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| **BOSA signature solution**  FPS information | bosa.png |

**Document history**

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| ***Date*** | ***Author*** | ***Comment*** |
| *25.02.2021* | *Zetes* | *Initial version* |
| *12.03.2021* | *Zetes* | *Fixes in the JSON, updates in redirect and call back URLs* |
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| *28.06.2021* | *Zetes* | *Added validation report when signing a document* |
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Summary

This document is intended for an FPS (Federal Public Service) that wishes to integrate the BOSA signature solution.  
It allows users (Belgian citizens or residents) who are surfing on the FPS website to sign a document with their eID or foreigner card. This document, for example a PDF or XML, has been prepared or created by the FPS.  
The whole signing process is handled by BOSA. The FPS only has to upload the unsigned document to BOSA, redirect the user to BOSA and wait for a callback; then the signed document can be downloaded.

Contents

[1. Introduction 3](#_Toc76549476)

[2. Details 4](#_Toc76549477)

[2.1. BOSA S3 server 4](#_Toc76549478)

[2.2. The getToken call 4](#_Toc76549479)

[2.3. The HTTP redirect 5](#_Toc76549480)

[2.4. The callback to the FPS 5](#_Toc76549481)

[2.4. PDF visible signatures 7](#_Toc76549482)

[3. Sample/test FPS code and service 9](#_Toc76549483)

[References 10](#_Toc76549484)

# 1. Introduction

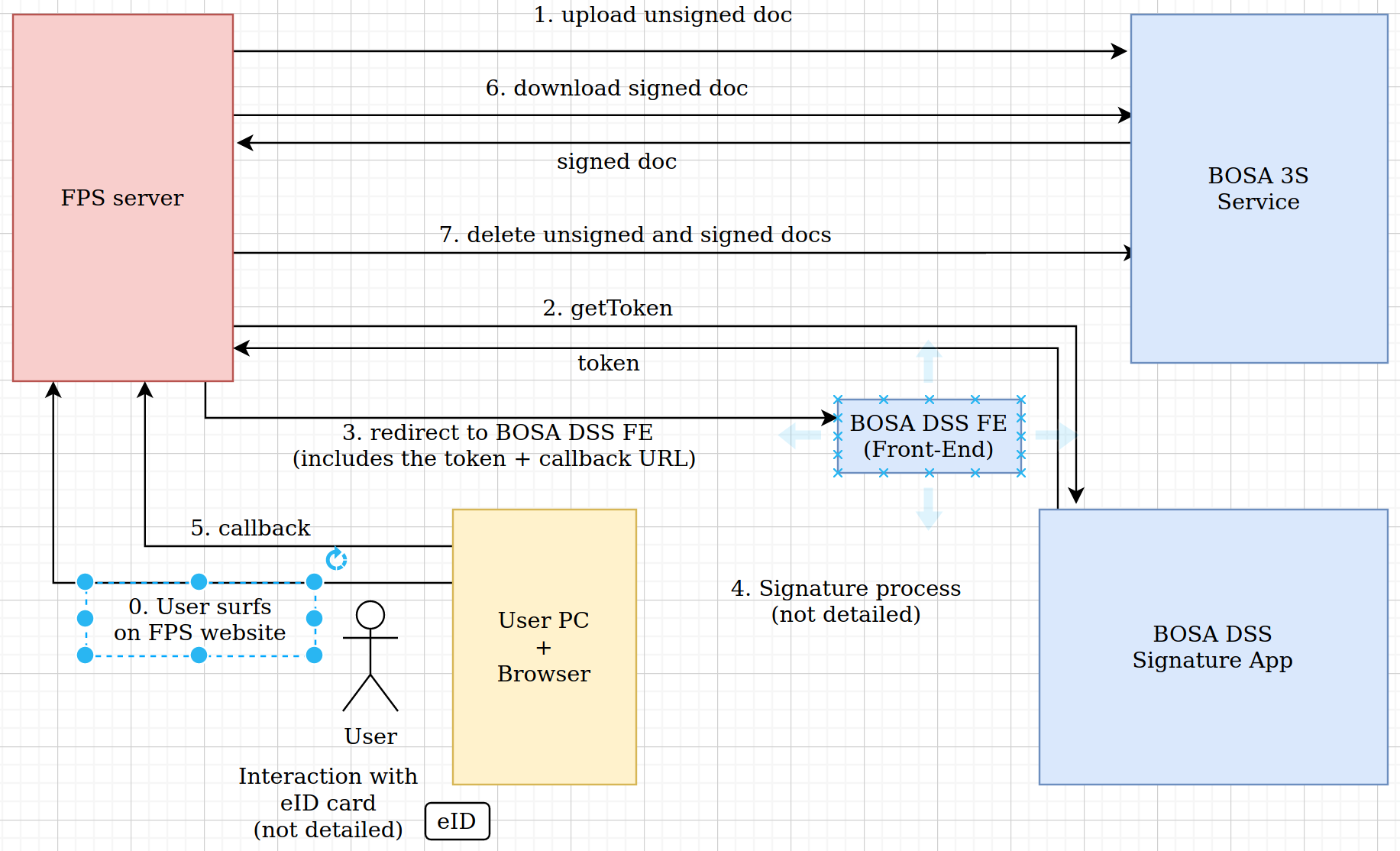
The goal of this document is to profile

The BOSA signature solution consists of 3 parties:

* An **FPS** that wants a User to sign a document with his/her eID/foreigner card
* A **User** (citizen, resident) with his/her PC, surfing on the FPS website
* **BOSA**, who offers the signing services

The flow goes as follows:

1. The User is surfing on the FPS website
2. The FPS creates a document (to be signed by the User) and uploads it to the BOSA S3 server  
   In case of an XML document, a corresponding XSLT file can optionally be uploaded too
3. The FPS sends a ‘getToken’ request to the BOSA DSS server and gets back a *token*
4. The FPS redirects the User to the BOSA DSS front-end server, this HTTP redirect includes the token and a *callback URL*
5. The actual signature process is done between the User and BOSA, at the end a signed document is put on the BOSA S2 server
6. A callback to the FPS is done
7. The FPS downloads the signed document
8. The FPS deletes the unsigned and signed documents



# 2. Details

## 2.1. BOSA S3 server

BOSA provides an Amazon S3 compatible server: MinIO [1].

The FPS uses this server to:

* Upload unsigned documents and additional files such as XSLT files or ‘PDF signature profiles’
* Download signed documents
* Delete the unsigned and signed documents

When the FPS registers for the signature solution, it receives a username and password for this BOSA S3 server. With this, the FPS can then upload, download and delete documents.

*It is important to note that this BOSA S3 server is not intended for long time storage: the space allocated to an FPS is limited, and the FPS itself is responsible for timely deleting documents that are no longer needed.*

There are free client SDKs available for several languages (Java, python, .NET, …) on [2].  
An FPS can use these to implement the upload/download/delete calls.

Implementation note: to connect to an S3 server, typically 3 things are needed: a ‘bucket name’ (this can be seen as a directory on the S3 server), a username and a password.  
For the BOSA S3 server however, the ‘bucket name’ and username are the same, therefore only a username and password are provided during the registration.

## 2.2. The getToken call

This is a REST call (a HTTP POST containing a json string) from the FPS to the BOSA DSS server; the BOSA DSS server will return a ‘token’.

This token is a string that contains a.o. the names of the unsigned (‘in’) and signed (‘out’) documents. It is cryptographically protected so they can’t be modified. Note: that it has nothing to do with OAuth or OpenID.

For the FPS, this token is transparent and does not have to be parsed/interpreted/.. It only has to be sent in the HTTP redirect call to the BOSA DSS front-end server.

Here is an example of the contents of a getToken request:

|  |
| --- |
| *{*  *"name":"minfin",*  *"pwd":"U84SnLEQvp",*  *"in":"test.xml",*  *"xslt":"test.xslt",*  *"out":"signed\_test.xml",*  *"prof":"XADES\_1"*  *}* |

The “xslt” parameter is optional. It can be used when the input document is an XML file and it use by the user’s browser to convert the XML file into HTML code for viewingin the browser.

The “prof” parameter specifies which type of signature is requested. BOSA provides a list of the available values and their meaning.

## 2.3. The HTTP redirect

After the FPS has uploaded the document and obtained the token, it will do a HTTP redirect of the User’s browser to the BOSA DSS front-end server; this will handle the actual signing process.

This redirect contains the following parameters:

* The token obtained in the getToken call: this is at the end of the URL path
* A callback URL to the FPS: this is a query parameter
* A language parameter: this is a query parameter. Values: en, nl, fr, de
* A name parameter: this is used to show the FPS name in the User’s browser

Example of a redirect URL:

|  |
| --- |
| *https://sign.ta.fts.bosa.belgium.be/sign/SDZEgF935d6e9.DKEi8D7nFDZz8EEZLazemJFeLIE.2FIDsdf987dILEJFd?callback=http%3A%2F%2F%2Feservices.minfin.fgov.be%2Fcallback%3Ffilename%3Dsigned\_test.pdf&language=en&name=FPS%20XXX* |

With the token, the user’s browser will download the unsigned document and, if present, the XSLT file from the BOSA DSS server. It will then display the document (the PDF, the XML or the XLST-transformed XML) and read out the certificates from the User’s eID/foreigner card. It will then ask to enter the PIN and proceed with the actual signing.

## 2.4. The callback to the FPS

After the document is signed and available on the BOSA S3 server, the User’s browser will do a callback to the callback URL specified in the redirect (see above). The callback URL is completely specified by the FPS and can contain query parameters like a session ID.

Update 28.06.2021: Next to the signed document, a json file is added to the BOSA S3 server that contains the signing certificate and the simple and the detailed validation report.  
The filename of this json file is the output filename of the signed document, appended with ".validationreport.json" (e.g. if the filename of the signed document = "*8uSOFNM03ns4F8N.xml*" then filename of the json file = "*8uSOFNM03ns4F8N.xml.validationreport.json*")  
Just like the other files, it is up to the FPS to delete this json file.  
If the validation report will be used/saved by the FPS, it should be downloaded and then deleted from the S3 at the same time as the signed document. This is to avoid the case that a document with the same name should (accidentally) be used while the validation report of the previous signed document is still present. In case of doubt, it is possible to link both together by means of the reference-id as shown below:

|  |  |
| --- | --- |
| Signed document:signed_doc.png | *Validation report:*  validation_report.png |

In case of an error, the following parameters are added:

* err: an error string, e.g. *CERT\_REVOKED*
* details: a string with error details, this parameter is optional
* ref: a unique reference

Examples of a full callback URL:

|  |
| --- |
| ***http://eservices.minfin.fgov.be/callback?session=349317359*** |

|  |
| --- |
| ***http://eservices.minfin.fgov.be/callback?session=762087326****&ref=20210423092112378&err=CERT\_REVOKED* |

|  |
| --- |
| ***http://eservices.minfin.fgov.be/callback?session=650807315****&ref=20210423091821774&details=* *exp.%20date%20=%202017.05.29%2022:00:00&err=SIGN\_CERT\_EXPIRED* |

The bold part is the original callback URL specified by the FPS in the redirect, the rest has been added by the browser’s javascript.

Below is a list of the error strings that have been defined so far:

|  |  |
| --- | --- |
| ***Error string*** | ***Explanation*** |
| *SIGN\_CERT\_EXPIRED* | *Signing cert has expired* |
| *CERT\_CHAIN\_INCOMPLETE* | *No or incomplete certificate chain provided by the user* |
| *CERT\_REVOKED* | *A certificate (probably the signing certificate) has been revoked* |
| *INTERNAL\_ERR* | *Internal server error* |
| *NO\_SIGN\_CERT* | *No signing certificate has been provided by the user* |
| *INVALID\_SIG\_DATE* | *The provided signature date is too old or in the future* |
| *NO\_TOKEN* | *No token was provided* |
| *INVALID\_DOC* | *Validation of the signed document failed* |
| *UNKNOWN\_PROFILE* | *Unknown profile specified* |
| *EMPTY\_PARAM* | *Empty (null) parameter specified by the user* |
| *PARSE\_ERROR* | *Error parsing the request* |

## 2.4. PDF visible signatures

For PDF signing, it is possible to create visible a signature field or to use an existing one.

There are quite a number of options (image, text, colors, ..) that can be specified. Because the token is limited in size it has been decided to use a ‘**PDF signature profile**’ file (see below) that is to be uploaded to the S3 server to hold most of the parameters and only provide a minimum of parameters in the **getTokenForDocument** call.

1. So the **getTokenForDocument** call (and therefore the token) can only contain these parameters:

* **psp**: the name of the ‘PDF signature profile’ file
* **psfN**: the name of an existing PDF visible signature field
* **psfC**: the ‘coordinates’ for a new PDF visible signature field, this is either
  + the string “default” to use the default coordinates that are specified in the ‘PSP’ file
  + a comma-separated value of 5 integers: *page*, the *x* and *y* coordinates, *width* and *height*
* **psfP**: a boolean, if true then the photo from the eID card is read and used as image
* **lang**: the language to be used for the text in the signature field, this language must be specified in the “texts” field of the PSP file

All parameter are optional, if none are specified then an invisible PDF signature is made.  
If psfN or psfC (they are mutually exclusive) are specified then a visble PDF signature is made/used.

This is an example of the contents of a getTokenForDocument request:

|  |
| --- |
| *{*  *"name":"minfin",*  *"pwd":"U84SnLEQvp",*  *"in":"test.pdf",*  *"out":"signed\_test.pdf",*  *"****psp****":"minfin1.psp",*  *"****psfC****":"1,20,30,180,60",*  *"****psfP****":true,*  *"****lang****":"en"*  *}* |

So the *psfC* value means: put a signature field on the **1**st page, at coordinates (**20**, **30**) from the left top corner of the page, with width **180** and height **60**

2. The **PSP (PDF signature profile)** file is a json file as in the example below:

|  |
| --- |
| {  "bgColor" : "#D0D0D0",  "texts" : {  "en" : "Signed door %gn% %sn%",  "de" : "Unterzeichnet von %gn% %sn%",  "nl" : "Getekend door %gn% %sn%",  "fr" : "Signé par %gn% %sn%"  },  "font": "freescpt",  "textSize" : 14,  "textPadding" : 20,  "textAlignH" : "CENTER",  "textAlignV" : "MIDDLE",  "textPos" : "BOTTOM",  "textColor" : "#0000FF",  "defaultCoordinates" : "1,30,20,120,60",  "imageDpi" : 400,  "image" : "ZGVmYXVsdA=="  } |

The “bgColor” and “textColor “values for the RGB color code scheme, e.g. “#0000FF” = blue.

The “texts” can contain the following macros:

* **%gn%** : this is replaced by the Given Name in the user’s certificate
* **%sn%**: this is replaced by the Surname in the user’s certificate
* **%rrn%**: this is replaced by the RRN in the user’s certificate
* **%d(XXX)%**: this is replaced by the signing date, XXX is according to Java’s SimpleDateFormat [4]  
  e.g. %d(“d MMMM yyyy)% is replaced by e.g. “4 March 2021” in English

For the “font”, a number of fonts will be installed and their names documented. Currently there is the DSS default font and a “freescpt” font that resembles handwriting.

The “textAlignH” is the horizontal text alignment and can be “LEFT”, “CENTER”, “RIGHT”  
Default value is “NONE”, see [5]

The “textAlignV” is the vertical text alignment and can be “TOP”, “MIDDLE”, “BOTTOM”   
Default value is “NONE”, see [6]

The “textPos” defined the position of the text relative to the image: “TOP”, “BOTTOM”, “LEFT”, “RIGHT”

The “image” is a base64 image, the type (png, jpg, …) is automatically detected;  
or it can be the base64 encoding of the word “default”: "ZGVmYXVsdA==".

In case the “psfP” parameter is set to *true* in the getTokenForDocument call, then the photo of the eID card is used and the “image” value in the PSP is ignored.

All values are optional; in case of absence a default is used. If no “image” is specified then no image is used.

3. Current restrictions:

* With the default font, the “textSize” parameter seems to be ignored
* The “freescpt” font is not by default installed on Linux
* When the image is on top or below the text, it expands or contracts horizontally in order to take the full width

# 3. Sample/test FPS code and service

A simple Java service has been made that can serve as an example for the FPS.

It provides a simple ‘home page’ where the use can select a document to sign.  
Then the sample service uploads this document, requests a token and does a redirect.  
Finally a callback page is foreseen where the signed document is downloaded and the unsigned and signed document are deleted from the S3 server.

To build the sample: install maven and type the following on a command prompt:  
 *mvn package*

To run the sample service on Linux/MacOSX:  
 *java -cp "target/lib/\*":target/test\_fps-0.0.1-SNAPSHOT.jar com.zetes.projects.bosa.testfps.Main*Or on Windows:  
 *java -cp "target/lib/\*";target/test\_fps-0.0.1-SNAPSHOT.jar com.zetes.projects.bosa.testfps.Main*

When started successfully, the service will show the URL to which to surf to:

|  |
| --- |
| *Service started - press Ctrl-C to stop*  *Surf with your browser to http://localhost:8080* |

When the service starts, it reads configuration parameters from the ***config.txt*** file.  
*To actually be able to connect to the BOSA S3 service, an account should be requested from BOSA; and this account information (username and password) must be filled in this config file (i.e. replace the USERNAME\_HERE and PASSWORD\_HERE strings).*

**Demo service**

The above code has been deployed and can be found at the following URL: [3].

# References

[1] MinIO: <https://en.wikipedia.org/wiki/MinIO>

[2] MinIO SDKs: <https://docs.minio.io/> - select ‘MINIO SDKS’ on the left

[3] Sample/test FPS service: <https://mintest.qa.fts.bosa.belgium.be>

[4] <https://docs.oracle.com/javase/7/docs/api/java/text/SimpleDateFormat.html>

[5] <https://ec.europa.eu/cefdigital/DSS/webapp-demo/apidocs/eu/europa/esig/dss/enumerations/VisualSignatureAlignmentHorizontal.html>

[6] <https://ec.europa.eu/cefdigital/DSS/webapp-demo/apidocs/eu/europa/esig/dss/enumerations/VisualSignatureAlignmentVertical.html>