10 Introduction to Context Variables

10.1 Description
This tutorial provides an introduction to context variables. Context variables contain a wealth of information about the message processing context and associated meta-data and are an invaluable tool for building flexible, dynamic policies.

10.2 Prerequisites

10.2.1 Environment
1. Layer 7 Gateway *(this tutorial was designed using a version 7.0 gateway; it may or may not work with earlier versions; it should work with later versions)*
2. Layer 7 Policy Manager *(this tutorial uses the Policy Manager software installation; the software installation version must match the gateway version; alternatively, users can use the Policy Manager browser-based version which always matches the gateway version that is connected to)*
3. soapUI *(this tutorial was designed using the free soapUI version 4.5.1; it may or may not work with other versions of soapUI; other clients can be used for this and other tutorials, but specific steps will not be provided for those other clients)*

10.2.2 Tutorials
1. Layer 7 Tutorials - Getting Started
2. Tutorial 1 - Deploy Tutorial Services
3. Tutorial 2 - Test Tutorial SOAP Service
4. Tutorial 4 - Publish SOAP Service

10.3 Tutorial Steps
1. Connect to your gateway using Policy Manager (see tutorial ***Layer 7 Tutorials - Getting Started***).
2. Per ***Layer 7 Tutorials - Getting Started/Basic Policy Concepts/Policy Authoring/Policy Revisions***, set the active policy version of the ***Warehouse SOAP Tutorials*** service to the version that has been commented with, **Tutorial 4 Complete**.
3. From the policy assertion tree, drag and drop the ***Policy Assertions/Logging, Auditing and Alerts/Audit Messages in Policy*** assertion to place it at the top of the ***Warehouse SOAP Tutorials*** service policy in the policy editor.
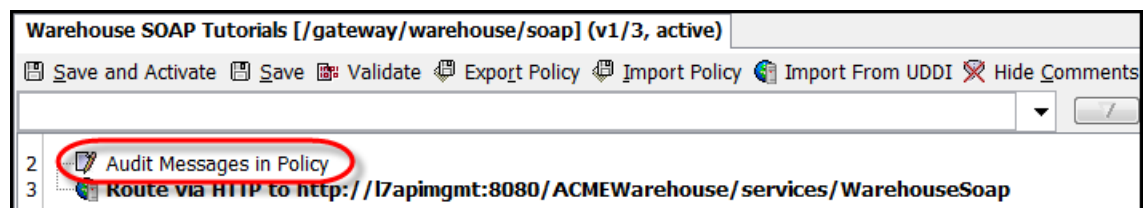

Note: Adding the Audit Messages in Policy assertion with the default settings will ensure that an audit entry will get saved for every request processed by this policy regardless of whether or not that request succeeds. Without this assertion only audit entries for failed requests would get saved. This assumes the Gateway is configured to

use default audit settings. Modifying the default audit settings is beyond the scope of this tutorial.

4. From the policy assertion tree, drag and drop the ==**Policy Assertions/Logging, Auditing and Alerts/Add Audit Details**== assertion so that it's assertion #3 in the **Warehouse SOAP Tutorials** service policy in the policy editor, and in the **Audit Detail Properties** dialog that appears, in the **Message** field, copy/paste the following text, and click the **OK** button:

> IP: ${request.tcp.remoteIP} requested SOAP Operation: ${request.soap.operation} at ${gateway.time.utc}. The request was processed by cluster node: ${gateway.cluster.hostname}.
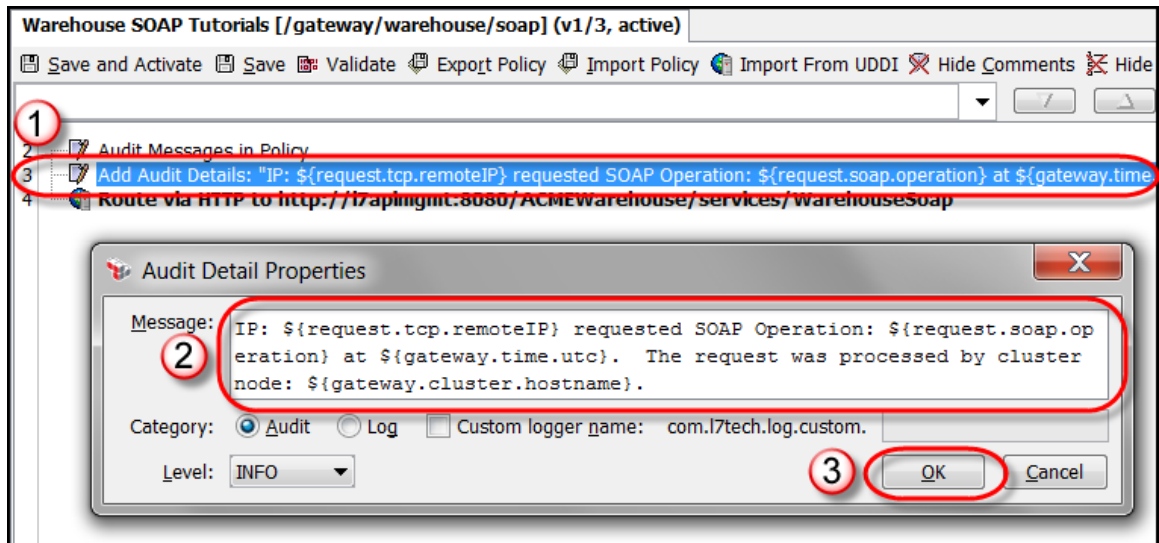

Note: All context variables are referenced using the dollar sign ('$') and curly braces ('{' & '}') as shown above. Most assertion text fields are capable of referencing context variables as input in this manner except context variables used in XPath expressions and XSL transformation. In those cases, context variables are referenced differently in those cases.

Note: The variable ${gateway.cluster.hostname}is a reference to a cluster property. You can view documentation for cluster properties in Appendix D of the online help, and you can view all custom cluster properties or cluster properties that have non-default values by navigating to Tasks > Manager Cluster-Wide Properties in Policy Manager. Cluster properties can be referenced as context variables by prefixing the cluster property name with 'gateway.' as shown above.

5. On the policy editor toolbar, click the **Save and Activate** button.
6. Open soapUI, and use the **Warehouse SOAP** project created in the **Tutorial 2 - Test Tutorial SOAP Service** to test this tutorial's policy.

7. Open the **listProducts** request, select the **HTTP endpoint** on your gateway, and send the message using the **green arrow**. You should receive a successful response.
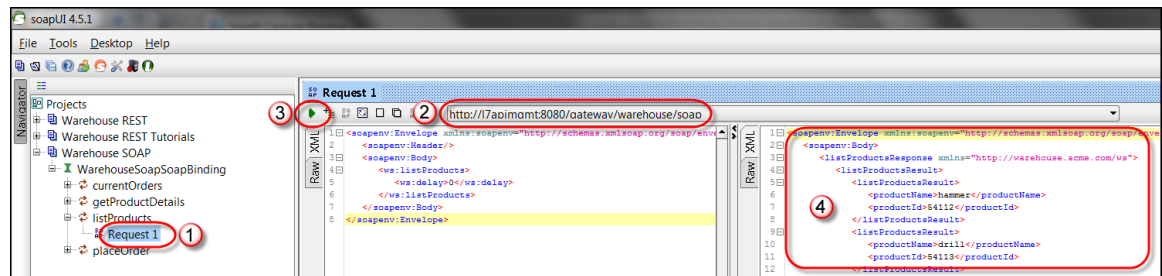
8. In Policy Manager, click **Policy Manager > View > Gateway Audit Events** to launch the Gateway's Audit Event viewer. You should see a WARNING entry for the Warehouse SOAP Tutorials service.

9. Select this audit record to display the audit detail information.
10. Select the **Associated Logs** tab.

11. You'll notice the IP of the client, the SOAP Operation, the time of request (in UTC) and the hostname of the cluster node that processed the request have all been captured and saved to the audit entry for our request.
12. Per **Layer 7 Tutorials - Getting Started/Basic Policy Concepts/Policy Authoring/Policy Revisions**, and as demonstrated at the end of **Tutorial 1 - Deploy Tutorial Services**, comment the active policy revision of the **Warehouse SOAP Tutorials** service with the comment, **Tutorial 10 Complete**.
13. You are done with this tutorial.

10.4 Additional Context

Many context variables support multiple suffixes. In this tutorial we referenced the *gateway.time* context variable and appended the suffix *utc* which displays time values in UTC. However, this variable supports many additional suffixes to display the value of the variable in different formats. See *Table 338: Suffixes for date and time variables* for a complete list of suffixes supported by time variables.

This tutorial deals with scalar, predefined context variables only. More complex context variables exist including multi-valued and message context variables. These more advanced variables will be covered in subsequent tutorials.

For a complete list of built-in context variables see the *Context Variables* entry in the online help or Appendix C in the Policy Manager User Manual.