

# **RFC 189 Http Service Updates**

Draft

49 Pages

# **Abstract**

The current Http Service specification is based on Servlet API 2.1. As such it misses newer functionality such as Servlet Filters or event listeners. In addition use of the service does not support the recent whiteboard pattern approach. This RFC lists requirement to update the Http Service specification as well as possible create new specification for extended Web Applications in the context of OSGi.



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August 21, 2013

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## 0.3 Feedback

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# 0.4 Table of Contents

0 Document Information	2
0.1 License	2
0.2 Trademarks	3
0.3 Feedback	
0.4 Table of Contents	
0.5 Terminology and Document Conventions	4
0.6 Revision History	
1 Introduction	5
2 Application Domain	6
3 Problem Description	6
3.1 Support for dated Serlvet API 2.1	6
3.2 Dependency on the HttpService service	
3.3 Configuration.	
· ·	
4 Requirements	7
4.1 Update to Http Service API	7
5 Technical Solution	9
5.1 Update Http Service API	9
5.1.1 Servlet API Reference Version	9
5.1.2 Annotations	
5.1.3 Web Application Events	10



Alliance	Draft	August 21, 2013
	5.1.4 Relationship to Servlet Container	10
	5.1.5 Http Service	
	5.1.6 APİ Version	12
	5.1.7 Servlet API Exports	13
5.2	2 Whiteboard Registration Support	13
	5.2.1 Servlet and Filter Registration Pattern	14
	5.2.2 Http Context for Servlets, Filters and Listeners	
	5.2.3 Resources	
	5.2.4 Event Listeners	15
	5.2.5 Service Registration Properties	10
	5.2.6 Provided Capability	17
6 Data	Transfer Objects	18
7 Javac	doc	18
8 Cons	sidered Alternatives	42
	1 Servlet API Reference Version	
	2 New methods to register Servlets and Filters	
	3 Web Application Events	
	8.3.1 Limiting events	42
	8.3.2 Event Ädmin Service	42
8.4	4 HTTP Sessions	42
	5 Resources	
9 Secui	rity Considerations	43
	,	-
10 Doc	ument Support	43
	.1 References	
10.	.2 Author's Address	43
	.3 Acronyms and Abbreviations	
	4 End of Dogument	

# 0.5 Terminology and Document Conventions

The key words "MUST", "MUST NOT", "REQUIRED", "SHALL", "SHALL NOT", "SHOULD", "SHOULD NOT", "RECOMMENDED", "NOT RECOMMENDED", "MAY" and "OPTIONAL" in this document are to be interpreted as described in 1.

Source code is shown in this typeface.

# 0.6 Revision History

The last named individual in this history is currently responsible for this document.

Revision	Date	Comments
Initial	11/02/12	Initial Version
		Felix Meschberger, Adobe Systems Incorporated, fmeschbe@adobe.com



Revision	Date	Comments
Update	01/27/12	Update on Feedback from Orlando F2F and BJ Hargrave on the CPEG mailing list.
		Felix Meschberger, Adobe Systems Incorporated, fmeschbe@adobe.com
Update	01/28/12	Update on feedback from Austin F2F
		Removal of new registration/unregistration methods
		Clarification of Servlet API 3 registration methods
		Definition of the osgi.whiteboard namespace
		Minor clarifications and fixes
		Felix Meschberger, Adobe Systems Incorporated, fmeschbe@adobe.com
Update	04/16/13	Update with feedback from Cologne F2F
		Annotations and asynchronous processing
		Carsten Ziegeler, Adobe Systems Incorporated, <a href="mailto:cziegele@adobe.com">cziegele@adobe.com</a>
Update	05/22/13	Added section about listener registration
		Carsten Ziegeler, Adobe Systems Incorporated, cziegele@adobe.com
Update	07/15/13	Updated with feedback from Palo Alto F2F
		Updated listener handling
		Clarified service lifecycle handling
		Renamed "pattern" property to "path"
		Carsten Ziegeler, Adobe Systems Incorporated, cziegele@adobe.com
Update	07/29/13	Updated with feedback from CPEG call
		Changed handling of multiple whiteboard implementation
		Carsten Ziegeler, Adobe Systems Incorporated, cziegele@adobe.com
Update	08/15/13	Updated with feedback from BJ (partially already mentioned at the Palo Alto F2F):
		Clean up requirements list
		Several clarifications / rewordings, samples
		Moved DTOs to org.osgi.dto.service.http
		Added security permissions
		Carsten Ziegeler, Adobe Systems Incorporated, cziegele@adobe.com

August 21, 2013

# Introduction

The OSGi Specifications currently only contain limited specification support for creating Web Applications in an OSGi context:

- Http Service Specification based on Servlet API 2.1. Apart from being based an old Servlet API version and being silent about how more recent versions are supported the main problem with this specification is that a provider of servlets and resources has to grab the Http Service first before being able to register servlets and resources. There is no whiteboard pattern support.
- Web Applications Specification basically just defines how existing web applications may be enhanced with OSGi Manifest headers and deployed into the OSGi Framework as-is. This is fine for moving existing web applications with minimal changes into the OSGi framework.

Some thoughts are already listed on the OSGi Community Wiki at http://wiki.osgi.org/wiki/WebExperience.

# **Application Domain**

Developers need to use the full extend of current Servlet API specifications (as of this writing Servlet API 3.0 is the most recent version). As such there is a need to register servlet filters and event listeners.

# **Problem Description**

#### Support for dated Serlvet API 2.1 3.1

Current support for web applications using the Http Service in traditional OSGi based applications is limited to servlets and resources. From the current Servlet API 3.0 specification the following functionality is missing:

- Servlet Filters
- Servlet Event Listeners

August 21, 2013

· Asynchronous Requests

At this moment some of this missing functionality is covered in a proprietary way. Examples are the Apache Felix Http Whiteboard support or the OPS4J Pax Web collection of bundles.

# 3.2 Dependency on the HttpService service

Currently the HttpService service (or one of them if multiple services exist in a framework) must be accessed to be able to register servlets and/or resources. In addition to register a servlet or resource an instance of the HttpContext interface is required.

This makes it very cumbersome to easily register servlets and resources. Particularly it is hard to come up with an HttpContext instance which for example uses an authentication mechanism available in the framework to implement the handleSecurity method.

To reduce (or simplify) this dependency it would be helpful to just register servlets as services and have them registered with a matching Http Service in a whiteboard pattern style. Likewise registration of static resources would be supported in an extender pattern style.

At this moment some of this missing functionality is covered in a proprietary way. Examples are the Apache Felix Http Whiteboard support or the OPS4J Pax Web collection of bundles.

# 3.3 Configuration

The Http Service specification currently declares a number of framework properties to configure the Http Service. This raises a number of issues:

- Unable to dynamically reconfigure the Http Service in an easy way
- Incomplete configuration. For example the local interface to bind to is not an official configuration property
- When the Http Service is implemented as bridge to a Servlet Container in which the OSGi framework is deployed (e.g. as part of a Web Application) these properties have no effect.

In addition the actual configuration of an Http Service instance cannot be easily be queried/introspected.

# 4 Requirements

# 4.1 Update to Http Service API

HS-1 The solution MUST update the Http Service specification to refer to the latest Servlet API specification and define to what extend the Http Service provides support.



- August 21, 2013
- HS-2 The solution MUST extend the HttpService service API to support Servlet registration with patterns as defined by the Servlet API specification (Section 12.2, Specification of Mappings, in the Servlet API 3.0 specification). This requirement aligns servlet registration to functionality provided by the Servlet API web application descriptor (web.xml).
- HS-3 The solution MUST extend the HttpService service API to support registration of Servlet API filters with patterns as defined by the Servlet API specification (Section 12.2, Specification of Mappings, in the Servlet API 3.0 specification) or referring to servlets by their names. This requirement aligns mapping filters to requests to functionality provided by the Servlet API web application descriptor (web.xml).
- HS-4 The solution MUST extend the HttpService service API to support registration of Servlet API listeners.
- HS-5 The solution MUST add support for error page configuration.
- HS-6 The solution MUST define how registered Servlets and Filters are named.
- HS-7 The solution MUST clarify ServletContext implementation in the HttpService for both standalone and bridged Http Service implementations.
- HS-8 The solution MUST clarify the ServletContext scope of Servlet API listeners registered through the HttpService.

HS-9

- HS-10 The solution MUST define service registration properties for the HttpService to reflect configuration of the service.
- HS-11 The solution MUST define whiteboard registration of servlet services with the HttpService.
- HS-12 The solution MUST define whiteboard registration of filter services with the HttpService.
- HS-13 The solution MUST define whiteboard registration of servlet listener services with the HttpService.
- HS-14 The solution MUST define registration of OSGi HttpContext services used for Servlet and Filter registration.
- HS-15 The solution MUST define how servlets, filters, and servlet listener services are matched with HttpService services for registration.
- HS-16 The solution MUST define whiteboard registration of static resources with the HttpService.
- HS-17 The solution MUST define whiteboard registration of error pages with the HttpService.

HS-18

HS-19 The solution MUST define a capability for the whiteboard pattern registration in one of the standard namespaces (or a new namespace to be defined in the Chapter 135, Common Namespaces Specification). Bundles registering servlet, filter, and/or servlet listener services can then require this capability.



# 5 Technical Solution

The Http Service Update consists of two parts:

- Updates and clarifications to the the Http Service API and specification itself.
- Whiteboard Registration support for Servlets, Filters, and HttpContexts.

# 5.1 Update Http Service API

The goal of the Http Service update is to make the registration of more elements of the Web Application Descriptor available to OSGi applications:

- Servlets may be registered with more than one pattern (instead of a single alias)
- Filters (introduced in Servlet API 2.3)
- Error pages (introduced in Servlet API 2.2)
- Event Listener (introduced in Servlet API 2.3)

Of the remaining elements defined in the Web Application descriptions, MIME type mapping and login configuration is already available through the HttpContext interface.

Resources (EJB) are not supported by the Http Service because these are outside of the scope of the Http Service and are supported by other mechanisms in the OSGi framework such as the service registry or through JNDI.

Registration of those elements is possible following the whiteboard pattern. Registration of Servlets and Resources through the Http Service is deprecated.

### 5.1.1 Servlet API Reference Version

Implementations of the Http Service Specification 1.3 is based on the Servlet API Specification Version 3.0. Implementatios of the Http Service Specification 1.3 may support a previous version of the Servlet API Specification only. The actual version supported is exposed through the ServletContext.getMajorVersion() and .getMinorVersion() methods.

### 5.1.2 Annotations

Annotations defined in the Servlet API Specifications must be ignored by an implementation of the Http Service Specification. This is to avoid class path scanning and going the OSGi way. In addition this avoids unwanted situations where servlets are registered just by the fact that a specific class is contained in a bundle – this could lead to the servlet registered twice, with the wrong context or registered at all.

Implementations of the Http Service Specification may support annotations through an additional proprietary optin mechanism like a manifest header or require capability.

## 5.1.3 Web Application Events

Starting with Servlet API 2.3 event listener interfaces have been defined to be notified of various events during the web application and request processing live cycle. The Http Service supports all listeners as defined in section 11.2, Event Listeners, of the Servlet API 3.0 specification [3].

## 5.1.4 Relationship to Servlet Container

Implementations of the Http Service specification will generally be backed by actual implementations of the Servlet Servlet API specification such as Tomcat or Jetty. There also exist implementations which bridge into a servlet container into which the OSGi Framework has been deployed as a web application, for example the Apache Felix Http Service Bridge or the Equinox Http Service Bridge.

As such an Http Service implementation will live in a servlet context and all Servlets, Filters, and Resources registered through the Http Service will be backed by the same ServletContext.

With respect to Web Applications two areas need clarification as to how they are segregated or shared amongst the Servlets, Filter, and Resources:

- ServletContext objects used for Servlet and Filter initialization
- Http Sessions acquired by Servlets and Filters through the HttpServletRequest

## 5.1.4.1 HttpContext and ServletContext

The Http Service specification currently defines the correlation between an HttpContext used for Servlet (and now Filter) registration and the ServletContext used for the Servlet and Filter initialization as follows:

Servlet objects require a ServletContext object. This object provides a number of functions to access the Http Service Java Servlet environment. It is created by the implementation of the Http Service for each unique HttpContext object with which a Servlet object is registered. Thus, Servlet objects registered with the same HttpContext object must also share the same ServletContext object.

The table lists all methods of the ServletContext interface and how these methods should be implemented:

Method	Implementation
getContextPath (Servlet API >= 2.5)	Backed by Servlet Container
getContext(String)	Backed by Servlet Container
getMajorVersion()	Backed by Servlet Container
getMinorVersion()	Backed by Servlet Container
getMimeType(String)	Backed by HttpContext
getEffectiveMinorVersion()	Same as getMinorVersion()
getEffectiveMajorVersion()	Same as getMajorVersion()
getResourcePaths(String)	Backed by HttpContext
getResource(String)	Backed by HttpContext
getResourceAsStream()	Backed by HttpContext
getRequestDispatcher(String)	See note 1.

August 21, 2013

getNamedDispatcher(String)	See note 1.
getServlet(String)	Backed by Servlet Container
getServlets()	Backed by Servlet Container
getServletNames()	Backed by Servlet Container
log(String)	Backed by Servlet Container
log(Exception, String)	Backed by Servlet Container
log(String, Throwable)	Backed by Servlet Container
getRealPatch(String)	Backed by HttpContext
getServerInfo()	Backed by Servlet Container
getInitParameter(String)	See note 2.
getInitParameterNames()	See note 2.
getAttribute(String)	Managed per HttpContext
getAttributeNames()	Managed per HttpContext
setAttribute(String, Object)	Managed per HttpContext
removeAttribute(String)	Managed per HttpContext
getServletContextName()	See note 3.
Programmatic Web Application configuration methods	See note 4.

### Notes:

- 1. If the argument matches a Servlet registered by the Http Service this method must be handled by the Http Service. Otherwise it must be backed by the Servlet Container.
- 2. In addition to the underlying ServletContext's initialization parameters, the Http Service exposes its own service registration properties as ServletContext initialization parameters.
- 3. By default this method is backed by the Servlet Container. Http Service implementations may opt to implement this method in an implementation specific way such as returning a name for the Http Service.
- 4. These methods for programmatic registration of Servlets, Filters, and Listeners in a Servlet API 3 servlet container always throw UnsupportedOperationException. These methods can only be called in ServletContextListener.contextInitialized methods for listeners managed by the servlet container itself. In the context of Http Service we don't have and support such listeners. All listeners supported are registered in the OSGi service registry and thus controlled by their respective registering bundles.

## 5.1.4.2 Http Sessions

HTTP Sessions are managed by the servlet container separately for each web application with the session ID sent back and forth between client and server as a cookie or as a request parameter. Assuming the session ID cookie, this is attached to the servlet context path.

Implementations of the Http Service must ensure HTTP Sessions are not shared amongst Servlets registered with different servlet contexts. The implementation must make sure to create and destroy the sessions. HTTP Sessions are defined by chapter 7, Sessions, in the Servlet API 3.0 [3]. specification.

## 5.1.4.3 Lifecycle of Request Handling Objects

When the Http Service receives a request it establishes the processing pipeline based on the available services (filters, servlets, and listeners) at this point of time and executes this pipeline. Between establishing the pipeline and finishing the processing, services used in this pipeline might become unregistered. It is up to the implementation of such a service whether it throws a servlet exception if it gets executed in that case or not. (This is basically the same as with the current Http Service and a servlet gets unregistered while it is processing a request).

### 5.1.4.4 Asynchronous Requests

If the implementation supports Servlet API 3.0 (or higher), servlets might use the asynchronous request handling feature. However as the servlet might not be available when the processing continues a servlet exception will be thrown.

A servlet or filter supporting the asynchronous mode must declare this with a service property osgi.http.whiteboard.asyncSupported.

## 5.1.5 Http Service

## 5.1.5.1 Service Registration Properties

The Http Service must expose the following information through its servlet registration properties:

A String+						ports;	
http://192.168	<u>:1.10:8080/</u>	. The re	elevant	inform	ation cor	ntained ir	n the
URLs is the context path							
registered.	4 001710	<i>5</i> (	011101	ontain		ittp Colvi	00 10

The port and address properties may not always be available to the Http Service implementation, particularly in a bridged implementation. In such cases these properties may be omitted from the service registration.

### 5.1.5.2 Configuration

The level of configurability of the Http Service may vary between implementations. Some implementations may allow to configure down to the interface and port level (for example the Jetty based Apache Felix implementation) while others don't allow anything to be configured (for example a bridging implementation where configuration is done in the servlet container).

If an implementation supports configuration, such configuration should be supplied via the Configuration Admin Service.

The framework properties org.osgi.service.http.port and org.osgi.service.http.port.secure apply in the absence of configuration.

## 5.1.5.3 Diagnostics

See chapter 6, Data Transfer Objects, on the diagnostic API. This API only allows for inspection of registered Servlets, resources, Filters, and error page locations.

### 5.1.6 API Version

The Http Service API version is incremented to 1.3.

## 5.1.7 Servlet API Exports

The Http Service implementation bundle is not required to export the Servlet API Java Packages. If it does so, the bundle must obey semantic versioning and support the portable Java Contracts as defined in RFC 180 [4]. The following sections list suggested exports and capabilities.

If the Servlet API is provided by another bundle, it is recommended to export the packages and provide the capabilities as listed.

# 5.1.7.1 Providing Serlvet API 3.0

```
Export-Package: javax.servlet; javax.servlet.http; version=3.0, javax.servlet; javax.servlet.http; version=2.6

Provide-Capability: osgi.contract; osgi.contract=java.servlet; version:Version=3; uses:="javax.servlet, javax.servlet.http", osgi.contract; osgi.contract=java.servlet; version:Version=2.5; uses:="javax.servlet, javax.servlet, javax.servlet; version:Version=2.4; uses:="javax.servlet, javax.servlet.http"
```

### 5.1.7.2 Providing Serlvet API 2.5

```
Export-Package: javax.servlet; javax.servlet.http; version=2.5
Provide-Capability: osgi.contract; osgi.contract=java.servlet;
version:Version=2.5; uses:="javax.servlet, javax.servlet.http",
osgi.contract; osgi.contract=java.servlet;
version:Version=2.4; uses:="javax.servlet, javax.servlet.http"
```

## 5.1.7.3 Providing Serlvet API 2.4

```
Export-Package: javax.servlet; javax.servlet.http; version=2.4 Provide-Capability: osgi.contract; osgi.contract=java.servlet; version:Version=2.4; uses:="javax.servlet, javax.servlet.http"
```

# 5.2 Whiteboard Registration Support

With Whiteboard registration support for Servlets, Listeners, Resources and Filters it is easy to register these web application elements without tracking the Http Service. The information required for the registration is provided with service registration properties.

Servlet, Filter, Listeners, and Resource services may register with a osgi.http.whiteboard.service.target property. This property is a filter expression. A Http Service about to consume a Servlet, Filter, Listener, or Resource must match that filter against his own service registration properties. Only if the filter matches, the Servlet, Filter, Listener or Resource is used by the Http Service. For example a service registered with the property

```
osgi.http.whiteboard.service.target = "(name=Admin)"
```

must only be used by an Http Service exposing the name property set to admin.

Without such a target property all available Http Services are matching. Even if a target property is used, still several Http Services might match. However, a Servlet, Listener, Resource or Filter service must only be used by a single Http Service. To prevent multiple uses a whiteboard support implementation must ensure to register such objects only with a single Http Service by themselve. If more than a single whiteboard support implementation is active at runtime, there is the potential that a servlet, listener, resource or filter is used by more than a single Http Service. In this case such objects should use the target property described above making sure that not more than one Http Service matchs the filter expression.



August 21, 2013

If more than one Http Service is matching and the servlet, filter, resource and listener services are registered with prototype scope (see RFC 195 Service Scopes), this service will be used by all matching Http Services. If more than one Http Service is matching and the servlet, filter, resource and listener services are registered with bundle scope, the service will be used by all matching Http Services registered by different bundles but only with one Http Service from the same bundle.

If more than one Http Service match, e.g, in the absence of the osgi.http.whiteboard.service.target property, any one Http Service may use the service. Which Http Service this is undefined.

The service registration properties of the Http Service using the Servlet, Filter, Listener or Resource service are exposed as ServletContext initialization parameters.

# 5.2.1 Servlet and Filter Registration Pattern

Servlet are registered with a list of patterns in the osgi.http.whiteboard.path service registration property. These patterns are defined by the Servlet API 3.0 specification [3]. in section 12.2, Specification of Mappings:

- A string beginning with a '/' character and ending with a '/\*' suffix is used for path mapping.
- A string beginning with a "\*." prefix is used as an extension mapping.
- The empty string ("") is a special URL pattern that exactly maps to the application's context root, i.e., requests of the form http://host:port/<context- root>/. In this case the path info is '/' and the servlet path and context path is empty string ("").
- A string containing only the '/' character indicates the "default" servlet of the application. In this case the servlet path is the request URI minus the context path and the path info is null.
- All other strings are used for exact matches only.

Servlet filters have been introduced into the Servlet API specification in Version 2.3 and thus far have been missing from the Http Service specification. This update adds support to register Servlets Filters the same as Servlets are registered. In addition to the patterns used for Servlet registration, a filter may be mapped to a specific Servlet by the Servlet's name. The mapping is considered to be a path, if it contains a slash, a '\*' or is the empty string, values not matching these criterias are considered to be a servlet name.

Alternative: two different props for filter registration – one for paths and one for names.

The name of a Servlet is exposed through the <code>ServletConfig.getServletName()</code> method and is defined as follows:

- The value of the osgi.http.whiteboard.name service property (of type String)
- Or the fully qualified name of the Servlet implementation class

### 5.2.2 Http Context for Servlets, Filters and Listeners

By default the whiteboard support is associating servlets, filters, listeners, and resources with the default HttpContext. Additional HttpContexts can be made available through the whiteboard support. In this cases the HttpContext service specifies the osgi.http.whiteboard.context.name service property. This name can be used as a reference by a servlet, filter, listener, or resource. If the HttpContext should be used by services from a different bundle than the bundle which registered the HttpContext, the HttpContext must set the osgi.http.whiteboard.context.shared property to the boolean value true.



August 21, 2013

If there is more than one HttpContext registering itself with the same context name, the HttpService is using the HttpContext with the highest service ranking.

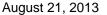
If not specified further, a servlet, filter, listener, or resource using the whiteboard registration is associated with the default HttpContext. The service can be registered with a specific HttpContext by using the osgi.http.whiteboard.context.name service property. If the referenced HttpContext does not exist, or is registered by a different bundle and the osgi.http.whiteboard.context.shared property is not set to the boolean value true, the HttpContext cannot be used and the referencing service is not used by the HttpService.

### 5.2.3 Resources

To register resources through the whiteboard an instance of the org.osgi.service.http.Resource servlet is registered as a regular servlet with the additional osgi.http.whiteboard.prefix servlet registration property. The osgi.http.whiteboard.path property must be a single value prefix pattern. The path property is used as the alias and the prefix property as the name for the registerResources call.

### Example using DS:

```
@Component(property={"osqi.http.whiteboard.context.name=resource-context"})
public class ResourceHttpContext implements HttpContext {
@Component(service = javax.servlet.Servlet.class,
     "osgi.http.whiteboard.path=/files/*",
     "osgi.http.whiteboard.prefix=/tmp",
     "osqi.http.whiteboard.context.name=resource-context"})
public class MyResource extends Resource {
Example:
Dictionary props = new Hashtable();
props.put("osqi.http.whiteboard.context.name", "resource-context");
HttpContext resourceContext = new ResourceHttpContext();
bundleContext.registerService("org.osgi.service.http.HttpContext",
                              resourceContext, props);
props = new Hashtable();
props.put("osgi.http.whiteboard.path", "/files/*");
props.put("osgi.http.whiteboard.prefix", "/tmp");
props.put("osgi.http.whiteboard.context.name", "resource-context");
bundleContext.registerService("javax.servlet.Servlet", new Resource(), props);
is equivalent to:
ServiceReference ref =
              bundleContext.getServiceReference(HttpService.class.getName());
if ( ref != null ) {
   HttpService httpService = (HttpService)btx.getService(ref);
    if ( httpService != null ) {
        HttpContext resourceContext = new ResourceHttpContext();
        httpService.registerResources("/files", "/tmp", resourceContext);
```



# 5.2.4 Event Listeners

Event listeners register themselves under the interface(s) they are implementing, supported are:

- ServletContextListener
- ServletContextAttributeListener
- ServletRequestListener
- ServletReguestAttributeListener
- HttpSessionListener
- HttpSessionAttributeListener
- AsyncListener

Events are sent to all listeners registered in the OSGi service registry based on their registration properties. Each listener is associated with a http context like servlets and filters. The listener might specify the osgi.http.whiteboard.context.name service property to further define the context. The association between a listener and the context is done in the same way as described for servlets and filters.

The http service implementation gets the listeners from the service registry as soon as the associated http context is established and releases them when the context is not available any more or the listener is unregistered.

### 5.2.4.1 ServletContextListener and ServletContextAttributeListener

The ServletContextListener receives events after the Http Service has started and the corresponding context is available and when either the context gets unavailable or the Http Service is about to stop. A newly registered listener will be called with the contextInitialized method either if the context is available or when the context becomes available. As soon as the context or the Http Service gets unavailable, the contextDestroyed method is called. The HttpService keeps the listener as long as the context is available. ServletContextAttributeListeners are kept for the same period of time.

Methods in the ServletContext object handed to the <code>contextInitialized</code> method of a registered ServletContextListener to programmatically register Servlets, Filters, and Listeners are not supported and will always throw <code>UnsupportedOperationException</code>. The particular reason for not supporting these methods is the mismatch between the lifecycle of the servlet container and the lifecycle of the bundle trying to register Servlets, Filters, or Listeners.

If implementations of the Http Service decide to support dynamic registration through the servlet context, they should require a proprietary opt-in mechanism like a manifest header or require capability.

### 5.2.5 Error Pages

A servlet can be marked to be called in case of errors, either if an exception is thrown during request processing or if a servlet uses the sendError method with a status code of 4xx or 5xx.

The service property <code>osgi.http.whiteboard.errorPage</code> can be configured on a servlet, the values can be a http status code or the fully qualified name of an exception. If such a status code is set via sendError or such an exception is thrown, this servlet is invoked to render an error page. However, the service property



osgi.http.whiteboard.errorPage is only evaluated if one value of the osgi.http.whiteboard.path service property contains an absolute path (and not a pattern).

## Example:

```
@Component(service = javax.servlet.Servlet.class,
    property={
        "osgi.http.whiteboard.path=/errors",
        "osgi.http.whiteboard.errorPage=java.io.IOException",
        "osgi.http.whiteboard.errorPage=500"})
public class MyErrorServlet extends HttpServlet {
        ...
}
```

The above servlet is invoked if the status code 500 is sent via sendError or if an IOException occurs.

# 5.2.6 Service Registration Properties

Property	Туре	Description
osgi.http.whiteboard.context.name	String(+	For HttpContext services this property is required and identifies the service when referred to by Servlet or Filter services. Http Context services without this property are ignored. For an HttpContext the type of this property is String+, as the context can be associated with more than one name. For servlet, listener, resource, and filter services this refers to the Http Context service used to register the servlet or filter. If the name Http Context is missing, the default context is used. If no context with the name exists or if the context s registered by another bundle and does not have the osgi.http.whiteboard.context.shared property set to true, the servlet or filter cannot be registered. For a servlet, filter, listener, or resource the type must be String.
osgi.http.whiteboard.context.share d	Boolean	Whether a Http Context service may be used by Servlet or Filter services registered by other bundles. By default Http Context services can only be used by Servlet and Filter services registered by the same bundle.
osgi.http.whiteboard.name	String	The name of a Servlet or Filter registered. This name is used as the value of the ServletConfig.getServletName() and FilterConfig.getFilterName() methods and defaults to the fully qualified name of the service object's class. Filter services may refer to servlets by this name in their osgi.http.whiteboard.path property to apply the filter to a concrete servlet.
osgi.http.whiteboard.path	String+	Registration pattern for the Servlet or Filter. See section 5.2.1, Servlet and Filter Registration Pattern for a description. Servlet or Filter services not registered with this property are ignored.
osgi.http.whiteboard.asyncSupport	Boolean	Declares whether the servlet or filter supports asynchronous operation mode.



osgi.http.whiteboard.errorPage	String+	Register the servlet as an error page for error code and/or exception; the value may be fully qualified exception type or three digit HTTP status code. Any value not being a three digit number is assumed to be a fully qualified class name. This property is only used for servlet services. For this property to be applicable the servlet must be registered with a single value osgi.http.whiteboard.path property being an absolute path. Otherwise the osgi.http.whiteboard.errorPage property must be ignored.
osgi.http.whiteboard.service.targe	String	Servlet or Filter services registered with this property are registered with an Http Service whose service registration properties match this LDAP filter expression.
osgi.http.whiteboard.prefix	String	Registers a mapping from the prefix pattern defined in the single valued osgi.http.whiteboard.path to resources found at the given prefix.

Note: String+ means String, String[] or Collection<String>.

# 5.2.7 Provided Capability

The bundle implementing whiteboard Servlet, Filter, Listener and HttpContext support has to provide the following osqi.whiteboard capability:

```
Provide-Capability: osgi.whiteboard;
   osgi.whiteboard="osgi.http";
   uses:="javax.servlet,javax";
   version:Version="1.3"
```

### 5.2.7.1 osgi.whiteboard Namespace

The whiteboard pattern leverages the OSGi service registry as a registry for objects. In the context of Http Service servlets could be registered directly with the Http Service and the Http Service could manage the registry. Applying the whiteboard pattern the services are registered with the OSGi service registry.

A Whiteboard Consumer is a service that uses the life cycle events from other services to use their functionality when the service is active. It can use metadata (service registration properties) to control its functionality. Whiteboard Providers, registering such services, therefore have a dependency on the Whiteboard Consumer that can be modeled with the osgi.whiteboard namespace. The definition for this namespace can be found in the following table and the WhiteboardNamespace class.

Name	Kind	M/O	Туре	Syntax	Description
osgi.whiteboard	CA	M	String	symbolic-name	A symbolic name for the whiteboard consumer. These names are defined in their respective specifications and should in general use the specification top level package name. For example, org.acme.foo. The OSGi Alliance reserves names that start with osgi.
version	CA	М	Version	version	A version. This version must correspond to the specification of the whiteboard consumer.

Specifications for whiteboard consumers (Http Service, Event Admin, etc.) should specify the values for these attributes. Whiteboard consumers that provide such a capability should list the packages that they use in their specification in the uses directive of that capability to ensure class space consistency. Whiteboard consumers can



consume a whiteboard provider even if that bundle does not require the whiteboard consumer unless the specification explicitly forbids this. For example an OSGi Http Service could declare its capability with the following manifest header:

```
Provide-Capability: osgi.whiteboard;
  osgi.whiteboard="osgi.http";
  uses:="javax.servlet,javax.servlet.http";
  version:Version="1.3"
```

A bundle that depends on a Http Service could require such a whiteboard consumer with the following manifest header:

```
Require-Capability: osgi.whiteboard;
filter:="(&(osgi.whiteboard=osgi.http)(version>=1.3)(!(version>=2.0)))"
```

# 6 Data Transfer Objects

This chapter defines an API to retrieve administrative information from the Http Service. The DTOs are accessed through the Http Service interface:

```
ServletDTO[] getServlets();
Map<String, String> getResources();
FilterDTO[] getFilters();
Map<String, String> getErrorLocations();
```

See the JavaDoc for details.

# 7 Javadoc

August 21, 2013



# **OSGi Javadoc**

15.08.13 13:41

Package Sum	mary	Page
org.osgi.dto.ser vice.http	OSGi Data Transfer Object Http Service Package Version 1.3.	21
org.osgi.servic e.http	Http Service Package Version 1.3.	29

# Package org.osgi.dto.service.http

OSGi Data Transfer Object Http Service Package Version 1.3.

#### See:

**Description** 

Class Summa	ary	Page
<u>FilterDTO</u>	Represents a Filter registered with the HttpService.	22
<u>ListenerDTO</u>	Represents a Listener used by an HttpService.	24
ServletContext DTO	Represents a ServletContext created for registered servlets and filters backed by the <a href="httpContext"><u>HttpContext</u></a> objects used during registration.	25
<u>ServletDTO</u>	Represents a Servlet registered with the <a href="httpService"><u>HttpService</u></a> .	27

# Package org.osgi.dto.service.http Description

OSGi Data Transfer Object Http Service Package Version 1.3.

Bundles wishing to use this package must list the package in the Import-Package header of the bundle's manifest. This package has two types of users: the consumers that use the API in this package and the providers that implement the API in this package.

Example import for consumers using the API in this package:

```
Import-Package: org.osgi.service.http.dto; version="[1.3,2.0)"
```

Example import for providers implementing the API in this package:

```
Import-Package: org.osgi.service.http.dto; version="[1.3,1.4)"
```

OSGi Javadoc -- 23.09.12 Page 21 of 49

# **Class FilterDTO**

### org.osgi.dto.service.http

public class FilterDTO
extends DTO

Represents a Filter registered with the <a href="https://example.com/https://example.c

### Version:

\$Id: c9e5922919c8ff6038850dc5ed2711a0423e1b3e \$

#### **NotThreadSafe**

Field Summary		Pag e
String	The name of the filter as returned by the FilterConfig.getFilterName() method.	22
String[]	The value of the	

Constructor Summary	Pag e
FilterDTO()	23

# **Field Detail**

### paths

public String[] paths

The value of the  $\underline{\text{HttpConstants.HTTP}}$  white  $\underline{\text{MHITEBOARD}}$  path service registration property of the registered javax.servlet.Filter Service.

### See Also:

HttpConstants.HTTP\_WHITEBOARD\_PATH

### name

public String name

The name of the filter as returned by the FilterConfig.getFilterName() method.

## See Also:

HttpConstants.HTTP\_WHITEBOARD\_NAME

OSGi Javadoc -- 23.09.12 Page 22 of 49

## servletContext

public ServletContextDTO servletContext

The  $\underline{\texttt{ServletContextDTO}}$  representing the javax.servlet.ServletContext to which this filter is registered.

# **Constructor Detail**

# **FilterDTO**

public FilterDTO()

OSGi Javadoc -- 23.09.12 Page 23 of 49

# **Class ListenerDTO**

### org.osgi.dto.service.http

public class ListenerDTO
extends DTO

Represents a Listener used by an <a href="https://example.com/http

### Version:

\$Id: c9e5922919c8ff6038850dc5ed2711a0423e1b3e \$

#### **NotThreadSafe**

Field Summary		Pag e
ServletCon textDTO	The ServletContext to which this listener is registered.	24
String	The listener type - this is the full qualified interface name of the corresponding listener interface.	24

Constructor Summary	Pag e
<u>ListenerDTO</u> ()	24

# **Field Detail**

# type

public String type

The listener type - this is the full qualified interface name of the corresponding listener interface.

### servletContext

public <u>ServletContextDTO</u> servletContext

The <u>ServletContextDTO</u> representing the javax.servlet.ServletContext to which this listener is registered.

# **Constructor Detail**

## ListenerDTO

public ListenerDTO()

OSGi Javadoc -- 23.09.12 Page 24 of 49

# Class ServletContextDTO

### org.osgi.dto.service.http

```
public class ServletContextDTO
extends DTO
```

Represents a ServletContext created for registered servlets and filters backed by the <a href="httpContext"><u>HttpContext</u></a> objects used during registration.

### Version:

\$ld: 1a4d0af68f98f053eb5ec5bd14ec3e58d4043027 \$

### NotThreadSafe

Field Summary		Pag e
Map <string ,object=""></string>	Servlet context attributes The value type must be a numerical type, Boolean, String, DTO or an array of any of the former.	26
String	<pre>contextPath The servlet context path returned from the ServletContext.getContextPath() method.</pre>	25
Map <string ,String&gt;</string 	initParams Servlet context initialization parameters	25
String	The name of the servlet context returned from the ServletContext.getServletContextName().	25

Constructor Summary	Pag e
<pre>ServletContextDTO()</pre>	26

# **Field Detail**

# name

public String name

The name of the servlet context returned from the ServletContext.getServletContextName().

### contextPath

public String contextPath

The servlet context path returned from the ServletContext.getContextPath() method.

### initParams

public Map<String,String> initParams

OSGi Javadoc -- 23.09.12 Page 25 of 49

Servlet context initialization parameters

## attributes

public Map<String,Object> attributes

Servlet context attributes The value type must be a numerical type, Boolean, String, DTO or an array of any of the former. Therefore this method will only return the attributes of the servlet context conforming to this constraint.

# **Constructor Detail**

### ServletContextDTO

public ServletContextDTO()

OSGi Javadoc -- 23.09.12 Page 26 of 49

# **Class ServletDTO**

### org.osgi.dto.service.http

public class ServletDTO
extends DTO

Represents a Servlet registered with the <a href="httpService"><u>HttpService</u></a>.

#### Version:

\$Id: 25c610ec71badfe96c9db47f4760322db6c61d3a \$
NotThreadSafe

Field Su	ımmary	Pag e
String	The name of the servlet as returned by the <code>ServletConfig.getServletName()</code> method.	27
String[]	The URL alias used to register the servlet with the HttpService.registerServlet(String, javax.servlet.Servlet, java.util.Dictionary, org.osgi.service.http.HttpContext) method or the value of the HttpConstants.HTTP WHITEBOARD PATH service registration property of the registered javax.servlet.Servlet Service.	27
ServletCon textDTO	ServletContext The ServletDTO representing the ServletContext to which this servlet is registered.	28
String	ServletInfo  The servlet information string returned from the servlet through the Servlet.getServletInfo() method.	28

Constructor Summary	Pag e
<pre>ServletDTO()</pre>	28

# **Field Detail**

# paths

public String[] paths

The URL alias used to register the servlet with the <a href="httpService.registerServlet(String">httpService.registerServlet(String</a>, <a href="mailto:javax.servlet.Servlet">javax.servlet.Servlet</a>, <a href="javax.servlet.Servlet">javax.util.Dictionary</a>, <a href="mailto:org.org.osgi.service.http.HttpContext">org.osgi.service.http.HttpContext</a>) <a href="mailto:method or the value of the HttpConstants.HTTP\_WHITEBOARD\_PATH">httpContext</a>) <a href="mailto:method or the value of the HttpConstants.HTTP\_WHITEBOARD\_PATH</a> service registration property of the registered javax.servlet.Servlet Service.

### See Also:

HttpService.registerServlet(String, javax.servlet.Servlet, java.util.Dictionary,
org.osgi.service.http.HttpContext), HttpConstants.HTTP WHITEBOARD PATH

#### name

public String name

OSGi Javadoc -- 23.09.12 Page 27 of 49

The name of the servlet as returned by the <code>ServletConfig.getServletName()</code> method.

### See Also:

HttpConstants.HTTP WHITEBOARD NAME

## servletInfo

public String servletInfo

The servlet information string returned from the servlet through the <code>Servlet.getServletInfo()</code> method.

# servletContext

public <u>ServletContextDTO</u> servletContext

The  $\underline{\mathtt{ServletDTO}}$  representing the  $\underline{\mathtt{ServletDTO}}$  representation  $\underline{\mathtt{ServletDTO}}$  representing the  $\underline{\mathtt{ServletDTO}}$  representation  $\underline{\mathtt{$ 

# **Constructor Detail**

## **ServletDTO**

public ServletDTO()

OSGi Javadoc -- 23.09.12 Page 28 of 49

# Package org.osgi.service.http

Http Service Package Version 1.3.

### See:

**Description** 

Interface Sum	ımary	Page
HttpContext	This interface defines methods that the Http Service may call to get information about a registration.	33
<u>HttpService</u>	The Http Service allows other bundles in the OSGi environment to dynamically register resources and servlets into the URI namespace of Http Service.	36

Class Summary		Page
<b>HttpConstants</b>	Defines standard names for Http Service constants.	30
Resource	The Resource servlet is a marker servlet which can be used to register resources through the Whiteboard to serve resources through the Http Context with which the Resource is registered.	

Exception Summary		Page
NamespaceEx ception	Deprecated. as of 1.3	40

# Package org.osgi.service.http Description

Http Service Package Version 1.3.

Bundles wishing to use this package must list the package in the Import-Package header of the bundle's manifest. This package has two types of users: the consumers that use the API in this package and the providers that implement the API in this package.

Example import for consumers using the API in this package:

```
Import-Package: org.osgi.service.http; version="[1.3,2.0)"
```

Example import for providers implementing the API in this package:

```
Import-Package: org.osgi.service.http; version="[1.3,1.4)"
```

OSGi Javadoc -- 23.09.12 Page 29 of 49

# **Class HttpConstants**

### org.osgi.service.http

java.lang.Object

└org.osgi.service.http.HttpConstants

final public class HttpConstants
extends Object

Defines standard names for Http Service constants.

Since:

1.3

Version:

\$Id: 4b7be7d793964cb6471df2af7d2cf2da4985e20b \$

Field Su	Field Summary	
static String	Lists URLs to which the Http Service is bound; e.g.	32
static String	For <a href="httpContext">httpContext</a> services this property is required and identifies the service when referred to by Servlet or Filter services.	30
static String	Whether a Http Context service may be used by Servlet or Filter services registered by other bundles.	31
static String	HTTP WHITEBOARD ERROR PAGE  Register the servlet as an error page for error code and/or exception; the value may be fully qualified exception type or three digit HTTP status code.	31
static String	The name of a Servlet or Filter registered.	31
static String	Registration pattern for the Servlet or Filter.	31
static String	HTTP WHITEBOARD PREFIX  Registers a mapping from the prefix pattern defined in the single valued HTTP WHITEBOARD PATH to resources found at the given prefix.	32
static String	HTTP WHITEBOARD TARGET  Servlet or Filter services registered with this property are registered with an Http Service whose service registration properties match this LDAP filter expression.	31

# **Field Detail**

## HTTP\_WHITEBOARD\_CONTEXT\_NAME

public static final String HTTP WHITEBOARD CONTEXT NAME = "osgi.http.whiteboard.context.name"

For <a href="httpContext">httpContext</a> services this property is required and identifies the service when referred to by Servlet or Filter services. Http Context services without this property are ignored. For Servlet and Filter services this refers to the Http Context services used to register the servlet or filter. If the name Http Context is missing or is registered by another bundle and does not have the <a href="http\_whiteboard\_context\_shared">http\_whiteboard\_context\_shared</a> property set to true, the servlet or filter cannot be registered.

The type of this servlet registration property is String.

### See Also:

HTTP\_WHITEBOARD\_CONTEXT\_SHARED

OSGi Javadoc -- 23.09.12 Page 30 of 49

## HTTP WHITEBOARD CONTEXT SHARED

public static final String HTTP\_WHITEBOARD\_CONTEXT\_SHARED
"osgi.http.whiteboard.context.shared"

Whether a Http Context service may be used by Servlet or Filter services registered by other bundles. By default Http Context services can only be used by Servlet and Filter services registered by the same bundle.

The type of this servlet registration property is Boolean.

### See Also:

HTTP\_WHITEBOARD\_CONTEXT\_NAME

# HTTP\_WHITEBOARD\_NAME

public static final String HTTP WHITEBOARD NAME = "osgi.http.whiteboard.name"

The name of a Servlet or Filter registered. This name is used as the value of the <code>ServletConfig.getServletName()</code> and <code>FilterConfig.getFilterName()</code> methods and defaults to the fully qualified name of the service object's class. Filter services may refer to servlets by this name in their <code>http whiteboard path</code> property to apply the filter to a concrete servlet.

The type of this servlet registration property is String.

#### See Also:

HTTP WHITEBOARD PATH

### HTTP WHITEBOARD PATH

public static final String HTTP WHITEBOARD PATH = "osgi.http.whiteboard.path"

Registration pattern for the Servlet or Filter. See section 5.1.2, Servlet and Filter Registration for a description. Servlet or Filter services not registered with this property are ignored.

The type of this servlet registration property is String+.

### HTTP\_WHITEBOARD\_ERROR\_PAGE

public static final String HTTP\_WHITEBOARD\_ERROR\_PAGE = "osgi.http.whiteboard.errorPage"

Register the servlet as an error page for error code and/or exception; the value may be fully qualified exception type or three digit HTTP status code. Any value not being a three digit number is assumed to be a fully qualified class name. This property is only used for Servlet services actually registered. For this property to be applicable the servlet must be registered with a single value <a href="https://exception.org/linearing/

The type of this servlet registration property is String+.

#### See Also:

HTTP WHITEBOARD PATH

## HTTP WHITEBOARD TARGET

public static final String HTTP\_WHITEBOARD\_TARGET = "osgi.http.whiteboard.service.target"

OSGi Javadoc -- 23.09.12 Page 31 of 49

Servlet or Filter services registered with this property are registered with an Http Service whose service registration properties match this LDAP filter expression.

The type of this servlet registration property is String.

## HTTP WHITEBOARD PREFIX

public static final String HTTP WHITEBOARD PREFIX = "osgi.http.whiteboard.prefix"

Registers a mapping from the prefix pattern defined in the single valued <a href="https://example.com/http

The type of this servlet registration property is String.

### See Also:

HTTP WHITEBOARD PATH

# HTTP\_SERVICE\_ENDPOINTS

public static final String HTTP SERVICE ENDPOINTS = "osgi.http.service.endpoints"

Lists URLs to which the Http Service is bound; e.g. http://192.168.1.10:8080/. The relevant information contained in the URLs is the scheme, IP Address of the bound interface, bound port, and the (optional) context path in a Servlet API servlet container the Http Service is registered.

The type of this servlet registration property is String+.

OSGi Javadoc -- 23.09.12 Page 32 of 49

# **Interface HttpContext**

org.osgi.service.http

public interface HttpContext

This interface defines methods that the Http Service may call to get information about a registration.

Servlets and resources may be registered with an HttpContext object; if no HttpContext object is specified, a default HttpContext object is used. Servlets that are registered using the same HttpContext object will share the same ServletContext object.

This interface is implemented by users of the HttpService.

### **ThreadSafe**

Field Summary		Pag e
String	AUTHENTICATION_TYPE  HttpServletRequest attribute specifying the scheme used in authentication.	33
String	AUTHORIZATION  HttpServletRequest attribute specifying the Authorization object obtained from the org.osgi.service.useradmin.UserAdmin Service.	34
String	REMOTE_USER  HttpServletRequest attribute specifying the name of the authenticated user.	33

Method Summary		Pag e
String	<pre>getMimeType (String name) Maps a name to a MIME type.</pre>	35
URL	<pre>getResource (String name) Maps a resource name to a URL.</pre>	35
boolean	<pre>handleSecurity (HttpServletRequest request, HttpServletResponse response) Handles security for the specified request.</pre>	34

# **Field Detail**

## **REMOTE USER**

public static final String REMOTE\_USER = "org.osgi.service.http.authentication.remote.user"

HttpServletRequest attribute specifying the name of the authenticated user. The value of the attribute can be retrieved by HttpServletRequest.getRemoteUser. This attribute name is org.osgi.service.http.authentication.remote.user.

#### Since:

1.1

### **AUTHENTICATION TYPE**

public static final String AUTHENTICATION\_TYPE = "org.osgi.service.http.authentication.type"

 $\label{thm:linear_problem} \begin{tabular}{lll} {\tt HttpServletRequest.attribute.} & \textbf{attribute specifying the scheme used in authentication. The value of the attribute can be retrieved by $\tt HttpServletRequest.getAuthType.$ This attribute name is $\tt org.osgi.service.http.authentication.type.$ \end{tabular}$ 

OSGi Javadoc -- 03.11.12 Page 33 of 49

Since:

1.1

### **AUTHORIZATION**

public static final String AUTHORIZATION = "org.osgi.service.useradmin.authorization"

HttpServletRequest attribute specifying the Authorization object obtained from the org.osgi.service.useradmin.UserAdmin service. The value of the attribute can be retrieved by HttpServletRequest.getAttribute(HttpContext.AUTHORIZATION). This attribute name is org.osgi.service.useradmin.authorization.

Since:

1.1

## **Method Detail**

# handleSecurity

boolean  ${f handle Security}$  (HttpServletRequest request, HttpServletResponse response) throws IOException

Handles security for the specified request.

The Http Service calls this method prior to servicing the specified request. This method controls whether the request is processed in the normal manner or an error is returned.

If the request requires authentication and the Authorization header in the request is missing or not acceptable, then this method should set the WWW-Authenticate header in the response object, set the status in the response object to Unauthorized(401) and return false. See also RFC 2617: HTTP Authentication: Basic and Digest Access Authentication (available at http://www.ietf.org/rfc/rfc2617.txt).

If the request requires a secure connection and the <code>getScheme</code> method in the request does not return 'https' or some other acceptable secure protocol, then this method should set the status in the response object to Forbidden(403) and return <code>false</code>.

When this method returns false, the Http Service will send the response back to the client, thereby completing the request. When this method returns true, the Http Service will proceed with servicing the request.

If the specified request has been authenticated, this method must set the <u>AUTHENTICATION\_TYPE</u> request attribute to the type of authentication used, and the <u>REMOTE\_USER</u> request attribute to the remote user (request attributes are set using the <code>setAttribute</code> method on the request). If this method does not perform any authentication, it must not set these attributes.

If the authenticated user is also authorized to access certain resources, this method must set the <a href="https://documents.org/news-number-24"><u>AUTHORIZATION</u> request attribute to the Authorization object obtained from the org.osgi.service.useradmin.UserAdmin Service.</a>

The servlet responsible for servicing the specified request determines the authentication type and remote user by calling the <code>getAuthType</code> and <code>getRemoteUser</code> methods, respectively, on the request.

### Parameters:

request - the HTTP request
response - the HTTP response

### Returns:

true if the request should be serviced, false if the request should not be serviced and Http Service will send the response back to the client.

### Throws:

 ${\tt IOException}$  - may be thrown by this method. If this occurs, the Http Service will terminate the request and close the socket.

OSGi Javadoc -- 03.11.12 Page 34 of 49

# getResource

URL getResource(String name)

Maps a resource name to a URL.

Called by the Http Service to map a resource name to a URL. For servlet registrations, Http Service will call this method to support the ServletContext methods getResource and getResourceAsStream. For resource registrations, Http Service will call this method to locate the named resource. The context can control from where resources come. For example, the resource can be mapped to a file in the bundle's persistent storage area via bundleContext.getDataFile(name).toURL() or to a resource in the context's bundle via getClass().getResource(name)

#### Parameters:

name - the name of the requested resource

## Returns:

URL that Http Service can use to read the resource or null if the resource does not exist.

## getMimeType

String getMimeType (String name)

Maps a name to a MIME type. Called by the Http Service to determine the MIME type for the name. For servlet registrations, the Http Service will call this method to support the <code>ServletContext</code> method <code>getMimeType</code>. For resource registrations, the Http Service will call this method to determine the MIME type for the Content-Type header in the response.

### Parameters:

name - determine the MIME type for this name.

#### Returns:

MIME type (e.g. text/html) of the name or null to indicate that the Http Service should determine the MIME type itself.

OSGi Javadoc -- 03.11.12 Page 35 of 49

# **Interface HttpService**

org.osgi.service.http

public interface HttpService

The Http Service allows other bundles in the OSGi environment to dynamically register resources and servlets into the URI namespace of Http Service. A bundle may later unregister its resources or servlets.

### See Also:

**HttpContext** 

**ThreadSafe** 

Method	Summary	Pag e
<pre>HttpContex     t</pre>	CreateDefaultHttpContext()  Deprecated. as of 1.3 with no replacement	38
Map <string ,string=""></string>	<pre>getErrorLocations()</pre>	39
FilterDTO[	<pre>getFilters()</pre>	39
<u>ListenerDT</u>	<pre>getListeners()</pre>	39
Map <string ,string=""></string>	Returns the registered resources as a map indexed by the resource alias with the resource prefixes being the values.	39
ServletCon textDTO	<pre>getServletContexts()</pre>	39
ServletDTO []	<pre>getServlets()</pre>	38
void	registerResources (String alias, String name, HttpContext context)  Deprecated. as of 1.3, use the whiteboard pattern registration of resources: Register a Resource instance as a service of type javax.servlet.Servlet adding at least the HttpConstants.HTTP_WHITEBOARD_PATH and HttpConstants.HTTP_WHITEBOARD_PREFIX service registration properties.	37
void	<pre>registerServlet (String alias, Servlet servlet, Dictionary<string,string> initparams, HttpContext context)  Deprecated. as of 1.3, use the whiteboard pattern registration of servlets: Register the servlet as a service of type javax.servlet.Servlet adding at least the HttpConstants.HTTP_WHITEBOARD_PATH service registration property.</string,string></pre>	
void	<pre>unregister(String alias)     Deprecated. as of 1.3 this method can only unregister servlets and resource registered through the deprecated registerServlet(String, Servlet, Dictionary, HttpContext) and registerResources(String, String, HttpContext) methods.</pre>	38

# **Method Detail**

# registerServlet

**Deprecated.** as of 1.3, use the whiteboard pattern registration of servlets: Register the servlet as a service of type <code>javax.servlet.Servlet</code> adding at least the <code>httpConstants.http\_whiteboard\_path</code> service registration property.

OSGi Javadoc -- 03.11.12 Page 36 of 49

Registers a servlet into the URI namespace.

The alias is the name in the URI namespace of the Http Service at which the registration will be mapped.

An alias must begin with slash ('/') and must not end with slash ('/'), with the exception that an alias of the form "/" is used to denote the root alias. See the specification text for details on how HTTP requests are mapped to servlet and resource registrations.

The Http Service will call the servlet's init method before returning.

```
httpService.registerServlet("/myservlet", servlet, initparams, context);
```

Servlets registered with the same HttpContext object will share the same ServletContext. The Http Service will call the context argument to support the ServletContext methods getResource,getResourceAsStream and getMimeType, and to handle security for requests. If the context argument is null, a default HttpContext object is used (see <a href="mailto:created-security-context">created-security-context</a> ()).

#### Parameters:

alias - name in the URI namespace at which the servlet is registered servlet - the servlet object to register

initparams - initialization arguments for the servlet or null if there are none. This argument is used by the servlet's ServletConfig object.

context - the HttpContext object for the registered servlet, or null if a default HttpContext is to be created and used.

#### Throws:

ServletException - if the servlet's init method throws an exception, or the given servlet object has already been registered at a different alias.

NamespaceException - if the registration fails because the alias is already in use.

IllegalArgumentException - if any of the arguments are invalid

## registerResources

**Deprecated.** as of 1.3, use the whiteboard pattern registration of resources: Register a Resource instance as a service of type <code>javax.servlet.Servlet</code> adding at least the <code>httpConstants.http\_whiteboard\_path</code> and <code>httpConstants.http\_whiteboard\_prefix</code> service registration properties.

Registers resources into the URI namespace.

The alias is the name in the URI namespace of the Http Service at which the registration will be mapped. An alias must begin with slash ('/') and must not end with slash ('/'), with the exception that an alias of the form "/" is used to denote the root alias. The name parameter must also not end with slash ('/') with the exception that a name of the form "/" is used to denote the root of the bundle. See the specification text for details on how HTTP requests are mapped to servlet and resource registrations.

For example, suppose the resource name /tmp is registered to the alias /files. A request for /files/foo.txt will map to the resource name /tmp/foo.txt.

```
httpservice.registerResources("/files", "/tmp", context);
```

The Http Service will call the HttpContext argument to map resource names to URLs and MIME types and to handle security for requests. If the HttpContext argument is null, a default HttpContext is used (see <a href="mailto:createDefaultHttpContext">createDefaultHttpContext</a> ()).

#### **Parameters**

```
alias - name in the URI namespace at which the resources are registered
name - the base name of the resources that will be registered
context - the HttpContext object for the registered resources, or null if a default HttpContext is
to be created and used.
```

#### Throws:

<u>NamespaceException</u> - if the registration fails because the alias is already in use.

OSGi Javadoc -- 03.11.12 Page 37 of 49

IllegalArgumentException - if any of the parameters are invalid

#### unregister

@Deprecated
void unregister(String alias)

**Deprecated.** as of 1.3 this method can only unregister servlets and resource registered through the deprecated registerServlet(String, Servlet, Dictionary, HttpContext) and registerResources(String, String, HttpContext) methods.

Unregisters a previous registration done by registerServlet or registerResources methods.

After this call, the registered alias in the URI name-space will no longer be available. If the registration was for a servlet, the Http Service must call the <code>destroy</code> method of the servlet before returning.

If the bundle which performed the registration is stopped or otherwise "unget"s the Http Service without calling <a href="https://www.negister.com/unregiste

#### Parameters:

alias - name in the URI name-space of the registration to unregister

#### Throws:

IllegalArgumentException - if there is no registration for the alias or the calling bundle was not the bundle which registered the alias.

## createDefaultHttpContext

HttpContext createDefaultHttpContext()

**Deprecated.** as of 1.3 with no replacement

Creates a default HttpContext for registering servlets or resources with the HttpService, a new HttpContext object is created each time this method is called.

The behavior of the methods on the default HttpContext is defined as follows:

- 1. getMimeType Does not define any customized MIME types for the Content-Type header in the response, and always returns null.
- 2. handleSecurity Performs implementation-defined authentication on the request.
- 3. getResource Assumes the named resource is in the context bundle; this method calls the context bundle's Bundle.getResource method, and returns the appropriate URL to access the resource. On a Java runtime environment that supports permissions, the Http Service needs to be granted org.osgi.framework.AdminPermission[\*, RESOURCE].

#### Returns:

a default HttpContext object.

Since:

1.1

# **getServlets**

```
ServletDTO[] getServlets()
```

#### Returns:

the registered servlets or null if no servlets are registered.

OSGi Javadoc -- 03.11.12 Page 38 of 49

**Since:** 1.3

See Also:

registerServlet(String, Servlet, Dictionary, HttpContext)

# getResources

Map<String, String> getResources()

Returns the registered resources as a map indexed by the resource alias with the resource prefixes being the values.

Returns:

the registered resources or null if no resources are registered.

Since:

1.3

See Also:

registerResources(String, String, HttpContext)

# getFilters

```
FilterDTO[] getFilters()
```

Returns:

the registered filters or null if no filters are registered.

Since:

1.3

# getErrorLocations

```
Map<String, String> getErrorLocations()
```

Returns:

defined error location mappings or null if no error location mappings have been registered.

Since:

1.3

# getServletContexts

```
ServletContextDTO getServletContexts()
```

Returns:

the registered http contexts or null if no http context has been registered.

Since:

1.3

# getListeners

```
ListenerDTO getListeners()
```

Returns:

the registered listeners or null if no listener has been registered.

Since:

1.3

OSGi Javadoc -- 03.11.12 Page 39 of 49

# **Class NamespaceException**

#### org.osgi.service.http

#### All Implemented Interfaces:

Serializable

```
@Deprecated
public class NamespaceException
extends Exception
```

#### Deprecated.

A NamespaceException is thrown to indicate an error with the caller's request to register a servlet or resources into the URI namespace of the Http Service. This exception indicates that the requested alias already is in use.

Constructor Summary	Pag e
NamespaceException (String message)  Construct a NamespaceException object with a detail message.	40
NamespaceException (String message, Throwable cause)  Construct a NamespaceException object with a detail message and a nested exception.	40

Method	Summary	Pag e
Throwable	getCause ()  Returns the cause of this exception or null if no cause was set.	46
Throwable	getException() Returns the nested exception.	41
Throwable	<u>initCause</u> (Throwable cause)  Initializes the cause of this exception to the specified value.	41

# **Constructor Detail**

## **NamespaceException**

```
public NamespaceException(String message)
```

Construct a NamespaceException object with a detail message.

#### Parameters:

message - the detail message

# **NamespaceException**

Construct a NamespaceException object with a detail message and a nested exception.

OSGi Javadoc -- 03.11.12 Page 40 of 49

#### Parameters:

message - The detail message. cause - The nested exception.

# **Method Detail**

# getException

```
public Throwable getException()
```

Returns the nested exception.

This method predates the general purpose exception chaining mechanism. The getCause() method is now the preferred means of obtaining this information.

#### Returns:

The result of calling getCause().

## getCause

```
public Throwable getCause()
```

Returns the cause of this exception or null if no cause was set.

#### **Overrides:**

getCause in class Throwable

#### Returns:

The cause of this exception or null if no cause was set.

#### Since:

1.2

#### initCause

```
public Throwable initCause(Throwable cause)
```

Initializes the cause of this exception to the specified value.

#### **Overrides:**

initCause in class Throwable

### Parameters:

cause - The cause of this exception.

## Returns:

This exception.

#### Throws:

IllegalArgumentException - If the specified cause is this exception. IllegalStateException - If the cause of this exception has already been set.

#### Since:

1.2

OSGi Javadoc -- 03.11.12 Page 41 of 49

# **Class Resource**

#### org.osgi.service.http

#### All Implemented Interfaces:

Serializable, Servlet, ServletConfig

```
final public class Resource extends GenericServlet
```

The Resource servlet is a marker servlet which can be used to register resources through the Whiteboard to serve resources through the Http Context with which the Resource is registered.

The Resource object is registered as a javax.servlet.Servlet service along with the <a href="httpConstants.HTTP"><u>HttpConstants.HTTP</a> WHITEBOARD PATH</u>, <a href="httpConstants.HTTP"><u>HttpConstants.HTTP</a> WHITEBOARD CONTEXT NAME</u> properties. See the specification text for more details.

Resource extends from GenericServlet and implements the service method with an empty method. Therefore calling the service method on a resource has absolutely no effect.

The default constructor must be used to instantiate new objects, the constructor as well is empty and does not call any other method.

Since:

1.3

Version:

\$Id: 0b578492d62dc4e4f1d5a96399d2de4c43ec9e74 \$

**ThreadSafe** 

Constructor Summary		
Resource ()	42	

Method Summary		Pag e
void service (ServletRequest request, ServletRespo	nse response)	47

## **Constructor Detail**

#### Resource

public Resource()

# **Method Detail**

#### service

#### Specified by:

service in interface Servlet

#### **Overrides:**

service in class GenericServlet

OSGi Javadoc -- 27.01.13 Page 42 of 49

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OSGi Javadoc -- 27.01.13 Page 43 of 49

August 21, 2013



# **OSGi Javadoc**

28.01.13 21:03

Package Sum	mary	Page
org.osgi.names pace.whiteboar d	Whiteboard Namespace Package Version 1.0.	21

# Package org.osgi.namespace.whiteboard

Whiteboard Namespace Package Version 1.0.

#### See:

**Description** 

<b>Class Summ</b>	ary	Page
WhiteboardNa mespace	Whiteboard Capability and Requirement Namespace.	22

# Package org.osgi.namespace.whiteboard Description

Whiteboard Namespace Package Version 1.0.

Bundles should not need to import this package at runtime since all the types in this package just contain constants for capability and requirement namespaces specified by the OSGi Alliance.

OSGi Javadoc -- 23.09.12 Page 45 of 49

# **Class WhiteboardNamespace**

#### org.osgi.namespace.whiteboard

final public class WhiteboardNamespace extends org.osgi.resource.Namespace

Whiteboard Capability and Requirement Namespace.

This class defines the names for the attributes and directives for this namespace. All unspecified capability attributes are of type string and are used as arbitrary matching attributes for the capability. The values associated with the specified directive and attribute keys are of type string, unless otherwise indicated.

#### Version:

\$Id: b23440f15fa24e7c0b0e27896d234d2fc4ecbb3a \$

#### **Immutable**

Field Summary		Pag e
static String	CAPABILITY BUNDLE SYMBOLICNAME ATTRIBUTE  The capability attribute contains the symbolic name of the bundle providing the whiteboard consumer.	23
static String	CHILDIEIT DONDER VERDICK HITTREDOTE	23
static String	CAPABILITY_VERSION_ATTRIBUTE  The capability attribute contains the Version of the specification of the whiteboard consumer.	22
static String	WHITEBOARD_NAMESPACE  Namespace name for whiteboard capabilities and requirements.	22

#### Fields inherited from class org.osgi.resource.Namespace

```
CAPABILITY_EFFECTIVE_DIRECTIVE, CAPABILITY_USES_DIRECTIVE, CARDINALITY_MULTIPLE, CARDINALITY_SINGLE, EFFECTIVE_ACTIVE, EFFECTIVE_RESOLVE, REQUIREMENT_CARDINALITY_DIRECTIVE, REQUIREMENT_FILTER_DIRECTIVE, REQUIREMENT_RESOLUTION_DIRECTIVE, RESOLUTION_MANDATORY, RESOLUTION_OPTIONAL
```

# **Field Detail**

## WHITEBOARD NAMESPACE

public static final String WHITEBOARD NAMESPACE = "osgi.whiteboard"

Namespace name for whiteboard capabilities and requirements.

Also, the capability attribute used to specify the name of the whiteboard consumer.

#### **CAPABILITY VERSION ATTRIBUTE**

public static final String CAPABILITY VERSION ATTRIBUTE = "version"

OSGi Javadoc -- 23.09.12 Page 46 of 49

The capability attribute contains the <code>Version</code> of the specification of the whiteboard consumer. The value of this attribute must be of type <code>Version</code>.

## CAPABILITY\_BUNDLE\_VERSION\_ATTRIBUTE

public static final String CAPABILITY BUNDLE VERSION ATTRIBUTE = "bundle-version"

The capability attribute contains the <code>version</code> of the bundle implementing the whiteboard consumer if one is specified or <code>0.0.0</code> if not specified. The value of this attribute must be of type <code>version</code>.

# CAPABILITY BUNDLE SYMBOLICNAME ATTRIBUTE

public static final String CAPABILITY BUNDLE SYMBOLICNAME ATTRIBUTE = "bundle-symbolic-name"

The capability attribute contains the symbolic name of the bundle providing the whiteboard consumer.

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# 8 Considered Alternatives

#### 8.1 Servlet API Reference Version

This specification is based on Servlet API 3.0. Implementations though are free to be based on any prior or later Servlet API specification. The specification must still be available to implementations in embedded environments which are still mostly based on Java ME corresponding to Java 1.4.

Therefore the specification cannot mandate either Servlet API 2.5 whose specification requires Java 5 or Servlet API 3.0 whose specification requires Java 6 even though none of the API really requires the respective platforms.

# 8.2 New methods to register Servlets and Filters

In addition to the proposed support for Whiteboard style registration of Servlets, Filters, Resources, HttpContexts, and error pages the Http Service API could have been extended to support programmatic support for such registration.

At the CPEG F2F in Austin it was decided that we should only offer one mechanism to register such objects. Since whiteboard pattern allows for simpler code than having to access a service to register with adding new API was dismissed.

OSGi Javadoc -- 23.09.12 Page 47 of 49

# 8.3 Web Application Events

## 8.3.1 Limiting events

Instead of just sending web application events to all event listeners registered in the OSGi service registry it would be conceivable that listeners may register with a <code>osgi.http.service.target</code> service property which defines an LDAP filter to limit the Http Services sending events to the listener service.

I am not sure whether this would really be of use.

#### 8.3.2 Event Admin Service

Servlet Events could be bridged into Event Admin Service events.

I am omitting such bridging right now because I am not sure of its use.

# 8.4 HTTP Sessions

The simplest implementation for HTTP Sessions would be to have a single HTTP Session backed by servlet container and thus shared amongst all Servlets and their servlet contexts. Yet, this would probably be unexpected for these applications which have separate servlet contexts and thus separate attribute value spaces but still share the same HTTP Session.

# 8.5 Resources

Alternatively to the proposed Resource servlet it might be conceivable to have the osgi.http.whiteboard.path and osg.http.whiteboard.prefix properties on an Http Context service to register resources to be served through the given Http Context. In this case the path property must be a prefix pattern. If we support multi-value properties, the pattern and prefix properties must provide the same number of values and they are put together by the same index; i.e.  $path[0] \rightarrow prefix[0]$ ,  $path[1] \rightarrow prefix[1]$ , etc.

While this solution looks appealing, I am not sure, whether there is a conceptual fit between the Http Context service and the resource registration. On the other hand resources are served (resolved actually) through an Http Context, so to register resources an Http Context is always required.

# 9 Security Considerations

Bundles that need to register a servlet, listener, resource filter, or http context must be granted ServicePermission[Interface Name, REGISTER] where interface name is the whiteboard interface the service is registered for.

Bundles that need to iterate the servlets, listeners, resources, filters, or http contexts registered with the system must be granted ServicePermission[interface name, GET] to retrieve the services from the service registry.

In addition if a whiteboard service wants to be associated with a shared http context registered by another bundle, the bundle registering the whiteboard service must be granted ServicePermission[org.osgi.service.http.HttpContext, GET].

OSGi Javadoc -- 23.09.12 Page 48 of 49

# 10 Document Support

# 10.1 References

- [1]. Bradner, S., Key words for use in RFCs to Indicate Requirement Levels, RFC2119, March 1997.
- [2]. Software Requirements & Specifications. Michael Jackson. ISBN 0-201-87712-0
- [3]. Rajiv Mordani, Java Servlet Specification Version 3.0, JSR-315, December 2009
- [4]. Portable Java SE/EE Contracts, RFC 180, work in progress

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# 10.3 Acronyms and Abbreviations

# 10.4 End of Document

OSGi Javadoc -- 23.09.12 Page 49 of 49