HP Select Audit Software

for the Windows® operating system

Software Version: 1.02

PKCS11 Keystores Configuration Guide

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1 Configuring Select Audit for PKCS11 Keystores

HP Select Audit software can digitally sign the audit data using keys stored on smart cards, USB tokens and HSMs. Integration with such devices requires a PKCS#11 provider which makes cryptographic operations of these devices accessible using the JCA/JCE framework.

Select Audit interoperates with the IAIK provider available at `https://jce.iaik.tugraz.at/sic/products/core_crypto_toolkits/pkcs_11_provider`. This PKCS11 provider is not included in Select Audit and must be acquired and licensed separately.

Download and expand the IAIK archive. In the instructions below `%IAIK%` refers to its expansion location on Windows and `$IAIK` to the expansion location on UNIX.

This document provides instructions for Windows systems only.

Adding IAIK PKCS#11 Provider to Select Audit

These instructions assume that the commands given below are executed in a Command window.

1 Create new folders for `PKCS11` files in your `BEA_HOME` directory.

```
mkdir %BEA_HOME%\PKCS11

mkdir %BEA_HOME%\PKCS11\lib

mkdir %BEA_HOME%\PCKS11\shlib

mkdir %BEA_HOME%\PCKS11\properties
```

2 Add the required IAIK `JAR` files to WebLogic's classpath using the following steps:

```
copy %IAIK%\provider\lib-signed\iaikPkcs11Provider.jar
%BEA_HOME%\PKCS11\lib

copy %IAIK%\provider\lib-signed\iaik_jce.jar %BEA_HOME%\PKCS11\lib

copy %IAIK%\provider\lib-signed\iaikPkcs11Wrapper.jar
%BEA_HOME%\PKCS11\lib
```

3 Add the PKCS11 `JAR` files to your Audit Server's classpath:

- If you are running a standalone WebLogic server instance, add:

  ```
  CLASSPATH=%BEA_HOME%\PKCS11\lib\iaikPkcs11Provider.jar;%BEA_HOME%\
  PKCS11\lib\iaik_jce.jar;%BEA_HOME%\PKCS11\lib\
  iaikPkcs11Wrapper.jar;%CLASSPATH%
  ```

  to your `startWebLogic.cmd`.

- If you are using a custom script or service to start WebLogic, modify its startup settings accordingly.

- If you are running a cluster, the classpath for managed servers must also be modified to include these JAR files.
  - If the servers are started using the provided startManagedWebLogic.cmd script, it has to be modified in the same way as startWebLogic.cmd (above).
  - If the servers are started using the Node Manager, the classpath can be modified to add:

    ```
    %BEA_HOME%\PKCS11\lib\iaikPkcs11Provider.jar;%BEA_HOME%\PKCS11\
    lib\iaik_jce.jar;%BEA_HOME%\PKCS11\lib\iaikPkcs11Wrapper.jar
    ```

    through the WebLogic Console, under **Servers → <myserver> → Remote Start**.

    If you are using the Console, the classpath will be replaced and not appended. Be sure to include everything that was previously on the classpath.

4 Make the appropriate shared library available to your WebLogic domain.

```
copy %IAIK%/lib/win32/pkcs11wrapper.dll %BEA_HOME\PKCS11\shlib
```

- If you are running a standalone WebLogic server instance, edit the startWebLogic.cmd and add the following line after all other set JAVA_OPTIONS lines in the startWebLogic.cmd file.

  ```
  set JAVA_OPTIONS=%JAVA_OPTIONS%
  -Djava.library.path=%BEA_HOME%\PKCS11\shlib
  ```

- If you are using a custom script or service to start WebLogic, modify its startup settings accordingly.
- If you are running a cluster, the JAVA_OPTIONS for managed servers must also be modified to include these shared libraries.
  - If the servers are started using the provided startManagedWebLogic.cmd script, it has to be modified in the same way as startWebLogic.cmd (above).
  - If the servers are started using the Node Manager, the Java arguments can be modified to add:

    ```
    -Djava.library.path=%BEA_HOME%\PKCS11\shlib
    ```

    through the WebLogic Console, under **Servers → <myserver> → Remote Start**.

    If you are using the Console, the arguments will be replaced and not appended. Be sure to include everything that was previously in the arguments.

5 In %BEA_HOME%\PCKS11\properties, create a file called iaik\pkcs\pkcs11\provider\IAIKPkcs11.properties which will contain the configuration for the provider (what hardware PKCS#11 module to use). For example, if you will use ActivCard on Windows, the file would contain:

```
PKCS11_NATIVE_MODULE = C:/Windows/System32/acpkcs.dll
```

You will have to install a driver for your ActivCard reader (whether USB2 or pmscia, or other) and the ActivCard Gold software.

6 Add the IAIKPkcs11.properties file to your Audit Server's classpath:

- If you are running a standalone WebLogic server instance, add the following to your startWebLogic.cmd:

  ```
  CLASSPATH=%BEA_HOME%\PKCS11\properties;%CLASSPATH%
  ```

- If you are using a custom script or service to start WebLogic, modify its startup settings accordingly.

- If you are running a cluster, the classpath for managed servers must also be modified to include these JAR files.
  - If the servers are started using the provided `startManagedWebLogic.cmd` script, it has to be modified in the same way as `startWebLogic.cmd` (above).
  - If the servers are started using the Node Manager, the classpath can be modified to add:

    `%BEA_HOME%\PKCS11\properties`

    through the WebLogic Console, under **Servers → <myserver> → Remote Start**.

    If you are using the Console, the classpath will be replaced and not appended. Be sure to include everything that was previously on the classpath.

Go to the `dist` directory of the Audit Server installation and create a temporary working directory and go into that directory.

```
cd C:\Program Files\HP Openview\Select Audit\auditserver\dist

mkdir temp

cd temp
```

7 Extract the `auditserver.ear` file into this directory.

```
%BEA_HOME%\jdk142_08\bin\jar -xvf ..\auditserver.ear
```

8 Go to the `APP-INF\lib` directory.

```
cd APP-INF\lib
```

9 Extract the contents of the `auditservercommon.jar` file.

```
%BEA_HOME%\jdk142_08\bin\jar -xvf auditservercommon.jar
```

10 Change to the security directory.

```
cd com\hp\ov\selectaudit\auditserver\common\security
```

11 Edit the `ProviderFactory.xml` file, add the highlighted sections (or uncomment) and save the file.

```
<?xml version="1.0" encoding="UTF-8"?>
<!DOCTYPE beans SYSTEM "http://www.springframework.org/dtd/
spring-beans.dtd">
<beans>
   <bean id="BcProvider"
            lazy-init="true"
            class="com.hp.ov.selectaudit.auditserver.common.security
            .BCProviderEntry">
            <property name="defaultProvider" value="true"/>
   </bean>

   <bean id="IaikProvider"
            lazy-init="true"
            class="com.hp.ov.selectaudit.auditserver.common.
            security.IAIKProviderEntry">
   </bean>

   <bean id="ProviderFactory"
```

```
            lazy-init="true"
            class="com.hp.ov.selectaudit.auditserver.common
            .security.ProviderFactory">
            <property name="providerEntries">
                 <list>
                     <ref local="BcProvider"/>
                     <ref local="IaikProvider"/>
                 </list>
            </property>
   </bean>
</beans>
```

12 In the `com\hp\ov\selectaudit\auditserver\common\security`, create a file called `IAIKProviderEntry.java` containing the following:

This location must correspond to the "class" specified in the `IaikProvider` bean in `ProviderFactory.xml` above and must also be the same as that specified in the "package" line in the Java code below.

```
package com.hp.ov.selectaudit.auditserver.common.security;
import iaik.pkcs.pkcs11.provider.IAIKPkcs11;
import iaik.security.provider.IAIK;

import java.security.Security;

import
com.hp.ov.selectaudit.auditserver.common.security.ProviderInterface;

public class IAIKProviderEntry implements ProviderInterface {
       protected boolean isDefaultProvider;
       protected String providerName1;
       protected String providerName2;

       public void loadProvider() throws Exception {
           IAIK p1 = new IAIK();
           providerName1 = p1.getName();
           Security.addProvider(p1);

           IAIKPkcs11 p2 = new IAIKPkcs11();
           providerName2 = p2.getName();
           Security.addProvider(p2);
       }

       public void removeProvider() throws Exception {
           if (providerName2 != null) {
                   Security.removeProvider(providerName2);
           }
```

```
            if (providerName1 != null) {
                    Security.removeProvider(providerName1);
            }
        }

        public boolean isDefaultProvider() {
            return isDefaultProvider;
        }

        public void setDefaultProvider(boolean isDefaultProvider) {
            this.isDefaultProvider = isDefaultProvider;
        }
}
```

13 Compile this Java code using the following command:

```
%BEA_HOME%\jdk142_08\bin\javac -classpath "C:\Program Files\HP
OpenView\Select Audit\auditserver\dist\temp\APP-INF\lib\
auditservercommon.jar;%BEA_HOME%\PKCS11\lib\iaikPkcs11Provider.jar;
%BEA_HOME%\PKCS11\lib\iaikPkcs11Wrapper.jar;%BEA_HOME%\PKCS11\lib\
iaik_jce.jar" IAIKProviderEntry.java
```

14 Change back to the `APP-INF\lib` directory.

```
cd C:\Program Files\HP
OpenView\SelectAudit\auditserver\dist\temp\APP-INF\lib
```

15 Create a new `auditservercommon.jar` file.

```
%BEA_HOME%\jdk142_08\bin\jar -cvf auditservercommon.jar com
```

16 Remove the `com` directory tree.

17 Create a new `ear` file.

```
cd C:\Program Files\HP OpenView\SelectAudit\auditserver\dist\temp
```

```
%BEA_HOME%\jdk142_08\bin\jar -cvf ..\auditserver.ear *
```

18 Connect to your Select Audit database using an SQL client and run the following SQL (remember to commit the changes).

```
delete from SACFGATTRIBUTE where AttributeName =
'dataSignatureCryptoProvider';
```

```
insert into SACFGATTRIBUTE values ('AuditServerConfig',
'dataSignatureCryptoProvider', 'IAIK PKCS#11:1');
```

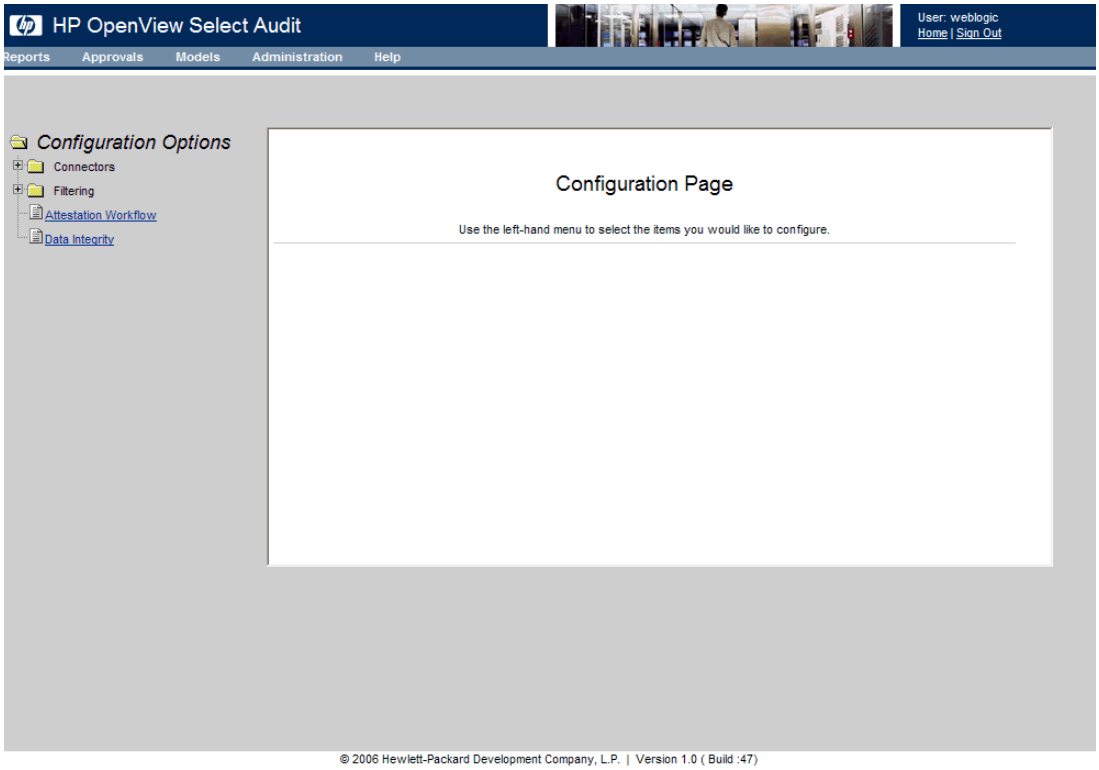
```
delete from SACFGATTRIBUTE where AttributeName =
'dataSignatureSecurityProvider';
```

```
insert into SACFGATTRIBUTE values ('AuditServerConfig',
'dataSignatureSecurityProvider', 'IAIK PKCS#11:1');
```

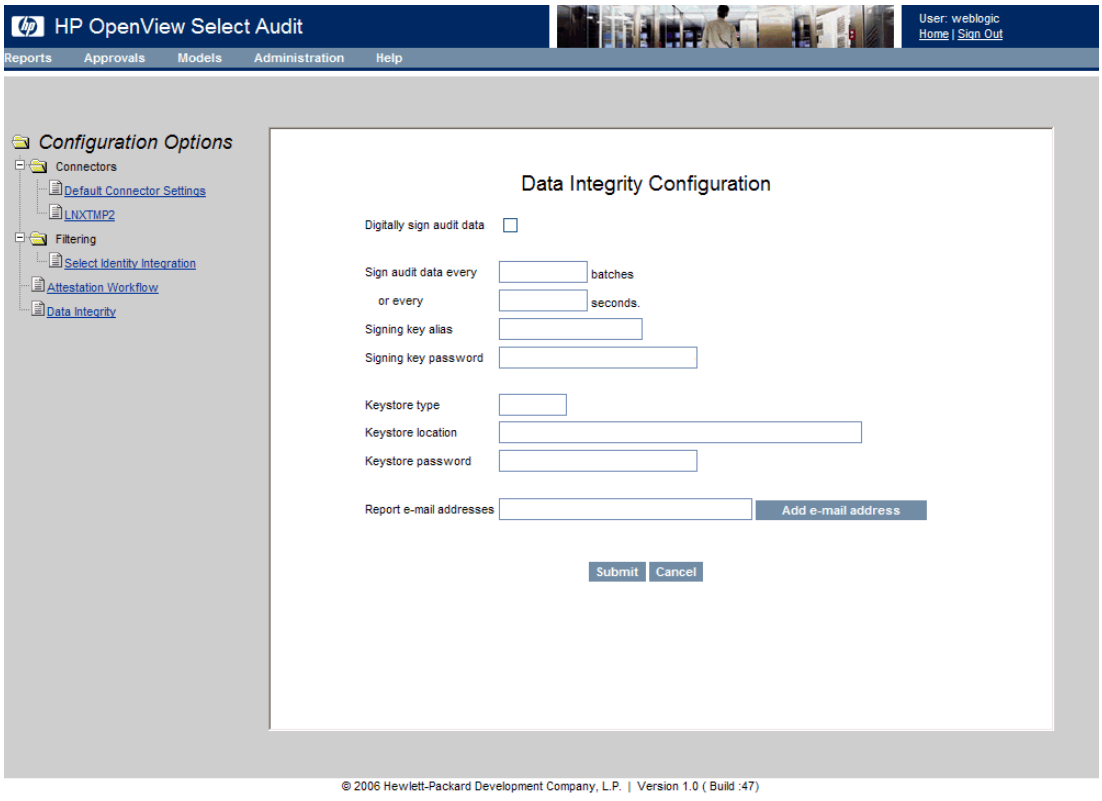
19 In the WebLogic console, deploy the new `auditserver.ear`. Restart WebLogic from the console of the machine where it is running as there may be issues with accessing the ActivCard reader when WebLogic is started from a Remote Administration window.

20 To configure Data Signing using a `PKCS11` keystore on an ActivCard, log on to the Select Audit Portal

21 In Select Audit, click **Administration** → **Configuration**. The **Configuration** screen opens.



22 Click **Data Integrity.** The **Data Integrity** screen opens.



23 On the **Data Integrity** screen, complete the fields as described in Table 1.

Table 1 Data Integrity Fields

Field	Data Entered
Signing key alias	Type your signing key alias.
Signing key password	Leave this field blank.
Keystore type	Type `pkcs11`.
Keystore location	Leave this field blank.
Keystore password	Type your Active Card's PIN.

24 Type the email address of the person who will receive the report in the **Report e-mail addresses** field and click **Add e-mail address**.

When you initially configure Data Integrity, you can type a semicolon separated list of email addresses. The email addresses will be saved when you click **Submit**. After Data Integrity is configured, you can add email addresses using **Add email address** without resaving the other parameters of the Data Integrity configuration.

25 Click **Submit**. The message **Successfully submitted** is shown at the bottom of the screen.