SAML Pummel User's Guide

SAML Pummel is a simple tool for attacking the XML Digital Signature protecting SAML assertions. As present, the tool integrates into WebScarab via BeanShell, and automatically detects a SAML 2.0 response. It allows for performing one of eight injection attacks available to the anonymous attacker. Extending the tool to support other federated identity protocols, such as WS-Federation, is a simple exercise.

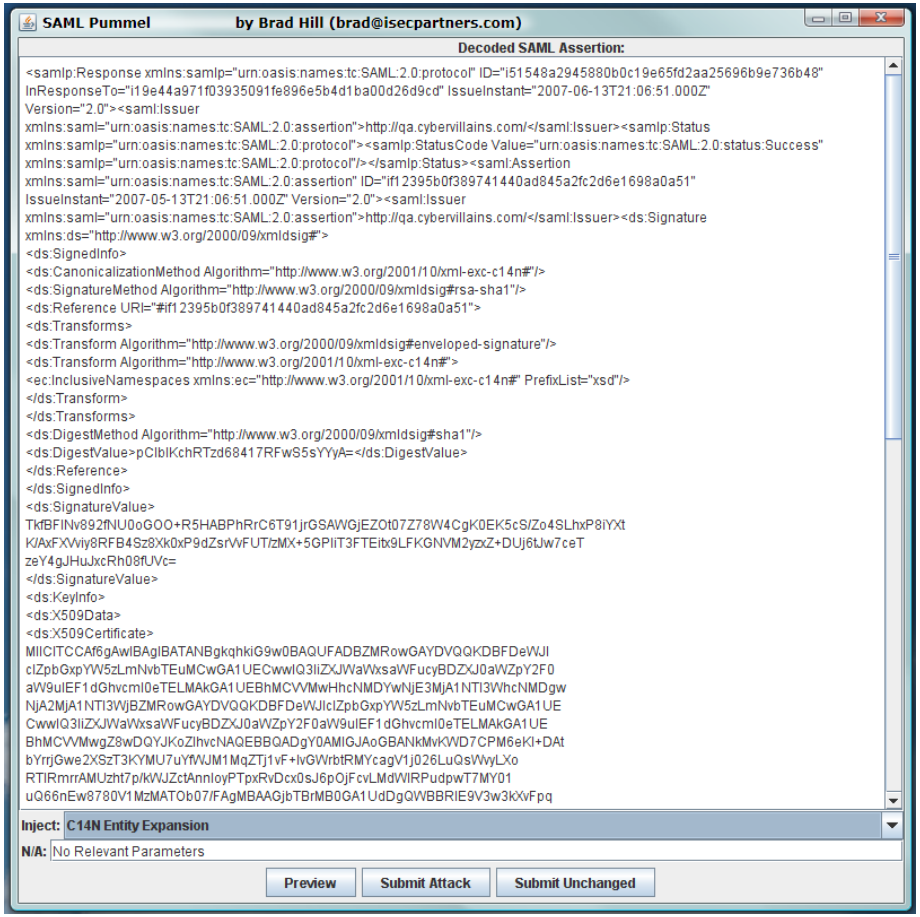
WebScarab is an intercepting HTTP proxy that allows the operator to view and modify requests. It is released by Rogan Dawes and the OWASP project under a GPL license. While alternative HTTP test proxies exist, in the author's opinion, WebScarab is the premier tool of the category because it is open source and can be easily extended. (as SAML Pummel demonstrates) WebScarab can be downloaded at: http://www.owasp.org/index.php/Category:OWASP_WebScarab_Project

SAML Pummel offers a simple graphical interface for performing the attacks, illustrated at right.

The "Decoded SAML Assertion" shows the intercepted payload, and provides a preview area.

The "Inject" drop down list allows selection of the attack to perform, and the text entry field below provides space for parameters.

"Preview" updates the decoded assertion to preview the attack. "Submit Attack" re-encodes and submits the new assertion, and "Submit Unchanged" cancels the operation and returns the assertion unchanged.

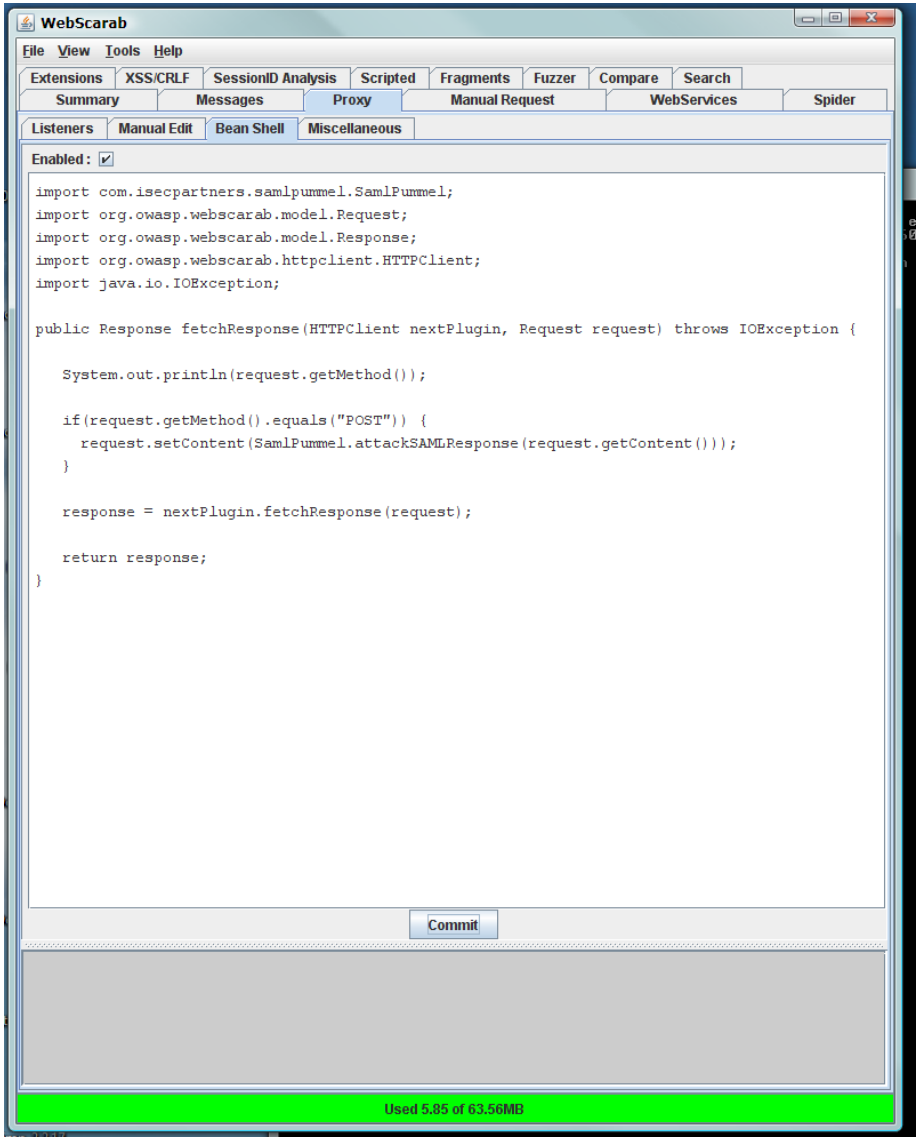


Using SAML Pummel

First it is necessary to add the com.isecpartners.samlpummel.* class files to the WebScarab classpath. I have found the simplest way to do this is to open the archive and add the entire "isecpartners" directory under "bin/com" directly to the WebScarab jar under "com". A pre-built jar of this sort is provided in the download, named: webscarab-selfcontained-20070504-1631-plusSamlPummel.jar

At this point, using SAML Pummel is relatively simple. Start WebScarab and go to the "Proxy" tab, then the "Bean Shell" tab. Check the "Enabled" box, paste the script from samlPummel.bsh into the window, and click the "Commit" button at the bottom. If you don't have samlPummel.bsh handy, the script is:

```
import com.isecpartners.samlpummel.SamlPummel;
import org.owasp.webscarab.model.Request;
import org.owasp.webscarab.model.Response;
import org.owasp.webscarab.httpclient.HTTPClient;
import java.io.IOException;

public Response fetchResponse(HTTPClient nextPlugin,
Request request) throws IOException {

   System.out.println(request.getMethod());

   if(request.getMethod().equals("POST")) {

request.setContent(SamlPummel.attackSAMLResponse(request
.getContent()));
   }

   response = nextPlugin.fetchResponse(request);

   return response;
}
```



Now, all you have to do is set your browser to use WebScarab as its proxy, and login to your SAML 2.0 enabled site. When the Identity Partner causes the browser to post back the assertion to the Application Partner, WebScarab and SAML Pummel will automatically recognize the request and pop up the SAML Pummel UI.

Attack Library

SAML Pummel comes with 8 prepackaged attacks.

C14N Entity Expansion inserts a DTD and expansion bomb into the document. There are no parameters for this attack.

C14N Transforms adds additional C14N transforms to a reference. The parameter is an integer telling how many transforms to apply. This attack is a good way to test the order of operations in signature processing in a black-box manner. If failures are reported with the same approximate round-trip time for one injected transform as one thousand, signature checking is likely being done before reference processing. If a thousand injected transforms takes much longer to process, the opposite can be inferred.

Remote DTD adds a remote DTD reference to the SAML assertion. Not technically a Digital Signature attack, this can still be useful to test. The parameter is a URL which you are monitoring for pingbacks.

Remote KeyInfo RetrievalMethod inserts a reference to a remote key utilizing the standard RetrievalMethod syntax from the core XMLDSIG specification. The parameter is a URL which you are monitoring for pingbacks.

Remote KeyInfo WSSE Security Token Reference also inserts a reference to a remote key, but utilizes the WS-Security security token reference format. The parameter is a URL which you are monitoring for pingbacks.

SignedInfo Remote Reference inserts a remote reference for signed content. This can be useful if arbitrary key material is not accepted but the order of operations for processing is wrong. The parameter is a URL which you are monitoring for pingbacks.

XSLT Transform URL Retrieval (Xalan) inserts an XSLT transform that utilizes Xalan extensions to fetch a remote URL. Useful intesting Java-based XMLDSIG processors. The parameter is a URL which you are monitoring for pingbacks.

XSLT Transform Thread Suspension (Xalan) inserts an XSLT transform that utilizes Xalan extensions to suspend the processing thread. Tests denial of service conditions against Java-based XMLDSIG processors. There are no parameters for this atack.

Updates

The most recent version of SAML Pummel will always be available for download at:

https://www.isecpartners.com/tools.html

SAML Pummel was written by Brad Hill. Please send comments, change requests and bug reports to: brad@isecpartners.com.

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WebScarab is licensed under the GPLv2. Source code for WebScarab is available from the OWASP Source Code Center at Sourceforge:

http://sourceforge.net/project/showfiles.php?group_id=64424&package_id=61823

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