Government of Canada Credential Federation
IDP Simulator Installation Guide

Identity, Authentication & Authorization Services
Shared Services Canada

Version 1.4
EDRM# 1483763

Shared Services Canada
Services partagés Canada

Canada

Revision History

Date	Version	Description
Nov 30, 2011	1.0	First version
May 10, 2012	1.1	Updates for new simulator version
May 24, 2012	1.2	Added Load testing tips
April 19, 2013	1.3	Added Instructions for enabling SHA-256
July 5, 2017	1.4	Added instructions to disable dynamic IPs for the virtual box setting

Table of Contents

1. Introduction

1.1 Purpose

Shared Services Canada maintains and provides an Identity Provider Simulator that GC Departments and Agencies can use to develop and test their SAML implementations. The purpose of this document is to provide information to assist departments and agencies with installing and using the IDP Simulator.

1.2 Audience

This document is primarily targeted toward system administrators and testers who are responsible for managing development and testing environments.

1.3 References

[CATS] Cyber Authentication Interface Architecture and Specification Version 2.0: Deployment Requirements

2. The IDP Simulator

Shared Services Canada maintains and provides an Identity Provider Simulator that GC Departments and Agencies can use to develop and test their SAML implementations. The IDP Simulator is a virtual machine appliance that has been packaged using the Open Virtualization Format (OVF) and can be deployed on popular virtualization platforms including VMWare Player and Oracle VirtualBox.

The IDP Simulator virtual machine comes with the Open Source ForgeRock Open AM SAML product pre-installed on Apache Tomcat and Linux. The first time the virtual machine is started an automated script is executed that quickly and easily configures the IDP simulator to work within the host network environment.

2.1 Virtual Hardware Requirements

The minimum virtual hardware requirements of the IDP simulator are quite modest:

1 Virtual CPU (32 bit)
1GB of virtual memory
6GB of virtual disk space
1 virtual network interface

Additional virtual hardware (for example a virtual CD-ROM drive) is also supported should you wish to install additional software or paravirtualized drivers. If you intend to use the IDP Simulator to support load testing of your RP application then 2GB of memory and additional CPUs are recommended.

2.2 Networking Requirements

The IDP simulator requires one static IP address in your environment. For best results the host name of the simulator should be registered with a Domain Name Service. The IDP simulator supports the IDP discovery profile and would normally have an additional separate DNS entry in a common domain for exchanging the IDP discovery common domain cookie. The host name and domain names of the simulator are fully configurable in order to work within the target network environment.

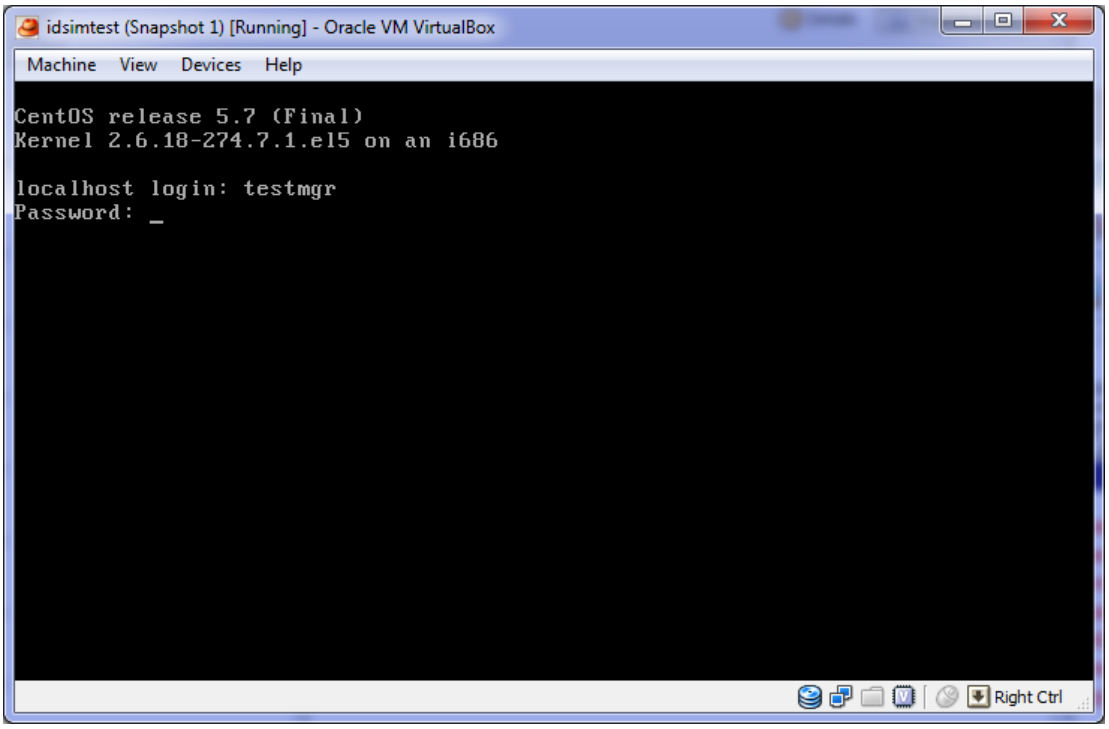
If a Domain Name Service is not available then the simulator also supports the use of host files for name resolution. Note that if host files are to be used then every server or client PC that accesses the IDP simulator must have an entry added to its host file. If an attempt is made to access the simulator by IP address or some other means then the secure nature of SAML and HTTPS will prevent it from functioning.

2.3 Installation

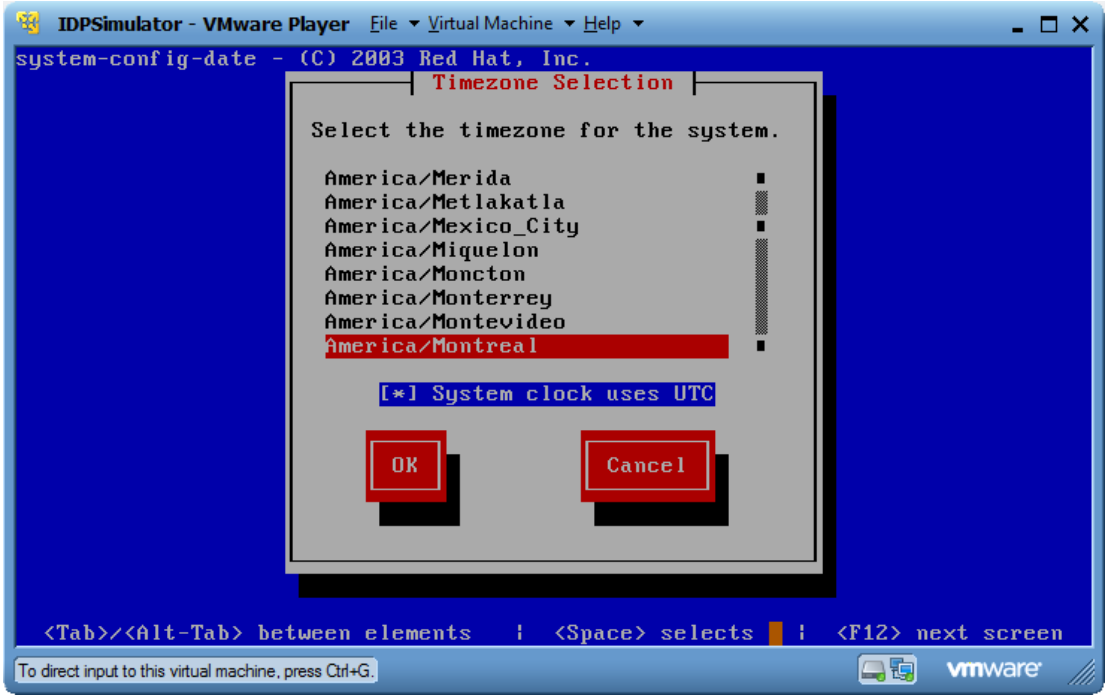
The generic process for installing and configuring the appliance is a follows:

1. Import the VM image into your virtualization product. (Consult your product documentation for details on how to do this)

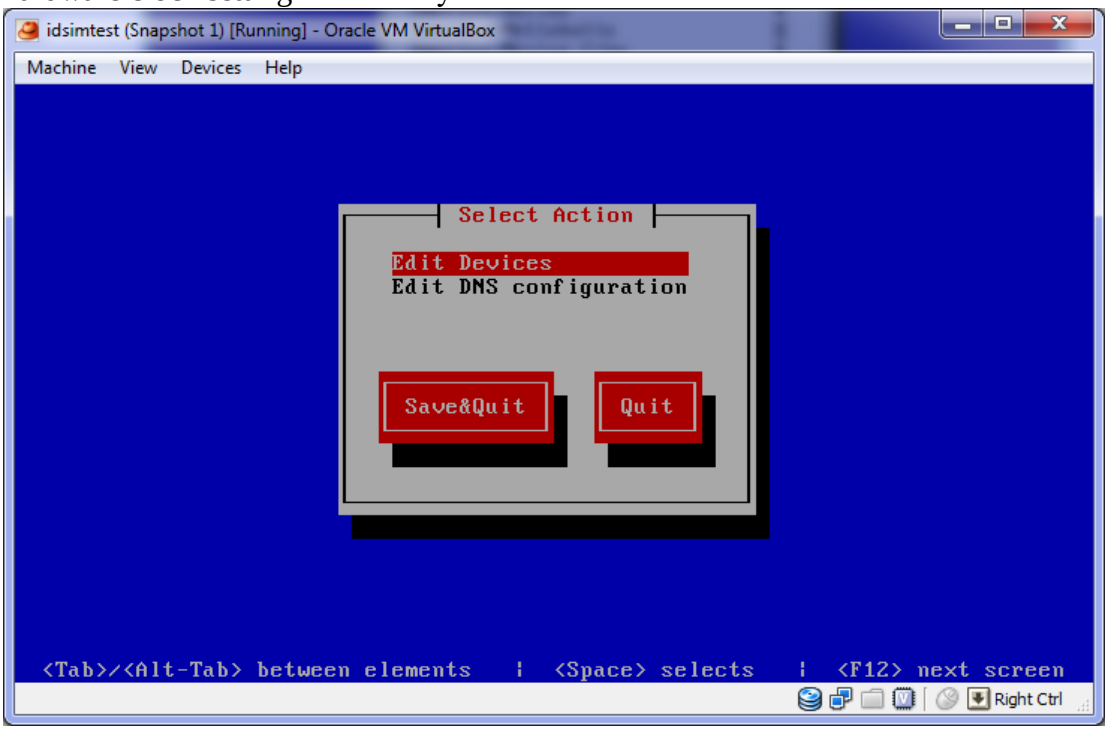
2. Please note: Do not use Dynamic IPs when configuring the virtual box; For instance, when setting up the virtual box network adapter for ‘host only network’, uncheck ‘enable dhcp’ Take down the IP
3. Configure the virtual network card for bridged or host only networking as required (most installations will use bridged networking)
4. Optionally configure a virtual CD-ROM drive if you wish to install any hypervisor specific guest tools (such as VMWare tools or VirtualBox guest additions)
5. Start the VM for the first time
6. Optionally log in to the VM as root (the password is “SAMLTest1”), install any hypervisor specific guest tools (such as VMWare tools or VirtualBox guest additions) and reboot the VM.



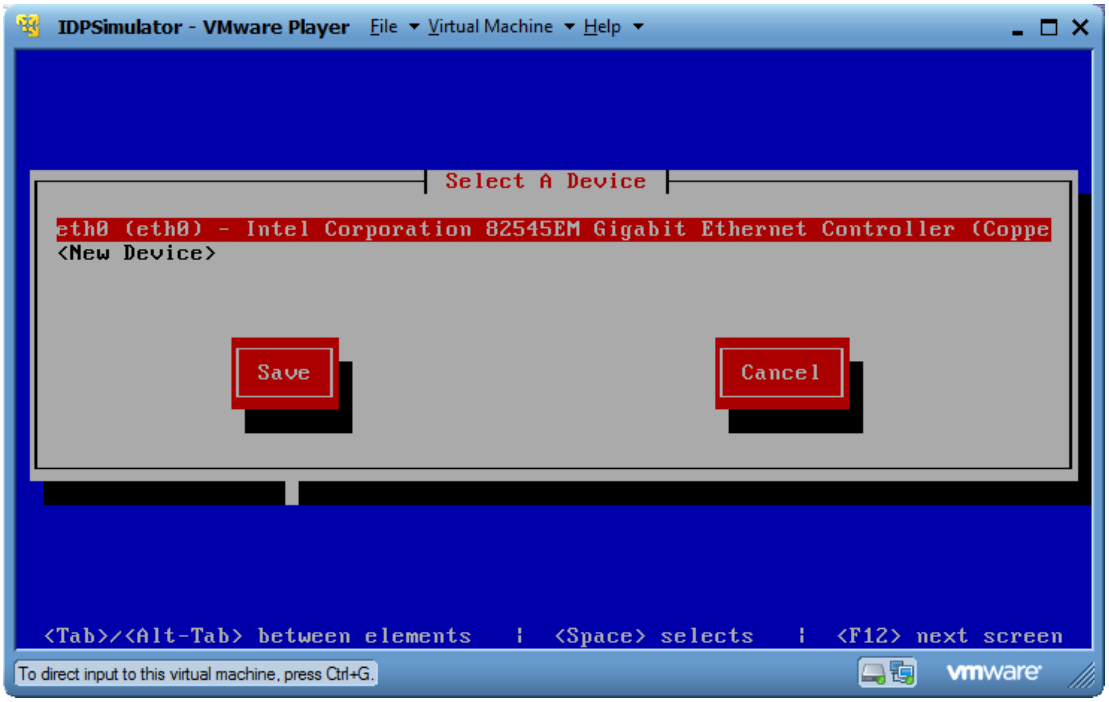
7. Once booting is complete, login as “testmgr”. The password is “SAMLTest1”.



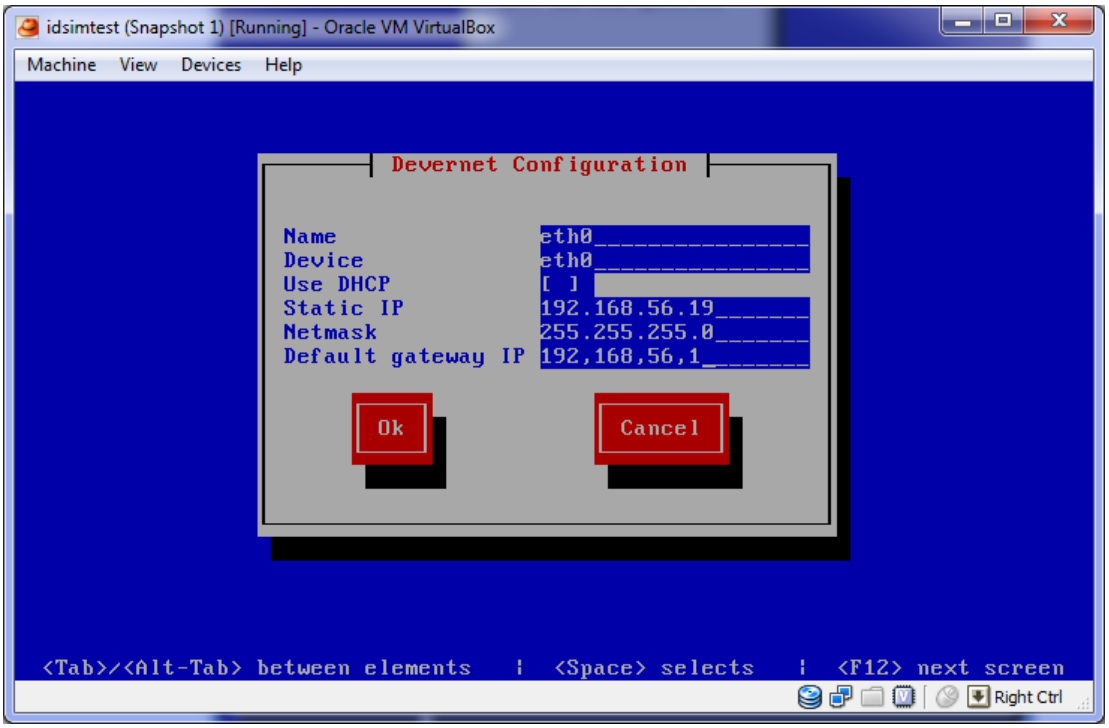
8. The Timezone configuration tool will automatically appear. Modify the timezone and hardware clock setting if necessary and then select “OK”



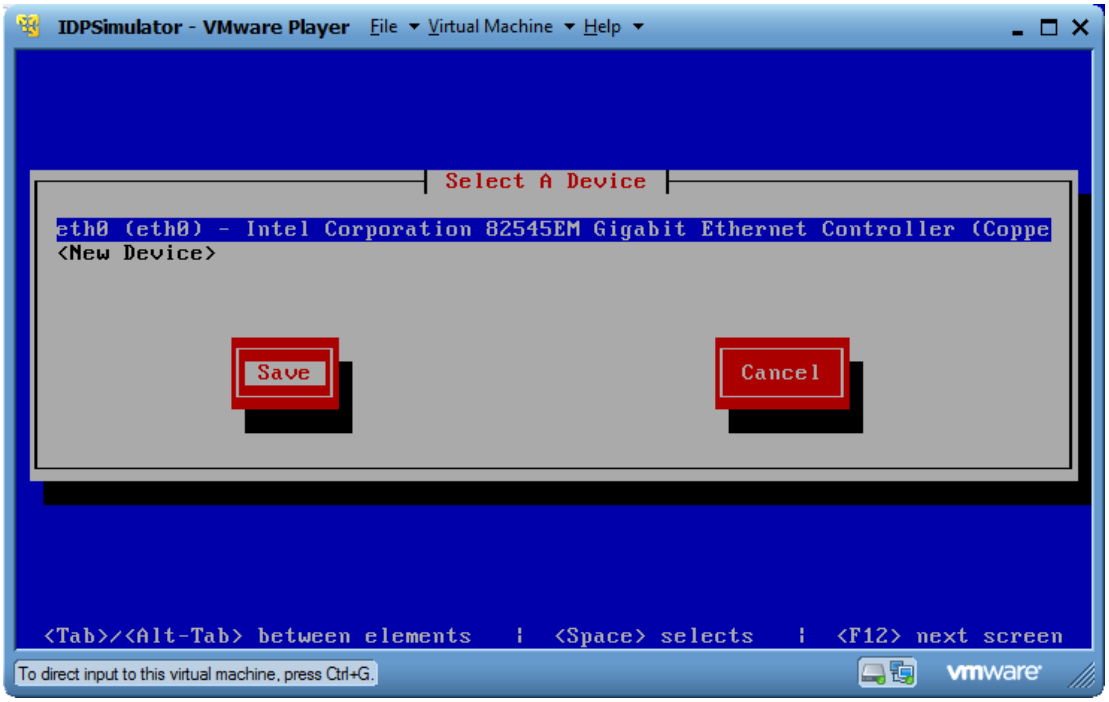
9. The Network configuration tool will automatically appear. Select “Edit Devices”



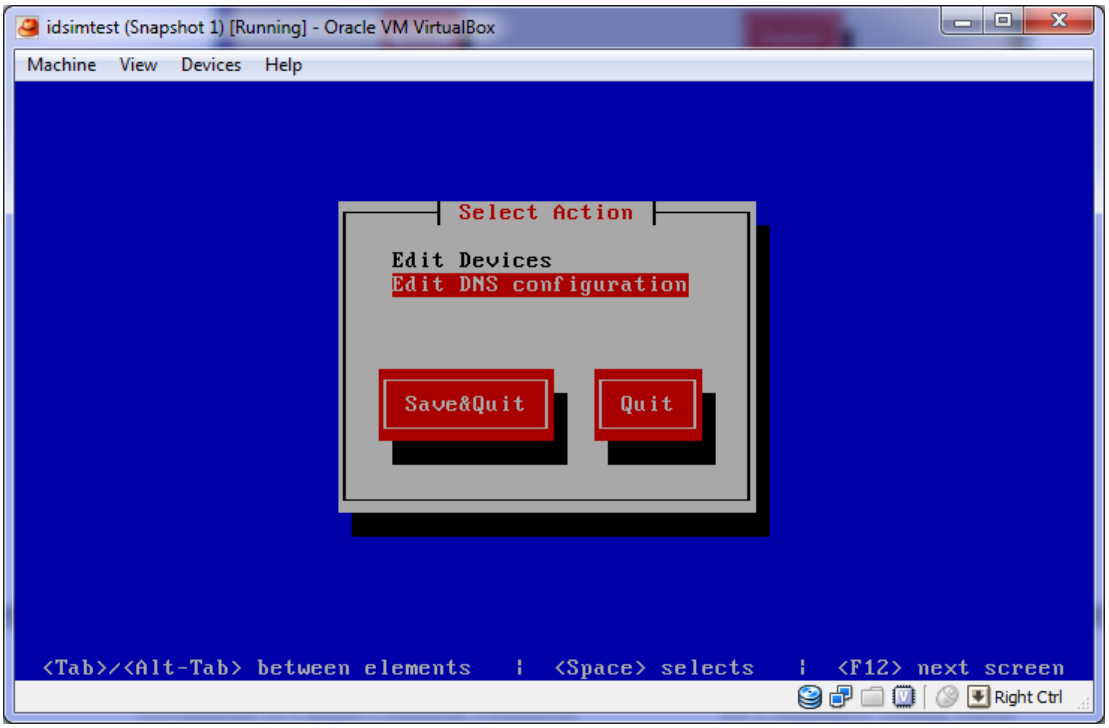
10. Select eth0



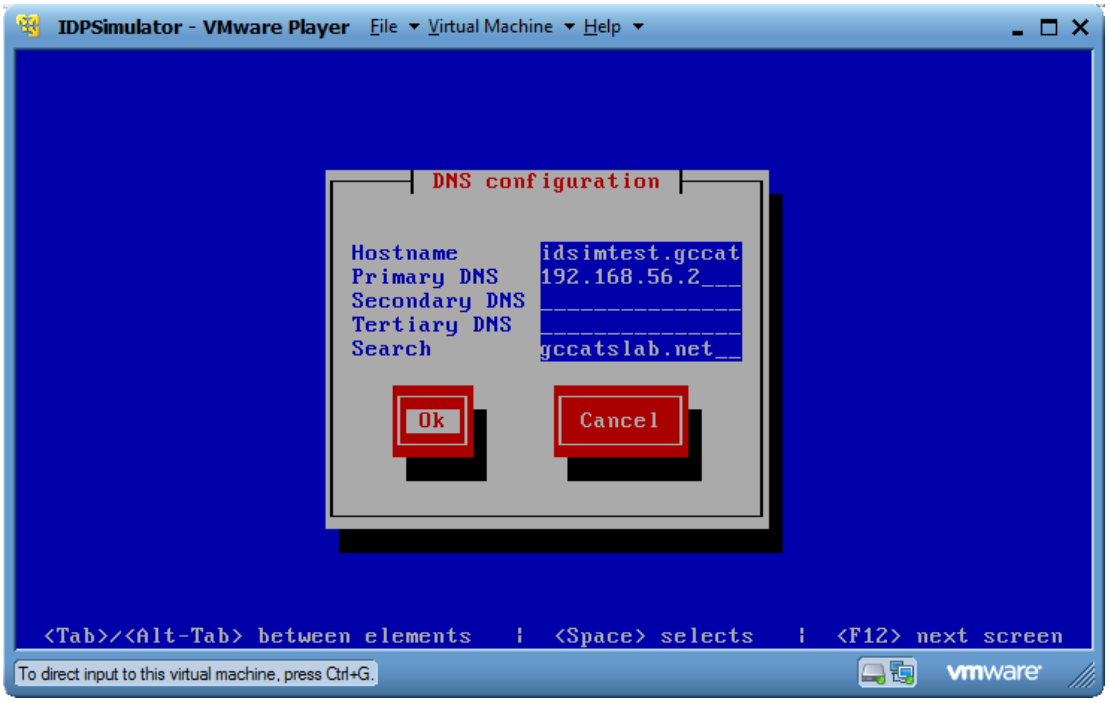
11. Configure the static IP address, netmask and default gateway for your network and select "OK".



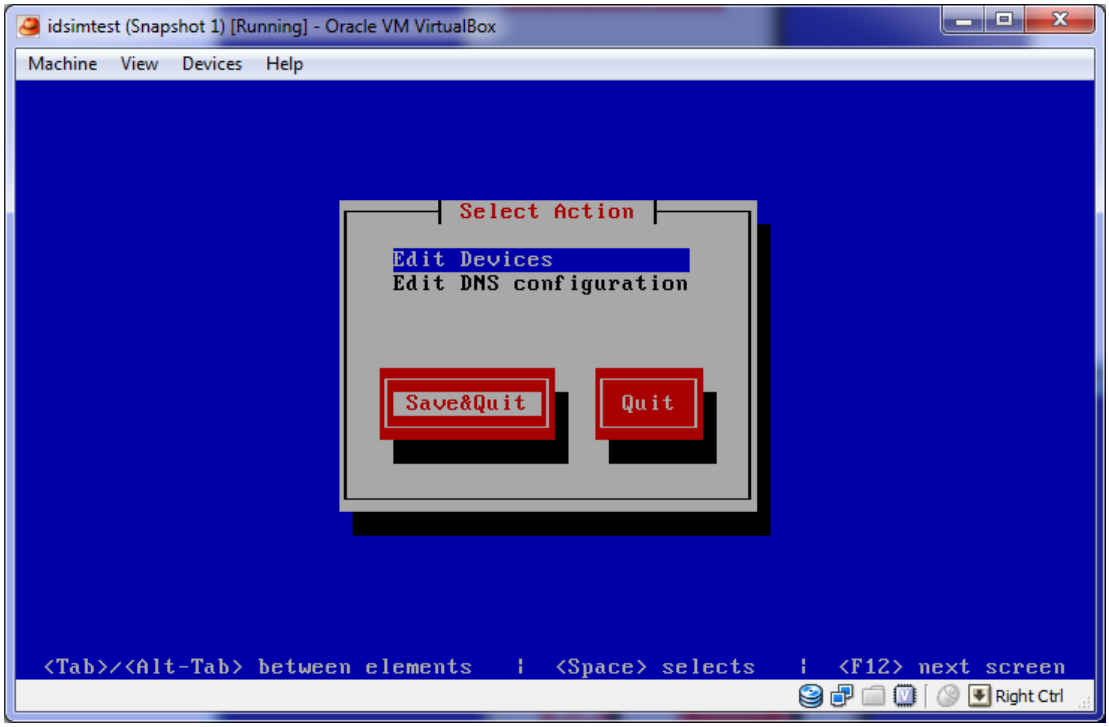
12. Select “Save”.



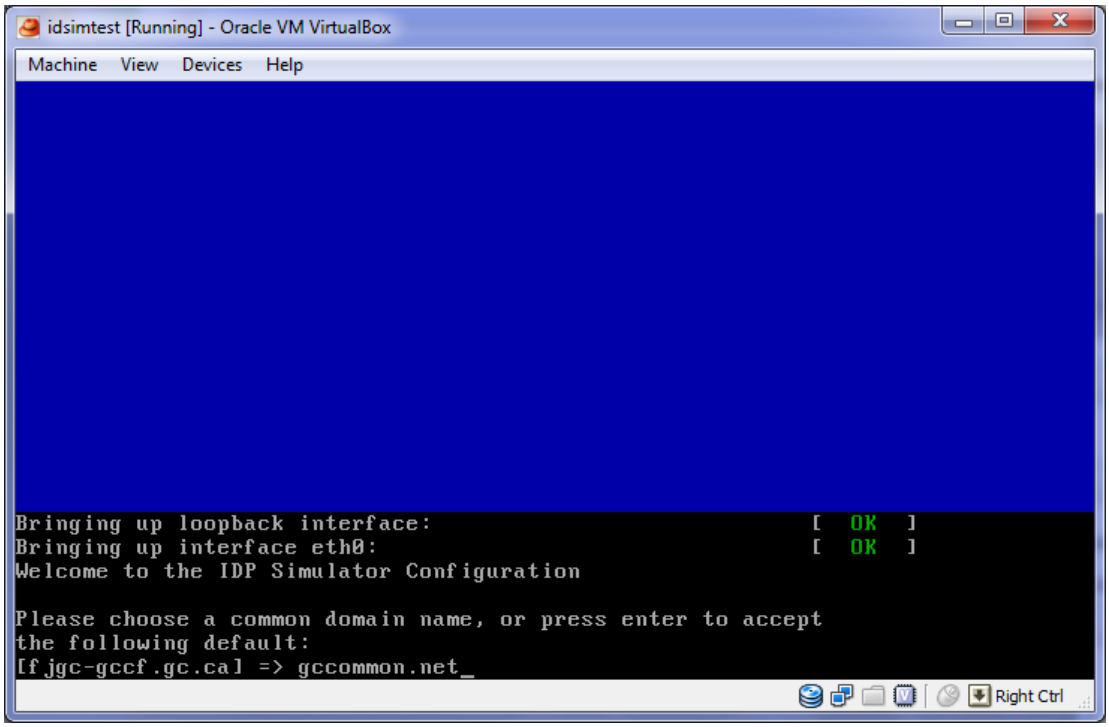
13. Select “Edit DNS Configuration”.



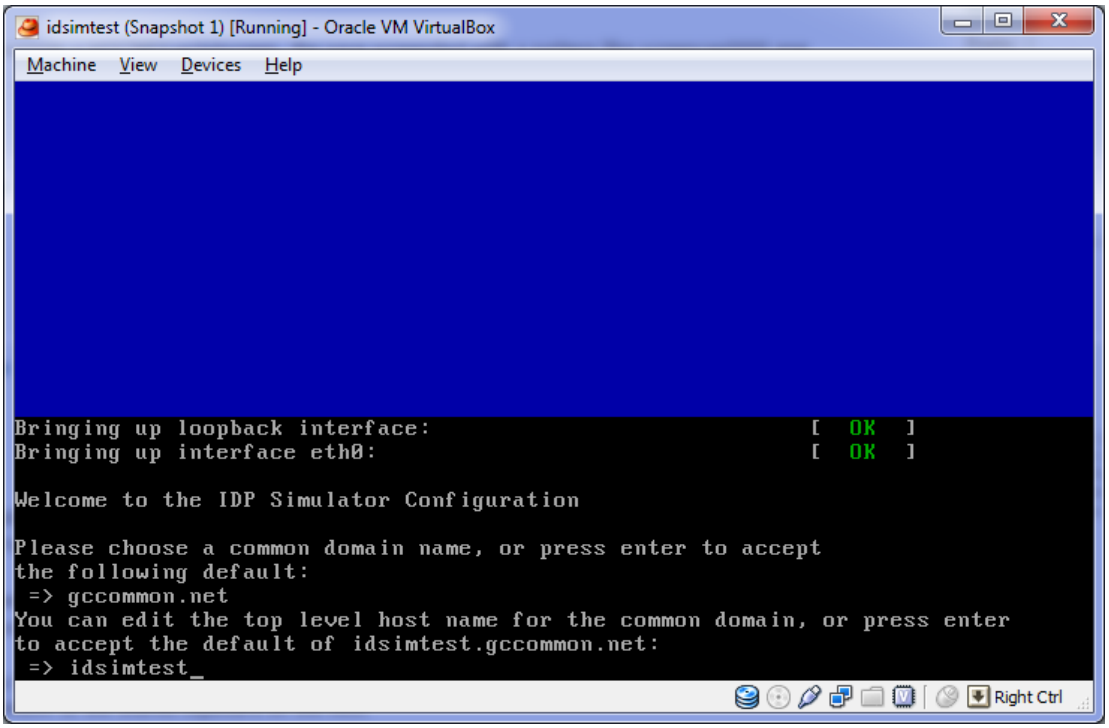
14. Enter a fully qualified host name (e.g. idsim.test.dept.gc.ca) for the IDP Simulator and the address(es) of your DNS servers. You may also specify a DNS search default if you wish. Select “Ok”.



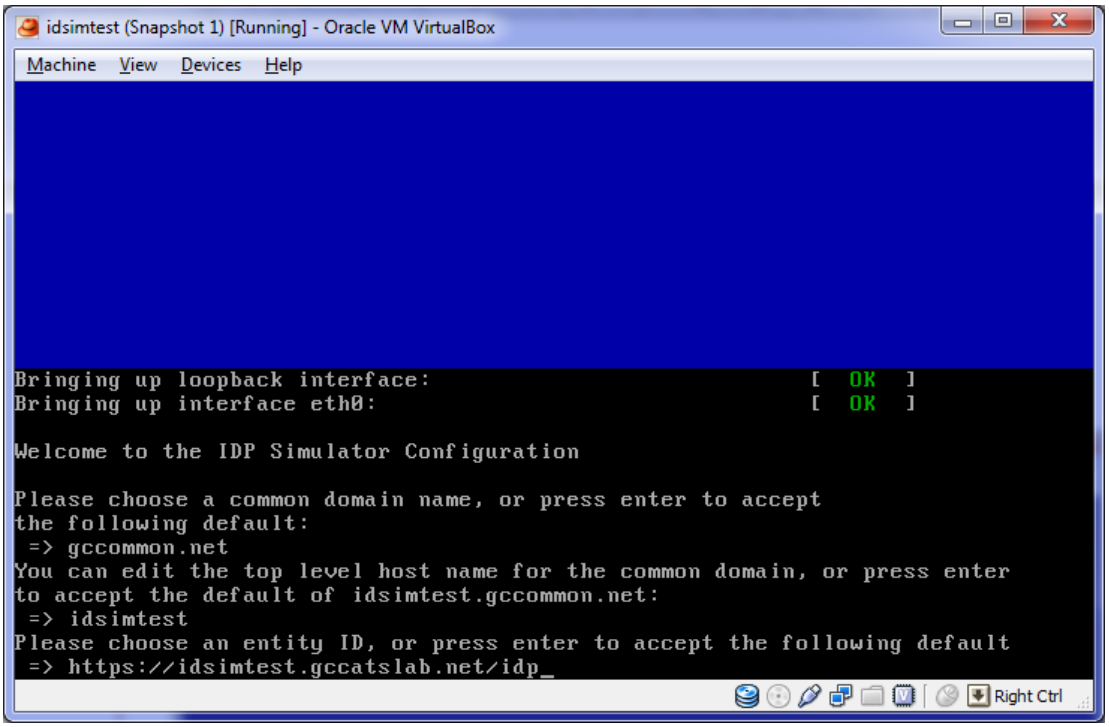
15. Select “Save & Quit”.



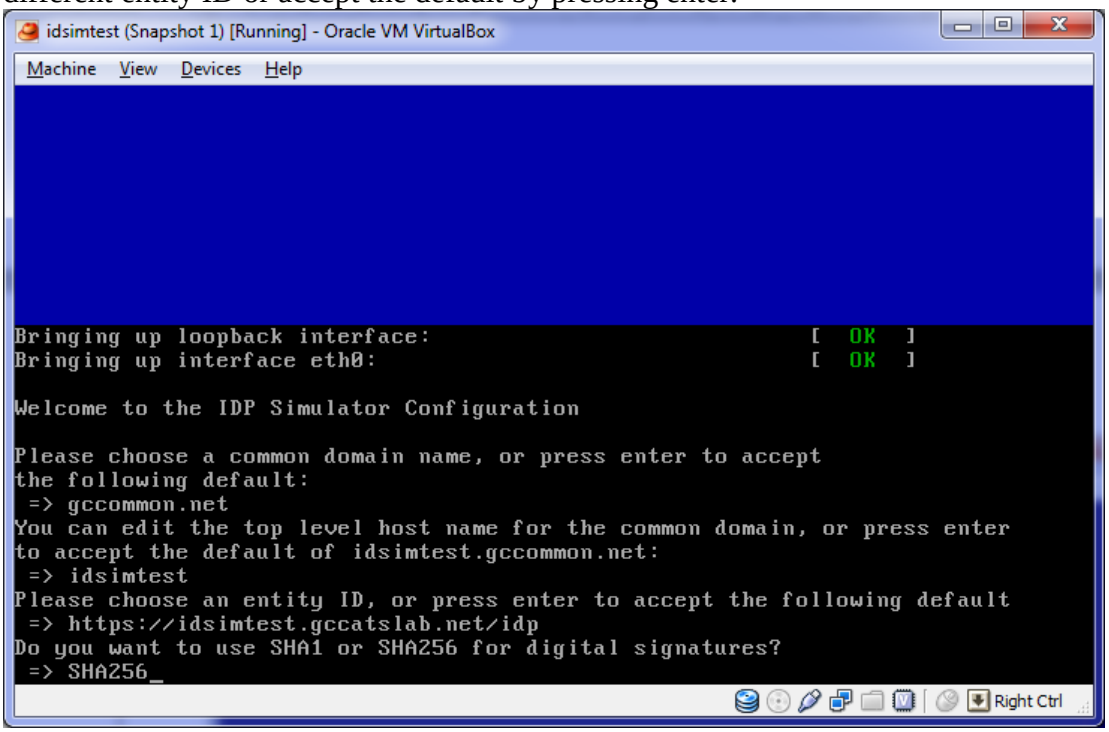
16. If you wish to use a common domain other than "fjgc-gccf.gc.ca" in your development or test environment you will be given an opportunity to specify its name. To use the default press enter.
17. At this point, the configuration script will attempt a DNS lookup of the host name you have specified. If no DNS entry is found (or no DNS server is configured) then an entry will be created in the /etc/hosts file.



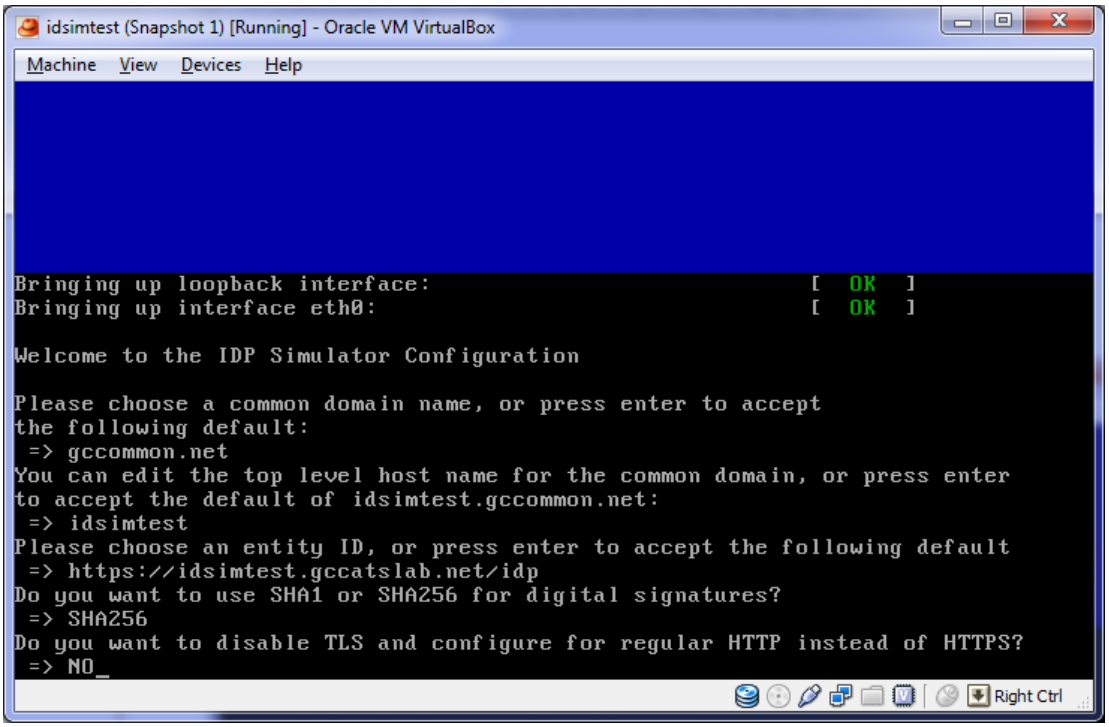
18. Next you can modify the host name to be used in the common domain if you wish.



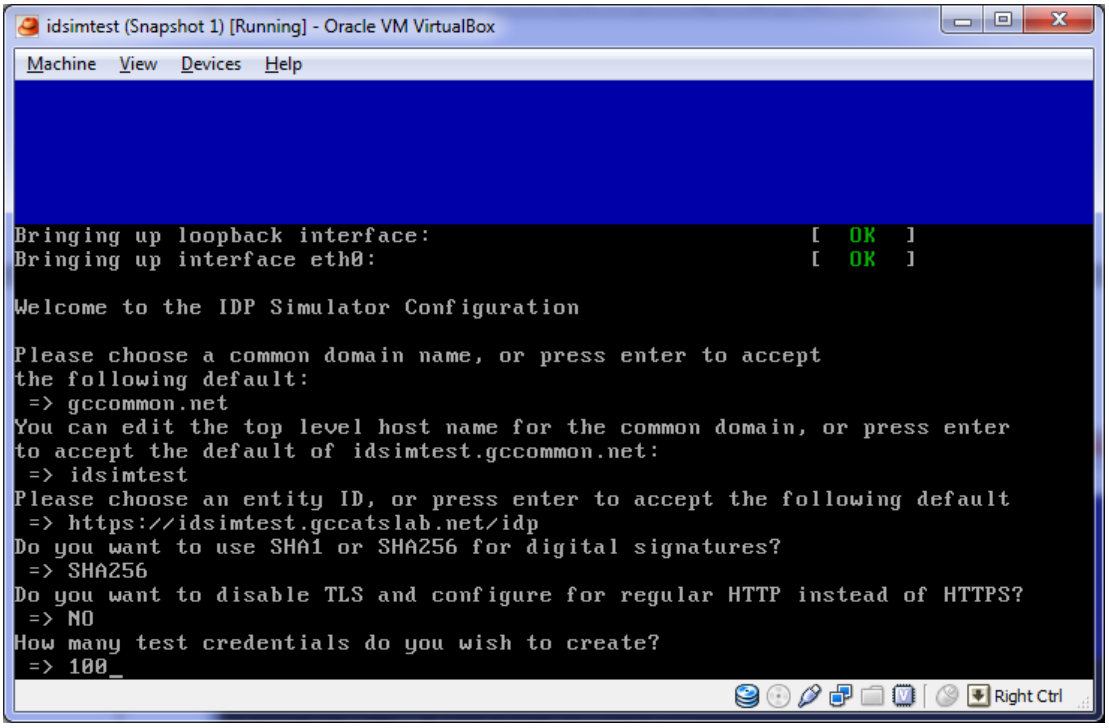
19. A default SAML entity ID will be created using the host name. You can specify a different entity ID or accept the default by pressing enter.



20. The IDP Simulator is capable of verifying both SHA-1 and SHA-256 signatures from RPs. Here you can specify which algorithm the simulator will use when signing it's own SAML messages.



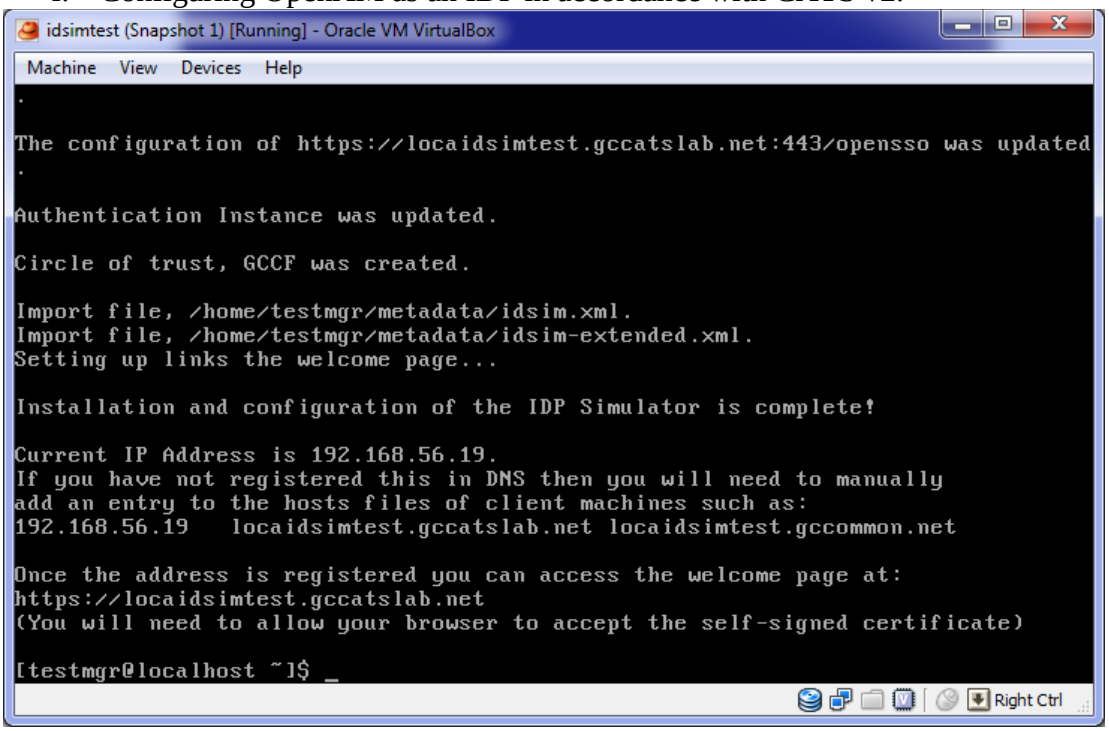
21. While CATS mandates the use of TLS it may be useful to disable it in order to perform troubleshooting in your development or test environment.



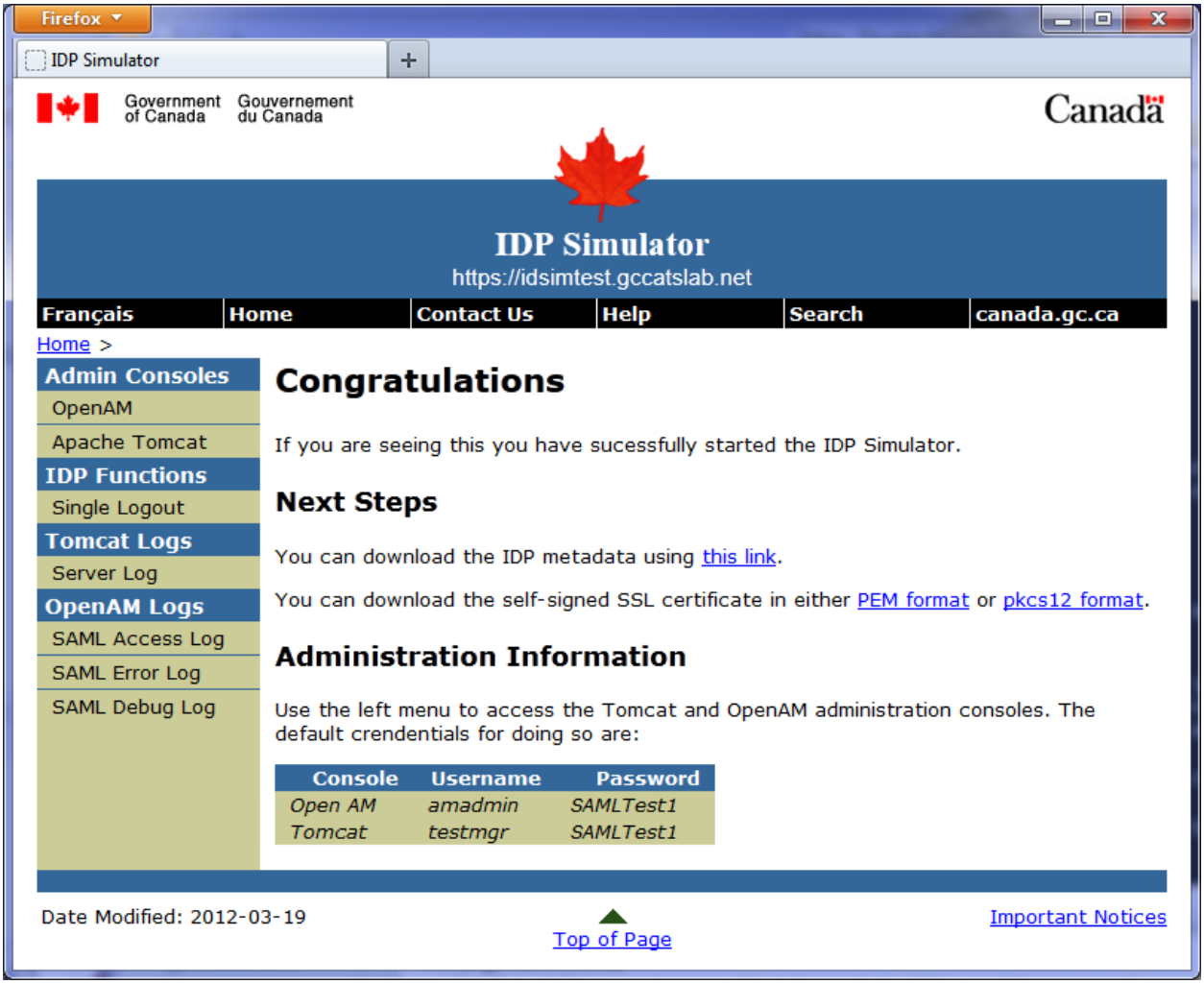
22. Next you can specify the number of test credentials that your wish to pre-load. The test userids will be of the format “user.*n*” where n starts at 0. All of the test credentials will

have the password “password”. Do not exceed 1 million test users as this may cause the simulator to run out of virtual disk space.

23. At this point, the configuration script has all of the information it needs. It will proceed to complete the installation and configuration process by:
    a. Generating and installing a self-signed SSL certificate for the web server,
    b. Installing and starting an OpenDJ directory server,
    c. Starting Apache Tomcat and installing OpenAM,
    d. Configuring OpenAM for the selected host name,
    e. Generating CATS-compliant SAML metadata for the IDP, and
    f. Configuring OpenAM as an IDP in accordance with CATS v2.



24. Once configuration is complete, the URL to access the web server will be displayed. Use a web browser to confirm that the simulator is running. Note that if the IDP Simulator is not registered in DNS then every server or client PC that accesses the IDP simulator must have an entry added to its host file. If an attempt is made to access the simulator by IP address or some other means then the secure nature of SAML and HTTPS will prevent it from functioning.



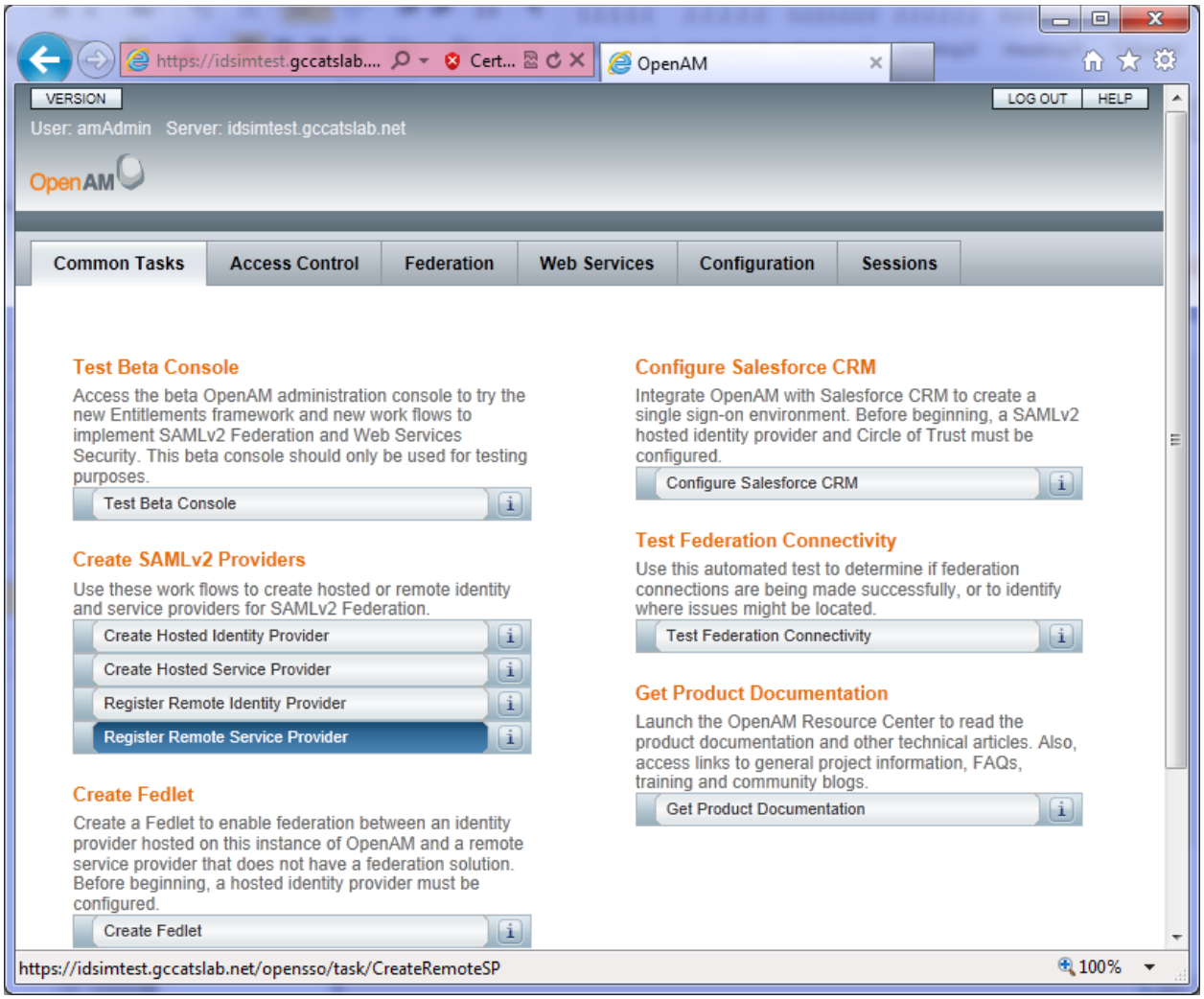
The IDP Simulator home page provides quick links to access the Tomcat and Open AM administration consoles. The Single Logout link can be used to initiate single logout from the IDP. Links are also provided to download the IDP's SAML metadata as well as the self-signed SSL certificate. Both of these will be required to configure your application's SAML interface to use the IDP Simulator. To assist in testing and debugging, links to download the Tomcat server log and the OpenAM SAML logs are also available.

2.4 Configuring a Service Provider

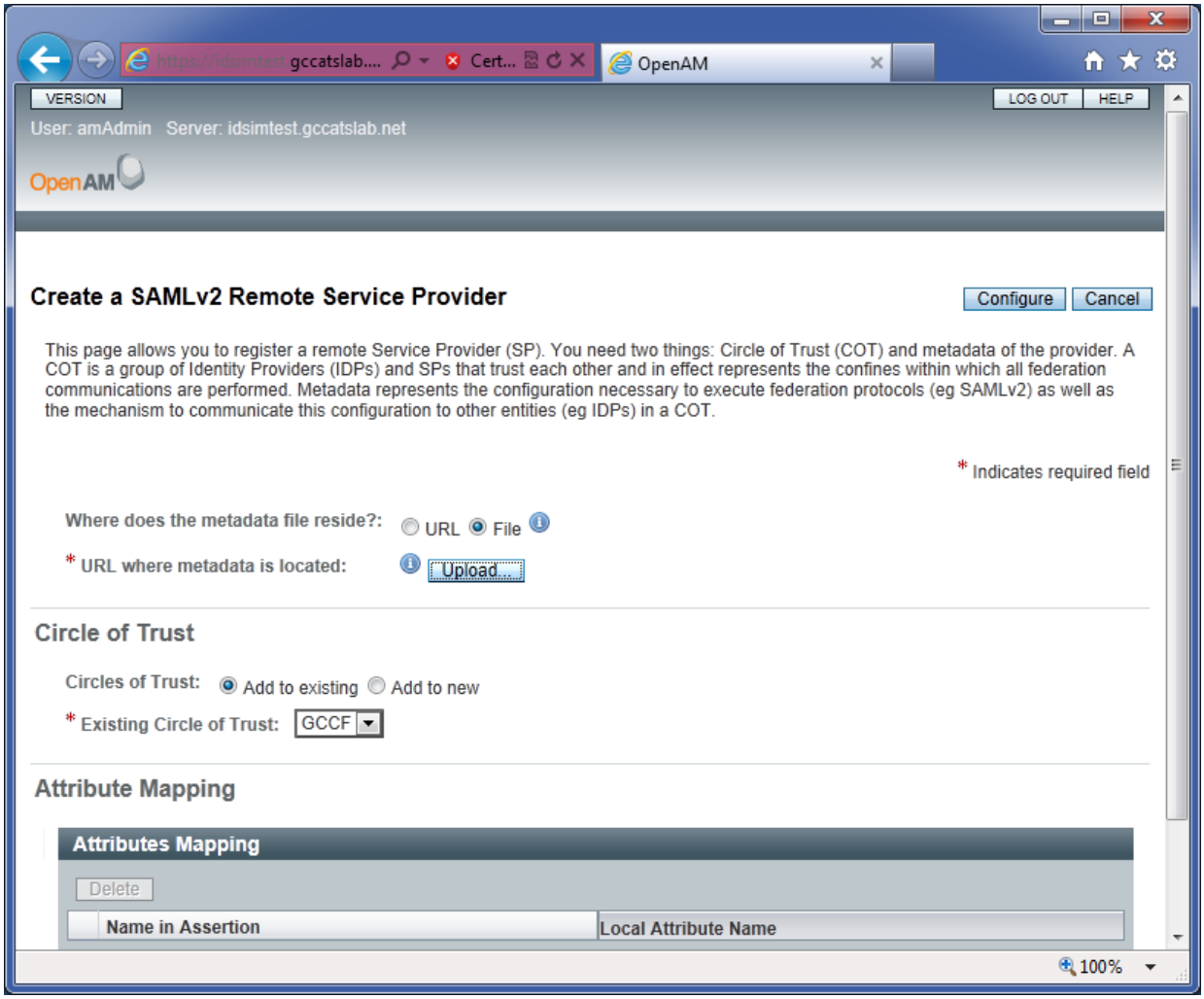
To configure the IDP Simulator to work with your application, proceed as follows.

1. From the IDP Simulator home page, launch the OpenAM admin console.

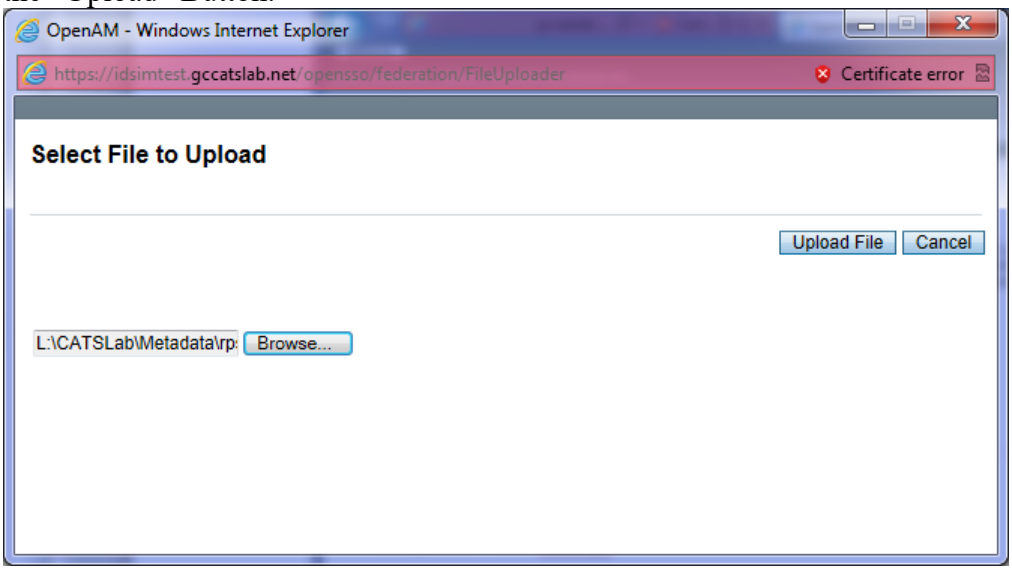
2. Log in as “amadmin” (the password is “SAMLTest1”).



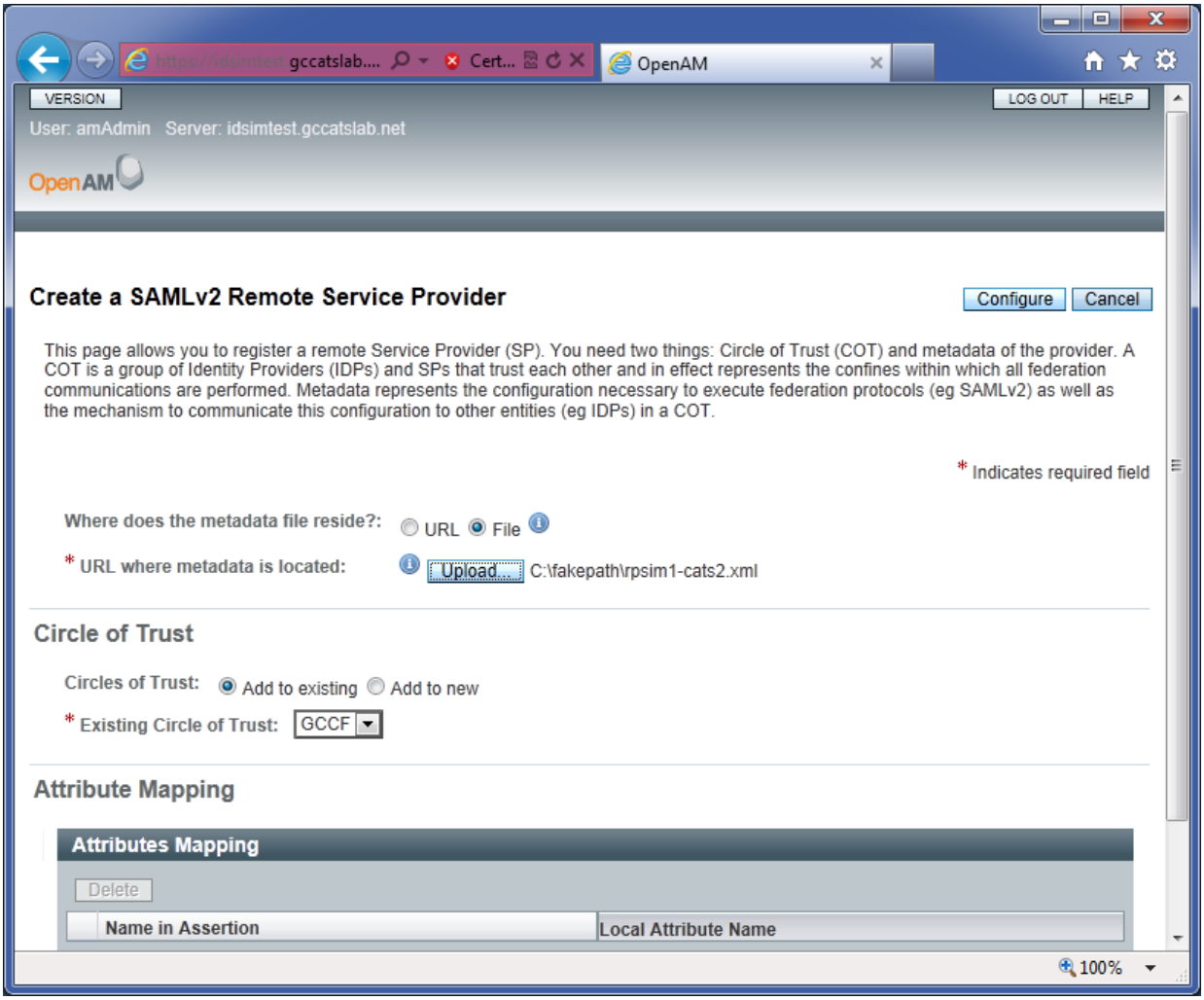
3. Select “Register Remote Service Provider”.



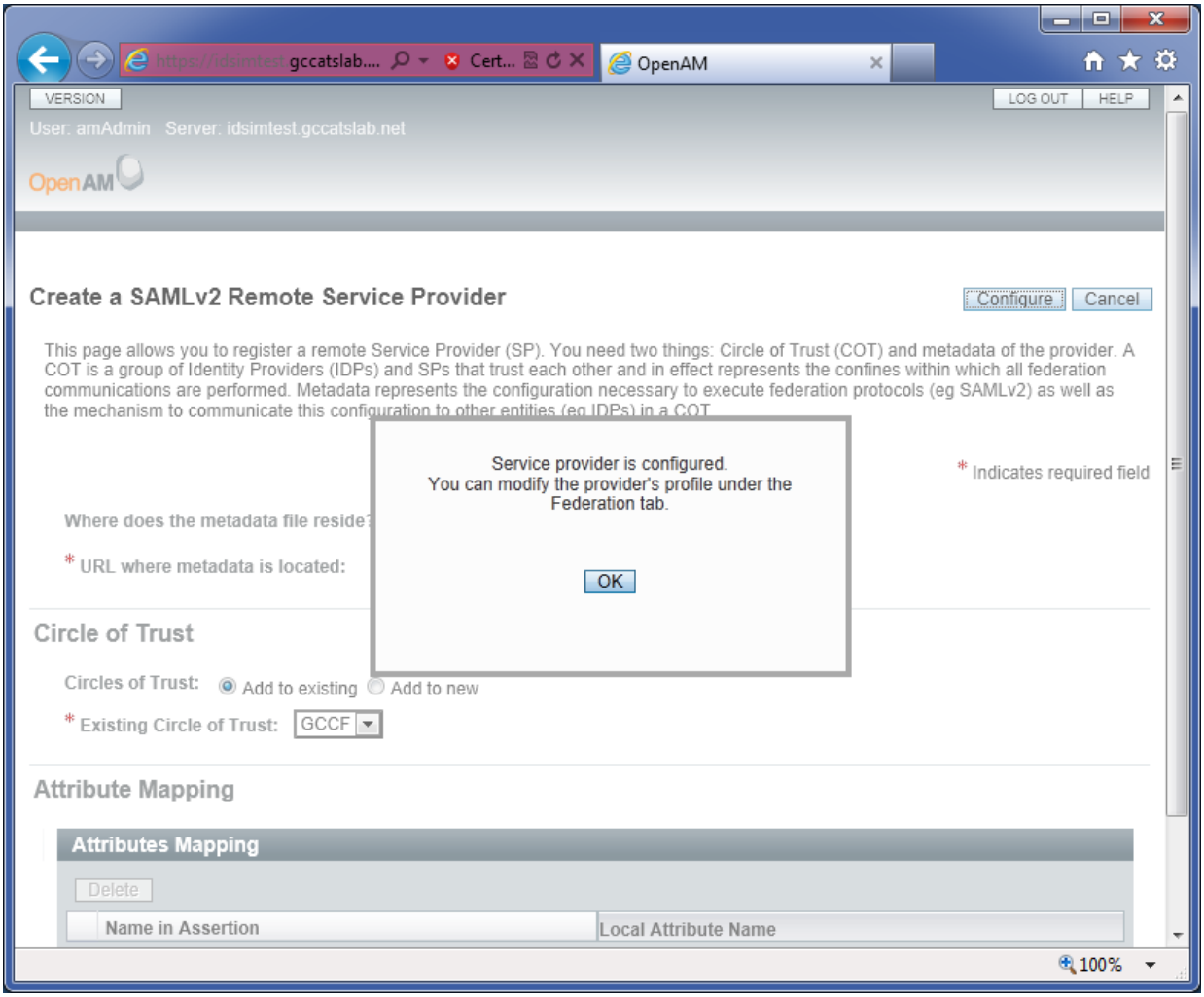
4. Select the "File" radio button next to "Where does the metadata file reside?", then select the "Upload" Button.



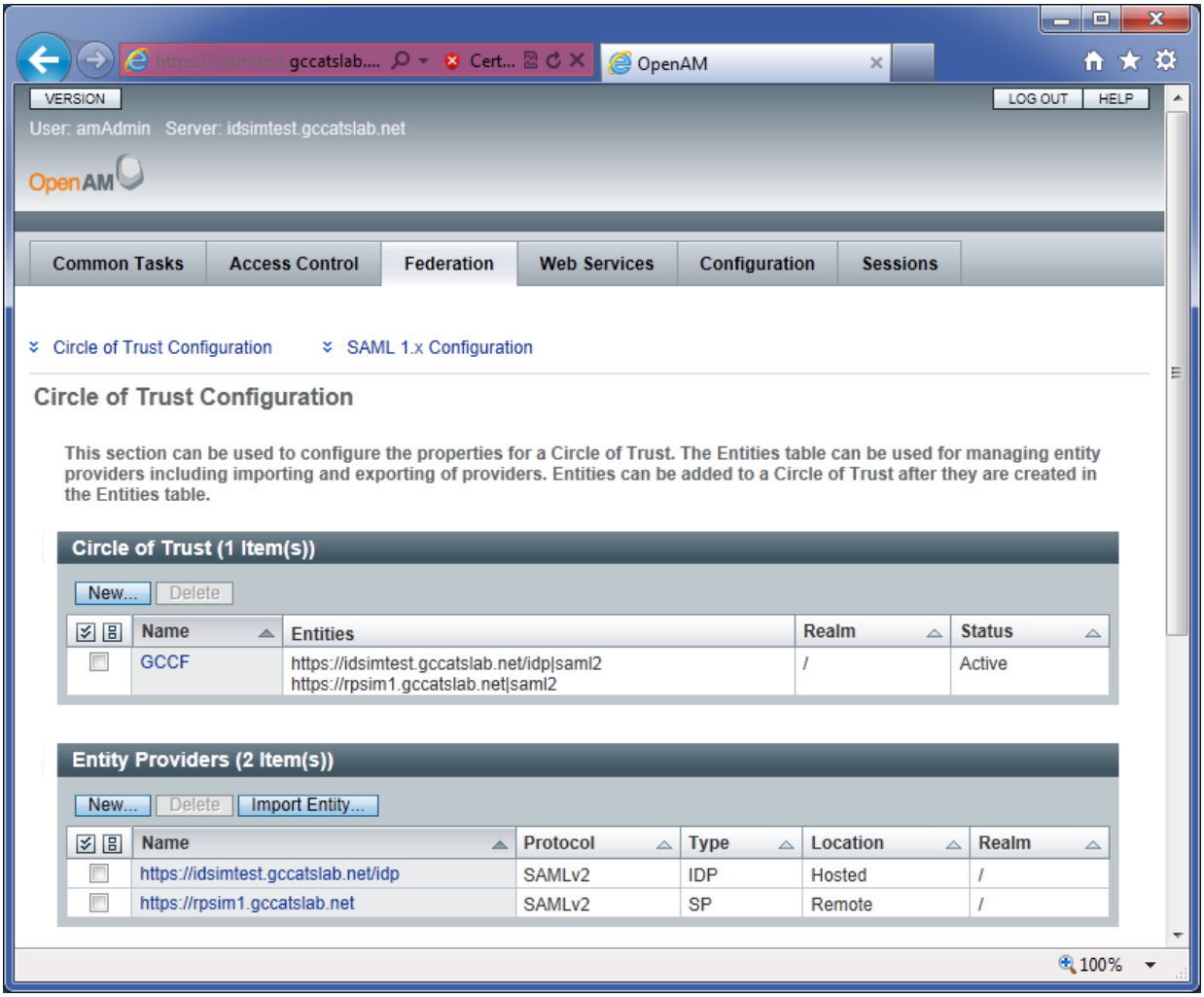
5. Browse to the location of your CATS2 compliant metadata and select "Upload File".



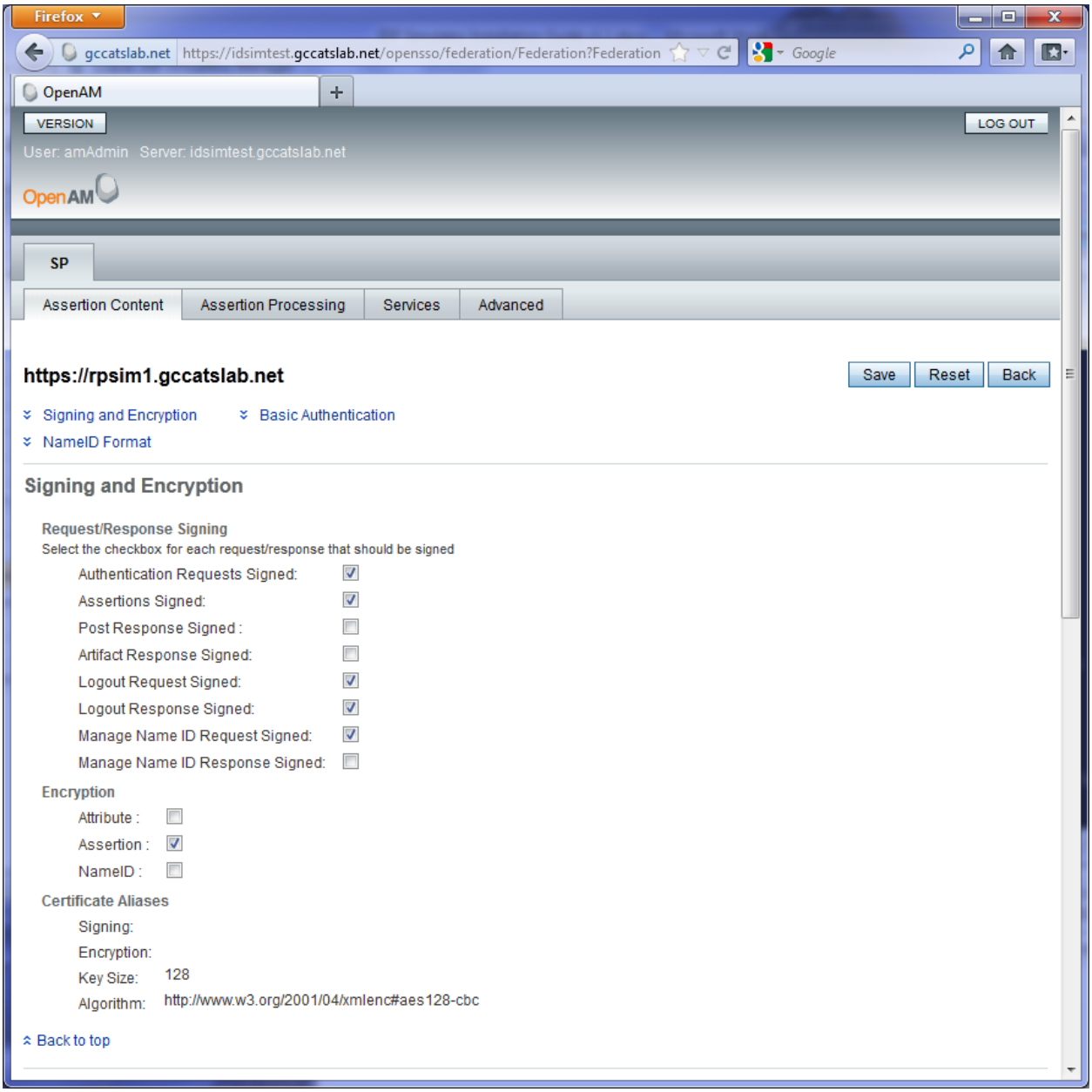
6. Select the “Configure” Button at the top-right of the page.



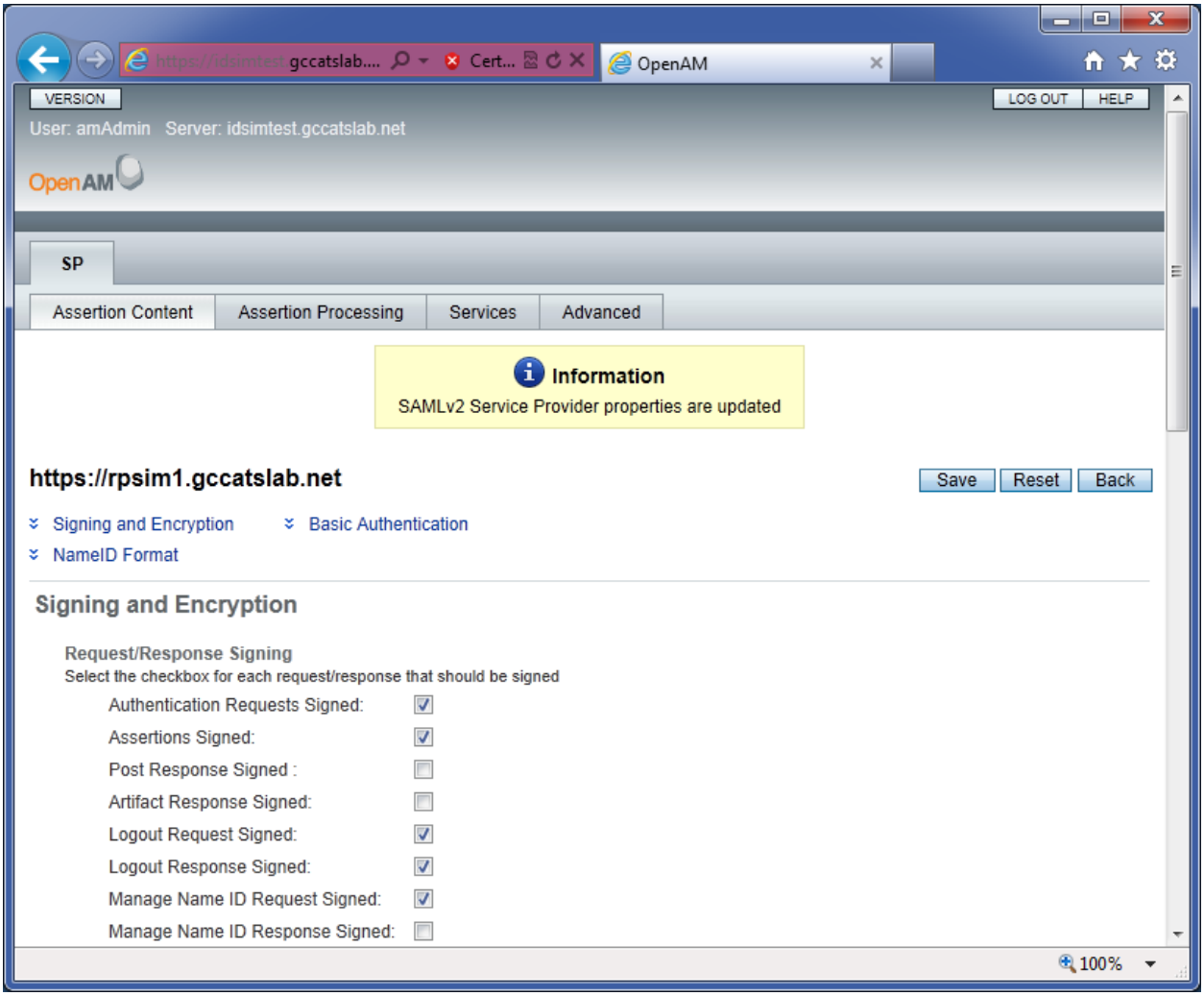
7. Click on “OK” to return to the admin console home page.



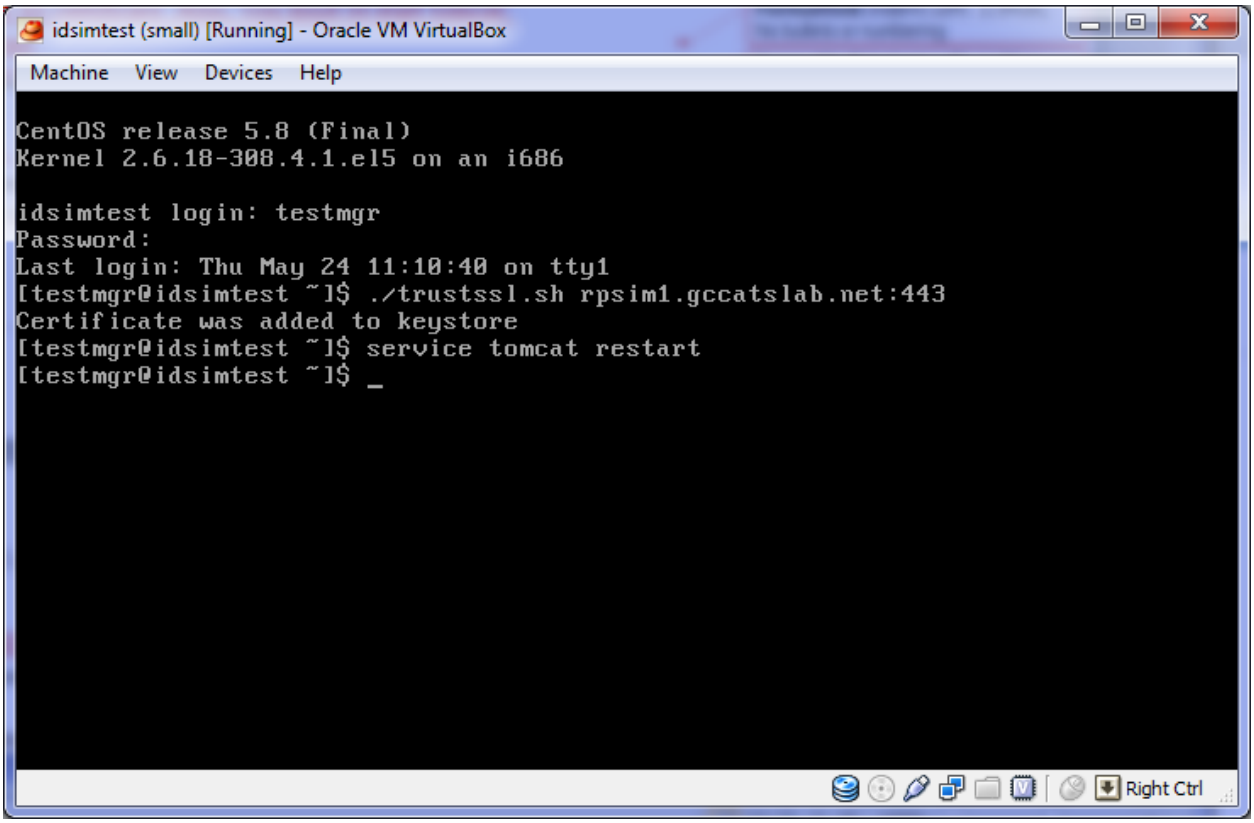
8. Select the “Federation Tab” to display the Circle of Trust configuration page.



9. Select the entity ID of your service provider at the bottom of the page to bring up the SP Configuration page. Under Request/Response signing select the checkboxes for “Logout Request Signed”, “Logout Response Signed” and Manage Name ID Request Signed”. Under Encryption, select the checkbox for “Assertion”.



10. Select “Save”. OpenAM is now configured to work with your application.
11. You should log out of the admin console before attempting a test (or OpenAM will satisfy your application’s authentication request by performing a single-sign on for the “amadmin” user). For best results, close and re-open your browser before testing.
12. If your RP is not using a commercially recognized SSL certificate they you will need to add its certificate to the IDP Simulator’s trusted certificate store in order for SOAP single logout to work. This can be easily done using the trustssl.sh script in the testmgr home directory:



Note that your RP web server must be running and accessible so that the trust.ssl script can connect to it and retrieve its certificate. Also, you must re-start tomcat as shown in order for the change to take effect.

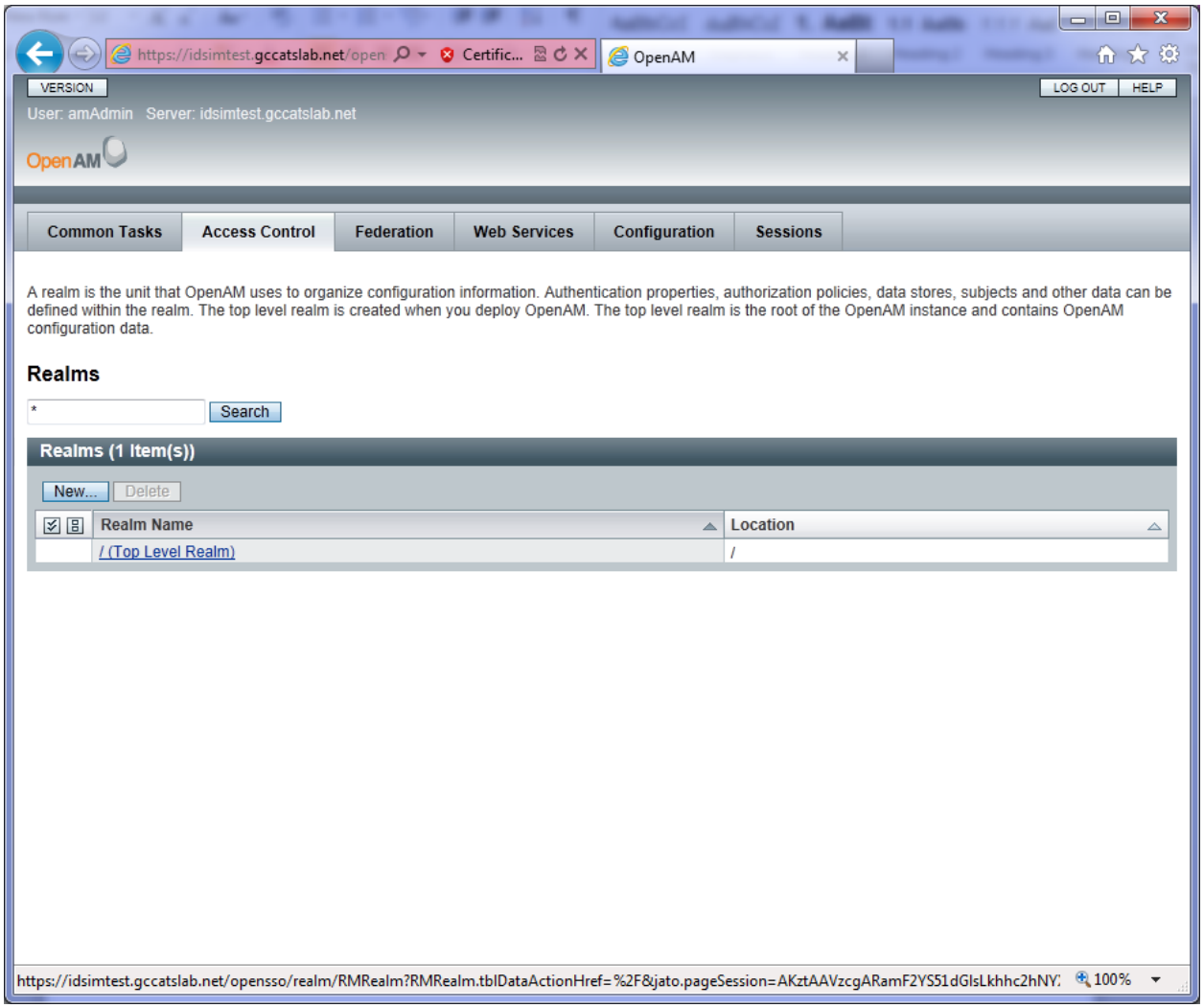
2.5 Creating Additional Test Users

Do not use the "amadmin" user to test your application. "amadmin" is a special user and OpenAM will not provide the same nameID (PAI) to your application from login to login. The test users created the installation will have username "user.*n*" (where n starts from 0) and password "password". Additional users can be manually added as follows:

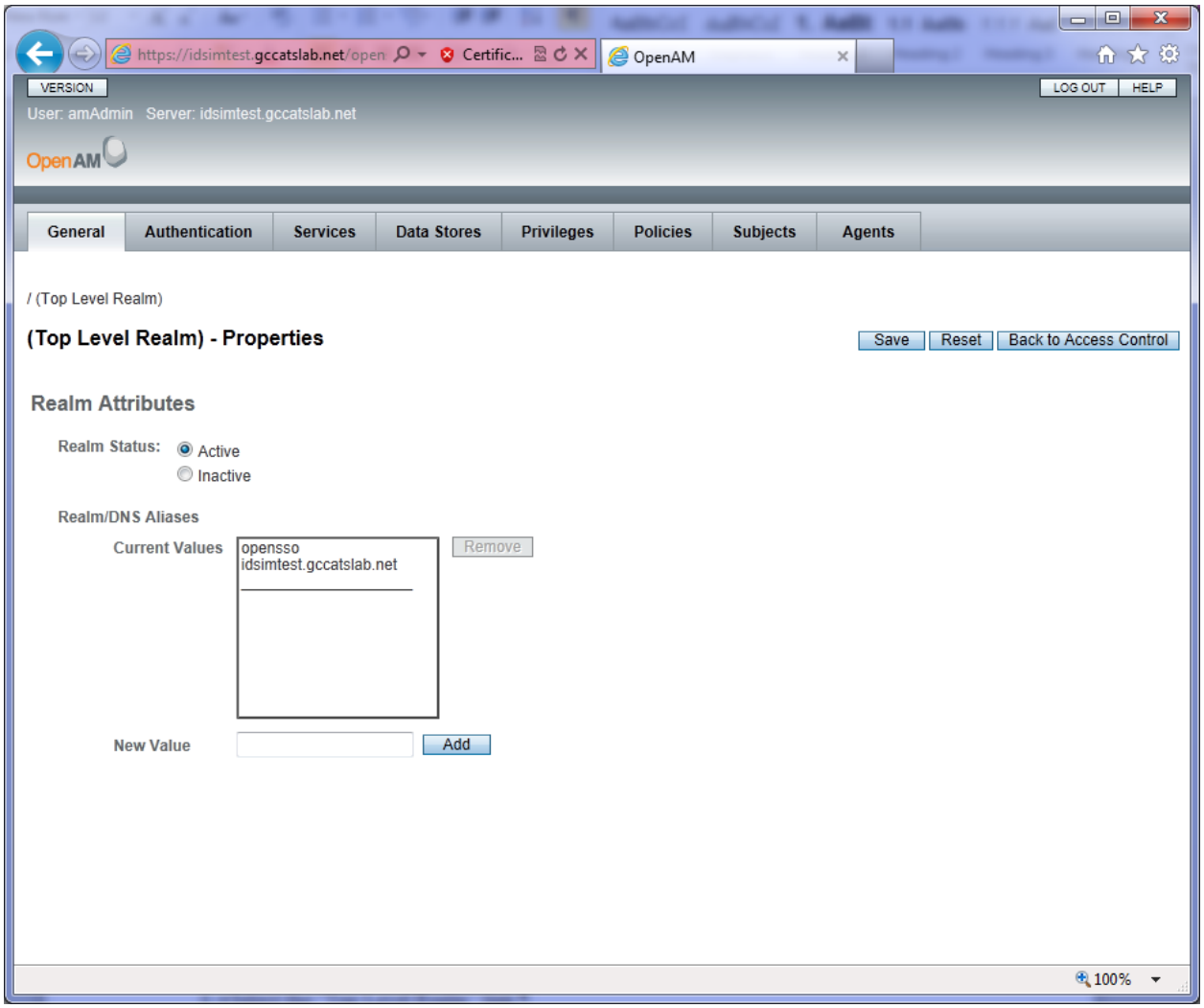
1. From the IDP Simulator home page, launch the OpenAM admin console.

2. Log in as “amadmin” (the password is “SAMLTest1”).

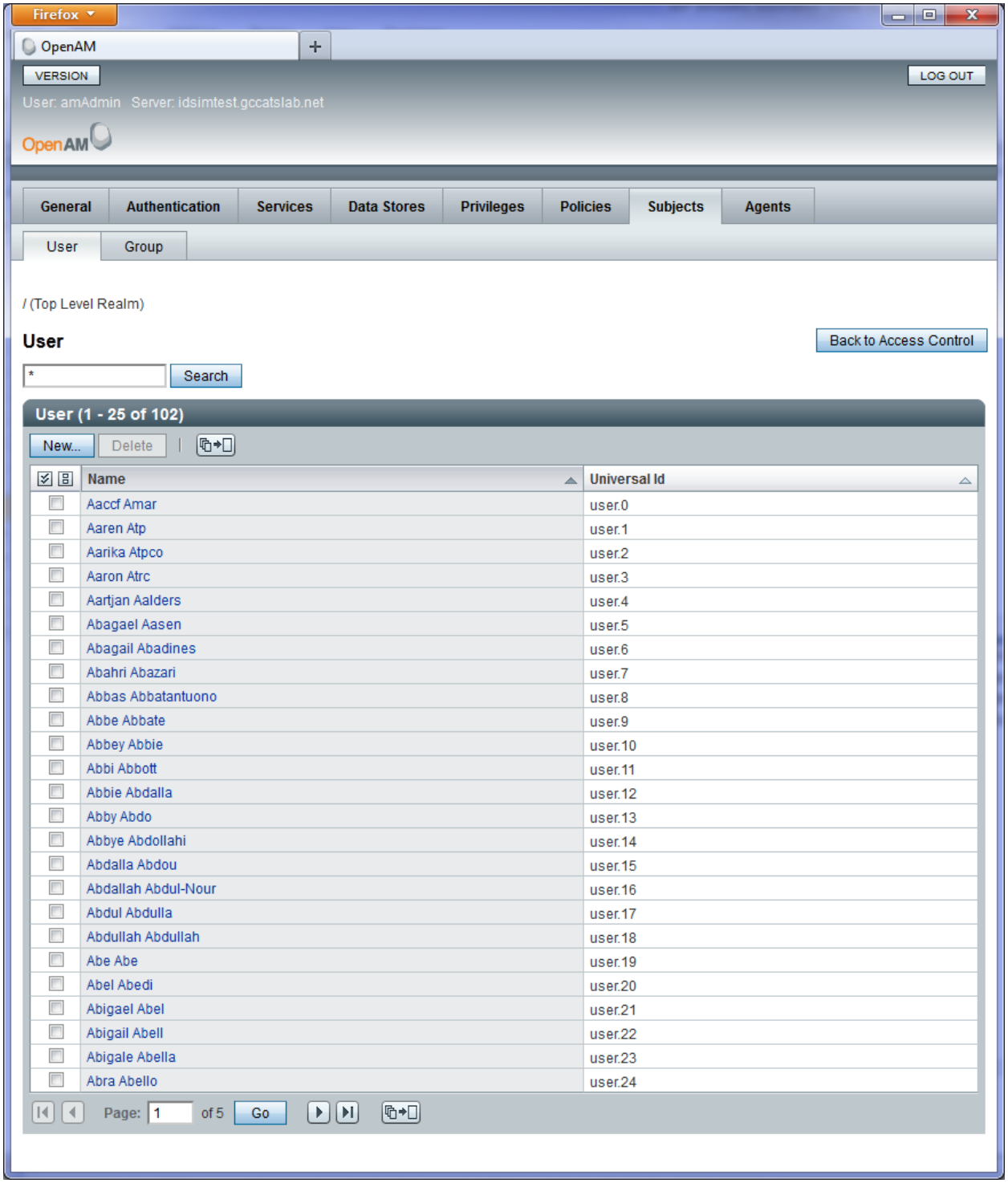
3. Select the “Access Control” tab.



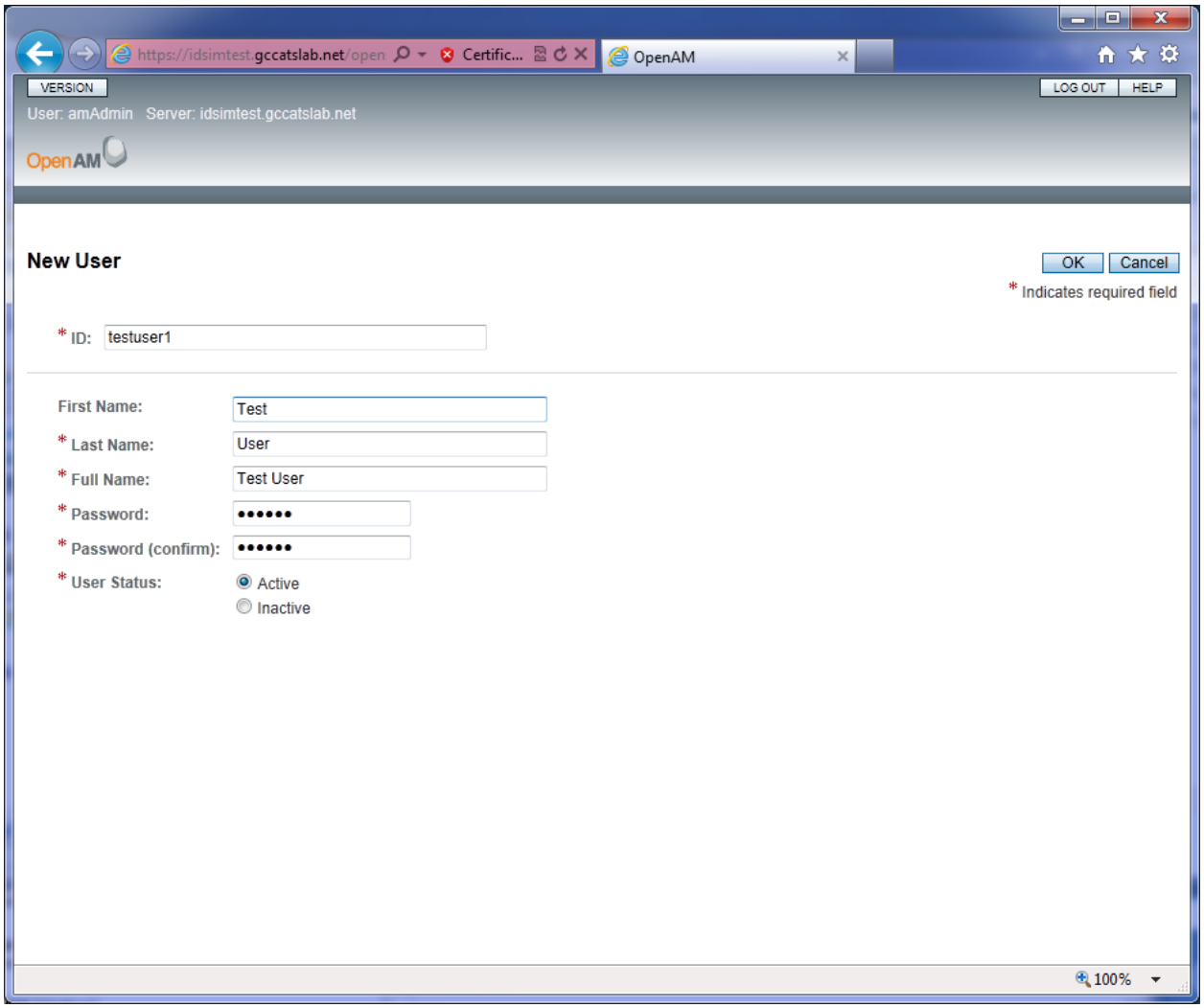
4. Select the “Top Level Realm” link.



5. Select the “Subjects” Tab.



6. At the top of the user list select the “New…” button.



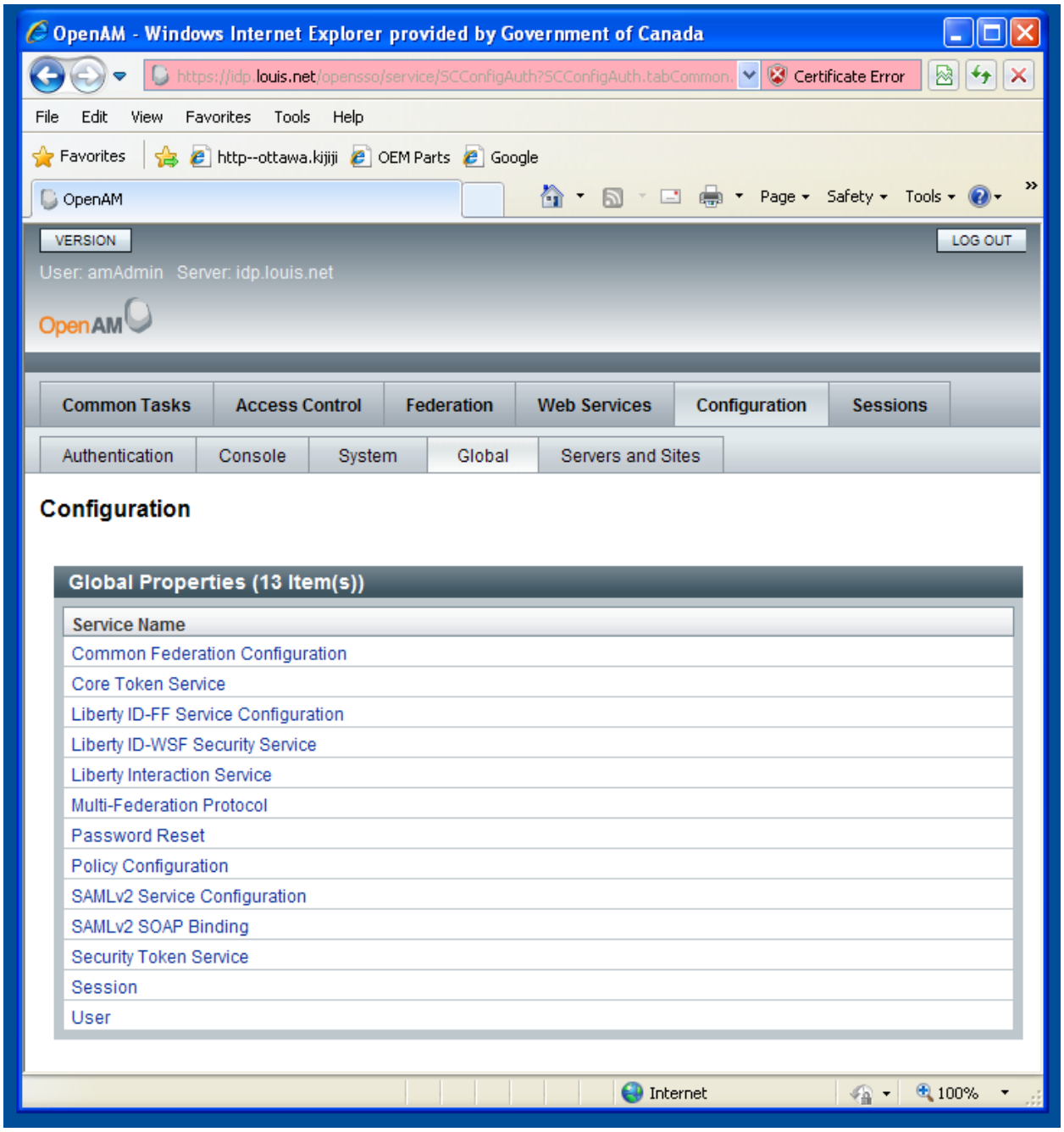
7. Enter the data for the new user account and select “OK”.

2.6 Enabling Signature Algorithm (SHA-256)

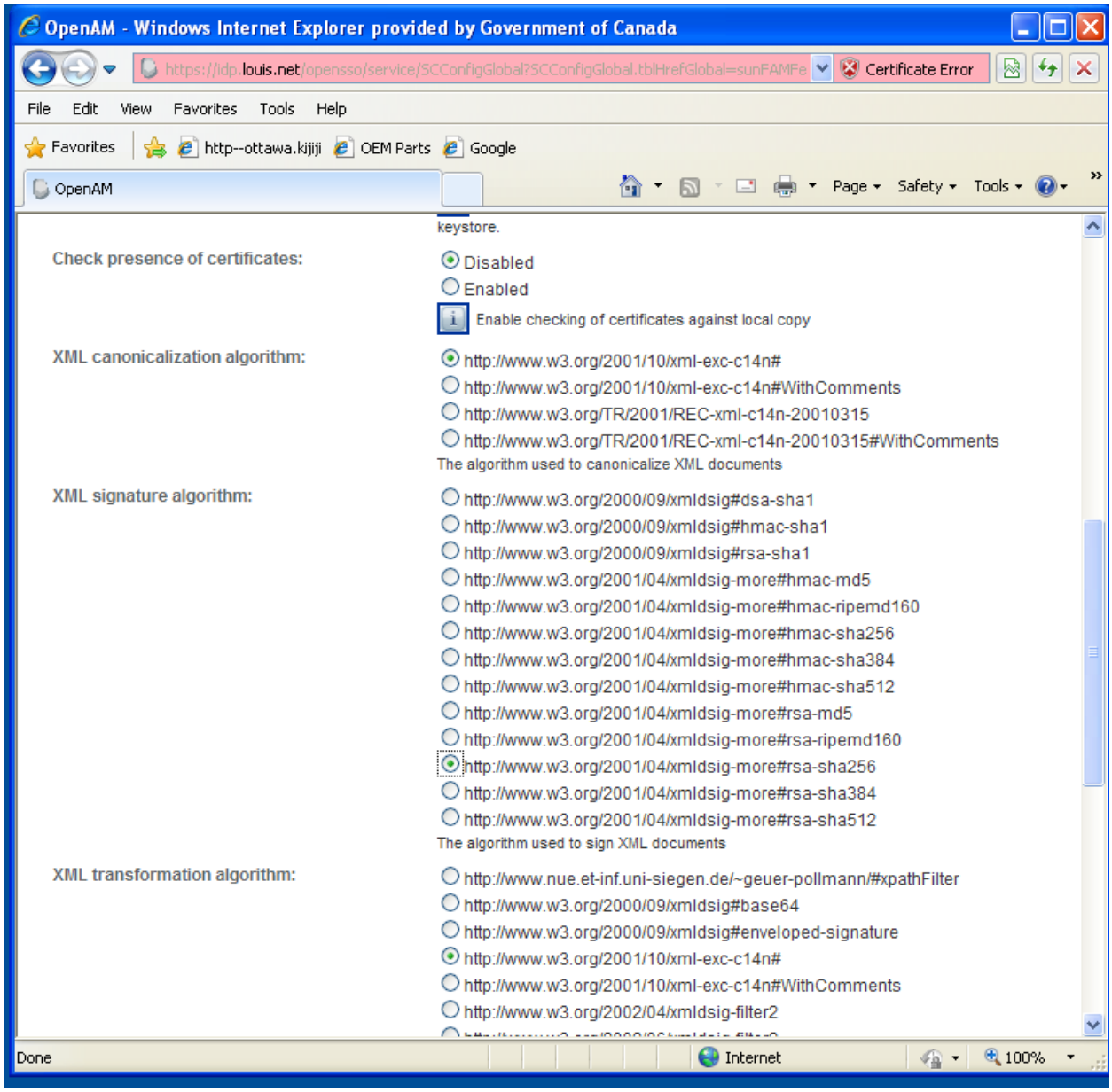
The IDP Simulator is capable of verifying both SHA-1 and SHA-256 signatures from RPs. The instruction below is to specify the use of the SHA-256 algorithm for when the IDP simulator sign it’s own SAML messages.

1. From the IDP Simulator home page, launch the OpenAM admin console.

2. Log in as “amadmin” (the password is “SAMLTest1”).



3. Select “Configuration”, then the “Global” tab.
4. Select ‘Common Federation Configuration’.



5. Scroll down and select “http:/www.w3.org./2001/04/xmldsig-more#rsa-sha256”.
6. Scroll back up, select ‘Save’. OpenAM is now configured to work with your application.
7. You should log out of the admin console before attempting a test (or OpenAM will satisfy your application’s authentication request by performing a single-sign on for the “amadmin” user). For best results, close and re-open your browser before testing.

3. Load and Performance Testing Tips

The IDP Simulator can be used to support load and performance testing of your Relying Party application and enrolment system. Testing by Shared Services Canada has shown that when allocated 2GB of memory and 4 CPUs, the IDP Simulator can sustain over 5,000 login/logout transactions per minute.

Here are a few useful tips for using the IDP Simulator in your performance testing environment:

- The very first time OpenAM sends an assertion to an RP for a given credential; it creates the NameID (PAI) for that RP and stores it in the directory. There is a significant (5x) performance hit when it does this, so it's a good idea to get your load testing tool to log in to each test credential once (via a SAML request from your RP) before starting actual testing of the RP application.
- Since the objective is to load test your application and not the IDP simulator, your testing tool should be configured to refrain from fetching unneeded page resources (images, css stylesheets, javascript files) that are referenced by the IDP Simulator login page.

4. Other Testing Tools

There are a number of simple tools available that can be of great help when testing the SAML interface between an RP and a CSP.

4.1.1 Browser HTTP Tracing

Most modern web browsers have built-in or third-party tools that can be used to observe the HTTP messages being sent to and from the browser. These can be of great help when examining the exchange of SAML messages that use the HTTP redirect and HTTP post bindings. For Example:

1. Microsoft Internet Explorer 9 provides an HTTP capture tool that can be accessed by pressing F12 and then clicking on the "Network" tab.
2. There are several add-ons available for Mozilla Firefox at https://addons.mozilla.org/. Two of the more useful are "HTTPFox", and "SAML Tracer".
3. The HTTP capture tool in Google Chrome can be accessed by launching the developer tools (Ctrl-Shift-I) and then selecting the "Network" icon.

4.1.2 URL and Base-64 Decoding Tools

SAML messages sent using the HTTP redirect and post bindings are Base 64 encoded and then URL encoded. Several public web services are available that can decode these strings allowing you to examine the SAML messages in their XML form. These can be easily found by searching for "URL Decoder" and "Base 64 Decoder" in your favorite search engine. Note that the "SAML Tracer" add-on for Firefox automatically performs URL and Base 64 decoding of SAML messages.