if it does not need to ask AM for policy decision because it is already cached, the session may expire in AM due to idle timeout before the user logs out from the application.

To mitigate this issue, set the value of the SSO Caching Polling Period (`com.sun.identity.agents.config.sso.cache.polling.interval`) property to a value smaller than the one assigned for the session idle timeout in AM.

This way, the agent will poll AM about the session on behalf of the user before the session expires.

Default: `false`

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). The URL can be absolute or relative.

The following are not permitted in the URL:

- Wildcards
- The `.` directory specifier
- The `..` directory specifier

Default: not set

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.

Valid values for the property are:

- All
- Error

- Info
- Message
- Warning

Default: `Error`

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

Agent Debug File Rotation

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

Default: `true`

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 5242880 bytes (5 MB), and lower values are reset to 5 MB. AM sets a default of 10000000 bytes (approximately 10 MB).

Default: `10000000`

Hot-swap: no. This is a bootstrap property.

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

Local Agent Debug File Name (Not yet in the AM console)[2]

Name of file stored locally on the agent that contains agent debug messages.

Default:`/web_agents/`*`agent_version`*`/instances/agent_`*`nnn`*`/logs/debug/debug.log`

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

Audit Properties

Audit Access Types

Specfies the type of audit events to log. Valid values include:

- `LOG_NONE`. Disable audit logging.
- `LOG_ALLOW`. Log access allowed events.
- `LOG_DENY`. Log access denied events.
- `LOG_BOTH`. Log access allowed and access denied events.

Default: `LOG_NONE`

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

Hot-swap: yes

Audit Log Location

Specifies the location where the web agent logs audit messages. Valid values include:

- `REMOTE`. Log audit event messages to the audit event handler configured in the AM realm where the web agent is configured.
- `LOCAL`. Log audit event messages locally to the agent installation.
- `ALL`. Log audit event messages to the audit event handler configured in the AM realm and locally to the agent installation.

Default: `REMOTE`

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

Hot-swap: yes

Remote Log Filename

This property does not apply to Web Agents 5.5, although it may appear in the AM console.

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

Remote Audit Log Interval

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

Default: `5`

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

Hot-swap: no

Rotate Local Audit Log

This property does not apply to Web Agents 5.5, although it may appear in the AM console.

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

Local Audit Log Rotation Size

Specifies the maximum size in bytes of the local audit log files. Web agents rotate audit log files when they reach this size.

Default: `52428800`

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

Hot-swap: no. This is a bootstrap property.

Local Agent Audit File Name (Not yet in the AM console)[2]

Name of file stored locally on the agent that contains agent audit messages if log location is LOCAL or ALL.

Default:`/web_agents/agent_version/instances/agent_nnn/logs/audit/audit.log`

Property: `com.sun.identity.agents.config.local.audit.logfile`

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`

Default: false

FQDN Default

FQDN 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.

> **Note**
>
> If you specify any FQDN in this property, you must also add it to the Agent Root URL for CDSSO property.

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 a virtual server`virtual.example.com` to `real.mydomain.example`, enter the keyword `validn`, where *n* is an incrementing integer starting at `1`, in the Map Key field. Enter `virtual.example.com` in the Corresponding Map Value field.

In the configuration file, this corresponds to `com.sun.identity.agents.config.fqdn.mapping[valid1]=virtual.example.com`.

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[Source hostname / IP address]=Target FQDN`

9.1.3. Configuring Application Properties

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

This section describes the following property groups:

- Not-enforced URL Processing Properties
- Not-Enforced IP Processing Properties
- Not-Enforced URL from IP Processing Properties
- Not-Enforced Fallback Mode Properties
- Profile Attributes Processing Properties
- Response Attributes Processing Properties
- Session Attributes Processing Properties
- Common Attributes Fetching Processing Properties

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 more information about Ignore Path Info, see Ignore Path Info Properties.

> **Note**
>
> The NGINX Plus web agent does not support this setting.

Default: `true`

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

Enable Regular Expressions for Not-Enforced URLs (Not yet in the AM console)[2]

When `true`, enables use of Perl-compatible regular expressions in Not-enforced URL settings.

Default: `false`

Property: `com.forgerock.agents.notenforced.url.regex.enable`

Not-Enforced URLs

List of URLs allowed to bypass authentication and grant immediate access to resources, such as images, stylesheets, or static HTML pages.

Tip

You can also limit not-enforced URL rules to specific HTTP methods. For more information, see "Not-Enforced URL and Client IP Lists".

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. The `-*-` wildcard can only be used in the path sections of a URL, not within the host, port, or protocol sections.

AM 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=*`.

To match a resource that uses non-ASCII characters, percent-encode the resource when creating the rule.

For example, to match resources under an IRI such as `http://www.example.com/forstå`, specify the following percent-encoded rule:

```
com.sun.identity.agents.config.notenforced.url[n]=/forst%C3%A5/*
```

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.

Default: not set

Property: `com.sun.identity.agents.config.notenforced.url[n]`

If you enabled use of Perl-compatible regular expressions to match not-enforced URLs, then all your settings must be done using regular expressions. (Do not mix settings; use either the mechanism described above or Perl-compatible regular expressions, but not both.)

The following example shows settings where no authentication is required for URLs whose path ends `/PublicServletA` or `/PublicServletB` (with or without query string parameters), and no authentication is required to access .png, .jpg, .gif, .js, or .css files under URLs that do not contain `/protectedA/` or `/protectedB/`.

```
com.sun.identity.agents.config.notenforced.url[0]=.*/(PublicServletA|PublicServletB)(\?.*|$)
com.sun.identity.agents.config.notenforced.url[1]=^(?!.*(/protectedA/|/protectedB/)).*\.(png|jpg|gif|
js|css)(\?.*|$)
```

Invert Not-Enforced URLs

When set to `true`, enforce policy for the URLS and patterns specified in the Not-Enforced URLs property instead of allowing access to them without authentication. Consider the following points when configuring this property:

- An empty Not-Enforced URL property results in all URLs being enforced
- At least one URL must be enforced. To allow access to any URL without authentication, consider disabling the web agent

Default: `false`

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

Fetch Attributes for Not-Enforced URLs

When enabled, the agent fetches profile, response, and session attributes that are mapped by doing policy evaluation, and forwards these attributes to not-enforced URLs.

Default: `false`

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

Not-Enforced IP Processing Properties

Not-Enforced Client IP List

Specifies IP addresses or network CIDR notation for which no authentication is required. Supported values are:

- IPV4 and IPV6 addresses.
- IPV4 and IPV6 addresses specified in CIDR notation.
- IPV4 and IPV6 ranges of addresses delimited by the **-** character.
- Network ranges specified in CIDR notation.

For example:

```
com.sun.identity.agents.config.notenforced.ip[0]= 192.18.145.128
com.sun.identity.agents.config.notenforced.ip[2]= 192.168.145.128/24
com.sun.identity.agents.config.notenforced.ip[1]= 2001:5c0:9168:0:0:0:0:2/128
com.sun.identity.agents.config.notenforced.ip[3]= 192.168.1.0/24
com.sun.identity.agents.config.notenforced.ip[4]= 192.18.145.128-192.168.145.133
com.sun.identity.agents.config.notenforced.ip[5]= 2001:5c0:9168:0:0:0:0:1-2001:5c0:9168:0:0:0:0:2
```

Web agents stop evaluating not-enforced properties after reaching an invalid netmask in the list.

Default: not set

Property: `com.sun.identity.agents.config.notenforced.ip[n]`

Note

Loopback addresses are not considered valid IPs on the Not-Enforced IP list. If specified, the web agent ignores the loopback address.

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.

Default: `false`

Property: `com.sun.identity.agents.config.client.ip.validation.enable`

Not-Enforced URL from IP Processing Properties

Not-Enforced URL from IP Processing List (Not yet in the AM console)[2]

Specifies a list of client IP addresses that do not require authentication when requesting the indicated URLs.

The supported format requires a list of IP addresses separated by spaces, the horizontal bar (|) character, and a list of URLs separated by spaces. For example:

```
org.forgerock.agents.config.notenforced.ipurl[0]=10.1.2.1 192.168.0.2|/public/*
```

In the preceding example, the IP addresses `10.1.2.1` and `192.168.0.2` can access any resource inside `/public` without authenticating.

The list of IP addresses supports IPv4 and IPv6 addresses specified by either CIDR or IP range notation:

- **IP range notation**

  Supported values are IPv4 and IPv6 ranges of addresses. For example:

  ```
  org.forgerock.agents.config.notenforced.ipurl[1]=192.168.1.1-192.168.1.10|/public/*
  org.forgerock.agents.config.notenforced.ipurl[2]=2001:5c0:9168:0:0:0:0:1-2001:5c0:9168:0:0:0:0:2|/
  public/*
  ```

  In the preceding IPv4 example, clients with IP addresses in the range `192.168.1.1-192.168.1.10` need not to authenticate to access the list of URLs included in `/public/*`.

- **CIDR notation**

Supported values are specified in CIDR notation. For example:

```
org.forgerock.agents.config.notenforced.ipurl[3]=192.168.1.0/24 192.168.100.0/24|/public/*
org.forgerock.agents.config.notenforced.ipurl[4]=2001:5c0:9168:0:0:0:0:2/128|/public/*
```

In the preceding IPv4 example, the IP addresses defined on the network `192.168.1` with netmask `255.255.255.0` and the network `192.168.100` with netmask `255.255.255.0` need not to authenticate to access the list of URLs included in `/public/*`.

The list of URLs can be specified by using the following methods:

- **Wildcards**

  The wildcard * matches all characters, except the question mark **?** character, 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`. For example:

  ```
  org.forgerock.agents.config.notenforced.ipurl[5]=192.6.8.0/24|/public/* /free_access/login*
  ```

  In the preceding example, the IP addresses specified in *`192.6.8.0/24`* do not need authenticating to access any resource inside the `/public` URI, or any resource (files or directories) that starts with `login` inside the `/free_access` URI.

- **Regular Expressions**

  To use regular expressions in the URL list, set the `org.forgerock.agents.config.notenforced.ext.regex.enable` property to `true` and use Perl-compatible regular expressions. For example:

  ```
  org.forgerock.agents.config.notenforced.ipurl[6]=192.6.8.0/24|.*\/private\/.*(png|jpg|gif)
  ```

  In the preceding example, the IP addresses specified in *`192.6.8.0/24`* do not need to authenticate to access any `png`, `jpg`, or `gif` images that are inside the `/private` URI.

- **Internationalized Resource Identifiers (IRIs)**

  To match a resource that uses non-ASCII characters, percent-encode the resource when creating the rule.

  For example, to match resources under an IRI such as `http://www.example.com/forstå`, specify the following percent-encoded rule:

  ```
  com.sun.identity.agents.config.notenforced.ipurl[7]=192.6.8.0/24|/forst%C3%A5/*
  ```

Default: not set

Property: `org.forgerock.agents.config.notenforced.ipurl[n]`

Enable Regular Expressions for Not-Enforced URLs from IP (Not yet in the AM console)[2]

Enable use of Perl-compatible regular expressions in Not-Enforced URL from IP settings.

Default: `false`

Property: `org.forgerock.agents.config.notenforced.ext.regex.enable`

Not-Enforced Fallback Mode Properties

Not-Enforced Fallback Mode (Not yet in the AM console)[2]

Specifies whether the web agent should allow traffic to resources specified in the not-enforced lists when AM is not available. The property accepts two values:

- `true`. While AM is unavailable, the web agent:
  1. Reads the cached agent profile configuration until it expires. If you are not familiar with the web agent's caches, see "Caching Capabilities".
  2. After the cache expires, reads the local configuration file `webagents/agent_type/instances/agent_1/config/agent.conf`.

  If not-enforced properties are configured in the local configuration file, the web agent allows access to the not-enforced resources. However, response attributes for not-enforced resources are not available until AM is accessible.
- `false`. When AM is unavailable, the web agent prevents access to all resources, including any not-enforced resources.

Configuring this property requires setting up several properties in the the local configuration file `webagents/agent_type/instances/agent_1/config/agent.conf` even if the agent profile is in centralized configuration.

In the `Bootstrap` section, configure the fallback property:

```
com.forgerock.agents.config.fallback.mode = true
```

In the `Configuration` section, configure the not-enforced properties required for your environment. For example:

```
com.sun.identity.agents.config.notenforced.url.attributes.enable = true
com.sun.identity.agents.config.notenforced.url.invert = false
com.sun.identity.agents.config.notenforced.url[0] = http://agenttest.example.com/index.html
```

Default: `false`

Property: `com.forgerock.agents.config.fallback.mode`

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.

Default: `NONE`

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, the case of which must exactly match the identity store schema, 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`.

Tip

Make sure the case of your LDAP attribute name matches the case of the LDAP schema, otherwise you may see an error similar to the following:

```
do_header_set(): SM_LOGIN (UiD) is not available in profile attributes
```

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[`*`LDAP_NAME`*`]=[`*`HTTP_HEADER`*`]`

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.

Default: `NONE`

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`.

Default: not set

Property: `com.sun.identity.agents.config.response.attribute.mapping[RESPONSE_ATTR]=HTTP_HEADER`

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.

Default: `NONE`

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`.

Default: Not set

Property: `com.sun.identity.agents.config.session.attribute.mapping[SESSION_ATTR]=HTTP_HEADER`

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`

Continuous Security Properties

Continuous Security Cookies

Maps cookie values available in inbound resource requests to entries in the environmental conditions map, which web agents send to AM during policy evaluation.

This property has the format `[cookie_name]=map_entry_name`, where:

- `[cookie_name]` specifies the name of the cookie in the inbound request.

- *map_entry_name* specifies the name of the entry within the environmental conditions map that contains the value of *cookie_name*.

Example:

```
org.forgerock.openam.agents.config.continuous.security.cookies[trackingcookie1]=myCookieEntry
```

Web agents add entries from both of the continuous security properties into the environmental conditions map, which AM's authorization framework accesses during policy evaluation.

Use server-side authorization scripts to:

- Access the map's contents
- Write scripted conditions based on cookies and headers in the request

For more information about server-side authorization scripts in AM, see the *ForgeRock Access Management Authorization Guide*.

When you specify continuous security properties, web agents generate environmental condition entries in the map as follows:

Key	Value
`requestIp` [a]	Contains the inbound request's IP address. The web agent determines the IP as follows: • If the `com.sun.identity.agents.config.client.ip.header` property is configured, the web agent extracts the IP address from the header. • If the `com.sun.identity.agents.config.client.ip.header` property is not configured, the web agent uses the container's connection information to determine the client ip address.
`requestDNSName` [b]	Contains the inbound request's host name. The web agent determines the host name as follows: • If the `com.sun.identity.agents.config.client.hostname.header` property is configured, the web agent extracts the host name from the header. • If the `com.sun.identity.agents.config.client.hostname.header` property is not configured, the web agent uses the the web agent uses the container's connection information to determine the client's host name.
variable_name [c]	Contains an array of cookie or header values.

[a] The `requestIp` entry is created in the map regardless of how the continuous security properties are configured.
[b] The `requestDNSName` entry is created in the map regardless of how the continuous security properties are configured.
[c] There may be as many *variable_name* entries as values specified in the continuous security properties.

Consider the following example:

```
org.forgerock.openam.agents.config.continuous.security.cookies[ssid]=mySsid
org.forgerock.openam.agents.config.continuous.security.headers[User-Agent]=myUser-Agent
```

Assuming the incoming request contains an `ssid` cookie and an `User-Agent` header, the environmental conditions map would contain the following variables:

- `requestIp`, containing the IP address of the client. For example, `192.16.8.0.1`.
- `requestDNSName`, containing the host name of the client. For example, `client.example.com`.
- `mySsid`, containing the value of the `ssid` cookie. For example, `77xe99f4zqi1l99z`.
- `myUser-Agent`, containing the value of the `from` header. For example, `Mozilla/5.0 (Windows NT 6.3; Trident/7.0; rv:11.0) like Gecko`.

Default: not set

Property: `org.forgerock.openam.agents.config.continuous.security.cookies[cookie_name]=map_entry_name`

Continuous Security Headers

Maps header values in inbound resource requests to entries in the environmental conditions map, which web agents send to AM during policy evaluation.

This property has the format `[header_name]=map_entry_name`, where:

- `[header_name]` specifies the name of the header in the inbound request.
- `map_entry_name` specifies the name of the entry within the environmental conditions map that contains the value of `header_name`.

Example:

```
org.forgerock.openam.agents.config.continuous.security.headers[User-Agent]=myUserAgentHeaderEntry
```

Web agents add entries from both of the continuous security properties into the environmental conditions map, which AM's authorization framework accesses during policy evaluation.

Use server-side authorization scripts to:

- Access the map's contents
- Write scripted conditions based on cookies and headers in the request

For more information about server-side authorization scripts in AM, see the *ForgeRock Access Management Authorization Guide*.

When you specify continuous security properties, web agents generate environmental condition entries in the map as follows:

Key	Value
`requestIp` [a]	Contains the inbound request's IP address. The web agent determines the IP as follows:

Key	Value
	• If the `com.sun.identity.agents.config.client.ip.header` property is configured, the web agent extracts the IP address from the header. • If the `com.sun.identity.agents.config.client.ip.header` property is not configured, the web agent uses the container's connection information to determine the client ip address.
`requestDNSName` [b]	Contains the inbound request's host name. The web agent determines the host name as follows: • If the `com.sun.identity.agents.config.client.hostname.header` property is configured, the web agent extracts the host name from the header. • If the `com.sun.identity.agents.config.client.hostname.header` property is not configured, the web agent uses the the web agent uses the container's connection information to determine the client's host name.
`variable_name` [c]	Contains an array of cookie or header values.

[a] The `requestIp` entry is created in the map regardless of how the continuous security properties are configured.
[b] The `requestDNSName` entry is created in the map regardless of how the continuous security properties are configured.
[c] There may be as many *`variable_name`* entries as values specified in the continuous security properties.

Consider the following example:

```
org.forgerock.openam.agents.config.continuous.security.cookies[ssid]=mySsid
org.forgerock.openam.agents.config.continuous.security.headers[User-Agent]=myUser-Agent
```

Assuming the incoming request contains an `ssid` cookie and an `User-Agent` header, the environmental conditions map would contain the following variables:

- `requestIp`, containing the IP address of the client. For example, `192.16.8.0.1`.
- `requestDNSName`, containing the host name of the client. For example, `client.example.com`.
- `mySsid`, containing the value of the `ssid` cookie. For example, `77xe99f4zqi1l99z`.
- `myUser-Agent`, containing the value of the `from` header. For example, `Mozilla/5.0 (Windows NT 6.3; Trident/7.0; rv:11.0) like Gecko`.

Default: not set

Property: `org.forgerock.openam.agents.config.continuous.security.headers[`*`header_name`*`]=`*`map_entry_name`*

9.1.4. Configuring SSO Properties

This section covers SSO web agent properties. After creating the agent profile, you access these properties in the AM console under Realms > *Realm Name* > Applications > Agents > Web > *Agent Name* > SSO.

This section describes the following property groups:

Cookie Properties

Cookie Name

Name of the SSO token cookie used between the AM 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.

Default: `false`

Property: `com.sun.identity.agents.config.cookie.secure`

Hot-swap: no

HTTPOnly Mode (Not yet in the AM console)[2]

Agents with this property set to `true` mark cookies as HTTPOnly to prevent scripts and third-party programs from accessing the cookies.

Default: `false`

Property: `com.sun.identity.cookie.httponly`

Cross Domain SSO Properties

CDSSO Redirect URI

Specifies a URI the agent uses to process CDSSO requests.

Default:`agent/cdsso-oauth2`

Property: `com.sun.identity.agents.config.cdsso.redirect.uri`

Hot-swap: yes

Cross Domain SSO

This property does not apply to Web Agents 5.5, although it may appear in the AM console. CDSSO is always enabled.

Property: `com.sun.identity.agents.config.cdsso.enable`

CDSSO Servlet URL

This property does not apply to Web Agents 5.5, although it may appear in the AM console.

Property: `com.sun.identity.agents.config.cdsso.cdcservlet.url`

Cookie 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
```

Default: not set

Property: `com.sun.identity.agents.config.cdsso.cookie.domain[n]`

Session Cookie Reset on Authentication Redirect (Not yet in the AM console) [2]

When set to true. the agent will not reset the session cookie on an authentication redirect if there is a policy advice present.

By default, the agent resets the session cookie in all configured domains on every authentication redirect when a policy advice is present.

Default: `false`

Property: `org.forgerock.agents.config.cdsso.advice.cleanup.disable`

Cookie Reset

Cookie Reset

When enabled, the web agent resets (blanks) cookies in the response before redirecting to authentication by issuing a Set-Cookie header to the client. An example of the header would be similar to the following:

```
Set-Cookie myCookie= ; Max-Age=0; Expires=Thu, 01-Jan-1970 00:00:00 GMT; Domain=.my.default.fqdn
```

If the `com.sun.identity.agents.config.fqdn.default` property is set, the web agent sets the cookie domain to the domain specified by the property. If it is not set, the web agent leaves the cookie domain blank.

Default: `false`

Property: `com.sun.identity.agents.config.cookie.reset.enable`

Cookie Reset Name List

List of cookies to reset. For example:

```
com.sun.identity.agents.config.cookie.reset[0]=myCookie
com.sun.identity.agents.config.cookie.reset[1]=nextCookie
```

Default: not set

Property: `com.sun.identity.agents.config.cookie.reset[n]`

9.1.5. Configuring Access Management Services Properties

This section covers AM services web agent properties. After creating the agent profile, you access these properties in the AM console under Realms > *Realm Name* > Applications > Agents > Web > *Agent Name* > OpenAM Services.

This section describes the following property groups:

- Login URL Properties
- Logout URL Properties
- Agent Logout URL Properties
- Policy Client Service Properties

Login URL Properties

Allow Custom Login Mode (Not yet in the AM console)[2]

Specifies whether the agent should use the default or the custom login mode when redirecting unauthenticated users.

Before configuring this property, ensure you have read "Redirection and Conditional Redirection".

Possible values are:

- `false`. Default login redirection mode enabled (OIDC compliant login flow). Use with the following properties:
  - OpenAM Conditional Login URL (`com.forgerock.agents.conditional.login.url`)

- Regular Expression Conditional Login URL (`org.forgerock.agents.config.conditional.login.pattern` and `org.forgerock.agents.config.conditional.login.url`)

Note that if the Allow Custom Login Mode property is set to `true` but the redirection URL contains the `oauth2/authorize` endpoint, the agent will use the default login redirection mode nevertheless.

- `true`. Custom login redirection mode enabled (Non-OIDC compliant login flow). Use with the following properties:
  - OpenAM Login URL (`com.sun.identity.agents.config.login.url`)
  - OpenAM Conditional Login URL (`com.forgerock.agents.conditional.login.url`)
  - Regular Expression Conditional Login URL (`org.forgerock.agents.config.conditional.login.pattern` and `org.forgerock.agents.config.conditional.login.url`)

Default: `false`

Property: `org.forgerock.openam.agents.config.allow.custom.login`

Hot-swap: yes

OpenAM Login URL

When configured, specifies the URL of a custom login page to which the agent redirects incoming users without sufficient credentials so that they can authenticate.

> **Important**
>
> When redirecting incoming login requests to a custom login page, you must add it to either the not-enforced URL or IP lists.

Before configuring this property, ensure you have read "Redirection and Conditional Redirection".

The login URL has the format *`URL`*`[?realm=`*`realm_name&parameter1=value1&...`*`]`, where:

- `URL` is the custom SSO-token-compliant login page to where the agent redirects the unauthenticated users.
- `[?realm=`*`realm_name?parameter1=value1&...`*`]` specifies optional parameters that the agent will pass to the custom login page, for example, the AM realm which the user should log into.

  You do not need to specify the realm in the login URL if any of the following conditions is true:

  - The custom login page itself sets the `realm` parameter, for example, because it lets the user chose it. In this case, you must ensure the custom login page *always* appends a `realm` parameter to the `goto` URL.

- The realm where the agent must log the user to has DNS aliases configured in AM.

  AM will log in the user to the realm whose DSN alias matches the incoming request URL. For example, an inbound request from the `http://marketplace.example.com` URL logs into the `marketplace` realm if the realm alias is set to `marketplace.example.com`.

- The users should always log in to the Top Level Realm.

Even if you decide to specify the realm by default, this parameter can be overwritten by the custom login page if, for example, the user can chose the realm for authentication.

You can specify as many parameters your custom login pages require.

Example:

```
https://login.example.com/login.jsp?realm=marketplace&param1=value1
```

When the agent redirects the user to the custom login page, it appends a `goto` parameter (as configured in the `com.sun.identity.agents.config.redirect.param` property) with the agent's CDSSO endpoint and a `state` parameter.

The following is an example of a redirection from the agent to a custom login page:

```
http://login.example.com/login.jsp?realm=marketplace&goto=http%3A%2F%2Fagent.example.com%2Fcustom-
login-response%3Fstate%3D3Df2fc384a07b7668e05fc6c26c01edf1bac8a3b55%26realm%3Dmarketplace
```

Note that the `goto` parameter is URL encoded. If the `realm` parameter is configured in the redirection rule, it is also appended to the `goto` parameter.

Once the user has logged in, the custom login page must redirect back to the agent. To avoid redirection loops and login failures, consider the following constraints:

- You must ensure that the custom login page redirects back to the agent using the URL contained in the `goto` parameter, and that the request contains the `state` parameter.
- You must set the `realm` parameter in the redirection request to the agent if the users should not log in to AM's Top Level Realm.

  For example, you could use the realm specified in the redirection request from the agent to the custom login pages (if configured in the redirection property), or the custom login page can let the user chose to which realm authenticate to and add the `realm` parameter when redirecting to the agent.

  The following is an example of a redirection from a custom login page to the agent with the realm added to it:

  ```
  http://agent.example.com/custom-login-response?
  state=3Df2fc384a07b7668e05fc6c26c01edf1bac8a3b55&realm=marketplace
  ```

  There is one exception; if the realm where the agent should log the user in to has a DNS alias configured, AM will log in the user to the realm whose DNS alias matches the incoming request

URL. For example, an inbound request from the `http://marketplace.example.com` URL will be logged in to the marketplace realm if the realm alias is set to `marketplace.example.com`, whether there is a `realm` parameter or not.

Default: *AMURL/openam/UI/Login*

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

Hot-swap: yes

OpenAM Conditional Login URL (Not yet in the AM console)[2]

Conditionally redirect users based on the incoming request URL. If the incoming request URL matches a specified domain name, the web agent redirects the request to a specific URL. That specific URL can be an AM instance, site, or a different website.

Important

When redirecting incoming login requests to a custom login page, you must add it to either the not-enforced URL or IP lists.

Before configuring this property, ensure you have read "Redirection and Conditional Redirection".

If the FQDN Check property (`com.sun.identity.agents.config.fqdn.check.enable`) is enabled, the web agent iterates through the list of URLs until it finds an appropriate redirect URL that matches the FQDN check values. Otherwise, the web agent redirects the user to the URL configured in the conditional redirect rules.

Conditional redirects have the format `[String]|[URL, URL...][?realm=value&module=value2&service=value3]`, with no spaces between values. Specify values in conditional redirects as follows:

- `String`

  Specifies the incoming log in request URL. It can take the following values:

  - A domain. For example, `example.com`.

    When you specify a domain in a conditional redirect, web agents match both the domain itself and its subdomains. For example, `example.com` matches `mydomain.example.com` and `www.example.com`.

    Domains can also include path information. For example, `www.example.com/market`.

  - A subdomain. For example, `mydomain.example.com`.

    Subdomains can include path information. For example, `example.com/secure`.

  - A path. For example, `/myapp`.

  - Anything else contained in the log in request URL. For example, a port, such as `8080`.

- No value, in which case nothing is specified before the | character. Conditional rules that do not specify the incoming request's domain apply to every incoming request.

Note

To specify the string as a regular expression, configure the `org.forgerock.agents.config.conditional.login.pattern` and `org.forgerock.agents.config.conditional.login.url` properties instead.

- `URL, URL...`

Specifies the URL to which redirect incoming login requests. The URL can be one of the following:

- An AM instance or site.

  Specify the URL of an AM instance or site in the format *`protocol://FQDN[:port]/URI`*`/oauth2/authorize`, where the port is optional if it is 80 or 443. For example, `https://openam.example.com/openam/oauth2/authorize`.

- A website other than AM.

  Specify a URL in the format *`protocol://FQDN[:port]/URI`*, where the port is optional if it is 80 or 443. For example, `https://myweb.example.com/authApp`.

- A list of AM instances or sites, or websites other than AM

  If the redirection URL is not specified, the web agent redirects the request to the AM instance or site specified by the `com.sun.identity.agents.config.naming.url` bootstrap property.

Important

When using the default redirection login mode, ensure the `org.forgerock.openam.agents.config.allow.custom.login` property is set to `false`.

When using the custom redirection login mode, consider the following points:

- The `org.forgerock.openam.agents.config.allow.custom.login` property must be set to `true`.
- When the agent redirects the user to the custom login page, it appends a `goto` parameter (as configured in the `com.sun.identity.agents.config.redirect.param` property) with the agent's CDSSO endpoint and a `state` parameter.

  The following is an example of a redirection from the agent to a custom login page:

  ```
  http://login.example.com/login.jsp?realm=marketplace&goto=http%3A%2F%2Fagent.example.com
  %2Fcustom-login-response%3Fstate%3D3Df2fc384a07b7668e05fc6c26c01edf1bac8a3b55%26realm
  %3Dmarketplace
  ```

  Note that the `goto` parameter is URL encoded. If the `realm` parameter is configured in the redirection rule, it is also appended to the `goto` parameter.

Once the user has logged in, the custom login page must redirect back to the agent. To avoid redirection loops and login failures, consider the following constraints:

- You must ensure that the custom login page redirects back to the agent using the URL contained in the `goto` parameter, and that the request contains the `state` parameter.
- You must set the `realm` parameter in the redirection request to the agent if the users should not log in to AM's Top Level Realm.

  For example, you could use the realm specified in the redirection request from the agent to the custom login pages (if configured in the redirection property), or the custom login page can let the user chose to which realm authenticate to and add the `realm` parameter when redirecting to the agent.

  The following is an example of a redirection from a custom login page to the agent with the realm added to it:

  ```
  http://agent.example.com/custom-login-response?
  state=3Df2fc384a07b7668e05fc6c26c01edf1bac8a3b55&realm=marketplace
  ```

  There is one exception; if the realm where the agent should log the user in to has a DNS alias configured, AM will log in the user to the realm whose DNS alias matches the incoming request URL. For example, an inbound request from the `http://marketplace.example.com` URL will be logged in to the marketplace realm if the realm alias is set to `marketplace.example.com`, whether there is a `realm` parameter or not.

- `?realm=value`

  Specifies the AM realm to where the agent should log the users to. For example, `?realm=marketplace`.

  You do not need to specify the realm in the login URL if any of the following conditions is true:

  - The custom login page itself sets the `realm` parameter, for example, because it lets the user chose it. In this case, you must ensure the custom login page *always* appends a `realm` parameter to the `goto` URL.
  - The realm where the agent must log the user to has DNS aliases configured in AM.

    AM will log in the user to the realm whose DSN alias matches the incoming request URL. For example, an inbound request from the `http://marketplace.example.com` URL logs into the `marketplace` realm if the realm alias is set to `marketplace.example.com`.
  - The users should always log in to the Top Level Realm.

  Even if you decide to specify the realm by default, this parameter can be overwritten by the custom login page if, for example, the user can chose the realm for authentication.

- `&module=value2&service=value3`

Specifies parameters that can be added to the URL(s), such as:

- `module`, which specifies the authentication module the user authenticates against. For example, `?module=myAuthModule`.
- `service`, which specifies an authentication chain or tree the user authenticates against. For example, `?service=myAuthChain`.
- Any other parameters your custom login pages require.

Chain parameters with an **&** character, for example, `realm=value&service=value`.

When configuring conditional login with multiple URLs, set up the parameters for each of the URLs.

Examples:

```
com.forgerock.agents.conditional.login.url[0]=example.com|https://openam.example.com/openam/oauth2/
authorize
com.forgerock.agents.conditional.login.url[1]=myapp.domain.com|https://openam2.example.com/openam/
oauth2/authorize?realm=sales
com.forgerock.agents.conditional.login.url[2]=sales.example.com/marketplace|?realm=marketplace
com.forgerock.agents.conditional.login.url[3]=sales.example.com/marketplace|https://
openam1.example.com/openam/oauth2/authorize?realm=sales, https://openam2.example.com/openam/oauth2/
authorize?realm=marketplace
com.forgerock.agents.conditional.login.url[4]=myapp.domain.com|http:/mylogin.example.com?
realm=customers
com.forgerock.agents.conditional.login.url[5]=|https://openam3.example.com/openam/oauth2/authorize?
realm=customers&module=myAuthModule
```

Property: `com.forgerock.agents.conditional.login.url[n]`

Hot-swap: Yes

Regular Expression Conditional Login URL (Not yet in the AM console)[2]

Conditionally redirect users based on the incoming request URL. If the incoming request URL matches a regular expression, the web agent redirects the request to a specific URL. That specific URL can be an AM instance, site, or a different website.

Before configuring this property, ensure you have read "Redirection and Conditional Redirection".

Regular expression conditional login URLs require two properties:

- `org.forgerock.agents.config.conditional.login.pattern`. Specifies the regular expression that the domain name must match.
- `org.forgerock.agents.config.conditional.login.url`. Specifies the redirection URL and its parameters. Configure this property in the same way you would configure the OpenAM Conditional Login URL (`com.forgerock.agents.conditional.login.url`) property, except you do not specify the string.

Example:

```
org.forgerock.agents.config.conditional.login.pattern[0] = .*shop
org.forgerock.agents.config.conditional.login.url[0] = |http://openam.example.com/openam/oauth2/
authorize?realm=sales
```

Default: not set

Properties:

`org.forgerock.agents.config.conditional.login.pattern[n]`
`org.forgerock.agents.config.conditional.login.url[n]`

Hot-swap: yes

Agent Connection Timeout

This property does not apply to Web Agents 5.5, although it may appear in the AM console.

Property: `com.sun.identity.agents.config.auth.connection.timeout`

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

AM logout page URLs, such as `http://openam.example.com:8080/openam/UI/Logout`.

Default: *AM_URL/openam/UI/Logout*

Property: `com.sun.identity.agents.config.logout.url[n]`

Hot-swap: yes

Enable Logout URL Redirect (Not yet in the AM console)[2]

When disabled, instead of redirecting the user-agent, the web agent performs session logout in the background and then continues processing access to the current URL.

Default: `enabled`

Property: `com.forgerock.agents.config.logout.redirect.disable`

Hot-swap: yes

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 AM session when these URLs are accessed. When using this property, specify a value for the Logout Redirect URL property.

Default: not set

Property: `com.sun.identity.agents.config.agent.logout.url[n]`

Hot-swap: yes

Agent Logout URL Regular Expression (Not yet in the AM console)[2]

Perl-compatible regular expression that matches logout URLs.

For example, to match URLs with `protectedA` or `protectedB` in the path and `op=logout` in the query string, use the following setting:

```
com.forgerock.agents.agent.logout.url.regex= \
*(/protectedA\?|/protectedB\?/).*(\&op=logout\&)(.*|$)
```

When you use this property, the agent ignores the settings for Logout URL List.

Default: not set

Hot-swap: yes

Logout Cookies List for Reset

Cookies to be reset upon logout in the same format as the cookie reset list.

List of cookies to be reset upon logout in the format: `name[=value][;Domain=value]`.

For example `Cookie2=value;Domain=subdomain.domain.com`, which equates to: `com.sun.identity.agents.config.logout.cookie.reset[0]=Cookie2=value;Domain=subdomain.domain.com`

Default: not set

Property: `com.sun.identity.agents.config.logout.cookie.reset[n]`

Hot-swap: yes

Logout Redirect URL

User gets redirected to this URL after logout. Specify this property alongside a Logout URL List.

Default: not set

Property: `com.sun.identity.agents.config.logout.redirect.url`

Hot-swap: yes

Invalidate Logout Session

Specifies whether the agent must invalidate the user session in AM when redirecting to the logout URL specified either by the Logout URL list (`com.sun.identity.agents.config.agent.logout.url`) or the AM logout URL (`com.sun.identity.agents.config.logout.url`) properties.

Possible values are:

- `true`. The agent invalidates the session in AM when redirecting to the logout URL.

  Use this value when the `com.sun.identity.agents.config.agent.logout.url` property is set to a page in your application, and your application *does not handle* the session invalidation process.

- `false`. The agent does not invalidate the session in AM when redirecting to the logout URL.

  Use this value in the following scenarios:

  - When the `com.sun.identity.agents.config.logout.url` property is set to a SAML v2.0 single logout page in AM.
  - When your application uses AM's end user pages. In this case, the `com.sun.identity.agents.config.logout.url` property is set to AM's logout page and the `com.sun.identity.agents.config.agent.logout.url` property is not set.
  - When the `com.sun.identity.agents.config.agent.logout.url` property is set to a page in your application, and your application handles the session invalidation process.

Default: true

Property: `com.sun.identity.agents.config.logout.session.invalidate`

Hot-swap: yes

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.

Default: `3`

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.

Tip

Sessions in AM have an idle timeout after which they expire. In general, when users access protected resources through an agent, the agent requests policy decision in behalf of that user, which resets the idle timeout.

If the agent is configured in SSO mode or if it does not need to ask AM for policy decision because it is already cached, the session may expire in AM due to idle timeout before the user logs out from the application.

To mitigate this issue, set the value of the SSO Caching Polling Period (`com.sun.identity.agents.config.sso.cache.polling.interval`) property to a value smaller than the one assigned for the session idle timeout in AM.

This way, the agent will poll AM about the session on behalf of the user before the session expires.

Default: `3`

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 AM 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 or LDAP attributes.

Default: `SESSION`

Property: `com.sun.identity.agents.config.userid.param.type`

Fetch Policies From The 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.

Default: `false`

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.

Default: `false`

Property: `com.sun.identity.agents.config.get.client.host.name`

Policy Clock Skew

Time in seconds used adjust time difference between agent system and AM. Clock skew in seconds = AgentTime - AMServerTime.

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 AM server time, the agent can make policy calls to the AM server before the policy subject cache has expired, or you can see infinite redirection occur.

Default: `0`

Property: `com.sun.identity.agents.config.policy.clock.skew`

Hot-swap: no

Realm

Realm where AM starts policy evaluation for this web agent.

Edit this property when AM should start policy evaluation in a realm other than the top-level realm, `/`, when handling policy decision requests from this web agent.

This property is recognized by AM, not the web agent, and does not support realm aliases.

Default: `/` (top-level realm)

Property: `org.forgerock.openam.agents.config.policy.evaluation.realm`

Hot-swap: yes

Application

Application where AM looks for policies to evaluate for this web agent.

Edit this property when AM should look for policies that belong to an application other than `iPlanetAMWebAgentService` when handling policy decision requests from this web agent.

This property is recognized by AM, not the web agent.

Default: `iPlanetAMWebAgentService`

Property: `org.forgerock.openam.agents.config.policy.evaluation.application`

Hot-swap: yes

9.1.6. Configuring Miscellaneous Properties

This section covers miscellaneous web agent properties. After creating the agent profile, you access these properties in the AM console under Realms > *Realm Name* > Applications > Agents > Web > *Agent Name* > Miscellaneous.

This section describes the following property groups:

Advice Handling Properties

Composite Advice Handling (Not yet in the AM console)[2]

When set to `true`, the agent sends composite advice in the query (GET request) instead of sending it through a POST request.

Default: `false`

Property: `com.sun.am.use_redirect_for_advice`

Locale Properties

Agent Locale

The default locale for the agent.

Default: `en_US`

Property: `com.sun.identity.agents.config.locale`

Hot-swap: no

Anonymous user Properties

Anonymous User

Enable or disable REMOTE_USER processing for anonymous users.

Default: `false`

Property: `com.sun.identity.agents.config.anonymous.user.enable`

Cookie Processing Properties

Encode special characters in Cookies

When enabled, use URL encoding for special characters in cookies. This is useful when profile, session, and response attributes contain special characters, and the attributes fetch mode is set to `HTTP_COOKIE`.

Default: `false`

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, enforces case insensitivity in both policy and not-enforced URL evaluation.

Default: `true`

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.

Default: `false`

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.

Default: `true`

Property: `com.sun.identity.agents.config.ignore.preferred.naming.url`

Invalid URL properties

Invalid URL Regular Expression (Not yet in the AM console)[2]

Specifies a Perl-compatible regular expression to parse valid request URLs. The web agent rejects requests to invalid URLs with HTTP 403 Forbidden status without further processing.

For example, to filter out URLs containing a list of characters and words such as `./ /. / . %00-%1f , %7f-%ff, %25, %2B, %2C, %7E, .info`, configure the following regular expression:

```
com.forgerock.agents.agent.invalid.url.regex=
^(\?!.\/|\/.|.|.info|%2B|%00-%1f|%7f-%ff|%25|%2C|%7E).*$
```

Default: not set

Ignore Server Check Properties

Ignore Server Check

When enabled, do not check whether AM is up before doing a 302 redirect.

Default: `false`

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 Java 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/servcontext/*` and the request URL is `http://host/webapp/servcontext/example.jsp`, the path info is `/servcontext/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.

> **Note**
>
> The NGINX Plus web agent does not support this setting.

Default: `false`

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.

Default: `false`

Property: `com.sun.identity.agents.config.convert.mbyte.enable`

Goto Parameter Name Properties

Goto Parameter Name

Allows to rename the `goto` parameter. The web agent appends the requested URL to the renamed parameter during redirection after logout or after reaching an access denied page. Rename the parameter when your application requires a parameter other than `goto`.

Consider the following example:

```
com.sun.identity.agents.config.redirect.param=goto2
```

A valid redirection URL using the `goto2` parameter may look similar to the following:

```
https://www.example.com:8443/accessDenied.html?goto2=http%3A%2F%www.example.com%3A8020%managers
%2Findex.jsp
```

In this example, the URL appended to the `goto2` parameter is the URL that the user tried to access when the web agent redirected the request to the `accessDenied.html` page. Note that you configure the access denied page using the Resources Access Denied URL (`com.sun.identity.agents.config.access.denied.url`) property.

The Goto Parameter Name property also affects the OpenAM Logout URL (`com.sun.identity.agents.config.logout.url`) property.

Default: `goto`

Property: `com.sun.identity.agents.config.redirect.param`

Hot-swap: yes

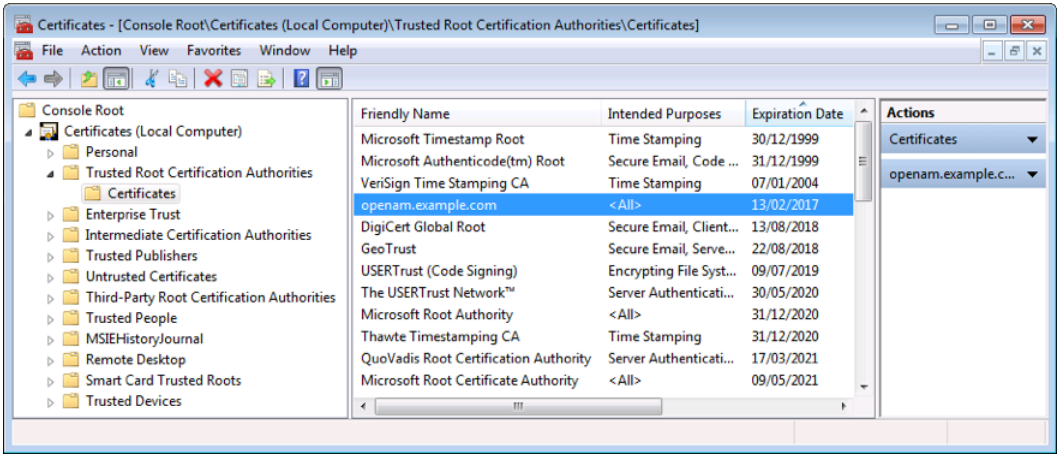
Encryption Properties

CA Certificate File Name (Not yet in the AM console)[2]

Set this property to the file name that contains one or more CA certificates. The file should be *Privacy Enhanced Mail* (PEM) encoded. AM requires PEM files to be base64-encoded ASCII data.

When using the Windows built-in Secure Channel API, set this property to the friendly name of the CA certificate file as it appears in the certificates snap-in. For example, the friendly name of the imported CA certificate in the image below is `openam.example.com`.

CA Friendly Name in the Windows Certificates Snap-in



You must set this property if `com.sun.identity.agents.config.trust.server.certs` is set to `false`.

Important

If you are using the Windows built-in Secure Channel API but your environment does not require client authentication, configure the following properties:

```
com.forgerock.agents.config.cert.ca.file =
com.forgerock.agents.config.cert.file = CA-cert-friendly-name
com.sun.identity.agents.config.trust.server.certs = false
```

Default: not set

Property: `com.forgerock.agents.config.cert.ca.file`

Public Client Certificate File Name (Not yet in the AM console)[2]

When AM is configured to perform client authentication, set this property to the name of the file that contains the public PEM-encoded client certificate that corresponds with the private key specified in `com.forgerock.agents.config.cert.key`.

When using the Windows built-in Secure Channel API, you can set this property to either the friendly name of the certificate file as it appears in the certificates snap-in, or the name of the file containing the client certificate in PKCS#12/PFX format.

To use a client certificate file in PKCS#12/PFX format:

1. Obtain your client certificate, ensuring the signing chain is intact, and that the key and CA certificate are included.
2. Run the **agentadmin** tool to generate an encrypted password for the certificate file:

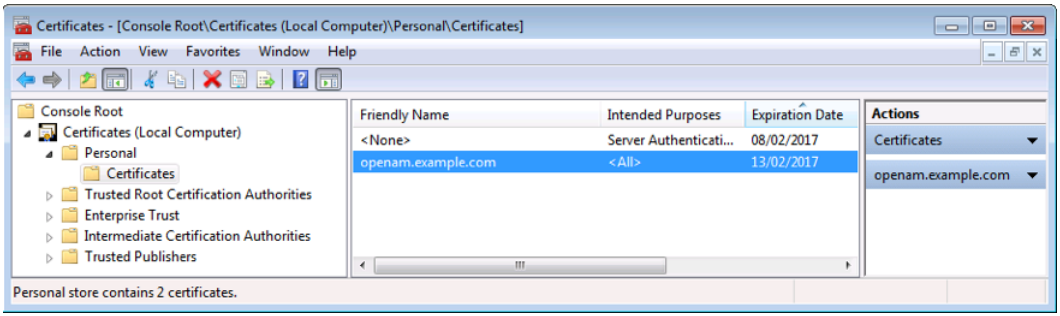
   ```
   C:\> cd web_agents\iis_agent\bin
   C:\path\to\web_agents\iis_agent\bin> agentadmin.exe --p "Encryption Key" "Certificate File
    Password"

   Encrypted password value: zck+6RKqjtc=
   ```

   The value used for *Encryption Key* comes from the `com.sun.identity.agents.config.key` property. The value of *Certificate File Password* should be the password required to access the client certificate file.
3. Use the encrypted password value in the agent configuration file as follows:

   ```
   com.forgerock.agents.config.cert.file=C:\Certificates\myClientCertificate.pfx
   com.forgerock.agents.config.cert.key=
   com.forgerock.agents.config.cert.key.password=zck+6RKqjtc=
   com.sun.identity.agents.config.trust.server.certs=false
   ```
4. Restart the agent.

If you do not want to use a file directly, enter the friendly name of the certificate as the value of the `com.forgerock.agents.config.cert.file` property instead. As an example, the friendly name of the imported certificate in the image below is `openam.example.com`.

Friendly Name in the Windows Certificates Snap-in



Default: not set

Property: `com.forgerock.agents.config.cert.file`

Private Client Certificate File Name (Not yet in the AM console)[2]

Set this property to the name of the file that contains the private key. On UNIX systems, that key should be encoded in PEM format.

On Windows systems, that entry depends. If SSL mutual authentication is required with AM, that entry should contain the name of the private key or certificate imported in the Windows Certificate Manager, part of the Microsoft Management Console. For a web server, that should point to the Local Machine or Service certificate store, depending on the account associated with the Web server.

Default: not set

Property: `com.forgerock.agents.config.cert.key`

Private Key Password (Not yet in the AM console)[2]

Set this property to the obfuscated private key password. Obfuscate the password by using **agentadmin --p**, as demonstrated in the following example to generate the value:

Unix example:

```
$ cd /web_agents/agent-type/bin
$ ./agentadmin --p "key" "`cat newpassword.file`"
```

Here, *agent-type* corresponds to the file system directory for the particular agent type, such as `apache24_agent`, *newpassword.file* is a file containing the private key password, and *key* is the obfuscation key as specified by `com.sun.identity.agents.config.key`.

Windows example:

```
C:\>cd c:\web_agents\agent-type\bin
C:\path\to\web_agents\bin\>agentadmin.exe --p "key" "newpassword"
```

Here, *agent-type* corresponds to the file system directory for the particular agent type, such as `apache24_agent`, *newpassword* is the new private key password, and *key* is the obfuscation key as specified by `com.sun.identity.agents.config.key`.

Tip

You can generate a new obfuscation key by using **agentadmin --k**.

This property is not used on Microsoft Windows systems.

Default: not set

Property: `com.forgerock.agents.config.cert.key.password`

Supported Cipher List (Not yet in the AM console)[2]

Set this property to a list of ciphers to support. The list consists of one or more cipher strings separated by colons, as defined in the man page for `ciphers` available at http://www.openssl.org/docs/apps/ciphers.html.

Default: `HIGH:MEDIUM`

Property: `com.forgerock.agents.config.ciphers`

AM SSL Certificate Verification (Not yet in the AM console)[2]

When SSL is configured, set to `false` to trust the AM SSL certificate only if the certificate is found to be correct and valid. Default is `true` to make it easy to try SSL during evaluation.

Important

The default setting, `true`, means that the web agent trusts all server certificates. Change this to `false`, and test that your web agent can trust server certificates before deploying the web agent in production.

Default: `true`

Property: `com.sun.identity.agents.config.trust.server.certs`

Use OpenSSL for Secure Communications (Not yet in the AM console)[2]

On Windows operating systems, web agents use the built-in Secure Channel API for SSL/TLS communications. Set this property to `true` to disable the built-in Secure Channel API and use OpenSSL instead.

The `org.forgerock.agents.config.secure.channel.disable` property must be set in the `/web_agents/agent_type/instances/Agent_nnn/config/agent.conf` file under the Bootstrap Properties section.

Default: `false`

Property: `org.forgerock.agents.config.secure.channel.disable`

OpenSSL Certificate Verification Depth (Not yet in the AM console)[2]

Specifies the certificate verification depth for OpenSSL. The supported format is a number between `0` and `9`, as specified in the OpenSSL man pages.

To turn off server certification validation, set the `com.sun.identity.agents.config.trust.server.certs` property to `true`.

Default: `9`

Property: `org.forgerock.agents.config.cert.verify.depth`

JSON-Formatted Response Properties

URLs to Receive JSON-Formatted Responses (Not yet in the AM console)[2]

Use wildcard patterns to specify a list of resource URLs that will trigger a JSON-formatted response from the agent, and optionally, override the default HTTP status code.

For more information on wildcard usage, see Specifying Resource Patterns with Wildcards.

Returning the responses in JSON format is useful for non-browser-based, or AJAX applications, that may not want to redirect users to the AM user interface for authentication.

> **Tip**
>
> You should set the HTTP Return Code for JSON-Formatted Responses property to a supported HTTP code, for example `202`, to prevent applications that do not support redirects, for example, from displaying a default error page.

For example, you could specify the following settings:

```
org.forgerock.agents.config.json.url[0]=http*://*.example.com:*/api/*
org.forgerock.agents.config.json.response.code=202
```

Performing a GET operation on a protected resource covered by the wildcard pattern would trigger a JSON response, as follows:

```
$  curl --include https://www.example.com/api/
HTTP/1.1 202 Accepted
Date: Tue, 29 Jan 2019 15:10:09 GMT
Server: Apache/2.4.6 (CentOS) OpenAM Web Agent/5.5.1.0
Set-Cookie: am-auth-jwt=; Path=/; Max-Age=0; Expires=Thu, 01-Jan-1970 00:00:00 GMT
Set-Cookie: agent-authn-tx=eJwN....XI34=; Path=/; HttpOnly; Max-Age=300; Expires=Tue, 29-Jan-2019
 15:15:09 GMT
Content-Length: 418
Content-Type: text/html; charset=iso-8859-1

{
    "error": {
        "errors": [
            {
                "message": "redirect",
                "location": "https://openam.example.com:8443/openam/oauth2/authorize
                             ?response_mode=form_post
                             &state=d38a8b36-894e-4544-a5a1-d9230fb85246
                             &redirect_uri=https%3A%2F%2Fwww.example.com%3A443%2Fagent%2Fcdsso-oauth2
                             &response_type=id_token
                             &scope=openid
                             &client_id=myApacheAgent
                             &agent_provider=true
                             &agent_realm=%2F
                             &nonce=531F....BB67"
            }
        ],
        "code": 302
    }
}
```

Notice that the HTTP result code is the specified `202 Accepted`, and the JSON response contains the actual result, a `302 Found` (redirect) to the AM server for authentication.

Default: not set

Property: `org.forgerock.agents.config.json.url[n]`

Headers and Values to Receive JSON-Formatted Responses (Not yet in the AM console)[2]

Specify HTTP headers and associated values that trigger JSON-formatted errors to be returned.

> **Tip**
>
> You should set the HTTP Return Code for JSON-Formatted Responses property to a non-error HTTP code, for example `202`, to prevent user agents displaying their default error pages.

For example, you could specify the following settings:

```
org.forgerock.agents.config.json.header[enableJsonResponse]=true
org.forgerock.agents.config.json.response.code=202
```

Performing a GET operation, and including the specified header, would trigger a JSON response, as follows:

```
$  curl --include --header "enableJsonResponse: true" https://www.example.com/endpoints/
HTTP/1.1 202 Accepted
Date: Tue, 29 Jan 2019 15:10:09 GMT
Server: Apache/2.4.6 (CentOS) OpenAM Web Agent/5.5.1.0
Set-Cookie: am-auth-jwt=; Path=/; Max-Age=0; Expires=Thu, 01-Jan-1970 00:00:00 GMT
Set-Cookie: agent-authn-tx=eJwN....EySX; Path=/; HttpOnly; Max-Age=300; Expires=Tue, 29-Jan-2019
 15:30:19 GMT
Content-Length: 418
Content-Type: text/html; charset=iso-8859-1

{
    "error": {
        "errors": [
            {
                "message": "redirect",
                "location": "https://openam.example.com:8443/openam/oauth2/authorize
                             ?response_mode=form_post
                             &state=d1e8b9e4-53c4-134a-bc6e-7b9c7f22e943
                             &redirect_uri=https%3A%2F%2Fwww.example.com%3A443%2Fagent%2Fcdsso-oauth2
                             &response_type=id_token
                             &scope=openid
                             &client_id=myApacheAgent
                             &agent_provider=true
                             &agent_realm=%2F
                             &nonce=531F....BB67"
            }
        ],
        "code": 302
    }
}
```

Notice that the HTTP result code is the specified `202 Accepted`, and the JSON response contains the actual result, a `302 Found` (redirect) to the AM server for authentication.

Default: not set

Property: `org.forgerock.agents.config.json.header[Header]=Value`

Invert Properties That Receive JSON-Formatted Responses (Not yet in the AM console)[2]

Set to `true` to invert the meaning of both the `org.forgerock.agents.config.json.url` and `org.forgerock.agents.config.json.header` properties. When inverted the specified values in those two properties will *not* trigger JSON-formatted responses. Any non-specified value will trigger JSON-formatted responses, instead.

Default: `false` (not set)

Property: `org.forgerock.agents.config.json.url.invert`

HTTP Return Code for JSON-Formatted Responses (Not yet in the AM console)[2]

Specifies an HTTP response code to return when a JSON-formatted error is triggered.

Tip

You should set this property to a non-error HTTP code, for example `202`, to prevent user agents displaying their default error pages.

Example: `org.forgerock.agents.config.json.response.code=202`

Default: not set

Property: `org.forgerock.agents.config.json.response.code`

Miscellaneous Header-Related Properties

Add Cache-Control Headers (Not yet in the AM console)[2]

Set this property to `true` to enable use of Cache-Control headers that prevent proxies from caching resources accessed by unauthenticated users.

Default: `false`

Property: `com.forgerock.agents.cache_control_header.enable`

Deprecated Agent Properties

Anonymous User Default Value

User ID of unauthenticated users.

Default: `anonymous`

Property: `com.sun.identity.agents.config.anonymous.user.id`

9.1.7. Configuring Advanced Properties

This section covers advanced web agent properties. After creating the agent profile, you access these properties in the AM console under Realms > *Realm Name* > Applications > Agents > Web > *Agent Name* > Advanced.

This section describes the following property groups:

- Client Identification Properties
- Load Balancer Properties
- Forward Proxy Properties
- Post Data Preservation Properties
- Sun Java System Proxy Server Properties
- Microsoft IIS Server Properties
- IBM Lotus Domino Server Properties
- Custom Properties

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 or 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.

Default: not set

Property: `com.sun.identity.agents.config.client.ip.header`

Client Hostname Header

HTTP header name that holds the hostname of the client.

Default: not set

Property: `com.sun.identity.agents.config.client.hostname.header`

Load Balancer Properties

Load Balancer Setup

This property does not apply to Web Agents 5.5, although it may appear in the AM console.

Property: `com.sun.identity.agents.config.load.balancer.enable`

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`).

Default: `false`

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`).

Default: `false`

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`).

Default: `false`

Property: `com.sun.identity.agents.config.override.port`

Override Notification URL

This property does not apply to Web Agents 5.5, although it may appear in the AM console.

Default: `false`

Property: `com.sun.identity.agents.config.override.notification.url`

Forward Proxy Properties

Forward Proxy Host Name (Not yet in the AM console)[2]

When AM and the agent communicate through a web proxy server configured in forward proxy mode, set this property to the proxy server host name.

Default: not set

Property: `com.sun.identity.agents.config.forward.proxy.host`

Forward Proxy Port Number (Not yet in the AM console)[2]

When AM and the agent communicate through a web proxy server configured in forward proxy mode, set this property to the proxy server port number.

Default: not set

Property: `com.sun.identity.agents.config.forward.proxy.port`

Forward Proxy User Name (Not yet in the AM console)[2]

When AM and the agent communicate through a web proxy server configured in forward proxy mode and the proxy server has the agent authenticate using Basic Authentication, set this property to the agent's user name.

Default: not set

Property: `com.sun.identity.agents.config.forward.proxy.user`

Forward Proxy Password (Not yet in the AM console)[2]

When AM and the agent communicate through a web proxy server configured in forward proxy mode and the proxy server has the agent authenticate using Basic Authentication, set this property to the agent's password.

Default: not set

Property: `com.sun.identity.agents.config.forward.proxy.password`

Post Data Preservation Properties

POST Data Preservation

Enables HTTP POST data preservation.

Default: `false`

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 Sticky Load Balancing Mode (Not yet in the AM console)[2]

Specifies whether to create a cookie, or to append a query string to the URL to assist with sticky load balancing. Possible values are:

- `COOKIE`. The web agent creates a cookie with the value specified in the `com.sun.identity.agents.config.postdata.preserve.stickysession.value` property.
- `URL`. The web agent appends the value specified in the `com.sun.identity.agents.config.postdata.preserve.stickysession.value` to the URL query string.

Default: not set

`com.sun.identity.agents.config.postdata.preserve.stickysession.mode`

POST Data Sticky Load Balancing Value (Not yet in the AM console)[2]

Specifies a key-value pair separated by the **=** character that the web agent creates when evaluating the `com.sun.identity.agents.config.postdata.preserve.stickysession.mode` property.

For example, a setting of `lb=myserver` either sets an `lb` cookie with `myserver` value, or adds `lb=myserver` to the URL query string.

When configuring POST data preservation with cookies, set the cookie name in the cookie pair to the same value configured in the `com.sun.identity.agents.config.postdata.preserve.lbcookie` property.

Default: not set

Property: `com.sun.identity.agents.config.postdata.preserve.stickysession.value`

POST Data Sticky Load Balancing Cookie Name (Not yet in the AM console)[2]

Specifies the name of a cookie to use for enabling sticky load balancing when the `com.sun.identity.agents.config.postdata.preserve.stickysession.mode` property is set to `COOKIE`.

Set the cookie name to the same value configured in the `com.sun.identity.agents.config.postdata.preserve.stickysession.value` property.

Default: not set

Property: `com.sun.identity.agents.config.postdata.preserve.lbcookie`

POST Data Storage Directory (Not yet in the AM console)[2]

The directory local to the agent installation where the agent writes preserved POST data while requesting authorization to AM.

This is a bootstrap property. Configure it in the agent.conf file, even when the agent is configured in centralized mode.

Default: `/web_agents/agent_type/log`

Property: `org.forgerock.agents.config.postdata.preserve.dir`

Submit POST Data using JavaScript (Not yet in the AM console)[2]

When set to `true`, preserved POST data will be resubmitted to the destination server after authentication by using JavaScript.

Default: `false`

Property: `org.forgerock.agents.pdp.javascript.repost`

URLs Ignored by the Agent POST Data Inspector (Not yet in the AM console)[2]

Specifies a list of URLs that will not be processed by the web agent POST data inspector. This allows other modules on the same server to access the POST data directly.

[2]For centralized configurations, set this property as a custom property in AM, by navigating to Realms > *Realm Name* > Applications > Agents > Web > *Agent Name* > Advanced > Custom Properties.

For local configurations, add it to the `agent.conf` file.

The following example uses wildcards to add a file named `postreader.jsp` in the root of any protected website to the list of URLs that will not have their POST data inspected: `org.forgerock.agents.config.skip.post.url[0]=http*://*:*/postreader.jsp`

Note

Any URLs added to this property should also be added to the Not-Enforced URLs (`com.sun.identity.agents.config.notenforced.url`) property. See Not-enforced URL Processing Properties.

Default: not set

Property: `org.forgerock.agents.config.skip.post.url[n]`

Sun Java System Proxy Server Properties

Override Proxy Server's Host and Port

When enabled ignore the host and port settings.

Default: `false`

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`.

Default: not set

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.

Default: not set

Property: `com.sun.identity.agents.config.replaypasswd.key`

Filter Priority

The loading priority of filter, DEFAULT, HIGH, LOW, or MEDIUM.

Default: `HIGH`

Property: `com.sun.identity.agents.config.iis.filter.priority`

Filter configured with OWA

This property does not apply to Web Agents 5.5, although it may appear in the AM console

Property: `com.sun.identity.agents.config.iis.owa.enable`

Change URL Protocol to HTTPS

This property does not apply to Web Agents 5.5, although it may appear in the AM console

Property: `com.sun.identity.agents.config.iis.owa.enable.change.protocol`

Idle Session Timeout Page URL

This property does not apply to Web Agents 5.5, although it may appear in the AM console

Property: `com.sun.identity.agents.config.iis.owa.enable.session.timeout.url`

Show Password in HTTP Header

Set to `true` if encrypted password should be set in HTTP header `AUTH_PASSWORD`.

Default: `false`

Property:`com.sun.identity.agents.config.iis.password.header`

Logon and Impersonation

Set to `true` if agent should do Windows Logon and User Impersonation.

Default: `false`

Property: `com.sun.identity.agents.config.iis.logonuser`

IBM Lotus Domino Server Properties

Check User in Domino Database

This property does not apply to Web Agents 5.5.1.0, although it may appear in the AM console.

Default: `false`

Property: `com.sun.identity.agents.config.domino.check.name.database`

Use LTPA token

This property does not apply to Web Agents 5.5.1.0, although it may appear in the AM console.

Default: `false`

Property: `com.sun.identity.agents.config.domino.ltpa.enable`

LTPA Token Cookie Name

This property does not apply to Web Agents 5.5.1.0, although it may appear in the AM console.

Default: `LtpaToken`

Property: `com.sun.identity.agents.config.domino.ltpa.cookie.name`

LTPA Token Configuration Name

This property does not apply to Web Agents 5.5.1.0, although it may appear in the AM console.

Default: `LtpaToken`

Property: `com.sun.identity.agents.config.domino.ltpa.config.name`

LTPA Token Organization Name

This property does not apply to Web Agents 5.5.1.0, although it may appear in the AM console.

Default: not set

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. Custom properties can be specified as follows:

- `customproperty=custom-value1`
- `customlist[0]=customlist-value-0`
- `customlist[1]=customlist-value-1`
- `custommap[key1]=custommap-value-1`
- `custommap[key2]=custommap-value-2`

Add any property that is not yet in the AM console as a custom property.

Property: `com.sun.identity.agents.config.freeformproperties`

9.1.8. Configuring Web Agent Environment Variables

This section covers web agent properties that are configured by using environment variables.

Configure the environment variables to affect the user that is running the web server, virtual host, or location that the agent protects.

Tip

For information on allowing environment variables to be used in NGINX, see the env directive in the *NGINX Core functionality documentation*.

You must restart the container in which web agents are running to apply changes to these settings.

Web Agent Environment Properties

`AM_SYSTEM_LOG_LEVEL`

Specifies the log level of garbage collector statistics for all web agents instances in the container. The logs are written into the `/web_agents/agent_type/log/system_n.log` file, where `n` indicates the agent group number.

Consider an environment with two Apache server installations:

- `Apache_1` has two agent instances configured, `agent_1` and `agent_2`, configured to share runtime resources (AmAgentId is set to 0). Both agent instances will write to the `syslog_0.log` file.
- `Apache_2` has one agent instance configured, `agent_3`, with AmAgentId set to 1. The instance will write to the `syslog_1.log` file.

The `system_n.log` file can contain the following information:

- Agent version information, written when the agent instance starts up.
- Logs for the agent background processes.
- WebSocket connection errors.
- Cache stats and removal of old POST data preservation files.
- Agent notifications.

The default value of the `AM_SYSTEM_LOG_LEVEL` variable is `Error`. Increase it to `Message` or `All` for fine-grained detail.

Valid values for the variable are:

- All
- Error
- Info
- Message

- Warning

`AM_MAX_SESSION_CACHE_SIZE`

Specifies the maximum size of shared memory for the session and policy cache, in bytes. When unset, the session cache size is 16777216 bytes (16 MB). The maximum size the cache can grow is 1073741824 bytes (1 GB), and the minimum size is 1024 bytes (1 MB).

Setting the variable to `0` configures a cache size of 16777216 bytes (16 MB).

You may need to increase the size of the session and policy cache if you plan to hold many active sessions at any given time.

`AM_RESOURCE_PERMISSIONS`

(Unix only) Specifies the permissions that the agent sets for its runtime resources. Possible values are:

- `0600`
- `0660`
- `0666`

The `AM_RESOURCE_PERMISSIONS` environment variable requires the `umask` value to allow these permissions for the files.

Consider an example where the Apache agent is running with the `apache` user. The `umask` value is set to `0022` and the `AM_RESOURCE_PERMISSIONS` environment variable is set to `0666`. The agent runtime resources will have the following permissions:

Resource Permissions Example in Linux

Resource	Permission	Owner
`/path/to/web_agents/agent_type/log/system_n.log`	644	`apache`
`/path/to/web_agents/agent_type/log/monitor_n.log`	644	`apache`
`/path/to/web_agents/agent_type/instances/agent_n/conf/agent.conf`	640	`apache`
`/path/to/web_agents/agent_type/instances/agent_n/logs/debug/debug.log`	644	`apache`
`/dev/shm/am_cache_0`	644	`apache`
`/dev/shm/am_log_data_0`	644	`apache`

Any semaphores owned by the `apache` user have `644` permissions as well.

Consider another example where `umask` is set to `0002` and the `AM_RESOURCE_PERMISSIONS` environment variable is set to `0666`. The files would be created with `664` permissions, which would allow the files to be read and written by the members of the group, as well.

`AM_MAX_AGENTS`

Specifies the maximum number of agent instances in the installation. The higher the number, the more shared memory the agent reserves. The default value is `32`.

If the number of web agent instances in the installation surpasses this limit, the agent instance starting over the limit logs an error message and does not protect the resources.

`AM_NET_TIMEOUT`

Specifies the timeout in seconds for the agent installer to contact AM during agent configuration validation. If not set, the default 4 seconds will be used.

For example, if the installer contacts AM to validate an agent configuration that lasts longer than 4 seconds, the installation will fail due to the default timeout of 4 seconds. You can extend this timeout by setting this environment variable.

`AM_SSL_OPTIONS`

Overrides the default SSL/TLS protocols for the agent, set in the `org.forgerock.agents.config.tls` bootstrap property (for more information, see Bootstrap Properties).

Specifies a space-separated list of security protocols preceded by a dash **-** that will *not* be used when connecting to AM.

The supported protocols are the following:

- `SSLv3`
- `TLSv1`
- `TLSv1.1`
- `TLSv1.2` (Default)

For example, to configure `TLSv1.1`, set the environment variable to `AM_SSL_OPTIONS = -SSLv3 -TLSv1 -TLSv1.2`.

9.2. 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 AM console under Realms > *Realm Name* > Applications > Agents > Agent Authenticator > *Agent Name*.

Password

Specifies the password the agent uses to connect to AM.

Status

Specifies whether the agent profile is active, and so can be used.

Agent Profiles allowed 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. AM checks that `goto` URLs match one of the agent root URLs for CDSSO.

9.3. Command-Line Tool Reference

Name

agentadmin — manage web agent installation

Synopsis

`agentadmin` {options}

Description

This command manages web agent installations.

Options

The following options are supported:

`--i`

Perform an interactive install of a new agent instance.

Usage: **agentadmin --i**

For more information, see:

- "Installing the Apache Web Agent"
- "Installing the IIS Web Agent"
- "Installing the NGINX Plus Web Agent"

`--s`

Perform a silent, non-interactive install of a new agent instance.

Usage: **agentadmin --s *web-server-config-file openam-url agent-url realm agent-profile-name agent-profile-password* [--changeOwner] [--acceptLicense] [--forceInstall]**

web-server-config-file

When installing in Apache HTTP Server, enter the full path to the Apache HTTP server configuration file. The installer modifies this file to include the web agent configuration and module.

When installing in Microsoft IIS, enter the ID number of the IIS site in which to install the web agent. To list the available sites in an IIS server and the relevant ID numbers, run **agentadmin.exe --n**.

openam-url

Enter the full URL of the AM instance that the web agents will use. Ensure the deployment URI is specified.

Example:

`https://openam.example.com:8443/openam`

agent-url

Enter the full URL of the server on which the agent is running.

Example:

`http://www.example.com:80`

realm

Enter the AM realm containing the agent profile.

agent-profile-name

Enter the name of the agent profile in AM.

agent-profile-password

Enter the full path to the agent profile password file.

`--changeOwner`

Use this option to change the ownership of the created directories to be the same user and group as specified in the Apache HTTP Server configuration, or the user that is running the selected IIS site.

`--acceptLicense`

When you run certain commands, you will be prompted to read and accept the software license agreement. You can suppress the license agreement prompt by including the optional `--acceptLicence` parameter. Specifying this options indicates that you have read and accepted the terms stated in the license.

To view the license agreement, open `/path/to/web_agents/agent_type/legal/Forgerock_License.txt`.

`--forceInstall`

Add this option to proceed with a silent installation even if it cannot connect to the specified AM server during installation, rather than exiting.

For more information, see:

- "Installing the Apache Web Agent Silently"
- "Installing IIS Web Agents Silently"
- "Installing NGINX Plus Web Agents Silently"

--n

(IIS web agent only) List the sites available in an IIS server.

Example:

```
c:\web_agents\iis_agent\bin> agentadmin.exe --n

 IIS Server Site configuration:
 ====================================
 id       details
 ====================================

 Default Web Site
 application path:/, pool DefaultAppPool
 1.1.1    virtualDirectory path:/, configuration: C:\inetpub\wwwroot\web.config

 MySite
 application path:/, pool: MySite
 2.1.1    virtualDirectory path:/, configuration C:\inetpub\MySite\web.config
 application path:/MyApp1, pool: MySite
```

--l

List existing configured agent instances.

Usage: **agentadmin --l**

Example:

```
$ ./agentadmin --l
OpenAM Web Agent configuration instances:

 id:            agent_1
 configuration: /opt/web_agents/apache24_agent/bin/../instances/agent_1
 server/site:   /etc/httpd/conf/httpd.conf

 id:            agent_2
 configuration: /opt/web_agents/apache24_agent/bin/../instances/agent_2
 server/site:   /etc/httpd/conf/httpd.conf

 id:            agent_3
 configuration: /opt/web_agents/apache24_agent/bin/../instances/agent_3
 server/site:   /etc/httpd/conf/httpd.conf
```

--g

(IIS web agent only) Remove all web agent instances and libraries from an IIS installation.

Usage: **agentadmin.exe --g**

For more information, see "To Remove Web Agents from IIS".

--e

(IIS web agent only) Enable an existing agent instance.

Usage: **agentadmin.exe --e *agent-instance***

For more information, see "To Disable and Enable Web Agents".

--d

(IIS web agent only) Disable an existing agent instance.

Usage: **agentadmin.exe --d *agent-instance***

For more information, see "To Disable and Enable Web Agents".

--o

(IIS web agent only) Modify Access Control Lists (ACLs) for files and folders related to a web agent instance.

Usage: **agentadmin.exe --o "*identity_or_siteID*" "*directory*" [--siteId]**

Usage: **agentadmin.exe --o "*directory*" --addAll --removeAll**

"*identity_or_siteID*"

Specifies the identity to be added to the directory's ACLs. When used with the `--siteId` option, it specifies an IIS site ID.

"*directory*"

Specifies the directory that would be modified.

`[--siteId]`

Specifies that the **agentadmin** should use `identity_or_siteID` as an IIS site ID.

`--addAll`

Add all IIS application pool identities to the directory's ACLs. This option is not compatible with the `--removeAll` option.

`--removeAll`

Remove all IIS application pool identities from the directory's ACLs. This option is not compatible with the `--addAll` option.

Examples:

```
C:\web_agents\iis_agent\bin>agentadmin.exe --o "IIS_user1" "C:\web_agents\iis_agent\lib"
C:\web_agents\iis_agent\bin>agentadmin.exe --o "2" "C:\web_agents\iis_agent\lib" --siteId
C:\web_agents\iis_agent\bin>agentadmin.exe --o  "C:\web_agents\iis_agent\lib" --addAll
```

--r

Remove an existing agent instance.

Usage: **agentadmin --r *agent-instance***

agent-instance

The ID of the web agent configuration instance to remove.

Respond `yes` when prompted to confirm removal.

On IIS web agents, the `--r` option does not remove the web agent libraries since they can be in use by other web agent instances configured on the same site. To remove all web agent instances and libraries, use the `--g` option instead.

For more information, see:

- "Removing the Apache Web Agent"
- "Enabling and Disabling IIS Web Agents"
- "Removing the NGINX Plus Web Agent"

--k

Generate a new signing key.

Usage: **agentadmin --k**

Examples:

- UNIX:

```
$ cd /web_agents/apache24_agent/bin/
$ ./agentadmin --k
Encryption key value: YWM0OThlMTQtMzMxOS05Nw==
```

- Windows:

```
C:\> cd web_agents\apache24_agent\bin
C:\web_agents\apache24_agent\bin> agentadmin --k
Encryption key value: YWM0OThlMTQtMzMxOS05Nw==
```

For more information, see Encryption Properties.

--p

Use a generated encryption key to encrypt a new password.

Usage: **agentadmin --p *encryption-key password***

encryption-key

An encryption key, generated by the **agentadmin --k** command.

password

The password to encrypt.

Examples:

- UNIX:

```
$ ./agentadmin --p "YWM0OThlMTQtMzMxOS05Nw==" "`cat newpassword.file`"
Encrypted password value: 07bJOSeM/G8ydO4=
```

- Windows:

```
C:\path\to\web_agents\apache24_agent\bin>agentadmin.exe --p "YWM0OThlMTQtMzMxOS05Nw==" "newpassword"
Encrypted password value: 07bJOSeM/G8ydO4=
```

For more information, see Encryption Properties.

--V

Validate an agent instance.

Usage:

agentadmin --V *agent_instance* [user name] [password file] [realm]

agent_instance

(Required) The agent instance where to run the validation tests. For example, `agent_1`.

user name

(Optional) A user ID that exists in the AM server. Required only for the `validate_session_profile` test. For example, `demo`.

password file

(Optional) A file containing the password of the user ID used for the `validate_session_profile` test. For example, `/tmp/passwd.txt`

realm

(Optional) The realm of the user ID used for the `validate_session_profile` test. For example, `/customers`

The validation mode performs the following tests:

- Ensures that the agent can reach the AM server(s) configured in the `com.sun.identity.agents.config.naming.url` property.
- Ensures that critical bootstrap properties are set. For more information, see "Configuration Location".
- Ensures that SSL libraries are available and that SSL configuration properties are set, if the agent is configured for SSL communication.

- Ensures the agent can log in to AM to fetch the agent profile.
- Ensures the system has enough RAM and shared memory.
- Ensures the agent can log in to AM with the provided user and password credentials.
- Ensures WebSocket connections are available between the agent and AM.
- Ensures that the core init and shutdown agent sequences are working as expected.
- (IIS agent only) Ensures that IIS is configured for running application pools in Integrated mode.

Important

On Unix, you should run the **agentadmin --V** validator command as the same user that runs the web server.

For example, to use the Apache HTTP Server `daemon` user:

```
$ sudo -u daemon ./bin/agentadmin --V agent_1
```

Running the command as a different user may cause the `/log/system_0.log` and `/log/monitor_0.pipe` files to be created with permissions that prevent the agent from writing to them. In this case, you may see an error such as:

```
2018-09-19 13:54:52 GMT ERROR   [0x7f0c9cf05700:22420]: unable to open event channel
```

Example:

```
$ ./agentadmin --V agent_1 demo passwd.txt /

Saving output to /web_agents/apache24_agent/bin//../log/validate_20180831121402.log

Running configuration validation for agent_1:

Agent instance is configured with 1 naming.url value(s):
1. https://openam.example.com:8443/openam is valid
selected https://openam.example.com:8443/openam as naming.url value
validate_bootstrap_configuration: ok
validate_ssl_libraries: ok
validate_agent_login: ok
get_allocator_blockspace_sz(): trying for configured cache size 16777216 bytes
validate_system_resources: ok
validate_session_profile: ok
validate_websocket_connection: ok
validate_worker_init_shutdown: ok

Result: 7 out of 7 tests passed, 0 skipped.
```

--v

Display information about **agentadmin** build and version numbers, and available system resources.

For example:

```
OpenAM Web Agent for IIS Server 7.5, 8.x
 Version: 5.5
 Revision: 5ba11d2
 Build machine: WIN-6R2CH15R77
 Build date: Nov  8 2016 11:30:18

System Resources:
 total memory size: 7.7GB
 pre-allocated session/policy cache size: 1.0GB
 log buffer size: 128.5MB
 min audit log buffer size: 2MB, max 2.0GB
 total disk size: 162.4GB
 free disk space size: 89.6GB

System contains sufficient resources (with remote audit log feature enabled).
```

Return Codes

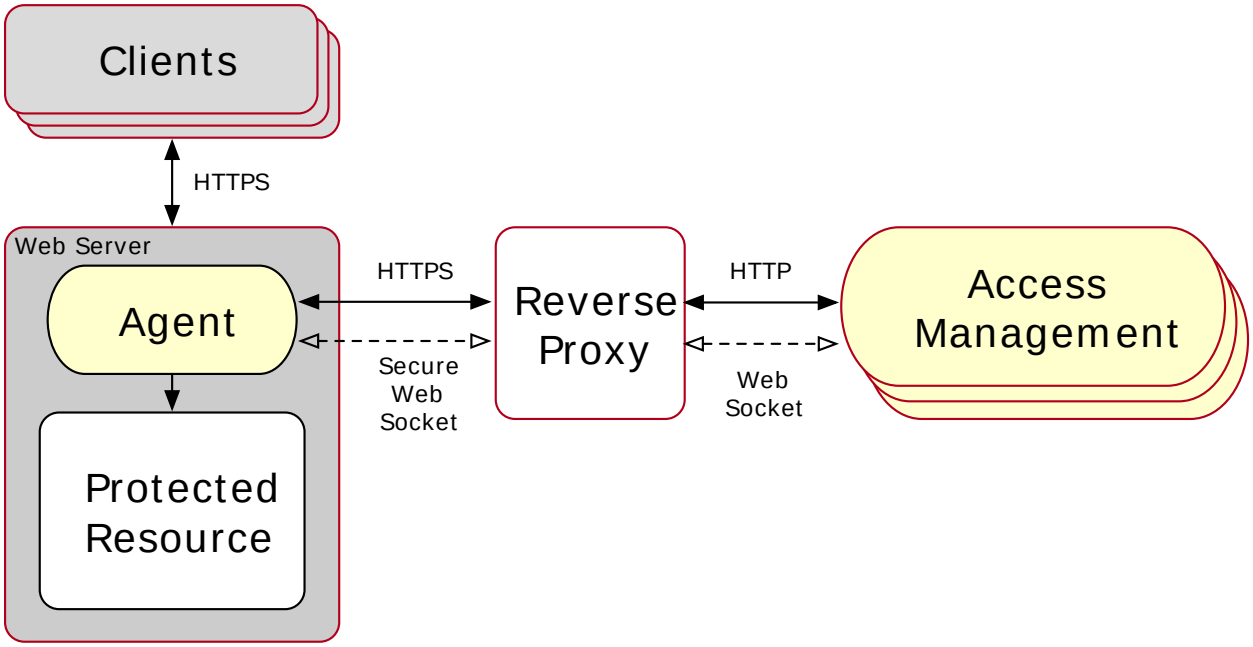
The **agentadmin** command returns `EXIT_SUCCESS` when an operation has completed successfully, and `EXIT_FAILURE` if the operation failed to complete.

The numerical return value will depend on the operating system in use, but is generally `0` for `EXIT_SUCCESS` and greater than zero for `EXIT_FAILURE`.

9.4. Configuring Apache HTTP Server as a Reverse Proxy Example

This section demonstrates a possible configuration of Apache as a reverse proxy between AM and the agent, but you can use any reverse proxy that supports the WebSocket protocol.

Reverse Proxy Configured Between the Agent and AM



Note that the communication protocol changes from HTTPS to HTTP.

To Configure Apache as a Reverse Proxy Example

This procedure demonstrates how to configure Apache HTTP Server as a reverse proxy between an agent and a single AM instance. Refer to the Apache documentation to configure Apache for load balancing and any other requirement for your environment:

1. Locate the `httpd.conf` file in your deployed reverse proxy instance.

2. Add the modules required for a proxy configuration as follows:

```
# Modules required for proxy
LoadModule proxy_module modules/mod_proxy.so
LoadModule proxy_http_module modules/mod_proxy_http.so
LoadModule proxy_wstunnel_module modules/mod_proxy_wstunnel.so
```

   The `mod_proxy_wstunnel.so` module is required to support the WebSocket protocol used for communication between AM and the agents.

3. Add the proxy configuration inside the `VirtualHost` context. Consider the following directives:

```
<VirtualHost 192.168.1.1>
...
# Proxy Config
RequestHeader set X-Forwarded-Proto "https" ❶
ProxyPass "/openam/notifications" "ws://openam.example.com:8080/openam/notifications"
 Upgrade=websocket ❷
ProxyPass "/openam" "http://openam.example.com:8080/openam" ❸
ProxyPassReverseCookieDomain "openam.internal.example.com" "proxy.example.com" ❹
ProxyPassReverse "/openam" "http://openam.example.com:8080/openam" ❺
...
</VirtualHost>
```

Key:

❶ **RequestHeader**. Set this directive to `https` or `http` depending on the proxy configuration. If the proxy is configured for https, as in the example depicted in the diagram above, set the directive to `https`. Otherwise, set it to `http`.

In a future step you configure AM to recognize the forwarded header and use it in the `goto` parameter for redirecting back to the agent after authentication.

❷ **ProxyPass**. Set this directive to allow WebSocket traffic between AM and the agent.

If you have HTTPS configured between the proxy and AM, set the directive to use the `wss` protocol instead of `ws`.

❸ **ProxyPass**. Set this directive to allow HTTP traffic between AM and the agent.

❹ **ProxyPassReverseCookieDomain**. Set this directive to rewrite the domain string in `Set-Cookie` headers in the format *internal domain* (AM's domain) *public domain* (proxy's domain).

❺ **ProxyPassReverse**. Set this directive to the same value configured for the `ProxyPass` directive.

For more information about configuring Apache as a reverse proxy, refer to the Apache documentation.

4. Restart the reverse proxy instance.

5. Configure AM to recover the forwarded header you configured in the reverse proxy. Also, review other configurations that may be required in an environment that uses reverse proxies. For more information, see "Regarding Communication Between AM and Agents"

Appendix A. Getting Support

For more information or resources about AM and ForgeRock Support, see the following sections:

A.1. Accessing Documentation Online

ForgeRock publishes comprehensive documentation online:

- The ForgeRock Knowledge Base offers a large and increasing number of up-to-date, practical articles that help you deploy and manage ForgeRock software.

  While many articles are visible to community members, ForgeRock customers have access to much more, including advanced information for customers using ForgeRock software in a mission-critical capacity.

- ForgeRock product documentation, such as this document, aims to be technically accurate and complete with respect to the software documented. It is visible to everyone and covers all product features and examples of how to use them.

A.2. Using the ForgeRock.org Site

The ForgeRock.org site has links to source code for ForgeRock open source software, as well as links to the ForgeRock forums and technical blogs.

If you are a *ForgeRock customer*, raise a support ticket instead of using the forums. ForgeRock support professionals will get in touch to help you.

A.3. Getting Support and Contacting ForgeRock

ForgeRock provides support services, professional services, training through ForgeRock University, and partner services to assist you in setting up and maintaining your deployments. For a general overview of these services, see https://www.forgerock.com.

ForgeRock has staff members around the globe who support our international customers and partners. For details on ForgeRock's support offering, including support plans and service level agreements (SLAs), visit https://www.forgerock.com/support.

Glossary

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.
Actions	Defined as part of policies, these verbs indicate what authorized identities can do to resources.
Advice	In the context of a policy decision denying access, a hint to the policy enforcement point about remedial action to take that could result in a decision allowing access.
Agent administrator	User having privileges only to read and write agent profile configuration information, typically created to delegate agent profile creation to the user installing a web or Java agent.
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 general terms, a service exposing protected resources. In the context of AM policies, the application is a template that constrains the policies that govern access to protected resources. An application can have zero or more policies.
Application type	Application types act as templates for creating policy applications. Application types define a preset list of actions and functional logic, such as policy lookup and resource comparator logic.

	Application types also define the internal normalization, indexing logic, and comparator logic for applications.
Attribute-based access control (ABAC)	Access control that is based on attributes of a user, such as how old a user is or whether the user is a paying customer.
Authentication	The act of confirming the identity of a principal.
Authentication chaining	A series of authentication modules configured together which a principal must negotiate as configured in order to authenticate successfully.
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.
Authentication module	AM authentication unit that handles one way of obtaining and verifying credentials.
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. AM 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 v2.0 provider federation.
Client	In OAuth 2.0, requests protected web resources on behalf of the resource owner given the owner's authorization. AM can play this role in the OAuth 2.0 authorization framework.
Client-based OAuth 2.0 tokens	After a successful OAuth 2.0 grant flow, AM returns a token to the client. This differs from CTS-based OAuth 2.0 tokens, where AM returns a *reference* to token to the client.
Client-based sessions	AM sessions for which AM returns session state to the client after each request, and require it to be passed in with the subsequent

	request. For browser-based clients, AM sets a cookie in the browser that contains the session information. For browser-based clients, AM sets a cookie in the browser that contains the session state. When the browser transmits the cookie back to AM, AM decodes the session state from the cookie.
Conditions	Defined as part of policies, these determine the circumstances under which which a policy applies. Environmental conditions reflect circumstances like the client IP address, time of day, how the subject authenticated, or the authentication level achieved. Subject conditions reflect characteristics of the subject like whether the subject authenticated, the identity of the subject, or claims in the subject's JWT.
Configuration datastore	LDAP directory service holding AM configuration data.
Cross-domain single sign-on (CDSSO)	AM capability allowing single sign-on across different DNS domains.
CTS-based OAuth 2.0 tokens	After a successful OAuth 2.0 grant flow, AM returns a *reference* to the token to the client, rather than the token itself. This differs from client-based OAuth 2.0 tokens, where AM returns the entire token to the client.
CTS-based sessions	AM sessions that reside in the Core Token Service's token store. CTS-based sessions might also be cached in memory on one or more AM servers. AM tracks these sessions in order to handle events like logout and timeout, to permit session constraints, and to notify applications involved in SSO when a session ends.
Delegation	Granting users administrative privileges with AM.
Entitlement	Decision that defines which resource names can and cannot be accessed for a given identity in the context of a particular application, which actions are allowed and which are denied, and any related advice and attributes.
Extended metadata	Federation configuration information specific to AM.
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 AM on the service provider side; AM lets you create Java Fedlets.
Hot swappable	Refers to configuration properties for which changes can take effect without restarting the container where AM 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 agent	Java web application installed in a web container that acts as a policy enforcement point, 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 agent	Java, web, or custom agent that intercepts requests for resources, directs principals to AM for authentication, and enforces policy decisions from AM.
Policy Administration Point (PAP)	Entity that manages and stores policy definitions.
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 (PIP)	Entity that provides extra information, such as user profile attributes that a PDP needs in order to make a decision.
Principal	Represents an entity that has been authenticated (such as a user, a device, or an application), and thus is distinguished from other entities.

	When a Subject successfully authenticates, AM associates the Subject with the Principal.
Privilege	In the context of delegated administration, a set of administrative tasks that can be performed by specified identities in a given realm.
Provider federation	Agreement among providers to participate in a circle of trust.
Realm	AM unit for organizing configuration and identity information. Realms can be used for example when different parts of an organization have different applications and identity stores, and when different organizations use the same AM deployment. Administrators can delegate realm administration. The administrator assigns administrative privileges to users, allowing them to perform administrative tasks within the realm.
Resource	Something a user can access over the network such as a web page. Defined as part of policies, these can include wildcards in order to match multiple actual resources.
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 attributes	Defined as part of policies, these allow AM to return additional information in the form of "attributes" with the response to a policy decision.
Role based access control (RBAC)	Access control that is based on whether a user has been granted a set of permissions (a role).
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).
Authentication Session	The interval while the user or entity is authenticating to AM.
Session	The interval that starts after the user has authenticated and ends when the user logs out, or when their session is terminated. For browser-based clients, AM manages user sessions across one or more applications by setting a session cookie. See also CTS-based sessions and Client-based sessions.

Session high availability	Capability that lets any AM server in a clustered deployment access shared, persistent information about users' sessions from the CTS token store. The user does not need to log in again unless the entire deployment goes down.
Session token	Unique identifier issued by AM after successful authentication. For a CTS-based sessions, the session token is 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.
Site	Group of AM servers configured the same way, accessed through a load balancer layer. The load balancer handles failover to provide service-level availability. The load balancer can also be used to protect AM services.
Standard metadata	Standard federation configuration information that you can share with other access management software.
Stateless Service	Stateless services do not store any data locally to the service. When the service requires data to perform any action, it requests it from a data store. For example, a stateless authentication service stores session state for logged-in users in a database. This way, any server in the deployment can recover the session from the database and service requests for any user. All AM services are stateless unless otherwise specified. See also Client-based sessions and CTS-based sessions.
Subject	Entity that requests access to a resource When an identity successfully authenticates, AM associates the identity with the Principal that distinguishes it from other identities. An identity can be associated with multiple principals.
Identity store	Data storage service holding principals' profiles; underlying storage can be an LDAP directory service or a custom `IdRepo` implementation.
Web Agent	Native library installed in a web server that acts as a policy enforcement point with policies based on web page URLs.