



# Release Notes

OpenIG 4.5

Mark Craig  
Joanne Henry

ForgeRock AS  
201 Mission St., Suite 2900  
San Francisco, CA 94105, USA  
+1 415-599-1100 (US)  
[www.forgerock.com](http://www.forgerock.com)

---

Copyright © 2012-2017 ForgeRock AS.

## Abstract

Notes covering OpenIG prerequisites, fixes, known issues. OpenIG provides a high-performance reverse proxy server with specialized session management and credential replay functionality.



This work is licensed under the Creative Commons Attribution-NonCommercial-NoDerivs 3.0 Unported License.

To view a copy of this license, visit <https://creativecommons.org/licenses/by-nc-nd/3.0/> or send a letter to Creative Commons, 444 Castro Street, Suite 900, Mountain View, California, 94041, USA.

ForgeRock® and ForgeRock Identity Platform™ are trademarks of ForgeRock Inc. or its subsidiaries in the U.S. and in other countries. Trademarks are the property of their respective owners.

UNLESS OTHERWISE MUTUALLY AGREED BY THE PARTIES IN WRITING, LICENSOR OFFERS THE WORK AS-IS AND MAKES NO REPRESENTATIONS OR WARRANTIES OF ANY KIND CONCERNING THE WORK, EXPRESS, IMPLIED, STATUTORY OR OTHERWISE, INCLUDING, WITHOUT LIMITATION, WARRANTIES OF TITLE, MERCHANTABILITY, FITNESS FOR A PARTICULAR PURPOSE, NONINFRINGEMENT, OR THE ABSENCE OF LATENT OR OTHER DEFECTS, ACCURACY, OR THE PRESENCE OF ABSENCE OF ERRORS, WHETHER OR NOT DISCOVERABLE. SOME JURISDICTIONS DO NOT ALLOW THE EXCLUSION OF IMPLIED WARRANTIES, SO SUCH EXCLUSION MAY NOT APPLY TO YOU.

EXCEPT TO THE EXTENT REQUIRED BY APPLICABLE LAW, IN NO EVENT WILL LICENSOR BE LIABLE TO YOU ON ANY LEGAL THEORY FOR ANY SPECIAL, INCIDENTAL, CONSEQUENTIAL, PUNITIVE OR EXEMPLARY DAMAGES ARISING OUT OF THIS LICENSE OR THE USE OF THE WORK, EVEN IF LICENSOR HAS BEEN ADVISED OF THE POSSIBILITY OF SUCH DAMAGES.

DejaVu Fonts

Bitstream Vera Fonts Copyright

Copyright (c) 2003 by Bitstream, Inc. All Rights Reserved. Bitstream Vera is a trademark of Bitstream, Inc.

Permission is hereby granted, free of charge, to any person obtaining a copy of the fonts accompanying this license ("Fonts") and associated documentation files (the "Font Software"), to reproduce and distribute the Font Software, including without limitation the rights to use, copy, merge, publish, distribute, and/or sell copies of the Font Software, and to permit persons to whom the Font Software is furnished to do so, subject to the following conditions:

The above copyright and trademark notices and this permission notice shall be included in all copies of one or more of the Font Software typefaces.

The Font Software may be modified, altered, or added to, and in particular the designs of glyphs or characters in the Fonts may be modified and additional glyphs or characters may be added to the Fonts, only if the fonts are renamed to names not containing either the words "Bitstream" or the word "Vera".

This License becomes null and void to the extent applicable to Fonts or Font Software that has been modified and is distributed under the "Bitstream Vera" names.

The Font Software may be sold as part of a larger software package but no copy of one or more of the Font Software typefaces may be sold by itself.

THE FONT SOFTWARE IS PROVIDED "AS IS", WITHOUT WARRANTY OF ANY KIND, EXPRESS OR IMPLIED, INCLUDING BUT NOT LIMITED TO ANY WARRANTIES OF MERCHANTABILITY, FITNESS FOR A PARTICULAR PURPOSE AND NONINFRINGEMENT OF COPYRIGHT, PATENT, TRADEMARK, OR OTHER RIGHT. IN NO EVENT SHALL BITSTREAM OR THE GNOME FOUNDATION BE LIABLE FOR ANY CLAIM, DAMAGES OR OTHER LIABILITY, INCLUDING ANY GENERAL, SPECIAL, INDIRECT, INCIDENTAL, OR CONSEQUENTIAL DAMAGES, WHETHER IN AN ACTION OF CONTRACT, TORT OR OTHERWISE, ARISING FROM, OUT OF THE USE OR INABILITY TO USE THE FONT SOFTWARE OR FROM OTHER DEALINGS IN THE FONT SOFTWARE.

Except as contained in this notice, the names of Gnome, the Gnome Foundation, and Bitstream Inc., shall not be used in advertising or otherwise to promote the sale, use or other dealings in this Font Software without prior written authorization from the Gnome Foundation or Bitstream Inc., respectively. For further information, contact: fonts at gnome dot org.

Arev Fonts Copyright

Copyright (c) 2006 by Tavmjong Bah. All Rights Reserved.

Permission is hereby granted, free of charge, to any person obtaining a copy of the fonts accompanying this license ("Fonts") and associated documentation files (the "Font Software"), to reproduce and distribute the modifications to the Bitstream Vera Font Software, including without limitation the rights to use, copy, merge, publish, distribute, and/or sell copies of the Font Software, and to permit persons to whom the Font Software is furnished to do so, subject to the following conditions:

The above copyright and trademark notices and this permission notice shall be included in all copies of one or more of the Font Software typefaces.

The Font Software may be modified, altered, or added to, and in particular the designs of glyphs or characters in the Fonts may be modified and additional glyphs or characters may be added to the Fonts, only if the fonts are renamed to names not containing either the words "Tavmjong Bah" or the word "Arev".

This License becomes null and void to the extent applicable to Fonts or Font Software that has been modified and is distributed under the "Tavmjong Bah Arev" names.

The Font Software may be sold as part of a larger software package but no copy of one or more of the Font Software typefaces may be sold by itself.

THE FONT SOFTWARE IS PROVIDED "AS IS", WITHOUT WARRANTY OF ANY KIND, EXPRESS OR IMPLIED, INCLUDING BUT NOT LIMITED TO ANY WARRANTIES OF MERCHANTABILITY, FITNESS FOR A PARTICULAR PURPOSE AND NONINFRINGEMENT OF COPYRIGHT, PATENT, TRADEMARK, OR OTHER RIGHT. IN NO EVENT SHALL TAVMJONG BAH BE LIABLE FOR ANY CLAIM, DAMAGES OR OTHER LIABILITY, INCLUDING ANY GENERAL, SPECIAL, INDIRECT, INCIDENTAL, OR CONSEQUENTIAL DAMAGES, WHETHER IN AN ACTION OF CONTRACT, TORT OR OTHERWISE, ARISING FROM, OUT OF THE USE OR INABILITY TO USE THE FONT SOFTWARE OR FROM OTHER DEALINGS IN THE FONT SOFTWARE.

Except as contained in this notice, the name of Tavmjong Bah shall not be used in advertising or otherwise to promote the sale, use or other dealings in this Font Software without prior written authorization from Tavmjong Bah. For further information, contact: tavmjong @ free . fr.

FontAwesome Copyright

Copyright (c) 2017 by Dave Gandy, <http://fontawesome.io>.

This Font Software is licensed under the SIL Open Font License, Version 1.1. This license is available with a FAQ at: <http://scripts.sil.org/OFL>.

---

# Table of Contents

1. What's New in OpenIG .....	1
1.1. New Features .....	1
1.2. Product Improvements .....	3
1.3. Security Advisories .....	5
2. Before You Install OpenIG Software .....	6
2.1. JDK Version .....	6
2.2. Web Application Containers .....	6
2.3. OpenAM Features .....	6
2.4. OpenAM Policy Agents .....	7
3. OpenIG Compatibility .....	8
3.1. Important Changes to Existing Functionality .....	8
3.2. Deprecated Functionality .....	9
3.3. Removed Functionality .....	10
4. Fixes, Limitations, and Known Issues .....	12
4.1. Key Fixes .....	12
4.2. Limitations .....	12
4.3. Known Issues .....	13
5. Documentation Changes .....	15
6. How to Report Problems and Provide Feedback .....	17
7. Support .....	18

## Chapter 1

# What's New in OpenIG

OpenIG 4.5 provides many new features and improvements.

## 1.1. New Features

This release of OpenIG includes the following new capabilities:

### Throttling Filter

The throttling filter has been extended to support different throttling rates (OPENIG-595).

OpenIG can now apply different throttling rates to different groups of requests. Before this release, only one throttling rate could be applied. Requests are categorized into groups by the evaluation of an expression. The throttling rate for each request group can be mapped in memory or configured by a script.

For more information, see Chapter 16, "*Throttling the Rate of Requests to a Protected Application*" in the *Gateway Guide* and `ThrottlingFilter(5)` in the *Configuration Reference*.

### SLF4J Logging in OpenIG

The Simple Logging Facade for Java (SLF4J) is now provided in OpenIG, allowing you to define different logging behavior for routes and third-party dependencies (OPENIG-920).

Before this release, some but not all log messages from SLF4J loggers were included with the default OpenIG log sink entries. To access all messages from SLF4J loggers, in `config.json` define the default `LogSink` as type `Slf4jLogSink`.

```
{
  "name": "LogSink",
  "type": "Slf4jLogSink",
  "config": {
    "base": "com.example.app"
  }
}
```

For more information, see Chapter 17, "*Logging Events in OpenIG*" in the *Gateway Guide* and `Slf4jLogSink(5)` in the *Configuration Reference*.

## OAuth 2.0 Common Resource Server Filter

OpenIG now uses the OAuth 2.0 Common Resource Server filter (OPENIG-864).

Previously, access tokens for `OAuth2ResourceServerFilter` were stored in the `"target"` attribute. This attribute has been removed. Access tokens are now stored in a dedicated context and accessed through `#{contexts.oauth2.accessToken}`.

For more information, see Chapter 8, "*OpenIG As an OAuth 2.0 Resource Server*" in the *Gateway Guide* and `OAuth2ResourceServerFilter(5)` in the *Configuration Reference*.

## Elasticsearch Audit Event Handler

The audit service now supports an `ElasticsearchAuditEventHandler` to log audit events in the Elasticsearch search and analytics engine.

For more information, see Chapter 15, "*Auditing and Monitoring OpenIG*" in the *Gateway Guide* and `ElasticsearchAuditEventHandler(5)` in the *Configuration Reference*.

## Condition Enforcement Filter

A condition enforcement filter is now available to verify that a specified condition is met before the chain of execution is continued (OPENIG-880).

For information, see `ConditionEnforcementFilter(5)` in the *Configuration Reference*.

## Class Import for Groovy Scripts

The following classes are imported automatically for Groovy scripts:

- `org.forgerock.http.Client`
- `org.forgerock.http.Filter`
- `org.forgerock.http.Handler`
- `org.forgerock.http.filter.throttling.ThrottlingRate`
- `org.forgerock.http.util.Uri`
- `org.forgerock.util.AsyncFunction`
- `org.forgerock.util.Function`
- `org.forgerock.util.promise.NeverThrowsException`
- `org.forgerock.util.promise.Promise`
- `org.forgerock.services.context.Context`
- `org.forgerock.http.protocol.*`

It is no longer necessary to include import statements for these classes in Groovy scripts (OPENIG-963).

For more information, see `ScriptableFilter(5)` in the *Configuration Reference* and `ScriptableHandler(5)` in the *Configuration Reference*.

### Scheduled Executor Service

OpenIG now provides a scheduled executor service that can be declared and configured in the heap, and shared by downstream components, such as filters and handlers, that use an executor service. Previously, each filter and handler created its own executor service (OPENIG-178).

This executor service simplifies configuration and makes it possible for components to share resources. You can configure the number of threads in the executor service and how the executor service is stopped.

For more information, see `ScheduledExecutorService(5)` in the *Configuration Reference*.

## 1.2. Product Improvements

This release of OpenIG includes the following enhancements:

### Improved Performance of the `PolicyEnforcementFilter`

Internal refactoring of the OpenIG policy enforcement filter has significantly improved performance (OPENIG-1013).

Before this release, the number of SSO tokens required by the policy enforcement filter was proportional to the number of connected user agents. From this release, a single token is requested the first time the policy enforcement filter is called, and then that same token is used for *all* policy evaluation requests. The token is automatically refreshed when necessary.

The refactoring has resulted in the following improvements:

- Reduced memory usage on OpenAM and OpenIG - there are fewer SSO sessions.
- Increased speed - OpenIG performs fewer HTTP calls to get SSO tokens, and therefore spends less time waiting for tokens.

For more information, see `PolicyEnforcementFilter(5)` in the *Configuration Reference*.

### Asynchronous Processing of Filters and Handlers

All of the filters and handlers in OpenIG have been refactored for fully asynchronous HTTP message processing (OPENIG-865).

### Configuration Settings Can Be Defined As Expressions

Filters, handlers, and other objects whose configuration settings require strings, integers, or booleans, can now be configured by expressions (OPENIG-397).

This improvement allows you to change configuration settings by changing the value of a system property or environment variable, and then restarting OpenIG or reloading the route. You can change configuration settings without changing the configuration file.

For more information, see [Configuration Settings\(5\)](#) in the *Configuration Reference*.

### Failures in `OAuth2ClientFilter` Are Diverted to a Failure Handler

All client failures are rerouted to a failure handler. Before this release, a `500 Internal Server Error` was returned. The failure object in the target has an additional field called `exception`, providing the cause of failure (OPENIG-981).

For more information, see [OAuth2ClientFilter\(5\)](#) in the *Configuration Reference*.

### Support for Environment and Subject/Claims in Policy Enforcement

The `PolicyEnforcementFilter` now provides support to specify a policy environment and to specify a subject by claims (OPENIG-836).

The circumstances under which a policy applies can now be configured. For example, environment conditions can specify that the policy applies only during working hours or only when accessing from a specific IP address. For this improvement, the `"environment"` attribute has been added to the `PolicyEnforcementFilter`.

Subjects can now be specified by JWT claims. For this improvement, the `"claimsSubject"` attribute has been added to the `PolicyEnforcementFilter`.

For more information, see [PolicyEnforcementFilter\(5\)](#) in the *Configuration Reference*.

### Attributes and Advices Returned With Policy Decisions

The `PolicyEnforcementFilter` now exposes attributes and advices returned by the policy decision (OPENIG-824).

For this improvement, the `"target"` attribute has been added to the `PolicyEnforcementFilter`. For more information, see [PolicyEnforcementFilter\(5\)](#) in the *Configuration Reference*.

### Logs at Error Level on `OAuth2ClientFilter`

The `OAuth2ClientFilter` now logs at the `error` level instead of the `warning` level (OPENIG-945).

### Error Messages Improved for Evaluation of Expressions

More warning and error logs are now available for the evaluation or assignation of expressions (OPENIG-451).

The following information is logged:

- Missing bean properties
- Out-of-bound index in lists

- Movement to an unmodifiable collection
- Exception during evaluation
- Unexpected result type
- Any function failure

## 1.3. Security Advisories

ForgeRock issues security advisories in collaboration with our customers and the open source community to address any security vulnerabilities transparently and rapidly. ForgeRock's security advisory policy governs the process on how security issues are submitted, received, and evaluated, as well as the timeline for the issuance of security advisories and patches.

For more information on ForgeRock's security advisory policy, click the following link: <http://www.forgerock.com/services/security-policy/>.

The following security advisory is about vulnerabilities in this release:

- OpenIG Security Advisory #201606



## Chapter 2

# Before You Install OpenIG Software

This chapter covers requirements for running OpenIG software.

### Tip

If you have a special request to support a component or combination not listed here, contact ForgeRock at [info@forgerock.com](mailto:info@forgerock.com).

## 2.1. JDK Version

This release of OpenIG requires Java Development Kit 7 or 8. ForgeRock recommends the most recent update to ensure you have the latest security fixes.

If you install an OpenAM policy agent in the same container as OpenIG, then you must use a Java release that is supported with the policy agent as well.

## 2.2. Web Application Containers

OpenIG runs in the following web application containers:

- Apache Tomcat 7 or 8
- Jetty 8 (8.1.13 or later) or 9

You must deploy OpenIG to the root context of the container. Deployment in other context causes unexpected results, and cannot be supported.

OpenIG requires Servlet 3.0 or later.

For details on setting up your web application container see Section 3.1, "Configuring Deployment Containers" in the *Gateway Guide*.

## 2.3. OpenAM Features

When using OpenIG with OpenAM, the following features are supported with OpenAM 13 or later:

- OpenAM policy enforcement, as described in Chapter 6, "*OpenIG As an OpenAM Policy Enforcement Point*" in the *Gateway Guide*
- OpenID Connect dynamic registration and discovery, as described in Section 9.7, "Using OpenID Connect Discovery and Dynamic Client Registration" in the *Gateway Guide*
- User Managed Access, as described in Chapter 11, "*OpenIG As an UMA Resource Server*" in the *Gateway Guide*

## 2.4. OpenAM Policy Agents

When installing an OpenAM policy agent in the same container as OpenIG, use an OpenAM Java EE policy agent version 3.5 or later. Earlier versions of OpenAM policy agents might not shut down properly with the web application container (OPENIG-258).

Make sure that the container version is supported both for OpenIG and for the OpenAM Java EE policy agent that you install alongside OpenIG.

## Chapter 3

# OpenIG Compatibility

This chapter describes major changes to existing functionality, deprecated functionality, and removed functionality.

## 3.1. Important Changes to Existing Functionality

This release brings the following important changes to OpenIG:

- The policy enforcement filter returns different HTTP status codes (OPENIG-871).

Before this release, the policy enforcement filter returned `401 Unauthorized` if a request was denied by OpenAM. From this release, the policy enforcement filter returns `403 Forbidden` if a request is denied, or `500 Internal Server Error` if an error occurs during the process.

- In the `PolicyEnforcementFilter`, the `policiesHandler` is replaced by `amHandler`, and the default `amHandler` is `ForgeRockClientHandler` (OPENIG-1014).
- In the `TokenTransformationFilter`, `amHandler` is now optional. If it is not defined, the default value `ForgeRockClientHandler` is used.
- In OpenID Connect (`OAuth2ClientFilter`), the `goto` parameter of the login/discovery endpoints is no longer decoded twice (OPENIG-847).

When `OAuth2ClientFilter` is configured to work with multiple providers, the user is directed to a login handler page, known as a NASCAR page, to choose a provider. The NASCAR page is defined by the `loginHandler` parameter of `OAuth2ClientFilter`.

Do not URL-encode the `goto` query parameter in the NASCAR page. For example, replace the first handler with the second.

```
{
  "name": "NascarPage",
  "type": "StaticResponseHandler",
  "config": {
    "status": 200,
    "entity": "<html><p><a
      href='/openid/login?registration=openam&goto=
      ${urlEncode(contexts.router.originalUri)}'
      >OpenAM Login</a></p>
    </html>"
  }
}
```

```
{
  "name": "NascarPage",
  "type": "StaticResponseHandler",
  "config": {
    "status": 200,
    "entity": "<html><p><a
      href='/openid/login?registration=openam&goto=${contexts.router.originalUri}'
      >OpenAM Login</a></p>
    </html>"
  }
}
```

- For OAuth 2.0 and OpenID Connect deployments, the `loginHandler` parameter of the `OAuth2ClientFilter` is now required when there are zero or multiple client registrations. It is optional when there is one client registration (OPENIG-954).

The `registration` parameter has been deprecated and replaced by `registrations`, which is an array of client registrations. Before a client registration can be used by the `OAuth2ClientFilter` filter, it must be declared in the `registrations` parameter.

For information, see `OAuth2ClientFilter(5)` in the *Configuration Reference*.

- When OpenIG fails to start up, a `500 Internal Server Error` is sent to the user agent, and an error is written to the logs. Before this release, the error page of the web container was displayed (OPENIG-1009).

## 3.2. Deprecated Functionality

Deprecation is defined in Section A.2, "ForgeRock Product Interface Stability" in the *Configuration Reference*.

- The following log sink classes are deprecated in this release: `Logger`, `ConsoleLogSink`, `FileLogSink`, `Slf4jLogSink`. The Simple Logging Facade for Java (SLF4J) is now provided in OpenIG, allowing you to define different logging behavior for routes and third-party dependencies.
- The `AuditDecorator` and `CaptureDecorator` deprecated in the previous release remain deprecated in this release.

Table 3.1. *Deprecated Configuration Settings*

Configuration Object	Deprecated Settings	Newer Evolving Settings
<code>ThrottlingFilter</code>	<code>partitionKey</code>	Replaced by <code>requestGroupingPolicy</code> .
<code>OAuth2ClientFilter</code>	Deprecated parameter and format "registration": <code>ClientRegistration</code> reference.	Replaced by "registrations": [ <code>ClientRegistration</code> reference(s) ].
	<code>loginHandler</code>	Required when there are zero or multiple client registrations. Optional when there is one client registration.
<code>PolicyEnforcementFilter</code>	<code>policiesHandler</code> , using <code>ClientHandler</code> as default.	<code>amHandler</code> , using <code>ForgeRockClientHandler</code> as default.

For details on the new and updated configuration objects, see `OAuth2ClientFilter(5)` in the *Configuration Reference*, `PolicyEnforcementFilter(5)` in the *Configuration Reference*, `Client(5)` in the *Configuration Reference*, and `ThrottlingFilter(5)` in the *Configuration Reference*.

### 3.3. Removed Functionality

The class `org.forgerock.openig.heap.NestedHeaplet` has been removed in this release. The interface to extend instead is `org.forgerock.openig.heap.GenericHeaplet` (OPENIG-803).

The "target" attribute of the `OAuth2ResourceServerFilter` has been removed (OPENIG-864). Access tokens are now stored in a dedicated context and accessed through `#{contexts.oauth2.accessToken}`.

Table 3.2. *Removed Configuration Settings*

Configuration Object	Deprecated Settings	Newer Evolving Settings
<code>OAuth2ClientFilter</code>	<code>providerHandler</code>	N/A
	<code>providers</code>	Replaced by separate <code>Issuer</code> and <code>ClientRegistration</code> configuration objects.
	<code>redirect_uris</code>	List the redirect URIs in the dynamic client registration <code>metadata</code> .

Configuration Object	Deprecated Settings	Newer Evolving Settings
	<a href="#">scopes</a>	List the scopes in the dynamic client registration <a href="#">metadata</a> .

## Chapter 4

# Fixes, Limitations, and Known Issues

OpenIG issues are tracked at <https://bugster.forgerock.org/jira/browse/OPENIG>. This chapter covers the status of key issues and limitations at release 4.5.

## 4.1. Key Fixes

The following important issues were fixed in this release:

- OPENIG-1084: OAuth2ClientFilter heaplet should use a defensive copy
- OPENIG-1012: OpenIDConnect : Thread remaining blocked in WAITING state on `unauthorized` response of application
- OPENIG-1008: OpenIDConnect : context attributes are not updated when a refresh token is performed by OAuth2ClientFilter
- OPENIG-933: Access token expiration in OAuth2ClientFilter still not handled in 4.0.0
- OPENIG-871: Policy Enforcement Filter should return a 403 instead of a 401
- OPENIG-847: goto URL in OIDC Nascar page does not need to be URL encoded
- OPENIG-834: Single logout processing in SamlFederationHandler.serviceSPInitiatedSLO does not correctly pass the metaalias property
- OPENIG-712: Issuer definition : supportedDomains doesn't lead to use of static clientRegistration
- OPENIG-683: Too much information in response in case of error
- OPENIG-555: OpenIG container doesn't stop properly, waiting for a promise

## 4.2. Limitations

The following limitations are present in this release:

- The log file of audit events can be overwritten when the log file is rotated.

When `CsvAuditEventHandler` is used to log audit events, the log file is overwritten if it is rotated before the file suffix, `rotationFileSuffix`, changes. By default, `rotationFileSuffix` is defined as a date in the format `_yyyy-MM-dd`.

Log files are rotated when one of the following limits is reached: `maxFileSize`, `rotationInterval`, or `rotationTimes`.

Workaround: Set the log rotation parameters so that the log is not likely to rotate before `rotationFileSuffix` changes.

- For HTTPS, OpenIG can check server certificates. However, mutual authentication, where OpenIG presents its client certificate, is not supported if the client certificate is not the first certificate in the `ClientHandler` keystore.
- OpenIG scripts are not sandboxed, but instead have access to anything in their environment. You must make sure that the scripts that OpenIG loads are safe.
- The `SamlFederationHandler` does not support filtering. Do not use a `SamlFederationHandler` as the handler for a `Chain`.

More generally, do not use this handler when its use depends on something in the response. The response can be handled independently of OpenIG, and can be `null` when control returns to OpenIG. For example, do not use this handler in a `SequenceHandler` where the `postcondition` depends on the response.

- `assertionMapping` does not support multi-valued attributes (OPENIG-98).

When using `assertionMapping` in the `SamlFederationHandler` to map a SAML assertion attribute value to a session attribute, only the first attribute value is saved in the session. If the SAML assertion attribute has multiple values, the other values are not saved in the session.

- The route `/openig` and its subroutes are reserved for administration endpoints.

## 4.3. Known Issues

The following known issues remained open at the time of release:

- OPENIG-910: ScriptableFilter : Get error `Cannot execute script` with groovy scripts previously working
- OPENIG-816: The UmaResourceServerFilter returns with wrong `as_uri`
- OPENIG-813: auditService : fileRotation may overwrite existing audit file
- OPENIG-659: CryptoHeaderFilter - error on handling header value with incorrect length
- OPENIG-458: CookieFilter is not JwtSession compatible
- OPENIG-322: Cannot access both an OpenAM (self-signed) and a Google HTTPS endpoint
- OPENIG-291: Class cast exception when using SAML federation & policy agent together



- OPENIG-234: Federation doesn't work if we used incomplete user in IDP
- OPENIG-221: Cannot specify which certificate to present to server if server requires mutual authentication in https
- OPENAM-9112: Audit logging outputs errors in debug log under high load

## Chapter 5

# Documentation Changes

This chapter describes important changes made to the documentation set in this release.

- Hostnames have been changed in examples.

To clarify which server is referenced in documentation examples, the hostname `www.example.com` has been replaced by one of the following hostnames:

- `openig.example.com:8080`
  - `app.example.com:8081`
  - `openam.example.com:8088`
- Throttling filters and policies are now described in dedicated sections.

The new chapter Chapter 16, "*Throttling the Rate of Requests to a Protected Application*" in the *Gateway Guide* provides tutorials on the new throttling policies and features. The new section `ThrottlingFilter(5)` in the *Configuration Reference* describes the new throttling policies.

- Logging behavior is now described in dedicated sections.

The new chapter Chapter 17, "*Logging Events in OpenIG*" in the *Gateway Guide* describes the default logging behavior in OpenIG and the new SLF4J logging feature. The new section `Logging Framework` in the *Configuration Reference* hosts the existing `ConsoleLogSink` and `FileLogSink` information, and introduces the new `Slf4jLogSink`.

- An example of token transformation is now provided.

The new chapter Chapter 10, "*Transforming OpenID Connect ID Tokens Into SAML Assertions*" in the *Gateway Guide* provides an example of how to transform an OpenID Connect ID token into a SAML 2.0 assertion, using the `TokenTransformationFilter`.

- SAML tutorials have been updated.

The following chapters have been updated to include additional information: Chapter 7, "*OpenIG As a SAML 2.0 Service Provider*" in the *Gateway Guide* and Appendix A, "*SAML 2.0 and Multiple Applications*" in the *Gateway Guide*.

The following table tracks changes to the documentation set following the release of OpenIG 4.5:

*Table 5.1. Documentation Change Log*

Date	Description
2018-01-30	Noted that cached policy decisions remain in the cache even after a user logs out of OpenAM. For information, see <code>PolicyEnforcementFilter(5)</code> in the <i>Configuration Reference</i> .

## Chapter 6

# How to Report Problems and Provide Feedback

If you have questions regarding OpenIG that are not answered by the documentation, there is a mailing list which can be found at <https://lists.forgerock.org/mailman/listinfo/openig> where you are likely to find an answer.

If you have found issues or reproducible bugs within OpenIG, report them in <https://bugster.forgerock.org>.

When requesting help with a problem, include the following information:

- Description of the problem, including when the problem occurs and its impact on your operation
- Machine type, operating system version, web container and version, Java version, and OpenIG release version, including any patches or other software that might be affecting the problem
- Steps to reproduce the problem
- Any relevant logs or stack traces

## Chapter 7

# Support

You can purchase OpenIG support, subscriptions and training courses from ForgeRock and from consulting partners around the world and in your area. To contact ForgeRock, send mail to [info@forgerock.com](mailto:info@forgerock.com). To find a partner in your area, use the ForgeRock website.