



# FUSE Services Framework

## Using the HTTP Transport

Version 2.0  
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Making Software Work Together™

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# Using the HTTP Transport

IONA Technologies

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# Basic Endpoint Addressing

## Summary

*The WSDL element used to specify the address of an HTTP endpoint varies depending on the type of payload being sent over the wire.*

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## Overview

There are three ways of specifying an HTTP endpoint's address depending on the payload format you are using.

- SOAP 1.1 uses the standardized `soap:address` element.
  - SOAP 1.2 uses the `soap12:address` element.
  - All other payload formats use the `http:address` element.
- 

## SOAP 1.1

When you are sending SOAP 1.1 messages over HTTP you must use the SOAP 1.1 `address` element to specify the endpoint's address. It has one attribute, `location`, that specifies the endpoint's address as a URL. The SOAP 1.1 `address` element is defined in the namespace `http://schemas.xmlsoap.org/wsdl/soap/`.

Example 1, "SOAP 1.1 Port Element" shows a `port` element used to send SOAP 1.1 messages over HTTP.

## Example 1. SOAP 1.1 Port Element

```
<definitions ...
  xmlns:soap="http://schemas.xmlsoap.org/wsdl/soap/" ...>
  ...
  <service name="SOAP11Service">
    <port binding="SOAP11Binding" name="SOAP11Port">
      <soap:address location="http://artie.com/index.xml">
    </port>
  </service>
```

---

```
...
<definitions>
```

## SOAP 1.2

When you are sending SOAP 1.2 messages over HTTP you must use the SOAP 1.2 `address` element to specify the endpoint's address. It has one attribute, `location`, that specifies the endpoint's address as a URL. The SOAP 1.2 `address` element is defined in the namespace

`http://schemas.xmlsoap.org/wsdl/soap12/`.

Example 2, "SOAP 1.2 Port Element" shows a `port` element used to send SOAP 1.2 messages over HTTP.

### Example 2. SOAP 1.2 Port Element

```
<definitions ...
    xmlns:soap12="http://schemas.xmlsoap.org/wsdl/soap12/" ... >
  <service name="SOAP12Service">
    <port binding="SOAP12Binding" name="SOAP12Port">
      <soap12:address location="http://artie.com/index.xml">
    </port>
  </service>
  ...
</definitions>
```

## Other messages types

When your messages are mapped to any payload format other than SOAP you must use the HTTP `address` element to specify the endpoint's address. It has one attribute, `location`, that specifies the endpoint's address as a URL. The HTTP `address` element is defined in the namespace

`http://schemas.xmlsoap.org/wsdl/http/`.

Example 3, "HTTP Port Element" shows a `port` element used to send an XML message.

### Example 3. HTTP Port Element

```
<definitions ...
    xmlns:http="http://schemas.xmlsoap.org/wsdl/http/" ... >
  <service name="HTTPService">
    <port binding="HTTPBinding" name="HTTPPort">
      <http:address location="http://artie.com/index.xml">

```

---

```
</port>  
</service>  
...  
</definitions>
```



---

# HTTP Consumer Endpoint Configuration

## **Summary**

*An HTTP consumer endpoint's connection properties can be configured using a configuration file or by specifying the connection properties in its WSDL document. Additional security information can be defined in the configuration file.*

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HTTP consumer endpoints can specify a number of HTTP connection attributes including whether the endpoint automatically accepts redirect responses, whether the endpoint can use chunking, whether the endpoint will request a keep-alive, and how the endpoint interacts with proxies. In addition to the HTTP connection properties, an HTTP consumer endpoint can specify how it is secured.

A consumer endpoint can be configured using two mechanisms:

- Configuration
- WSDL

## Using Configuration

### Namespace

The elements used to configure an HTTP consumer endpoint are defined in the namespace

`http://cxf.apache.org/transport/http/configuration`. It is commonly referred to using the prefix `http-conf`. In order to use the HTTP configuration elements you will need to add the lines shown in Example 4, “HTTP Consumer Configuration Namespace” to the `beans` element of your endpoint's configuration file. In addition, you will need to add the configuration elements' namespace to the `xsi:schemaLocation` attribute.

### Example 4. HTTP Consumer Configuration Namespace

```
<beans ...
  xmlns:http-conf="http://cxf.apache.org/transport/http/configuration
  ...
  xsi:schemaLocation="...
    http://cxf.apache.org/transport/http/configuration
    http://cxf.apache.org/schemas/configuration/http-conf.xsd
  ...>
```

### The conduit element


You configure an HTTP endpoint using the `http-conf:conduit` element and its children. The `http-conf:conduit` element takes a single attribute, `name`, that specifies the WSDL `port` element that corresponds to the endpoint. The value for the `name` attribute takes the form `portQName.http-conduit`. For example, Example 5, “`http-conf:conduit` Element” shows the `http-conf:conduit` element that would be used to add configuration for an endpoint that was specified by the WSDL fragment `<port binding="widgetSOAPBinding" name="widgetSOAPPort">` if the endpoint's target namespace was `http://widgets.widgetvendor.net`.

### Example 5. `http-conf:conduit` Element

```
...
<http-conf:conduit name="{http://widgets/widgetvendor.net}widgetSOAPPort.http-conduit">
  ...
</http-conf:conduit>
...
```

The `http-conf:conduit` element has a number of child elements that specify configuration information. They are described in Table 1, “Elements Used to Configure an HTTP Consumer Endpoint”.

**Table 1. Elements Used to Configure an HTTP Consumer Endpoint**


Element	Description
<code>http-conf:client</code>	Specifies the HTTP connection properties such as timeouts, keep-alive requests, content types, etc. See The <code>client</code> element.
<code>http-conf:authorization</code>	Specifies the the parameters for configuring the basic authentication method that the endpoint uses preemptively.   <b>Tip</b>  The preferred approach is to supply a Basic Authentication Supplier object.
<code>http-conf:proxyAuthorization</code>	Specifies the parameters for configuring basic authentication against outgoing HTTP proxy servers.
<code>http-conf:tlsClientParameters</code>	Specifies the parameters used to configure SSL/TLS.
<code>http-conf:basicAuthSupplier</code>	Specifies the bean reference or class name of the object that supplies the the basic authentication information used by the endpoint both preemptively or in response to a 401 HTTP challenge.
<code>http-conf:trustDecider</code>	Specifies the bean reference or class name of the object that checks the HTTP(S) <code>URLConnection</code> object in order to establish trust for a connection with an HTTPS service provider before any information is transmitted.



### The client element




The `http-conf:client` element is used to configure the non-security properties of a consumer endpoint's HTTP connection. Its attributes, described in Table 2, “HTTP Consumer Configuration Attributes”, specify the connection's properties.

**Table 2. HTTP Consumer Configuration Attributes**

Attribute	Description
<code>ConnectionTimeout</code>	Specifies the amount of time, in milliseconds, that the consumer will attempt to establish a connection before it times out. The default is 30000.

Attribute	Description
	0 specifies that the consumer will continue to send the request indefinitely.
ReceiveTimeout	Specifies the amount of time, in milliseconds, that the consumer will wait for a response before it times out. The default is 30000.  0 specifies that the consumer will wait indefinitely.
AutoRedirect	Specifies if the consumer will automatically follow a server issued redirection. The default is <code>false</code> .
MaxRetransmits	Specifies the maximum number of times a consumer will retransmit a request to satisfy a redirect. The default is -1 which specifies that unlimited retransmissions are allowed.
AllowChunking	Specifies whether the consumer will send requests using chunking. The default is <code>true</code> which specifies that the consumer will use chunking when sending requests.   <b>Important</b>  Chunking cannot be used if either of the following are true: <ul style="list-style-type: none"> <li>• <code>http-conf:basicAuthSupplier</code> is configured to provide credentials preemptively.</li> <li>• <code>AutoRedirect</code> is set to <code>true</code>.</li> </ul> <p>In both cases the value of <code>AllowChunking</code> is ignored and chunking is disallowed.</p>
Accept	Specifies what media types the consumer is prepared to handle. The value is used as the value of the HTTP <code>Accept</code> property. The value of the attribute is specified using as multipurpose internet mail extensions (MIME) types.
AcceptLanguage	Specifies what language (for example, American English) the consumer prefers for the purposes of receiving a response. The value is used as the value of the HTTP <code>AcceptLanguage</code> property.  Language tags are regulated by the International Organization for Standards (ISO) and are typically formed by combining a language code, determined by the ISO-639 standard, and country code, determined by the ISO-3166 standard, separated by a hyphen. For example, <code>en-US</code> represents American English.
AcceptEncoding	Specifies what content encodings the consumer is prepared to handle. Content encoding labels are regulated by the Internet Assigned Numbers Authority (IANA). The value is used as the value of the HTTP <code>AcceptEncoding</code> property.

Attribute	Description
ContentType	<p>Specifies the media type of the data being sent in the body of a message. Media types are specified using multipurpose internet mail extensions (MIME) types. The value is used as the value of the HTTP ContentType property. The default is <code>text/xml</code>.</p> <p> <b>Tip</b></p> <p>For web services, this should be set to <code>text/xml</code>. If the client is sending HTML form data to a CGI script, this should be set to <code>application/x-www-form-urlencoded</code>. If the HTTP POST request is bound to a fixed payload format (as opposed to SOAP), the content type is typically set to <code>application/octet-stream</code>.</p>
Host	<p>Specifies the Internet host and port number of the resource on which the request is being invoked. The value is used as the value of the HTTP Host property.</p> <p> <b>Tip</b></p> <p>This attribute is typically not required. It is only required by certain DNS scenarios or application designs. For example, it indicates what host the client prefers for clusters (that is, for virtual servers mapping to the same Internet protocol (IP) address).</p>
Connection	<p>Specifies whether a particular connection is to be kept open or closed after each request/response dialog. There are two valid values:</p> <ul style="list-style-type: none"> <li>• <code>Keep-Alive</code> specifies that the consumer wants to keep its connection open after the initial request/response sequence. If the server honors it, the connection is kept open until the consumer closes it.</li> <li>• <code>close(default)</code> specifies that the connection to the server is closed after each request/response sequence.</li> </ul>
CacheControl	<p>Specifies directives about the behavior that must be adhered to by caches involved in the chain comprising a request from a consumer to a service provider. See Consumer Cache Control Directives.</p>
Cookie	<p>Specifies a static cookie to be sent with all requests.</p>

Attribute	Description
BrowserType	Specifies information about the browser from which the request originates. In the HTTP specification from the World Wide Web consortium (W3C) this is also known as the <i>user-agent</i> . Some servers optimize based upon the client that is sending the request.
Referer	<p>Specifies the URL of the resource that directed the consumer to make requests on a particular service. The value is used as the value of the HTTP Referer property.</p> <p> <b>Note</b></p> <p>This HTTP property is used when a request is the result of a browser user clicking on a hyperlink rather than typing a URL. This can allow the server to optimize processing based upon previous task flow, and to generate lists of back-links to resources for the purposes of logging, optimized caching, tracing of obsolete or mistyped links, and so on. However, it is typically not used in web services applications.</p> <p> <b>Important</b></p> <p>If the <code>AutoRedirect</code> attribute is set to <code>true</code> and the request is redirected, any value specified in the <code>Referer</code> attribute is overridden. The value of the HTTP Referer property will be set to the URL of the service who redirected the consumer's original request.</p>
DecoupledEndpoint	<p>Specifies the URL of a decoupled endpoint for the receipt of responses over a separate provider-&gt;consumer connection. For more information on using decoupled endpoints see, <i>Using the Decoupled HTTP Transport</i>.</p> <p> <b>Warning</b></p> <p>You must configure both the consumer endpoint and the service provider endpoint to use WS-Addressing for the decoupled endpoint to work.</p>
ProxyServer	Specifies the URL of the proxy server through which requests are routed.
ProxyServerPort	Specifies the port number of the proxy server through which requests are routed.
ProxyServerType	<p>Specifies the type of proxy server used to route requests. Valid values are:</p> <ul style="list-style-type: none"> <li>• HTTP(default)</li> </ul>

Attribute	Description
	<ul style="list-style-type: none"><li>SOCKS</li></ul>

---

**Example**

Example 6, "HTTP Consumer Endpoint Configuration" shows a the configuration for an HTTP consumer endpoint that wants to keep its connection to the provider open between requests, will only retransmit requests once per invocation, and cannot use chunking streams.

**Example 6. HTTP Consumer Endpoint Configuration**

```
<beans xmlns="http://www.springframework.org/schema/beans"
  xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance"
  xmlns:http-conf="http://cxf.apache.org/transport/http/configuration"
  xsi:schemaLocation="http://cxf.apache.org/transport/http/configuration
    http://cxf.apache.org/schemas/configuration/http-conf.xsd
    http://www.springframework.org/schema/beans
    http://www.springframework.org/schema/beans/spring-beans.xsd">

  <http-conf:conduit name="{http://apache.org/hello_world_soap_http}SoapPort.http-conduit">

    <http-conf:client Connection="Keep-Alive"
      MaxRetransmits="1"
      AllowChunking="false" />
  </http-conf:conduit>
</beans>
```

## Using WSDL

---

### Namespace

The WSDL extension elements used to configure an HTTP consumer endpoint are defined in the namespace

`http://cxf.apache.org/transports/http/configuration`. It is commonly referred to using the prefix `http-conf`. In order to use the HTTP configuration elements you will need to add the line shown in Example 7, “HTTP Consumer WSDL Element’s Namespace” to the `definitions` element of your endpoint’s WSDL document.

### Example 7. HTTP Consumer WSDL Element’s Namespace

```
<definitions ...  
  xmlns:http-conf="http://cxf.apache.org/transports/http/configuration
```

### The client element

The `http-conf:client` element is used to specify the connection properties of an HTTP consumer in a WSDL document. The `http-conf:client` element is a child of the WSDL `port` element. It has the same attributes as the `client` element used in the configuration file. The attributes are described in Table 2, “HTTP Consumer Configuration Attributes”.

---

### Example

Example 8, “WSDL to Configure an HTTP Consumer Endpoint” shows a WSDL fragment that configures an HTTP consumer endpoint to specify that it will not interact with caches.

### Example 8. WSDL to Configure an HTTP Consumer Endpoint

```
<service ...>  
  <port ...>  
    <soap:address ... />  
    <http-conf:client CacheControl="no-cache" />  
  </port>  
</service>
```

## Consumer Cache Control Directives

Table 3, “`http-conf:client` Cache Control Directives” lists the cache control directives supported by an HTTP consumer.

**Table 3. `http-conf:client` Cache Control Directives**

Directive	Behavior
no-cache	Caches cannot use a particular response to satisfy subsequent requests without first revalidating that response with the server. If specific response header fields are specified with this value, the restriction applies only to those header fields within the response. If no response header fields are specified, the restriction applies to the entire response.
no-store	Caches must not store any part of a response or any part of the request that invoked it.
max-age	The consumer can accept a response whose age is no greater than the specified time in seconds.
max-stale	The consumer can accept a response that has exceeded its expiration time. If a value is assigned to max-stale, it represents the number of seconds beyond the expiration time of a response up to which the consumer can still accept that response. If no value is assigned, it means the consumer can accept a stale response of any age.
min-fresh	The consumer wants a response that will be still be fresh for at least the specified number of seconds indicated.
no-transform	Caches must not modify media type or location of the content in a response between a provider and a consumer.
only-if-cached	Caches should return only responses that are currently stored in the cache, and not responses that need to be reloaded or revalidated.
cache-extension	Specifies additional extensions to the other cache directives. Extensions might be informational or behavioral. An extended directive is specified in the context of a standard directive, so that applications not understanding the extended directive can at least adhere to the behavior mandated by the standard directive.



---

# HTTP Service Provider Configuration

## **Summary**

*An HTTP service provider's connection properties can be configured using a configuration file or by specifying the connection properties in its WSDL document.*

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HTTP service provider endpoints can specify a number of HTTP connection attributes including if it will honor keep alive requests, how it interacts with caches, and how tolerant it is of errors in communicating with a consumer.

A service provider endpoint can be configured using two mechanisms:

- Configuration
- WSDL

## Using Configuration

### Namespace

The elements used to configure an HTTP provider endpoint are defined in the namespace `http://cxf.apache.org/transports/http/configuration`. It is commonly referred to using the prefix `http-conf`. In order to use the HTTP configuration elements you will need to add the lines shown in Example 9, “HTTP Provider Configuration Namespace” to the `beans` element of your endpoint's configuration file. In addition, you will need to add the configuration elements' namespace to the `xsi:schemaLocation` attribute.

### Example 9. HTTP Provider Configuration Namespace

```
<beans ...
  xmlns:http-conf="http://cxf.apache.org/transports/http/configuration
  ...
  xsi:schemaLocation="...
    http://cxf.apache.org/transports/http/configuration
    http://cxf.apache.org/schemas/configuration/http-conf.xsd
  ...>
```

### The destination element

You configure an HTTP service provider endpoint using the `http-conf:destination` element and its children. The `http-conf:destination` element takes a single attribute, `name`, that specifies the WSDL `port` element that corresponds to the endpoint. The value for the `name` attribute takes the form `portQName.http-destination`. For example, Example 10, “`http-conf:destination` Element” shows the `http-conf:destination` element that would be used to add configuration for an endpoint that was specified by the WSDL fragment `<port binding="widgetSOAPBinding" name="widgetSOAPPort">` if the endpoint's target namespace was `http://widgets.widgetvendor.net`.

### Example 10. `http-conf:destination` Element

```
...
<http-conf:destination name="{http://widgets/widgetvendor.net}widgetSOAPPort.http-destination">
  ...
</http-conf:destination>
...
```

The `http-conf:destination` element has a number of child elements that specify configuration information. They are described in Table 4, “Elements Used to Configure an HTTP Service Provider Endpoint”.

**Table 4. Elements Used to Configure an HTTP Service Provider Endpoint**


Element	Description
<code>http-conf:server</code>	Specifies the HTTP connection properties. See The <code>server</code> element.
<code>http-conf:contextMatchStrategy</code>	Specifies the parameters that configure the context match strategy for processing HTTP requests.
<code>http-conf:fixedParameterOrder</code>	Specifies whether the parameter order of an HTTP request handled by this destination is fixed.

#### The server element

The `http-conf:server` element is used to configure the properties of a service provider endpoint's HTTP connection. Its attributes, described in Table 5, “HTTP Service Provider Configuration Attributes”, specify the connection's properties.

**Table 5. HTTP Service Provider Configuration Attributes**

Attribute	Description
<code>ReceiveTimeout</code>	Sets the length of time, in milliseconds, the service provider tries to receive a request before the connection times out. The default is <code>30000</code> .  <code>0</code> specifies that the provider will not timeout.
<code>SuppressClientSendErrors</code>	Specifies whether exceptions are to be thrown when an error is encountered on receiving a request. The default is <code>false</code> ; exceptions are thrown on encountering errors.
<code>SuppressClientReceiveErrors</code>	Specifies whether exceptions are to be thrown when an error is encountered on sending a response to a consumer. The default is <code>false</code> ; exceptions are thrown on encountering errors.
<code>HonorKeepAlive</code>	Specifies whether the service provider honors requests for a connection to remain open after a response has been sent. The default is <code>false</code> ; keep-alive requests are ignored.
<code>RedirectURL</code>	Specifies the URL to which the client request should be redirected if the URL specified in the client request is no longer appropriate for the requested

Attribute	Description
	resource. In this case, if a status code is not automatically set in the first line of the server response, the status code is set to 302 and the status description is set to <code>Object Moved</code> . The value is used as the value of the HTTP <code>RedirectURL</code> property.
<code>CacheControl</code>	Specifies directives about the behavior that must be adhered to by caches involved in the chain comprising a response from a service provider to a consumer. See <code>Service Provider Cache Control Directives</code> .
<code>ContentLocation</code>	Sets the URL where the resource being sent in a response is located.
<code>ContentType</code>	Specifies the media type of the information being sent in a response. Media types are specified using multipurpose internet mail extensions (MIME) types. The value is used as the value of the HTTP <code>ContentType</code> location.
<code>ContentEncoding</code>	<p>Specifies any additional content encodings that have been applied to the information being sent by the service provider. Content encoding labels are regulated by the Internet Assigned Numbers Authority (IANA). Possible content encoding values include <code>zip</code>, <code>gzip</code>, <code>compress</code>, <code>deflate</code>, and <code>identity</code>. This value is used as the value of the HTTP <code>ContentEncoding</code> property.</p> <p> <b>Note</b></p> <p>The primary use of content encodings is to allow documents to be compressed using some encoding mechanism, such as <code>zip</code> or <code>gzip</code>. FUSE Services Framework performs no validation on content codings. It is the user's responsibility to ensure that a specified content coding is supported at application level.</p>
<code>ServerType</code>	Specifies what type of server is sending the response. Values take the form <code>program-name/version</code> . For example, <code>Apache/1.2.5</code> .

**Example**

Example 11, “HTTP Service Provider Endpoint Configuration” shows a the configuration for an HTTP service provider endpoint that honors keep alive requests and suppresses all communication errors.

**Example 11. HTTP Service Provider Endpoint Configuration**

```
<beans xmlns="http://www.springframework.org/schema/beans"
  xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance"
  xmlns:http-conf="http://cxf.apache.org/transports/http/configuration"
```

```
xsi:schemaLocation="http://cxf.apache.org/transports/http/configuration
                    http://cxf.apache.org/schemas/configuration/http-conf.xsd
                    http://www.springframework.org/schema/beans
                    http://www.springframework.org/schema/beans/spring-beans.xsd">

<http-conf:destination name="{http://apache.org/hello_world_soap_http}SoapPort.http-des
tination">
  <http-conf:server SuppressClientSendErrors="true"
                    SuppressClientReceiveErrors="true"
                    HonorKeepAlive="true" />
</http-conf:destination>
</beans>
```

## Using WSDL

---

### Namespace

The WSDL extension elements used to configure an HTTP provider endpoint are defined in the namespace

`http://cxf.apache.org/transports/http/configuration`. It is commonly referred to using the prefix `http-conf`. In order to use the HTTP configuration elements you will need to add the line shown in Example 12, “HTTP Provider WSDL Element's Namespace” to the `definitions` element of your endpoint's WSDL document.

### Example 12. HTTP Provider WSDL Element's Namespace

```
<definitions ...  
  xmlns:http-conf="http://cxf.apache.org/transports/http/configuration
```

### The server element

The `http-conf:server` element is used to specify the connection properties of an HTTP service provider in a WSDL document. The `http-conf:server` element is a child of the WSDL `port` element. It has the same attributes as the `server` element used in the configuration file. The attributes are described in Table 5, “HTTP Service Provider Configuration Attributes”.

---

### Example

Example 13, “WSDL to Configure an HTTP Service Provider Endpoint” shows a WSDL fragment that configures an HTTP service provider endpoint to specify that it will not interact with caches.

### Example 13. WSDL to Configure an HTTP Service Provider Endpoint

```
<service ...>  
  <port ...>  
    <soap:address ... />  
    <http-conf:server CacheControl="no-cache" />  
  </port>  
</service>
```

## Service Provider Cache Control Directives

Table 6, “`http-conf:server` Cache Control Directives” lists the cache control directives supported by an HTTP service provider.

**Table 6. `http-conf:server` Cache Control Directives**

Directive	Behavior
no-cache	Caches cannot use a particular response to satisfy subsequent requests without first revalidating that response with the server. If specific response header fields are specified with this value, the restriction applies only to those header fields within the response. If no response header fields are specified, the restriction applies to the entire response.
public	Any cache can store the response.
private	Public ( <i>shared</i> ) caches cannot store the response because the response is intended for a single user. If specific response header fields are specified with this value, the restriction applies only to those header fields within the response. If no response header fields are specified, the restriction applies to the entire response.
no-store	Caches must not store any part of response or any part of the request that invoked it.
no-transform	Caches must not modify the media type or location of the content in a response between a server and a client.
must-revalidate	Caches must revalidate expired entries that relate to a response before that entry can be used in a subsequent response.
proxy-revalidate	Means the same as <code>must-revalidate</code> , except that it can only be enforced on shared caches and is ignored by private unshared caches. If using this directive, the <code>public</code> cache directive must also be used.
max-age	Clients can accept a response whose age is no greater than the specified number of seconds.
s-max-age	Means the same as <code>max-age</code> , except that it can only be enforced on shared caches and is ignored by private unshared caches. The age specified by <code>s-max-age</code> overrides

Service Provider Cache Control  
Directives

---

<b>Directive</b>	<b>Behavior</b>
	the age specified by max-age. If using this directive, the proxy-revalidate directive must also be used.
cache-extension	Specifies additional extensions to the other cache directives. Extensions might be informational or behavioral. An extended directive is specified in the context of a standard directive, so that applications not understanding the extended directive can at least adhere to the behavior mandated by the standard directive.

---

# Configuring the HTTP Server Runtime

## Summary

*The Jetty instance used to implement the HTTP server runtime has a number of configurable properties.*

---

## Overview

The Jetty runtime is used by HTTP service providers and HTTP consumers using a decoupled endpoint. The runtime's thread pool can be configured. You can also set a number of the security settings for an HTTP service provider through the Jetty runtime.

---

## Namespace

The elements used to configure the Jetty runtime are defined in the namespace `http://cxf.apache.org/transport/http-jetty/configuration`. It is commonly referred to using the prefix `httpj`. In order to use the Jetty configuration elements you will need to add the lines shown in Example 14, "Jetty Runtime Configuration Namespace" to the `beans` element of your endpoint's configuration file. In addition, you will need to add the configuration elements' namespace to the `xsi:schemaLocation` attribute.

## Example 14. Jetty Runtime Configuration Namespace

```
<beans ...
  xmlns:httpj="http://cxf.apache.org/transport/http-jetty/configuration
  ...
  xsi:schemaLocation="...
    http://cxf.apache.org/transport/http-jetty/configuration
    http://cxf.apache.org/schemas/configuration/http-jetty.xsd
  ...>
```

## The engine-factory element

The `httpj:engine-factory` element is the root element used to configure the Jetty runtime used by an application. It has a single required attribute, `bus`, whose value is the name of the `Bus` that manages the Jetty instances being configured.



## Tip

The value is typically `cxf` which is the name of the default `Bus` instance.

---

The `httpj:engine-factory` element has three children that contain the information used to configure the HTTP ports instantiated by the Jetty runtime factory. The children are described in Table 7, “Elements for Configuring a Jetty Runtime Factory”.

**Table 7. Elements for Configuring a Jetty Runtime Factory**

Element	Description
<code>httpj:engine</code>	Specifies the configuration for a particular Jetty runtime instance. See The <code>engine</code> element.
<code>httpj:identifiedTLSServerParameters</code>	Specifies a reusable set of properties for securing an HTTP service provider. It has a single attribute, <code>id</code> , that specifies a unique identifier by which the property set can be referred.
<code>httpj:identifiedThreadingParameters</code>	Specifies a reusable set of properties for controlling a Jetty instance's thread pool. It has a single attribute, <code>id</code> , that specifies a unique identifier by which the property set can be referred.  See Configuring the thread pool.

---

### The engine element

The `httpj:engine` element is used to configure specific instances of the Jetty runtime. It has a single attribute, `port`, that specifies the number of the port being managed by the Jetty instance.



### Tip

You can specify a value of 0 for the `port` attribute. Any threading properties specified in an `httpj:engine` element with its `port` attribute set to 0 are used as the configuration for all Jetty listeners that are not explicitly configured.

Each `httpj:engine` element can have two children: one for configuring security properties and one for configuring the Jetty instance's thread pool. For each type of configuration you can either directly provide the configuration information or provide a reference to a set of configuration properties defined in the parent `httpj:engine-factory` element.

The child elements used to provide the configuration properties are described in Table 8, “Elements for Configuring a Jetty Runtime Instance”.

---

**Table 8. Elements for Configuring a Jetty Runtime Instance**

Element	Description
<code>httpj:tlsServerParameters</code>	Specifies a set of properties for configuring the security used for the specific Jetty instance.
<code>httpj:tlsServerParametersRef</code>	Refers to a set of security properties defined by a <code>identifiedTLSServerParameters</code> element. The <code>id</code> attribute provides the id of the referred <code>identifiedTLSServerParameters</code> element.
<code>httpj:threadingParameters</code>	Specifies the size of the thread pool used by the specific Jetty instance. See <a href="#">Configuring the thread pool</a> .
<code>httpj:threadingParametersRef</code>	Refers to a set of properties defined by a <code>identifiedThreadingParameters</code> element. The <code>id</code> attribute provides the id of the referred <code>identifiedThreadingParameters</code> element.

---

### Configuring the thread pool

You can configure the size of a Jetty instance's thread pool by either:

- Specifying the size of thread pool using a `identifiedThreadingParameters` element in the `engine-factory` element. You then refer to the element using a `threadingParametersRef` element.
- Specify the size of the of thread pool directly using a `threadingParameters` element.

The `threadingParameters` has two attributes to specify the size of a thread pool. The attributes are described in [Table 9, "Attributes for Configuring a Jetty Thread Pool"](#).



### Note

The `httpj:identifiedThreadingParameters` element has a single child `threadingParameters` element.

---

**Table 9. Attributes for Configuring a Jetty Thread Pool**

Attribute	Description
minThreads	Specifies the minimum number of threads available to the Jetty instance for processing requests.
maxThreads	Specifies the maximum number of threads available to the Jetty instance for processing requests.

---

**Example**

Example 15, “Configuring a Jetty Instance” shows a configuration fragment that configures a Jetty instance on port number 9001.

**Example 15. Configuring a Jetty Instance**

```
<beans xmlns="http://www.springframework.org/schema/beans"
  xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance"
  xmlns:sec="http://cxf.apache.org/configuration/security"
  xmlns:http="http://cxf.apache.org/transports/http/configuration"
  xmlns:httpj="http://cxf.apache.org/transports/http-jetty/configuration"
  xmlns:jaxws="http://java.sun.com/xml/ns/jaxws"
  xsi:schemaLocation="http://cxf.apache.org/configuration/security
    http://cxf.apache.org/schemas/configuration/security.xsd
    http://cxf.apache.org/transports/http/configuration
    http://cxf.apache.org/schemas/configuration/http-conf.xsd
    http://cxf.apache.org/transports/http-jetty/configuration
    http://cxf.apache.org/schemas/configuration/http-jetty.xsd
    http://www.springframework.org/schema/beans
    http://www.springframework.org/schema/beans/spring-beans-2.0.xsd">
...

<httpj:engine-factory bus="cxf">
  <httpj:identifiedTLSServerParameters id="secure">
    <sec:keyManagers keyPassword="password">
      <sec:keyStore type="JKS" password="password"
        file="certs/cherry.jks"/>
    </sec:keyManagers>
  </httpj:identifiedTLSServerParameters>

  <httpj:engine port="9001">
    <httpj:tlsServerParametersRef id="secure" />
    <httpj:threadingParameters minThreads="5"
      maxThreads="15" />
  </httpj:engine>
</httpj:engine-factory>
</beans>
```

---

# Using the Decoupled HTTP Transport

## Summary

*The decoupled HTTP transport allows you to send requests and responses using separate HTTP connections.*

---

## Overview

In normal HTTP request/response scenarios, the request and the response are sent using the same HTTP connection. The service provider processes the request and responds with a response containing the appropriate HTTP status code and the contents of the response. In the case of a successful request, the HTTP status code is set to 200.

In some instances, such as when using WS-RM or when requests take an extended period of time to execute, it makes sense to decouple the request and response message. In this case the service providers sends the consumer a 202 `Accepted` response to the consumer over the back-channel of HTTP connection on which the request was received. It then processes the request and sends the response back to the consumer using a new decoupled server->client HTTP connection. The consumer runtime receives the incoming response and correlates it with the appropriate request before returning to the application code.

---

## Configuring decoupled mode

Using the HTTP transport in decoupled mode requires that you do two things:

1. Specify that the consumer and any service provider with which the consumer will interact use WS-Addressing.

You can specify that an endpoint uses WS-Addressing in one of two ways:

- Adding the `wswa:UsingAddressing` element to the endpoint's WSDL `port` element as shown in Example 16, "Activating WS-Addressing using WSDL".

## Example 16. Activating WS-Addressing using WSDL

```
...
<service name="WidgetSOAPService">
  <port name="WidgetSOAPPort" binding="tns:WidgetSOAPBinding">
    <soap:address="http://widgetvendor.net/widgetSeller" />

```

---

```
<wsa:UsingAddressing xmlns:wsa="http://www.w3.org/2005/02/addressing/wsdl"/>
</port>
</service>
...
```

- Adding the WS-Addressing policy to the endpoint's WSDL `port` element as shown in Example 17, “Activating WS-Addressing using a Policy”.

### Example 17. Activating WS-Addressing using a Policy

```
...
<service name="WidgetSOAPService">
  <port name="WidgetSOAPPort" binding="tns:WidgetSOAPBinding">
    <soap:address="http://widgetvendor.net/widgetSeller" />
    <wsp:Policy xmlns:wsp="http://www.w3.org/2006/07/ws-policy">
      <wsam:Addressing xmlns:wsam="http://www.w3.org/2007/02/addressing/metadata">
        <wsp:Policy/>
      </wsam:Addressing>
    </wsp:Policy>
  </port>
</service>
...
```



### Note

The WS-Addressing policy supersedes the `wsa:UsingAddressing` WSDL element.

2. Configure the consumer endpoint to use a decoupled endpoint using the `DecoupledEndpoint` attribute of the `http-conf:conduit` element.

Example 18, “Configuring a Consumer to Use a Decoupled HTTP Endpoint” shows the configuration for the setting up the endpoint defined in Example 16, “Activating WS-Addressing using WSDL” to use a decoupled endpoint. The consumer will now receive all responses at `http://widgetvendor.net/widgetSellerInbox`.

### Example 18. Configuring a Consumer to Use a Decoupled HTTP Endpoint

```
<beans xmlns="http://www.springframework.org/schema/beans"
  xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance"
  xmlns:http="http://cxf.apache.org/transports/http/configuration"
```

---

```
xsi:schemaLocation="http://cxf.apache.org/transports/http/configuration
                    http://cxf.apache.org/schemas/configuration/http-conf.xsd
                    http://www.springframework.org/schema/beans
                    http://www.springframework.org/schema/beans/spring-beans.xsd">

<http:conduit name="{http://widgetvendor.net/services}WidgetSOAPPort.http-conduit">
  <http:client DecoupledEndpoint="http://widgetvendor.net:9999/decoupled_endpoint" />
</http:conduit>
</beans>
```

---

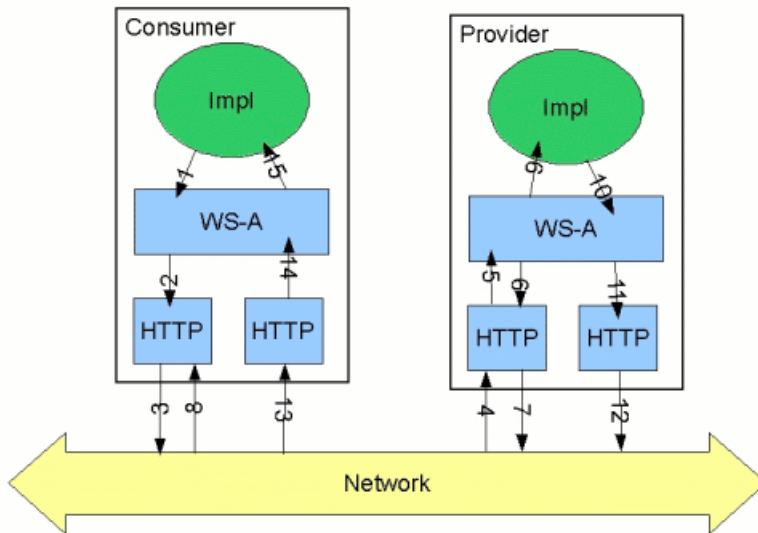
### How messages are processed

Using the HTTP transport in decoupled mode adds extra layers of complexity to the processing of HTTP messages. While the added complexity is transparent to the implementation level code in an application, it may be important to understand what happens for debugging reasons.

Figure 1, "Message Flow in for a Decoupled HTTP Transport" shows the flow of messages when using HTTP in decoupled mode.

---

**Figure 1. Message Flow in for a Decoupled HTTP Transport**



A request starts the following process:

1. The consumer implementation invokes an operation and a request message is generated.
2. The WS-Addressing layer adds the WS-A headers to the message.

When a decoupled endpoint is specified in the consumer's configuration the address of the decoupled endpoint is placed in the WS-A ReplyTo header.

3. The message is sent to the service provider.

- 
4. The service provider receives the message.
  5. The request message from the consumer is dispatched as far as the provider's WS-A layer.
  6. Because the WS-A ReplyTo header is not set to anonymous, the provider sends back a message with the HTTP status code set to 202 to acknowledge that the request has been received.
  7. The HTTP layer sends a 202 Accepted message back to the consumer using the original connection's back-channel.
  8. The consumer receives the 202 Accepted reply on the back-channel of the HTTP connection used to send the original message.

When the consumer receives the 202 Accepted reply the HTTP connection is closed.

9. The request is passed to the service provider's implementation where the request is processed.
10. When the response is ready, it is dispatched to the WS-A layer.
11. The WS-A layer adds the WS-Addressing headers to the response message.
12. The HTTP transport sends the response to the consumer's decoupled endpoint.
13. The consumer's decoupled endpoint receives the response from the service provider.
14. The response is dispatched to the consumer's WS-A layer where it is correlated to the proper request using the WS-A RelatesTo header.
15. The correlated response is returned to the client implementation and the invoking call is unblocked.



---

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