



FORUM SENTRY™ VERSION 9

REST POLICIES GUIDE



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INTRODUCTION TO THE REST POLICIES GUIDE

Audience for the REST Policies Guide

The *Forum Systems Sentry™ Version 9 REST Policies Guide* for System Administrators who will:

- Create or import REST policies.
- Manage Virtual Directories on an REST policy.
- Manage settings on an REST policy.
- Associate IDP Groups to REST policies.
- Apply a Task List Group to an REST policy.
- Apply a Pattern Match policy to REST requests/responses.
- Apply Request Filter Templates on an REST policy.

Assumptions

This document also assumes that the reader is familiar with the *Forum Systems Sentry™ Version 9 Web-based Administration Guide*.

For information on Task Lists and performing Tasks on an REST policy, refer to the *Forum Systems Sentry™ Version 9 Tasks Management Guide*.

Screen Element on Legacy Systems

For customers upgrading from earlier versions of Forum Systems software to V9, the DOCUMENTS tab will not be visible on REST policies.

However, for customers running legacy versions, the DOCUMENTS tab will be visible. The Documents listed in the DOCUMENTS tab will not appear in the Documents screen (on the Navigator), but remain in the REST policies to be available for those customers who have run previous versions of the software.

Conventions Used in the REST Policies Guide

A red asterisk (*) aligned with a field term means that this field is required. In this and other documentation, the Web Administration Interface is referred to as the WebAdmin and the Forum REST Security Appliance™ is referred to as the 'device', 'product' or 'system'.

In this document, all data or commands that must be entered or selected are displayed in boldface. Example:

User name: **johnsmith**
Password: *********

UI screens which display a STATUS column represent the following states:

- Green status light = enabled policy.
- Yellow status light = a required functional element of this policy is disabled.
- Red status light = disabled policy.

Throughout this and other documents in the Documentation Set, repetitive actions such as the following are not shown:



- View / edit a policy.
- Enable / disable a policy.
- Delete a policy.
- Rename a policy.
- Limit display of policies with Search or Max Results fields.

(For more information, refer to the Common Operations section of the *Forum Systems Sentry™ Version 9 Web-based Administration Guide*.)



Customers with plug-in licenses on the system, confirm that your Integration License is visible on the General Info screen under the SUPPORTED FEATURES section.

Any specifications and constraints referenced in this volume appear in the Appendices of this volume.

For the focus of this document, the STATUS column is displayed on REST policies, and Virtual Directories.

Virtual Directories		
Task Lists		
Settings		
<input type="checkbox"/>	VIRTUAL DIRECTORY	STATUS
<input type="checkbox"/>	New Virtual Directory	
<input type="checkbox"/>	New Virtual Directory2	

Request Filters, however, have a status of Enabled or Disabled only.

REQUEST FILTER POLICY					
Policy Name*:		Default_REST			
<input type="checkbox"/>	#	MESSAGE TYPE FILTER	FORMAT	DESCRIPTION	STATUS
<input type="checkbox"/>	1	 REST to XML	REST	Convert HTTP query parameters to XML	
<input type="checkbox"/>	2	 REST (CRUD)	Simple	HTTP POST, GET, PUT, DELETE	
Enable Disable New Delete Update Save Restore Defaults					

An REST policy is a set of rules that provide a policy for processing of REST flowing through the system.

From an open REST policy, users may select:

- **Enable / Disable** to enable or disable the Virtual Directory.
- **Delete** to delete a Virtual Directory.
- **New** to create a new Virtual Directory.

REST Features

An overview of the features available in a REST policy includes:

- Add an REST policy.
- Create new or associate existing listener and/or remote network policy.
- Add, view or edit virtual directories.
- Apply access control to virtual directories.
- Associate Task List Groups in the REST policy.
- Transfer, import or export REST policies. (For more information, refer to the *Forum Systems Sentry™ Version 9 System Management Guide*.)
- Edit the default HTTP Request Filter settings.

REST Policy Examples

Examples for a REST policy include:

- Add an REST Policy.
- Create New Network Policies for REST Policy.
- Use Existing Network Policy for REST Policy.
- View Virtual Directories of an REST Policy.

Add an REST Policy

When adding an REST policy, you may associate any existing Listener policy (HTTP, HTTPS, FTP, Tibco RV, Tibco EMS, IBM MQ, or Group Remote policy). Follow these steps to add an REST policy and associate an existing Listener policy:

Adding an REST Policy



The screenshot shows a web interface for adding a new REST policy. At the top, the breadcrumb navigation reads 'REST POLICIES > NEW REST POLICY'. Below this, the section title 'NEW REST POLICY' is displayed. A form field labeled 'Name*' contains the text 'New REST Policy2'. To the right of the form field is a red button with the text 'Next'.

- Navigate to the **REST Policies** screen and select **New**.
- In the Name field, enter the **Name** for this REST policy, and then click **Next**.
- The SET LISTENER POLICY screen appears.

Note: At this point, you could associate any existing listener policy or create a new listener policy. This instruction uses the **Select from an existing listener policies** option.

Create New or Use Existing Network Policy for the REST Policy
You may create a new Listener Policy when creating an REST Policy:

REST POLICIES > NEW REST POLICY

SET LISTENER POLICY

Please specify a listener policy for virtual directory: New Virtual Directory

☒ Select from existing listener policies

HttpListenerPolicy (10.5.1.35:80) [Edit](#)

☐ Create a new HTTP listener policy

Listener Policy Name*: NewRESTPolicy2-Listener

Use Device IP: ☐

Listener IP*: 192.168.1.35

Listener Port*: 80

SET VIRTUAL DIRECTORY PATH

Virtual Directory Path:

SET REMOTE POLICY

Please specify a remote network policy

☐ Do not send to remote server

☒ Select from existing remote policies

NewXMLPolicy-Remote (10.5.1.17:80) [Edit](#)

☐ Create a new HTTP remote policy for this remote server

Remote Policy Name*: NewRESTPolicy2-Remote

Remote Policy Host*:

Remote Policy Port*: 80

[Finish](#)

- From the SET LISTENER POLICY section, select the **Create a new HTTP listener policy** radio button.

NOTE: CHECKING THE USE DEVICE IP CHECKBOX MEANS THAT THE IP FROM WHICH THIS LISTENER POLICY LISTENS WILL BE THE SAME AS THE SYSTEM'S DEVICE IP.

- Enter the **Listener IP** address in the Listener IP field or check the **Use Device IP** checkbox to use the assigned device IP of the system.
- Enter the **Listener Port** in the Listener Port field.
- Enter the **Virtual Directory URI** path for accessing this policy (here users can “cloak” the back-end URI by entering a value different from the actual physical URI of the back-end server).
- From the SET REMOTE POLICIES section, select the **Create a new HTTP remote policy for this remote server** radio button.

Note: The Virtual URI is a read-only field because the system determines this value from the Network

policy, virtual path, Filter and Replace Expression settings. The Physical Path and Physical URI fields are read-only because the system uses the values from the REST document.

If Administrators need to allow arbitrary subdirectories or URL parameters, the Filter Expression can be changed from the default `"/?"` to `"/.*?"`.

- Enter the **Remote IP** in the Remote policy Host field.
- Enter the **Remote Port** in the Remote policy Port field.
- Click **Finish**.

You may also use an existing Network Listener policy or Remote policy.

VIRTUAL DIRECTORIES

The Virtual Directories tab displays a summary of all the Virtual URIs in this REST policy, as well as the Virtual URI and the Remote URI. REST policies can have multiple Virtual Directories, but each must either have a unique Virtual URI or specify a unique Virtual Host.

Clicking on the **Virtual Directory name** link reveals the Virtual Directory settings for this REST policy. Each virtual directory is used to map a virtual URI (local) to the physical path and URI (remote, as defined in the REST document).

NOTE: WHERE HTTP POLICIES ARE DISCUSSED, ALL OTHER NETWORK POLICIES ARE VALID, EXCEPT WHEN USING AN FTP POLICY AS A REMOTE POLICY.

A Virtual Directory is a pattern which matches an incoming HTTP request URI. A Virtual Directory is defined on the port node in an REST policy. Because the physical endpoint defined in the REST policy is static, virtual directories can be used to:

- Group different users according to their individual access control.
- Expose a different URI than the physical back end server URI.

Virtual Directories Tab Screen Terms for REST Policies

The following table describes each term and definition on the Virtual Directories tab in REST policies.

TERM	DEFINITION
Virtual Directory	Local URIs used to access the REST policy.
Status	<ul style="list-style-type: none">• Green status light = enabled policy.• Yellow status light = a required functional element of this policy is disabled; i.e. the listener is disabled or the remote network policy is disabled.• Red status light = disabled policy.
Virtual URI	The Unique Resource Indicator (URI) path used by clients to access this policy.
Remote URI	Actual URI back-end server.

Virtual Directory Detail Terms for REST Policies

The following table describes each term and definition found on the Virtual Directory of an REST policy.

TERM	DEFINITION
Name	The identifier of this Virtual Directory.
Description	An optional description of this Virtual Directory.
Listener Policy	The Listener Policy on the system to associate with this Virtual Directory.
User Virtual Host as a Regular Expression	Using regular expressions within the virtual host definitions allow the HOST header to be matched based on the defined regular expression pattern. Enable this checkbox if the value entered in the virtual host field is to be interpreted as a regular expression rather than a string match for comparing to the inbound HOST header.
Virtual Host	<p>The Virtual Host option allows the IP:Port combination to have a 3rd parameter which uses the HOST header of the inbound request to determine which virtual directory policy matches. With no virtual host defined, the virtual directory is matched simply based on IP, Port and URI. With virtual host defined, the virtual directory is matched based on IP, Port, HOST Header, and URI.</p> <p>i.e.</p> <p>http://10.5.1.1:80/test/policy HOST: prod.company.com</p> <p>http://10.5.1.1:80/test/policy HOST: dev.company.com</p>
Virtual Path	The Virtual Path field allows users to customize this REST's virtual path.
Virtual URI	The Unique Resource Indicator (URI) path used by clients to access this policy. This is where the system receives a request.

Filter Expression	The default "/" value represents an extended regular expression on which exists a trailing portion that must match a defined pattern before a request is accepted for processing.
Replace Expression	The "\$0" value represents the entire trailing portion of the request URI.
Send to remote server	<ul style="list-style-type: none"> When checked, the Remote Policies drop down list is enabled. Now, all requests and responses will be processed by the system in Proxy mode and sent to the selected Remote Policy. When unchecked, all requests and responses will be processed by the system in Service mode, with the processed request being returned to the client, and access to the Remote policy is disabled. <p>For more on Proxy versus Service mode see the chapter below titled: Processing in Proxy and Service Modes</p>
Discard response from server	When checked, responses from the back-end server are discarded.
Remote Policy	The Remote Policy associated with this Virtual Directory.
Remote Path	The back-end server IP / Port which identifies the Remote Policy.
Remote URI	Actual URI back-end server.
Host Header	The Host header set by Sentry when communicating with the remote server.
Process Response	When set to ON, the response from the back-end server undergoes pre-processing before being sent to the client.
IP ACL	The IP Access Control List that will be enforced on this Virtual Directory. With Unrestricted selected, there is no access control by IP enforced.
ACL	The User Access Control List that will be enforced on this Virtual Directory. With the Allow All ACL selected, there is no access control enforced. The selected User ACL grants access of this REST policy to any member of the User ACL.

Password Authentication	<p>When set to From Listener Policy, the password authentication credentials captured at the Listener Policy level will be used for enforcement.</p> <p>When set to Specify, the administrator can choose to enforce any of the following Password Authentication options:</p> <ul style="list-style-type: none"> • Use basic authentication • Use digest authentication • Use cookie authentication • Use form post authentication • Username and Password Parameters are used with the form post authentication • Require password authentication (any): to enforce a successful authentication not just capture the credentials. <p>For more information on Password Authentication please refer to the Forum Sentry v9 Access Control Guide.</p>
Redirect Policy	<p>The Redirect Policy that is associated to this Virtual Directory. Redirect Policies allow redirection to a different URL based on four events: Authentication Success, Authentication Failure, No Credentials and On Error. A valid Redirect Policy will need to be configured on the Resources>>Redirect Policies page in order to associate a Redirect Policy to the Virtual Directory.</p>
Error Template	<p>Associate an Error Template to this Virtual Directory or reference the Error Template in a selected Listener Policy that is associated with this Virtual Directory.</p>
Request Task List Group	<p>The Task List Group selected to process the request messages for this Virtual Directory.</p>
Response Task List Group	<p>The Task List Group selected to process the response message for this Virtual Directory.</p>

For information on HTTP Request Filters, refer to the Request Filters for REST Policies section of this document.

Operations on Virtual Directories for REST Policies

REST policies may have one or more Virtual Directories. Operations on Virtual Directories include:

- Add, edit or associate another Listener and/or Remote policy to the Virtual Directory.
- Configure Additional Virtual Directories on an REST policy.
- View / reconfigure a Virtual Directory.
- Enable / disable the Virtual Directory.
- Associate an ACL policy to the Virtual Directory.
- Associate an Error Template to this Virtual Directory or reference the Error Template in the Listener Policy.
- Edit the Remote Path of this Virtual Directory.
- Edit the Filter Expression used.
- Change the Replace Expression used.
- Add, edit, enable/disable, remove, promote or demote the request filter associated with the Virtual Directory.
- Select a Redirect Policy for the Virtual Directory.


Virtual Directories in REST policies may be set to process traffic in proxy mode or service mode.

Processing in Proxy and Service Modes

The following graphic displays processing in Proxy or Service modes:

Virtual Directories > Virtual Directory: New Virtual Directory

VIRTUAL DIRECTORY

Name*: 

Description:

Virtual URI:

Remote URI:

VIRTUAL URI SETTINGS

Listener Policy: [Edit](#)

Virtual Host:

☐ Use virtual host as a regular expression

Virtual Path:

☐ Enable Virtual Path Case Insensitivity

Filter Expression:

Replace Expression:

Request Filter Policy: [Edit](#)

Error Template:

ACCESS CONTROL

IP ACL Policy: [Edit](#)

ACL Policy:

XACML Policy:

Password Authentication:

Redirect Policy:

VIRTUAL DIRECTORY TASKS

Request Task List Group:

Response Task List Group:

REMOTE SETTINGS

☒ Send to remote server

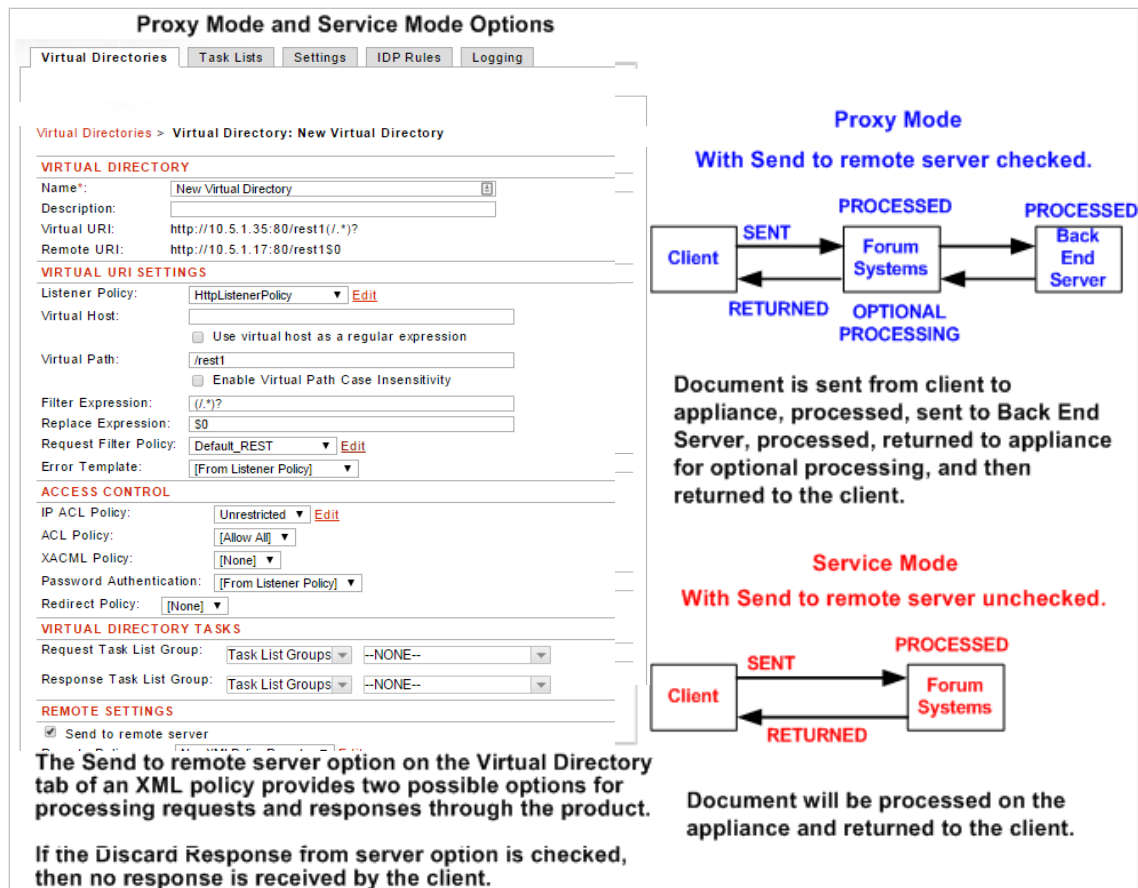


Figure 1: Proxy and Service Modes.

Proxy Mode

In Proxy mode, a document is sent from the client to the appliance, processed, sent to the back end server, processed, returned to the appliance for optional processing, and then returned to the client. Proxy mode is set when:

- the **Sent to Remote Server** checkbox in the Virtual Directory is checked.
- a **Remote policy name** is selected in the Remote policy field in the Virtual Directory.

Service Mode

Service mode allows the product to run as a service provider. A client request is processed by the product as an REST document and then sent back to the client in the HTTP response. Service mode is set when:

- the **Sent to Remote Server** checkbox in the Virtual Directory is unchecked.
- access to the Remote policy field is blocked in the Virtual Directory.

Protocol Mixing with REST Policies

Protocol mixing with REST policies provides a method of mixing protocols between incoming request and outgoing responses on the system. Protocol mixing is allowed on the following example network policies, from Incoming Request to Outgoing Response on the system:

- from HTTP/S listener to Tibco-Rv remote.
- from HTTP/S listener to Tibco-EMS remote.
- from HTTP/S listener to IBM MQ remote.
- from HTTP/S listener to SMTP remote.
- from Tibco-Rv listener to HTTP/S remote.
- from Tibco-EMS listener to HTTP/S remote.
- from IBM MQ listener to HTTP/S remote.
- from SMTP listener to HTTP/S remote.

NOTE: THE BULLETED LIST ABOVE DOES NOT CONTAIN **EVERY** PERMUTATION POSSIBLE WITH PROTOCOL MIXING, BUT IS A SMALL REPRESENTATIVE SUMMARY OF SOME PROTOCOLS THAT MAY BE MIXED WITH OTHERS.

How the System Manages Protocol Mixing on REST Policies

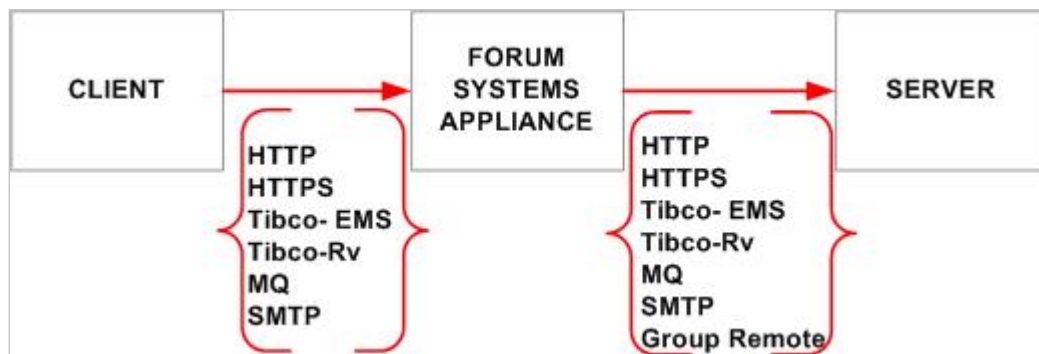


Figure 2: Protocol Mixing on REST Policies.

NOTE: FOR MORE INFORMATION, REFER TO THE MIX PROTOCOLS ON AN REST POLICY INSTRUCTION.

Asynchronous Protocols Supported with REST Policies

The system also supports protocol mixing between the following asynchronous protocols:

- from Tibco-EMS to Tibco-Rv.
- from Tibco-EMS to IBM MQ.
- from Tibco-RV to Tibco-EMS.
- from Tibco-Rv to IBM MQ.
- from IBM MQ to Tibco-EMS.
- from IBM MQ to Tibco-Rv.

Asynchronous protocols, such as IBM MQ, need to be used in the “synchronous” mode in order to be compatible with HTTP. For example, if an IBM MQ policy has the Synchronous policy option turned off, protocol matching cannot occur with HTTP because they are incompatible paradigms.

Authentication with IBM MQ Policies

When authenticating a message in an IBM MQ policy or Tibco-EMS policy during run-time, the system searches each message for the **fs_user** and **fs_password** property, and uses this information to authenticate each message and establish identity.

For the JMS-based messaging protocols that support SSL (Tibco EMS, IBM MQ) we have added our own basic authentication capability to allow each message to be authenticated and an identity established. The identity can then be used for access control, obtaining a signing key or even generating and

propagating an identity token such as a SAML token. The sender simply has to add two fields to the message headers that contain the user and password to use. For protocols that support SSL, it is recommended that SSL is used when sending the password along with a message. The password will not be propagated after it is consumed by the system. The properties **fs_user** and **fs_password** should be used in the JMS headers to add the appropriate credentials.

HTTP Headers

When HTTP is the inbound protocol, all headers allowed by RFC 2616 may be propagated to the remote protocol. The converse is also true, if the listener protocol is a JMS protocol (Tibco EMS or IBM MQ) any http headers that are specified (escaped with underscores rather than dashes) and the remote protocol is HTTP the headers will be placed into the HTTP protocol and propagated. This allows cookies such as authentication tokens from Tivoli Access Manager to be propagated and also content-type and any other stateful headers to be passed.

When mixing protocols on an IBM MQ policy, for example, the system manages authentication by converting all dashes to underscores in HTTP headers. This allows for the case of | HTTP | ----- | IBM MQ | ----- |HTTP| and all of the inbound headers (and cookies) will be propagated.

Default Filter Expression in a Virtual Directory

When a client request is received on a Virtual Directory at run time, the path of the client request URI consists of the Virtual Path followed by a trailing portion. The Filter Expression is an extended regular expression which the trailing portion must match before the request is accepted for processing.

To review the syntax of the Filter Expression follows Java's regular expression rules; refer to documentation at

JDK 1.8: <https://docs.oracle.com/javase/8/docs/api/java/util/regex/Pattern.html>

NOTE: THE DEFAULT FILTER EXPRESSION `"/?"` IS MORE RESTRICTIVE THAN IN SOME PREVIOUS VERSIONS OF THE PRODUCT. IF YOU NEED TO ALLOW SUBDIRECTORIES OR URI PARAMETERS (A QUERY STRING), YOU CAN CHANGE THE FILTER EXPRESSION TO THE ALL-INCLUSIVE `".*"`.

Replace Expression in a Virtual Directory

When a client request starts with the virtual path and the trailing portion matches the Filter Expression, the trailing portion is replaced by the Replace Expression and appended to the physical URI (WSDL policies) or Remote URI (REST policies) when connecting to the remote server. In the Replace Expression, \$0 represents the entire trailing portion of the request URI. \$1 represents the portion of the request URL matched by the first set of parentheses in the Filter Expression (first capture group), \$2 represents the portion matched by the second set of parentheses, up through \$9. See the example below.

The default Replace Expression '\$0' means that the system will preserve the trailing portion of the client request URI in the remote request URI. The Replace Expression can be left empty to indicate that the Remote URI should not include the trailing portion at all.

Client requests are mapped to a Virtual Directory at run-time as follows:

1. The path of the client request URI is compared with the virtual path of each enabled Virtual Directory configured for the Listener policy the request was received on.
2. If more than one Virtual Directory matches, the most specific match is selected. For example, if Virtual Directories '/one' and '/one/two' are configured, a request for '/one/two/three' will be processed by the Virtual Directory with path '/one/two', while a request for '/one/four' will be processed by the Virtual Directory with path '/one'. If the Virtual Directory with path '/one/two' is subsequently disabled, both requests will now be processed by the Virtual Directory with path '/one'.
3. If no Virtual Directories match the request URI, the request is rejected with an error message stating that the requested Virtual Directory is not found.
4. Once a Virtual Directory is selected, the trailing portion of the request URI is matched against the Filter Expression. If the match fails, the request is rejected with an error message stating that the path match has failed. Other, less-specific Virtual Directories found in step 2 are **not** used in this case.

Example:

WSDL port Virtual Directory is configured with:

```
[ HTTP Listener policy IP: 10.1.0.1, port: 80 ]
Virtual Path: /virtual/service
Filter Expression: \?id=(u[0-9]{2})&food=([a-z]+)
Replace Expression: /fruit/$2;user=$1
[ Remote Path from WSDL: /remote ]
[ Physical URI: http://10.0.0.3/remote/fruit/$2;user=$1 ]
```

A client request comes in for the URL <http://10.1.0.1/virtual/service?id=u21&food=apple>.

The trailing portion is '?id=u21&food=apple' which matches the Filter Expression. In the Filter Expression, the first capturing group is 'u[0-9]{2}' which matches 'u21' from the request URL, and the second capturing group is '([a-z]+)' which matches 'apple' from the request URL.

Therefore, the request is proxied to a remote server using the following Physical URI:
<http://10.0.0.3/remote/fruit/apple;user=u21>.

TASK LISTS AND TASK LIST GROUPS FOR REST POLICIES

The Task List tab allows users to view all Tasks and Task Lists associated with an REST policy through Task List Groups.

Note: With Forum Systems Sentry v9, Task List Groups can now be set to process request or response documents individually per Virtual Directory, or per REST Policy. In previous releases, a single Task List Group was set for all messages (request and response) for the Virtual Directory.

Task Lists Groups at the Virtual Directory Level

Task List Groups set at the Virtual Directory level are applicable only the Request or Response Messages for that Virtual Directory. Different Task List Groups can be selected for the request or response messages.

Virtual Directories Task Lists Settings IDP Rules Logging Documents

Virtual Directories > Virtual Directory: New Virtual Directory

VIRTUAL DIRECTORY

Name: New Virtual Directory

Description:

Virtual URI: http://10.10.20.10:8181/testtesttest(/.*)?

Remote URI: http://api.openweathermap.org/testtesttest\$0

OPENAPI SETTINGS

☐ Publish a different location in exported OpenAPI

Published Protocol: http

Published Host:

Published Port:

VIRTUAL URI SETTINGS

Listener Policy: DEX-8181 Edit

Virtual Host:

☐ Use virtual host as a regular expression

Virtual Path: /testtesttest

☐ Enable Virtual Path Case Insensitivity

Filter Expression: (/.*)?

Replace Expression: \$0

Request Filter Policy: Default_HTML Edit

Error Template: [From Listener Policy]

Google Analytics: [None]

ACCESS CONTROL

IP ACL Policy: Unrestricted Edit

Host ACL Policy: [None]

ACL Policy: [Allow All]

Password Authentication: [From Listener Policy]

Redirect Policy: [None]

VIRTUAL DIRECTORY TASKS

Request Processing: Task List Groups Type or select label name [None]

Response Processing: Task List Groups Type or select label name [None]

REMOTE SETTINGS

☒ Send to remote server

Remote Policy: api-openweathermap.org Edit

Remote Path: /testtesttest

Host Header:

Process Response: On

☐ Discard response from server

Apply Save

Task Lists Groups at the REST Policy Level

Task List Groups set at the REST Policy level are applicable for all Virtual Directories of the REST Policy. The Task List Groups can be associated with the Request or Response Messages for all Virtual Directories. Different Task List Groups can be selected for the request or response messages.

REST POLICIES > REST POLICY

REST POLICY

Policy Name: New REST Policy

Virtual Directories

Task Lists

Settings

IDP Rules

Logging

TASK LIST GROUPS

Request Task List Group

Task List Groups --NONE--

Response Task List Group

Task List Groups --NONE--

Create

Save

NOTE: FOR FULL DOCUMENTATION ON TASKS, TASK LISTS AND TASK LIST GROUPS, REFER TO THE *FORUM SYSTEMS SENTRY™ VERSION 9 TASKS MANAGEMENT GUIDE*.
FOR INFORMATION ON EDITING / VIEWING A TASK LIST, REFER TO THE *COMMON OPERATIONS OF THE FORUM SYSTEMS SENTRY™ VERSION 9 WEB-BASED ADMINISTRATION GUIDE*.

SETTINGS FOR REST POLICIES

The Settings tab includes name and description for this REST policy. The Settings tab also includes the “Protect virtual resource option” and the “Enable session cookies option.”

TERM	DEFINITION
Policy Name	The identifier of this REST Policy.
Policy Description	An optional description of this REST Policy.
Protect Virtual Resource	<p>When Protect virtual resource is checked, the system uses the Sentry Virtual Directory when authenticating and authorizing against the back end server.</p> <p>When Protect virtual resource is unchecked, the system uses the Sentry physical URI when authenticating and authorizing against the back end server.</p>
Enable Session Cookies	<p>When the Enable session cookies option is checked, Sentry will automatically set a cookie (often the FSESSION cookie) for authentication and cache it for the duration noted. The cookie can be used in a Single Sign On paradigm.</p> <p>When the Enable session cookies option is unchecked, cookie is set.</p> <p>Cookie Parameters include:</p> <ul style="list-style-type: none">• Cookie Name• Cookie Path• Cookie Domain• Session Timeout (mins)• Session Idle Timeout (mins)
Enable Persistent Sessions	When the Enable Persistent Sessions option is checked, Sentry will store the cookie information in a database, using the selected Data Source. This allows for persistent sessions across multiple Sentry instances that all use the same database.
Use Secure cookies	A cookie with the Secure attribute is sent to the server only with an encrypted request over the HTTPS protocol, never with unsecured HTTP, and therefore can't easily be accessed by a man-in-the-middle attacker.
Use HTTP Only cookies	HttpOnly is an additional flag included in a Set-Cookie HTTP response header. Using the HttpOnly flag when generating a cookie helps mitigate the risk of client side script accessing the protected cookie (if the browser supports it)
WAF Policy	Associate a Web Application Firewall (WAF) policy from Resources->WAF Policies
Exclude from Monitoring	Do not include statistics from this policy in the Monitoring and performance statistics
Enable Response Caching	Enable a response caching policy (when licensed for this feature) to apply to responses for this policy
Enable Google Analytics	Enable statistics from this policy to be written to a Google Analytics policy (when licensed for this feature)
Enable Persistent Sessions	When the Enable Persistent Sessions option is checked, Sentry will store the cookie information in a database, using the selected Data Source. This allows for persistent sessions across multiple Sentry instances that all use the same database.

IDP RULES FOR REST POLICIES

Intrusion Detection and Prevention (IDP) Rules define a set of criteria which can be associated with an REST policy. IDP Groups represent a reusable collection of IDP Rules that may be applied to this REST policy. Under the IDP Group drop down list is a listing of all the IDP Rules included in the selected IDP Group.

NOTE: FOR FULL DOCUMENTATION THAT THE PRODUCT PROVIDES ON IDP RULES, REFER TO THE *FORUM SYSTEMS SENTRY™ VERSION 9 IDP RULES GUIDE*.

IDP Rules also allow throttling and black listing based on identity, IP and traffic load. IDP Rules can be scheduled based on expected traffic to throttle back transactions or reroute messages.

IDP Rules have actions associated with them that can generate an email alert or invoke a specified web service, triggering any event programmed into the web service.

IDP Rules define a set of identified criteria used by the system to detect intrusion. Once created, IDP Rules may be reused.

IDP Rule Tab Screen Terms for REST Policy

The following table describes each term and definition found on the IDP Rule tab.

TERM	DEFINITION
IDP Group	The identifier for this IDP Group.
IDP Rule	IDP Rules that is included in this IDP Group.
IDP Criterion	Description of the type of IDP Rule.
Threshold	Any constrained value, period or rate applied to the detection settings of the IDP Rule.
User Group	The name of the User group for which the IDP Rule applies.
Enforce By	<ul style="list-style-type: none">• If User, the IDP Rule is enforced on a per User basis. If IP, the IP address that is defined in the detection settings of the IDP Rule.• If IP, the IDP Rule is enforced on a per IP address User basis.
IDP Action	The name of the IDP Action policy applied to the IDP Rule.
IDP Schedule	The name of the IDP Schedule policy applied to the IDP Action.

LOGGING SETTINGS FOR REST POLICIES

Policy level logging can be set for each REST Policy. This allows for logging different policies with different log levels.

Logging Tab Screen Terms for REST Policy

The following table describes each term and definition found on the IDP Rule tab.

TERM	DEFINITION
Enable Policy Level Logging Settings	When checked, policy level logging is enabled for the REST Policy. When not checked, policy level logging is disabled for the REST Policy.
Policy Log Level	When policy level logging is enabled, this is the log level set for this policy.
Always Log the Following Code	When policy level logging is enabled, this is a list of error codes that will always be logged regardless of the log level set for this policy.
Pattern Match Policy	When policy level logging is enabled, and the Always log the following codes option is enabled, a pattern match policy can be used to log messages based on a pattern match policy (regex).

Note: For more information on logging with Sentry, please see the [Forum Sentry v9 Logging Guide](#). For more information on Pattern Match policies, see the [Forum Sentry v9 IDP Rules Guide](#).

TRANSFERRING EXPORTING AND IMPORTING REST POLICIES

Users may transfer one or more REST policies (and all its dependencies) from one Agent machine to another Agent machine with the **GDM Transfer** command visible on the REST Policies screen. This type of transfer is referred to as a GDM partial configuration transfer.

Users may export one or more REST policies (and all its dependencies) to a local file system via an FSG file using the **GDM Export** command visible on the REST Policies screen. This type of export is referred to as a GDM partial configuration export.

Through the Import / Export screen, users may import REST policies with all their dependencies into the product using the **Import** command from the **GDM IMPORT** section of the screen. This type of import is referred to as a GDM partial configuration import.

For information on the following features, refer to the following sections of these volumes:

- To transfer an REST policy to an Agent Group, refer to the GDM Partial Configuration Transfer section of the *Forum Systems Sentry™ Version 9 System Management Guide*.
- To export an REST policy, to a local file system via an FSG file, refer to the GDM Partial Configuration Export section of the *Forum Systems Sentry™ Version 9 System Management Guide*.

REST POLICIES

Search Usage: type any text Filter Usage: type or select the label

No Labels

<input type="checkbox"/>	NAME	VIRTUAL DIRECTORY	STATUS	VIRTUAL URI	REMO
<input type="checkbox"/>	New REST Policy	New Virtual Directory		http://10.5.1.35:80/rest1	http://
		New Virtual Directory2		http://192.168.1.35:80/rest2	http://
<input type="checkbox"/>	New REST Policy2	New Virtual Directory			

- To Import an REST policy with all its dependencies to the current machine via an FSG file, refer to the GDM Partial Configuration Import section of the *Forum Systems Sentry™ Version 6.5 System Management Guide*.

GDM IMPORT

Password*:

☒ From file (.fsg)*: No file chosen

☐ From database

Configuration Name:

REQUEST FILTERS FOR REST POLICIES

A Request filter allows the system to select those HTTP requests that match selection criteria based on the HTTP headers and decode the request appropriately. Most request filters will only need to examine the content-type header, but any header may be used.

Request filters can be used to manage sets of standard, emerging and future content types, along with associated rules. Administrators may add, configure, edit and remove request filters, as well as restore default request filters that have been deleted. You may enable or disable request filters, and re-prioritize the list of request filters. Request filters include a name, format, description, identifying expression and parameter.

There are two sets of default Request Filters. One is pre-configured; the other one is not.

One set of Request Filters is common; that is, these are a collection of Request Filters which are available to all REST policies.

The other set of Request Filters is local; that is, these are a collection of Request Filters which are available to any subsequently created Virtual Directory on an individual REST policy.

Both sets of Request Filters include:

- REST Default*
- Web Form*
- Web Form Data
- HTTP GET*
- Multipart
- DIME (Direct Internet Message Encapsulation)
- Streaming
- REST
- MTOM
- JSON

* These Request Filters are enabled by default; the others are not.

NOTE: WITH REST POLICIES, REQUEST FILTERS ARE ASSOCIATED WITH THE VIRTUAL DIRECTORIES TAB. WHEN ALL REQUEST FILTERS ON AN REST POLICY ARE DISABLED, THE STATUS OF THE REST POLICY WILL ALSO BE DISABLED (YELLOW STATUS LIGHT).

Requests not matching a defined Request Filter policy will not be processed.

Request Filter Properties

The following table displays the terms and description of the elements of the Request Filter Properties screen:

TERM	DEFINITION
Name	The name given to the Request Filter.
Format	The following formats are available for Request Filters: <ul style="list-style-type: none">• Simple• Web Form• Multipart• DIME (Direct Internet Message Encapsulation)

- Web Form Data
- Streaming
- REST
- MTOM

Note: for JSON use Simple or use the default JSON Request Filter.

Description	A description for the Request Filter.
Identification Expression	An expression using “request filter” syntax, used to match HTTP request to process with this filter.
Parameter	For “Web Form” and “Web Form Data” request filters, the name of the HTML form parameter which contains the data to process.
Convert Content-encoding	<ul style="list-style-type: none"> • The No conversion option means that whatever compression (i.e. HTTP Transfer-encoding) was received from the client (compress, gzip, deflate, or none) will be retained and used for forwarding the REST message to the back end server. • The identity (uncompressed) option means that any compression used by the originating client will be removed before forwarding the uncompressed REST message to the back end server. • The gzip option means that whatever compression was received from the client (compress, gzip, deflate, or none) will be replaced with gzip compression before forwarding the REST message to the back end server. • The deflate option means that whatever compression was received from the client (compress, gzip, deflate, or none) will be replaced with deflate compression before forwarding the REST message to the back end server.

Request Filters Available to All REST Policies

The collection of common default request filters on the system is accessed from the **REQUEST FILTER POLICIES** screen. These request filters affect and apply only to newly created REST policies and represent the collection of all Request Filters available to any newly created Virtual Directory. The Request Filters area of the screen displays the three enabled request filters.

REQUEST FILTER POLICIES > REQUEST FILTER POLICY					
REQUEST FILTER POLICY					
Policy Name*:		Default_REST			
<input type="checkbox"/>	#	MESSAGE TYPE FILTER	FORMAT	DESCRIPTION	STATUS
<input type="checkbox"/>	1	REST to XML	REST	Convert HTTP query parameters to XML	●
<input type="checkbox"/>	2	REST (CRUD)	Simple	HTTP POST, GET, PUT, DELETE	●
Enable Disable New Delete Update Save Restore Defaults					

Request Filters Available to Each Virtual Directory

Local default request filters on the system are accessed from the **REST Policies** screen, after selecting an **individual REST Policy name link**. On the Virtual Directory tab, select a **Virtual Directory link**. On

the Virtual Directory Details screen. Select **Edit** next to the Request Filter Policy. These request filters apply only to an individual Virtual Directory on an REST policy and represent the collection of all local Request Filters available to this specific Virtual Directory. The Request Filters area of the screen displays the three enabled request filters.

Virtual Directories

Task Lists

Settings

<input type="checkbox"/>	VIRTUAL DIRECTORY	STATUS	V
<input type="checkbox"/>	New Virtual Directory	●	h
<input type="checkbox"/>	New Virtual Directory2	●	h

REQUEST FILTER POLICIES > REQUEST FILTER POLICY

REQUEST FILTER POLICY

Policy Name*: Default_REST

<input type="checkbox"/>	#	MESSAGE TYPE FILTER	FORMAT	DESCRIPTION	STATUS
<input type="checkbox"/>	1 ↓	REST to XML	REST	Convert HTTP query parameters to XML	●
<input type="checkbox"/>	2 ↑	REST (CRUD)	Simple	HTTP POST, GET, PUT, DELETE	●

Enable

Disable

New

Delete

Update

Save

Restore Defaults

Common Default Request Filters with REST Policies

A summary of the common default Request Filters that come pre-configured with REST policies are:

REQUEST FILTER NAME	FORMAT	CONTENT TYPES
REST Default	Simple	<ul style="list-style-type: none">• text/REST• application/REST
Web Form	Web Form	<ul style="list-style-type: none">• application/x-www-form-urlencoded
Web Form Data	Web Form Data	<ul style="list-style-type: none">• multipart/form-data
HTTP GET	Simple	<ul style="list-style-type: none">• text/REST• application/REST
Multipart	Multipart	<ul style="list-style-type: none">• multipart/related
DIME	DIME	<ul style="list-style-type: none">• application/dime
Streaming	Streaming	<ul style="list-style-type: none">• (agnostic)
REST	REST	<ul style="list-style-type: none">• (agnostic)
MTOM	MTOM	<ul style="list-style-type: none">• multipart/related.type=application/xop+REST
JSON	Simple	<ul style="list-style-type: none">• application/json

Note: Add a new Request Filter by navigating to the **Virtual Directories** tab, and then click **Edit** next to the Request Filter Policy. Select New on the Request Filter Policies screen. Enter **values**, and then click **Save**.

Request Filter Syntax

The following table displays literal Request Filter syntax conventions used when creating an identifying expression for a Request Filter:

LITERAL CONVENTION	DEFINITION
	Or
&&	And
()	Grouping
==	Exact match
==i	Case insensitive (Header field will be matched without regard to case.)
==~	Regular expression match (Header field will be matched to a regular expression or a wild card.)
" "	Quotes must surround the value to match.

Note: If your business processes use only the default Request Filters, then there is no need to create new Request Filters. Adding a new Request Filter is a global operation, and doing so makes all content types listed in the Request Filter screen available to all documents that are processed on the system.

For information on enabling / disabling or editing a Request Filters, refer to the Common Operations of the *Forum Systems Sentry™ Version 9 Web-based Administration Guide*.

View or Restore Common Default Request Filters for REST Documents

Viewing Common Default Request Filters for REST Documents

The common default Request Filters for REST policies can be viewed by navigating to the **REST Policies** screen, and selecting **Settings**. The REQUEST FILTERS screen appears. If any of the common default request filters have been edited or removed, you may restore them back to their factory state by following these steps:

These common default Request Filters are available to all Virtual Directories of all REST policies on the system.

Note: When restoring default Request Filters, all previously created Request Filters will be deleted.

Add a Web Form Request Filter

This instruction displays adding a Web Form request filter:

REQUEST FILTER POLICIES > REQUEST FILTER POLICY > MESSAGE TYPE FILTER

HTTP REQUEST FILTER

Name*:

Format:

Description:

Identification Expression*:

☒ Generate Expression

Methods:

☐ GET ☐ POST ☐ HEAD ☐ PUT ☐ DELETE

☐ OPTIONS ☐ TRACE ☐ CONNECT

Content Types:

☐ ANY ☐ XML ☐ SOAP 1.1 ☐ SOAP 1.2 ☐ SwA

☐ MIME ☐ MTOM ☐ DIME ☐ JSON

☐ URL Encoded ☐ Web Form

Parameter:

Remote Convert Content-Encoding:

Client Convert Content-Encoding:

Create

- From the Navigator, select **REST Policies**. The policy opens with the Virtual Directories tab displayed.
- Select **Edit** next to Request Filter Policy, and then select **New**.
- On the REQUEST FILTER details screen, enter a **Request Filter** name in the Name field.
- From the Format drop down list, click **Web Form**.
- Enter a **Description** in the Description field (optional).

Note: Review the previous section entitled Request Filter Syntax or enter an identifying expression that parallels the examples below:

Example #1 `Content-Type == "application/x-www-form-urlencoded" && method == "POST"`

Example #2 `(Host == "acme3.com" || Content Type =~ "acme3/.*") && method == "POST"`

You may type either expression into the Identification Expression field, or paste an expression into it.

- Enter an expression that tests HTTP header values in the Identification Expression field. Enter:
`Content-Type == "application/x-www-form-urlencoded" && method == "POST"`
- Enter **DOCUMENT** (the name of the text field from the posted form) in the Parameter field.
- Skip the Convert Content-Encoding drop down list.
- Click **Create**.

Promote or Demote a Request Filter Priority

Follow these steps to promote a Request Filter priority. This instruction promotes the Web Form Request Filter:

<input type="checkbox"/>	#		MESSAGE TYPE FILTER	FORMAT	DESCRIPTION	STATUS
<input type="checkbox"/>	1	↓	<u>REST</u>	REST	HTTP REST request	●
<input type="checkbox"/>	2	↑	<u>CRUD</u>	Simple	HTTP POST, GET, PUT, DELETE	●
<div>Restore Defaults Enable Disable Delete New</div>						

- From the Navigator, select the **REST Policies** screen. The policy opens with the Virtual Directories tab displayed.
- Select **Edit** next to Request Filter Policy.
- With your mouse, select the **UP arrow** aligned with the Web Form Request Filter.
- The REQUEST FILTERS screen refreshes and the Web Form Request Filter has been promoted.

Delete a Request Filter

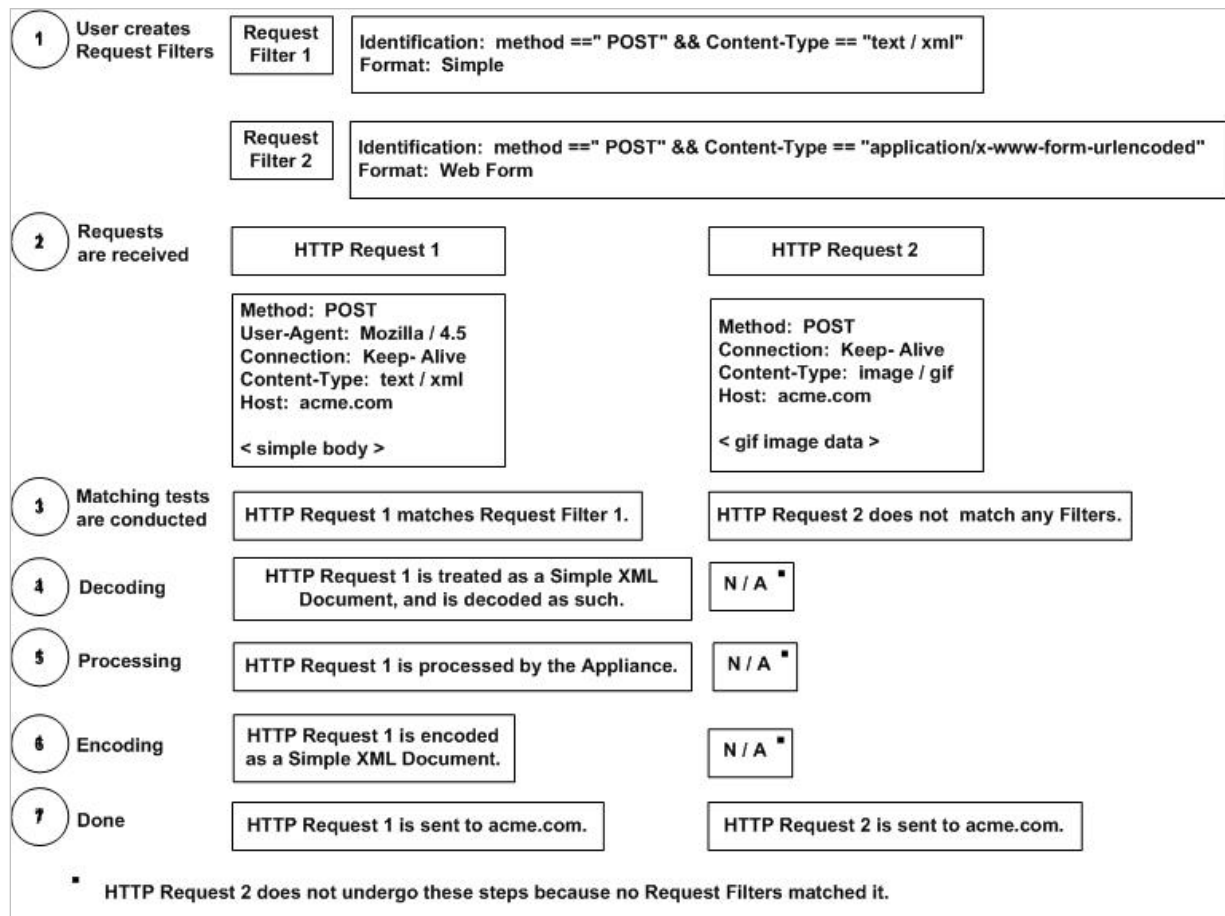
Follow these steps to delete a Request Filter:

- From the Navigator, select the **REST Policies** screen. The policy opens with the Virtual Directories tab displayed.
- Select **Edit** next to Request Filter Policy to view all current Request Filters.
- Check the **checkbox** aligned with a Request Filter, and then select **Delete**.
- The "Are you sure that you want to permanently delete all existing filters?" message appears. Click **OK**.

APPENDIX

Appendix A - How Request Filters Work

Request Filters identify and decode REST documents of different types as they are prepared for processing in the system, before actual document manipulation. The graphic below displays the actions that occur as Request Filters are applied to a document:



NOTE: THIS GRAPHIC ASSUMES THAT THE NO MATCHING XML IDP RULE IS OFF.

Figure 3: Request Filters Identify and Convert REST Documents

Appendix B - Constraints in REST Policies Guide

ELEMENT	CONSTRAINTS	CHARACTER COUNT
REST policy Names	Unique and case sensitive. Must start with an alpha character. Accepts underscores and dashes.	1-32
Virtual Directory name	Unique and case sensitive	1-256
Request Filter name	Unique and case sensitive	1-256

Appendix C - Specifications in REST Policies Guide

ELEMENT SUPPORTED	SPECIFICATIONS
REST policies	Unlimited *
Virtual Directories	With REST policies, you may have an unlimited number of Virtual Directories per REST policy.
Request Filters	100
Task Lists allowed per REST policy	Unlimited * Task Lists are associated to Task List Groups, not directly to REST Policies. Task List Groups can contain multiple Task List.
Task List Groups allowed per REST policy	1 Task List Group can be set at the following levels: <ul style="list-style-type: none">• Virtual Directory for Requests• Virtual Directory for Responses• REST Policy for Requests• REST Policy for Responses

* Limited only by disk space.

Appendix D - Virtual Directory Reference Chart in REST Policies Guide

Click on the Virtual Directory name link to view available options in a Virtual Directory.

The screenshot shows the 'Virtual Directories' configuration interface. At the top are tabs for 'Virtual Directories', 'Task Lists', 'Settings', and 'IDP Rules'. The main heading is 'Virtual Directories > Virtual Directory: New Virtual Directory'.

VIRTUAL DIRECTORY

Name*: New Virtual Directory

Description:

Listener Policy: Bayside_Listener

Virtual Path: /virtual/service

Virtual URI: https://10.5.6.92:8034/virtual/service/?

Filter Expression: /?

Replace Expression: \$0

☒ Send to remote server

☐ Discard response from server

Remote Policy: Bayside_Remote

Remote Path: /remote

Remote URI: http://www.server.com:8080/remote/\$0

Process Response: On

ACL: EastCoast_ACL

Error Template: [From Listener Policy]

Annotations:

- From the Listener Policy drop down list, select a Listener Policy to associate with this XML Policy.
- The Virtual Path field allows users to customize this XML policy's Virtual Path.
- With **Send to remote server** checked, the Remote Policies drop down list becomes enabled.
- With **Discard response from server** checked, any responses from the back end server are discarded.
- From the Remote Policies drop down list, select a **Remote Policy** to associate with this XML Policy.
- The Remote Path field allows users to customize this XML policy's Remote Path.
- From the Access Control List drop down, select an **ACL Policy** to enforce on this XML policy. The "Allow All" ACL means there is no access control enforced.
- From the Error Template drop down list, select the **Error Template Policy** referenced on the Listener policy, or select another one.

HTTP REQUEST FILTER TABLE:

#	HTTP REQUEST FILTER	FORMAT	DESCRIPTION	STATUS
1	XML_Default	Simple	Plain XML	●
2	Web_Form	Web Form	Posted form (URL Encoded)	●
3	HTTP_GET	Simple	HTTP GET	●
4	Multipart	Multipart	SOAP with Attachments	●
5	DIME	DIME	WS-Attachments	●

Buttons: Restore Defaults, Enable, Disable, Delete, New

Select a **Request Filter** link to view details, or select **New** to create a new HTTP Request Filter.

Figure 4: The Virtual Directories Screen and Associated Options with REST Policies.

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