IBM Software Group

Using WebSphere DataPower SOA Appliance with the FTP Transport Protocol

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1 February 2011

WebSphere® Support Technical Exchange

Agenda

- Overview
- Scenario 1: FTP Poller
- Scenario 2: SFTP Poller
- Scenario 3: FTP Server FSH
- Scenario 4: SFTP Server FSH
- Summary

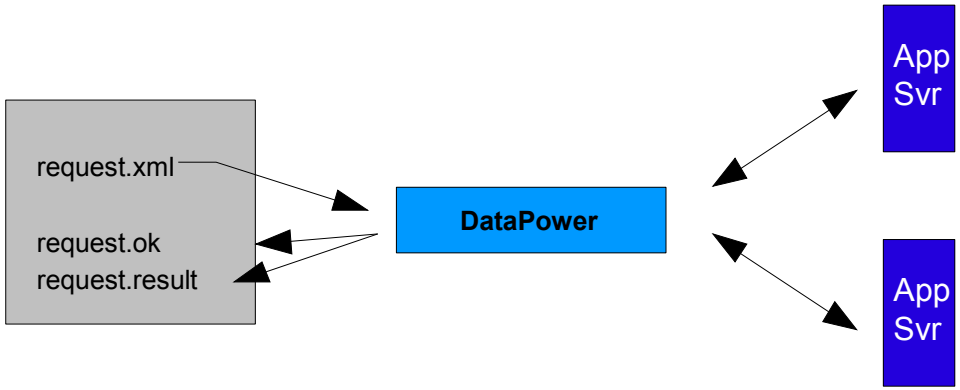
Overview

- Enterprise customers want/need to bridge legacy S/FTP-based messaging flows to newer HTTP-based Web Services
- Enterprise customers want/need to bridge S/FTP-based messaging flows to other protocols (i.e. MQ)
- Enterprise customers want/need to transparently proxy S/FTP servers
- This presentation examines configuration patterns for each business need

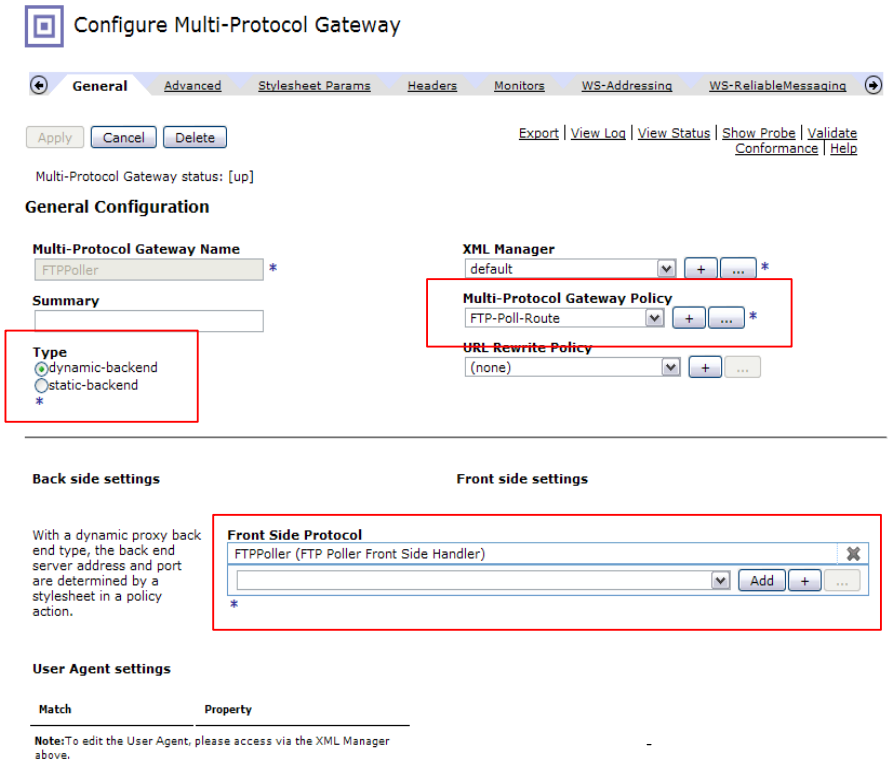
Scenario 1: FTP Poller

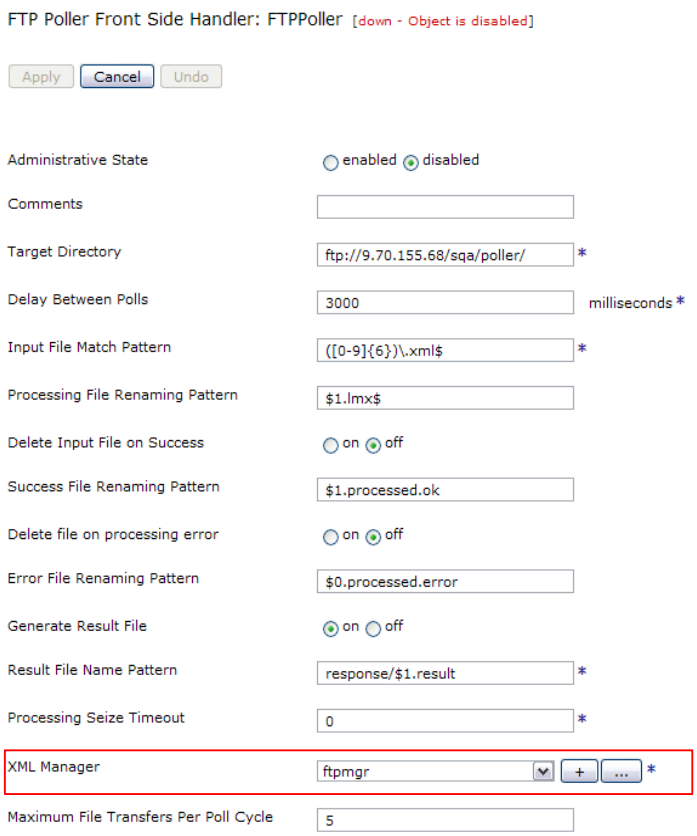
The DataPower device bridges the legacy FTP-based transport used by business partners to newer HTTP-based services within the enterprise. The DataPower device performs the following tasks:

- Retrieve message files by polling a remote FTP server
- Route messages to an enterprise HTTP application server for processing
- Capture the response provided by the HTTP-based application and place the response file on the remote FTP server, using a predetermined naming pattern.



Scenario 1: FTP Poller





Scenario 1: FTP Poller

Additional Considerations

This configuration renames rather than deletes files as they are processed. Some systems may work better if processed files are deleted. See the FTP Poller FSH configuration to delete files automatically.

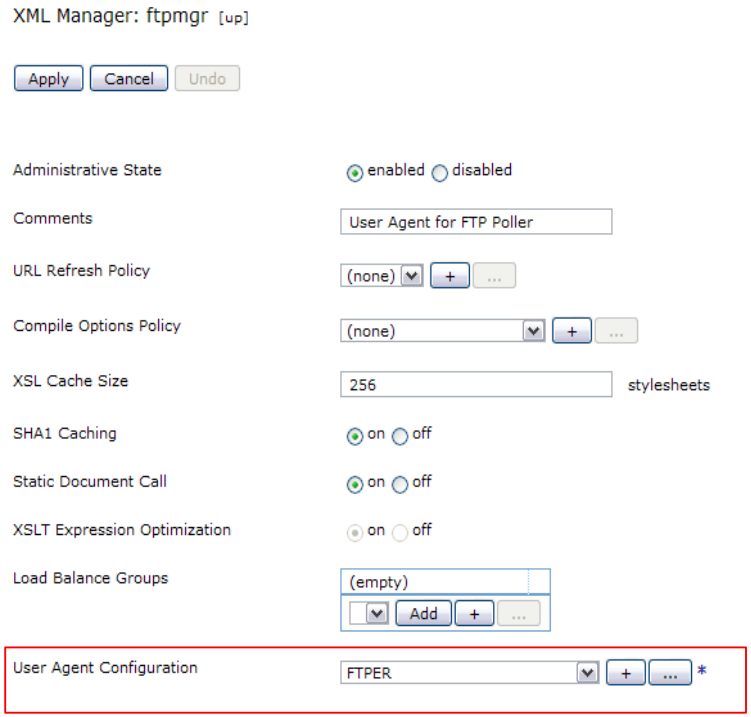
By default, the FTP Poller retrieves only one file at a time. This may not provide the throughput needed for the client systems. Use the **Maximum File Transfers Per Poll Cycle** input of the Front Side Handler to increase the number of matching files retrieved per connection. Note that the optimal setting will depend upon the size of the files retrieved and the message processing latency for each message. This setting may also be affected by the **Delay Between Polls** setting of the Handler. Note that the next cycle of retrieval will not start until the current cycle completes.

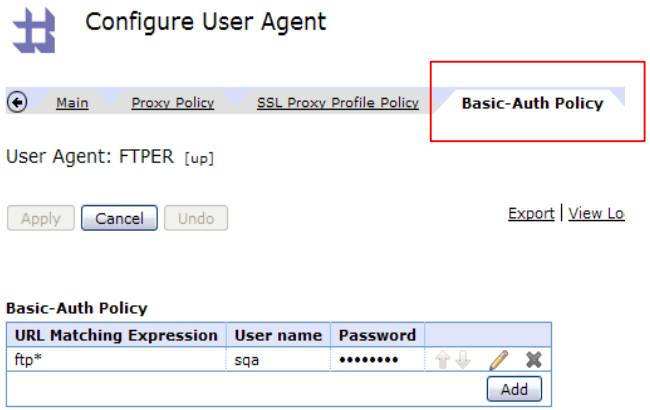
The frequency of polling can be controlled using the **Delay Between Polls** setting of the Handler. The optimal value for this setting will be determined by the processing latency of each message and the ability of the back end services to accept traffic. This may also be affected by the **Maximum File Transfers Per Poll Cycle** setting.

The device opens a new connection for each file retrieved, which results in two connections to the front side FTP server for each file obtained. This behavior can be modified by setting the Gateway **Persistent Connections** property to *On* (on the Advanced tab). This will cause the poller to reuse connections to the server as much as possible.

When more than one service polls the same remote directory, consider setting the **Processing Seize Timeout** input to a non-zero value. This can potentially prevent an inbound message from failing to reach the intended destination. Without using this mechanism, a file can be marked as “in process” forever.

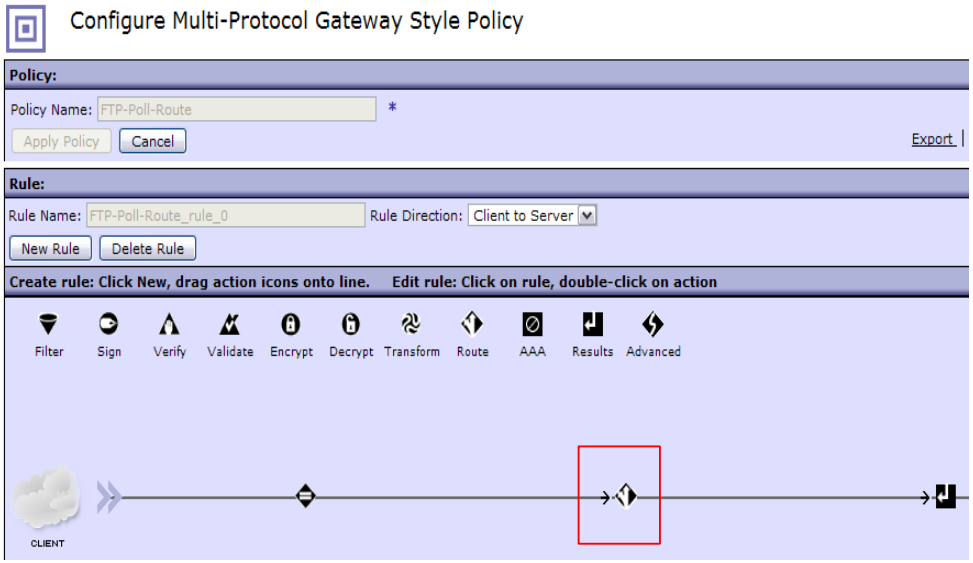
Scenario 1: FTP Poller

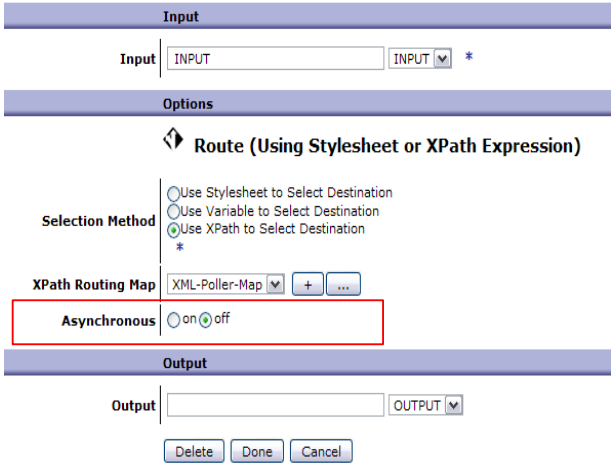




The Basic-Auth Policy of the User Agent attached to the XML Manager provides credentials for connecting to the remote FTP Server.

Scenario 1: FTP Poller





XPath Routing Map: XML-Poller-Map [up]

Apply | Cancel | Undo

Export | View Log | View Status | Help

Rules

XPath Expression	Remote Host	Remote Port	SSL
/*[namespace-uri()='urn:oasis:names:specification:ubl:schema:xsd:CommonBasicComponents-1.0' and local-name()='QuoteRequest']	127.0.0.1	3888	off
/*[namespace-uri()='urn:oasis:names:specification:ubl:schema:xsd:CommonBasicComponents-1.0' and local-name()='Order']	127.0.0.1	3888	off

Add

*

The Route Action uses an Xpath Routing Map keyed on the root node of the request to determine destination.

Scenario 1: FTP Poller

Additional Considerations

No response rule was configured. All responses will pass through the gateway unaltered.

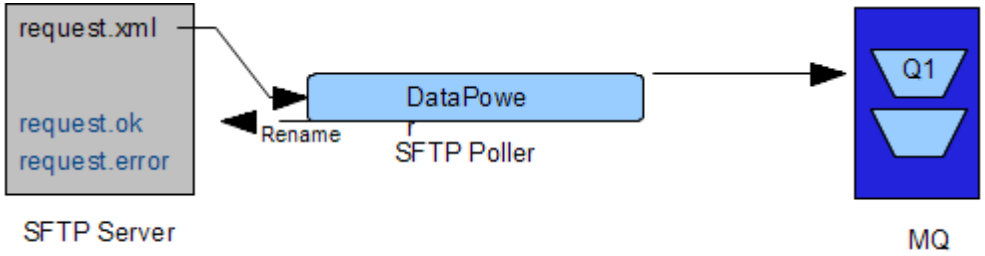
Request files that do not meet either of the routing criteria will result in an error. This is, in effect, a firewall protecting the enterprise from processing requests placed in the remote FTP location that do not meet the criteria of the back-end application. This same benefit can be achieved by using an Xpath expression in the Match action for matching requests to processing rules. Two rules would be needed for the two Xpath expression cases configured in the Route action. A third rule, matching all other requests, could then be configured to send non-conformant requests to a different processing system rather than triggering an error.

No error rule was configured. This is done to illustrate what will happen by default if the device encounters an error in processing requests. This behavior can be controlled by creating an error rule that takes the desired action.

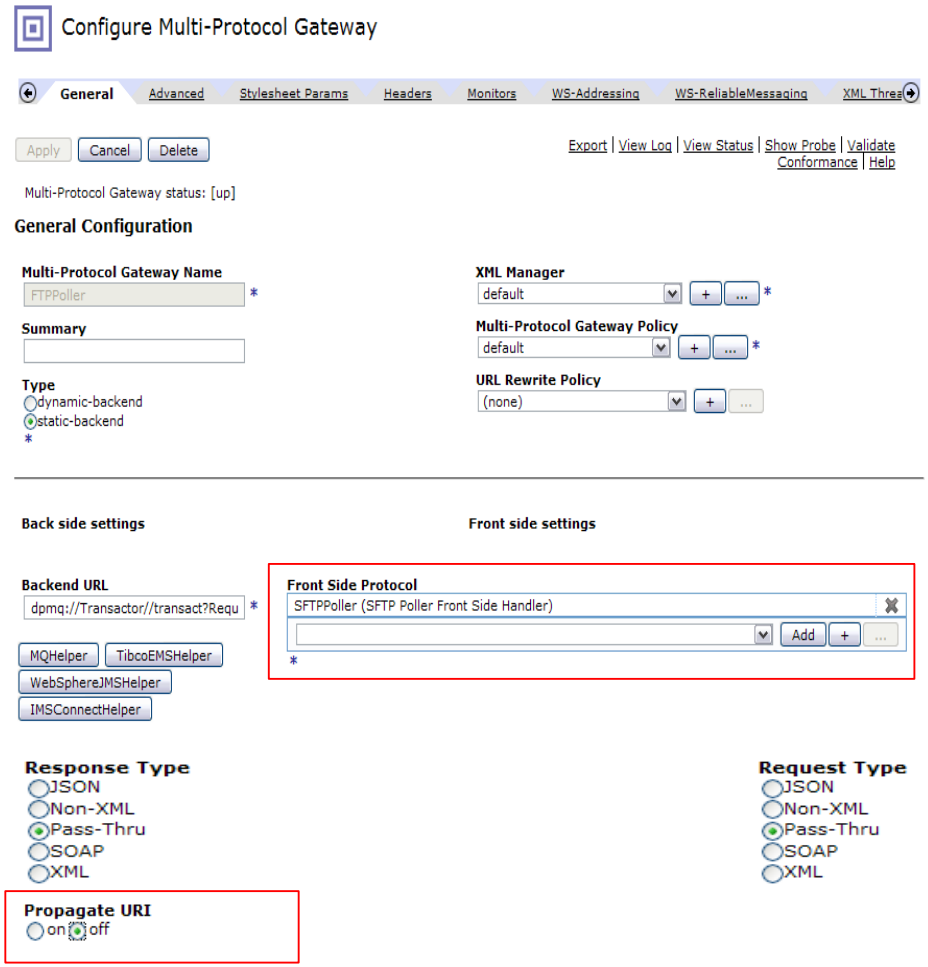
Scenario 2: SFTP Poller

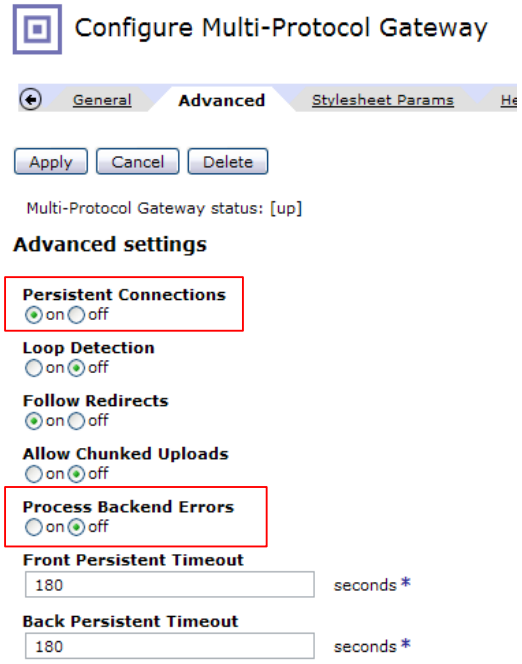
In this scenario, the DataPower device extends the ESB to include FTP-based clients requiring additional security. The message exchange pattern established by the enterprise does not require a response back to the SFTP server (such information is provided in a different manner), which makes this use case a one-way transaction through the DataPower device. The DataPower device performs the following tasks:

- Retrieve message files by polling a remote SFTP server
- Pass possibly binary message files through to an enterprise MQ queue.
- Capture the response from the MQ system and place the response file on the remote SFTP server, using a predetermined naming pattern.



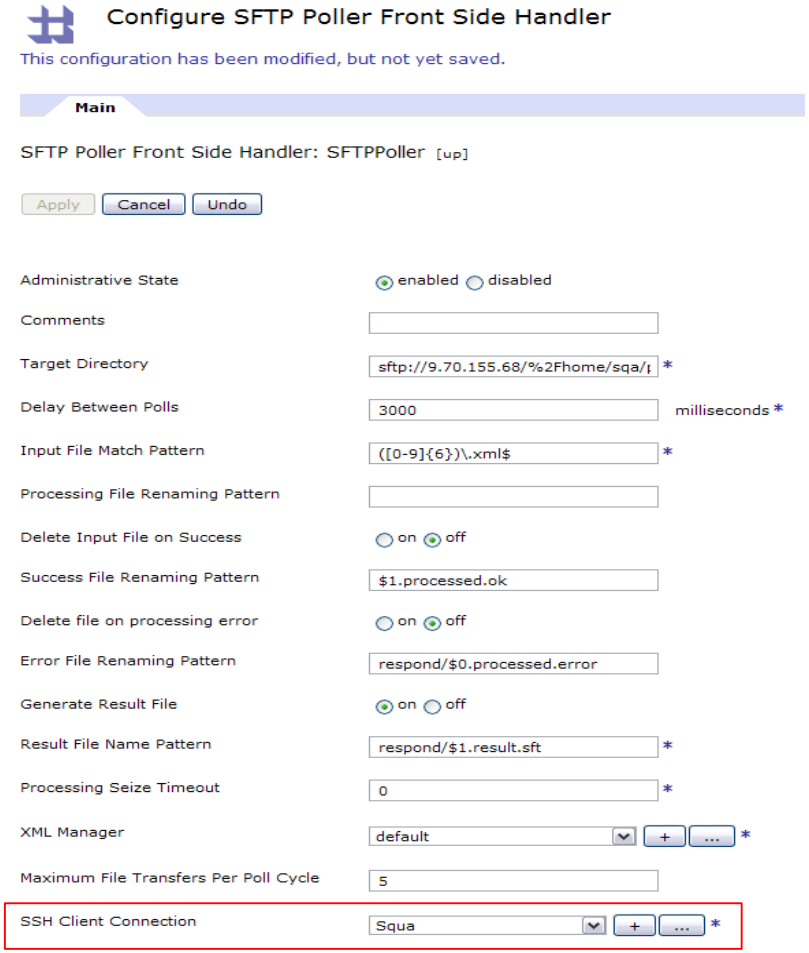
Scenario 2: SFTP Poller

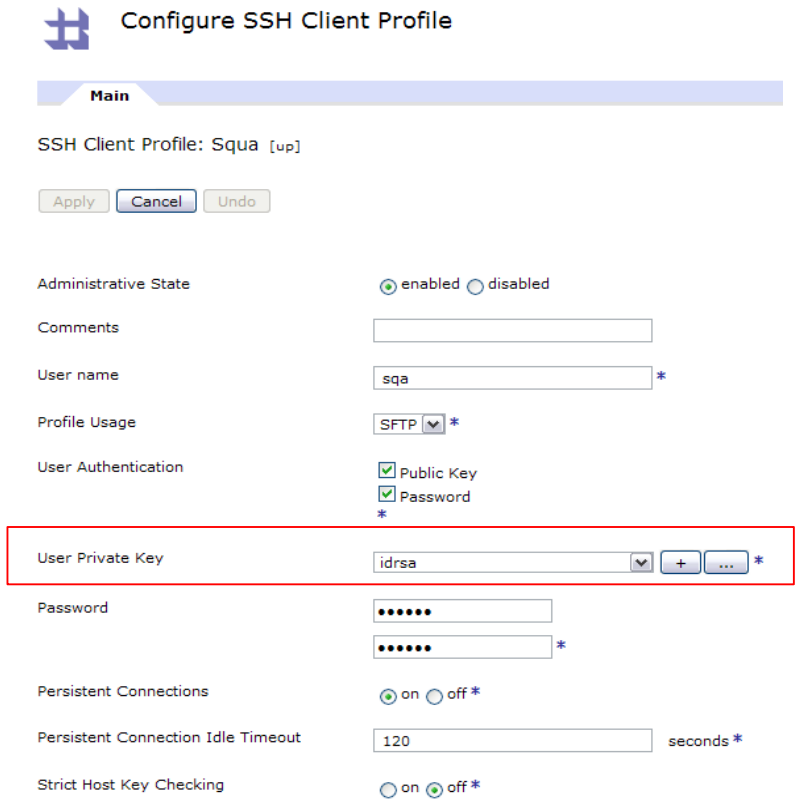




Gateway Configuration settings reside on both the General and the Advanced Tabs.

Scenario 2: SFTP Poller



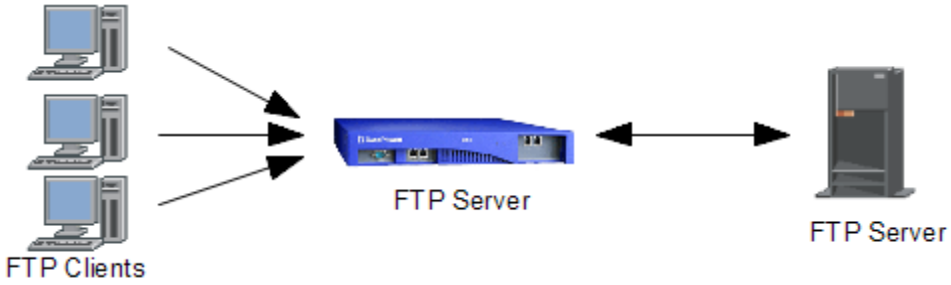


Note the use of File Renaming conventions to signal success or failure, and also the ability to rename files in process.

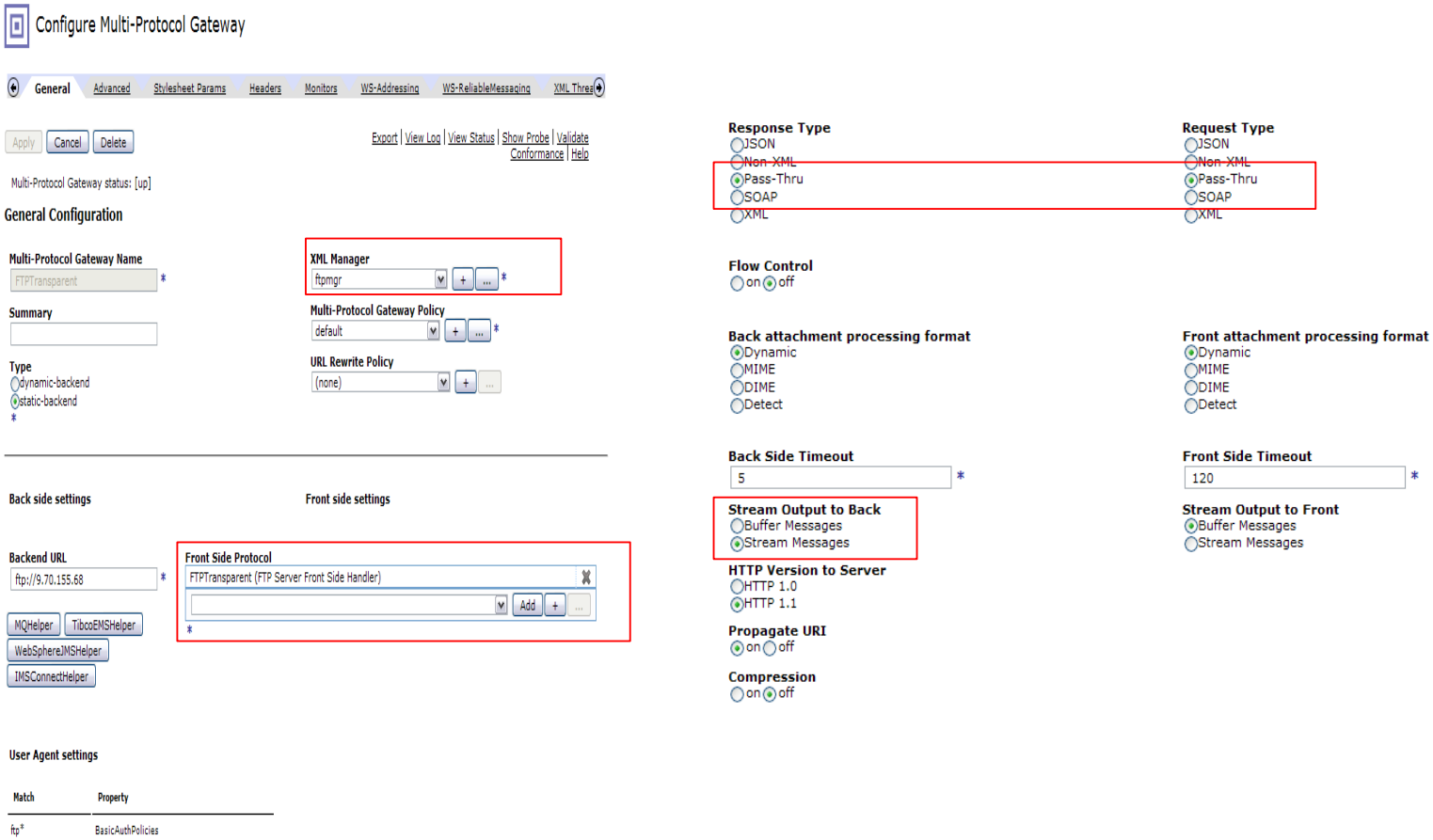
Scenario 3: FTP Server FSH

The DataPower device protects existing enterprise FTP-based assets. The device acts as a transparent FTP server proxy, accepting inbound FTP connections from remote FTP clients and allows the remote clients to transparently access the FTP files and directories offered by the back end server.

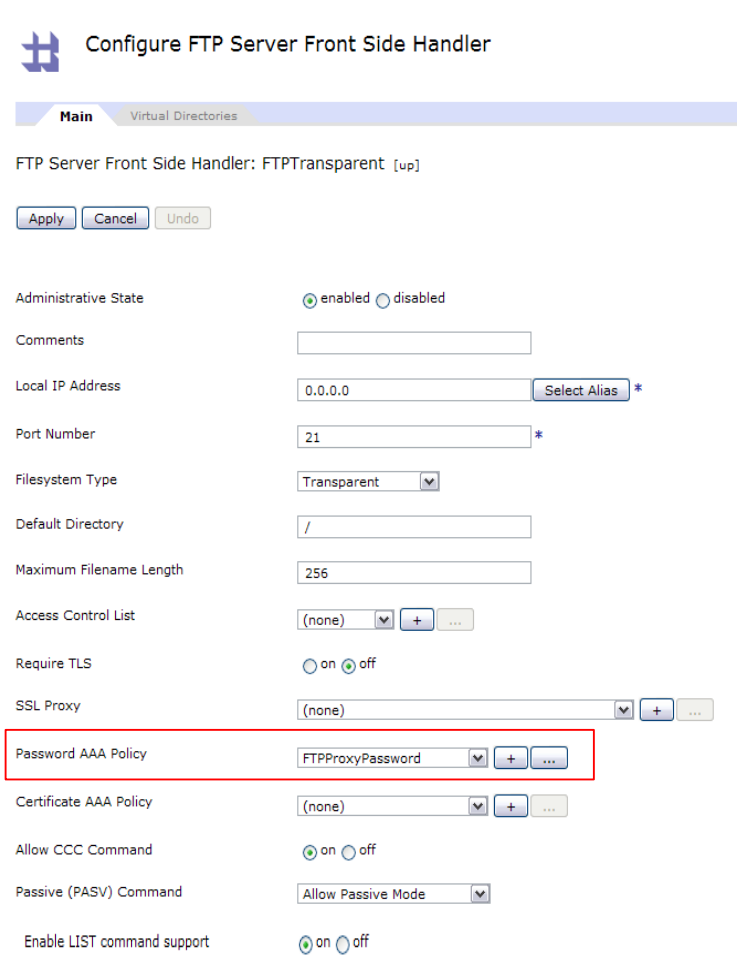
- Accepts inbound FTP connections from remote FTP clients and allows the remote clients to transparently access the FTP files and directories offered by the back end server.
- Authenticates the username and password of inbound connections before allowing the remote client to gain access to the server system.
- Supports the streaming of large files through the device.

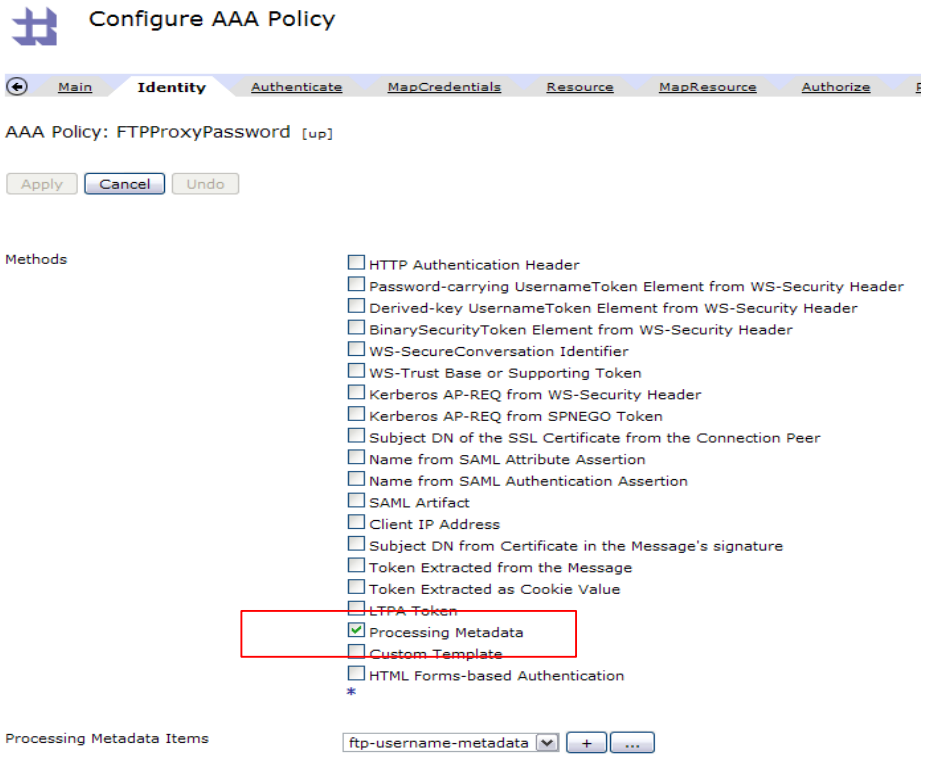


Scenario 3: FTP Server FSH



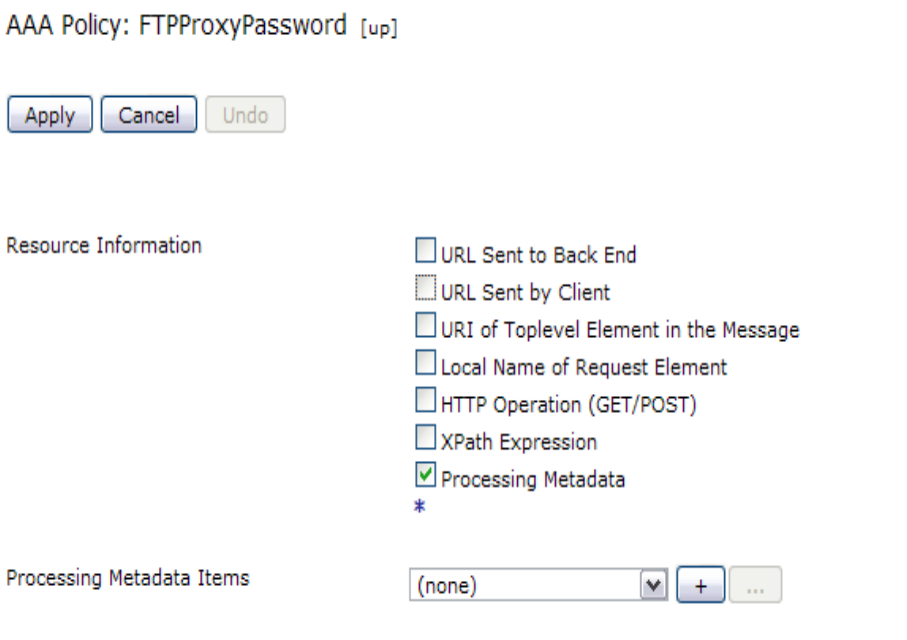
Scenario 3: FTP Server FSH

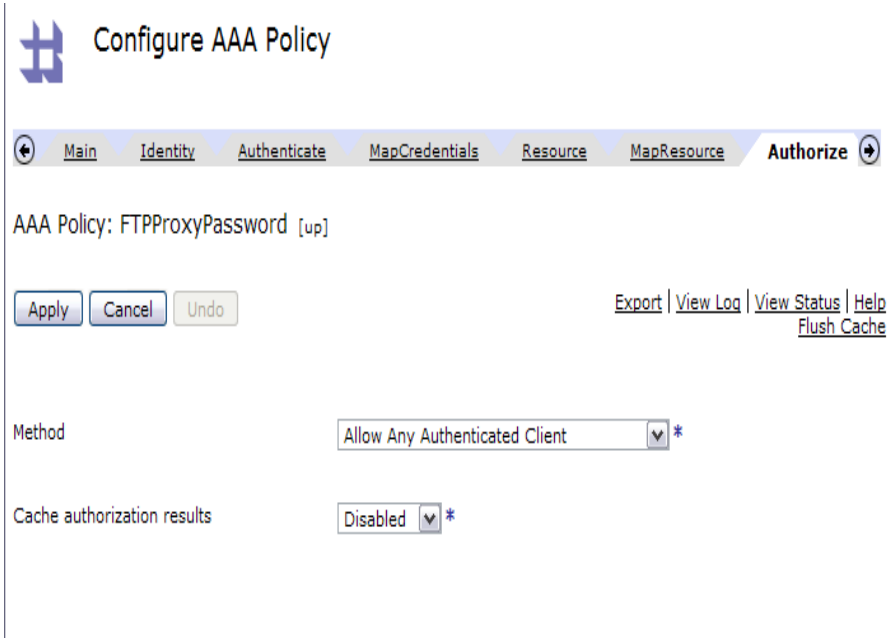




The FSH Password AAA Policy relies on the use of Metadata to capture the ID/PWD of the remote client, which is used to authenticate that client.

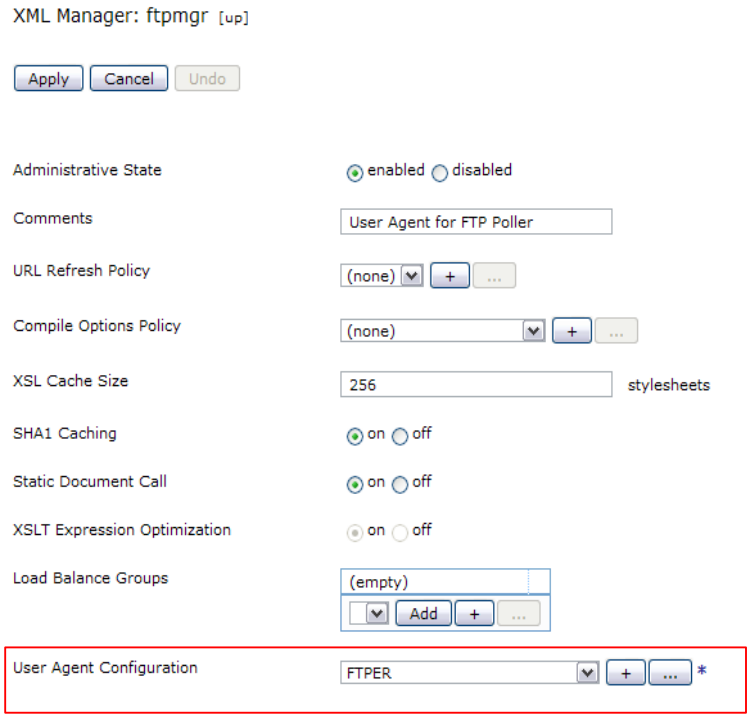
Scenario 3: FTP Server FSH

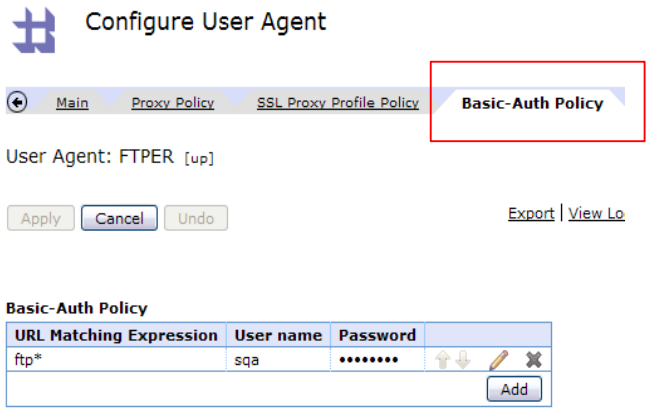




The FSH Password AAA Policy relies on the use of Metadata to configure the AAA Policy. No other value will work.

Scenario 3: FTP Server FSH



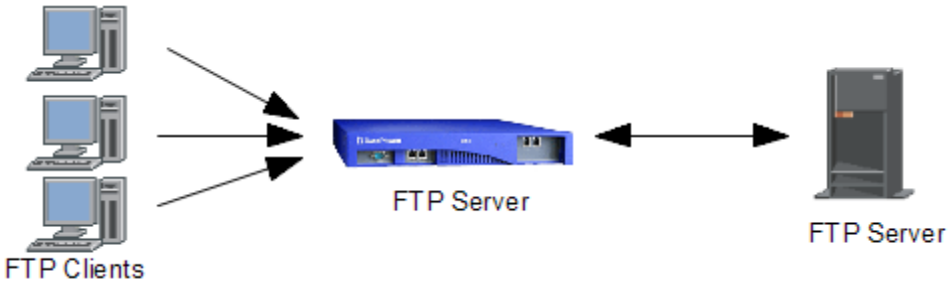


The Basic-Auth Policy of the User Agent associated with the XML Manager in use provides the credentials necessary to connect to the destination (back end) FTP Server.

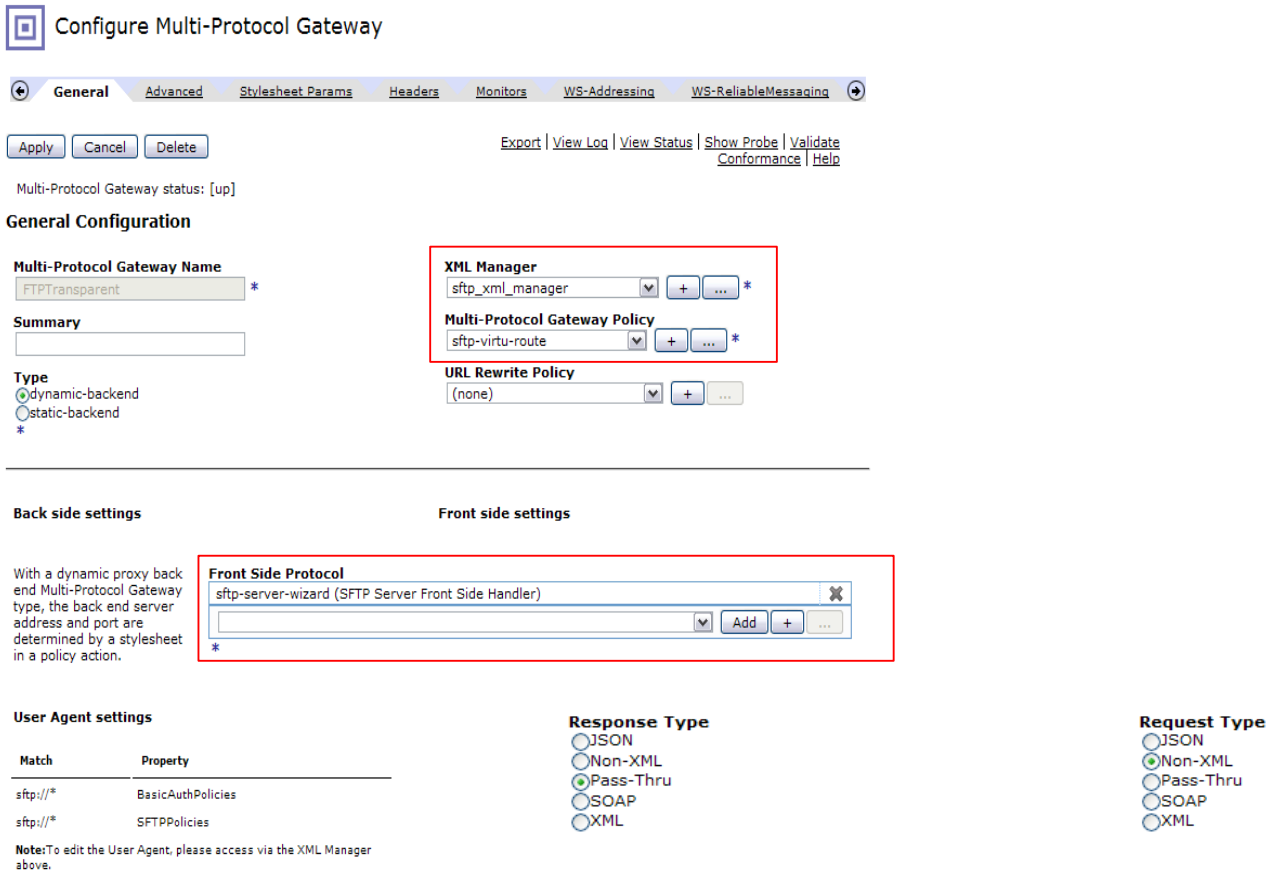
Scenario 4: SFTP Server FSH

In this scenario, the DataPower device provides additional security for SFTP-based message exchange patterns. The device performs the following tasks:

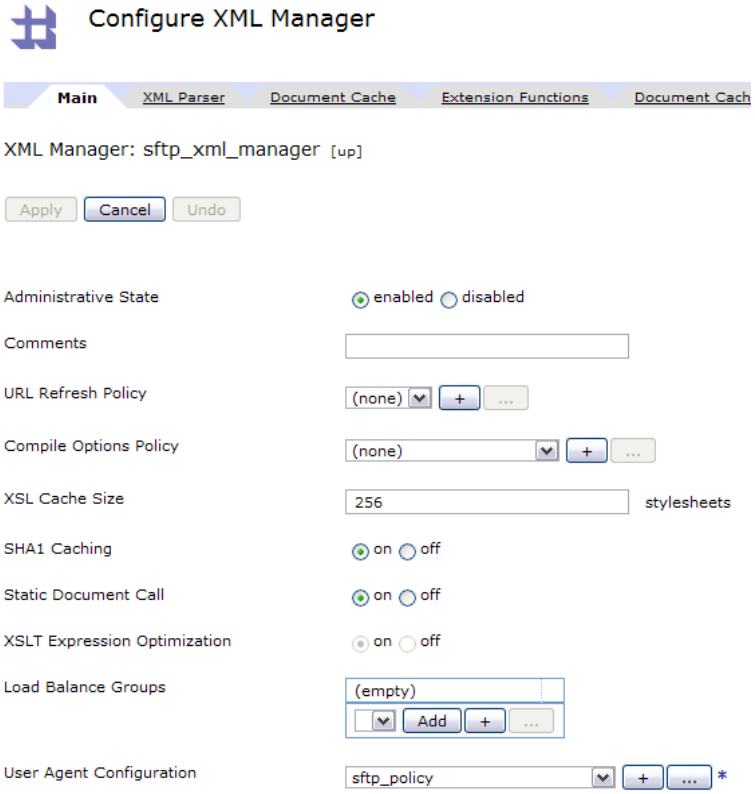
- acts as an SFTP server to which remote clients connect
- presents a virtual filesystem that exists only on the device, masking the actual back end server.
- dynamically routes files to the desired location on the back end SFTP server.
- performs public key authentication on the inbound connections

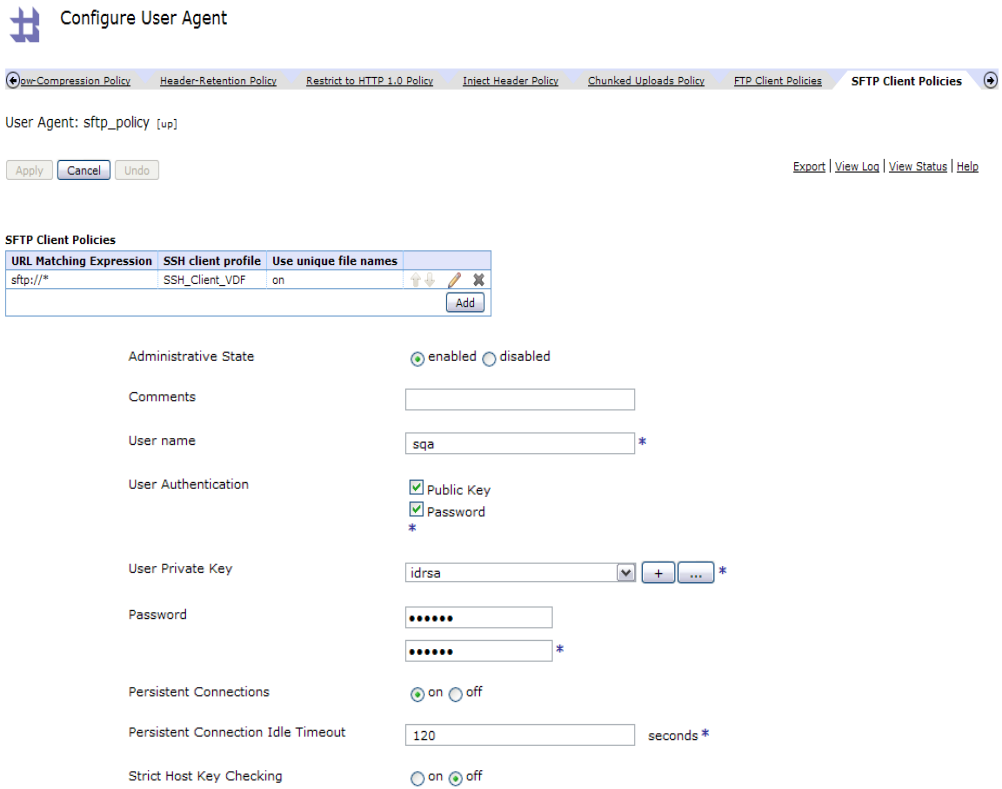


Scenario 4: SFTP Server FSH



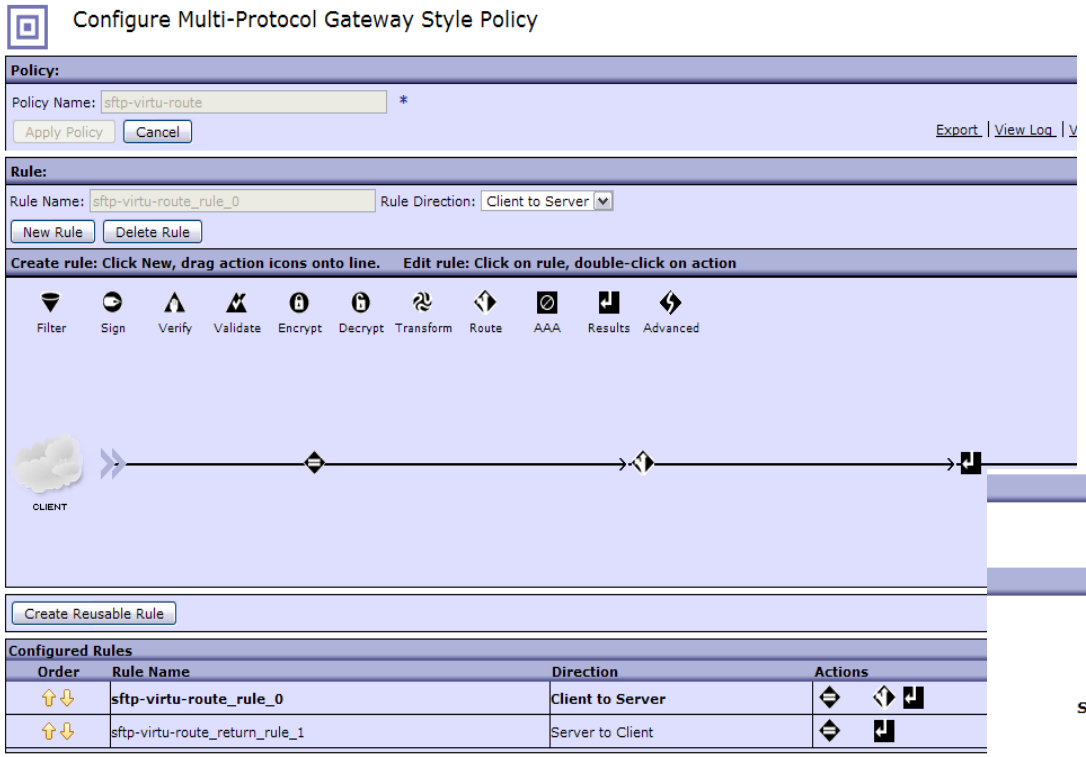
Scenario 4: SFTP Server FSH



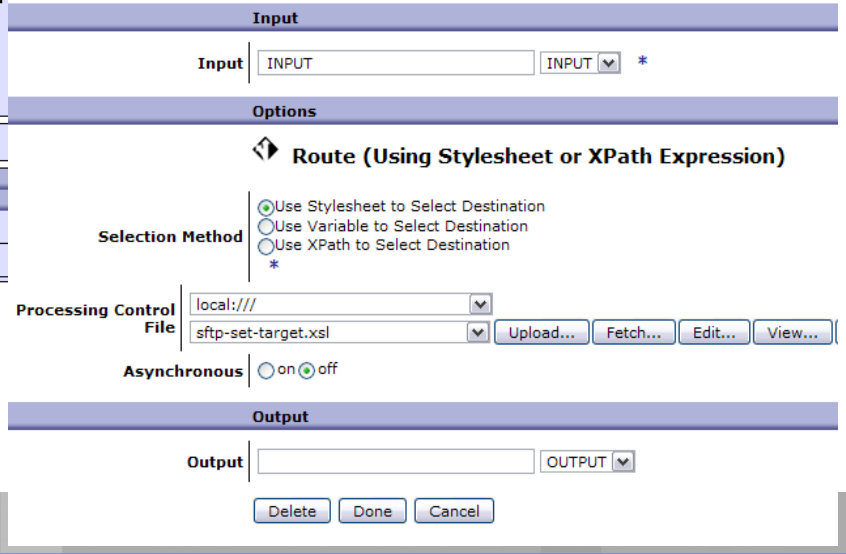


The User Agent used by the XML Manager provides the necessary credentials to connect to the destination SFTP server.

Scenario 4: SFTP Server FSH



The Gateway dynamically routes messages through the use of a stylesheet executed by the Route action.



Scenario 4: SFTP Server FSH

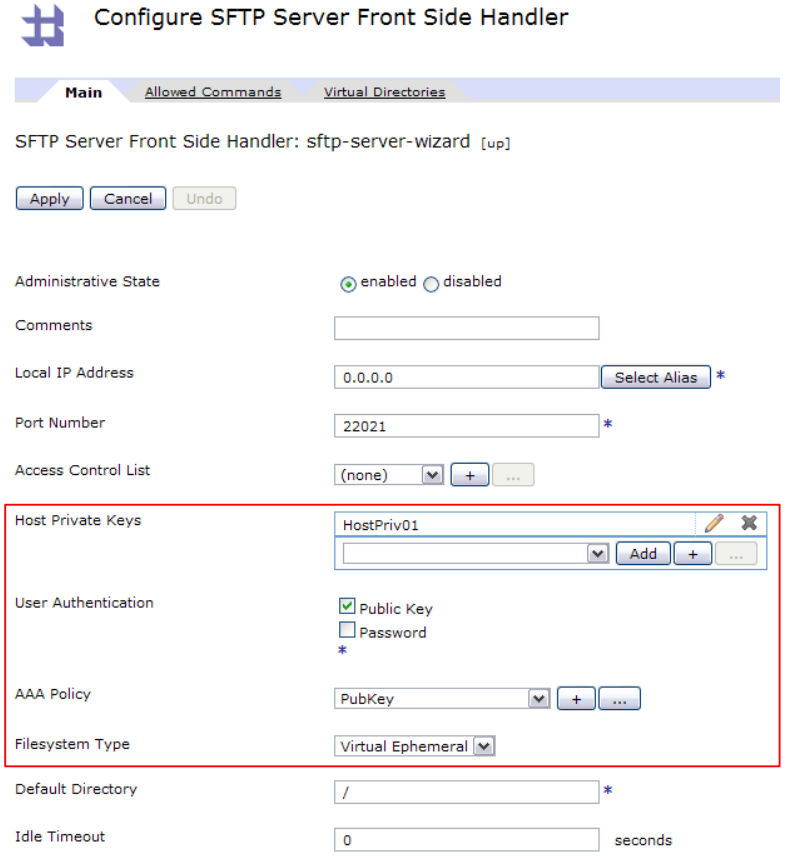
```
<?xml version="1.0" encoding="UTF-8"?>
<xsl:stylesheet version="2.0" xmlns:xsl="http://www.w3.org/1999/XSL/Transform"
xmlns:fo="http://www.w3.org/1999/XSL/Format" xmlns:xs="http://www.w3.org/2001/XMLSchema"
xmlns:fn="http://www.w3.org/2005/xpath-functions" xmlns:xdt="http://www.w3.org/2005/xpath-datatypes"
xmlns:dp="http://www.datapower.com/extensions" xmlns:dpconfig="http://www.datapower.com/param/config"
extension-element-prefixes="dp" exclude-result-prefixes="dp dpconfig">
     <xsl:output method="xml"/>
     <xsl:template match="/">
     <xsl:variable name="inboundurl">
     <xsl:value-of select="dp:variable('var://service/routing-url')" />
                    <!-- http://9.30.12.17/inbound/987654.xml -->
     </xsl:variable>
     <xsl:variable name="filen" select="substring-after($inboundurl,'inbound/')" />
     <xsl:variable name="fulluri">sftp://9.70.155.68/home/sqa/poller/<xsl:value-of select="$filen" />
     </xsl:variable>
     <dp:set-variable name="'var://service/routing-url'" value="$fulluri" />


     <dp:set-variable name="'var://context/uservars/resultURL'" value="$fullurl"/>
     <xsl:message dp:priority="alert" dp:type="mpgw">
     <xsl:value-of select="$fullurl"/>
     </xsl:message>

    </xsl:template>
</xsl:stylesheet>
```

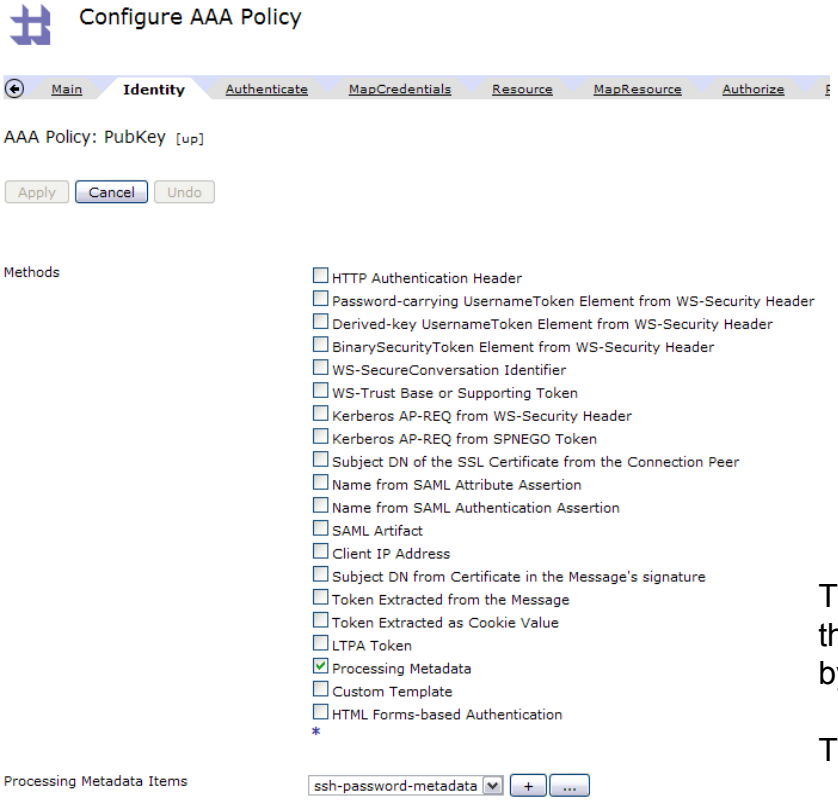
This stylesheet captures the filename sent by the client and uses it to place the file on the back end server. The remote client never sees the files on the destination server.

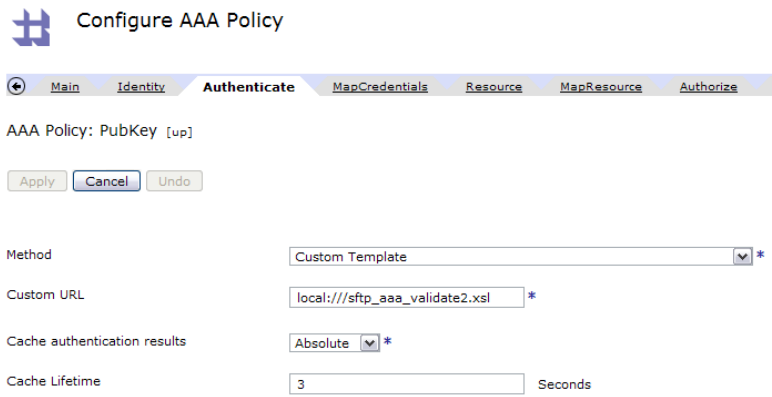
Scenario 4: SFTP Server FSH



This Server FSH uses a virtual ephemeral filesystem, obscuring the file/directory structure of the destination server. This server also authenticates clients by using a public key exchange.

Scenario 4: SFTP Server FSH





The AAA Policy used by the FSH identifies clients by examining the Processing Metadata, which contains the public key provided by the remote client.

To Authenticate the client, the AAA Policy uses a custom stylesheet.

Scenario 4: SFTP Server FSH

```
<!-- Get EI metadata information from datapower, store it to variables, log it,
        and authenticate user/pass or user/pubkey combinations -->
<xsl:variable name="ssh_user">
        <xsl:value-of select="dp:variable('var://context/INPUT/ssh/username')"/>
</xsl:variable>
<xsl:variable name="ssh_cert">
        <xsl:value-of select="dp:variable('var://context/INPUT/ssh/publickey')"/>
</xsl:variable>
<xsl:variable name="ssh_pass">
        <xsl:value-of select="dp:variable('var://context/INPUT/ssh/password')"/>
</xsl:variable>
<xsl:message>The SFTP User is: <xsl:value-of select="$ssh_user"/>
</xsl:message>
```

The custom stylesheet begins by retrieving the identification information provided by the Metadata.

Scenario 4: SFTP Server FSH

```
<!-- This function performs validation the public key. -->
<xsl:template name="validatePublicKey">
        <xsl:param name="user"/>
        <xsl:param name="pubkey"/>
        <xsl:choose>
                <xsl:when test="($pubkey = 'ssh-rsa AAAAB...xnaKQ==' )">
                        <publickey_authenticator user="FITS">Passed</publickey_authenticator>
                </xsl:when>
                <xsl:when test="($pubkey = 'ssh-dss
                AAAAB3NzaC1kc3MAAAEBAKtnTlSZHRc7....zyR5w==')">
                        <publickey_authenticator user="SABRE">Passed</publickey_authenticator>
                </xsl:when>
                <xsl:when test="($pubkey = 'ssh-rsa AAAA...Z22c0=')">
                <publickey_authenticator user="NEWTESTER">Passed</publickey_authenticator>
                </xsl:when>
                <xsl:otherwise/>
        </xsl:choose>
</xsl:template>
```

The public key provided by the remote client is then compared the the public key held by the device. (Note that the key material is truncated here.) Rather than embed this key material in the stylesheet, the stylesheet could open an independent file to get the key materials.

Scenario 4: SFTP Server FSH

Additional Considerations

In some cases, the back end application returns a result (as would be the case for an HTTP transaction, for example) which must be returned to the front side client. In such a case, the device automatically places the result file in the same virtual directory as the request file. Front side clients using FTP can then retrieve the result from the virtual directory system.

The example stylesheet shown here only authenticates by public key. The stylesheet could also authenticate by username/password, requiring all information from the remote client.

Summary

- DataPower offers both Poller and Server methods for obtaining FTP-based messages
- DataPower can easily connect FTP-based traffic to other protocols
- The full power of message handling is available
- DataPower can proxy back end S/FTP servers with a high degree of security
- FTP support continues to evolve and improve

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  http://www.ibm.com/software/info/education/assistant
- View a webcast replay with step-by-step instructions for using the Service Request (SR) tool for submitting problems electronically:
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- Sign up to receive weekly technical My Notifications emails:
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