RFC 189 Http Whiteboard Service

Draft

79 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 create a new Http Whiteboard Service specification.

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0.3 Feedback

This document can be downloaded from the OSGi Alliance design repository at https://github.com/osgi/design
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0.4 Table of Contents

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	02.11.12	Initial Version Felix Meschberger, Adobe Systems Incorporated, fmeschbe@adobe.com
Update	27.01.12	Update on Feedback from Orlando F2F and BJ Hargrave on the CPEG mailing list. Felix Meschberger, Adobe Systems Incorporated, fmeschbe@adobe.com
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Update	29.07.13	Updated with feedback from CPEG call • Changed handling of multiple whiteboard implementation Carsten Ziegeler, Adobe Systems Incorporated, cziegele@adobe.com

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Update	15.08.13	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
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1 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.

2 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.

3 Problem Description

3.1 Support for dated Servlet API 2.1

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
- 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 queried/introspected.

4 Requirements

4.1 New Http Whiteboard Service API

HS-1 The solution MUST provide a Http Whiteboard Service specification to refer to Servlet API 3.0 specification and define to what extent the Http Whiteboard Service provides support.

HS-2 The solution MUST provide a 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 provide a 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 add support for error page configuration.

HS-5 The solution MUST define how registered servlets and servlet filters are named.

HS-6 The solution MUST clarify ServletContext implementation for both standalone and bridged Http Whiteboard Service implementations.

HS-7 The solution MUST clarify the ServletContext scope of Servlet API listeners registered through the Http Whiteboard Service.

HS-8 The solution MUST define runtime attribute of the Http Whiteboard Service to reflect configuration of the service.

HS-9 The solution MUST define whiteboard registration of servlet services with the Http Whiteboard Service.

HS-10 The solution MUST define whiteboard registration of filter services with the Http Whiteboard Service.

HS-11 The solution MUST define whiteboard registration of servlet listener services with the Http Whiteboard Service.

HS-12 The solution MUST define registration of OSGi HttpContext services used for Servlet and Filter registration.

HS-13 The solution MUST define how servlets, filters, and servlet listener services are matched with Http Whiteboard Service implementations.

HS-14 The solution MUST define whiteboard registration of static resources.

HS-15 The solution MUST define whiteboard registration of error pages.

HS-16 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 Whiteboard Specification consists of three parts:

- Whiteboard Registration support for servlets, servlet filters, listeners, resources and servlet context.
- Http Runtime Service to introspect the current state of the whiteboard service
- Potential Updates to the Http Service specification

The Http Whiteboard Specification provides all the functionality currently covered by the Http Service Specification Version 1.3 with the difference of using the whiteboard pattern instead of a programmatic API.

5.1 New Http Whiteboard Service API

The goal of this specification is to make the registration of more elements of the Web Application Descriptor available to OSGi applications compared to the current Http Service:

- Servlets may be registered with more than one pattern (instead of a single alias)
- Servlet 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 descriptors, MIME type mapping and login configuration iwill be provided through a similar concept as the `HttpContext` interface of the Http Service specification.

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

5.1.1 Servlet API Reference Version

Implementations of the Http Whiteboard Service Specification 1.0 are based on the Servlet API Specification Version 3.0. The implementation may support a higher version than Version 3.0 and must declare this through those methods as well. 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 Whiteboard Service Specification. This is to avoid class path scanning and rather 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 Whiteboard Service Specification may support annotations through an additional proprietary opt-in 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 life cycle. The Http Whiteboard 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 Whiteboard Service specification will generally be backed by actual implementations of the Servlet API specification such as Apache 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 Whiteboard Service implementation will live in a servlet context and all servlets, servlet filters, listeners and resources registered through the Http Whiteboard Service will be backed by the same `ServletContext`. However as explained in the next section, based on the configuration servlets, servlet filters, listeners and resources might get different `ServletContext` objects which delegate certain functionality to the backing context. In the case of a bridged usage the relationship looks like below where ServletContext A is the backing context.

```
Servlet Container 1:n
    Webapp 1:1
        ServletContext[A] 1:1
            Http Service 1:n
                ServletContextHelper 1:1
```

ServletContext[B]

With respect to Web Applications two areas need clarification as to how they are segregated or shared amongst the servlets, servlet filters, listeners and resources:

- ServletContext objects used for servlet and servlet filter initialization
- Http Sessions acquired by servlets and servlet filters through the HttpServletRequest

5.1.4.1 HttpContext, ServletContextHelper 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 Servlet API 3.0 contains functionality which would require an extension of the existing HttpContext interface. As enhancing this interface would require a major version change on the Http Service specification and would break existing implementations of the Http Service and to make this specification independent from the HttpService specificationt this specification introduces a new abstract class ServletContextHelper. Own implementations of this class must inherit from the abstract class and register themselves as ServletContextHelper services.

A ServletContextHelper is also handling resource processing and is therefore usually associated with a bundle to serve resources from a bundle. However, as a ServletContextHelper can be associated with services from different bundles, a ServletContextHelper should be implemented as a ServiceFactory ensuring services from different bundles use a different ServletContextHelper object referencing the bundle of the whiteboarded service. The default ServletContextHelper must be implemented in this way.

Servlets, resources, servlet filters, and listeners are registered with a ServletContextHelper. A ServletContext object is created by the implementation of the Http Whiteboard Service for each ServletContextHelper service with which a whiteboard service is registered. Thus, whiteboard services registered with the same ServletContextHelper object must also share the same ServletContext, even if the ServletContextHelper is registered as a ServiceFactory.

However, the ServletContext instance passed to a whiteboard service may be different for services from different bundles as a proxy is passed on. The proxy handles dispatching resource calls to the correct ServletContextHelper instance and maybe also other methods like the getClassLoader() method (see below table).

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

Method	Implementation
getClassLoader (Servlet API >= 3.0)	This method must return the class loader of the whiteboard service. An implementation of the Http Whiteboard Service can achieve this by returning separate instances of the ServletContext to each whiteboard service. Such an instance would be a facade of the used Servlet Context but has access to the context of the bundle of the whiteboard service.

`getContextPath` (Servlet API >= 2.5)	Backed by Servlet Container and might return ServletContextHelper specific path. See 5.2.2
`getContext(String)`	Backed by Servlet Container. Always returns the backing context
`getMajorVersion()`	Backed by Servlet Container
`getMinorVersion()`	Backed by Servlet Container
`getMimeType(String)`	Backed by `ServletContextHelper`
`getEffectiveMinorVersion()`	Same as `getMinorVersion()`
`getEffectiveMajorVersion()`	Same as `getMajorVersion()`
`getResourcePaths(String)`	Backed by `ServletContextHelper`
`getResource(String)`	Backed by `ServletContextHelper`
`getResourceAsStream()`	Backed by `ServletContextHelper`
`getRequestDispatcher(String)`	See note 1.
`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
`getRealPath(String)`	Backed by `ServletContextHelper`
`getServerInfo()`	Backed by Servlet Container
`getInitParameter(String)`	See note 2.
`getInitParameterNames()`	See note 2.
`getAttribute(String)`	Managed per `ServletContextHelper`
`getAttributeNames()`	Managed per `ServletContextHelper`
`setAttribute(String, Object)`	Managed per `ServletContextHelper`
`removeAttribute(String)`	Managed per `ServletContextHelper`
`getServletContextName()`	See note 3.
Programmatic Web Application configuration methods	See note 4.

Notes:

1. If the argument matches a servlet registered by the Http Whiteboard 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 Whiteboard Service exposes its own service registration properties and runtime attributes as ServletContext initialization parameters.

3. By default this method is backed by the Servlet Container. If the ServletContextHelper has a name, this name is returned.

4. These methods for programmatic registration of servlets, servlet filters, and listeners in a Servlet API 3 servlet container should throw `IllegalStateException`.

5.1.4.2 Http Sessions

HTTP Sessions are defined by chapter 7, Sessions, in the Servlet API 3.0 [3]. specification. 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.

Session handling is usually done by the servlet container outside of the Http Whiteboard Service implementation. Therefore the container manages a single session for the Http Whiteboard Service implementation. The Http Whiteboard Service implementation must make sure to create a wrapper session object for each ServletContextHelper which manages the session attributes as a separate set for each ServletContextHelper.

5.1.4.3 Lifecycle of Request Handling Objects

When the Http Whiteboard 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 the appropriate service property `osgi.http.whiteboard.servlet.asyncSupported` or `osgi.http.whiteboard.filter.asyncSupported`.

5.1.5 Http Runtime Service

The Http Runtime Service provides introspection the current state of the Http Whiteboard Service with respect to used whiteboard services and failed usages of the whiteboard services.

5.1.5.1 Runtime Attributes

The Http Runtime Service implementation must define a set of runtime attributes which can be used by whiteboard services to associate themselves with a specific implementation. This is done via the `osgi.http.whiteboard.target` service property. The runtime attributes can be examined as service properties of the HttpServiceRuntime service registration. The runtime attributes should include the following attribute.

`osgi.http.endpoint`	A String+ value of Http Whiteboard Service endpoints provided as URLs e.g. http://192.168.1.10:8080/ or relative paths, e.g. **/myapp/**.

	Relative paths may be used if the scheme and authority parts of the URLs are not known such as in a bridged Http Whiteboard Service implementation. If the Http Whiteboard Service is serving the root context and neither scheme nor authority is known, the value of the property is "/". Each entry must end with a slash.

5.1.5.2 Configuration

The level of configurability of the Http Whiteboard 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.

This draft explicitly does not define a standard configuration PID for the Http Whiteboard Service implementation to be used as this would prevent scalability/usual implementation patters, like using factory configurations or having multiple Http Whiteboard Service implementations at runtime.

5.1.5.3 Diagnostics

See chapter 6, Data Transfer Objects, on the diagnostic API.

5.1.6 Servlet API Exports

The Http Whiteboard 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 the entry for providing the contract for Servlet API 3.0 and Servlet API 2.5.

If the Servlet API is provided by another bundle, the Http Whiteboard Service implementation is a consumer of that API and should require the contract. The bundle providing the Servlet API should provide the corresponding contract.

5.1.6.1 Providing Serlvet API 3.0

```
Export-Package: javax.servlet; javax.servlet.http, javax.servlet.annotation,
         javax.servlet.descriptor; version=2.6
Provide-Capability: osgi.contract; osgi.contract=JavaServlet;
                   version:List<Version>="2.5,3.0";
  uses:="javax.servlet, javax.servlet.http, javax.servlet.annotation,
         javax.servlet.descriptor"
Providing Serlvet API 2.5
Export-Package: javax.servlet; javax.servlet.http; version=2.5
Provide-Capability: osgi.contract; osgi.contract=JavaServlet;
 version:Version=2.5; uses:="javax.servlet, javax.servlet.http"
```

5.2 Whiteboard Registration Support

With whiteboard registration support for servlets, listeners, resources, servlet filters, and ServletContextHelper services it is easy to register these web application elements without tracking the any service. The information required for the registration is provided with service registration properties.

The following table lists the common properties for whiteboard registration of servlets, listeners, resources and servlet filters. They are explained in more detailed in the next chapters.

Property	Type	Description
`osgi.http.whiteboard.context.select`	String	The value of this service property refers to a `ServletContextHelper` service. If this property is missing, the default context is used. The value must be ~~If the property does start with a (it is used as~~ a filter expression that is matched against the service properties of the ServletContextHelper~~, otherwise it is matched against the name of the ServletContextHelper. The special value "*" selects all available ServletContextHelper services~~. If a value is specified and no matching context exists, the whiteboard service is ignored.This situation is reflected in the failed DTOs. If more than one service matches, the whiteboard service is associated with each matching ServletContextHelper.
`osgi.http.whiteboard.target`	String	The value of this service property is an LDAP filter expression which selects the Http Whiteboard Service implementation to process the whiteboard service.

5.2.1 Target HttpService

Servlet, servlet filter, listener, and resource services may register with a `osgi.http.whiteboard.target` property containing a filter expression. A Http Whiteboard Service about to process a servlet, servlet filter, listener, or resource must match that filter against its runtime attributes. Only if the filter matches, the servlet, servlet filter, listener, or resource is used by the Http Whiteboard Service. For example a whiteboard service registered with the property

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

must only be used by an Http Whiteboard Service with the runtime attribute `osgi.http.implementation.name` having the value `admin`.

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

If more than one Http Whiteboard Service is matching and the servlet, 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 Whiteboard Services. If more than one Http Whiteboard Service is matching and the servlet, servlet filter, resource and listener services are registered with bundle scope, the service will be used by all matching Http

Whiteboard Services registered by different bundles but only with one Http Whiteboard Service from the same bundle.

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

The runtime attributes of the Http Whiteboard Service using the servlet, servlet filter, listener, or resource service are exposed as ServletContext initialization parameters.

5.2.2 ServletContextHelper for servlets, servlet filters, resources, and listeners

By default the whiteboard support is associating servlets, servlet filters, listeners, and resources with the default ServletContextHelper of the targeted Http Whiteboard Service. Additional ServletContextHelper services can be made available through the whiteboard support. In this case the ServletContextHelper service must specify the `osgi.http.whiteboard.context.name` service property. This name can be referenced by a servlet, servlet filter, listener, or resource services. The default ServletContextHelper has the predefined name `default`. If a context is registered with this name, it is overriding the default context. Such a context can be registered with any valid path and is not required to be the root.

If there are multiple, usable ServletContextHelper services registered with the same context name, the Http Whiteboard Service implementation must use the ServletContextHelper with the highest service ranking. This might lead to re-binding the servlet, servlet filter, listener or resource e.g. if a new usable ServletContextHelper with a higher service ranking arrives or the current used ServletContextHelper is unregistered (see section 5.2.3).

If a servlet or servlet filter is used by an Http Whiteboard Service implementation, the implementation calls the init() method of the servlet or servlet filter which gets a configuration object (`ServletConfig` or `FilterContext`) that returns a `ServletContext` object. The Http Whiteboard Service implementation is creating a `ServletContext` object for each `ServletContextHelper` it is using. Therefore servlets and servlet filters used by the same Http Whiteboard Service and referencing the same ServletContextHelper, share the ServletContext object.

Property	Type	Description
`osgi.http.whiteboard.context.name`	String	For `ServletContextHelper` services this property is required and identifies the service when referred to by a whiteboard service. ServletContextHelper services without this property are ignored. The name must follow the symbolic name definition. If the name is invalid, the context is not used and this situation is reflected in the failure DTOs.
`osgi.http.whiteboard.context.path`	String	Required property for defining a context path for the context. The value is either a slash for the root or it must start with a slash but not end with a slash. Valid characters are as defined in rfc3986#section-3.3. If the value is invalid, the context is not used and this situation is reflected in the failure DTOs.

A `ServletContextHelper` is registered with a context path, like in the example below is the default context and two custom contexts registered with different paths.

```
Http Service 1:n
    ServletContextHelper [name=default, path=/]
    ServletContextHelper [name=A, path=/app-a]

    ServletContextHelper [name=B, path=/app-b]
```

Assuming the root of the Http Whiteboard Service is accessible via the path `/myserver`, servlets registered with the above default context helper will be registered under /`myserver`, servlets registered with helper A will be registered under `/myserver/app-a` and servlets registered with helper B will be registered under `/myserver/app-b`. Different ServletContextHelper services with different names may use the same context path property. If there are several contexts for the same path, the one with the highest service ranking is used.

I

When a request is received, the ServletContextHelper with the longest matching path is used for processing the request. The method `handleSecurity(final HttpServletRequest request, final HttpServletResponse response)` from the `ServletContextHelper` object is called before any request listener, filter or servlet is called. If the call to this method returns `false`, no further processing must take place.

The execution pipeline consisting of request listeners, filters and the servlet (see section 5.1.4.3) is assembled of the servlet matching the request and those listeners and filters which match the request. Only services associated with the processing ServletContextHelper are taken into account. Listeners and filters are chained based on their service ranking, highest ranking first.

The using bundle for a `ServletContextHelper` must be the bundle of the whiteboard service – this is in order to correctly support `ServiceFactory` registrations for `ServletContextHelper` services.

5.2.3 Lifecycle of servlets, servlet filters, resources, and listeners

If a servlet, servlet filter, resource or listener service is used by an Http Whiteboard Service implementation, the following order of actions are performed:

1. The service is get from the service registry
2. For servlets and servlet filters, init() is called

If the service is not used anymore, these actions are performed:

1. For servlets and servlet filters, destroy() is called
2. The service is released

As servlet and servlet filters services might come and go as well as `ServletContextHelper` services might come and go, the whiteboard service registration can be very dynamic. Therefore servlet and servlet filter services might transition between used by a Http Whiteboard Service implementation to not being used and back to be used. As in this case, `init()` and `destroy()` are called each time the service is used, the recommended way to register servlet and servlet filter services is to use the prototype scope. In that case a new instance is created for each usage. If the prototype scope is not used, the service should be implemented in a reentrant way and be prepared that after a call of `destroy()` a new initialization through `init()` might follow.

If a servlet or servlet filter is not registered with the prototype scope, it can only be associated with a single `ServletContextHelper` to conform to the Servlet API specification. The service will be used with the first matching `ServletContextHelper` and ignored for further contexts, unless there is a matching ServletContextHelper with a higher service ranking. In this case, a rebind to the context with the higher ranking occurs. The failure DTOs capture the situation of matching servlet context helpers which are not associated to the service. Once such a service is not associated with a `ServletContextHelper` anymore, it is free to be used with another context in the future.

5.2.4 Servlet Registration

Servlets are registered with a list of patterns in the `osgi.http.whiteboard.servlet.pattern` 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.

A servlet may register itself with the property `osgi.http.whiteboard.servlet.name` which can be used by servlet filters to address this servlet. If the servlet does not set this property, the servlet name defaults to the fully qualified class name of the service object. If there is more than one servlet with the same name and also associated with the same ServletContextHelper, then the servlet with the highest service ranking is used and the other servlet is ignored. The same happens if there is more than a single servlet using the exact value for a pattern within the same ServletContextHelper.

If a servlet is used by an Http Whiteboard Service implementation, the init() method of the servlet will be called. Once the servlet is no longer be used by the Http Whiteboard Service implementation the destroy() method will be called. All service registration properties starting with servlet.init. are passed as servlet init parameters to the servlet as well as all runtime attributes of the Http Runtime Service. The service registration properties have precedence over the runtime attributes.

Property	Type	Description
`osgi.http.whiteboard.servlet.name`	String	The name of a servlet. This name is used as the value of the `ServletConfig.getServletName()` method and defaults to the fully qualified name of the service object's class.
`osgi.http.whiteboard.servlet.pattern`	String+	Registration patterns for the servlet.
`osgi.http.whiteboard.servlet.asyncSupported`	Boolean	Declares whether the servlet supports asynchronous operation mode.
`osgi.http.whiteboard.servlet.errorPage`	String+	Register the servlet as an error page for error code and/or exception; the value may be fully qualified exception type, ~~a or~~ three digit HTTP status code or the one of the special values “4xx” or “5xx” to refer to all error codes in the four hundred or five hundred range. Any value not being a three digit number or one of the two special values is assumed to be a fully qualified class name.
servlet.init.*	String+	Properties starting with this prefix are passed as servlet init parameters to the init method of the servlet.

5.2.5 Servlet Filter Registration

Servlet filters have been introduced into the Servlet API specification in Version 2.3 and thus far support for them has been absent in the Http Service specification. This specification adds support to register servlet filters through the whiteboard pattern. A servlet filter can be registered with path patterns like a servlet or a servlet filter may be mapped to a specific servlet by referencing the servlet's name.

A servlet filter can set the `osgi.http.whiteboard.filter.pattern` property to path patterns as defined by the Servlet API 3.0 specification [3]. in section 12.2, Specification of Mappings or a servlet filter can set the `osgi.http.whiteboard.filter.regex` property to regular expressions matched against the path. A servlet filter can also reference servlets by name using the `osgi.http.whiteboard.filter.servlet` property. A servlet filter matches the request if at least one of the provided properties matches.

A servlet filter may register itself with the property `osgi.http.whiteboard.filter.name`. If the servlet filter does not set this property, the servlet filter name defaults to the fully qualified class name of the service object. If there is more than one servlet filter with the same name and also associated with the same ServletContextHelper, then the servlet filter with the highest service ranking is used and the other servlet filter is ignored.

The servlet filter dispatcher configuration can be set with the property `osgi.http.whiteboard.filter.dispatcher`. Allowed string values are REQUEST, ASYNC, ERROR, INCLUDE, and FORWARD. The default for a filter is REQUEST. See Java servlet specification 3.0, Chapter 6.2.5 for more information.

If a servlet filter is used by an Http Whiteboard Service implementation, the init() method of the servlet filter will be called. Once the servlet filter is no longer be used by the Http Whiteboard Service implementation, the destroy() method will be called. All service registration properties starting with filter.init. are passed as init parameters to the filter as well as all runtime attributes of the Http Runtime Service. The service registration properties have precedence over the runtime attributes.

Depending on the service configuration through the `osgi.http.whiteboard.context.select` service property, the servlet filter might be bound to one or more `ServletContextHelper` services. A servlet filter is only run as part of a request targetting a servlet selecting the same `ServletContextHelper`.

Property	Type	Description
`osgi.http.whiteboard.filter.name`	String	The name of a servlet filter. This name is used as the value of the `FilterConfig.getFilterName()` method and defaults to the fully qualified name of the service object's class.
`osgi.http.whiteboard.filter.pattern`	String+	Registration property for a servlet filter to apply this filter to the url paths.
`osgi.http.whiteboard.filter.servlet`	String+	Registration property for a servlet filter to apply this filter to the referenced servlet.
`osgi.http.whiteboard.filter.regex`	String+	Registration property for a servlet filter to apply this filter to the url paths. The values must be regular expressions following the Java syntax defined in java.util.regex.Pattern.
`osgi.http.whiteboard.filter.asyncSupported`	Boolean	Declares whether the servlet filter supports asynchronous operation mode.
`osgi.http.whiteboard.filter.dispatcher`	String+	Registration property for a servlet filter to set the associated dispatcher configuration when the filter

		should be called.
`filter.init.*`	String+	Properties starting with this prefix are passed as filter init parameters to the init method of the filter.

5.2.6 Resources

To register resources through the whiteboard ~~an instance of the type javax.servlet.Servlet~~ a service is registered ~~as a regular servlet~~ with ~~the additional~~both the `osgi.http.whiteboard.resource.prefix` ~~servlet~~ registration property and~~.~~ ~~t~~The `osgi.http.whiteboard.~~servlet~~resource.pattern` property ~~must also be specified~~. The service type can be any type, it is adviced to use the implementation class as the type.

Property	Type	Description
`osgi.http.whiteboard.resource.prefix`	String	This prefix is used to map a requested resource to the bundle's entries.
`osgi.http.whiteboard.resource.pattern`	String+	Registration patterns for resources.

Example using DS:

```
@Component(service = org.osgi.service.http.context.ServletContextHelper.class,
   property={"osgi.http.whiteboard.context.name=resource-context"})
public class ResourceHttpContext extends ServletContextHelper{
    ...
}

package org.osgi.samples;
@Component(service = ~~javax.servlet.Servlet~~org.osgi.samples.MyResource.class,
~~scope=ServiceScope.PROTOTYPE,~~
   property={
     "osgi.http.whiteboard.~~servlet~~resource.pattern=/files/*",
     "osgi.http.whiteboard.resource.prefix=/tmp",
      "osgi.http.whiteboard.context.select=(osgi.http.whiteboard.context.name=resour
ce-context)"})
public class MyResource extends HttpServlet {
    ...
}
```

5.2.7 Event Listeners

Event listeners register themselves under the interface(s) they are implementing. This specification supports:

- ServletContextListener
- ServletContextAttributeListener
- ServletRequestListener
- ServletRequestAttributeListener
- HttpSessionListener
- HttpSessionAttributeListener

Events are sent to all listeners registered in the OSGi service registry based on their registration properties. Each listener is associated with an ServletContextHelper as described in section 5.2.2.

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

5.2.7.1 ServletContextListener and ServletContextAttributeListener

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

Due to the nature of using the whiteboard pattern, a ServletContextListener or ServletContextAttributeListener might be registered after other services like servlets or filters for the same ServletContextHelper. And the listeners might also disappear before other services are unregistered. In this case the ordering of events might not be the same as in a typical web application where the listeners are always called first. If other whiteboard services require a listener to be setup before this whiteboard service is initialized, it needs to create some kind of dependency on the listener to ensure the correct ordering. For example, if Declarative Services is used to implement the whiteboard services, a servlet could have a mandatory reference to the listener service.

A Http Whiteboard Servlet implementation must process registered ServletContextListener and ServletContextAttributeListeners before any other whiteboard service.

Methods in the ServletContext object handed to the `contextInitialized` method of a registered ServletContextListener to programmatically register servlets, servlet filters, and listeners are not supported and should throw `UnsupportedOperationException`. 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 programmatically register Servlets, Filters, or Listeners.

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

5.2.7.2 Supported Non-Whiteboard Listeners

The servlet specification defines some listener interfaces where the listener is not registered through the web.xml or the corresponding api. For example, the HttpSessionActivationListener is supported for objects registered as session attributes. For these types of listeners, whiteboard registration is neither required nor supported. Implementation of this specification support the following listeners:

- HttpSessionActivationListener
- HttpSessionBindingListener
- AsyncListener

5.2.8 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 `osgi.http.whiteboard.servlet.errorPage` can be specified on a servlet service. The property values can be an 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. A servlet serving error page requests does not need to set the `osgi.http.whiteboard.servlet.pattern` service property. If it does so, the servlet can be called by using the path, but might wish to do so to serve regular requests as well.

Example:

```
@Component(service = javax.servlet.Servlet.class, scope=ServiceScope.PROTOTYPE,
   property={
     "osgi.http.whiteboard.servlet.errorPage=java.io.IOException",
     "osgi.http.whiteboard.servlet.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. In general error pages are invoked according to the rules defined in section 10.9.2 in the servlet specification.

If there is more than one error page registered for the same exception or error code within a single ServletContextHelper, the one with the highest service ranking is used.

5.3 Provided Capability

The Http Whiteboard Service implementation bundle must provide the `osgi.whiteboard` capability for “osgi.http”. For example:

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

The Http Whiteboard Service implementation must provide support for all whiteboard service types as outlined in this specification.

5.3.1 *osgi.whiteboard Namespace*

The whiteboard pattern leverages the OSGi service registry as a registry for objects. In the context of Http Whiteboard Service, servlets can be registered as services and the Http Whiteboard Service implementation uses these services to interact with the servlets.

A *Whiteboard Services Consumer* is a bundle that monitors the life cycle events of specific services to use their functionality when the specific services are active. It can use metadata (service properties) to control its functionality. *Whiteboard Services Providers*, register such services, therefore have a dependency on the Whiteboard Services 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	Type	Syntax	Description
osgi.whiteboard	CA	M	String	symbolic-name	A symbolic name for the whiteboard services 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	M	Version	version	A version. This version must correspond to the specification of the whiteboard services consumer.

Specifications for whiteboard services consumers (Http Whiteboard Service, Event Admin, etc.) should specify the values for these attributes. Whiteboard services consumers that provide such a capability should list the packages that they use in their implementation in the uses directive of that capability to ensure class space consistency. Whiteboard services consumers can consume a whiteboard services provider even if that bundle does not require the whiteboard consumer unless the specification explicitly forbids this. For example an Http Whiteboard 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 an Http Whiteboard Service implementation 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)))"
```

5.4 Potential Update of the Http Service

In order to get support for Servlet API 3.0 and support of the runtime inspection, the Http Service specification could be updated at least with the following chapters.

5.4.1 *Supported Servlet API*

The Http Service implementation can supped declaring the supported servlet API as explained in secion 5.1.6.

5.4.2 *Relationship to the Http Runtime Service*

If an Http Service implementation wants to support introspection through the Http Service Runtime service, the Http Service Runtime service must have a service registration property `osgi.http.runtime.httpservice.serviceid` containing the service id of the Http Service service.

As the DTOs contain a field with the service id of the whiteboarded services, in the case of servlets or resources registered via the Http Service, the Http Runtime Service needs to generate unique negative ids for these instances.

5.4.3 *Coexistance of the Http Service and the Http Whiteboard Service*

If an implementation implements both, the Http Service and the Http Whiteboard Service, services registered by any of those means coexist potentially within the same Http context. In the case of a clash between a service registered through the whiteboard pattern and the Http Service, the whiteboard service wins as it has a higher service ranking.

The default Http Context from the Http Service represents the same servlet context as the default ServletContextHelper from the Http Whiteboard service.

6 Data Transfer Objects

This RFC defines an API to retrieve administrative information from the Http Whiteboard Service implementation. The HttpServiceRuntime service is introduced and can be called to obtain various DTOs.

The DTOs for the various services contain the field serviceId. In the case of whiteboard services this value is the value of the service.id property of the corresponding service registration. If the Http Runtime Service supports introspection of an Http Service, for servlets and resources directly registered through the HttpService API, the Http Runtime Service implementation assigns each registration a unique negative service id starting with -1 and decreasing for each registration.

In the case of a clash, e.g. two servlets registered with the same path on the same servlet context, only the service with the highest service id is used. The service(s) with the lower service id(s) are unused. The Http Service Runtime provides DTOs for those unused services as well as failures when using a service like an exception thrown by a servlet from within the init() method in order to find setup problems.

See the JavaDoc for details.

7 Javadoc

OSGi Javadoc

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Package Summary		Page
org.osgi.service.http.context	Http Service Context Package Version 1.0.	28
org.osgi.service.http.runtime	Http Service Runtime Package Version 1.0.	34
org.osgi.service.http.runtime.dto	Http Service Runtime DTO Package Version 1.0.	37
org.osgi.service.http.whiteboard	Http Service Whiteboard Package Version 1.0.	69

Package org.osgi.service.http.context

```
@org.osgi.annotation.versioning.Version(value="1.0")
```

Http Service Context Package Version 1.0.

See:
Description

Class Summary		Page
ServletContext Helper	Helper service for a servlet context used by a Http Whiteboard implementation to serve HTTP requests.	29

Package org.osgi.service.http.context Description

Http Service Context Package Version 1.0.

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.context; version="[1.0,2.0)"
```

Example import for providers implementing the API in this package:

```
Import-Package: org.osgi.service.http.context; version="[1.0,1.1)"
```

Class ServletContextHelper

org.osgi.service.http.context

```
java.lang.Object
  └ org.osgi.service.http.context.ServletContextHelper
```

```
@org.osgi.annotation.versioning.ConsumerType
abstract public class ServletContextHelper
extends Object
```

Helper service for a servlet context used by a Http Whiteboard implementation to serve HTTP requests.

This service defines methods that the Http Whiteboard Implementation may call to get information for a request when dealing with whiteboard services.

Each `ServletContextHelper` is registered with a `service property` containing a name to reference by servlets, servlet filters, resources, and listeners. If there is more than one `ServletContextHelper` registered with the same context name, the one with the highest service ranking is active, the others are inactive.

A context is registered with the `service property` to define a path under which all services registered with this context are reachable. If there is more than one `ServletContextHelper` registered with the same path, the one with the highest service ranking is active, the others are inactive.

Servlets, servlet filters, resources, and listeners services may be `associated` with a `ServletContextHelper` service. If the referenced `ServletContextHelper` service does not exist or is currently not active, the whiteboard services for that `ServletContextHelper` are not active either.

If no `ServletContextHelper` service is associated, that is no `HttpWhiteboardConstants.HTTP_WHITEBOARD_CONTEXT_SELECT` is configured for a whiteboard service, a default `ServletContextHelper` is used.

Those whiteboard services that are associated using the same `ServletContextHelper` object will share the same `ServletContext` object.

The behavior of the methods on the default `ServletContextHelper` 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 bundle of the whiteboard service. This method calls the whiteboard service bundle's `Bundle.getEntry` method, and returns the appropriate URL to access the resource. On a Java runtime environment that supports permissions, the Http Whiteboard Implementation needs to be granted `org.osgi.framework.AdminPermission[*,RESOURCE]`.
4. `getResourcePaths` - Assumes that the resources are in the bundle of the whiteboard service. This method calls `Bundle.findEntries` method, and returns the found entries. On a Java runtime environment that supports permissions, the Http Whiteboard Implementation needs to be granted `org.osgi.framework.AdminPermission[*,RESOURCE]`.
5. `getRealPath` - This method returns `null`.

See Also:
`HttpWhiteboardConstants.HTTP_WHITEBOARD_CONTEXT_NAME`, `HttpWhiteboardConstants.HTTP_WHITEBOARD_CONTEXT_PATH`

ThreadSafe

Field Summary		Page
static String	**AUTHENTICATION_TYPE** `HttpServletRequest` attribute specifying the scheme used in authentication.	30
static String	**AUTHORIZATION** `HttpServletRequest` attribute specifying the `Authorization` object obtained from the `org.osgi.service.useradmin.UserAdmin` service.	30

static String	**REMOTE_USER** HttpServletRequest attribute specifying the name of the authenticated user.	30

Constructor Summary	Page
ServletContextHelper() Default constructor	31
ServletContextHelper(org.osgi.framework.Bundle b) Construct a new context helper and set the bundle associated with this context.	31

	Method Summary	Page
String	**getMimeType**(String name) Maps a name to a MIME type.	32
String	**getRealPath**(String path) Gets the real path corresponding to the given virtual path.	33
URL	**getResource**(String name) Maps a resource name to a URL.	32
Set<String>	**getResourcePaths**(String path) Returns a directory-like listing of all the paths to resources within the web application whose longest sub-path matches the supplied path argument.	32
boolean	**handleSecurity**(HttpServletRequest request, HttpServletResponse response) Handles security for the specified request.	31

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.

AUTHENTICATION_TYPE

```
public static final String AUTHENTICATION_TYPE = "org.osgi.service.http.authentication.type"
```

HttpServletRequest attribute specifying the scheme used in authentication. The value of the attribute can be retrieved by HttpServletRequest.getAuthType. This attribute name is org.osgi.service.http.authentication.type.

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.

Constructor Detail

ServletContextHelper

```
public ServletContextHelper()
```

Default constructor

ServletContextHelper

```
public ServletContextHelper(org.osgi.framework.Bundle b)
```

Construct a new context helper and set the bundle associated with this context.

Parameters:
`b` - The bundle

Method Detail

handleSecurity

```
public boolean handleSecurity(HttpServletRequest request,
                              HttpServletResponse response)
                       throws IOException
```

Handles security for the specified request.

The Http Whiteboard Implementation 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 `getScheme` 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 `false`.

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

If the specified request has been authenticated, this method must set the `AUTHENTICATION_TYPE` request attribute to the type of authentication used, and the `REMOTE_USER` request attribute to the remote user (request attributes are set using the `setAttribute` 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 `AUTHORIZATION` request attribute to the `Authorization` object obtained from the `org.osgi.service.useradmin.UserAdmin` service.

The servlet responsible for servicing the specified request determines the authentication type and remote user by calling the `getAuthType` and `getRemoteUser` 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 Whiteboard Implementation will send the response back to the client.

Throws:
`IOException` - may be thrown by this method. If this occurs, the Http Whiteboard Implementation will terminate the request and close the socket.

---

getResource

```
public URL getResource(String name)
```

Maps a resource name to a URL.

Called by the Http Whiteboard Implementation to map the specified resource name to a URL. For servlets, the Http Whiteboard Implementation will call this method to support the `ServletContext` methods `getResource` and `getResourceAsStream`. For resources, the Http Whiteboard Implementation 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:
A URL that a Http Whiteboard Implementation can use to read the resource or `null` if the resource does not exist.

---

getMimeType

```
public String getMimeType(String name)
```

Maps a name to a MIME type.

Called by the Http Whiteboard Implementation to determine the MIME type for the specified name. For whiteboard services, the Http Whiteboard Implementation will call this method to support the `ServletContext` method `getMimeType`. For resource servlets, the Http Whiteboard Implementation will call this method to determine the MIME type for the `Content-Type` header in the response.

Parameters:
`name` - The name for which to determine the MIME type.
Returns:
The MIME type (e.g. text/html) of the specified name or `null` to indicate that the Http Service should determine the MIME type itself.

---

getResourcePaths

```
public Set<String> getResourcePaths(String path)
```

Returns a directory-like listing of all the paths to resources within the web application whose longest sub-path matches the supplied path argument.

Called by the Http Whiteboard Implementation to support the `ServletContext` method `getResourcePaths` for whiteboard services.

Parameters:
`path` - the partial path used to match the resources, which must start with a /
Returns:
a Set containing the directory listing, or null if there are no resources in the web application whose path begins with the supplied path.

---

getRealPath

```
public String getRealPath(String path)
```

Gets the real path corresponding to the given virtual path.

Called by the Http Whiteboard Implementation to support the `ServletContext` method `getRealPath` for whiteboard services.

Parameters:
`path` - the virtual path to be translated to a real path
Returns:
the real path, or null if the translation cannot be performed

Package org.osgi.service.http.runtime

```
@org.osgi.annotation.versioning.Version(value="1.0")
```

Http Service Runtime Package Version 1.0.

See:
Description

Interface Summary		Page
HttpServiceRuntime	The `HttpServiceRuntime` service represents the runtime information of a Http (Whiteboard) Implementation.	35

Class Summary		Page
HttpServiceRuntimeConstants	Defines standard names for Http Runtime Service constants.	36

Package org.osgi.service.http.runtime Description

Http Service Runtime Package Version 1.0.

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.runtime; version="[1.0,2.0)"
```

Example import for providers implementing the API in this package:

```
Import-Package: org.osgi.service.http.runtime; version="[1.0,1.1)"
```

Interface HttpServiceRuntime

org.osgi.service.http.runtime

```
@org.osgi.annotation.versioning.ProviderType
public interface HttpServiceRuntime
```

The `HttpServiceRuntime` service represents the runtime information of a Http (Whiteboard) Implementation.

It provides access to DTOs representing the current state of the service.

The `HttpServiceRuntime` service must at least be registered with the `HttpServiceRuntimeConstants.HTTP_SERVICE_ENDPOINT_ATTRIBUTE` attribute.

ThreadSafe

Method Summary		Page
RequestInfoDTO	**calculateRequestInfoDTO**(String path) Return a request info DTO containing the services involved with processing a request for the given path.	35
RuntimeDTO	**getRuntimeDTO**() Return the runtime DTO representing the current state.	35

Method Detail

getRuntimeDTO

`RuntimeDTO` **getRuntimeDTO**()

Return the runtime DTO representing the current state.

Returns:
The runtime DTO

---

calculateRequestInfoDTO

`RequestInfoDTO` **calculateRequestInfoDTO**(String path)

Return a request info DTO containing the services involved with processing a request for the given path.

Parameters:
`path` - The request path, relative to the root of the Http (Whiteboard) Service.
Returns:
A request info DTO

Class HttpServiceRuntimeConstants

org.osgi.service.http.runtime

```
java.lang.Object
  └ org.osgi.service.http.runtime.HttpServiceRuntimeConstants
```

```
final public class HttpServiceRuntimeConstants
extends Object
```

Defines standard names for Http Runtime Service constants.

Field Summary		Page
static String	**HTTP_SERVICE_ENDPOINT_ATTRIBUTE** Http Runtime Service registration property specifying the endpoints upon which the Http Service Runtime is listening.	36

Field Detail

HTTP_SERVICE_ENDPOINT_ATTRIBUTE

```
public static final String HTTP_SERVICE_ENDPOINT_ATTRIBUTE = "osgi.http.endpoint"
```

Http Runtime Service registration property specifying the endpoints upon which the Http Service Runtime is listening.

An endpoint value is a URL or a relative path, to which the Http service runtime is listening. For example, `http://192.168.1.10:8080/` or `/myapp/`. A relative path may be used if the scheme and authority parts of the URL are not known, e.g. in a bridged Http Service implementation. If the Http Service implementation is serving the root context and neither scheme nor authority is known, the value of the property is "/". Both, a URL and a relative path, must end with a slash.

An Http Service Runtime can be listening on multiple endpoints.

The value of this attribute must be of type `String`, `String[]`, or `Collection<String>`.

Package org.osgi.service.http.runtime.dto

```
@org.osgi.annotation.versioning.Version(value="1.0")
```

Http Service Runtime DTO Package Version 1.0.

See:
Description

Class Summary		Page
BaseServletDTO	Represents common information about a `javax.servlet.Servlet` service.	38
DTOConstants	Defines standard constants for the DTOs.	40
ErrorPageDTO	Represents a `javax.servlet.Servlet` for handling errors and currently being used by a servlet context.	42
FailedErrorPageDTO	Represents a `javax.servlet.Servlet` service registered as an error page but currently not being used by a servlet context due to a problem.	44
FailedFilterDTO	Represents a servlet `Filter` service which is currently not being used by a servlet context due to a problem.	46
FailedListenerDTO	Represents a listener service which is currently not being used by a servlet context due to a problem.	47
FailedResourceDTO	Represents a resource definition which is currently not being used by a servlet context due to a problem.	48
FailedServletContextDTO	Represents a servlet context that is currently not used due to some problem.	49
FailedServletDTO	Represents a `javax.servlet.Servlet` service which is currently not being used by a servlet context due to a problem.	51
FilterDTO	Represents a servlet `javax.servlet.Filter` service currently being used for by a servlet context.	53
ListenerDTO	Represents a listener currently being used by a servlet context.	56
RequestInfoDTO	Represents the services used to process a specific request.	58
ResourceDTO	Represents a resource definition currently being used by a servlet context.	60
RuntimeDTO	Represents the state of a Http Service Runtime.	62
ServletContextDTO	Represents a `javax.servlet.ServletContext` created for servlets, resources, servlet Filters, and listeners associated with that servlet context.	65
ServletDTO	Represents a `javax.servlet.Servlet` currently being used by a servlet context.	68

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

Http Service Runtime DTO Package Version 1.0.

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.runtime.dto; version="[1.0,2.0)"
```

Example import for providers implementing the API in this package:

```
Import-Package: org.osgi.service.http.runtime.dto; version="[1.0,1.1)"
```

Class BaseServletDTO

org.osgi.service.http.runtime.dto

```
java.lang.Object
  └org.osgi.dto.DTO
      └org.osgi.service.http.runtime.dto.BaseServletDTO
```

Direct Known Subclasses:
ErrorPageDTO, ServletDTO

```
abstract public class BaseServletDTO
extends org.osgi.dto.DTO
```

Represents common information about a `javax.servlet.Servlet` service.

NotThreadSafe

Field Summary		Page
boolean	**asyncSupported** Specifies whether the servlet supports asynchronous processing.	39
Map<String,String>	**initParams** The servlet initialization parameters as provided during registration of the servlet.	39
String	**name** The name of the servlet.	38
long	**serviceId** Service property identifying the servlet.	39
long	**servletContextId** The service id of the servlet context for the servlet represented by this DTO.	39
String	**servletInfo** The information string from the servlet.	38

Constructor Summary	Page
BaseServletDTO()	39

Methods inherited from class org.osgi.dto.DTO
toString

Field Detail

name

```
public String name
```

The name of the servlet. This value is never `null`.

---

servletInfo

```
public String servletInfo
```

The information string from the servlet.

This is the value returned by the `Servlet.getServletInfo()` method.

---

asyncSupported

```
public boolean asyncSupported
```

Specifies whether the servlet supports asynchronous processing.

---

initParams

```
public Map<String,String> initParams
```

The servlet initialization parameters as provided during registration of the servlet. Additional parameters like the Http Service Runtime attributes are not included. If the service has no initialization parameters, the map is empty.

---

servletContextId

```
public long servletContextId
```

The service id of the servlet context for the servlet represented by this DTO.

---

serviceId

```
public long serviceId
```

Service property identifying the servlet. In the case of a servlet registered in the service registry and picked up by a Http Whiteboard Implementation, this value is not negative and corresponds to the service id in the registry. If the servlet has not been registered in the service registry, the value is negative and a unique negative value is generated by the Http Service Runtime in this case.

Constructor Detail

BaseServletDTO

```
public BaseServletDTO()
```

Class DTOConstants

org.osgi.service.http.runtime.dto

```
java.lang.Object
  └ org.osgi.service.http.runtime.dto.DTOConstants
```

```
final public class DTOConstants
extends Object
```

Defines standard constants for the DTOs.

Field Summary		Page
static int	**FAILURE_REASON_EXCEPTION_ON_INIT** An exception occurred during initializing of the service.	41
static int	**FAILURE_REASON_NO_SERVLET_CONTEXT_MATCHING** No matching `ServletContextHelper`.	40
static int	**FAILURE_REASON_SERVICE_ALREAY_USED** The service is not registered as a prototype scoped service and is already used with one servlet context and therefore can't be used with another servlet context.	41
static int	**FAILURE_REASON_SERVICE_NOT_GETTABLE** The service is registered in the service registry but getting the service fails as it returns `null`.	41
static int	**FAILURE_REASON_SERVLET_CONTEXT_FAILURE** Matching `ServletContextHelper`, but the context is not used due to a problem with the context.	41
static int	**FAILURE_REASON_SHADOWED_BY_OTHER_SERVICE** Service is shadowed by another service, e.g. a service with the same registration properties but a higher service ranking.	41
static int	**FAILURE_REASON_UNKNOWN** Failure reason is unknown The value of `FAILURE_REASON_UNKNOWN` is 0.	40
static int	**FAILURE_REASON_VALIDATION_FAILED** The service is registered in the service registry but the provided registration properties are invalid.	41

Field Detail

FAILURE_REASON_UNKNOWN

```
public static final int FAILURE_REASON_UNKNOWN = 0
```

Failure reason is unknown

The value of `FAILURE_REASON_UNKNOWN` is 0.

FAILURE_REASON_NO_SERVLET_CONTEXT_MATCHING

```
public static final int FAILURE_REASON_NO_SERVLET_CONTEXT_MATCHING = 1
```

No matching `ServletContextHelper`.

The value of `FAILURE_REASON_NO_SERVLET_CONTEXT_MATCHING` is 1.

FAILURE_REASON_SERVLET_CONTEXT_FAILURE

```
public static final int FAILURE_REASON_SERVLET_CONTEXT_FAILURE = 2
```

Matching `ServletContextHelper`, but the context is not used due to a problem with the context.

The value of `FAILURE_REASON_SERVLET_CONTEXT_FAILURE` is 2.

FAILURE_REASON_SHADOWED_BY_OTHER_SERVICE

```
public static final int FAILURE_REASON_SHADOWED_BY_OTHER_SERVICE = 3
```

Service is shadowed by another service, e.g. a service with the same registration properties but a higher service ranking.

The value of `FAILURE_REASON_SHADOWED_BY_OTHER_SERVICE` is 3.

FAILURE_REASON_EXCEPTION_ON_INIT

```
public static final int FAILURE_REASON_EXCEPTION_ON_INIT = 4
```

An exception occurred during initializing of the service. This reason can only happen for servlets and servlet filters.

The value of `FAILURE_REASON_EXCEPTION_ON_INIT` is 4.

FAILURE_REASON_SERVICE_NOT_GETTABLE

```
public static final int FAILURE_REASON_SERVICE_NOT_GETTABLE = 5
```

The service is registered in the service registry but getting the service fails as it returns `null`.

The value of `FAILURE_REASON_SERVICE_NOT_GETTABLE` is 5.

FAILURE_REASON_VALIDATION_FAILED

```
public static final int FAILURE_REASON_VALIDATION_FAILED = 6
```

The service is registered in the service registry but the provided registration properties are invalid.

The value of `FAILURE_REASON_VALIDATION_FAILED` is 6.

FAILURE_REASON_SERVICE_ALREAY_USED

```
public static final int FAILURE_REASON_SERVICE_ALREAY_USED = 7
```

The service is not registered as a prototype scoped service and is already used with one servlet context and therefore can't be used with another servlet context.

The value of `FAILURE_REASON_SERVICE_ALREAY_USED` is 7.

Class ErrorPageDTO

org.osgi.service.http.runtime.dto

```
java.lang.Object
  └org.osgi.dto.DTO
      └org.osgi.service.http.runtime.dto.BaseServletDTO
          └org.osgi.service.http.runtime.dto.ErrorPageDTO
```

Direct Known Subclasses:
FailedErrorPageDTO

```
public class ErrorPageDTO
extends BaseServletDTO
```

Represents a `javax.servlet.Servlet` for handling errors and currently being used by a servlet context.

NotThreadSafe

Field Summary		Page
long[]	**errorCodes** The error codes the error page is used for.	42
String[]	**exceptions** The exceptions the error page is used for.	42

Fields inherited from class org.osgi.service.http.runtime.dto.BaseServletDTO
asyncSupported, initParams, name, serviceId, servletContextId, servletInfo

Constructor Summary	Page
ErrorPageDTO()	43

Methods inherited from class org.osgi.dto.DTO
toString

Field Detail

exceptions

```
public String[] exceptions
```

The exceptions the error page is used for. This array might be empty.

---

errorCodes

```
public long[] errorCodes
```

The error codes the error page is used for. This array might be empty.

Constructor Detail

ErrorPageDTO

```
public ErrorPageDTO()
```

Class FailedErrorPageDTO

org.osgi.service.http.runtime.dto

```
java.lang.Object
  └org.osgi.dto.DTO
      └org.osgi.service.http.runtime.dto.BaseServletDTO
          └org.osgi.service.http.runtime.dto.ErrorPageDTO
              └org.osgi.service.http.runtime.dto.FailedErrorPageDTO
```

```
public class FailedErrorPageDTO
extends ErrorPageDTO
```

Represents a `javax.servlet.Servlet` service registered as an error page but currently not being used by a servlet context due to a problem.

As the servlet represented by this DTO is not used due to a failure, the field `BaseServletDTO.servletContextId` always returns `0` and does not point to an existing `ServletContextHelper`.

NotThreadSafe

Field Summary		Page
int	**failureReason** The reason why the servlet represented by this DTO is not used.	44

Fields inherited from class org.osgi.service.http.runtime.dto.ErrorPageDTO
errorCodes, exceptions

Fields inherited from class org.osgi.service.http.runtime.dto.BaseServletDTO
asyncSupported, initParams, name, serviceId, servletContextId, servletInfo

Constructor Summary	Page
FailedErrorPageDTO()	45

Methods inherited from class org.osgi.dto.DTO
toString

Field Detail

failureReason

```
public int failureReason
```

The reason why the servlet represented by this DTO is not used.

See Also:

DTOConstants.FAILURE_REASON_UNKNOWN, DTOConstants.FAILURE_REASON_EXCEPTION_ON_INIT, DTOConstants.FAILURE_REASON_NO_SERVLET_CONTEXT_MATCHING, DTOConstants.FAILURE_REASON_SERVICE_NOT_GETTABLE, DTOConstants.FAILURE_REASON_SERVLET_CONTEXT_FAILURE, DTOConstants.FAILURE_REASON_SHADOWED_BY_OTHER_SERVICE

Constructor Detail

FailedErrorPageDTO

```
public FailedErrorPageDTO()
```

Class FailedFilterDTO

org.osgi.service.http.runtime.dto

```
java.lang.Object
  └org.osgi.dto.DTO
      └org.osgi.service.http.runtime.dto.FilterDTO
          └org.osgi.service.http.runtime.dto.FailedFilterDTO
```

```
public class FailedFilterDTO
extends FilterDTO
```

Represents a servlet `Filter` service which is currently not being used by a servlet context due to a problem.

As the service represented by this DTO is not used due to a failure, the field `FilterDTO.servletContextId` always returns `0` and does not point to an existing servlet context.

NotThreadSafe

Field Summary		Page
int	**failureReason** The reason why the servlet filter represented by this DTO is not used.	46

Fields inherited from class org.osgi.service.http.runtime.dto.FilterDTO
asyncSupported, dispatcher, initParams, name, patterns, regexs, serviceId, servletContextId, servletNames

Constructor Summary	Page
FailedFilterDTO()	46

Methods inherited from class org.osgi.dto.DTO
toString

Field Detail

failureReason

```
public int failureReason
```

The reason why the servlet filter represented by this DTO is not used.

See Also:

DTOConstants.FAILURE_REASON_UNKNOWN, DTOConstants.FAILURE_REASON_EXCEPTION_ON_INIT, DTOConstants.FAILURE_REASON_NO_SERVLET_CONTEXT_MATCHING, DTOConstants.FAILURE_REASON_SERVICE_NOT_GETTABLE, DTOConstants.FAILURE_REASON_SERVLET_CONTEXT_FAILURE, DTOConstants.FAILURE_REASON_SHADOWED_BY_OTHER_SERVICE

Constructor Detail

FailedFilterDTO

```
public FailedFilterDTO()
```

Class FailedListenerDTO

org.osgi.service.http.runtime.dto

```
java.lang.Object
  └org.osgi.dto.DTO
      └org.osgi.service.http.runtime.dto.ListenerDTO
          └org.osgi.service.http.runtime.dto.FailedListenerDTO
```

```
public class FailedListenerDTO
extends ListenerDTO
```

Represents a listener service which is currently not being used by a servlet context due to a problem.

As the listener represented by this DTO is not used due to a failure, the field BaseServletDTO.servletContextId always returns 0 and does not point to an existing servlet context.

NotThreadSafe

Field Summary		Page
int	**failureReason** The reason why the listener represented by this DTO is not used.	47

Fields inherited from class org.osgi.service.http.runtime.dto.ListenerDTO
serviceId, servletContextId, types

Constructor Summary	Page
FailedListenerDTO()	47

Methods inherited from class org.osgi.dto.DTO
toString

Field Detail

failureReason

```
public int failureReason
```

The reason why the listener represented by this DTO is not used.

See Also:

DTOConstants.FAILURE_REASON_UNKNOWN, DTOConstants.FAILURE_REASON_EXCEPTION_ON_INIT, DTOConstants.FAILURE_REASON_NO_SERVLET_CONTEXT_MATCHING, DTOConstants.FAILURE_REASON_SERVICE_NOT_GETTABLE, DTOConstants.FAILURE_REASON_SERVLET_CONTEXT_FAILURE, DTOConstants.FAILURE_REASON_SHADOWED_BY_OTHER_SERVICE

Constructor Detail

FailedListenerDTO

```
public FailedListenerDTO()
```

Class FailedResourceDTO

org.osgi.service.http.runtime.dto

```
java.lang.Object
  └org.osgi.dto.DTO
      └org.osgi.service.http.runtime.dto.ResourceDTO
          └org.osgi.service.http.runtime.dto.FailedResourceDTO
```

```
public class FailedResourceDTO
extends ResourceDTO
```

Represents a resource definition which is currently not being used by a servlet context due to a problem.

As the resource represented by this DTO is not used due to a failure, the field ResourceDTO.servletContextId always returns 0 and does not point to an existing servlet context.

NotThreadSafe

Field Summary		Page
int	**failureReason** The reason why the resource represented by this DTO is not used.	48

Fields inherited from class org.osgi.service.http.runtime.dto.ResourceDTO
patterns, prefix, serviceId, servletContextId

Constructor Summary	Page
FailedResourceDTO()	48

Methods inherited from class org.osgi.dto.DTO
toString

Field Detail

failureReason

```
public int failureReason
```

The reason why the resource represented by this DTO is not used.

See Also:

DTOConstants.FAILURE_REASON_UNKNOWN, DTOConstants.FAILURE_REASON_EXCEPTION_ON_INIT, DTOConstants.FAILURE_REASON_NO_SERVLET_CONTEXT_MATCHING, DTOConstants.FAILURE_REASON_SERVICE_NOT_GETTABLE, DTOConstants.FAILURE_REASON_SERVLET_CONTEXT_FAILURE, DTOConstants.FAILURE_REASON_SHADOWED_BY_OTHER_SERVICE

Constructor Detail

FailedResourceDTO

```
public FailedResourceDTO()
```

Class FailedServletContextDTO

org.osgi.service.http.runtime.dto

```
java.lang.Object
  └org.osgi.dto.DTO
      └org.osgi.service.http.runtime.dto.ServletContextDTO
          └org.osgi.service.http.runtime.dto.FailedServletContextDTO
```

```
public class FailedServletContextDTO
extends ServletContextDTO
```

Represents a servlet context that is currently not used due to some problem. The following fields return an empty array for a `FailedServletContextDTO`:

- ServletContextDTO.servletDTOs
- ServletContextDTO.resourceDTOs
- ServletContextDTO.filterDTOs
- ServletContextDTO.errorPageDTOs
- ServletContextDTO.listenerDTOs

The method ServletContextDTO.attributes returns an empty map for a `FailedServletContextDTO`.

NotThreadSafe

Field Summary		Page
int	**failureReason** The reason why the servlet context represented by this DTO is not used.	49

Fields inherited from class org.osgi.service.http.runtime.dto.ServletContextDTO
attributes, contextName, contextPath, errorPageDTOs, filterDTOs, initParams, listenerDTOs, name, resourceDTOs, serviceId, servletDTOs

Constructor Summary	Page
FailedServletContextDTO()	50

Methods inherited from class org.osgi.dto.DTO
toString

Field Detail

failureReason

```
public int failureReason
```

The reason why the servlet context represented by this DTO is not used.

See Also:

DTOConstants.FAILURE_REASON_UNKNOWN, DTOConstants.FAILURE_REASON_EXCEPTION_ON_INIT, DTOConstants.FAILURE_REASON_NO_SERVLET_CONTEXT_MATCHING, DTOConstants.FAILURE_REASON_SERVICE_NOT_GETTABLE, DTOConstants.FAILURE_REASON_SERVLET_CONTEXT_FAILURE, DTOConstants.FAILURE_REASON_SHADOWED_BY_OTHER_SERVICE

Constructor Detail

FailedServletContextDTO

```
public FailedServletContextDTO()
```

Class FailedServletDTO

org.osgi.service.http.runtime.dto

```
java.lang.Object
  └org.osgi.dto.DTO
      └org.osgi.service.http.runtime.dto.BaseServletDTO
          └org.osgi.service.http.runtime.dto.ServletDTO
              └org.osgi.service.http.runtime.dto.FailedServletDTO
```

```
public class FailedServletDTO
extends ServletDTO
```

Represents a `javax.servlet.Servlet` service which is currently not being used by a servlet context due to a problem.

As the servlet represented by this DTO is not used due to a failure, the field `BaseServletDTO.servletContextId` always returns `0` and does not point to an existing servlet context.

NotThreadSafe

Field Summary		Page
int	**failureReason** The reason why the servlet represented by this DTO is not used.	51

Fields inherited from class org.osgi.service.http.runtime.dto.ServletDTO
patterns

Fields inherited from class org.osgi.service.http.runtime.dto.BaseServletDTO
asyncSupported, initParams, name, serviceId, servletContextId, servletInfo

Constructor Summary	Page
FailedServletDTO()	52

Methods inherited from class org.osgi.dto.DTO
toString

Field Detail

failureReason

```
public int failureReason
```

The reason why the servlet represented by this DTO is not used.

See Also:

DTOConstants.FAILURE_REASON_UNKNOWN, DTOConstants.FAILURE_REASON_EXCEPTION_ON_INIT, DTOConstants.FAILURE_REASON_NO_SERVLET_CONTEXT_MATCHING, DTOConstants.FAILURE_REASON_SERVICE_NOT_GETTABLE, DTOConstants.FAILURE_REASON_SERVLET_CONTEXT_FAILURE, DTOConstants.FAILURE_REASON_SHADOWED_BY_OTHER_SERVICE

Constructor Detail

FailedServletDTO

```
public FailedServletDTO()
```

Class FilterDTO

org.osgi.service.http.runtime.dto

```
java.lang.Object
  └org.osgi.dto.DTO
      └org.osgi.service.http.runtime.dto.FilterDTO
```

Direct Known Subclasses:
FailedFilterDTO

```
public class FilterDTO
extends org.osgi.dto.DTO
```

Represents a servlet `javax.servlet.Filter` service currently being used for by a servlet context.

NotThreadSafe

Field Summary		Page
boolean	**asyncSupported** Specifies whether the servlet filter supports asynchronous processing.	54
String[]	**dispatcher** The dispatcher associations for the servlet filter.	54
Map<String,String>	**initParams** The servlet filter initialization parameters as provided during registration of the servlet filter.	54
String	**name** The name of the servlet filter.	53
String[]	**patterns** The request mappings for the servlet filter.	54
String[]	**regexs** The request mappings for the servlet filter.	54
long	**serviceId** Service property identifying the servlet filter.	55
long	**servletContextId** The service id of the servlet context for the servlet filter represented by this DTO.	55
String[]	**servletNames** The servlet names for the servlet filter.	54

Constructor Summary	Page
FilterDTO()	55

Methods inherited from class org.osgi.dto.DTO
toString

Field Detail

name

```
public String name
```

The name of the servlet filter. This field is never `null`.

patterns

```
public String[] patterns
```

The request mappings for the servlet filter.

The specified patterns are used to determine whether a request is mapped to the servlet filter. This array might be empty.

servletNames

```
public String[] servletNames
```

The servlet names for the servlet filter.

The specified names are used to determine the servlets whose requests are mapped to the servlet filter. This array might be empty.

regexs

```
public String[] regexs
```

The request mappings for the servlet filter.

The specified regular expressions are used to determine whether a request is mapped to the servlet filter. This array might be empty.

asyncSupported

```
public boolean asyncSupported
```

Specifies whether the servlet filter supports asynchronous processing.

dispatcher

```
public String[] dispatcher
```

The dispatcher associations for the servlet filter.

The specified names are used to determine in what occasions the servlet filter is called. This array is never `null`.

initParams

```
public Map<String,String> initParams
```

The servlet filter initialization parameters as provided during registration of the servlet filter. Additional parameters like the Http Service Runtime attributes are not included. If the servlet filter has not initialization parameters, this map is empty.

serviceId

```
public long serviceId
```

Service property identifying the servlet filter. In the case of a servlet filter registered in the service registry and picked up by a Http Whiteboard Implementation, this value is not negative and corresponds to the service id in the registry. If the servlet filter has not been registered in the service registry, the value is negative and a unique negative value is generated by the Http Service Runtime in this case.

---

servletContextId

```
public long servletContextId
```

The service id of the servlet context for the servlet filter represented by this DTO.

Constructor Detail

FilterDTO

```
public FilterDTO()
```

Class ListenerDTO

org.osgi.service.http.runtime.dto

```
java.lang.Object
  └org.osgi.dto.DTO
      └org.osgi.service.http.runtime.dto.ListenerDTO
```

Direct Known Subclasses:
FailedListenerDTO

```
public class ListenerDTO
extends org.osgi.dto.DTO
```

Represents a listener currently being used by a servlet context.

NotThreadSafe

Field Summary		Page
long	**serviceId** Service property identifying the listener.	56
long	**servletContextId** The service id of the servlet context for the listener represented by this DTO.	57
String[]	**types** The fully qualified type names the listener.	56

Constructor Summary	Page
ListenerDTO()	57

Methods inherited from class org.osgi.dto.DTO
toString

Field Detail

types

```
public String[] types
```

The fully qualified type names the listener. This array is never empty.

---

serviceId

```
public long serviceId
```

Service property identifying the listener. In the case of a Listener registered in the service registry and picked up by a Http Whiteboard Implementation, this value is not negative and corresponds to the service id in the registry. If the listener has not been registered in the service registry, the value is negative and a unique negative value is generated by the Http Service Runtime in this case.

---

servletContextId

```
public long servletContextId
```

The service id of the servlet context for the listener represented by this DTO.

Constructor Detail

ListenerDTO

```
public ListenerDTO()
```

Class RequestInfoDTO

org.osgi.service.http.runtime.dto

```
java.lang.Object
  └org.osgi.dto.DTO
      └org.osgi.service.http.runtime.dto.RequestInfoDTO
```

```
public class RequestInfoDTO
extends org.osgi.dto.DTO
```

Represents the services used to process a specific request.

NotThreadSafe

Field Summary		Page
FilterDTO[]	**filterDTOs** The servlet filters processing this request.	58
String	**path** The path of the request relative to the root.	58
ResourceDTO	**resourceDTO** The resource processing this request.	59
long	**servletContextId** The service id of the servlet context processing the request represented by this DTO.	58
ServletDTO	**servletDTO** The servlet processing this request.	59

Constructor Summary	Page
RequestInfoDTO()	59

Methods inherited from class org.osgi.dto.DTO
toString

Field Detail

path

```
public String path
```

The path of the request relative to the root.

---

servletContextId

```
public long servletContextId
```

The service id of the servlet context processing the request represented by this DTO.

---

filterDTOs

```
public FilterDTO[] filterDTOs
```

The servlet filters processing this request. If no servlet filters are called for processing this request, an empty array is returned.

---

servletDTO

```
public ServletDTO servletDTO
```

The servlet processing this request. If the request is processed by a servlet, this field points to the DTO of the servlet. If the request is processed by another type of component like a resource, this field is `null`.

---

resourceDTO

```
public ResourceDTO resourceDTO
```

The resource processing this request. If the request is processed by a resource, this field points to the DTO of the resource. If the request is processed by another type of component like a servlet, this field is `null`.

Constructor Detail

RequestInfoDTO

```
public RequestInfoDTO()
```

Class ResourceDTO

org.osgi.service.http.runtime.dto

```
java.lang.Object
  └org.osgi.dto.DTO
      └org.osgi.service.http.runtime.dto.ResourceDTO
```

Direct Known Subclasses:
FailedResourceDTO

```
public class ResourceDTO
extends org.osgi.dto.DTO
```

Represents a resource definition currently being used by a servlet context.

NotThreadSafe

Field Summary		Page
String[]	**patterns** The request mappings for the resource.	60
String	**prefix** The prefix of the resource.	60
long	**serviceId** Service property identifying the resource.	61
long	**servletContextId** The service id of the servlet context for the resource represented by this DTO.	61

Constructor Summary	Page
ResourceDTO()	61

Methods inherited from class org.osgi.dto.DTO
toString

Field Detail

patterns

```
public String[] patterns
```

The request mappings for the resource.

The specified patterns are used to determine whether a request is mapped to the resource. This value is never `null`.

---

prefix

```
public String prefix
```

The prefix of the resource.

---

serviceId

```
public long serviceId
```

Service property identifying the resource. In the case of a resource registered in the service registry and picked up by a Http Whiteboard Implementation, this value is not negative and corresponds to the service id in the registry. If the resource has not been registered in the service registry, the value is negative and a unique negative value is generated by the Http Service Runtime in this case.

---

servletContextId

```
public long servletContextId
```

The service id of the servlet context for the resource represented by this DTO.

Constructor Detail

ResourceDTO

```
public ResourceDTO()
```

Class RuntimeDTO

org.osgi.service.http.runtime.dto

```
java.lang.Object
  └org.osgi.dto.DTO
      └org.osgi.service.http.runtime.dto.RuntimeDTO
```

```
public class RuntimeDTO
extends org.osgi.dto.DTO
```

Represents the state of a Http Service Runtime.

NotThreadSafe

Field Summary		Page
Map<String,String>	**attributes** The runtime attributes.	62
FailedErrorPageDTO[]	**failedErrorPageDTOs** Returns the representations of the error page `javax.servlet.Servlet` services associated with this runtime but currently not used due to some problem.	63
FailedFilterDTO[]	**failedFilterDTOs** Returns the representations of the servlet `javax.servlet.Filter` services associated with this runtime but currently not used due to some problem.	63
FailedListenerDTO[]	**failedListenerDTOs** Returns the representations of the listeners associated with this runtime but currently not used due to some problem.	63
FailedResourceDTO[]	**failedResourceDTOs** Returns the representations of the resources associated with this runtime but currently not used due to some problem.	63
FailedServletContextDTO[]	**failedServletContextDTOs** Returns the representations of the `javax.servlet.ServletContext` objects currently not used by the Http service runtime due to some problem.	63
FailedServletDTO[]	**failedServletDTOs** Returns the representations of the `javax.servlet.Servlet` services associated with this runtime but currently not used due to some problem.	63
ServletContextDTO[]	**servletContextDTOs** Returns the representations of the `javax.servlet.ServletContext` objects used by the Http Service Runtime.	63

Constructor Summary	Page
RuntimeDTO()	64

Methods inherited from class org.osgi.dto.DTO
toString

Field Detail

attributes

```
public Map<String,String> attributes
```

The runtime attributes. This value is never `null`.

servletContextDTOs

public ServletContextDTO[] **servletContextDTOs**

Returns the representations of the `javax.servlet.ServletContext` objects used by the Http Service Runtime. The returned array may be empty if the Http Service Runtime is currently not using any `javax.servlet.ServletContext` objects.

failedServletContextDTOs

public FailedServletContextDTO[] **failedServletContextDTOs**

Returns the representations of the `javax.servlet.ServletContext` objects currently not used by the Http service runtime due to some problem. The returned array may be empty.

failedServletDTOs

public FailedServletDTO[] **failedServletDTOs**

Returns the representations of the `javax.servlet.Servlet` services associated with this runtime but currently not used due to some problem. The returned array may be empty.

failedResourceDTOs

public FailedResourceDTO[] **failedResourceDTOs**

Returns the representations of the resources associated with this runtime but currently not used due to some problem. The returned array may be empty.

failedFilterDTOs

public FailedFilterDTO[] **failedFilterDTOs**

Returns the representations of the servlet `javax.servlet.Filter` services associated with this runtime but currently not used due to some problem. The returned array may be empty.

failedErrorPageDTOs

public FailedErrorPageDTO[] **failedErrorPageDTOs**

Returns the representations of the error page `javax.servlet.Servlet` services associated with this runtime but currently not used due to some problem. The returned array may be empty.

failedListenerDTOs

public FailedListenerDTO[] **failedListenerDTOs**

Returns the representations of the listeners associated with this runtime but currently not used due to some problem. The returned array may be empty.

Constructor Detail

RuntimeDTO

```
public RuntimeDTO()
```

Class ServletContextDTO

org.osgi.service.http.runtime.dto

```
java.lang.Object
  └ org.osgi.dto.DTO
      └ org.osgi.service.http.runtime.dto.ServletContextDTO
```

Direct Known Subclasses:
FailedServletContextDTO

```
public class ServletContextDTO
extends org.osgi.dto.DTO
```

Represents a `javax.servlet.ServletContext` created for servlets, resources, servlet Filters, and listeners associated with that servlet context. The Servlet Context is usually backed by a `ServletContextHelper` service.

NotThreadSafe

Field Summary		Page
Map<String,Object>	**attributes** The servlet context attributes.	66
String	**contextName** The context name of the servlet context.	66
String	**contextPath** The servlet context path.	66
ErrorPageDTO[]	**errorPageDTOs** Returns the representations of the error page `Servlet` services associated with this context.	67
FilterDTO[]	**filterDTOs** Returns the representations of the servlet `Filter` services associated with this context.	67
Map<String,String>	**initParams** The servlet context initialization parameters.	66
ListenerDTO[]	**listenerDTOs** Returns the representations of the listener services associated with this context.	67
String	**name** The name of the servlet context.	66
ResourceDTO[]	**resourceDTOs** Returns the representations of the resource services associated with this context.	67
long	**serviceId** Service property identifying the servlet context.	66
ServletDTO[]	**servletDTOs** Returns the representations of the `Servlet` services associated with this context.	67

Constructor Summary	Page
ServletContextDTO()	67

Methods inherited from class org.osgi.dto.DTO
toString

Field Detail

name

```
public String name
```

The name of the servlet context. The name of the corresponding ServletContextHelper.

---

contextName

```
public String contextName
```

The context name of the servlet context.

This is the value returned by the `ServletContext.getServletContextName()` method.

---

contextPath

```
public String contextPath
```

The servlet context path. This is the value returned by the `ServletContext.getContextPath()` method.

---

initParams

```
public Map<String,String> initParams
```

The servlet context initialization parameters. This is the set of parameters provided when registering this context. Additional parameters like the Http Service Runtime attributes are not included. If the context has no initialization parameters, this map is empty.

---

attributes

```
public Map<String,Object> attributes
```

The 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. Other attributes are omitted. If there are no attributes conforming to the constraint, an empty map is returned.

---

serviceId

```
public long serviceId
```

Service property identifying the servlet context. In the case of a servlet context backed by a `ServletContextHelper` registered in the service registry and picked up by a Http Whiteboard Implementation, this value is not negative and corresponds to the service id in the registry. If the servlet context is not backed by a service registered in the service registry, the value is negative and a unique negative value is generated by the Http Service Runtime in this case.

---

servletDTOs

public ServletDTO[] **servletDTOs**

Returns the representations of the `Servlet` services associated with this context. The representations of the `Servlet` services associated with this context. The returned array may be empty if this context is currently not associated with any `Servlet` services.

---

resourceDTOs

public ResourceDTO[] **resourceDTOs**

Returns the representations of the resource services associated with this context. The representations of the resource services associated with this context. The returned array may be empty if this context is currently not associated with any resource services.

---

filterDTOs

public FilterDTO[] **filterDTOs**

Returns the representations of the servlet `Filter` services associated with this context. The representations of the servlet `Filter` services associated with this context. The returned array may be empty if this context is currently not associated with any servlet `Filter` services.

---

errorPageDTOs

public ErrorPageDTO[] **errorPageDTOs**

Returns the representations of the error page `Servlet` services associated with this context. The representations of the error page `Servlet` services associated with this context. The returned array may be empty if this context is currently not associated with any error pages.

---

listenerDTOs

public ListenerDTO[] **listenerDTOs**

Returns the representations of the listener services associated with this context. The representations of the listener services associated with this context. The returned array may be empty if this context is currently not associated with any listener services.

Constructor Detail

ServletContextDTO

public **ServletContextDTO**()

Class ServletDTO

org.osgi.service.http.runtime.dto

```
java.lang.Object
  └org.osgi.dto.DTO
      └org.osgi.service.http.runtime.dto.BaseServletDTO
          └org.osgi.service.http.runtime.dto.ServletDTO
```

Direct Known Subclasses:
FailedServletDTO

```
public class ServletDTO
extends BaseServletDTO
```

Represents a `javax.servlet.Servlet` currently being used by a servlet context.

NotThreadSafe

Field Summary		Page
String[]	**patterns** The request mappings for the servlet.	68

Fields inherited from class org.osgi.service.http.runtime.dto.BaseServletDTO
asyncSupported, initParams, name, serviceId, servletContextId, servletInfo

Constructor Summary	Page
ServletDTO()	68

Methods inherited from class org.osgi.dto.DTO
toString

Field Detail

patterns

```
public String[] patterns
```

The request mappings for the servlet.

The specified patterns are used to determine whether a request is mapped to the servlet. This array is never empty.

Constructor Detail

ServletDTO

```
public ServletDTO()
```

Package org.osgi.service.http.whiteboard

```
@org.osgi.annotation.versioning.Version(value="1.0")
```

Http Service Whiteboard Package Version 1.0.

See:
[Description]

Class Summary		Page
HttpWhiteboardConstants	Defines standard constants for the whiteboard services.	70

Package org.osgi.service.http.whiteboard Description

Http Service Whiteboard Package Version 1.0.

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.whiteboard; version="[1.0,2.0)"
```

Example import for providers implementing the API in this package:

```
Import-Package: org.osgi.service.http.whiteboard; version="[1.0,1.1)"
```

Class HttpWhiteboardConstants

org.osgi.service.http.whiteboard

```
java.lang.Object
  └ org.osgi.service.http.whiteboard.HttpWhiteboardConstants
```

```
final public class HttpWhiteboardConstants
extends Object
```

Defines standard constants for the whiteboard services.

Field Summary		Page
static String	**DISPATCHER_ASYNC** Possible value for the HTTP_WHITEBOARD_FILTER_DISPATCHER property indicating the servlet filter is applied in the asynchronous context.	75
static String	**DISPATCHER_ERROR** Possible value for the HTTP_WHITEBOARD_FILTER_DISPATCHER property indicating the servlet filter is applied when an error page is called.	75
static String	**DISPATCHER_FORWARD** Possible value for the HTTP_WHITEBOARD_FILTER_DISPATCHER property indicating the servlet filter is applied to forward calls to the dispatcher.	75
static String	**DISPATCHER_INCLUDE** Possible value for the HTTP_WHITEBOARD_FILTER_DISPATCHER property indicating the servlet filter is applied to include calls to the dispatcher.	75
static String	**DISPATCHER_REQUEST** Possible value for the HTTP_WHITEBOARD_FILTER_DISPATCHER property indicating the servlet filter is applied to client requests.	75
static String	**HTTP_WHITEBOARD_CONTEXT_NAME** Service property specifying the name of an ServletContextHelper service.	71
static String	**HTTP_WHITEBOARD_CONTEXT_PATH** Service property specifying the path of an ServletContextHelper service.	71
static String	**HTTP_WHITEBOARD_CONTEXT_SELECT** Service property referencing a ServletContextHelper service.	72
static String	**HTTP_WHITEBOARD_DEFAUT_CONTEXT_NAME** The name of the default ServletContextHelper.	71
static String	**HTTP_WHITEBOARD_FILTER_ASYNC_SUPPORTED** Service property specifying whether a servlet Filter service supports asynchronous processing.	74
static String	**HTTP_WHITEBOARD_FILTER_DISPATCHER** Service property specifying the dispatcher handling of a servlet Filter.	74
static String	**HTTP_WHITEBOARD_FILTER_NAME** Service property specifying the servlet filter name of a Filter service.	73
static String	**HTTP_WHITEBOARD_FILTER_PATTERN** Service property specifying the request mappings for a Filter service.	73
static String	**HTTP_WHITEBOARD_FILTER_REGEX** Service property specifying the request mappings for a servlet Filter service.	74
static String	**HTTP_WHITEBOARD_FILTER_SERVLET** Service property specifying the servlet names for a servlet Filter service.	74
static String	**HTTP_WHITEBOARD_RESOURCE_PATTERN** Service property specifying the request mappings for resources.	76
static String	**HTTP_WHITEBOARD_RESOURCE_PREFIX** Service property specifying the resource entry prefix for a resource service.	76

static String	**HTTP_WHITEBOARD_SERVLET_ASYNC_SUPPORTED** Service property specifying whether a `Servlet` service supports asynchronous processing.	73
static String	**HTTP_WHITEBOARD_SERVLET_ERROR_PAGE** Service property specifying whether a `Servlet` service acts as an error page.	73
static String	**HTTP_WHITEBOARD_SERVLET_NAME** Service property specifying the servlet name of a `Servlet` service.	72
static String	**HTTP_WHITEBOARD_SERVLET_PATTERN** Service property specifying the request mappings for a `Servlet` service.	72
static String	**HTTP_WHITEBOARD_TARGET** Service property specifying the target filter to select the Http Whiteboard Implementation to process the service.	76

Field Detail

HTTP_WHITEBOARD_CONTEXT_NAME

```
public static final String HTTP_WHITEBOARD_CONTEXT_NAME = "osgi.http.whiteboard.context.name"
```

Service property specifying the name of an `ServletContextHelper` service.

For `ServletContextHelper` services, this service property must be specified. Context services without this service property are ignored.

Servlet, listener, servlet filter, and resource services might refer to a specific `ServletContextHelper` service referencing the name with the `HTTP_WHITEBOARD_CONTEXT_SELECT` property.

For `ServletContextHelper` services, the value of this service property must be of type `String`. The value must follow the "symbolic-name" specification from Section 1.3.2 of the OSGi Core Specification.

See Also:
`HTTP_WHITEBOARD_CONTEXT_PATH`, `HTTP_WHITEBOARD_CONTEXT_SELECT`, `HTTP_WHITEBOARD_DEFAUT_CONTEXT_NAME`

HTTP_WHITEBOARD_DEFAUT_CONTEXT_NAME

```
public static final String HTTP_WHITEBOARD_DEFAUT_CONTEXT_NAME = "default"
```

The name of the default `ServletContextHelper`. If a service is registered with this property, it is overriding the default context with a custom provided context.

See Also:
`HTTP_WHITEBOARD_CONTEXT_NAME`

HTTP_WHITEBOARD_CONTEXT_PATH

```
public static final String HTTP_WHITEBOARD_CONTEXT_PATH = "osgi.http.whiteboard.context.path"
```

Service property specifying the path of an `ServletContextHelper` service.

For `ServletContextHelper` services this service property is required. Context services without this service property are ignored.

This property defines a context path under which all whiteboard services associated with this context are registered. Having different contexts with different paths allows to separate the URL space.

For ServletContextHelper services, the value of this service property must be of type String. The value is either a slash for the root or it must start with a slash but not end with a slash. Valid characters are defined in rfc3986#section-3.3. Contexts with an invalid path are ignored.

See Also:
HTTP_WHITEBOARD_CONTEXT_NAME, HTTP_WHITEBOARD_CONTEXT_SELECT

HTTP_WHITEBOARD_CONTEXT_SELECT

```
public static final String HTTP_WHITEBOARD_CONTEXT_SELECT = "osgi.http.whiteboard.context.select"
```

Service property referencing a ServletContextHelper service.

For servlet, listener, servlet filter, or resource services, this service property refers to the associated ServletContextHelper service. The value of this property is a filter expression which is matched against the service registration properties of the ServletContextHelper service. If this service property is not specified, the default context is used. If there is no context service matching, the servlet, listener, servlet filter, or resource service is ignored.

For example, if a whiteboard service wants to select a servlet context helper with the name "Admin" the expression would be "(osgi.http.whiteboard.context.name=Admin)". Selecting all contexts could be done with "(osgi.http.whiteboard.context.name=*)".

For servlet, listener, servlet filter, or resource services, the value of this service property must be of type String.

See Also:
HTTP_WHITEBOARD_CONTEXT_NAME, HTTP_WHITEBOARD_CONTEXT_PATH

HTTP_WHITEBOARD_SERVLET_NAME

```
public static final String HTTP_WHITEBOARD_SERVLET_NAME = "osgi.http.whiteboard.servlet.name"
```

Service property specifying the servlet name of a Servlet service.

This name is used as the value for the ServletConfig.getServletName() method. If this service property is not specified, the fully qualified name of the service object's class is used as the servlet name. Filter services may refer to servlets by this name in their HTTP_WHITEBOARD_FILTER_SERVLET service property to apply the filter to the servlet.

Servlet names must be unique among all servlet services associated with a single ServletContextHelper. If multiple servlet services associated with the same HttpContext have the same servlet name, then all but the highest ranked servlet service are ignored.

The value of this service property must be of type String.

HTTP_WHITEBOARD_SERVLET_PATTERN

```
public static final String HTTP_WHITEBOARD_SERVLET_PATTERN = "osgi.http.whiteboard.servlet.pattern"
```

Service property specifying the request mappings for a Servlet service.

The specified patterns are used to determine whether a request should be mapped to the servlet. Servlet services without this service property or HTTP_WHITEBOARD_SERVLET_ERROR_PAGE are ignored.

The value of this service property must be of type String, String[], or Collection<String>.

See Also:
"Java Servlet Specification Version 3.0, Section 12.2 Specification of Mappings"

HTTP_WHITEBOARD_SERVLET_ERROR_PAGE

```
public static final String HTTP_WHITEBOARD_SERVLET_ERROR_PAGE = "osgi.http.whiteboard.servlet.errorPage"
```

Service property specifying whether a `Servlet` service acts as an error page.

The service property values may be the name of a fully qualified exception class, a three digit HTTP status code, the value "4xx" for all error codes in the 400 rage, or the value "5xx" for all error codes in the 500 rage. Any value that is not a three digit number, or one of the two special values is considered to be the name of a fully qualified exception class.

The value of this service property must be of type `String`, `String[]`, or `Collection<String>`.

HTTP_WHITEBOARD_SERVLET_ASYNC_SUPPORTED

```
public static final String HTTP_WHITEBOARD_SERVLET_ASYNC_SUPPORTED = "osgi.http.whiteboard.servlet.asyncSupported"
```

Service property specifying whether a `Servlet` service supports asynchronous processing.

By default servlet services do not support asynchronous processing.

The value of this service property must be of type `Boolean`.

See Also:
"Java Servlet Specification Version 3.0, Section 2.3.3.3 Asynchronous Processing"

HTTP_WHITEBOARD_FILTER_NAME

```
public static final String HTTP_WHITEBOARD_FILTER_NAME = "osgi.http.whiteboard.filter.name"
```

Service property specifying the servlet filter name of a `Filter` service.

This name is used as the value for the `FilterConfig.getFilterName()` method. If this service property is not specified, the fully qualified name of the service object's class is used as the servlet filter name.

Servlet filter names must be unique among all servlet filter services associated with a single `ServletContextHelper`. If multiple servlet filter services associated with the same context have the same servlet filter name, then all but the highest ranked servlet filter service are ignored.

The value of this service property must be of type `String`.

HTTP_WHITEBOARD_FILTER_PATTERN

```
public static final String HTTP_WHITEBOARD_FILTER_PATTERN = "osgi.http.whiteboard.filter.pattern"
```

Service property specifying the request mappings for a `Filter` service.

The specified patterns are used to determine whether a request should be mapped to the servlet filter. Filter services without this service property or the `HTTP_WHITEBOARD_FILTER_SERVLET` or the `HTTP_WHITEBOARD_FILTER_REGEX` service property are ignored.

The value of this service property must be of type `String`, `String[]`, or `Collection<String>`.

See Also:
"Java Servlet Specification Version 3.0, Section 12.2 Specification of Mappings"

HTTP_WHITEBOARD_FILTER_SERVLET

```
public static final String HTTP_WHITEBOARD_FILTER_SERVLET = "osgi.http.whiteboard.filter.servlet"
```

Service property specifying the servlet names for a servlet `Filter` service.

The specified names are used to determine the servlets whose requests should be mapped to the servlet filter. Servlet filter services without this service property or the HTTP_WHITEBOARD_FILTER_PATTERN or the HTTP_WHITEBOARD_FILTER_REGEX service propertyare ignored.

The value of this service property must be of type `String`, `String[]`, or `Collection<String>`.

HTTP_WHITEBOARD_FILTER_REGEX

```
public static final String HTTP_WHITEBOARD_FILTER_REGEX = "osgi.http.whiteboard.filter.regex"
```

Service property specifying the request mappings for a servlet `Filter` service.

The specified regular expressions are used to determine whether a request should be mapped to the servlet filter. The regular expressions must follow the syntax defined in `java.util.regex.Pattern`. Servlet filter services without this service property or the HTTP_WHITEBOARD_FILTER_SERVLET or the HTTP_WHITEBOARD_FILTER_PATTERN service property are ignored.

The value of this service property must be of type `String`, `String[]`, or `Collection<String>`.

See Also:
"java.util.regex.Pattern"

HTTP_WHITEBOARD_FILTER_ASYNC_SUPPORTED

```
public static final String HTTP_WHITEBOARD_FILTER_ASYNC_SUPPORTED = "osgi.http.whiteboard.filter.asyncSupported"
```

Service property specifying whether a servlet `Filter` service supports asynchronous processing.

By default servlet filters services do not support asynchronous processing.

The value of this service property must be of type `Boolean`.

See Also:
"Java Servlet Specification Version 3.0, Section 2.3.3.3 Asynchronous Processing"

HTTP_WHITEBOARD_FILTER_DISPATCHER

```
public static final String HTTP_WHITEBOARD_FILTER_DISPATCHER = "osgi.http.whiteboard.filter.dispatcher"
```

Service property specifying the dispatcher handling of a servlet `Filter`.

By default servlet filter services are associated with client requests only (see value DISPATCHER_REQUEST).

The value of this service property must be of type `String`, `String[]`, or `Collection<String>`. Allowed values are DISPATCHER_ASYNC, DISPATCHER_ERROR, DISPATCHER_FORWARD, DISPATCHER_INCLUDE, DISPATCHER_REQUEST.

See Also:
"Java Servlet Specification Version 3.0, Section 6.2.5 Filters and the RequestDispatcher"

DISPATCHER_REQUEST

```
public static final String DISPATCHER_REQUEST = "REQUEST"
```

Possible value for the HTTP_WHITEBOARD_FILTER_DISPATCHER property indicating the servlet filter is applied to client requests.

See Also:
"Java Servlet Specification Version 3.0, Section 6.2.5 Filters and the RequestDispatcher"

DISPATCHER_INCLUDE

```
public static final String DISPATCHER_INCLUDE = "INCLUDE"
```

Possible value for the HTTP_WHITEBOARD_FILTER_DISPATCHER property indicating the servlet filter is applied to include calls to the dispatcher.

See Also:
"Java Servlet Specification Version 3.0, Section 6.2.5 Filters and the RequestDispatcher"

DISPATCHER_FORWARD

```
public static final String DISPATCHER_FORWARD = "FORWARD"
```

Possible value for the HTTP_WHITEBOARD_FILTER_DISPATCHER property indicating the servlet filter is applied to forward calls to the dispatcher.

See Also:
"Java Servlet Specification Version 3.0, Section 6.2.5 Filters and the RequestDispatcher"

DISPATCHER_ASYNC

```
public static final String DISPATCHER_ASYNC = "ASYNC"
```

Possible value for the HTTP_WHITEBOARD_FILTER_DISPATCHER property indicating the servlet filter is applied in the asynchronous context.

See Also:
"Java Servlet Specification Version 3.0, Section 6.2.5 Filters and the RequestDispatcher"

DISPATCHER_ERROR

```
public static final String DISPATCHER_ERROR = "ERROR"
```

Possible value for the HTTP_WHITEBOARD_FILTER_DISPATCHER property indicating the servlet filter is applied when an error page is called.

See Also:
"Java Servlet Specification Version 3.0, Section 6.2.5 Filters and the RequestDispatcher"

HTTP_WHITEBOARD_RESOURCE_PATTERN

```
public static final String HTTP_WHITEBOARD_RESOURCE_PATTERN = "osgi.http.whiteboard.resource.pattern"
```

Service property specifying the request mappings for resources.

The specified patterns are used to determine whether a request should be mapped to resources. Resource services without this service property are ignored.

The value of this service property must be of type `String`, `String[]`, or `Collection<String>`.

See Also:
"Java Servlet Specification Version 3.0, Section 12.2 Specification of Mappings", HTTP_WHITEBOARD_RESOURCE_PREFIX

HTTP_WHITEBOARD_RESOURCE_PREFIX

```
public static final String HTTP_WHITEBOARD_RESOURCE_PREFIX = "osgi.http.whiteboard.resource.prefix"
```

Service property specifying the resource entry prefix for a resource service.

If a resource service is registered with this property, requests are served with bundle resources.

This prefix is used to map a requested resource to the bundle's entries. The value must 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.

The value of this service property must be of type `String`, `String[]`, or `Collection<String>`.

See Also:
HTTP_WHITEBOARD_RESOURCE_PATTERN

HTTP_WHITEBOARD_TARGET

```
public static final String HTTP_WHITEBOARD_TARGET = "osgi.http.whiteboard.target"
```

Service property specifying the target filter to select the Http Whiteboard Implementation to process the service.

An Http Whiteboard Implementation can define any number of attributes which can be referenced by the target filter. The attributes should always include the `osgi.http.endpoint` attribute if the endpoint information is known.

If this service property is not specified, then all Http Whiteboard Implementations can process the service.

The value of this service property must be of type `String` and be a valid `filter string`.

8 Considered Alternatives

8.1 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.

8.2 Web Application Events

8.2.1 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 `osgi.http.service.target` service property which defines an LDAP filter to limit the Http Whiteboard Services sending events to the listener service.

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

8.2.2 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.

8.3 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.

8.4 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]` → `prefix[0]`, `path[1]` → `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.

8.5 Deprecated HttpService

Instead of updating the Http Service it has been decided to create a new specification for the Http Whiteboard Service and leave the Http Service as is. The new specification is split up in different packages, one for all whiteboard related stuff, one for the new Http Service Runtime and one for the new ServletContextHelper.

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 servlet context helpers 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 servlet context helper registered by another bundle, the bundle registering the whiteboard service must be granted ServicePermission[org.osgi.service.http.context.ServletContextHelper, GET].

Bundles that need to introspect the state of the Http Whiteboard Service runtime will need PackagePermission[org.osgi.service.http.runtime, IMPORT] and ServicePermission[org.osgi.service.http.runtime.HttpServiceRuntime, GET] to obtain the HttpServiceRuntime service and access the DTO types.

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